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Andre Vianna

The University of Texas Rio Grande Valley

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Effects of Bush Tax Cut and Obama Tax Increase on corporate payout policy and stock returns

Andre Vianna [†]

Abstract

This article analyzes the effects of the American Taxpayer Relief Act of 2012 (Obama Tax Increase) and the Jobs and Growth Tax Relief Reconciliation Act of 2003 (Bush Tax Cut) on corporate payout decision and stock returns. Logit and fixed-effect panel data analyses are conducted on all firms listed in NYSE, Amex and NASDAQ in the announcement windows of two, three and four quarters before and after the tax reforms. The results show that the implementation of these tax reforms more persistently affects dividend payments than stock repurchases. It also has a boosting effect on stock returns in the Bush Tax Cut that is 75% greater than their reducing effect in the Obama Tax Increase, in absolute terms, controlling for dividend payment and stocks repurchase. These effects are robust to different market capitalization sizes. Less solvent firms persistently spend larger dollar amounts in stock repurchases, especially in the announcement of the Bush Tax Cut (+1.11% per solvency ratio percentage in the [-2Q, +2Q] window). Insolvency is more often significant and with positive impacts on stock returns in the Obama Tax Increase, suggesting that some investors decide to migrate to leveraged-high-growth firms once they realize that some dividend-paying firms could change their dividend policies.

Keywords: Dividends; Payout policy; Regulation

JEL Classification: G35; C23; G38

[†] Financial Analyst at the Ministry of Finance of Brazil and CAPES Doctoral Grantee at the University of Texas Rio Grande Valley. E-mail address: andre.vianna01@utrgv.edu
College of Business and Entrepreneurship, University of Texas Rio Grande Valley, 1201 West University Drive, Edinburg, TX 78539, USA.

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1. Introduction

Firms can set different strategies for their payout policy, using dividend payments and stock repurchases as ways of sharing profits to their shareholders. Stocks repurchases are usually an opportunity for firms to have some control of the return of their shares, since buying them back can affect the market expectations about future stock price levels. Dittmar and Field (2015) show that, after controlling for risk factors, repurchasing firms earn positive returns. Dividend payments, on the other hand, are the instruments most commonly used by companies who wish to signal to the investor that they can make enough profit to distribute profits and, at the same time, have reached a safe and mature level of growth.

The choice of the best corporate policy depends on the firm's strategy. Fama and French (2001) show that dividend payment decision is related to the characteristics of the firm. Besides that, even after controlling for those firm characteristics, they show the existence of a long-term declining trend in dividend-paying firms. This paper analyzes two important U.S. tax reforms' implementation effects on the dividend payment and the stock repurchase policies. Those tax reforms are the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA 2003, also known as Bush Tax Cut) and the American Taxpayer Relief Act of 2012 (ATRA 2012, also known as Obama Tax Increase).

On May 28, 2003, President George W. Bush signed the JGTRRA 2003, which was later extended by the Tax Increase Prevention and Reconciliation Act of 2005 and by the Tax Relief, Unemployment Insurance Reauthorization and Job Creation Act of 2010. The main modification made by this tax law is the reduction of the maximum statutory personal tax rate on dividends from 38.1 percent to 15 percent. On January 2, 2013 President Barack Obama signed the Act of 2012 after a long battle with the Congress. The most important adjustment by this tax reform was the increase in the dividend tax rate for the top income tax payers – single filers who exceed the threshold of \$400,000, heads of households above \$425,000, joint filers beyond \$450,000 and estates and trusts with more than \$11,950 – from 15 to 20 percent.

The U.S. government faced different challenges when President George W. Bush cut dividends taxes in 2003 and when President Barack Obama signed the dividend tax increase in January 2013. Dubay (2013) states that, in 2003, lower interest rates were not generating economic benefits fast enough, and that was the reason for the Bush Tax Cut. In concerns to the Obama Tax Increase, the U.S. government faced several fiscal challenges in 2012, as well as income inequality concerns. Hungerford (2013) shows a 15-percent increase in income inequality among U.S. tax filers between 1991 and 2006: the largest contributors to that increase are the changes in income from capital gains and dividends. Huang and Marr (2012) affirm that the top 1 percent of taxpayers would receive 71 percent of all capital gains in that year, while the bottom 80 percent would receive 6 percent of all capital gains. Thus, one can argue that both tax reforms have advantages and disadvantages in terms of income inequality versus tax benefits: the Bush Tax

Cut boosted dividend distribution through a tax relief that makes dividend payments more attractive and helps to improve economic growth, even though income inequality rose in the following years, while Obama Tax Increase focuses on reducing this income inequality from the previous years by raising dividend tax rate only for the top-income tax payers – who receive most of the capital gains income – as a tool to help redistributing economic welfare among taxpayers.

The main questions in this paper are: a) how do dividend tax rate change effects on corporate payout policy compare between the Obama Tax Increase and the Bush Tax Cut? b) In the announcement windows in which those laws are passed, how quickly do those effects dissipate? c) How do the dividend tax rate changes, controlling for dividend payments and stock repurchases, affect stock returns?

The goal of this paper is to perform a study around announcement periods in order to quantitatively compare the effects of Bush Tax Cut and Obama Tax Increase on dividend payments, stocks repurchases and stock returns. This study analyses 18,229 firms listed on the NYSE, Amex and Nasdaq from January 1990 to June 2014. Financial firms and utilities are excluded, as done by similar studies, to avoid noise in the regressions from those firms' regulatory issues. Panel-data logit regressions measure the effect of the independent variables – especially the dividend tax rate – on dividend payment and stock repurchase decisions. Panel-data fixed-effect regressions quantify the relationships between the studied variables and the dollar amounts paid in dividends and spent in stock repurchases. The hypotheses of this paper are: 1) both tax reforms' implementations had short-lived effects on corporate payout policy and stock returns, since markets should rapidly adjust; 2) Controlling for dividend payments and stock repurchases, stock returns are more affected by the Bush Tax Cut than the Obama Tax Increase, since the latter was not as large as expected by the market.

Hypothesis 1 works as a null hypothesis that will be rejected if there is any evidence that a tax law passage has persistent effects on dividend payments, stock repurchases and stock returns. Hypothesis 2 states that stock returns receive a larger impact from the Bush Tax Cut than from the Obama Tax Increase. Although a similar comparison on these two tax law reforms has not been done yet in the literature to knowledge, the second hypothesis is based upon Yousuf (2013) who reports that fund strategists expected a higher tax hike and are relieved because dividend stocks will still be attractive compared to other alternative investments. Moreover, both hypotheses are based upon Jagannathan, Stephens and Weisbach's (2000) evidence that dividend payments and stock repurchases are used at different times from one another and that repurchases are very pro-cyclical.

