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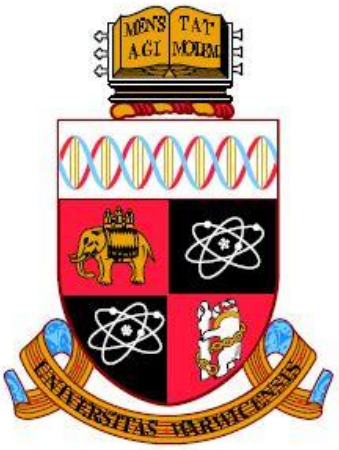

Essays in Empirical Corporate Finance

by

Zicheng Lei

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Declarations

I declare that any material contained in this thesis has not been submitted for a degree to any other University. I further declare that one paper titled "Leveraged Buybacks", drawn from Chapter Two of this thesis, is co-authored with Chendi Zhang. A version of this chapter received “revise and resubmit” from the *Journal of Corporate Finance* during the summer of 2015. Furthermore, the paper titled "Institutional Investors and Corporate Political Activism", drawn from Chapter Three of this thesis, is co-authored with Rui Albuquerque, Jörg Rocholl, and Chendi Zhang. Finally, the paper titled "A Direct Test of Catering Theory of Dividends", drawn from Chapter Four of this thesis, is co-authored with Alok Kumar and Chendi Zhang.

Zicheng Lei

September 2015

Abstract

The first essay (Chapter 2) investigates debt-financed share repurchases. We find that debt-financed share buybacks generate positive short-term and long-run abnormal stock returns. Leveraged buyback firms have more debt capacity and lower growth prospects ex ante, increase leverage and reduce investments more sharply ex post than cash-financed buyback firms. Firms that are over-levered ex-ante are associated with lower returns and real investments following leveraged buybacks. The lower announcement returns are concentrated on firms with weaker corporate governance. Leveraged buybacks also have lower completion rates than cash-financed buybacks. The evidence is consistent with leveraged buybacks enabling firms to optimize their leverage, on average benefiting shareholders. The benefits decrease with a firm's leverage ex ante.

The second essay (Chapter 3) studies the effect of the Supreme Court landmark *Citizens United* decision on how firms adjust their political activism under the constraints imposed on them by institutional investors. The essay shows that firms with more political connections have lower announcement returns, which are concentrated in firms with high institutional ownership. Furthermore, firms headquartered in states with corporate campaign contribution bans before *Citizens United* have relatively fewer state political connections afterwards. This result is concentrated in firms with low institutional ownership. The evidence is consistent with institutional investors' preference to not use the new avenue of political activism.

The third essay (Chapter 4) tests the dividend catering theory proposed by Baker and Wurgler (2004b) by using the Internet search volume for dividend-related keywords as a direct measure of investors' dividend sentiment. We find that firms initiate or increase dividends when the dividend sentiment is stronger. These effects are concentrated on firms located in high dividend sentiment states. They are robust after controlling for firm characteristics, risk, and the dividend premium. Our results are consistent with managers catering to investor's time-varying demand for dividend-paying stocks.

Chapter 1

Introduction

The thesis consists of three essays on empirical corporate finance. Chapter Two investigates debt-financed share repurchases and studies whether or not leveraged buybacks are consistent with shareholder value maximization and economic efficiency. Chapter Three examines how corporations adjust their political activism in response to the *Citizens United* ruling and the constraints imposed on them by institutional investors. Chapter Four tests the dividend catering theory proposed by Baker and Wurgler (2004b) by using the Internet search volume for dividend-related keywords as a direct measure of investors' dividend sentiment.

Over the past decade share repurchases have become a dominant payout method for firms to return excess cash to shareholders (Skinner (2008)). Previous research shows that share repurchases are value-enhancing for shareholders, both in the short-term and the long-run (Vermaelen (1981), Ikenberry, Lakonishok, and Vermaelen (1995), Gong, Louis, and Sun (2008), Peyer and Vermaelen (2009)).

In Chapter Two, we study whether or not leveraged buybacks are consistent with shareholder value maximization and economic efficiency. In leveraged buybacks the cash paid out to shareholders is raised from debtholders, which has a larger impact

on a firm's leverage than cash-financed buybacks. Hence from a standard tradeoff view of optimal capital structure, firms might conduct leveraged buybacks to optimize their leverage, which in turn benefits shareholder value. On the other hand, the adjustment in capital structure associated with leveraged buybacks may increase a firm's debt beyond its optimal level and raise the probability of bankruptcy sub-optimally.

Empirically, we find that leveraged buybacks on average add value to shareholders. Under-levered firms with declining growth prospects and substantial debt capacity repurchase shares via issuing debt to optimize their leverage. To our best knowledge our study is the first attempt to analyze leveraged buybacks.

On January 21, 2010, the U.S. Supreme Court issued a landmark decision on *Citizens United v. Federal Election Commission* asserting for the first time that corporations, like individuals, benefit from First Amendment protection regarding freedom of speech in the form of independent political expenditures. In practice, the ruling lifts prior bans on corporations to use their treasury to advocate in favor or against a political candidate on a federal election, so called independent expenditures on express advocacy. Representing the most dramatic change regarding the role of corporations in campaign finance in the U.S. since the Taft-Hartley Act of 1947 that prohibited corporations from making any expenditure in connection to federal elections, *Citizens United* provides a natural experiment setting to study how corporations adjust their inputs to political activism.

In Chapter Three, we examine how corporations adjust their inputs to political activism in response to the *Citizens United* ruling. We ask how investors assess the impact of the ruling for corporations already engaged in other forms of political activism and whether the market response to *Citizens United* depends on having

institutional investor owners that may be engaged in political activism themselves. We find that firms with more political connections have lower announcement returns. The lower returns are concentrated on firms with high institutional ownership. Further, using variation in state campaign finance laws, we show that firms headquartered in states with corporate campaign contribution bans prior to *Citizens United* have fewer state political connections after *Citizens United* relative to a control group. This result appears concentrated on firms with low or no institutional ownership. Our results are consistent with many institutional investors objecting to the use of independent expenditures and fighting vigorously for greater disclosure of campaign finance since the Court ruling.

An emerging literature in corporate payout policy examines the potential driver of firm's dividend policy. In particular, Baker and Wurgler (2004a, 2004b) provide a catering explanation. They propose that investors have time-varying demand for dividend-paying stocks and managers cater to investor demand. Academic scholars then apply the catering theory to dividend increase or decrease (Li and Lie, 2006) and share repurchases (Jiang, Kim, Lie, and Yang, 2013; Kulchania, 2013).

Empirical research on the catering effect of corporate payout policy has typically used dividend/repurchase premium to measure investor demand. The dividend/repurchase premium is defined as the difference between the logs of the value-weighted market-to-book ratio of dividend payers (share repurchasers) and nonpayers (non-repurchasers). However, most academic authors interpret market-to-book ratio as a proxy for growth opportunities, making it difficult to cleanly interpret the dividend premium as a measure of investor demand for dividends. It would offset the catering effect if firms with good investment opportunities are more likely to cut dividends.

In Chapter Four, we study how the time-variation in investors' dividend attitudes affects firm's dividend policy. We conjecture that investors' attention to dividend-paying stocks may motive managers to change firm's dividend policy consequently. In particular, we posit that managers initiate or increase (cut) dividends when investors search more (less) on dividends via Internet. To test the conjecture, we develop a direct measure of dividend sentiment using the Internet search volume for dividend-related keywords. We find that managers cater to the time-varying investor demand for dividends. Managers initiate or increase (cut) dividends when retail investors have stronger (weaker) dividend sentiment. These effects are concentrated on firms located in high dividend sentiment states. Results are robust after controlling for firm characteristics, risk, and the dividend premium.

Chapter 2

Leveraged Buybacks

2.1 Introduction

"Corporate America is increasingly turning to debt to fund stock repurchases. Some investors view even debt-financed stock buybacks as a form of returning cash to shareholders—except, it isn't!" - *CNBC (8th November 2011)*

Share repurchases have become a dominant payout method for firms to return excess cash to shareholders (Skinner (2008)). Previous research shows that share repurchases are value-enhancing for shareholders, both in the short-term and the long-run (Vermaelen (1981), Ikenberry, Lakonishok, and Vermaelen (1995), Gong, Louis, and Sun (2008), Peyer and Vermaelen (2009)). One of the key explanations is that managers convey favorable information to the market by buying back undervalued stocks (Vermaelen (1981), Jagannathan, Stephens, and Weisbach (2000)). Another explanation is that payouts in the form of share repurchases from

firms with declining investment opportunities reduce the agency cost of free cash-flows (Jensen (1986), Grullon and Michaely (2004)).[1]

Over the past decade it has been increasingly popular for firms to finance their share repurchase programs by issuing debt, which generates controversy. In leveraged buybacks the cash paid out to shareholders is raised from debtholders, which has a larger impact on a firm's leverage than cash-financed buybacks. On the one hand, share buybacks from undervalued firms may convey favorable information to the market even if they are financed by debt, mitigating problems of information asymmetry or market undervaluation. Issuing debt to finance share buybacks also reduces the agency cost of free cash-flows as money borrowed is paid back over time. In addition, it may save taxes for companies as interest payments are tax-deductible, or because it is costly to repatriate cash trapped overseas.[2] Hence from a standard tradeoff view of optimal capital structure, firms that are ex-ante under-levered, with substantial debt capacity, or with declining future growth options may conduct leveraged buybacks to increase tax benefits or reduce agency costs of free cash-flows.[3] Therefore, we hypothesize that firms conduct leveraged buybacks to optimize their leverage, which in turn benefits shareholder value. For example, Jim Turner, head of debt capital markets at BNP Paribas, said in an interview: "If a company has debt capacity at its current ratings, and it makes sense from a capital optimization point of view, share repurchases with bond proceeds still make good sense." (Reuters, 6th September 2013).

[1]Other motives of share repurchases include wealth expropriation from bondholders (Bradley and Wakeman (1983), Maxwell and Stephens (2003)), takeover defenses (Bagwell (1991), Billett and Xue (2007)), and inflation of earnings per share (Fenn and Liang (2001), Kahle (2002)).

[2] For example, Ebay was criticized by investors for repatriating cash trapped overseas to repurchase shares and paying $3 billion in taxes. (The Wall Street Journal, 29th April, 2014).

[3] For example, Lang, Ofek, and Stulz (1996) show that leverage is negatively associated with future growth and does not reduce growth for firms with good investment opportunities.

On the other hand, the informational, agency and tax benefits of leveraged buybacks may decrease with ex-ante leverage of a firm. It is likely that leveraged buybacks lead to excessive debt, which is detrimental to firm value. The adjustment in capital structure associated with leveraged buybacks, which is akin to a debt-for-equity swap, may increase a firm's debt beyond its optimal level and raise the probability of bankruptcy sub-optimally.[4] It may also lead to investment-related agency issues such as the debt overhang problem, where a positive net-present-value project is not invested in and firm value is destroyed (Myers (1977)). Hence we hypothesize that ex-ante over-levered firms are associated with lower returns and sharper decline in real investments following leveraged buybacks. In an article titled "Share buybacks: corporate cocaine", the Economist magazine argues in its 13th September 2014 issue "Some firms may be borrowing too much to pay for their buyback habit… Shareholder capitalism is about growth and creation, not just dividing the spoils."

This paper studies whether or not leveraged buybacks are consistent with shareholder value maximization and economic efficiency. We collect a comprehensive sample of debt-financed repurchases in the U.S. from 1994 to 2012. For comparison we also construct a sample of share repurchases that explicit state that they are cash-financed for the same period. In addition, we match them to samples of non-repurchasing firms with similar characteristics to calculate abnormal changes in firm performance. Our cash-financed buyback firms have comparable firm characteristics to those reported in the buyback literature (Lie (2005), Massa, Rehman, and Vermaelen (2007), Grullon and Michaely (2004)).

[4] Moody's Investor Service reports that rating agencies often reacted leveraged buybacks or debt-financed dividends less favorably than debt used for other corporate purposes (CFO Journal, WSJ, 25th March 2013). For instance, Moody's Investor Service downgraded Lowe Cos.'s debt two levels after the leverage increase was announced to facilitate repurchasing shares (Bloomberg, 17th April 2012).

We find positive short-term market reactions for debt-financed repurchases. The average three-day abnormal return for debt-financed repurchases is 2.2%, which suggests that leveraged buybacks send a positive signal to the stock market initially. In addition, there are significantly negative abnormal returns in the six months prior to the repurchase announcements. The market reacts less favorably for leveraged buybacks than cash-financed ones. We also find positive long-term stock performance following leveraged buybacks. For the next three years following the announcements, the abnormal return for leveraged buybacks is 82 basis points per month (10% per annum). This suggests that leveraged buybacks, on average, benefit shareholders.

We next examine whether the benefits from leveraged buybacks depend on ex-ante firm characteristics such as leverage, free cash-flows and cash holdings. In our sample, 74% of leveraged buyback firms have substantial unused debt capacity and 81% are estimated to be under-levered ex ante. For those under-levered firms, the average pre-repurchase debt ratio (13%) is substantially below the average target debt ratio (25%). This suggests that under-levered firms utilize their unused debt capacity to repurchase shares. Four years after the buyback announcements, the debt ratio is 6.4% higher than that before repurchase announcements. The permanent increase in leverage is consistent with our leverage optimization hypothesis. However, firms are over-levered ex-ante in a small segment of the leveraged buyback market (19% of our sample).

We find that the average three-day abnormal returns and long-run stock performance of over-levered firms are lower than those of under-levered firms, supporting that the benefits of leveraged buybacks decrease with a firm's leverage ex ante. In addition, 73% of leveraged buyback firms have ex-ante cash holdings below

the estimated optimal level. But free cash-flows and excess cash holdings do not explain the differences in market reactions to leveraged buybacks and to cash-financed buybacks.

After share buybacks, firms experience a decline in real investments, similar to those reported by Grullon and Michaely (2004). More importantly, we find that leveraged buyback firms have lower ex-post investments than matched non-repurchasing peers. The decline in real investments is larger for leveraged buybacks than that for cash-financed ones. The reduction is also sharper for firms that are over-levered ex ante. More specifically, we find a 5.5% (1.1%) decline in abnormal investments for over-levered (under-levered) firms, and the difference is statistically significant at the 1% level.

Firms with lower future growth options may conduct leveraged buybacks from a leverage optimization point of view. To examine whether the sharper reduction in investments is related to declines in future growth options, we then follow Rhodes-Kropf, Robinson, and Viswanathan (2005) to measure a firm's growth prospects. We find that the growth prospects for leveraged buyback firms are significantly lower and decline more sharply than those for cash-financed repurchasing firms. However, changes in growth prospects following leveraged buybacks do not explain the lower announcement returns and sharper decline in ex-post real investments that are associated with over-levered firms. Instead, we find that weaker corporate governance explains the lower announcement returns for over-levered firms.

In addition, debt-financed repurchases exhibit lower completion rates than cash-financed ones. We do not find significant differences in ex-post operating performance and financial distress risk between debt- and cash-financed buybacks.

Our paper contributes to the following strands of literature. First, we contribute to the share repurchase literature (Vermaelen (1981), Ikenberry, Lakonishok, and Vermaelen (1995), Grullon and Michaely (2004)) by showing that leveraged buybacks on average benefit shareholders. Firms with declining growth prospects and substantial debt capacity optimize leverage by conducting leveraged buybacks. The informational, agency and tax benefits decrease with a firm's leverage ex ante. Financing buybacks by debt affects the motivations, short-term market reactions, long-run performance, real investments and completion rates of repurchase programs. To our best knowledge our study is the first paper analyzing leveraged buybacks. Second, our paper adds to the literature on debt-for-equity swap. Cornett and Travlos (1989) analyze a sample of 40 firms proposing debt-for-equity exchanges and find positive market reactions. We report positive abnormal returns for leveraged buybacks in which a firm simultaneously increases debt and reduces equity. Third, our study is also related to the literature on sources of financing of corporate financial transactions such as takeovers (Schlingemann (2004), Martynova and Renneboog (2009)).[5] We show that the sources of financing matter for share buybacks.

The remainder of the paper is organized as follows. Section 2.2 describes our data and methodology. Section 2.3 reports our empirical results and Section 2.4 concludes.

2.2 Data

[5] Schlingemann (2004) analyzes the relation between the source of funds available before a takeover and the potential bidder gains. Martynova and Renneboog (2009) show that bidder's pecking order preference, the corporate governance environment and firm's potential growth opportunities together determine the financing decision in takeovers.

We collect our initial sample of common stock repurchases from the Securities Data Company (thereafter SDC) US Mergers and Acquisitions database. Our sample contains buybacks announced between January 1, 1994 and December 31, 2012. The time period is chosen from 1994 as SEC's EDGAR Database starts providing comprehensive filings for buyback firms. SDC reports the "source of funds used to finance deal" if firms disclose relative information via corporate filings, news or other related sources. A share repurchase is defined as a debt-financed one if it is partially or fully financed by debt.

To verify the reliability of the data, we collect information from SEC's EDGAR Database and manually check the corporate filings i.e. 8-K, 10-Q, and 10-K for each repurchase. We classify a repurchase as a debt-financed one only if the filings explicitly say that the firm expects to use debt to fund the share repurchase.[6] Several categories of debt financing are mentioned to finance buybacks in the filings, including revolving credit facility, bridge loan, borrowing, line of credit or debt offering etc. However, details of the exact source of financing for each leveraged buyback are unavailable. Similarly, we define a repurchase as a cash-financed one if the firm explicitly states that cash or internal fund is used to finance the repurchase program.[7] The above procedures lead to 277 debt-financed repurchases and 433 cash-financed repurchases.

[6] For example, we define the following repurchase as a debt-financed repurchase. Below is extracted from the Current-Event (8-K) filing of Dollar General Corp: "In connection with its previously announced $500 million common stock repurchase program, on March 25, 2012 Dollar General Corporation entered into an agreement with Buck Holdings, L.P. to repurchase from it approximately $300 million in shares of common stock concurrent with, and conditional upon, the completion of a contemplated underwritten secondary offering of shares by certain selling shareholders. *Dollar General expects to fund the share repurchase with borrowings under its asset-based revolving credit facility*."

[7] For example, we define the following buyback as a cash-financed repurchase. Below is derived from the Current-Event (8-K) filing of Extreme Networks Inc. :"Extreme Networks, Inc. (Nasdaq: EXTR) today announced its Board of Directors has authorized the repurchase of common stock worth up to $75 million which may be purchased over the next three years from time to time in the open market or in privately negotiated transactions. *Extreme Networks will fund the share repurchases from cash on*

We obtain stock returns from the Center for Research in Securities Prices (CRSP) files. Accounting variables are collected form Compustat and we require that financial variables of each firm are available in Compustat in the year prior to the share repurchase. We winsorise all control variables of firm characteristics at the 1st and 99th percentiles. Our summary statistics of firm characteristics are comparable to the literature (Lie (2005), Massa, Rehman, and Vermaelen (2007)). The summary statistics will be discussed in Section 2.2.6. The sample for cross-sectional analysis consists of 218 debt-financed repurchases and 357 cash-financed repurchases from 1994 to 2012.

2.2.1 Measuring Abnormal Stock Returns

We measure the short-term market reaction using the three-day cumulative abnormal return (CAR) from day −1 to day +1 where day 0 is the announcement date of a share repurchase. We use the market model to measure expected returns and the CRSP value-weighted market index as the benchmark. The estimation period ends 46 days before the repurchase announcement and we require the minimum (maximum) estimation length to be 15 (255) days.