The results show that these dividend tax law passages are more persistently correlated with dividend payments than with stock repurchases and also confirm the hypothesis that, in absolute terms, stock returns are more affected by the Bush Tax Cut (+1.3% in the shorter event window) than the Obama Tax Increase (-0.75% in the shorter event

window). Moreover, larger firms are more likely to pay dividends than to repurchase stocks in the quarters immediately after the dividend tax reform implementation. The evidence suggests that less solvent firms persistently spend larger dollar amounts in stock repurchases, especially in the Bush Tax Cut (+1.11% per solvency ratio percentage). Finally, the results show that the previous findings are robust for different firm sizes (small, mid, and large cap).

The rest of the paper proceeds as follows. Section 2 outlines the previous literature. Section 3 describes the data and the methodology. Section 4 reports the regressions results, while section 5 provides robustness checks for different firm sizes. Finally, section 6 provides the conclusion of the paper.

2. Previous Studies

The dividend irrelevance hypothesis by Miller and Modigliani (1961) demonstrates that corporate dividend policy does not matter. Later studies, however, provide evidence that dividend policy is relevant to the real world. For instance, research claims the existence of market imperfections such as differential taxes (Litzenberger & Ramaswamy, 1979; Poterba & Summers 1984; Barclay 1987) while others discuss clientele effects (Pettit, 1977; Scholz, 1992; Allen, Bernardo & Welch, 2000). The signaling theory explains that firms deliver information to the market by paying dividends (Bhattacharya, 1979; Miller and Rock, 1985; Bali 2003), while the agency theory claims that dividends can reduce controlling shareholder's cost of conflict (Rozeff, 1982; Easterbrook, 1984; Jensen, 1986; Alli, Khan and Ramirez 1993).

Lower propensity to pay dividends is at least as important as changing characteristics of firms to the declining incidence of dividend-paying firms (Fama and French, 2001). Despite of some controversy around the propensity to pay variable, authors agree that the changing characteristics of dividend payers lead to lower percentages of dividend payers in the long term.¹

As revealed by Blouin, Raedy and Shackelford (2004), the implementation of the Jobs and Growth Tax Relief Reconciliation Act of 2003 had the effect of increasing regular dividends by \$3.8 billion and special dividends by \$1.2 billion. The authors examine dividend payments in the three months immediately after the tax reform passage (from May 23 to August 22, 2003). They compare dividend payments in the post-reform period with dividends in the same period in 2002 and the three month period immediately before the tax law, and conclude that virtually all the increase in dividend payments after the tax reform is due solely to 17 firms, finding no statistically significant changes in regular dividend amounts.

¹ Chahyadi & Salas (2012) assert that 100% of the decline in the proportion of dividend payers can be explained by changes in firm characteristics only.

Julio and Ikenberry (2004) extend Fama and French (2001) analysis up to the first quarter of 2004, and show that the secular downward trend in the percentage of firms paying dividends makes a reversal starting in late 2000. This paper analyzes the period from 1990 to June 2014 to compare the characteristics of dividend payers between the 1990-1999 and 2000-2014 periods. Figure 1 shows that the rising trend in the percentage of dividend payers detected by Julio and Ikenberry (2004) is in fact persistent in the last decade, although it shows a temporary slowdown in 2007-2009 which corresponds to the United States financial crisis period.

Nam, Wang, and Zhang (2004) find executive ownership's correlation with dividend increases in 2003, despite of no such relation in previous years. Although the focus of the current study is to analyze the effects of Bush's and Obama's tax reform implementation on dividend payment decision, the findings on executive ownership shed light on the fact that there are different reasons why a firm considers dividend payments and stock repurchases. Considering the Obama Tax Cut, Pérez-Cavazos and Silva (2014) find that top executives strategically realize their built-in capital gains prior to the tax hikes, saving nearly \$740 million in personal taxes in 2012. They also distribute \$8 billion in special and accelerated dividends, saving their shareholders from nearly \$700 million in taxes in that year. Cebula et al. (2014) provide evidence that the incentive to engage in federal personal income tax evasion has been increased as a direct consequence of the public tax-increase policies as the Act of 2012. Hanlon and Hoopes (2014) find evidence that, immediately before the expected tax increase, firms altered the timing of their regular dividend payments by shifting what would normally be January regular dividend payments into the preceding December. This suggests that corporate payout decisions react to the before and after periods of the dividend tax reforms. This paper takes into account small (-2Q, +2Q), medium (-3Q, +3Q) and large (-4Q, +4Q) windows of the announcement in order to capture those important corporate payout movements.

There are notable differences between choosing to payout by means of dividends or stock repurchases. The most practical difference is that stock repurchases are not taxable to the firm, neither to the investors who keep their shares. Wealth effects of stock repurchase programs have been extensively studied and shows that increases in the wealth of common stockholders occur around the announcement data of the stock repurchases (Masulis, 1980; Dann, 1981; Dann and DeAngelo, 1983; Bradley and Wakeman, 1983; Vermaelen, 1981, & 1984; Klein & Rosenfeld 1988).

Additionally, deleveraging the firm's capital structure is associated with a firm's decision to repurchase shares. Tsetsekos, Kaufman Jr and Gitman (2011) perform a comprehensive survey of major U.S. firms and provide evidence that they view stock repurchases as financing decisions rather than investment. The reason behind most of the repurchase decisions is mainly due to changes in the firm's capital structure, having the majority of the survey responses being consistent with the signaling hypothesis.

Ben-Rephael, Oded, and Wohl (2013) show that firms repurchase at prices that are significantly lower than average market prices. They find that the price discount has a negative relationship with firm size and a positive association with market-to-book ratio. They also show that insider trading is positively related to actual repurchases. Finally, Jagannathan et al. (2000) show that dividend payments and stock repurchases are used at different times from one another and that repurchases are very pro-cyclical. This evidence is consistent with the hypotheses of short-lived effects of dividend tax reforms' passage on corporate payout policy and stock returns and of dividend different tax reform effects on stock returns among the Bush Tax Cut and the Obama Tax Increase. After controlling for dividend payments and stock repurchases, results shows further evidence to Yousuf (2013) who reports that fund strategists expected a higher tax hike and are relieved after the law passage.

3. Data and methodology

In order to examine the comparison between dividend payers and stock repurchasers, quarterly data from January 1990 to June 2014 is collected from Compustat. The announcement windows used in the regressions are up to four quarters before and after the dividend tax change announcements. The sample consists of 18,229 firms listed on NYSE, Amex and Nasdaq. Financial firms (SIC codes 6000-6999) and utilities (SIC codes 4900-4949) are excluded, following Fama and French (2001).

Figure 1: Percentage of dividend-paying and stock-repurchasing firms

This figure reports the percentages of firms that paid dividends and the percentages of firms that repurchased stocks in at least one of the four quarters of the year. The data is yearly from 1990 to 2014. For 2014, data is from the first two quarters of that year.

Data Source: Compustat. Graph produced by: the author.

Figure 1 shows a reversal in the declining trend of dividend-paying firms (percentage of dividend payers) starting in 2000, as noted by Julio and Ikenberry (2004). This rising trend of dividend-paying firms continues up to the present, even though there is a period of declining payments from 2007 to 2009 due to the United States financial crisis period. Stock repurchases move in cycles, with a top in the pre and post periods of the internet bubble and 2008 – 2009 financial crisis.

Hausman test is conducted on the fixed effects (FE) and random effects (RE) panel data to check for the most efficient method.² The test result indicates fixed effects is the appropriate regressions.

The following empirical model is analyzed by using logit and fixed-effect panel data methods:

$$PAYOUT_{ij} = \beta_0 + \beta_1 Size_{it} + \beta_2 Tobin's Q_{it} + \beta_3 Growth_{it} + \beta_4 Profitability_{it} + \beta_5 Insolvency_{it} + \beta_6 Tax_{it} + c_i + \varepsilon_{it}$$

where:

$PAYOUT_{it}$ alternates four different forms depending on the method of regression (Logit and Fixed-effects) and the corporate payout (dividend payment and stock repurchase).

In the logit regressions, the binary variable $PAYDIV$ measures the dividend payment probability and the variable REP measures the stock repurchasing decision. In the fixed-effects regressions, the variable $\ln(DIV)$ corresponds to the natural log of the dividend dollar amounts, while the variable $\ln(REPURCH)$ refers to the natural log for the stock repurchase dollar amounts.

Size is the natural log of the market capitalization, Tobin's Q is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities), Growth is the natural log of the growth of assets between each quarter, Profitability is the natural log of the earnings to asset ratio, Insolvency is the natural log of the liabilities to assets ratio, and Tax is the dividend tax rate for the top-income stockholders. The term c_i corresponds to the unobserved heterogeneity and only applies to the fixed-effect regressions, while the term ε_{it} is the panel-data regression error term.

Since results from logit regressions on the decision of paying dividends or repurchasing stocks do not need to be necessarily similar to the results from the dividend payments and repurchases dollar amounts³, additional robustness checks are performed in section 5 by checking whether results hold for different firm sizes and different time periods.

² See Hausman (1978).

Variables are log transformed to normalize the data, without changing the variance properties of the variables. This way, each firm's variables are in smoother scales which are more compatible with one another. In the log-log model, the coefficients can be interpreted as “the elasticity of y with respect to x ” (Wooldridge, 2012, p.44), or the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. Martínez-Zarzoso (2013) argues that the rationale for using a log-log model comes from a desire to generate an estimate that easily yields elasticities or a need to deal with dependent variables that are skewed to the right.

Firm size is the variables that has the highest correlation with dividend payment amounts and stock repurchases (Figure 2).

Figure 2: Firm size correlation with dividend and stock repurchase dollar amounts

This figure shows the correlation between the natural log of firm size, measured by market capitalization, and the natural log of: a) the dividend payment dollar amount, in the graph on the left; b) the stock repurchase dollar amount, in the graph on the right. The data is quarterly from January 1990 to June 2014.

Data Source: Compustat.

Table 1 shows the summary statistics of the variables in the model, which are in more details in the following subsections.⁴

3.1. Size

³ For example, a firm with good investment opportunities (high Tobin's Q) could decide to start paying dividends after a dividend tax cut, but the payment dollar amounts from those high-Tobin's-Q firms will not necessarily be higher than other firms' amounts.

⁴ On section 5, a robustness check from Table 9 compares the variables for dividend payers and non-payers in the periods from 1990 to 1999 and from 2000 to 2014.

The variable *Size* is the natural logarithm of the market capitalization (market value of the stock). The market capitalization value is in US\$ million. Dividend payers are larger than non-payers from 1990-2014. From 1990 to 1999, the average market capitalization of dividend payers is about US\$ 3 billion, while in 2000-2014, it is around US\$ 8.3 billion. The size of the non-payers is much smaller: in 1990-1999 it averages US\$ 361 million and about US\$ 1.1 billion in the period from 2000 to 2014.

3.2. Investment opportunities (Market-to-book asset ratio: a proxy for Tobin's Q)

The market-to-book asset ratio (variable *Tobin's Q*) is the investment opportunities variable from Fama and French (2001). It is the natural log of the book-to-market ratio of assets. Dividend payers have less investment opportunities than non-payers. In the period from 1990 to 1999, the average market-to-book ratio of dividend payers is about 1.3, while in the 2000-2014 period, it is around 1.4. The investment opportunities of non-payers are much higher: in 1990-1999 the market-to-book ratio averages 2.7 and is 13.0 in the period from 2000 to 2014.

3.3 Growth Opportunities

The variable growth is the percentage gain or loss of total assets in two periods: $(A_t - A_{t-1})/A_{t-1}$. Dividend payers are firms with less growth opportunities than non-payers. From 1990 to 1999, the average asset growth ratio of dividend payers is about 4.1, while in 2000-2014 it is around 12.8. The growth opportunities of non-payers are much higher: in 1990-1999 asset growth ratio averages 33.2 and is 83.5 in the period from 2000 to 2014.

3.4. Profitability

The natural log of the ratio of aggregate earnings before interest to aggregate assets is a proxy for *Profitability*. Comparing the profitability of firms in the 1990-1999 and in the 2000-2014 periods, dividend payers are more profitable than non-payers. From 1990 to 1999, the average profitability of dividend payers is close to zero (0.005 per quarter), while in 2000-2014 it is negative (-0.01 per quarter). The profitability ratio of the non-payers is even more negative: in 1990-1999 it is -0.208 and it averages -1.901 in the period from 2000 to 2014.

3.5. Insolvency

The variable *Insolvency* is equal to the natural log of the ratio of total liabilities to total assets. Dividend payers have lower insolvency ratios, i.e., they are more solvent than non-payers. From 1990 to 1999, the average insolvency ratio of dividend payers is about 0.53, while in 2000-2014, it is around 0.56. The insolvency ratios of non-payers are much higher: in 1990-1999 the insolvency ratio averages 0.94 and it is 2.74 in the period from 2000 to 2014.