We estimate the long-run abnormal returns after the buyback announcement using the calendar-time portfolio approach and Ibbotson's (1975) Returns Across Time and Securities (RATS) method. For the calendar-time portfolio approach, we form an equally-weighted portfolio which includes firms that made a buyback announcement in the previous 12, 24 or 36 months in each calendar month. The composition of the portfolio varies each month and the average monthly abnormal

hand, which was approximately $200 million as of September 30, 2012. As of August 6, 2012, there were approximately 95 million shares of common stock outstanding."

return of the portfolio (the intercept) is estimated based on the Fama-French three-factor model:

$$R_t - R_{ft} = \alpha + \beta_1\left(R_{mt} - R_{ft}\right) + \beta_2 HML_t + \beta_3 SMB_t + \varepsilon_t \quad (1)$$

Where R_t stands for the portfolio return in month *t*, *HML* and *SMB* denote the returns on book-to-market and size factor-mimicking portfolios. R_{mt} is the stock market benchmark return, R_{ft} is the monthly risk-free return, and α captures the monthly risk-adjusted return.

Ibbotson's (1975) RATS method allows firm risk to change over time. Following the literature (Peyer and Vermaelen (2009)), cross-sectional regressions are estimated for each month after buyback announcements:

$$R_{it} - R_{ft} = \alpha_t + \beta_{1t}\left(R_{mt} - R_{ft}\right) + \beta_{2t} HML_t + \beta_{3t} SMB_t + \varepsilon_{it} \quad t = 1, \ldots\ldots, 36 \quad (2)$$

Where *i* stands for each buyback firm, *t* denotes the number of months following an announcement date. α_t captures risk-adjusted abnormal return in time *t*.

2.2.2 Measuring Abnormal Investment & Operating Performance

We measure a firm's investment as the capital expenditure (item 145 in Compustat) divided by total assets (item 6). We construct a control sample of non-repurchasing firms matched by investment, industry and size. For each repurchasing firm, the matched non-repurchasing firm is of the same two-digit SIC code, and with both pre-repurchase investment and book value of assets in year -1 within $\pm 20\%$ of those of the repurchasing firm. Among those firms satisfying the above criteria, the matched firm is the one with the least deviations from the repurchasing firm.[8] If no firms meet the criteria, we relax the industry criterion to one-digit SIC code. The

[8] The score function is defined as:
$(|\text{Investment}_{\text{year}-1,\text{sample firm}} - \text{Investment}_{\text{year}-1,\text{matched firm}}|)/\text{Investment}_{\text{year}-1,\text{sample firm}} +$
$(|\text{Total Assets}_{\text{year}-1,\text{sample firm}} - \text{Total Assets}_{\text{year}-1,\text{matched firm}}|)/\text{Total Assets}_{\text{year}-1,\text{sample firm}}$

abnormal investment of a repurchasing firm is defined as its capital-expenditure-to-assets ratio minus that of its matched firm.

Operating performance is measured as return on assets (ROA), which is defined as operating income before depreciation (item 13) divided by book assets at the beginning of the year (item 6). This is calculated over the eight quarters after the repurchase announcement quarter (Lie (2005), Gong, Louis, and Sun (2008), Chen and Wang (2012)). Prior research (Fama and French (2000), Jagannathan, Stephens, and Weisbach (2000)) shows that pre-announcement performance characteristics and market-to-book ratio predict future operating performance. Hence we select the matched sample of non-repurchasing firms based on prior operating performance, market-to-book ratio, industry and size.

The non-repurchasing firm is of the same two-digit SIC code, and with both operating performance and market-to-book ratio in year −1 within ±20% of those of the repurchasing firm. In addition, the book value of assets for the matched firm in year −1 is also within ± 20% of that of the repurchasing firm. If no firms meet the above criteria, we relax the industry criterion to one-digit SIC code or disregard the industry criterion if there is still no match. Among firms satisfying the above criteria, we select the matched firm as the one with the least deviations from the repurchasing firm.[9] The *abnormal operating performance* for a repurchasing firm is defined as its ROA minus that of the matched firm.

2.2.3 Measuring Growth Prospects

[9] This score function is defined as:
$(|\mathrm{ROA}_{\text{year}-1,\text{sample firm}} - \mathrm{ROA}_{\text{year}-1,\text{matched firm}}|)/\mathrm{ROA}_{\text{year}-1,\text{sample firm}} + (|\mathrm{TA}_{\text{year}-1,\text{sample firm}} - \mathrm{TA}_{\text{year}-1,\text{matched firm}}|)/\mathrm{TA}_{\text{year}-1,\text{sample firm}} + (|\mathrm{M/B}_{\text{year-1, sample firm}} - \mathrm{M/B}_{\text{year-1, matched firm}}|)/\mathrm{M/B}_{\text{year-1, sample firm}}$

To measure firms' growth prospects, we follow Rhodes-Kropf, Robinson, and Viswanathan (2005) to decompose the market-to-book ratio into three components:

$$m_{it} - b_{it} = \underbrace{m_{it} - v_{it}(\alpha_{jt})}_{firm-specific\ error} + \underbrace{v_{it}(\alpha_{jt}) - v_{it}(\alpha_j)}_{time-series\ sector\ error} + \underbrace{v_{it}(\alpha_j) - b_{it}}_{long-run\ value\ to\ book} \quad (3)$$

i stands for each firm, *t* denotes year and *j* accounts for industry. *m* is the market value of equity, *b* is the book value and *v* is a measure of fundamental value, all expressed in logs. α is the regression coefficient. The fundamental value $v_{it}(\alpha_{jt})$ is to be estimated for firm *i* on time *t* in industry *j* and $v_{it}(\alpha_j)$ is an industry-specific long-run value that equals the industry average of $v_{it}(\alpha_{jt})$.

The first term in equation (3) is the difference between the market value and the estimated fundamental value. It captures firm-specific error in market valuation. The second term reflects the difference between the estimated fundamental value on time *t* and industry *j* and the long-run sector-specific value. Hence it captures the time-series sector error. Our variable of interest is the third component: long-run value to book $v_{it}(\alpha_j) - b_{it}$. It is the difference between the long-run sector-specific fundamental value and the observed book value. It measures a firm's growth prospects.

To measure the last component, we follow Rhodes-Kropf, Robinson, and Viswanathan (2005), and estimate α via the following regression based on Fama-French 12 industries:

$$m_{it} = \alpha_{0jt} + \alpha_{1jt} b_{it} + \varepsilon_{it} \quad (4)$$

Equation (4) is estimated annually for each industry *j* so that we have estimated coefficients α_{0jt} and α_{1jt} for each industry-year. $\bar{\alpha}_{0j}$ and $\bar{\alpha}_{1j}$ are the average α_{0jt} and α_{1jt} respectively over the sample period for each industry *j*. They are used to calculate the long-run sector-specific fundamental value:

$$v_{it}(\bar{\alpha}_{0j}, \bar{\alpha}_{1j}) = \bar{\alpha}_{0j} + \bar{\alpha}_{1j} b_{it} \qquad (5)$$

The long-run value to book, i.e. the difference between v_{it} and b_{it}, is our measure of a firm's growth prospects. The higher the measure, the better the growth prospects.

2.2.4 Measuring Target Leverage, Debt Capacity and Optimal Cash Ratios

The target leverage ratios vary across firms and over time. Following Flannery and Rangan (2006) and Faulkender, Flannery, Hankins, and Smith (2012), we estimate the target leverage ratio for each firm per year using the following model:

$$MDR_{i,t+1} = \beta X_{i,t} + \varepsilon_{it} \quad (6)$$

Where $MDR_{i,t+1}$ is firm *i*'s market debt ratio, i.e. the book value of debt divided by the sum of the book value of debt and the market value of equity, at year *t+1*, $X_{i,t}$ is a vector of firm characteristics related to costs and benefits of adjusting the leverage ratio. They include *EBIT_TA, MB, DEP_TA, LnTA, FA_TA, R&D_TA, R&D_DUM* and *Ind_median*. *EBIT_TA* is earnings before interest and taxes, as a proportion of total assets. *MB* is market-to-book ratio of assets. *DEP_TA* is depreciation as a proportion of total assets. *LnTA* is log of asset size, measured in 1983 dollars. *FA_TA* is fixed assets proportion to total assets. *R&D_TA* is R&D expenses as a proportion of total assets. *R&D_DUM* is a dummy variable that equals one if firm did not report R&D expenses. *Ind_median* is median industry market debt ratio calculated for each year based on the industry groupings in Fama and French (2002). After β is estimated, the predicted value of $MDR_{i,t+1}$ is the *target leverage ratio* for firm *i* at year *t+1*. A firm is defined as over-levered (under-levered) if its actual market debt ratio is higher (lower) than the target debt ratio before the repurchase announcement.

Following Lemmon and Zender (2010), our measure of debt capacity is based on the likelihood that a firm has access public debt market. We estimate a logit model in which the dependent variable is one if a firm has debt rating in a given year and zero otherwise. Debt rating data are available in Compustat and our sample period is from 1994 to 2012. The explanatory variables include *Ln_TA, ROA, PPE, MB, Leverage, Ln_Firm Age* and *Standard deviation of daily stock returns*. *Ln_TA* is natural log of asset size. *ROA* is the ratio of operating profits to total assets. *PPE* is the ratio of property, plant and equipment to total assets. *MB* is market-to-book ratio of assets. *Ln_Firm Age* is the natural log of firm age where firm age is measured as the age of the firm relative to the first year the firm appears on Compustat. The estimated coefficients from the logit model are used to derive an estimated probability that a given firm could get a bond rating for each year during the sample period. We divide our sample firms into three groups based on their estimated likelihood of gaining access public debt market.[10] Firms in the lowest (highest) tercile are defined as firms with low (high) debt capacity.

Following Opler, Pinkowitz, Stulz, and Williamson (1999), we estimate the optimal cash level for each firm in each year and define the excess cash of a firm as its cash holdings in excess of its optimal level of cash. In the regression to estimate the optimal cash level, the dependent variable is the logarithm of cash and short-term investments (item 1) divided by net assets, where net assets are defined as total assets (item 6) minus cash and short-term investments (item 1). The explanatory variables are those that affect firms' cash expenditure and revenue, including the market-to-book ratio, size, cash flow, net working capital, capital expenditure, leverage, industry sigma (a measure of the volatility of an industry's cash flow),

[10] We also divide our sample firms into two groups based on the ranking of their debt ratings. The results are similar to those reported here.

R&D and a dividend dummy. Cash flow, net working capital and capital expenditure are divided by net assets. After the regression model is estimated, we calculate excess cash by taking the antilog of the residual of the regression model.

2.2.5 Measuring Financial Distress Risk

A firm's credit risk is measured by using Altman's (1968) methodology. In particular, Altman's Z-score is computed as:

$$Z\ score = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.4X_4 + 0.999X_5 \quad (7)$$

where X_1 is working capital divided by book assets; X_2 is retained earnings divided by book assets; X_3 is earnings before interest and taxes divided by book assets; X_4 is the market value of equity divided by total liabilities; and X_5 is net sales divided by book assets. A lower Z-Score indicates a higher financial distress risk.

The *abnormal Z-Score* for a repurchasing firm is its Z-Score minus that of a matched non-repurchasing peer. The matched firm is of the same two-digit SIC code, and both the pre-announcement Z-Score and book value of assets in year −1 within ±20% of those of the repurchasing firm. These factors are important in explaining the cross-sectional variation in corporate distress risk (Fama and French (1993)). If no firms meet these criteria, we relax the industry criterion to one-digit SIC code or disregard the industry criterion. Among these firms, the matched firm is selected as the one with the least deviations from the repurchasing firm.[11]

2.2.6 Summary Statistics

[11] This score function is $(|\text{Z\_Score}_{\text{year}-1,\text{sample firm}} - \text{Z\_Score}_{\text{year}-1,\text{matched firm}}|)/\text{Z\_Score}_{\text{year}-1,\text{sample firm}} +$
$(|\text{Total Assets}_{\text{year}-1,\text{sample firm}} - \text{Total Assets}_{\text{year}-1,\text{matched firm}}|)/\text{Total Assets}_{\text{year}-1,\text{sample firm}}$

The distribution of our sample of share repurchases over time is presented in Table 2.1. There is relative small numbers of repurchases in the 1990's.[12] In most years of our sample period, the median deal size of debt-financed repurchases is larger than that of cash-financed ones.

Table 2.2 reports the difference of pre-repurchase firm characteristics between debt- and cash-financed buybacks. Debt-financed repurchasing firms have higher capital expenditure ratios, lower cash holdings, higher debt ratio and financial distress risk than cash-financed ones. Those firms are more mature with more assets in place, lower growth prospects, larger firm size, and better operating performance before conducting leveraged buybacks. The differences are statistically significant at, at least, the 5% level. Our summary statistics of firm characteristics are comparable to the literature (Lie (2005), Massa, Rehman, and Vermaelen (2007)).

2.3 Empirical Results

2.3.1 Stock Performance Around Repurchases

Table 2.3 presents the short-term market reaction and long-run stock return following share repurchase announcements for debt- and cash-financed repurchases. Panels A reports average CAR using either equally- or value-weighted market index as the benchmark. We observe positive market reactions for both debt- and cash-financed repurchases. The average three-day announcement-period abnormal returns for debt-financed repurchases vary from 2.19% to 2.27%, which is lower than the average abnormal returns of 2.72% to 2.83% for cash-financed repurchases. Our three-day abnormal returns for cash-financed repurchases are comparable to those in

[12] Our sample is smaller than that of previous research on repurchases (Grullon and Michaely (2004), Gong, Louis, and Sun (2008), Chen and Wang (2012)) as we require that the sources of financing of buybacks are disclosed. Rule 10b-18 of SEC became *effective* on 17 December 2003, which requires voluntary disclosure of the sources of financing used to finance repurchases.

Grullon and Michaely (2004), who report an average 2.71% three-day CAR using value-weighted market index as the benchmark for cash-financed repurchases.

The long-term price drift prior to and following repurchase programs is listed in Panel B and C. Long-term stock returns in Panel B are measured via a calendar-time portfolio approach where the Fama-French three factors are used as the benchmark. We observe negative monthly calendar-time alphas six months prior to buyback announcements and the returns of debt-financed buybacks are significant (-51 basis points per month). Consistent with previous research (Ikenberry, Lakonishok, and Vermaelen (1995), Peyer and Vermaelen (2009)), we find positive post-repurchase abnormal returns. The average monthly abnormal returns for debt-financed buybacks range from 82 basis points to 96 basis points per month, while cash-financed repurchases experience average abnormal returns of 74 basis points to 118 basis points per month.

To the extent that the calendar-time portfolio approach does not allow the factor loadings to change over time (Peyer and Vermaelen (2009)), the observed positive abnormal return may be due to higher systematic risk ex post. Hence we re-estimate the long-term price drift using Ibbotson's (1975) RATS method, which allows for risk changes through time.

Panel C exhibits negative monthly abnormal return for both debt- and cash-financed repurchases six months prior to buyback announcements (-59 basis points and -91 basis points per month respectively). The results are consistent with Information/Timing hypothesis as beaten down firms initiate share repurchase (Peyer and Vermaelen (2009)). The monthly abnormal returns are between 31 basis points and 47 basis points over 36 months for debt-financed repurchases. The long-term monthly abnormal returns for cash-financed repurchases vary from 39 basis points to

45 basis points over 36 months. Hence our results show that debt-financed repurchases on average add value to shareholders.

2.3.2 Changes in Firm Performance Around Repurchases

Panel A of Table 2.4 shows the average changes in investment, cash, leverage, net leverage, operating performance and Z-score before repurchase announcements. Firms exhibit significant declines in cash and significant increases in operating performance before leveraged buyback announcements. Cash-financed buyback firms experience significant declines in investment and improved operating performance before buyback announcements.

Panel B of Table 2.4 shows the average changes in investment, cash, leverage, net leverage, operating performance and Z-score between year −1 (the year before the repurchase announcement) and years +1, +2, +3, and +4 (i.e. the years after the repurchase announcement). Debt-financed buyback firms experience significant declines in investment, and operating performance and significant increases in leverage, net leverage and financial distress risk ex post. After the initial mechanical increases following buyback announcements, the debt ratio begins levelling off and remains 6.4% higher in four years than that before repurchase announcements. Cash-financed repurchasing firms experience significant declines in cash, and operating performance and significant increases in financial distress risk following buyback announcements. Consistent with Lie (2005) and Gong, Louis, and Sun (2008), we observe a decline in ex-post operating performance for all buyback firms, before taking into account that of matched non-repurchasing peers. Figure 2.1 depicts changes of cash and leverage prior to and after repurchase announcements.

2.3.3 Ex-ante Firm Characteristics: Leverage, Free Cash-Flows and Cash Holdings

The section studies how the effects of leveraged buybacks depend on ex-ante firm characteristics. First, we study whether unused debt capacity motivates firms to conduct leveraged buybacks. 74% of debt-funded buyback firms belong to the high debt capacity group, while 29% of cash-financed buyback firms have high debt capacity ex ante. Ex-ante under-levered firms may adjust the debt ratio towards its optimal level via leveraged buybacks. We also estimate the target debt ratio and find that 81% of debt-financed repurchasing firms are under-levered ex ante. For those under-levered firms, the average pre-repurchase debt ratio (13%) is substantially below the average target debt ratio (25%). As a small segment of our sample, 19% of leveraged buybacks are conducted by firms that are estimated to be over-levered ex ante.

Second, we divide our sample of leveraged buybacks into two subsamples: ex-ante over-levered firms and under-levered ones. Table 2.5 reports the difference in firm performance. Both over-levered firms and under-levered ones experience positive three-day abnormal returns, while those of over-levered firms are insignificant. Over-levered firms have negative but insignificant long-run stock performance, while that of under-levered firms is significantly positive under both the calendar-time portfolio approach and Ibbotson's (1975) RATS method. The difference in long-run stock performance is statistically significant at the 1% level, suggesting that the benefits of leveraged buybacks decrease with a firm's leverage ex ante.

Third, we relate the market reactions to ex-ante firm characteristics in a multivariate regression framework, and report results in Table 2.6. The *LBB Dummy*

equals one for debt-financed repurchases and zero otherwise. As the announcement effect of a privately negotiated repurchase is stronger than that for an open market repurchases (Chen and Wang (2012)), we include a dummy variable that equals one if the repurchase is an open market share repurchase and zero otherwise. Bonaime (2012) shows that after the 2004 modification to SEC Rule 10b-18, firms disclose more about repurchase transactions. Hence we also include a binary variable that equals one if the repurchase announcement is made from 2004 onwards.

The coefficient on the *LBB Dummy* in column (1) is significantly negative at the 5% level. This suggests that debt-financed repurchases experience lower abnormal returns than cash-financed ones. Consistent with the agency cost of free cash-flows (Jensen (1986)), there is a less favorable market reaction if the firm has substantial free cash-flows. Larger firms and those with higher prior abnormal returns experience lower market reactions.

The financial leverage increases mechanically following leveraged buybacks. We study whether the benefits from leveraged buybacks depend on the ex-ante debt ratio. In column (2) of Table 2.6, we interact the *LBB Dummy* with the *Market Leverage*. The coefficient on this interaction term is significantly negative at the 5% level. The *LBB Dummy* is significantly positive at the 10% level, which suggests that market reacts favorably to debt-financed repurchasing firms with low debt ratio, In addition, for leveraged buybacks, firms with ex-ante high debt ratio experience lower abnormal returns than those with low debt ratio, consistent with the leverage optimization hypothesis.

A firm with high debt ratio is not necessarily over-levered. The optimal capital structure varies across firms. In column (3) of Table 2.6, we add an interaction term, *LBB Dummy* × *TLEV Dummy* to the regression, where *TLEV Dummy* is a binary

variable that equals one if the firm is over-levered before the repurchase announcement and zero otherwise. For leveraged buybacks, we find that the average three-day abnormal return is lower if the firm is ex-ante over-levered.

Fourth, we examine how free cash-flows and excess cash holdings in a firm affect the impact of debt financing on the market reaction to repurchases. We include an interaction term, *LBB Dummy* × *Free Cash Flow* in column (4) of Table 2.6. The coefficient on the interaction term is insignificant. As the optimal cash holdings vary across firms, following Opler, Pinkowitz, Stulz, and Williamson (1999), we estimate the target cash holdings for each firm-year. We include an interaction term in column (5) of Table 2.6, *LBB Dummy* × *TCASH Dummy*, where *TCASH Dummy* is a binary variable that equals one if a firm's cash holding ex ante is above the optimal level and zero otherwise. The coefficient on the interaction term is insignificant. This suggests that free cash-flows or excess cash does not affect the impact of debt financing on three-day abnormal returns.