3.6. Dividend tax

Tax is the dividend tax rate for the top-income stockholder which moves down from 20 to 15 percent in the Bush Tax Cut and increases from 15 to 20 percent in the Obama Tax Increase for investors whose income levels are set to pay an ordinary income tax rate of 39.6%.⁵

Table 1: Summary Statistics

This table reports the summary statistics of the log-transformed variables. The variables *PAYDIV* and *REP* are, respectively, the dividend payment decision and the stock repurchase decision binary variables used as dependent variables in the Logit regressions; the variables *ln(DIV)* and *ln(REPURCH)* are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables used as dependent variables in the fixed-effect regressions; *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q; *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders.

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
PAYDIV	615,039	0.2696	0.4437	0.0000	1.0000
REP	615,039	0.2221	0.4157	0.0000	1.0000
ln(DIV)	158,750	1.8675	2.5366	-6.9078	10.4944
ln(REPURCH)	136,614	1.1321	3.1013	-6.9078	10.4839
Size	565,602	4.8238	2.4276	-9.7346	13.3480
Tobin's Q	563,842	0.0204	1.2708	-14.2784	11.6562
Growth	565,910	0.0181	0.3054	-16.6355	16.2804
Profitability	318,144	-4.2010	1.0627	-16.8953	12.5757
Insolvency	593,412	-0.8759	0.9797	-9.4656	10.1647
Tax	615,039	0.1808	0.0243	0.1500	0.2000

Table 2 provides the correlation table, which shows a strong relationship between the dependent variables and firm size, consistent with Fama and French (2001), suggesting that newborn firms aim high growth and do not pay dividends

⁵ The top-income stockholders are the majority of investors. As noted by Huang and Marr (2012), the top 20 percent of taxpayers received around 94% percent of all capital gains in 2012.

in the beginning years. Profitability and Tobin's Q (investment opportunities) have a medium correlation of about 0.45, while Size and Tobin's Q show a low correlation of around 0.22.

Since the variable *Size* has a high correlation with all the dependent variables, the reader might ask himself whether the dividend payment decision and respective dollar amounts are simply a matter of how big a firm is. In order to show that results hold for firms with different capitalization sizes (small cap, mid cap and large cap), I include two robustness checks in Section 5.

Table 2: Correlations

This table reports the correlations of the log-transformed variables. The variables *PAYDIV* and *REP* are, respectively, the dividend payment decision and the stock repurchase decision binary variables used as dependent variables in the Logit regressions; the variables *ln(DIV)* and *ln(REPURCH)* are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables used as dependent variables in the fixed-effect regressions; *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders.

	PAYDIV	REP	ln(DIV)	ln(REPURCH)	Size	Tobin's Q	Growth	Profitability	Insolvency
REP	0.2469	1.0000							
ln(DIV)	.	0.1931	1.0000						
ln(REPURCH)	0.2917	.	0.6837	1.0000					
Size	0.4090	0.2900	0.8347	0.7418	1.0000				
Tobin's Q	-0.0754	-0.0264	0.0974	0.1895	0.2153	1.0000			
Growth	0.0036	-0.0083	-0.0211	0.0106	0.1037	0.0271	1.0000		
Profitability	-0.0268	0.0156	0.0670	0.1297	-0.0112	0.4555	0.0535	1.0000	
Insolvency	0.0677	-0.0024	0.1704	0.1777	-0.0676	-0.1265	-0.1342	-0.1173	1.0000
Tax	0.0022	-0.0338	-0.2078	-0.1799	-0.1477	-0.0566	-0.0100	-0.0459	0.0184

4. Results

The panel data logit regression results for the Bush Tax Cut (Table 3) show that firm size, profitability and the dividend tax rate are significant explanatory variables to the dividend payment decision in the (-2Q, +2Q) window. Firm size has a strong positive effect (1.933 percent more likely to pay dividends for each 1 percent change in firm size), significant to the 10% level. Profitability shows a positive coefficient sign with 5% level significance and a negative elasticity towards dividend payment decision. The tax rate shows a strong negative coefficient that is significant to the 1% level. In the (-3Q, +3Q) window, size becomes an insignificant variable. Tobin's Q (investment

opportunities) shows a surprisingly positive coefficient that is significant to the 5% level. Profitability effect remains positive in this announcement window and the tax rate keeps a strong negative coefficient, only slightly weaker than in the tightest announcement window. In the (-4Q, +4Q) window, the market-to-book asset ratio maintains the positive coefficient, while profitability becomes statistically insignificant. The dividend tax rate kept a strong negative sign in this announcement window. Evidence also shows that firm's growth and insolvency does not affect the dividend payment decision in the Bush Tax Cut. The stock repurchase probability is greater than the dividend payment decision in the (-2Q, +2Q) window for the highly profitable but less solvent firms. The dividend tax rate reduction is effective in this smaller announcement windows, however it turns out insignificant for the broader windows (-3Q, +3Q) and (-4Q, +4Q). For these two windows, stock repurchase decision is more likely in smaller firms with a high market-to-book asset ratio.

For the Obama Tax Increase, the panel data logit regression (Table 4) shows that larger firms are more likely to pay dividends and less likely to repurchase stocks in the (-2Q, +2Q) window, but became more likely to use both payout methods in the broader (-4Q, +4Q) window. Moreover, the tax rate coefficient shows that firms most likely avoid paying dividends and repurchasing stocks in the (-2Q, +2Q) and (-3Q, +3Q) windows. However, in the (-4Q, +4Q), the tax rate effect is significantly positive for the dividend payment decision and shows no significance to stocks buybacks. These two results combined add evidence that the tax hike was not as large as expected by the market, which is consistent with Yousuf (2013), who reports that fund strategists are relieved, despite the tax rate increase, because dividend stocks would still be attractive compared to other alternative investments. Consistent with the literature, firms with high market-to-book ratios and asset growth are less likely to pay dividends, as well as to repurchase stocks. Additionally, profitable firms are more likely to repurchase stocks than pay dividends. Insolvent firms have a greater probability to repurchase stocks in the immediate quarters of the dividend tax announcement, while solvent firms are more likely to pay dividends longer. This result is in line with Yousuf's (2013) evidence that market analysts agreed that the Obama Tax Increase could have been worse.

Table 3: Panel Data Logit regressions on Bush Tax Cut

This table reports the panel data Logit regressions for the log-transformed variables in windows of two, three and four quarters before and after the Bush tax reform. The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The variables *PAYDIV* and *REP* are, respectively, the dividend payment decision and the stock repurchase decision binary variables used as dependent variables; *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

	<i>PAYDIV</i> : Dividend payment decision			<i>REP</i> : Stock repurchase decision		
Independent Variables	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-24.18*** (-6.38)	-18.20*** (-7.66)	-17.30*** (-8.89)	-10.78*** (-4.50)	-2.261 (-1.57)	-1.629 (-1.42)
Insolvency	0.108 (0.11)	0.330 (0.83)	0.448 (1.58)	0.889** (2.10)	0.424** (2.02)	-0.0282 (-0.19)
<i>Control variables</i>						
Size	1.933* (1.91)	-0.219 (-0.45)	0.448 (1.50)	0.0391 (0.06)	-1.830*** (-5.89)	-1.307*** (-6.70)
Tobin's Q	0.0608 (0.05)	1.243** (2.29)	0.824** (2.46)	0.241 (0.33)	1.361*** (4.12)	0.868*** (4.11)
Growth	-0.904 (-0.78)	0.0233 (0.05)	-0.426 (-1.00)	-0.500 (-0.76)	-0.0895 (-0.25)	-0.321 (-1.27)
Profitability	0.301** (2.28)	0.127* (1.72)	0.0476 (0.80)	0.251*** (3.17)	0.178*** (3.75)	0.133*** (3.56)
Chi-squared	186.31	179.81	327.19	52.58	82.63	103.67
Pseudo R-squared	0.2330	0.0977	0.1089	0.0360	0.0190	0.0140
Observations	1,068	2,353	3,665	1,971	5,780	9,187
Number of firms	294	461	563	548	1,151	1,438

Table 4: Panel Data Logit regressions on Obama Tax Increase

This table reports the panel data Logit regressions for the log-transformed variables in windows of two, three and four quarters before and after the Obama tax reform. The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The variables *PAYDIV* and *REP* are, respectively, the dividend payment decision and the stock repurchase decision binary variables used as dependent variables; *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

Independent Variables	<i>PAYDIV</i> : Dividend payment decision			<i>REP</i> : Stock repurchase decision		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-20.55*** (-8.96)	-11.56*** (-6.13)	2.886* (1.89)	-13.19*** (-6.88)	-7.533*** (-5.13)	-0.0967 (-0.08)
Insolvency	0.867* (1.76)	0.725** (2.14)	0.478* (1.85)	1.148** (2.47)	0.505* (1.89)	0.0624 (0.34)
<i>Control variables</i>						
Size	1.512* (1.77)	1.439*** (2.94)	1.905*** (5.58)	-1.204* (-1.75)	-0.114 (-0.30)	0.729*** (2.95)
Tobin's Q	-0.585 (-0.67)	-0.235 (-0.46)	-1.229*** (-3.50)	-0.223 (-0.34)	-0.601 (-1.58)	-1.310*** (-5.10)
Growth	-3.364*** (-4.04)	-2.327*** (-4.09)	-3.382*** (-6.64)	-1.693** (-2.57)	-1.719*** (-3.85)	-1.657*** (-5.04)
Profitability	-0.0565 (-0.67)	0.0463 (0.70)	0.0640 (1.20)	0.250*** (3.39)	0.0739 (1.45)	0.104*** (2.60)
Chi-squared	107.74	68.43	106.55	156.68	89.32	57.64
Pseudo R-squared	0.0906	0.0334	0.0323	0.0902	0.0268	0.0104
Observations	1,604	2,743	4,155	2,269	4,158	6,929
Number of firms	443	521	624	640	813	1063

Table 5 shows interesting results for the dollar amounts of dividend payments and stock repurchases in the Bush Tax Cut. The dividend tax rate cut in 2003 boosted dividend dollar amounts with a higher intensity and persistence than the stock repurchasing amounts. It also shows a positive firm size effect for both payout methods, with a greater coefficient for the dividend payment dollar amounts. The market-to-book asset ratio is significant only for the dividend dollar amounts, with negative sign as in the literature.

Table 5: Panel Data Fixed-Effects regressions on Bush Tax Cut

This table reports the panel data fixed-effects regressions for the log-transformed variables in windows of two, three and four quarters before and after the Bush tax reform. The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The variables $\ln(DIV)$ and $\ln(RepURCH)$ are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables used as dependent variables; $Size$ is the natural log of the market capitalization; $Tobin's Q$ is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); $Growth$ is the natural log of the growth of assets between each quarter; $Profitability$ is the natural log of the earnings to asset ratio; $Insolvency$ is the natural log of the liabilities to assets ratio; Tax is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

Independent Variables	$\ln(DIV)$			$\ln(RepURCH)$		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-10.43*** (-19.29)	-2.995*** (-6.54)	-1.402*** (-3.80)	-6.878*** (-8.38)	-1.314 (-1.59)	-0.318 (-0.43)
Insolvency	-0.0163 (-0.14)	0.221** (2.41)	0.113* (1.81)	1.107*** (6.23)	0.990*** (6.44)	0.811*** (6.81)
<i>Control variables</i>						
Size	1.044*** (6.60)	0.0994 (0.89)	0.292*** (4.03)	0.677** (2.43)	-0.253 (-1.13)	0.224 (1.42)
Tobin's Q	-0.579*** (-3.39)	0.0354 (0.29)	-0.150* (-1.85)	-0.395 (-1.34)	0.378 (1.57)	-0.100 (-0.59)
Growth	-0.518*** (-3.72)	-0.326*** (-2.82)	-0.415*** (-4.50)	-1.110*** (-4.08)	-0.595** (-2.37)	-0.970*** (-4.56)
Profitability	0.0928*** (5.09)	0.0826*** (5.23)	0.0777*** (6.27)	0.155*** (5.35)	0.131*** (4.52)	0.133*** (5.17)
Constant	-2.980*** (-2.64)	2.417*** (2.99)	0.735 (1.38)	-0.172 (-0.09)	4.652*** (3.06)	1.351 (1.25)
Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,225	6,335	8,546	4,040	5,936	7,868
F-statistics	163.63	23.28	26.27	40.23	10.79	14.6
R-squared	0.261	0.029	0.023	0.088	0.016	0.015
Number of firms	1,446	1,589	1,695	1,539	1,860	2,076

Firm growth is significant and negatively related to both dividend and repurchase dollar amounts, although fast-growing firms are less likely to spend dollars on stocks buybacks than on dividend payments. Profitable firms are more likely to use both payout methods, with a higher probability to use stock repurchases.