Our results suggest that the market reacts favorably for leveraged buyback firms with low debt ratio. We find lower three-day announcement returns and poorer long-run stock performance for firms that are ex-ante over-levered.

2.3.4 Ex-Post Real Investments

Grullon and Michaely (2004) find that firms reduce their capital expenditures and R&D following repurchases. Table 2.7 shows results of the cross-sectional analysis of changes in real investments ex post. The dependent variable is changes of *abnormal investment*, where *abnormal investment* is the capital expenditure of a repurchasing firm minus that of the matched peer with similar pre-buyback characteristics, from the end of year −1 to the end of year +2. In column (1), the

coefficient of the *LBB Dummy* is significantly negative at the 5% level, which shows that debt-financed repurchasing firms experience sharper decline in ex-post abnormal investments than cash-financed ones. Post-repurchase capital expenditures are higher for firms with higher growth opportunities as proxied by Tobin's Q, similar to findings in previous studies (Jagannathan, Stephens, and Weisbach (2000)). Leverage is negatively associated with changes of abnormal investment (Lang, Ofek, and Stulz (1996)).

In column (2), we include an interaction term, *LBB Dummy* × *Leverage*, to examine how leverage affects the impact of debt financing on post-repurchase real investments. The coefficient on the *LBB Dummy* is no longer significant but the coefficient on the interaction term is significantly negative at the 5% level. This suggests that leveraged buybacks lead to a sharper decline in ex-post abnormal investment only for highly-levered firms, not for firms with ex-ante low leverage.

We then investigate whether over-levered buybacks are associated with sharper decline in ex-post real investment than under-levered ones. Table 2.5 shows that both over-levered leveraged buyback firms and under-levered ones experience significant declines in investment after controlling for matched non-repurchasing peers. We observe a 5.5% (1.1%) decline in abnormal investments for over-levered (under-levered) firms, and the difference is statistically significant at the 1% level. Similarly in column (3) of Table 2.7, we include an interaction term *LBB Dummy* × *TLEV Dummy*. For leveraged buybacks, post-repurchase abnormal investment declines more sharply for firms with leverage above the optimal ratio ex ante.

To examine whether free cash-flows or excess cash affects the impact of debt financing on post-repurchase real investments, we interact *LBB Dummy* with *Free Cash Flow* and *TCASH Dummy* in columns (4) and (5). The coefficients of both

interaction terms are insignificant, suggesting that they do not have a significant impact.

Our results indicate that leveraged buybacks experience a steeper decline in abnormal investments ex post than cash-financed ones. The reduction in real investments is sharper for firms with high leverage ex ante.

2.3.5 Growth Prospects

We analyze whether the reduction in real investments ex post is driven by declining growth prospects. For each repurchasing firm, the matched non-repurchasing firm is of the same two-digit SIC code, and with both pre-repurchase investment and book value of assets in year −1 within ±20% of those of the repurchasing firm.

Table 2.8 reports changes of growth prospects, measured by long-run value to book, prior to and following buyback announcements for debt-, cash-financed repurchases and their matched non-repurchasing peers. Figure 2.1 shows the graph. The average change in the long-run value to book from the end of year −1 to the end of year 0 is insignificant for both leveraged buybacks and their matched peers. From the end of year 0 to the end of year +4, only the change for leveraged buybacks is significantly negative. The difference between the changes for leveraged buybacks and matched peers is statistically significant at the 1% level.

Then we compare the changes in long-run value to book of debt-financed repurchases with those of cash-financed ones. Debt-financed buyback firms experience a significantly sharper decline in long-run value to book than cash-financed buyback firms from the end of year 0 to the end of year +4.

We next examine whether changes in growth prospects explain the lower returns and sharper decline in ex-post real investments for over-levered firms. Table 2.5 reports the changes in growth prospects from the end of year −1 to the end of year +2 for the subsamples of over-levered and under-levered firms. Post-repurchase growth prospects for over-levered firms do not change significantly, while under-levered firms experience significant decline in growth prospects following repurchase announcements. This suggests that changes in growth prospects do not explain the lower returns and sharper decline in ex-post real investments for over-levered firms.

Furthermore, we control for growth prospects and changes in growth prospects in our return and post-repurchase real investment regressions. We interact *Change in Growth Prospect* with *LBB Dummy* in columns (1) and (3) of Table 2.9 and interact *Growth Prospect* with *LBB Dummy* in columns (2) and (4). In Table 2.9, the LBB and over-leverage interactions remain significant, while all interaction terms with growth prospects are insignificant. This confirms that differences in growth prospects do not explain the announcement returns and ex-post investments for over-levered firms.

Our results suggest that the growth prospects decline significantly for all repurchasing firms ex post after controlling for non-repurchasing matched peers. The effect is stronger for debt-financed buyback firms. Hence lower growth prospects may contribute to the post-repurchase reduction in real investments for leveraged buybacks. However, changes in growth prospects following leveraged buybacks do not explain the lower announcement returns and sharper decline in ex-post real investments that are associated with over-levered firms.

2.3.6 Can Corporate Governance Explain the Lower Returns of Over-Levered Firms?

We next examine whether corporate governance explains the lower announcement returns and sharper decline in ex-post real investments for over-levered firms. Following Gompers et al. (2003), we use *G-Index* to control for differences in corporate governance across firms. Gompers et al. (2003) construct an equally-weighted index based on 24 governance provisions provided by the Investor Responsibility Research Center (IRRC). Higher *G-Index* indicates weaker corporate governance. Among our sample of 575 repurchasing firms, data on *G-Index* is available for 317 firms.

Table 2.5 reports *G-Index* at the end of year −1 for the subsamples of over-levered and under-levered firms. Over-levered firms have significantly weaker corporate governance than under-levered firms, and the difference is statistically significant at the 5% level. In Table 2.10 we then control for corporate governance in our regressions for announcement returns (columns (1) and (2)) and post-repurchase real investment (columns (3) and (4)). We interact *G-Index* with *LBB Dummy* in all columns and interact *TLEV Dummy* with *LBB Dummy* in columns (2) and (4). In column (1) of Table 2.10, the LBB and *G-Index* interaction is significantly negative, suggesting that weaker corporate governance is associated with lower abnormal returns for leveraged buyback firms. In column (2), *LBB Dummy*G-Index* remains significant, while *LBB Dummy*TLEV Dummy* becomes insignificant. This implies that weaker corporate governance explains the lower announcement returns for over-levered firms.

In our investment regressions in columns (3) and (4), the LBB and over-leverage interactions remain significant, while all interaction terms with *G-Index* are

insignificant. This shows that weaker corporate governance cannot explain the sharper decline in ex-post investments for over-levered firms.

2.3.7 Motives and Completion Rates of Leveraged Buybacks

We study why firms use debt to finance repurchases by employing logit and probit regressions. The dependent variable is a dummy variable that equals one if firms use debt to fund repurchases and zero otherwise. The explanatory variables include one-year lagged firm characteristics. We include both industry and year dummies to account for potential industry-specific and year-specific differences. Standard errors are clustered by firm.

Table 2.11 shows that firms with lower cash holdings are more likely to use debt to finance share buybacks. Holding other explanatory variables at the average, the probability of using debt to buy back shares increases by 7.8% for a one-percent decrease in cash holdings. As the optimal cash holdings vary across firms, following Opler, Pinkowitz, Stulz, and Williamson (1999), we estimate the target cash holdings for each firm-year. 73% of debt-financed repurchasing firms have ex-ante cash holdings below the estimated optimal cash level. This result supports a pecking order of financing where the firm raises external debt if internal cash is insufficient (Myers and Majluf (1984)).

Furthermore, firms with stronger past performance have higher probability of conducting leveraged buybacks. Holding other explanatory variables at their average, there is a 8.5% (1.3%) increase in the probability of using debt to finance repurchases for a one-percent increase in ROA (prior abnormal returns). These results show that firms with lower cash holdings and better past performance are more prone to conduct leveraged buybacks.

Unlike repurchases via Dutch auction or tender offers, open-market repurchase programs do not commit to completing a pre-specified buyback program. Hence managers may use repurchase programs for their own interest (Fenn and Liang (2001), Chan, Ikenberry, Lee, and Wang (2010)).[13] For leveraged buybacks, existing bondholders may deter the execution of repurchases due to an increased leverage.[14]

We then examine the completion rates of debt-financed repurchases after repurchase announcements. We keep only open-market repurchases and drop privately-negotiated deals. To measure the completion rates of share repurchases, we use the purchase of common and preferred stock (item 115) minus any decrease in redeemable preferred stock (item 175) from Compustat, divided by the market value of equity (Grullon and Michaely (2004), Gong, Louis, and Sun (2008)).[15]

In column (1) of Table 2.12, we employ the Tobit model where the dependent variable is the actual buyback ratio two years after the repurchase announcement. We include intended buyback ratio as an additional explanatory variable in our regression. Intended buyback ratio is defined as the intended buyback size disclosed in the Current-Event (8-K) filing over the market value of equity (Chen and Wang (2012)). The coefficient on the *LBB Dummy* is significantly negative at the 5% level. This suggests that debt-financed repurchases have lower completion rates than cash-financed buybacks. The results also show that more levered firms have lower

[13] Bonaime (2012) finds a reputation effect where the lagged completion rate predicts future completion rates of buybacks.

[14] This is possibly due to interventions from debtholders. For example, Bloomberg reports on 17 April 2012: "Lowe's Cos. (LOW) is raising $2 billion in the bond market to finance stock repurchases as the second-biggest U.S. home-improvement retailer boosts leverage to reward shareholders even as its profitability wanes. That raises concern among bondholders and bondholders are somewhat skeptical of the company given that the firm changed its financial policies. Debtholders tend to negotiate with the senior officials in order to avoid worsen financial position of the company."

[15] Several proxies are proposed by previous research to measure actual buyback ratio. Fama and French (2001) select changes in treasury stock from Compustat to proxy for actual repurchase rate. Stephens and Weisbach (1998) and Guay and Harford (2000) use decreases in shares outstanding from CRSP to measure actual buyback ratio. Banyi, Dyl, and Kahle (2008) show that purchase of common and preferred stock minus any decrease in redeemable preferred stock from Compustat is considered a better measure.

completion rates. The results are similar when we use OLS regressions in column (2).

2.3.8 Operating Performance, Financial Distress Risk and Robustness Checks

We first examine whether operating performance improves following debt-financed repurchases. Figure 2.2 depicts changes of operating performance following repurchase announcements for debt- and cash-financed buybacks and their matched peers. Consistent with Lie (2005) and Gong, Louis, and Sun (2008), we find lower reductions in operating performance ex post for debt- and cash-financed repurchases than matched non-repurchasing firms. We then test whether the abnormal post-repurchase operating performance differs between debt- and cash-financed buybacks, controlling for other factors in a regression setting. The dependent variable is changes of *abnormal operating performance* from the end of year −1 to the end of year +2. We do not find significant difference in ex-post *abnormal operating performance* between debt- and cash-financed buybacks (Tables are available upon request).

We next analyze whether debt-financed buyback firms face higher financial distress risk ex post than their matched non-repurchasing peers. Shareholders may use buybacks to expropriate wealth from debtholders (Bradley and Wakeman (1983), Maxwell and Stephens (2003)). For instance, Greenberg reports on 8th November 2011: "Fitch Rating downgraded Amgen the day when the firm announced that it would use debt to finance the repurchase." Figure 2.2 plots changes of Z-score following buyback announcements for debt-, cash-financed repurchases and their matched non-repurchasing peers. Debt-financed buyback firms do not exhibit higher financial distress risk than their matched peers. We also run regression where the

dependent variable is changes of *abnormal Z-score* from the end of year −1 to the end of year +2. The coefficient of the *LBB Dummy* is negative but insignificant. We do not find significant difference of abnormal changes of financial distress risk ex post between debt- and cash-financed buybacks (Tables are available upon request).

We also conduct several robustness checks to our main results. First, we use an alternative definition of debt-financed repurchases. We define a repurchase as a debt-financed one only if the corporate filings explicitly state that the firm expects to use only debt to finance the share repurchase. In our sample, 86 out of 218 leveraged buybacks are fully financed by debt. We investigate short-term market reaction to those fully-debt financed repurchases. We find similar results to those reported before.

Second, we use alternative measures of abnormal returns. For example, we use a five-day window in CAR. We also use alternative models such as the CRSP equally-weighted market index as the benchmark or market-adjusted returns where equity beta is assumed to be 1. The results are very similar to those reported in Table 2.6.

Third, an alternative measure of completion rates is employed. Following Bonaime (2012), we use the purchase of common and preferred stock minus any decrease in redeemable preferred stock, all scaled by the announced size of repurchase plan to measure completion rates.[16] Results remain unchanged.

Fourth, Peyer and Vermaelen (2005) argue that the motivation for conducting privately negotiated repurchase differs from that of open market share repurchases. Therefore, we exclude 57 privately negotiated repurchases in our sample. The results are very similar to what we reported previously.

[16] Results are similar when we drop the decrease in redeemable preferred stock item.

2.4 Conclusion

This paper studies the performance of leveraged buybacks. We propose that firms conduct leveraged buybacks to optimize their capital structures. Consistent with our hypothesis, under-levered firms with low cash holdings but substantial debt capacity conduct leveraged buybacks. We find positive short-term abnormal returns and long-term price drift for debt-financed repurchases. The market reactions are less positive than those of cash-financed buybacks. The stock market reacts less favorably to firms with ex-ante higher leverage, consistent with the informational, agency and tax benefits of leveraged buybacks decreasing with a firm's leverage. Leveraged buyback firms experience a steeper decline in real investments ex post than cash-financed buyback firms. Lower growth prospects do not explain the lower announcement returns and ex-post real investments that are associated with ex-ante over-levered firms. Instead, we find that the lower announcement returns for over-levered firms are concentrated on firms with weaker corporate governance. Debt-financed repurchases also exhibit lower completion rates than cash-financed ones. Debt-financed buyback firms do not have significantly different financial distress risk or operating performance ex post than cash-financed ones.

Our results suggest that leveraged buybacks on average add value to shareholders. Firms with declining growth prospects and substantial debt capacity repurchase shares via issuing debt to generate tax benefits or reduce agency costs of free cash-flows, therefore optimizing their leverage. However, the evidence does not imply that *all* leveraged buybacks are consistent with value maximization and economic efficiency. For a small segment of the leveraged buyback market where firms are over-levered ex-ante, leveraged buybacks lead to lower market reactions and sharper reductions in ex-post investments than under-levered firms.

Table 2.1: The Distribution of Share Repurchases Over Time

This table lists the number of debt- and cash-financed repurchases each year over the period 1994-2012. Debt-financed repurchases are share buybacks that use external debt to buyback stocks. Cash-financed repurchases are repurchase programs that use internal funds to finance share buybacks. We also report the mean (median) deal value for both debt- and cash-financed repurchases.

	Debt-Financed Repurchases			Cash-Financed Repurchases		
Year	N	Mean Deal Value ($million)	Median Deal Value ($million)	N	Mean Deal Value ($million)	Median Deal Value ($million)
1994	12	81.30	25.75	13	41.93	9.40
1995	19	115.85	34.68	6	13.25	9.09
1996	14	133.78	43.67	12	113.81	24.53
1997	17	229.30	47.81	10	124.42	6.32
1998	16	36.16	17.76	10	401.69	19.22
1999	17	48.41	15.70	6	53.47	63.89
2000	4	91.47	47.50	4	9.80	8.15
2001	7	114.23	53.28	7	78.64	11.49
2002	8	104.84	33.00	13	297.15	9.60
2003	3	70.02	38.50	4	46.69	41.65
2004	7	869.66	100.00	28	318.55	101.38
2005	13	361.70	300.00	26	311.76	57.5
2006	12	411.37	250.00	27	228.59	25.52
2007	35	1001.39	150.00	62	253.43	55.00
2008	29	146.48	46.30	102	390.16	20.00
2009	10	161.65	63.00	27	167.49	25.00
2010	6	300.40	212.50	9	348.38	15.00
2011	31	470.91	100.00	37	132.09	50.00
2012	17	426.47	200.00	30	756.96	250.00
Total	**277**	**335.21**	**70.00**	**433**	**291.39**	**30.00**

Table 2.2: Source of Financing and Firm Characteristics

The sample consists of 218 debt-financed repurchases and 357 cash-financed repurchases over the period 1994-2012. *Investment* is defined as capital expenditure (item 145 in Compustat) divided by total assets (item 6). *Cash Holding* is the cash and cash equivalents (item 1) over total assets (item 6). *Free Cash Flow* is the gross operating income (item 13) minus the sum of depreciation (item 14), tax paid (item 16), interest expenses (item 15) and dividends paid (item19+item 21). *Market Leverage* is defined as book value of debt (item 9+ item 34) divided by the sum of book value of debt (item 9+ item 34) and market value of equity (item 25* item 24). *Net Market Leverage* is the book value of debt minus cash and cash equivalents, all divided by the sum of book value of debt and market value of equity. *Intended Buyback Ratio* is the intended buyback size disclosed in the 8-k filing over the market value of equity (item 25* item 24). *Z-score* is Altman's (1968) measure of credit risk. *Dividend* is the sum of common (item 21) and preferred (item 19) dividend paid to shareholders over total assets (item 6). *Tobin's Q* is defined as the book value of assets (item 6) minus book value of equity (item144) plus market value of equity (item 25* item 24), all divided by book value of assets (item 6). *Size* is defined as the log of asset size (item 6), measured in 1983 dollars. *Operating Performance* is measured by ROA, which is defined as operating income (item 13) divided by book assets (item 6). *FA_TA* is the property, plant and equipment (item 14) over total book assets (item 6). The last column reports the difference in mean test. ***, **and * represent statistical significance at the 1%, 5% and 10% level, respectively.

	Debt-Financed Repurchases			Cash-Financed Repurchases			Difference
	N	Mean	Median	N	Mean	Median	Debt - Cash
Investment	215	0.07	0.04	351	0.04	0.03	0.03***
Cash Holding	218	0.09	0.04	356	0.25	0.22	-0.16***
Free Cash Flow	203	0.06	0.05	292	0.06	0.05	0.00
Market Leverage	214	0.21	0.15	346	0.15	0.07	0.06***
Net Market Leverage	214	0.16	0.12	346	-0.03	-0.06	0.19***
Intended Buyback Ratio	194	0.10	0.07	317	0.07	0.05	0.03***
Z-score	193	4.34	3.71	308	6.63	4.18	-2.29***
Dividend	217	0.02	0.00	355	0.01	0.00	0.01*
Tobin's Q	214	1.91	1.57	349	2.14	1.60	-0.23**
Size	218	20.04	19.90	356	19.65	19.73	0.39**
Operating Performance	211	0.18	0.15	349	0.13	0.12	0.05***
FA_TA	209	0.30	0.20	350	0.18	0.11	0.12***

Table 2.3: Short-Term and Long-Run Stock Performance

This table shows the short-term market reaction and long-term price drift for both debt- and cash-financed repurchases. Panel A shows the cumulative abnormal returns based on different event windows. We use market model and select CRSP equally-weighted (EW) or value-weighted (VW) market index as the benchmark. Panel B reports the monthly calendar-time alphas 6-month prior to and 12-, 24-, and 36-month following the repurchase announcement date, where portfolios are formed monthly in calendar time. Panel C shows the monthly abnormal returns 6-month prior to and 12-, 24-, and 36-month following the repurchase announcement using Ibbotson's (1975) Return Across Time and Securities (RATS) method. ***, **and *represent the 1%, 5% and 10% significance level, respectively.

Panel A: Short-term CAR

	ALL			Debt-Financed Repurchases			Cash-Financed Repurchases		
	N	EW	VW	N	EW	VW	N	EW	VW
(-1,0)	672	1.30%***	1.19%***	269	1.14%***	1.04%***	403	1.41%***	1.30%***
(0,1)	672	2.68%***	2.63%***	269	2.27%***	2.21%***	403	2.96%***	2.90%***
(-1,+1)	672	2.60%***	2.50%***	269	2.27%***	2.19%***	403	2.83%***	2.72%***

Panel B: Fama-French Long-term AR

	ALL		Debt-Financed Repurchases		Cash-Financed Repurchases	
	N	Calendar-time Approach	N	Calendar-time Approach	N	Calendar-time Approach
(-6,0)	682	-0.54%**	273	-0.51%*	409	-0.06%
(+1,+12)	682	1.00%***	273	0.96%***	409	1.18%***
(+1,+24)	682	0.87%***	273	0.89%***	409	0.84%***
(+1,+36)	682	0.78%***	273	0.82%***	409	0.74%***

Panel C: Fama-French IRATS Long-term AR

	ALL		Debt-Financed Repurchases		Cash-Financed Repurchases	
	N	Ibbotson RATS	N	Ibbotson RATS	N	Ibbotson RATS
(-6,0)	682	-0.82%***	273	-0.59%**	409	-0.91%***
(+1,+12)	682	0.46%***	273	0.47%**	409	0.42%**
(+1,+24)	682	0.43%***	273	0.37%**	409	0.45%***
(+1,+36)	682	0.37%***	273	0.31%**	409	0.39%***

Table 2.4: Changes in Investment, Cash, Leverage, ROA and Z-Score around Buybacks

This table reports average changes in investment, cash, leverage, net leverage, operating performance and Z-score before and after repurchase announcements. Panel A shows changes ex ante and Panel B displays changes ex post. Year 0 is defined as the fiscal year when share repurchase is announced. Period (x, y) measures changes from the end of year y to the end of year x. *Investment* is defined as capital expenditure (item 145) divided by total assets (item 6). *Cash Holding* is the cash and cash equivalents (item 1) over total assets (item 6). *Market Leverage* is defined as book value of debt (item 9+ item 34) divided by the sum of book value of debt (item 9+ item 34) and market value of equity (item 25* item 24). *Net Market Leverage* is the book value of debt minus cash and cash equivalents, all divided by the sum of book value of debt and market value of equity. *Operating Performance* is measured by ROA, which is defined as operating income (item 13) divided by book assets (item 6). *Z-score* is Altman's (1968) measure of credit risk. ***, **and * represent statistical significance at the 1%, 5% and 10% level, respectively.

Panel A: Changes in Performance ex ante							
Category	Period	Change in *INV*	Change in *CASH*	Change in *LEV*	Change in *NLEV*	Change in *OP*	Change in *Z-Score*
Debt-Financed Repurchases	(-2,-1)	0.001	-0.004**	-0.007	-0.004	0.007*	0.127
	(-3,-1)	-0.000	-0.012**	-0.022*	-0.008	0.010**	0.274
	(-4,-1)	-0.000	-0.015***	-0.022	-0.012	0.018**	0.141
	(-5,-1)	-0.002	-0.025***	-0.001	0.011	0.017**	-0.356
Cash Financed Repurchases	(-2,-1)	-0.002	0.004	-0.001	-0.007	0.010*	0.205
	(-3,-1)	-0.005**	-0.001	-0.004	-0.012	0.018**	0.213
	(-4,-1)	-0.009***	0.007	-0.010	-0.030**	0.028***	-0.204
	(-5,-1)	-0.006**	-0.003	-0.028***	-0.042***	0.019**	-1.572***
Panel B: Changes in Performance ex post							
Category	Period	Change in *INV*	Change in *CASH*	Change in *LEV*	Change in *NLEV*	Change in *OP*	Change in *Z-Score*
Debt-Financed Repurchases	(-1,+1)	-0.012**	-0.001	0.084***	0.068***	-0.003	-0.884***
	(-1,+2)	-0.021***	0.002	0.061***	0.044***	-0.013*	-1.016***
	(-1,+3)	-0.020***	0.008	0.064***	0.038**	-0.019**	-1.093***
	(-1,+4)	-0.020***	0.013*	0.064***	0.033	-0.031***	-1.354***
Cash Financed Repurchases	(-1,+1)	0.001	-0.028***	0.021**	0.011	-0.018**	-1.469***
	(-1,+2)	-0.001	-0.032***	0.014	0.001	-0.014*	-1.418***
	(-1,+3)	-0.005*	-0.035***	0.036***	-0.008	-0.022**	-2.068***
	(-1,+4)	-0.001	-0.035***	0.026*	-0.022	-0.017*	-2.163***

Table 2.5: Leveraged Buybacks and Firm Performance: Over-levered vs Under-levered Firms

We disentangle over-levered leveraged buyback firms from under-levered ones. The leveraged buyback firm is defined as over-levered if its market leverage exceeds the optimal level one year before the repurchase announcement. Following Flannery and Rangan (2006) and Faulkender, Flannery, Hankins, and Smith (2012), we estimate the target leverage ratio for each firm per year. *CAR* is the three-day cumulative abnormal return (−1, +1) where day 0 is the repurchase announcement date. *Fama-French Calendar-time AR* is the monthly calendar-time alphas 12 months following the repurchase announcement date, where portfolios are formed monthly in calendar time. *Ibbotson RATS AR* is the monthly abnormal returns 12 months following the repurchase announcement using Ibbotson's (1975) Return Across Time and Securities (RATS) method. We calculate *Changes in Abnormal Investment, Abnormal Operating Performance, Abnormal Z-Score,* and *Growth Prospect* from the end of year −1 to the end of year +2. *Abnormal Investment* is a repurchasing firm's capital expenditure (item 145) divided by total assets (item 6), minus that of its matched firm. The *Abnormal Operating Performance* for a repurchasing firm is its ROA, which is defined as operating income (item 13) divided by book assets (item 6) minus that of the matched firm. The *Abnormal Z-Score* for the repurchasing firm is the firm specific *Z-Score* minus that of the matched firm. *Growth Prospect* is the difference between long-run value and observed book value. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). High *G-Index* indicates weak corporate governance. The last column reports the difference in mean test. ***, **and * represent statistical significance at the 1%, 5% and 10% level, respectively.

	Over-levered Firms		**Under-levered Firms**		**Difference**
	N	Mean	N	Mean	Over - Under
CAR	41	0.016	173	0.027***	-0.011
Fama-French Calendar-time AR (+1,+12)	41	-0.008	173	0.007**	-0.0154***
Ibbotson RATS AR (+1,+12)	41	-0.001	173	0.005**	-0.0062***
Changes in Abnormal Investment	32	-0.055***	144	-0.011**	-0.044***
Changes in Abnormal Operating Performance	30	0.014	138	0.058**	-0.044
Changes in Abnormal Z-Score	31	-0.243	139	0.806	-1.049
Changes in Growth Prospect	29	0.009	137	-0.031***	0.040***
G-Index	22	8.591***	119	7.578***	1.013**

Table 2.6: Cross-Sectional Analysis of Short Term Reaction to Buyback Announcements

This table reports results of the cross-sectional analysis of short-term market reaction to repurchase announcements. The dependent variable is the three day CAR (−1, +1) where day 0 is the repurchase announcement date. *LBB Dummy* is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. We define a share repurchase as a debt-financed one if the transaction is partially or fully financed by debt. *TLEV Dummy* is a binary variable that equals one if the firm is over-levered before the repurchase announcement and zero otherwise. *TCASH Dummy* is a dummy variable that equals one if the firm has excess cash prior to the buyback announcement. *OMSR Dummy* is a dummy variable that equals one if the repurchase is an open market repurchase program and zero otherwise. *HD Dummy* is a binary variable that equals one if the repurchase announcement is made from 2004 onwards and zero otherwise. We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
Intercept	**0.156**	**0.195**	**0.194**	**0.157**	**0.163**
	[3.09]***	[3.91]***	[3.54]***	[3.07]***	[3.18]***
LBB Dummy	**-0.019**	**0.022**	**-0.000**	**-0.022**	**-0.022**
	[2.03]**	[1.71]*	[0.02]	[1.66]*	[1.47]
TLEV Dummy			**0.042**		
			[1.76]*		
TCASH Dummy					**0.001**
					[0.06]
OMSR Dummy	**-0.008**	**-0.006**	**-0.005**	**-0.008**	**-0.003**
	[0.64]	[0.50]	[0.42]	[0.68]	[0.23]
HD Dummy	**-0.009**	**-0.016**	**-0.015**	**-0.009**	**-0.009**
	[0.54]	[0.90]	[0.73]	[0.53]	[0.49]
Prior AR	**-0.116**	**-0.128**	**-0.152**	**-0.116**	**-0.123**
	[2.61]***	[3.14]***	[3.30]***	[2.61]***	[2.63]***
Q	**-0.003**	**-0.001**	**-0.001**	**-0.003**	**-0.003**
	[0.87]	[0.20]	[0.20]	[0.86]	[0.84]
Size	**-0.005**	**-0.008**	**-0.007**	**-0.005**	**-0.006**
	[2.36]**	[3.43]***	[3.02]***	[2.35]**	[2.61]***
Cash Holdings	**-0.018**	**-0.021**	**-0.028**	**-0.019**	**-0.019**
	[0.52]	[0.64]	[0.78]	[0.55]	[0.50]
Free Cash Flow	**-0.197**	**-0.195**	**-0.204**	**-0.207**	**-0.188**
	[1.99]**	[1.97]**	[1.87]*	[1.82]*	[1.88]*
Leverage	**-0.008**	**0.079**	**-0.023**	**-0.008**	**-0.006**
	[0.26]	[1.47]	[0.76]	[0.25]	[0.19]
Dividend	**-0.022**	**0.061**	**0.097**	**-0.022**	**-0.026**
	[0.21]	[0.59]	[0.79]	[0.20]	[0.25]
LBB Dummy Leverage*		**-0.141**			
		[2.45]**			
LBB Dummy TLEV Dummy*			**-0.057**		
			[1.97]**		
LBB Dummy Free Cash Flow*				**0.042**	
				[0.29]	
LBB Dummy TCASH Dummy*					**0.005**
					[0.26]
Industry Dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Time Dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N	575	554	479	554	543
Adjusted R^2	0.12	0.14	0.16	0.12	0.13

Table 2.7: Cross-Sectional Analysis of Changes in Post-Repurchase Real Investments

This table reports results of the cross-sectional analysis of post-announcement changes in abnormal investment. The dependent variable is changes in abnormal investment from the end of year −1 to the end of year +2. Abnormal investment is a repurchasing firm's capital expenditure (item 145) divided by total assets (item 6), minus that of its matched firm. *LBB Dummy* is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. We define a share repurchase as a debt-financed one if the transaction is partially or fully financed by debt. *TLEV Dummy* is a binary variable that equals one if the firm is over-levered before the repurchase announcement and zero otherwise. *TCASH Dummy* is a binary variable that equals one if the firm has excess cash prior to the buyback announcement. *OMSR Dummy* is a dummy variable that equals one if the repurchase is an open market repurchase program and zero otherwise. *HD Dummy* is a binary variable that equals one if the repurchase announcement is made from 2004 onwards and zero otherwise. We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
Intercept	**0.003**	**0.004**	**-0.006**	**0.001**	**-0.001**
	[0.06]	[0.09]	[0.15]	[0.02]	[0.03]
LBB Dummy	**-0.022**	**-0.011**	**-0.011**	**-0.015**	**-0.017**
	[2.51]**	[1.14]	[1.26]	[1.59]	[1.63]
TLEV Dummy			**0.006**		
			[0.59]		
TCASH Dummy					**0.008**
					[0.84]
OMSR Dummy	**-0.015**	**-0.014**	**-0.013**	**-0.014**	**-0.014**
	[1.92]*	[1.84]*	[1.71]*	[1.89]*	[1.90]*
HD Dummy	**0.001**	**0.003**	**0.003**	**0.001**	**0.000**
	[0.13]	[0.23]	[0.28]	[0.14]	[0.03]
Prior AR	**-0.030**	**-0.030**	**-0.045**	**-0.030**	**-0.029**
	[1.35]	[1.34]	[2.03]**	[1.36]	[1.28]
Q	**0.008**	**0.009**	**0.007**	**0.009**	**0.009**
	[2.35]**	[2.43]**	[1.40]	[2.57]**	[2.54]**
Size	**0.000**	**-0.000**	**0.001**	**0.000**	**0.000**
	[0.18]	[0.12]	[0.32]	[0.18]	[0.16]
Cash Holdings	**-0.025**	**-0.018**	**-0.031**	**-0.025**	**-0.036**
	[1.22]	[0.90]	[1.15]	[1.25]	[1.59]
Free Cash Flow	**-0.011**	**-0.006**	**-0.015**	**0.006**	**-0.013**
	[0.38]	[0.21]	[0.49]	[0.22]	[0.45]
Leverage	**-0.032**	**0.001**	**-0.022**	**-0.031**	**-0.033**
	[2.17]**	[0.06]	[1.31]	[2.06]**	[2.26]**
LBB Dummy Leverage*		**-0.056**			
		[2.20]**			
LBB Dummy TLEV Dummy*			**-0.045**		
			[2.55]**		
LBB Dummy Free Cash Flow*				**-0.118**	
				[1.30]	
LBB Dummy TCASH Dummy*					**-0.008**
					[0.57]
Industry Dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Time Dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N	419	419	398	419	409
Adjusted R^2	0.16	0.17	0.20	0.17	0.17

Table 2.8: Changes of Growth Prospects after Share Buybacks

This table reports average changes of growth prospects, measured by long-run value to book (Rhodes-Kropf, Robinson, and Viswanathan (2005)). Year 0 is defined as the fiscal year when share repurchase is announced. Period (x, y) measures changes from the end of year y to the end of year x. *Long-run value to book* is the difference between long-run value and observed book value and accounts for firm's growth prospects. Both debt- and cash-financed repurchases are matched to non-repurchasing peers with similar pre-repurchase firm characteristics. For each repurchasing firm, the matched non-repurchasing firm is of the same two-digit SIC code, and with both pre-repurchase investment and book value of assets in year −1 within ±20% of those of the repurchasing firm. Tests of differences and difference-in-difference are reported. ***, **and * represent statistical significance at the 1%, 5% and 10% level, respectively.

Category	(−1,0)	(0,+1)	(0,+2)	(0,+3)	(0,+4)
Debt-financed Repurchases	**-0.004**	**-0.007**	**-0.017**	**-0.027**	**-0.038**
	[1.52]	[3.57]***	[3.84]***	[4.25]***	[5.31]***
Matched Non-repurchasing Firms	**0.006**	**0.014**	**0.016**	**0.011**	**-0.006**
	[1.11]	[1.09]	[1.00]	[0.48]	[0.46]
Difference (1)	**-0.010**	**-0.021**	**-0.033**	**-0.038**	**-0.044**
	[0.83]	[2.42]**	[2.79]***	[3.64]***	[4.71]***
Cash-financed Repurchases	**-0.003**	**-0.005**	**-0.012**	**-0.015**	**-0.026**
	[1.51]	[2.78]***	[3.43]***	[2.41]**	[4.26]***
Matched Non-repurchasing Firms	**0.001**	**-0.002**	**-0.003**	**-0.007**	**-0.005**
	[0.21]	[0.38]	[0.50]	[0.82]	[0.49]
Difference (2)	**-0.004**	**-0.003**	**-0.009**	**-0.008**	**-0.021**
	[1.02]	[2.39]**	[3.11]***	[2.25]**	[3.73]***
Diff-in-Diff (1)-(2)	**-0.006**	**-0.018**	**-0.024**	**-0.030**	**-0.023**
	[0.77]	[2.51]**	[2.86]***	[2.38]**	[3.04]***

Table 2.9: The Effect of Growth Prospects on Market Reaction and Post-Repurchase Investments

This table reports the effect of growth prospects on short-term market reaction to repurchase announcements and post-repurchase real investments. The dependent variable in columns (1) and (2) is the three day CAR (−1, +1) where day 0 is the repurchase announcement date. The dependent variable in columns (3) and (4) is changes in abnormal investment from the end of year −1 to the end of year +2. Abnormal investment is a repurchasing firm's capital expenditure (item 145) divided by total assets (item 6), minus that of its matched firm. *LBB Dummy* is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. We define a share repurchase as a debt-financed one if the transaction is partially or fully financed by debt. *OMSR Dummy* is a dummy variable that equals one if the repurchase is an open market repurchase program and zero otherwise. *HD Dummy* is a binary variable that equals one if the repurchase announcement is made from 2004 onwards and zero otherwise. *TLEV Dummy* is a binary variable that equals one if the firm is over-levered before the repurchase announcement and zero otherwise. *Growth Prospect* is the difference between long-run value and observed book value one year prior to the repurchase announcement. *Change in Growth Prospect* is changes in growth prospects from the end of year −1 to the end of year +2. We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)
Intercept	**0.202**	**0.096**	**-0.026**	**0.026**
	[3.40]***	[0.59]	[0.59]	[0.32]
LBB Dummy	**-0.000**	**0.011**	**-0.002**	**-0.003**
	[0.02]	[0.82]	[0.27]	[0.20]
OMSR Dummy	**-0.005**	**-0.003**	**-0.010**	**-0.012**
	[0.39]	[0.21]	[1.33]	[1.60]
HD Dummy	**-0.014**	**-0.014**	**0.003**	**0.003**
	[0.66]	[0.65]	[0.26]	[0.23]
TLEV Dummy	**0.049**	**0.049**	**0.002**	**0.006**
	[1.93]*	[1.87]*	[0.15]	[0.55]
Prior AR	**-0.163**	**-0.155**	**-0.051**	**-0.045**
	[3.43]***	[3.43]***	[2.13]**	[2.02]**
Q	**-0.000**	**-0.002**	**0.007**	**0.006**
	[0.02]	[0.43]	[1.40]	[1.34]
Change in Growth Prospect	**0.138**		**0.016**	
	[0.83]		[0.21]	
Growth Prospect		**0.045**		**-0.005**
		[0.89]		[0.18]
Size	**-0.008**	**-0.003**	**0.001**	**-0.001**
	[3.02]***	[0.45]	[0.51]	[0.22]
Cash Holdings	**-0.029**	**-0.026**	**-0.027**	**-0.032**
	[0.73]	[0.72]	[1.14]	[1.11]
Free Cash Flow	**-0.166**	**-0.197**	**0.002**	**-0.010**
	[1.44]	[1.80]*	[0.06]	[0.33]
Leverage	**-0.026**	**-0.025**	**-0.010**	**-0.019**
	[0.83]	[0.83]	[0.55]	[0.98]
Dividend	**0.114**	**0.105**		
	[0.86]	[0.84]		
*LBB Dummy*TLEV Dummy*	**-0.067**	**-0.062**	**-0.055**	**-0.047**
	[2.17]**	[1.97]**	[2.66]***	[2.45]**
*LBB Dummy*Change in Growth Prospect*	**0.027**		**0.223**	
	[0.12]		[1.44]	
*LBB Dummy*Growth Prospect*		**-0.030**		**-0.020**
		[1.13]		[0.67]
R^2	0.18	0.17	0.24	0.20
N	434	463	390	400

Table 2.10: The Effect of Corporate Governance on Market Reaction and Post-Repurchase Investments