Table 6: Panel Data Fixed-Effects regressions on Obama Tax Increase

This table reports the panel data fixed-effects regressions for the log-transformed variables in windows of two, three and four quarters before and after the Obama tax reform. The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The variables $\ln(DIV)$ and $\ln(REPURCH)$ are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables used as dependent variables; $Size$ is the natural log of the market capitalization; $Tobin's Q$ is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); $Growth$ is the natural log of the growth of assets between each quarter; $Profitability$ is the natural log of the earnings to asset ratio; $Insolvency$ is the natural log of the liabilities to assets ratio; Tax is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

Independent Variables	$\ln(DIV)$			$\ln(REPURCH)$		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-11.01*** (-20.35)	-6.613*** (-16.09)	-1.676*** (-4.50)	-8.585*** (-10.73)	-4.540*** (-6.84)	-0.567 (-0.91)
Insolvency	0.412*** (3.20)	0.209** (2.49)	0.0959 (1.35)	0.415** (2.13)	0.457*** (3.45)	0.399*** (3.59)
<i>Control variables</i>						
Size	0.306 (1.55)	0.929*** (7.84)	1.232*** (14.04)	0.290 (0.98)	0.412** (2.28)	0.708*** (4.98)
Tobin's Q	-0.204 (-1.07)	-0.540*** (-4.48)	-0.930*** (-10.23)	-0.520* (-1.77)	-0.400** (-2.18)	-0.549*** (-3.77)
Growth	-0.755*** (-4.32)	-0.594*** (-4.98)	-0.808*** (-7.61)	-0.712** (-2.47)	-0.466*** (-2.69)	-0.793*** (-4.87)
Profitability	0.0805*** (3.54)	0.0696*** (4.27)	0.0601*** (4.27)	0.147*** (4.39)	0.136*** (5.16)	0.156*** (6.66)
Constant	3.459** (2.34)	-2.220** (-2.52)	-5.528*** (-8.50)	2.785 (1.29)	1.169 (0.89)	-1.662 (-1.61)
Fixed Effects?	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,129	7,758	10,225	4,743	7,158	9,438
F-statistics	91.31	49.88	40.12	31.68	16.34	14.68
R-squared	0.139	0.048	0.028	0.060	0.018	0.012
Number of firms	1,722	1,796	1,857	1,741	1,866	2,029

For the Obama Tax Increase, the panel data fixed-effects regression (Table 6) shows the dividend tax rate increase made firms decrease the dividend payment dollar amounts in a greater magnitude than they reduced the stock repurchase amounts, for which the tax increase effect becomes insignificant for the broader announcement window (-4Q, +4Q). This indicates a faster dissipation of the tax increase effect on the buybacks. It also provides evidence that large firms spent larger dollar amounts with dividends than with stock repurchases. In line with Fama and French (2001), fast-growing firms, highly profitable companies with high market-to-book asset ratio spent larger dollar amounts with dividend payments and stock repurchases.

Table 7: Stock returns (Panel Data Fixed-Effects for both Tax Reforms)

This table reports the panel data fixed-effects regressions for the log-transformed variables in windows of two, three and four quarters before and after both tax reforms. The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The dependent variable is the quarterly stock return. The variables $\ln(DIV)$ and $\ln(REPURCH)$ are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables that, in this regression, are explanatory variables. The other explanatory variables are: *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

Dependent variable: Stock returns						
VARIABLES	Bush Tax Cut			Obama Tax Increase		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-1.304*** (-5.27)	-0.589*** (-2.76)	-1.122*** (-6.24)	-0.747*** (-5.55)	-0.146 (-1.36)	-0.263*** (-2.83)
$\ln(DIV)$	-0.0376*** (-3.79)	0.00771 (0.92)	-0.00101 (-0.15)	-0.0110** (-2.31)	-0.00416 (-1.11)	-0.0126*** (-3.99)
$\ln(REPURCH)$	-0.000445 (-0.07)	-0.00167 (-0.35)	0.000474 (0.13)	-0.00420 (-1.16)	-0.00416 (-1.58)	-0.00403* (-1.93)
Tobin's Q	0.750*** (22.32)	0.443*** (14.42)	0.410*** (17.62)	0.586*** (19.41)	0.478*** (24.61)	0.389*** (26.58)
Growth	0.477*** (5.74)	0.326*** (4.25)	0.343*** (5.67)	0.371*** (8.02)	0.309*** (9.55)	0.258*** (9.23)
Profitability	-0.00289 (-0.32)	-0.0182** (-2.02)	-0.0179** (-2.44)	0.00118 (0.19)	0.00104 (0.22)	-0.00278 (-0.71)
Insolvency	0.106 (1.44)	0.100 (1.53)	0.139*** (2.88)	0.112*** (2.73)	0.101*** (3.69)	0.0834*** (3.87)
Constant	0.407*** (4.58)	0.126 (1.60)	0.233*** (3.70)	0.268*** (4.97)	0.130*** (3.39)	0.162*** (5.26)
Observations	1,851	2,712	3,604	2,707	4,094	5,367
F-statistic	112.13	47.56	80.92	59.0	106.45	119.67
R-squared	0.406	0.151	0.175	0.196	0.198	0.165
Number of firms	695	828	927	1,007	1,063	1,130

The stock returns regression (Table 7) shows that stock returns are more affected by the Bush Tax Cut than the Obama Tax Increase. In the (-2Q, +2Q) announcement window, the boosting effect on stock returns in the Bush Tax Cut is 75% greater than the reducing effect in the Obama Tax Increase. These effects are measured by controlling for dividend payment and stocks repurchase. The negative signs from those control variables mean that those payouts negatively affect stock returns, as expected, since prices usually go down when there is a corporate payout. The remaining control variables behave similarly in both tax reform periods, although insolvency is more often significant and has positive impacts on stock returns in the Obama Tax Increase. This suggests that leveraged high-growth firms did not benefit as much from the Bush

Tax Cut than from the Obama Tax Increase and, therefore, some investors may have decided to migrate to those firms' stocks once they realize that some dividend-paying firms could change their dividend policies.

5. Robustness Checks

This section performs two robustness checks for firm size in Tables 8 and 9. Size is highly correlated with dividend payment decision and dollar payment amounts as well as with the repurchase probability and its dollar amounts. Table 8 splits the sample into large cap, mid cap and small cap firms. The large capitalization firms (Panel A) are the ones with market capitalization above US\$ 10 billion, while the mid cap firms (Panel B) are the ones with sizes between US\$ 2 and 10 billion. Finally, the small cap firms (Panel C) have a market capitalization below US\$ 2 billion. Table 9 compares the averages of the variables in the model among dividend payers and non-payers in the 1990-1999 and 2000-2014 periods.