This table reports the effect of corporate governance on short-term market reaction to repurchase announcements and post-repurchase real investments. The dependent variable in columns (1) and (2) is the three day CAR (−1, +1) where day 0 is the repurchase announcement date. The dependent variable in columns (3) and (4) is changes in abnormal investment from the end of year −1 to the end of year +2. Abnormal investment is a repurchasing firm's capital expenditure (item 145) divided by total assets (item 6), minus that of its matched firm. *LBB Dummy* is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. We define a share repurchase as a debt-financed one if the transaction is partially or fully financed by debt. *OMSR Dummy* is a dummy variable that equals one if the repurchase is an open market repurchase program and zero otherwise. *HD Dummy* is a binary variable that equals one if the repurchase announcement is made from 2004 onwards and zero otherwise. *TLEV Dummy* is a binary variable that equals one if the firm is over-levered before the repurchase announcement and zero otherwise. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). High *G-Index* indicates weak corporate governance. We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)
Intercept	**0.002**	**0.006**	**-0.113**	**-0.088**
	[0.03]	[0.08]	[1.10]	[0.94]
LBB Dummy	**0.053**	**0.056**	**0.023**	**0.027**
	[2.02]**	[2.16]**	[0.56]	[0.64]
OMSR Dummy	**-0.001**	**0.000**	**-0.003**	**-0.002**
	[0.05]	[0.02]	[0.22]	[0.19]
HD Dummy	**-0.013**	**-0.013**	**-0.015**	**-0.013**
	[0.57]	[0.56]	[0.91]	[0.83]
TLEV Dummy	**0.015**	**0.023**	**-0.015**	**0.004**
	[1.05]	[1.19]	[1.06]	[0.27]
G-Index	**0.002**	**0.002**	**-0.001**	**-0.000**
	[1.07]	[1.11]	[0.27]	[0.10]
Prior AR	**-0.085**	**-0.085**	**-0.042**	**-0.039**
	[2.53]***	[2.58]***	[1.29]	[1.28]
Q	**-0.002**	**-0.002**	**-0.004**	**-0.005**
	[0.25]	[0.27]	[0.69]	[0.76]
Size	**0.001**	**0.000**	**0.007**	**0.005**
	[0.19]	[0.09]	[1.30]	[1.09]
Cash Holdings	**0.028**	**0.030**	**-0.041**	**-0.034**
	[0.63]	[0.69]	[0.80]	[0.66]
Free Cash Flow	**0.030**	**0.029**	**0.079**	**0.082**
	[0.22]	[0.22]	[0.82]	[0.84]
Leverage	**-0.070**	**-0.070**	**-0.029**	**-0.018**
	[1.52]	[1.55]	[1.31]	[0.80]
Dividend	**0.162**	**0.157**		
	[0.83]	[0.82]		
*LBB Dummy*G-Index*	**-0.007**	**-0.007**	**-0.005**	**-0.005**
	[2.42]***	[2.40]***	[1.18]	[1.13]
*LBB Dummy*TLEV Dummy*		**-0.020**		**-0.053**
		[0.63]		[1.97]**
R^2	0.13	0.13	0.21	0.24
N	317	317	297	297

Table 2.11: Motives of Leveraged Buybacks

This table shows results of the relation between the sources of financing used and firm characteristics. The dependent variable is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. *Prior AR* represents stock returns on the firm minus returns on the value-weighted CRSP index, calculated from 44 days prior to the announcement until 4 days prior to the announcement. *Tobin's Q* is defined as the book value of assets (item 6) minus book value of equity (item144) plus market value of equity (item 25* item 24), all divided by book value of assets (item 6). *Size* is defined as the log of asset size (item 6), measured in 1983 dollars. *Cash Holding* is the cash and cash equivalents (item 1) over total assets (item 6). *Leverage* is defined as book value of debt (item 9+ item 34) divided by the sum of book value of debt (item 9+ item 34) and market value of equity (item 25* item 24). *Operating Performance* is measured by ROA, which is defined as operating income (item 13) divided by book assets (item 6). *Dividend* is the sum of common (item 21) and preferred (item 19) dividend paid to shareholders over total assets (item 6). *Z-score* is Altman's (1968) measure of credit risk. We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	Logit	**Probit**
Intercept	**1.574**	**0.660**
	(0.95)	(0.69)
Prior AR	**1.284**	**0.763**
	(2.07)**	(2.13)**
Tobin's Q	**0.029**	**0.001**
	(0.17)	(0.01)
Size	**-0.091**	**-0.044**
	(1.22)	(1.03)
Cash Holding	**-8.067**	**-4.440**
	(5.10)***	(5.48)***
Leverage	**0.464**	**0.426**
	(0.42)	(0.74)
Operating Performance	**8.095**	**4.456**
	(3.87)***	(3.86)***
Dividend	**-0.339**	**-0.220**
	(0.11)	(0.13)
Z-Score	**-0.077**	**-0.029**
	(1.36)	(1.05)
Industry Dummies	*Yes*	*Yes*
Time Dummies	*Yes*	*Yes*
N	501	501
Adjusted R^2	0.295	0.290

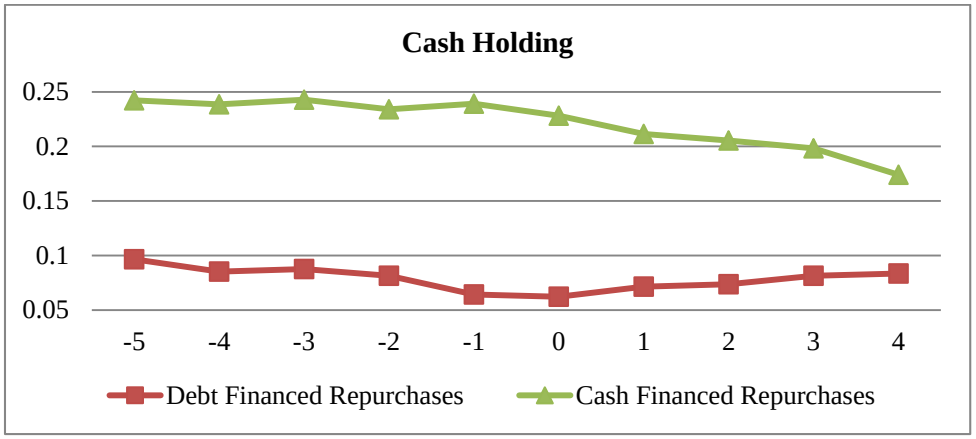
Table 2.12: Cross-Sectional Analysis of Actual Share Repurchases

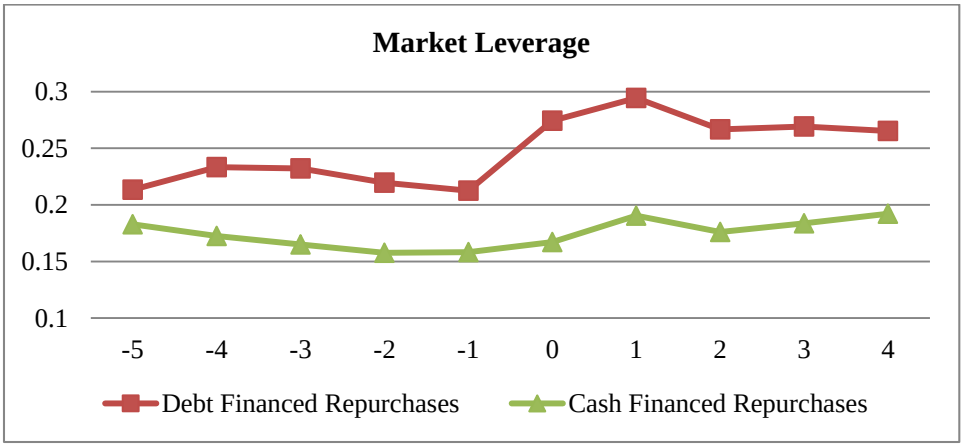
This table displays results of the cross-sectional analysis of actual share repurchases. The dependent variable is the *actual buyback ratio* two years after the repurchase announcement. The *actual buyback ratio* is defined as purchase of common and preferred stock (item 115) minus any decrease in redeemable preferred stock (item 175), all divided by market value of equity (item 25* item 24). *LBB Dummy* is a dummy variable that equals one if the repurchase is debt-financed and zero otherwise. We define a share repurchase as a debt-financed one if the transaction is partially or fully financed by debt. *HD Dummy* is a binary variable that equals one if the repurchase announcement is made from 2004 onwards and zero otherwise. *Intended buyback ratio* is the intended buyback size disclosed in the 8-k filing over the market value of equity (item 25* item 24). We include two time dummies capturing the Dot-com bubble from 1997 to 2000 and the financial crisis from 2007 to 2012. We also include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm.***, **and *represent 1%, 5% and 10% significance level, respectively.

	Tobit	**OLS**
Intercept	**-0.117**	**0.098**
	(0.40)	(0.50)
LBB Dummy	**-0.010**	**-0.072**
	(2.01)**	(2.04)**
HD Dummy	**-0.084**	**-0.053**
	(1.04)	(0.91)
Prior AR	**-0.047**	**-0.059**
	(0.35)	(0.61)
Tobin's Q	**0.011**	**0.009**
	(0.54)	(0.66)
Size	**0.012**	**0.001**
	(0.75)	(0.05)
Cash Holding	**-0.302**	**-0.211**
	(1.49)	(1.37)
Free Cash Flow	**0.268**	**-0.002**
	(1.03)	(0.01)
Leverage	**-0.452**	**-0.206**
	(2.76)***	(2.22)**
Dividend	**-0.699**	**-0.355**
	(0.59)	(0.46)
Intended Buyback Ratio	**0.169**	**0.090**
	(1.34)	(1.41)
Industry Dummies	*Yes*	*Yes*
Time Dummies	*Yes*	*Yes*
N	419	419
Adjusted R^2	0.116	0.101

Figure 2.1: Changes in Cash, Leverage and Growth Prospects around Buybacks

This figure shows average changes in cash holdings, market leverage and growth prospects prior to and following buyback announcements for both debt- and cash-financed repurchases. Year 0 is defined as the fiscal year when share repurchase is announced. *Cash Holding* is the cash and cash equivalents (item 1) over total assets (item 6). *Market Leverage* is defined as book value of debt (item 9+ item 34) divided by the sum of book value of debt (item 9+ item 34) and market value of equity (item 25* item 24). *Growth Prospects* is measured by long-run value to book, which is the difference between long-run value and observed book value.





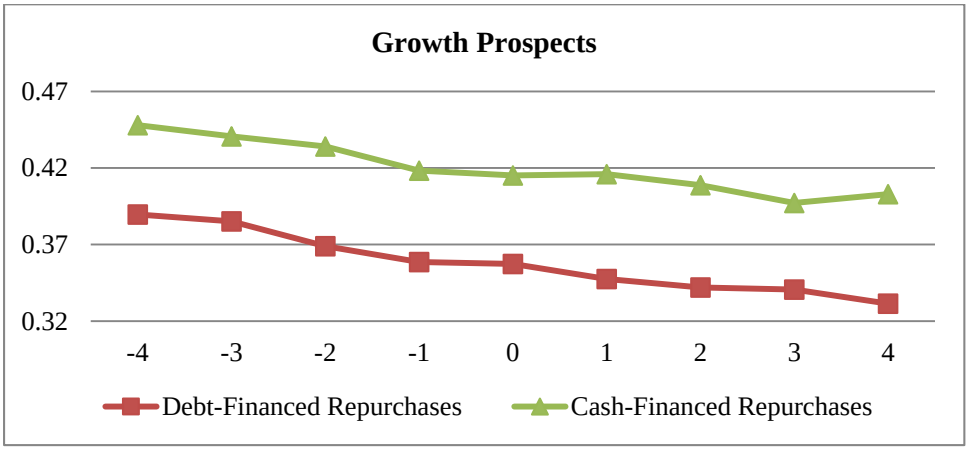
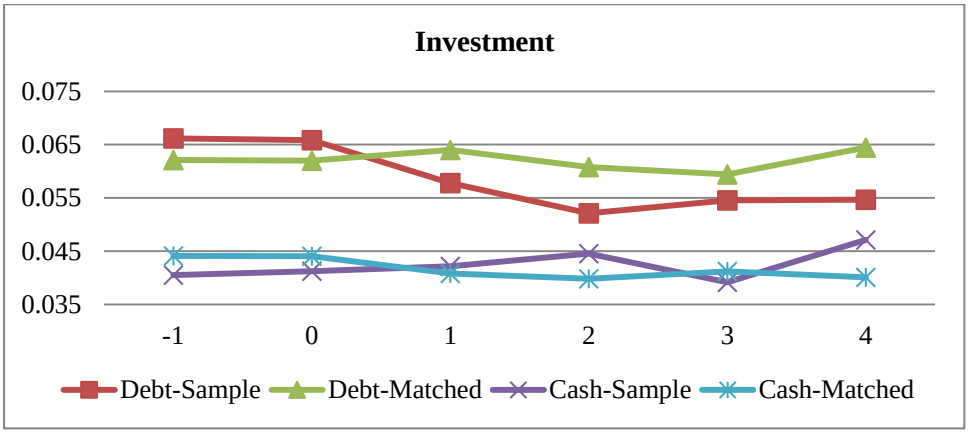
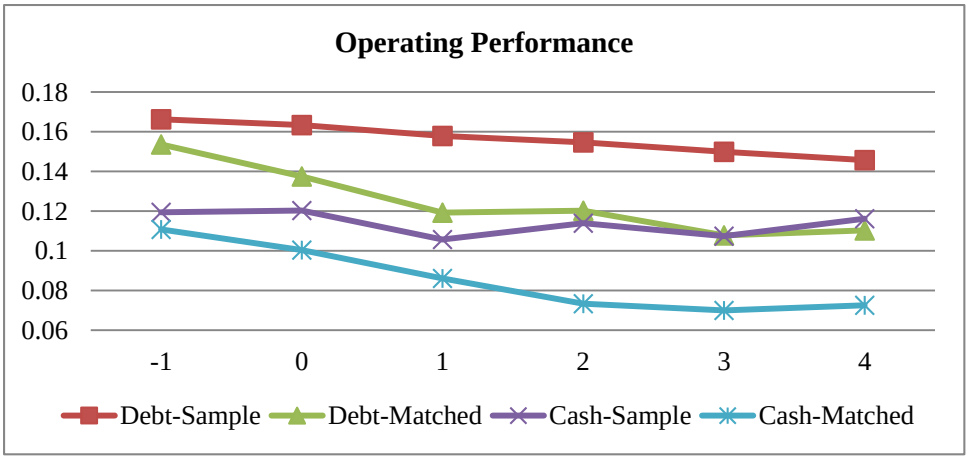
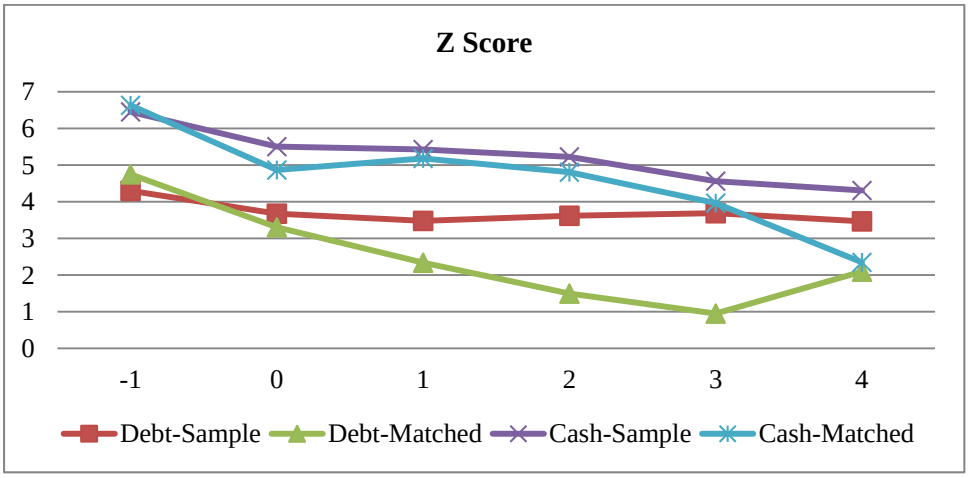


Figure 2.2: Changes in Investment, Operating Performance and Z-Score around Buybacks

This figure shows average changes in investment, operating performance and Z-score after repurchase announcements for both debt- and cash-financed buyback firms and their matched non-repurchasing peers. Year 0 is defined as the fiscal year when share repurchase is announced. *Investment* is defined as capital expenditure (item 145) divided by total assets (item 6). *Operating performance* is measured by ROA, which is defined as operating income (item 13) divided by book assets (item 6). *Z-score* is Altman's (1968) measure of credit risk.







Chapter 3

Institutional Investors and Corporate Political Activism

> "Merchants and master manufacturers are, in this order, the two classes of people who commonly employ the largest capitals, and who by their wealth draw to themselves the greatest share of the public consideration. […] As their thoughts, however, are commonly exercised rather about the interest of their own particular branch of business, than about that of the society, their judgment, even when given with the greatest candour (which it has not been upon every occasion), is much more to be depended upon with regard to the former of those two objects, than with regard to the latter. […]The proposal of any new law or regulation of commerce which comes from this order, ought always to be listened to with great precaution, and ought never to be adopted till after having been long and carefully examined, not only with the most scrupulous, but with the most suspicious attention."
>
> *Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations, pp. 316-17.*

3.1 Introduction

On January 21, 2010, the U.S. Supreme Court issued a landmark decision on *Citizens United v. Federal Election Commission* asserting for the first time that corporations, like individuals, benefit from First Amendment protection regarding

freedom of speech in the form of independent political expenditures.[17] In practice, the ruling lifts prior bans on corporations to use their treasury to advocate in favor or against a political candidate on a federal election, so called independent expenditures on express advocacy.[18] The result, according to the Centre for Responsive Politics (CRP), is a seven-fold increase in independent expenditures to federal elections.[19]

The Supreme Court ruling generated significant controversy. A week after the ruling, President Barack Obama (2010) voiced the opinion of many regarding *Citizens United* in his *State of the Union Address*: "Last week, the Supreme Court reversed a century of law that I believe will open the floodgates for special interests – including foreign corporations – to spend without limit in our elections. Well I don't think American elections should be bankrolled by America's most powerful interests …" On February 24, 2010, the Council of Institutional Investors (CII), an association of public, union and corporate employee benefit plans, endowments and foundations, and the Center for Political Accountability (CPA) wrote a letter to 427 S&P 500 companies – those lacking disclosure rules on political spending – urging them to adopt rules to disclose all political contributions from corporate treasuries and calling on boards to review and approve such contributions (CPA-CII, 2010).[20]

Representing the most dramatic change regarding the role of corporations in campaign finance in the U.S. since the Taft-Hartley Act of 1947 that prohibited

[17] Citizens United, Appellant v. Federal Election Commission, 558 U.S. (docket nos. 08-205) decided 1/21/2010. Werner (2011) provides an overview of the antecedents of *Citizens United* and of the ruling itself.
[18] Direct contributions to candidates or coordinated expenditures are still prohibited.
[19] Expenditures increase in presidential cycles from $143 million in 2008 to over $1 billion in the 2012 election cycle, and in non-presidential cycles from $37 million in 2006 to $205 million in 2010 and $550 million in 2014 (CRP, 2015).
[20] The CII pressed on when Ann Yerger, Executive Director of the CII, testified before Congress on March 11, 2010, asking for legislation along the same lines (Yerger, 2010). Interestingly, Institutional Shareholder Services Inc., a leading proxy advisor firm, only changed their recommendation from vote CASE-BY-CASE to "generally vote FOR proposals requesting greater disclosure of a company's political contributions and trade association spending policies and activities" in their Dec/19/2011 Proxy voting Guideline Updates.

corporations from making any expenditure in connection to federal elections, *Citizens United* provides a natural experiment setting to study how corporations adjust their inputs to political activism. Corporations are not new to political activism and have used for that purpose, political connections, lobbying, and contributions by both executives and Political Action Committees (PAC). We ask how investors assess the impact of the ruling for corporations already engaged in other forms of political activism. Further, because many institutional investors are agencies of state governments, we ask whether the market response to *Citizens United* depends on having institutional investor owners that may be engaged in political activism themselves. We therefore revisit Adam Smith (1776)'s point on the influence of business over politics, adapted to today's ownership structure and to the possibility that politics can also influence business through the ownership structure. We examine four hypotheses of which the first two hypotheses deal with the announcement returns around *Citizens United*.

First, we hypothesize that firms that are engaged in political activism benefit from having access to a new input to political activism, but only if they can adjust their other inputs. This hypothesis follows from the fact that *Citizens United* creates the opportunity to actively pursue political activism with money from corporate treasuries. *Ceteris paribus*, the price of independent expenditures relative to the price of other inputs to political activism falls (from infinity). Corporations engaged in political activism should therefore benefit from the lower cost of independent expenditures and increase firm value by redirecting some of their funds to independent expenditures and away from other inputs. However, firms may be constrained from using certain forms of political activism, which may result in a decrease in firm value. This loss in value occurs whenever a firm's other inputs to

political activism lose some of their value, for example, through the loss of real options associated with them. Second, we hypothesize that the ability to adjust between independent expenditures and other forms of political activism is affected by the share ownership of institutional investors. Specifically, institutional investors' behavior post *Citizens United* indicates a strict preference to not use independent political expenditures. Therefore, for the firms with high institutional ownership, the inability to adjust may mean that in the new equilibrium they are required to spend more in relatively more expensive inputs to keep up with the same level of political activism.

The last two hypotheses deal with changes in political activism after *Citizens United* and looks to see if the actions of firms were consistent with the initial market reaction. We explore the fact that prior to *Citizens United* twenty-three states had bans on independent political expenditures by corporations on state elections besides the ban on all states on independent political expenditures on federal elections. State bans had been ruled constitutional by the U.S. Supreme Court in 1990 in *Austin v. Michigan Chamber of Commerce.*[21] The decision in *Citizens United* overruled *Austin*. In our third and fourth hypotheses, we exploit these cross-sectional differences to consider the differential impact of *Citizens United* on corporate decisions based on company headquarter state, with corporations headquartered in ban states being the treatment group and corporations headquartered in no-ban states being the control group (see also Spencer and Wood, 2014).

Our third hypothesis states that firms that are headquartered in ban states engage in less of the other forms of political activism after *Citizens United* than firms in no-

[21] Austin, Michigan Secretary of State, et al. v. Michigan Chamber of Commerce, 494 U.S. 652 (1990).

ban states. This means that firms that were previously hindered from using independent political expenditures in state elections and thus had to rely on other forms of political activism at the state level, can now adjust by decreasing their engagement in the latter. Fourth, we hypothesize that the ability to decrease their engagement in other forms of political activism is most pronounced in firms with low or no institutional ownership, which, according to hypothesis two, have no adjustment restrictions.

Using a merged sample of 1,722 firm-year observations based on ExecuComp and BoardEx, we find that the average three-day return on the announcement of the *Citizens United* ruling amounts to 0.92%. In the cross-section, firms with more political connections exhibit lower three-day abnormal stock returns than firms with less political connections, but this negative effect is concentrated in firms with high institutional ownership. A one-standard-deviation increase in the number of political connections leads to a 1.15% lower three-day abnormal return for firms with high institutional ownership relative to firms with low institutional ownership, or a relative loss of $80 million in market capitalization. This result is consistent with a general inability of high institutional ownership firms with established political connections to adjust to the presence of a new input to political activism. We do not find any significant stock market reaction for lobbying, PAC spending, or executive contributions. This could be because lobbying activities encompass the provision of issue-specific information (Bertrand, Bombardini, Trebbi, 2014) and therefore may bring unique value to political activism;[22] PAC contributions come from employees

[22] The evidence finds that lobbying increases firm value through lower effective tax rates and tax savings (Richter, Samphantharak, and Timmons, 2009, and Alexander, Mazza, and Scholz, 2009), access to subsidies during a financial crisis (Duchin and Sosyura, 2012, and Adelino and Dinc, 2014), lower likelihood of SEC enforcement actions and lower penalties (Correia, 2014), and higher financial performance ex post (Chen, Parsley, and Yang, 2012).

(and shareholders) and so are not at the full discretion of management; and executive contributions have low legal limits. In contrast, political connections, like independent political expenditures, are exclusively about political activism and are strictly under the control of the management.[23]

Our results are consistent with firms with low institutional ownership benefiting from the ruling (i.e., taking advantage of substitutability) and firms with high institutional ownership, given their preference not to adjust, being relatively worse off. We pursue three other main specifications of Hypotheses one and two. First, the results are robust to a variety of controls including several corporate governance variables. More importantly, we show that the effect of high institutional ownership does not capture the quality of governance normally associated with these institutions. However, it is the institutional owners without business ties to the corporation that seem to drive the negative market reaction, suggesting that an arm's length relationship may be more effective in imposing constraints on management. Second, when we separate institutional ownership according to the political color of the institutional investors' headquarter's state in the 2008 presidential election, our main result goes through only for democratic-state-based institutional owners. Third, one concern with our exercise is the presence of other information events occurring in the day of the ruling. The main other such event that we could identify is the announcement by President Obama of the Volcker rule, which states that commercial banks should not be allowed to engage in proprietary trading. While Paul Volcker's conception of the rule was not a surprise, the decision to adopt it may have come as a surprise to some. We repeat our exercise without financial firms and the results are unchanged.

[23] Corporations have historically hired executives and board members with current or past political connections (e.g., Faccio, 2006, Bunkanwanicha and Wiwattanakantang, 2009, and Goldman, Rocholl and So, 2009).

We test Hypotheses three and four on all forms of political activism. Again the main results are with regards to political connections. We find that on average firms in ban states, i.e. the treatment group, establish less state-level political connections after *Citizens United* than firms in no-ban states, i.e. the control group. We also find that this effect depends on the level of institutional ownership. *Citizens United* has a negative net impact on state-level political connections for low institutional-ownership firms, which we argue can adjust to the presence of the new input. In contrast, high-institutional-ownership firms do not significantly change or mildly increase state-level political connections after *Citizens United*. Historical connections are affected in the same way that state connections are, but we find that it is the historical-state connections that explain the result. This evidence is consistent with the preference for no adjustment by high institutional investor firms. We find that state-level PAC contributions appear to respond to *Citizens United* in a way that is consistent with hypothesis four, though statistical significance exists only for firms in ban states with high institutional ownership. We do not find any evidence of change in the inputs lobbying and executive contributions perhaps because these are not state level variables.

We conduct two falsification tests. First, we move the announcement day of the Court ruling to either two weeks prior to the true announcement day or two weeks after. We observe no effect of political activism variables over the respective three-day abnormal returns. Second, we conduct a falsification test over changes in political activism. We move the window of study to the period 2004-2009, non-overlapping with the Court ruling, and create a fictitious date for a ruling in 2007. We find no effect of institutional investor ownership in ban states after the fictitious Court-ruling year.

We consider several alternative explanations. One alternative explanation that we emphasize here is that firms with high institutional ownership have connections of higher quality than firms with low institutional ownership and this is what causes the former to not substitute inputs. Using two proxies for the quality of connections from Goldman, Rocholl and So (2009), we find that high institutional ownership firms do not have connections of higher quality than low institutional ownership firms.

Our paper is related to different strands of the literature. First, it relates to the papers that examine how institutional investors can alleviate agency conflicts between management and shareholders. There is evidence that institutional investor activism increases firm value (Gillan and Starks, 2000, Brav, Jiang, Partnoy, and Thomas, 2008, and Klein and Zur, 2009) through a variety of channels, including through investment and growth prospects (Bushee, 1998), executive turnover and compensation (Hartzell and Starks, 2003), corporate governance (Aggarwal, Erel, Ferreira, and Matos, 2011, and Chung and Zhang, 2011) and the quality of management earnings forecast (Ajinkya, Bhojraj, and Sengupta, 2005). We consider a potential conflict of interest between institutional investors and other shareholders and propose that some institutional investors may pursue agendas that are outside the scope of public corporations, for example regarding their political motivations.

Second, our paper is related to the work on the effects of *Citizens United*. Werner (2011) finds no evidence of market reaction to *Citizens United* for firms with lobbying activity, political action committee (PAC) contributions, and procurement contracts. Burns and Jindra (2014) and Skaife and Werner (2014) uncover a response by firms in regulated industries, which we control for with industry dummies in our regressions. In work contemporaneous to ours, Newton and Uysal (2013) also find a negative market reaction around the announcement of *Citizens United* for politically

connected firms, but they do not identify the effect of institutional investors. Consistent with our results, Spencer and Wood (2014) find an increase in independent expenditures in state elections for states with prior bans on contributions. Like us, Coates (2012) finds increased PAC contributions, though our evidence suggests that the effect is concentrated on firms with high institutional ownership. Coates (2012) also finds increased lobbying after *Citizens United* and lower industry-adjusted Tobin's Q for politically active unregulated firms. Klumpp, Mialon and Williams (2014) find evidence that *Citizens United* is associated with an increase in Republican election probabilities in state House races.

Finally, our paper contributes to the evidence on political connections by demonstrating that political connections and independent expenditures are substitute inputs in the production of political activism. There is a large literature documenting that political connections add value to the firm (see Goldman, Rocholl and So, 2009, for evidence in the U.S., and Fisman, 2001, Faccio, 2006, Bunkanwanicha and Wiwattanakantang, 2009, and Stahl, 2015, for international evidence). The value from political connections comes from a variety of sources including the ability to access outside funding (Khwaja and Mian, 2005, and Leuz and Oberholzer-Gee, 2006), the likelihood of being bailed out (Faccio, Masulis and McConnell, 2006), the subsidies gained in the event of financial crises (Johnson and Mitton, 2003, and Duchin and Sosyura, 2012, Acemoglu et al., 2013) and in obtaining procurement contracts (Goldman, Rocholl and So, 2013).

The rest of the paper is organized in the following manner. Section 3.2 presents the hypothesis development. Section 3.3 presents the data and Section 3.4 gives our main results. Section 3.5 concludes the paper.

3.2 Hypothesis Development

We assume that firms engage in political activism using a variety of inputs, political connections, lobbying, PAC contributions, executive contributions and independent political expenditures. We further assume that the firms' objective is to minimize the cost of providing for a certain value of political activism.[24] We develop the following four main hypotheses.

Hypothesis 1: *If firms can adjust their inputs to political activism, then firms with more political activism have higher announcement returns following Citizens United, otherwise they have lower announcement returns.*

Citizens United recognizes for the first time corporations' First Amendment rights regarding independent political expenditures and overturns state bans deemed constitutional in *Austin v. Michigan Chamber of Commerce*. The decision was unexpected, broader than the original lawsuit and with a Court closely divided vote of 5 "conservative" judges in favor against 4 "liberal" judges. *Citizens United* creates a new avenue for political activism by allowing firms to spend unlimited amounts from their corporate treasuries in support of candidates in state and federal elections as long as uncoordinated with the political campaigns of the specific candidates being financed, so called independent expenditures. On the one hand, this new input provides firms with added flexibility in the production of political activism. In practice, the relative price of independent expenditures decreased from infinity (because they were illegal) to some finite amount allowing firms to produce the same amount of political activism possibly with the same or less spending. On the other

[24] We do not require the assumption that political activism is value increasing. While the existing literature seems to suggest that political activism is in general value increasing, the hypotheses and results in this paper could in principle be consistent with an agency view of political activism where *Citizens United* allows firms to produce the same level of political activism in a more cost-efficient manner.

hand, firms may be subject to constraints on the use of certain forms of political activism. If these constraints critically limit the ability of a firm to adjust, firm value may decrease if the firm's other inputs to political activism lose some of the value associated with them, for example, through the loss of real options associated with them, or if these firms are now less well equipped to compete with other firms for political favoritism.

Provided the firm can adjust its inputs, the substitutability across inputs dictates the optimal amount of adjustment and hence the effect on firm value. Substitutability requires that the inputs share similar characteristics with independent political expenditures, namely that they are under the full control of management, that they can target specific politicians, and that they may not have to be disclosed.[25] Political connections, lobbying, PAC and executive contributions are all under the control of management, though the size of PAC contributions is not entirely at the discretion of managers and the legal maximum for executive contributions is very low. All can be used to target specific politicians, though lobbying may have a component of complement to the input of political activism because of its dual role as a mechanism to provide issue-specific information (Bertrand, Bombardini, Trebbi, 2014). Finally, while political connections do not have to be disclosed, lobbying, and PAC and executive contributions have clear disclosure rules, which may make them less substitutable. Overall, political connections appear to be the closer substitute to independent expenditures. Hypothesis one resembles the argument by Issacharoff and Karlan (1999) that campaign finance can be viewed as a hydraulic system where

[25] Whether these expenditures are disclosed depends on who gets the money. They are eventually disclosed if made through a Super PAC because of Federal Election Comission regulations, but will not de disclosed if made through organizations formed under section 501(c)(4) of the U.S. tax code, reserved for "social welfare groups", section 501(c)(5), reserved for "labor organizations", or section 501(c)(6), reserved for business leagues, chambers of commerce, the real estate boards, or boards of trade because the IRS does not require these organizations to disclose their sources of funding.

money, like water, must go somewhere. “Money, like water, will seek its own level. The price of apparent containment may be uncontrolled flood damage elsewhere” (p. 1713).

Hypothesis 2: *Higher announcement returns are concentrated in firms with low institutional ownership.*

We expect firms with institutional shareowners to give up on the added input flexibility that comes with *Citizens United* due to the public reaction by the Council of Institutional Investors shortly after the Court ruling, and the many shareholder proposals initiated by institutional investors on disclosure of political contributions especially since *Citizens United* (Westcott, 2013). The origin of this preference may be premised on the advancement of governance usually associated with these investors (e.g. Gillan and Starks, 2000, Aggarwal et al., 2011, and Chung and Zhang, 2011). Alternatively, it may be premised on political pressure, as some of these institutional investors are state employee pension funds like CalPERS (the California Public Employees’ Retirement System) and CalSTRS (the California State Teachers’ Retirement System), both leading institutional investors and agencies of the State of California. Bill Lockyer, California Treasurer, wrote to CalPERS and CalSTRS urging them – as a consequence of *Citizens United* – to develop policies regarding disclosure of political contributions by portfolio companies (Lockyer, 2011). The premise of political pressure for not using independent expenditures is also observed by Westcott (2013) who instead argues that the goal of institutional investors is not to promote disclosure but to force corporations out of the political debate. Along similar lines, Finseth (2013) suggests that employees that are forced to contribute to such pension funds should be able to control on a pro rata basis the publicly traded shares of the companies that the funds are trying to influence. In sum, firms with

institutional shareowners are expected to react most negatively to *Citizens United* (see also Taub, 2012).

Hypothesis 3: *If firms can adjust their inputs to political activism, then firms headquartered in states with corporate campaign contribution bans prior to Citizens United reduce other inputs to political activism after Citizens United relative to a control group, otherwise they do not change or even increase other inputs to political activism.*

Prior to *Citizens United,* twenty-three states had bans on independent expenditures by corporations on state elections, based on *Austin v. Michigan Chamber of Commerce*.[26] These bans are overruled by *Citizens United*. We thus use firms in ban states as the treatment group and firms in no-ban states as the control group (Spencer and Wood, 2014). We expect that firms in ban states that could not use their own treasury and had to rely on other forms of political activism before *Citizens United*, but that are unconstrained to use the flexibility created with *Citizens United*, reduce other inputs to political activism after *Citizens United*. Firms that cannot take advantage of the added flexibility may do nothing or overcompensate by engaging more in the other forms of political activism.

Hypothesis 4: *The reduction in other forms of political activism for firms headquartered in states with corporate campaign contribution bans prior to Citizens United is concentrated in firms with low or no institutional ownership*.

Citizens United is expected to have a negative net impact on other types of political activism for low-institutional-ownership firms. These firms now substitute into independent political expenditures. In contrast, high-institutional-ownership

[26] Austin, Michigan Secretary of State, et al. v. Michigan Chamber of Commerce, 494 U.S. 652 (1990).

firms do not significantly change their political activism after *Citizens United*, given the outside pressure posed on them.

3.3 Data

Our sample is based on firms in ExecuComp and BoardEx. We use BoardEx to collect CVs of corporate board members and executives and produce a list of individuals who currently hold or previously have held a position in a government organization in the U.S.[27] The number of political connections for each firm in any given year (*Connection*) is the number of executives and board members of the firm with such positions in that year. To merge BoardEx to ExecuComp, we require firms to have valid identifiers such as tickers and when tickers are missing or incorrect from BoardEx, we manually match firms using firm names. Most ExecuComp firms have at least one political connection in 2009. We further distinguish between contemporaneous and historical connections, and political connections with national-, state- and local-level government organizations. A political connection is defined as contemporaneous if the individual simultaneously holds both government and firm positions whereas it is an historical connection if the executive or board member used to hold a government position.

Our source for lobbying data is the Center for Responsive Politics that has been collecting data since 1998, after the Lobbying Disclosure Act of 1995 that requires firms that spend more than $20,000 on direct lobbying activities to file with the

[27] We drop observations if the start and end date for government or firm positions held by individuals are missing. We also delete observations if individuals leave the firm before joining the government. The position each individual holds in a firm varies each year. For individuals with no more than two observations, we create the earliest start/end year and the latest start/end year for each individual to verify the duration of individual's stay in the firm. For individuals that have three or more observations, we manually check to identify whether the individual holds a position each year from 1990 to 2013.

Senate Office of Public Records and the Clerk of the House of Representatives.[28] We add up all past lobbying expenditures made before the end of 2009 for each firm to calculate cumulative prior lobbying expenditures (*Lobbying*).[29] We match these data to the ExecuComp sample by manually checking firm names. We code lobbying as zero for ExecuComp firms that never spend money on lobbying.

Individual political contributions data are collected from the Federal Election Commission (FEC) for 10 federal election cycles from 1991 to 2010 and matched to ExecuComp names. The FEC gives information on donors' names, employers, addresses, and sometimes their occupation. We develop an algorithm to conduct the match and visually check the results. The match is based on (i) last name (exact match), (ii) first name (allowing for variations, e.g. Rob vs. Robert), (iii) either employer names (including employment history) or (3-digit) Zip codes.[30] We measure managers' political contributions (*Executive Contributions*) by adding all past contributions made before the end of 2009 by current managers independently of their previous occupation. This measure does not include contributions made by past managers.[31]

Political contributions of firms' Political Action Committees to state elections are obtained from the National Institute on Money in State Politics.[32] We add all past contributions donated before the end of 2009 for each firm to calculate cumulative contributions prior to 2010 (*PAC Contributions*). We match the contributions data to

[28] Lobbying data are available on https://www.opensecrets.org/lobby/.
[29] We also use lobbying spending in 2009 as an alternative variable with similar results.
[30] In the end, 82% of matched results are based on employer names rather than zip codes. We also check the occupation of matched donors. The FEC records occupation since 2001 and the coverage has improved over time. In 2010, 80% of the matched donors have recorded occupation of 'executive', 'director', 'CEO', etc.
[31] We also sum up contributions made by both current and past managers provided the contributions are made during the tenure as a top executive of the firm. The results are similar.
[32] PAC contributions data are available on http://www.followthemoney.org/.

the ExecuComp sample by manually checking firm names. One third of firms have positive *PAC Contributions*.

We obtain stock returns from the Center for Research in Securities Prices (CRSP) files and require that ExecuComp firms have available stock return data around January 21st, 2010. We calculate three-day cumulative abnormal return (CAR) from day -1 to day 1 using the market model to measure expected returns and the CRSP value-weighted market index as the benchmark.[33] Finally, accounting variables are obtained from Compustat. We winsorise these control variables at the 1st and 99th percentiles. Our main sample consists of 1,722 firms.

We obtain institutional ownership data from the FactSet/LionShares database. The institutions covered in the database are qualified money managers such as pension funds, mutual funds, insurance companies, and bank trusts. FactSet/LionShares collects quarterly institutional holding data from public sources such as stock exchanges, national regulatory agencies, company proxies, and industry directories, as described by Ferreira and Matos (2008). Institutional ownership (*I.O_DOM*) is calculated as of the final quarter of 2009 and includes ordinary shares, preferred shares, American Depositary Receipts (ADRs), Global Depositary Receipts (GDRs), and dual listings. Of the 1,722 firms in our sample, 1,631 firms have positive institutional ownership. For firms whose shares are not held by any institutions in FactSet/LionShares, we set the institutional ownership variable to zero following Gompers and Metrick (2001).