Results from Table 8 provide evidence that the variables' relationships found in the previous tables in this paper are robust. The tax variable coefficient confirms the negative relationship between dividend tax and stock returns: for the Bush Tax Cut, results from the $(-2Q,+2Q)$ windows show further evidence that for larger firms (Panel A) the coefficient is larger (-1.685) in absolute value than for mid cap (-1.410) and small cap firms (-1.252) . These coefficients are significant to the one percent level. For the Obama Tax Increase, there is evidence that tax impacts in $(-2Q,+2Q)$ and $(-4Q,+4Q)$ found in table 7 are consistent, especially for the large cap firms. However, Panels B and C (mid and small cap firms) show significant responses only in the immediate $(-2Q,+2Q)$ window, suggesting a faster adjustment of small and mid-cap firms to dividend tax changes.

Table 8 confirms that insolvency plays an important role in the stock returns of a firm in the Obama Tax Increase period: controlling for dividends and stock repurchase, insolvency is positively associated with stock returns, which suggests that insolvent firms – which usually do not pay dividends – benefit from the dividend tax increase. The control variables in Table 8 display similar results to Table 7, confirming that the model is robust to firm size. Additionally, results from the control variables are in line with results from Fama and French (2001).

Table 8: Stock returns for Different Firm Sizes (Panel Data Fixed-Effects)

This table reports the panel data fixed-effects regressions for the log-transformed variables in windows of two, three and four quarters before and after both tax reforms. Panel A shows the regressions for firms with market capitalization sizes above US\$ 10 billion (large cap). Panel B performs regressions for capitalization sizes between US\$ 2 and 10 billion (mid cap). Panel C displays the regression results for firms with market capitalization below US\$ 2 billion (small cap). The log-log model not only benefits from normalizing the skewed and different scaled data, but also makes the interpretation easier since it measures the elasticity, i.e., the percentage-point change effect in the dependent variable for each percentage point change in the explanatory variable. The dependent variable is the quarterly stock return. The variables $\ln(DIV)$ and $\ln(REPURCH)$ are, respectively, the dividend dollar amounts and the stock repurchase dollar amounts variables that, in this regression, are explanatory variables. The other explanatory variables are: *Size* is the natural log of the market capitalization; *Tobin's Q* is the natural log of the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the natural log of the growth of assets between each quarter; *Profitability* is the natural log of the earnings to asset ratio; *Insolvency* is the natural log of the liabilities to assets ratio; *Tax* is the dividend tax rate for the top-income stockholders. *, ** and *** refer to significance at the 0.10, 0.05 and 0.01 levels. t-statistics are reported in parentheses.

PANEL A: Large Cap			Dependent variable: Stock returns			
VARIABLES	Bush Tax Cut			Obama Tax Increase		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-1.685*** (-3.28)	-0.553* (-1.74)	-1.268*** (-4.46)	-0.782*** (-4.16)	-0.200 (-1.35)	-0.404*** (-2.98)
$\ln(DIV)$	-0.00650 (-0.25)	0.0298*** (2.69)	0.0183* (1.77)	-0.0126** (-2.06)	-0.00330 (-0.68)	-0.0134*** (-3.14)
$\ln(REPURCH)$	-0.0136 (-0.97)	-0.0112 (-1.39)	-0.0121* (-1.66)	-0.00779 (-1.48)	-0.00480 (-1.21)	-0.00221 (-0.68)
Tobin's Q	0.782*** (9.06)	0.501*** (7.94)	0.401*** (7.42)	0.613*** (11.26)	0.488*** (13.86)	0.416*** (15.23)
Growth	0.418** (2.15)	0.522*** (3.49)	0.407*** (3.15)	0.375*** (4.75)	0.359*** (5.66)	0.327*** (5.57)
Profitability	-0.0890*** (-3.83)	-0.0575*** (-2.99)	-0.0385** (-2.16)	-0.0105 (-0.88)	-0.0100 (-1.14)	-0.0113 (-1.46)
Insolvency	-0.269 (-0.87)	0.210 (1.17)	0.210 (1.52)	0.309*** (3.06)	0.155** (2.09)	0.163*** (3.09)
Constant	-0.403 (-1.52)	-0.261 (-1.47)	0.0139 (0.09)	0.305*** (3.11)	0.0662 (0.93)	0.167*** (2.95)
Observations	333	506	688	760	1,179	1,593
F-Statistic	20.54	13.74	15.44	22.3	34.94	39.22
R-squared	0.422	0.218	0.177	0.237	0.214	0.175
Number of firms	129	155	177	251	273	293

PANEL B: Mid Cap		Dependent variable: Stock returns				
VARIABLES	Bush Tax Cut			Obama Tax Increase		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-1.410*** (-3.82)	-0.222 (-0.73)	-1.101*** (-4.02)	-1.026*** (-3.42)	-0.234 (-1.00)	-0.312 (-1.64)
<i>ln(DIV)</i>	-0.0326* (-1.86)	0.0135 (1.06)	0.00658 (0.58)	-0.00810 (-0.70)	0.00113 (0.13)	-0.0118* (-1.71)
<i>ln(REPURCH)</i>	-0.0171 (-1.65)	-0.00868 (-1.14)	-0.0134** (-2.04)	-0.0111 (-1.36)	-0.0103* (-1.70)	-0.00670 (-1.51)
Tobin's Q	0.735*** (11.42)	0.458*** (8.29)	0.413*** (9.53)	0.607*** (8.17)	0.465*** (10.19)	0.383*** (12.10)
Growth	0.278** (2.06)	0.293** (2.40)	0.410*** (4.51)	0.471*** (4.12)	0.492*** (5.47)	0.324*** (4.89)
Profitability	0.0175 (1.25)	-0.0207 (-1.48)	-0.0188* (-1.65)	0.00693 (0.49)	0.00523 (0.50)	-0.00493 (-0.61)
Insolvency	0.0765 (0.63)	-0.0279 (-0.27)	0.0141 (0.17)	0.0925 (1.19)	0.0852* (1.75)	0.0615 (1.63)
Constant	0.468*** (3.22)	-0.105 (-0.89)	0.0876 (0.87)	0.288** (2.47)	0.113 (1.40)	0.122** (2.03)
Observations	477	711	943	871	1,321	1,748
F-Statistic	35.04	14.98	25.86	11.35	19.57	25.05
R-squared	0.471	0.184	0.212	0.129	0.126	0.116
Number of firms	195	238	263	329	363	401