Following Gompers et al. (2003) and Bebchuk et al. (2009), we use both *G-Index* and *E-Index* to control for differences in corporate governance. Gompers et al. (2003)

[33] Our results are similar when we use two-day CAR from day 0 to day 1. The estimation period ends 10 days before the announcement of Citizens United decision and we require the minimum (maximum) estimation length to be 60 (505) days.

construct an equally-weighted index based on 24 governance provisions provided by the Investor Responsibility Research Center (IRRC). Bebchuk et al. (2009) propose an entrenchment index based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for charter amendments and mergers.[34] Among our 1,722 firms, 1,429 firms have available data on *G-Index* and *E-Index*.

We use two additional measures of corporate governance. We follow Larcker et al. (2011) and measure excess pay (*Excesspay*) using ExecuComp data as the difference between CEO compensation and the median compensation of a set of peer firms in the same industry and of similar size as that of the firm.[35] Specifically, it is calculated as the natural logarithm of total compensation (variable TDC1 from ExecuComp) for the CEO minus the natural logarithm of the median total annual pay for all remaining firms on ExecuComp that are in the same Fama and French (1997) 12 industry group and size quintile of the firm for that year. This measure captures compensation earned by the CEO in excess of the market pay for CEOs at other firms with similar firm characteristics. A firm where the CEO is also chairman of the board may have fewer mechanisms for supervising management. Hence we also use a dummy variable to capture whether a CEO is the Chairman of the Board (*CEO Duality*). We obtain positions of executives from RiskMetrics and manually check whether the CEO held the position of chairman of the board as of December 31, 2009. Table 3.1 shows the summary statistics for each variable (Panel A) and the correlations between key variables (Panel B).

[34] IRRC covers between 1400 and 1800 firms depending on the year. All S&P 500 firms are covered in IRRC and other firms not included in the S&P 500 but considered important are covered in IRRC as well.

[35] We thank Ana Albuquerque for providing us with the data.

3.4 Empirical Results

3.4.1 Political Activism and Firm Value

Table 3.2 presents a test of Hypothesis 1.[36] The table displays estimates of how existing political activism by firms is perceived by the stock market with the announcement of the ruling in *Citizens United v. FEC*. The dependent variable is the three-day cumulative abnormal return around January 21st, 2010, the day the ruling is announced. We add control variables that are suggested in previous literature. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. In columns (1) through (4), we include *Connection*, *Lobbying*, *Executive Contributions* and *PAC Contributions* separately in the regression and in column (5) we include all these inputs.

We find that *Connection* is negatively associated with the three-day CAR. The coefficients on other political variables are insignificant. The results are consistent with firms not being able to adjust to the new input to political activism (Hypothesis 1). Table 3.3 repeats the regression in column (5) of Table 3.2 but adds *Excesspay*, *E-Index*, *G-Index* and *CEO Duality* respectively in columns (1) through (4) as corporate governance control variables. The corporate governance controls appear not to affect the market response. We also use alternative corporate governance variables, such as a founder-CEO dummy, the percentage of independent directors in the board of directors, *Excesspay_Cai* defined by Cai and Walking (2011) and a co-opted board dummy.[37] The results are similar.

3.4.2 Political Activism and Institutional Ownership

[36] Any result discussed in the main text that is not tabulated can be found in the paper's internet appendix.

[37] Co-opted board dummy is a binary variable that equals one if the firm has a high co-opted board (measured as the percentage of directors appointed by the CEO among the top quintile of the firm-years observations) and zero otherwise.

In Table 3.4, we investigate whether institutional investors affect the stock market reaction for firms that engage in political activism (Hypothesis 2). We interact institutional ownership of domestic institutions, *I.O_DOM*, with *Connection*, *Lobbying*, *Executive Contributions* and *PAC Contributions* respectively in columns (1) through (4) of Table 3.4.

In column (1), the coefficient on the *I.O_DOM*Connection* is significantly negative at the 1% level. For firms with institutional ownership in the 90th percentile, i.e., with a total percent ownership of 94%, and relative to firms with zero institutional ownership, a one standard deviation increase in the number of political connections established prior to *Citizens United* leads to a 1.15% (=0.004*0.94*3.06) lower three-day abnormal return (equivalent to a relative decrease in market value of $80 million for the average firm). This calculation uses our regression results that only allow us to describe the conditional, or relative outcome of firms with high institutional ownership versus those with low institutional ownership. To analyze the unconditional or absolute outcome of *Citizens United* we look at the abnormal returns of highly connected firms, i.e. firms that rank in the top 10 percentile in our sample of 1,722 firms for the number of political connections. We split these firms into high institutional ownership, i.e. firms that rank in the top 10th percentile for the institutional ownership share, and low institutional ownership, i.e. firms that rank in the bottom 10th percentile for the institutional ownership share. Highly connected firms with high institutional ownership experience a stock return of -0.18% over the three-day period surrounding *Citizens United*, whereas highly connected firms with low institutional ownership see a stock return of 1.52% over the same time period. Given an average market capitalization of $21.4 billion for highly connected firms, being connected results on average in an unconditional loss of $39 million for high

institutional ownership firms and an unconditional gain of $325 million for low institutional ownership firms.

We interpret these results as suggesting that political connections are a substitute to independent political expenditures for firms with flexibility to adjust inputs to political activism, i.e. firms with low or no institutional ownership, consistent with Hypothesis 1. For firms with high institutional ownership, the results are consistent with the view that these firms do not adjust to the new input in virtue of the public discourse by many institutional investors after the Court ruling, consistent with Hypothesis 2. The loss of firm value may come from the loss of value produced by the other inputs, for example, via real options associated with them.

These results are robust to using bootstrapped *p*-values. Bootstrapped *p*-values account for the fact that the announcement could result in cross-sectional correlation of returns across stocks and thus bias the OLS standard errors even with the industry clustering (Sefcik and Thompson, 1986, and Bernard, 1987). We use a procedure similar to that of Lo (2003), Zhang (2007), and Cai and Walking (2011). The procedure generates 10,000 repetitions where each repetition uses sample firm abnormal returns from 50 randomly-selected non-overlapping 3-day windows from non-event periods. This procedure maintains the cross-sectional correlation of firms' returns in the non-event period so that one can assess whether the event returns are significant independently of any correlation generated by the event.

The three-day CAR does not appear to be sensitive to any other form of political activism. As discussed above, there are reasons to believe that there is a lower degree of substitutability with these other inputs. In the rest of the analysis, we continue to tabulate the results for all forms of political activism, but to conserve on space we

will only comment on *Connection* since the effect of the other inputs lacks statistical significance.

In Table 3.5, we repeat the regression model in column (5) of Table 3.4 but add corporate governance control variables. In columns (1) and (3), we add *G-Index* and *E-Index* respectively, as controls. The coefficient associated with *I.O_DOM*Connection* remains negative and the coefficient associated with *Connection* remains positive. In columns (2) and (4) of Table 3.5, we interact the inputs in the production of political activism with *G-Index* and *E-Index*, respectively.[38] If the effect of institutional ownership were premised on the advancement of governance in our specific exercise, then one would expect a similar effect from interacting other governance variables with the inputs to political activism. In contrast, we find that the estimated parameters associated with the interaction terms are statistically insignificant.

3.4.3 Political Activism and Institutional Ownership: Business Relationships

The evidence above is consistent with institutional investors pursuing agendas that are outside the scope of public corporations, for example regarding their political motivations. If this is the case, then our results are driven by institutional investors without business ties to corporations. This is because institutional investors without business ties may be less sensitive to pressures from corporate managers (Brickley, Lease, and Smith, 1988) and may exert more pressure themselves. Our definition of business ties between institutional investors and corporations follows that of Brickley, Lease, and Smith (1988) who classify institutional investors into "pressure sensitive" (i.e. with business ties to corporations), "pressure resistant"

[38] The results are similar if we use alternative governance variables such as excesspay or CEO duality.

(without business ties to corporations) or "pressure indeterminate".[39] They argue that mutual funds and pension funds, endowments and foundations are pressure resistant because they have little potential business ties with the firms in which they invest, which makes them more independent. In contrast, insurance companies, banks, and nonbank trusts are more likely to have current or prospective business relationships with corporations and are labeled as "pressure-sensitive" institutions. Finally, brokerage houses, investment counsel firms, miscellaneous and unidentified institutions are "pressure-indeterminate" institutions. The correlation between *IO_Pressure_Sensitive (IO_Pressure_Resistant)* with our institutional ownership variable *I.O_DOM* is 0.05 (0.78) (see Panel B of Table 3.1).

In Table 3.6, we interact *IO_Pressure_Sensitive, IO_Pressure_Resistant* and *IO_Pressure_Indeterminate* with *Connection*. In column (1) we show that there is a negative association between *IO_Pressure_Resistant*Connection* with the three-day CAR while *IO_Pressure_Sensitive*Connection* and *IO_Pressure_Indeterminate*Connection* are statistically insignificant. The effect that political connections reduce value for firms with high institutional ownership is driven by "pressure-resistant" institutions. As with previous results, we find no effect from interacting the various *IO_Pressure* variables with other inputs to political activism. When we add the corporate governance control variables as in Table 3.5, we obtain similar results.

3.4.4 Political Activism and State of headquarter of Institutional Investor

[39] Other papers follow a similar definition of investor types and label them differently. For example, Almazan, Hartzell, and Starks (2005) divide institutions as "passive" (with business ties) or "active" (without business ties). Ferreira and Matos (2008) label institutions as independent (without business ties) or grey (with business ties) institutions.

Next we ask whether the political color of the institutional investor's headquarter state explains the results. Because the Court ruling was decided by the Republican-leaning judges against the Democratic-leaning judges and the negative reaction to the Court ruling came primarily from the Democratic side of the political spectrum, we expect the negative stock market response to be concentrated on firms with a significant percentage of institutional investors from democratic-leaning states. We define *I.O_DOM_Dem* (*I.O_DOM_Rep*) as the institutional ownership of domestic institutions from democratic (republican) states based on the 2008 presidential election. There is significant concentration of institutional investors in the U.S. with 86 percent of them headquartered in democratic states.

The results are in Table 3.7. Consider the regression model in column (5). The variable *Connection* displays an estimated positive coefficient whereas the coefficient on the interaction variable *I.O_DOM_Dem*Connection* displays a negative coefficient and the coefficient on the interaction variable *I.O_DOM_Rep*Connection* is insignificant. These results suggest that it is the institutions from democratic states that drive our results. Moreover, we also divide our "pressure resistant" institutions into those from democratic states and those from republican states. In untabulated results, we show that it is the "pressure resistant" institutions from democratic states that appear to drive our results.

3.4.5 Changes of Political Connections Following the Citizens United Ruling

We turn now to examining Hypothesis 3. We start by analyzing the effect of *Citizens United* on political connections. We test whether the number of political connections changes after the *Citizens United* ruling using a sample period from 2007 to 2012. The dependent variable is the number of connections for any firm and

year, but we also consider the breakdown of connections into the potentially *overlapping* categories of contemporaneous, historical, national, state and local connections. Because the ban is at the state level, we expect state connections to be most affected. *Post Dummy* is a dummy variable that equals one from 2010 to 2012 and zero from 2007 to 2009. Each of these periods contains two years of a presidential election cycle and one year of a mid-term election cycle. *Ban States* is a binary variable that equals one if the headquarter of the firm locates in a state that had bans on independent expenditures on state elections and zero otherwise.[40] We add firm characteristics that affect the establishment of political connections and other inputs in the production of political activism as control variables. We include industry dummies based on Fama-French 12 industries and standard errors are clustered by firm.

Table 3.8 reports the results. In column (1), the coefficient on the interaction *Ban States* Post Dummy* is significantly negative at the 1% level. This suggests that firms in ban states have less political connections after the *Citizens United* ruling than firms in no-ban states. The expected number of political connections is 0.19 units lower for firms in ban states compared to those in no-ban states after *Citizens United*. The results are similar across all types of connections except for local connections, though statistical significance is highest for historical and state connections. This evidence is consistent with Hypothesis 3 that firms adjust by decreasing the number of political connections. Results are similar if we use a Poisson regression model, which is a log-linear model and also if we add corporate governance control variables such as *G-Index* and *E-Index*.

[40] Our data is collected from the National Conference of State Legislatures. There were 23 states that prohibited or restricted corporate spending on candidate elections at the time of the *Citizens United* ruling, which we define as *Ban States*. In 17 of these states, legislation has been introduced to amend the state laws in response to the *Citizens United* ruling (source: http://www.ncsl.org/research/elections-and-campaigns/citizens-united-and-the-states.aspx).

To test Hypothesis 4, we incorporate institutional ownership and examine whether the change in the number of political connections following *Citizens United* differs between firms with high and low institutional ownership. In Table 3.9, we interact *Ban States* with *Post Dummy* and *I.O_DOM*. *Ban States*Post Dummy*I.O_DOM* is positively associated with connections while *Ban States*Post Dummy* is negatively associated with connections, though these effects are only statistically significant for all connections, historical and state connections. In untabulated results we show that the effect on historical connections is driven by the state-level historical connections. This suggests that firms with low institutional ownership have fewer state-level political connections after *Citizens United* if their headquarters locate in ban states than those in no-ban states. The expected number of state political connections is 0.42 units lower for firms without institutional ownership in ban states compared to those in no-ban states after *Citizens United*. The results are economically significant as the reduction represents 55% of the average number of state political connections in our sample (0.76). In contrast, high institutional ownership firms in ban states have virtually no change in state political connections after *Citizens United* when compared with those in no-ban states. The evidence is consistent with Hypothesis 4 that the firms that adjust political connections the most are firms with no or low institutional ownership.

The diff-in-diff analysis of Tables 3.8 and 3.9 assumes that the growth in political connections before the treatment effect is the same for firms in ban states and firms in no-ban states. In the online appendix we report the results from comparing average growth rates of political connections across the two groups of firms and show that the differences of all connections, historical, and state connections are not statistically significant. Further, we check that no firm in ban

states moves to a non-ban state during the period of analysis or vice-versa. Finally, we consider the possibility of confounding biases. Spencer and Wood (2014) argue that the level of political competition can create a confounding bias. In our exercise increased political competition may lead to higher independent expenditures and political connections. In the online appendix we tabulate results where the models in Tables 3.8 and 3.9 are extended to also control for a *Political Competition Index.*[41] The results are qualitatively the same as those in the paper. We also look to see if there is any significant difference in political leaning in ban states versus no-ban states to account for the possibility that democratic-leaning states promote legal bans on spending, for example, and the firms headquartered in these states substitute less. Our data suggest that ban states are more likely to be republican leaning than non-ban states, but the difference is not statistically significant. Finally, ban and no-ban states could differ in their industries and this difference could condition the response of connections to *Citizens United*. However, we find no difference in industry composition across ban and no-ban states. Further, in untabulated results we control for corporate governance variables and the results are unchanged.

3.4.6 Changes of Lobbying, Executive Contributions and PAC Contributions

In Table 3.10, we examine changes to lobbying expenditures, executive contributions and PAC contributions after *Citizens United*. Of these three variables only PAC contributions is a state-level variable. We therefore expect no significant change on lobbying expenditures and executive contributions from pre- to post-*Citizens United* from removing the ban on state contributions. As expected, Table

[41] The political competition index for state i and year j is given by $PC_{ij} = -\left|\frac{LHD_{ij}+UHD_{ij}}{LHD_{ij}+UHD_{ij}+LHR_{ij}+UHR_{ij}} - 0.5\right|$, where LHD_{ij} *(*LHR_{ij}*)* and UHD_{ij} *(*UHR_{ij}*)* represent the number of seats that Democrats (Republicans) hold, respectively, in the lower and upper chambers of the state legislature that was elected in year *j*. The range of the index is from -0.5 to 0.

3.10 shows that the triple interactions and double interactions are insignificant for lobbying expenditures and executive contributions.

In the next-to-last column, we find that *Ban States*Post Dummy* is positively associated with *PAC Contributions* (see also Coates, 2012): firms in ban states have 15% more PAC contributions after *Citizens United* than firms in no-ban states, but this effect is not statistically significant. In the last column we show that the effect on PAC contributions comes from high institutional investor ownership firms. *Ban States*Post Dummy*I.O_DOM* is positively associated with contributions from PACs. This suggests that high institutional ownership firms in ban states spend more on contributions from PACs after *Citizens United* just as they also increase the number of political connections. Firms in the 90th percentile of institutional ownership that are in ban states see their PAC contributions increase by 39% (−0.659+1.117*0.94) more than those in no-ban states after *Citizens United*. Consistent with Hypothesis four, firms with no institutional owners in ban states decrease the level of PAC contributions after *Citizens United*, but the effect is not statistically significant.

3.4.7 Placebo Tests

We conduct placebo tests to validate that our results are subject to the exogenous shock of the *Citizens United* ruling rather than other events. First, we use the three-day CAR from -1 to +1 when day 0 is two weeks before/after the date when the *Citizens United* decision is announced (January 21st, 2010). The results are shown in panel A of Table 3.11. *Connection, Lobbying, Executive Contributions, and PAC Contributions* are all statistically insignificant. In panel B, we interact *I.O_DOM*

with *Connection* and find that all interaction terms are insignificant with or without corporate governance control variables.

Second, we eliminate the Citizens United effect and examine changes to inputs in the production of political activism where the pre-period is 2004-2006 and the post-period is 2007-2009. The results are shown in Table 3.12. The coefficient associated with *Ban States*Post Dummy*I.O_DOM* is insignificant in all specifications. This evidence supports our identification strategy and suggests that our previous results come from *Citizens United*.

3.4.8 Robustness Tests and Alternative Hypotheses

We conduct several robustness tests. First, we look for other confounding, contemporaneous information events. The same day that the Supreme Court ruling was announced, President Obama announces the Volcker rule that commercial banks should not be allowed to engage in proprietary trading. [42] Paul Volcker had "campaigned" for the rule during much of 2009, but the decision to adopt it may have still come as a surprise to some because of its controversy. While our tests include industry dummies to ensure the results are not driven by a particular industry, to further minimize this concern, we also drop financial firms (i.e. SIC codes between 6000 and 6999) from our sample. Our main results remain similar after excluding financial firms.

Second, we test the alternative hypothesis that high institutional ownership firms had higher valued connections than low institutional ownership firms. Accordingly, the value of connections and not any constraint on the ability to adjust inputs to political activism post-*Citizens United* would explain the results we get. Then

[42] The full text of the speech is available at http://blogs.wsj.com/deals/2010/01/21/full-text-of-obamas-remarks-on-financial-reform/.

Citizens United would result in higher returns for low-institutional ownership firms as they would benefit most from the new input to political activism. We examine this possibility by taking into account the quality of connections following Goldman, Rocholl and So (2009) who show that the connected director has a greater impact in early nominations, while this impact decreases as the director joins further companies. We find that the difference of the nomination order between these two types of firms is very small and insignificant. Furthermore, high institutional ownership firms have lower recent political connections than low institutional ownership firms and the difference is significant at the 1% level. This is an important point to consider as more recent political connections could be considered as being more valuable than more historical ones. In sum, high institutional ownership firms do not seem to have higher quality of connections than low institutional ownership firms. The results are robust to identifying the firms with institutional ownership above the 70th percentile, as high institutional ownership firms.

Third, we add state-level political competition as a control variable using two measures suggested in previous literature: *Political Competition Index*, described above, and *Divided Government Dummy*. *Divided Government Dummy* equals one if the state government is divided (different parties control different branches of government) and zero if the state government is unified. We wish to control for the possibility that the marginal benefit of political connections depends on the state-level political system. For example, after the *Citizens United* ruling political connections become costlier for firms in states with more political competition between political parties. Consistent with this we find that *Political Competition Index*Connection* is negatively associated with the three-day CAR, but the coefficient is insignificant. Other results remain qualitatively the same as before.

Fourth, we investigate whether top customers of the company affect the relation between political activism and firm value. We collect data from Compustat and create the variable *Government Dummy* that equals one if at least one top customer of the firm is government-related and zero otherwise. As political connections help obtain government procurement contracts (Goldman, Rocholl and So, 2013), we expect a weaker substitution effect if one of the top customers in a firm is government-related. Consistent with this we find that *Government Dummy*Connection* is positively associated with the three-day CAR although the coefficient is insignificant. *Government Dummy* itself is insignificant as well and the relation between political activism and firm value still holds.