PANEL C: Small Cap		Dependent variable: Stock returns				
VARIABLES	Bush Tax Cut			Obama Tax Increase		
	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)	(-2Q, +2Q)	(-3Q, +3Q)	(-4Q, +4Q)
Tax	-1.252*** (-3.24)	-0.831** (-2.32)	-1.102*** (-3.71)	-0.629*** (-2.88)	-0.138 (-0.74)	-0.131 (-0.78)
<i>ln(DIV)</i>	-0.0644*** (-4.06)	0.00150 (0.10)	-0.00656 (-0.57)	-0.0123 (-1.63)	-0.00748 (-1.22)	-0.0123** (-2.23)
<i>ln(REPURCH)</i>	0.0114 (1.18)	0.00117 (0.16)	0.00467 (0.86)	0.00750 (1.35)	0.00270 (0.67)	-0.00192 (-0.56)
Tobin's Q	0.787*** (16.39)	0.436*** (9.42)	0.426*** (12.41)	0.577*** (13.80)	0.488*** (17.23)	0.375*** (16.58)
Growth	0.547*** (4.57)	0.287** (2.47)	0.294*** (3.18)	0.338*** (4.80)	0.278*** (6.35)	0.229*** (5.75)
Profitability	0.00989 (0.78)	-0.0128 (-0.96)	-0.0152 (-1.42)	0.00355 (0.42)	0.00405 (0.61)	0.00243 (0.42)
Insolvency	0.113 (1.14)	0.140 (1.46)	0.181*** (2.64)	0.0719 (1.21)	0.0719* (1.72)	0.0718** (2.11)
Constant	0.567*** (4.55)	0.334*** (2.77)	0.381*** (4.09)	0.293*** (3.67)	0.192*** (3.20)	0.190*** (3.73)
Observations	1,041	1,495	1,973	1,076	1,594	2,026
F-Statistic	57.72	21.65	38.36	28.3	49.84	46.79
R-squared	0.394	0.133	0.162	0.254	0.248	0.184
Number of firms	413	500	575	486	527	564

Table 9 shows that dividend payers are larger than non-payers. From 1990 to 1999, the average market capitalization of dividend payers is about US\$ 3 billion, while in 2000-2014 it is around US\$ 8.3 billion. The size of the non-payers is much smaller: in 1990-1999 it averages US\$ 361 million and about US\$ 1.1 billion in the period from 2000 to 2014. Likewise the results confirm that dividend payers have less investment opportunities than non-payers. From 1990 to 1999, the average market-to-book ratio of dividend payers is about 1.3, while in 2000-2014 it is around 1.4. The investment opportunities of non-payers are much higher: in 1990-1999 the market-to-book ratio averages 2.7 and is 13.0 in the period from 2000 to 2014. Dividend payers are firms with less growth opportunities than non-payers. From 1990 to 1999, the average asset growth ratio of dividend payers is about 4.1, while in 2000-2014 it is around 12.8. The growth opportunities of non-payers are much higher: in 1990-1999 the asset growth ratio averages 33.2 and it is 83.5 in the period from 2000 to 2014. Dividend payers are more profitable than non-payers. From 1990 to 1999, the average profitability of dividend payers is close to zero (0.005 per quarter), while in 2000-2014 it is negative (-0.01 per quarter). The profitability ratio of the non-payers is even more negative: in 1990-1999 it is -0.208 and it averages -1.901 in the period from 2000 to 2014. Dividend payers have lower insolvency ratios, i.e., they are more solvent than non-payers. From 1990 to 1999, the average insolvency ratio of dividend payers is about 0.53, while in 2000-2014 it is around 0.56. The insolvency ratios of non-payers are much higher: in 1990-1999 the insolvency ratio averages 0.94 and it is 2.74 in the period from 2000 to 2014.

Table 9. Variables in the model: comparison of the 1990-1999 and 2000-2014 periods

This table reports the means of the variables in the theoretical model, in the periods of 1990-1999 and 2000-2014. *Size* is the market capitalization; *Tobin's Q* is the market-to-book asset ratio, a proxy for Tobin's Q (investment opportunities); *Growth* is the growth of assets between each quarter; *Profitability* is the aggregate earnings to total asset ratio; *Insolvency* is the liabilities to assets ratio. Note: in this table, variables are not in the log form.

Dates	Size		Tobin's Q		Growth of Assets		Profitability		Insolvency	
	Market Capitalization, in US\$ million		Investment Opportunities (Market-to-book ratio)		$(A_t - A_{t-1}) / (A_{t-1})$ (in %)		Aggregate Earnings / Total Assets (quarterly)		Total Liabilities/Total Assets	
	Dividend payers	Non-payers	Dividend payers	Non-payers	Dividend payers	Non-payers	Dividend payers	Non-payers	Dividend payers	Non-payers
1990-1999	3,001	361	1.3	2.7	4.1	33.2	0.005	-0.208	0.53	0.94
2000-2014	8,325	1,105	1.4	13.0	12.8	83.5	-0.010	-1.901	0.56	2.74

6. Conclusions

This paper uses regressions with different announcement windows to compare and contrast the effects of dividend tax reform implementation on payout policy and stock returns. The study around the announcement periods of the dividend tax changes shows that both tax reform passages had stronger and more persistent negatively correlated effects on the dividend payments than on the stock repurchasing. This result suggests that, even though Bush Tax Cut boosted dividend payments and Obama Tax Increase slowed them down, some firms decide to change their strategies to stock repurchasing, since evidence shows that the implementation of these tax reforms affected those buybacks in a smaller and less persistent manner. This result is consistent with the evidence from Jagannathan, Stephens and Weisbach (2000), who show that dividend payments and stock repurchases are used at different times from one another and that repurchases are very pro-cyclical. Figure 1 confirms the procyclicality of stock buybacks, especially in the pre- and post-periods of the “internet bubble” and the 2007-2009 United States financial crisis.

The passage of dividend tax reforms has a boosting effect on stock returns in the Bush Tax Cut that is 75% greater than their reducing effect in the Obama Tax Increase, in absolute terms, when controlling for dividend payment and stocks repurchase. Results also show that insolvency affects payout policy in the quarters neighboring the dividend tax changes. The insolvency variable shows larger and more significant coefficients in the stock repurchase regressions, which suggests that leveraged firms reacted strongly to the tax reforms by repurchasing stocks, especially in the Bush Tax Cut: +1.11% per solvency ratio percentage. This result is in line with finding from the analysis on stock returns which shows that insolvency is more often significant and has positive impacts on stock returns in the Obama Tax Increase, suggesting that some investors may have decided to migrate to leveraged-high-growth firms once they realize that some dividend-paying firms could change their dividend policies.

In conclusion, overall results show that firms’ payout policies and investors have reacted differently to Bush Tax Cut and Obama Tax Increase. This happens not only because of firm characteristics, but also because of investors’ preferences and firms’ strategies related to timing and flexibility of payout policy.

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