Fifth, we winsorise *Connection*, *Lobbying*, *Executive Contributions* and *PAC Contributions* and the results are similar to those reported above. We use various proxies to measure institutional ownership. We use the sum of the holdings of *all* institutions divided by the firm's market capitalization, and the sum of ownership by the top five institutional investors in percentage of market capitalization. The results are very similar to what we reported previously. Because the level of institutional ownership is highly correlated with firm size, we include both *Size*Connection* and *IO_DOM*Connection*. The coefficients on both interaction terms are significantly negative in the announcement return regressions. This implies that *IO_DOM*Connection* is robust to the inclusion of size interaction.

3.4.9 Other Relevant Dates in Citizens United

On June 29th, 2009, the Supreme Court decided that a rehearing was needed so the parties could address the question of whether a resolution of the case was tied to, among other things, the overruling of *Austin v. Michigan Chamber of Commerce*,

which upheld a state law prohibiting an independent political expenditure by the nonprofit Michigan Chamber of Commerce. The rehearing happened on September 9th, 2009. Expanding the scope of the case and ordering new oral arguments by the Court is rare and may have provided a signal to expert observers that the likely outcome was a ruling in favor of Citizens United. We therefore repeat the stock market announcement analysis for each of these dates. We find that neither *Connection* nor *Connection*I.O_DOM* is statistically significant in either date. While there could be many reasons for these results, it is possible that a significant amount of uncertainty about the final ruling still remained that was only truly resolved on January 21st, 2010.

3.5 Conclusion

This paper studies how corporations adjust their political activism in response to the Supreme Court ruling on *Citizens United v. FEC* and the constraints imposed on firms by some investors. We find that firms with high political connections and low or no institutional ownership experienced a greater stock market return with the announcement of *Citizens United* relative to firms with high institutional ownership. We did not find any market reaction for firms with lobbying, PAC contributions and executive contributions. Our results are consistent with actions taken by many institutional investors since the Court ruling objecting to the use of independent expenditures and fighting vigorously for greater disclosure of campaign finance. High institutional ownership firms appear to lose value by choosing not to avail themselves of the added flexibility created by *Citizens United* for the production of political activism.

Our work focuses on the intensive margin of political activism. We ask how firms that are already engaged in political activism respond to the *Citizens United* ruling. There is an equally interesting question of whether an extensive margin of response can be observed? That is, are there firms that started doing political activism because of Citizens United?

Table 3.1: Summary Statistics

This table shows the summary statistics for each variable. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. *I.O_DOM* is the institutional ownership of domestic institutions. *I.O_DOM_Dem* is the institutional ownership of domestic institutions from democratic states. *I.O_DOM_Rep* is the institutional ownership of domestic institutions from republican states. *IO_Pressure_Sensitive* is the institutional ownership held by insurance companies, banks, and nonbank trusts. *IO_Pressure_Resistant* is the institutional ownership held by public pension funds, mutual funds, endowments, and foundations. *IO_Pressure_Indeterminate* is the institutional ownership held by brokerage houses, investment counsel firms, miscellaneous and unidentified institutions. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). *E-Index* is proposed by Bebchuk et al (2009) and based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for charter amendments and mergers. We follow Larcker et al. (2011) and measure *Excesspay* as the difference between CEO compensation and the median compensation of a set of peer firms in the same industry and of similar size as that of the firm. *CEO Duality* is a binary variable that equals one if the CEO held the position of chairman of the board as of December 31, 2009. *CAR* is the three-day abnormal return from −1 to +1 where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. The definitions of other financial control variables are listed in the data appendix.

Panel A: Summary Statistics

Variables	N	Mean	10th Perc.	Median	90th Perc.	Std. Dev
Connection	1,722	2.27	0.00	1.00	6.00	3.06
Lobbying	1,722	5.85	0.00	0.00	15.95	7.16
Executive Contributions	1,722	8.63	0.00	9.66	12.01	3.60
PAC Contributions	1,722	3.04	0.00	0.00	11.54	4.95
I.O_DOM	1,722	0.67	0.12	0.75	0.94	0.28
I.O_DOM_Dem	1,722	0.60	0.11	0.65	0.83	0.22
I.O_DOM_Rep	1,722	0.07	0.02	0.06	0.12	0.05
IO_Pressure_Sensitive	1,722	0.002	0.00	0.001	0.003	0.03
IO_Pressure_Resistant	1,722	0.26	0.04	0.28	0.40	0.12
IO_Pressure_Indeterminate	1,722	0.46	0.13	0.50	0.67	0.19
G-Index	1,429	7.42	6.00	7.00	9.00	1.51
E-Index	1,429	3.68	2.00	4.00	5.00	1.14
Excesspay	1,722	-0.07	-0.98	0.00	0.79	0.87
CEO Duality	1,636	0.51	0.00	1.00	1.00	0.50
CAR	1,722	0.01	-0.03	0.00	0.06	0.05
Size	1,722	7.41	5.53	7.32	9.51	1.60
BM	1,722	0.64	0.18	0.55	1.18	0.53
Past Return	1,722	0.04	-0.00	0.03	0.10	0.05
ROA	1,722	0.02	-0.09	0.03	0.11	0.11
Debt	1,722	0.22	0.00	0.19	0.48	0.19
Cash	1,722	0.16	0.01	0.10	0.40	0.16

Panel B: Correlation Matrix

	Connection	*Lobbying*	*Executive Contributions*	*PAC Contributions*	*I.O_DOM*	*I.O_DOM_Dem*	*I.O_DOM_Rep*	*IO_Pressure_Sensitive*	*IO_Pressure_Resistant*	*IO_Pressure_Indeterminate*	*G-Index*	*E-Index*
Connection	1.0000											
Lobbying	0.3550	1.0000										
Executive Contributions	0.3176	0.3117	1.0000									
PAC Contributions	0.2618	0.3774	0.2567	1.0000								
I.O_DOM	-0.0822	0.0071	-0.1860	0.0330	1.0000							
I.O_DOM_Dem	-0.1922	-0.0597	-0.1308	-0.0722	0.3944	1.0000						
I.O_DOM_Rep	-0.1527	-0.1433	-0.1353	-0.0858	0.1900	0.1277	1.0000					
IO_Pressure_Sensitive	0.0267	0.0070	0.0202	-0.0045	0.0503	0.0439	-0.0294	1.0000				
IO_Pressure_Resistant	0.0133	0.0742	-0.0812	0.0440	0.7752	0.2767	0.0376	-0.0031	1.0000			
IO_Pressure_Indeterminate	-0.0841	0.0170	-0.1714	0.0640	0.8982	0.3729	0.2003	-0.0052	0.5449	1.0000		
G-Index	-0.1063	-0.0502	-0.0240	-0.0323	0.0357	0.0231	0.0658	-0.0371	0.0413	0.0395	1.0000	
E-Index	-0.0630	0.0089	-0.0453	0.0186	0.1270	0.0364	0.0527	-0.0290	0.1419	0.1309	0.7640	1.0000

Table 3.2: Political Activism and Firm Value

This table shows results of the relation between political activism and firm value. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contribution. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
I.O_DOM	**0.006**	**0.006**	**0.006**	**0.006**	**0.006**
	[1.23]	[1.18]	[1.20]	[1.18]	[1.26]
Size	**0.000**	**-0.001**	**-0.001**	**-0.001**	**-0.000**
	[0.05]	[0.73]	[0.95]	[0.74]	[0.21]
BM	**0.011**	**0.010**	**0.010**	**0.010**	**0.011**
	[1.82]*	[1.74]*	[1.72]*	[1.74]*	[1.82]*
Past Return	**-0.069**	**-0.068**	**-0.068**	**-0.068**	**-0.068**
	[1.61]	[1.60]	[1.60]	[1.61]	[1.62]
ROA	**-0.004**	**-0.002**	**-0.002**	**-0.002**	**-0.004**
	[0.23]	[0.13]	[0.13]	[0.14]	[0.23]
Debt	**0.008**	**0.007**	**0.007**	**0.007**	**0.007**
	[0.94]	[0.86]	[0.80]	[0.87]	[0.85]
Cash	**0.008**	**0.008**	**0.008**	**0.008**	**0.008**
	[0.78]	[0.80]	[0.83]	[0.78]	[0.83]
Connection	**-0.001**				**-0.001**
	[2.67]***				[2.67]***
Lobbying		**0.000**			**0.000**
		[0.08]			[0.25]
Executive Contributions			**0.000**		**0.000**
			[0.59]		[0.77]
PAC Contributions				**-0.000**	**-0.000**
				[0.17]	[0.01]
Constant	**-0.012**	**-0.008**	**-0.009**	**-0.009**	**-0.013**
	[0.81]	[0.54]	[0.61]	[0.56]	[0.89]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.21	0.21	0.21	0.21	0.21
N	1,722	1,722	1,722	1,722	1,722

Table 3.3: Political Activism and Firm Value with Controls for Corporate Governance

This table shows results of the relation between political activism and firm value, controlling for corporate governance variables. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. We follow Larcker et al. (2011) and measure *Excesspay* as the difference between CEO compensation and the median compensation of a set of peer firms in the same industry and of similar size as that of the firm. *E-Index* is proposed by Bebchuk et al (2009) and based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for charter amendments and mergers. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). *CEO Duality* is a binary variable that equals one if the CEO held the position of chairman of the board as of December 31, 2009. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)
I.O_DOM	**0.007**	**0.005**	**0.004**	**-0.003**
	[1.39]	[1.04]	[0.97]	[0.59]
Size	**-0.000**	**-0.000**	**0.000**	**-0.000**
	[0.12]	[0.02]	[0.02]	[0.37]
BM	**0.011**	**0.015**	**0.014**	**0.008**
	[1.84]*	[1.91]*	[1.92]*	[1.51]
Past Return	**-0.065**	**-0.133**	**-0.131**	**-0.088**
	[1.53]	[3.14]***	[3.13]***	[2.61]***
ROA	**-0.004**	**0.004**	**0.004**	**-0.023**
	[0.23]	[0.34]	[0.37]	[1.87]*
Debt	**0.008**	**0.001**	**0.001**	**0.007**
	[0.97]	[0.19]	[0.23]	[1.00]
Cash	**0.008**	**0.001**	**0.002**	**0.009**
	[0.80]	[0.10]	[0.18]	[0.94]
Connection	**-0.001**	**-0.001**	**-0.001**	**-0.001**
	[2.71]***	[2.51]**	[2.43]**	[3.09]***
Lobbying	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.27]	[0.35]	[0.34]	[0.09]
Executive Contributions	**0.000**	**0.000**	**0.000**	**0.000**
	[0.79]	[0.25]	[0.24]	[1.08]
PAC Contributions	**-0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.00]	[0.55]	[0.56]	[0.45]
Excesspay	**-0.002**			
	[1.18]			
E-Index		**0.001**		
		[0.76]		
G-Index			**0.001**	
			[1.31]	
CEO Duality				**-0.000**
				[0.03]
Constant	**-0.015**	**-0.009**	**-0.015**	**0.002**
	[0.96]	[0.62]	[0.90]	[0.22]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.21	0.24	0.24	0.23
N	1,722	1,429	1,429	1,636

Table 3.4: Institutional Ownership, Political Activism and Firm Value

This table shows results of the effect of institutional ownership on the relation between political activism and firm value. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
I.O_DOM	**0.012**	**0.007**	**0.014**	**0.008**	**0.015**
	[2.16]**	[1.13]	[1.47]	[1.48]	[1.54]
Size	**-0.000**	**-0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.30]	[0.22]	[0.28]	[0.23]	[0.32]
BM	**0.011**	**0.011**	**0.011**	**0.011**	**0.011**
	[1.82]*	[1.82]*	[1.82]*	[1.81]*	[1.82]*
Past Return	**-0.072**	**-0.068**	**-0.069**	**-0.068**	**-0.073**
	[1.72]*	[1.62]	[1.64]	[1.62]	[1.72]*
ROA	**-0.004**	**-0.004**	**-0.004**	**-0.004**	**-0.004**
	[0.26]	[0.23]	[0.23]	[0.24]	[0.26]
Debt	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**
	[0.86]	[0.86]	[0.85]	[0.84]	[0.85]
Cash	**0.008**	**0.008**	**0.008**	**0.008**	**0.008**
	[0.79]	[0.83]	[0.87]	[0.82]	[0.81]
Connection	**0.002**	**-0.001**	**-0.001**	**-0.001**	**0.002**
	[1.91]*	[2.68]***	[2.65]***	[2.75]***	[1.69]*
Lobbying	**0.000**	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.37]	[0.41]	[0.31]	[0.28]	[0.28]
Executive Contributions	**0.000**	**0.000**	**0.001**	**0.000**	**0.001**
	[0.83]	[0.78]	[1.15]	[0.76]	[0.67]
PAC Contributions	**-0.000**	**0.000**	**0.000**	**0.001**	**0.000**
	[0.02]	[0.00]	[0.05]	[1.03]	[0.56]
*I.O_DOM*Connection*	**-0.004**				**-0.004**
	[2.78]***				[2.49]**
*I.O_DOM*Lobbying*		**-0.000**			**0.000**
		[0.32]			[0.54]
*I.O_DOM*Executive Contributions*			**-0.001**		**-0.000**
			[0.91]		[0.36]
*I.O_DOM*PAC Contributions*				**-0.001**	**-0.001**
				[1.14]	[0.62]
Constant	**-0.016**	**-0.014**	**-0.019**	**-0.014**	**-0.018**
	[1.03]	[0.87]	[1.24]	[0.93]	[1.18]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.21	0.21	0.21	0.21	0.21
N	1,722	1,722	1,722	1,722	1,722

Table 3.5: Institutional Ownership, Political Activism and Firm Value with Governance Controls

This table shows results of the effect of institutional ownership on the relation between political activism and firm value, controlling for corporate governance variables. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). *E-Index* is proposed by Bebchuk et al (2009) and based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for charter amendments and mergers. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)
I.O_DOM	**0.006**	**0.005**	**0.006**	**0.005**
	[0.45]	[1.05]	[0.48]	[1.06]
Size	**-0.000**	**0.000**	**-0.000**	**-0.000**
	[0.08]	[0.10]	[0.12]	[0.02]
BM	**0.014**	**0.014**	**0.014**	**0.015**
	[1.91]*	[1.85]*	[1.90]*	[1.87]*
Past Return	**-0.135**	**-0.131**	**-0.137**	**-0.131**
	[3.28]***	[3.07]***	[3.29]***	[3.14]***
ROA	**0.004**	**0.005**	**0.004**	**0.004**
	[0.36]	[0.41]	[0.33]	[0.38]
Debt	**0.002**	**0.001**	**0.001**	**0.001**
	[0.25]	[0.21]	[0.21]	[0.20]
Cash	**0.001**	**0.002**	**0.000**	**0.001**
	[0.09]	[0.17]	[0.01]	[0.12]
Connection	**0.002**	**-0.003**	**0.002**	**-0.003**
	[1.89]*	[1.77]*	[1.92]*	[1.92]*
Lobbying	**-0.000**	**0.000**	**-0.000**	**-0.000**
	[0.79]	[0.13]	[0.80]	[0.03]
Executive Contributions	**-0.000**	**0.000**	**-0.000**	**0.002**
	[0.12]	[0.18]	[0.12]	[1.29]
PAC Contributions	**-0.000**	**-0.000**	**-0.000**	**0.001**
	[0.66]	[1.22]	[0.63]	[0.67]
*I.O_DOM*Connection*	**-0.005**		**-0.005**	
	[3.01]***		[3.06]***	
*I.O_DOM*Lobbying*	**0.001**		**0.001**	
	[1.10]		[1.11]	
*I.O_DOM*Executive Contributions*	**0.000**		**0.000**	
	[0.25]		[0.27]	
*I.O_DOM*PAC Contributions*	**-0.000**		**-0.000**	
	[0.03]		[0.13]	
G-Index	**0.001**	**0.000**		
	[1.28]	[0.50]		
*G-Index*Connection*		**0.000**		
		[1.43]		
*G-Index*Lobbying*		**-0.000**		
		[0.31]		
*G-Index*Executive Contributions*		**0.000**		
		[0.02]		
*G-Index*PAC Contributions*		**0.000**		
		[1.19]		
E-Index			**0.001**	**0.003**
			[0.78]	[1.44]
*E-Index*Connection*				**0.001**
				[1.47]
*E-Index*Lobbying*				**0.000**
				[0.23]
*E-Index*Executive Contributions*				**-0.000**
				[1.28]
*E-Index*PAC Contributions*				**-0.000**
				[0.85]
Constant	**-0.014**	**-0.011**	**-0.008**	**-0.019**
	[0.69]	[0.68]	[0.45]	[1.31]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.24	0.24	0.24	0.24
N	1,429	1,429	1,429	1,429

Table 3.6: Institutional Ownership, Political Activism and Firm Value: The Role of Business Relationships

This table disentangles institutions with and without business ties to corporations. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *IO_Pressure_Sensitive* is the institutional ownership held by insurance companies, banks, and nonbank trusts. *IO_Pressure_Resistant* is the institutional ownership held by public pension funds, mutual funds, endowments, and foundations. *IO_Pressure_Indeterminate* is the institutional ownership held by brokerage houses, investment counsel firms, miscellaneous and unidentified institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
IO_Pressure_Sensitive	**-0.000**	**-0.013**	**-0.056**	**-0.012**	**-0.045**
	[0.00]	[0.48]	[0.53]	[0.42]	[0.28]
IO_Pressure_Resistant	**0.011**	**-0.005**	**-0.005**	**-0.002**	**0.010**
	[0.83]	[0.48]	[0.56]	[0.15]	[0.71]
IO_Pressure_Indeterminate	**0.017**	**0.016**	**0.018**	**0.017**	**0.013**
	[1.73]*	[1.59]	[1.38]	[1.75]*	[0.91]
Size	**-0.000**	**-0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.25]	[0.19]	[0.29]	[0.21]	[0.27]
BM	**0.011**	**0.010**	**0.010**	**0.010**	**0.010**
	[1.80]*	[1.76]*	[1.76]*	[1.77]*	[1.77]*
Past Return	**-0.075**	**-0.071**	**-0.071**	**-0.072**	**-0.075**
	[1.81]*	[1.71]*	[1.69]*	[1.72]*	[1.79]*
ROA	**-0.004**	**-0.004**	**-0.003**	**-0.004**	**-0.004**
	[0.27]	[0.23]	[0.20]	[0.24]	[0.25]
Debt	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**
	[0.85]	[0.79]	[0.81]	[0.79]	[0.86]
Cash	**0.008**	**0.008**	**0.007**	**0.008**	**0.007**
	[0.79]	[0.80]	[0.76]	[0.79]	[0.74]
Connection	**0.003**	**-0.001**	**-0.001**	**-0.001**	**0.003**
	[2.38]**	[2.32]**	[2.73]***	[2.67]***	[2.31]**
Lobbying	**0.000**	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.38]	[0.31]	[0.27]	[0.27]	[0.26]
Executive Contributions	**0.000**	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.81]	[0.78]	[0.50]	[0.77]	[0.05]
PAC Contributions	**-0.000**	**0.000**	**-0.000**	**0.001**	**0.001**
	[0.13]	[0.04]	[0.10]	[1.15]	[0.64]
*IO_Pressure_Sensitive**	**-0.006**				**-0.008**
Connection	[0.18]				[0.28]
*IO_Pressure_Resistant**	**-0.010**				**-0.010**
Connection	[2.39]**				[2.22]**
*IO_Pressure_Indeterminate**	**-0.002**				**-0.002**
Connection	[0.77]				[0.78]
*IO_Pressure_Sensitive**		**-0.000**			**-0.000**
Lobbying		[0.27]			[0.44]
IO_Pressure_Resistant		**-0.000**			**0.000**
**Lobbying*		[0.48]			[0.07]
*IO_Pressure_Indeterminate**		**-0.000**			**0.000**
Lobbying		[0.20]			[0.53]
*IO_Pressure_Sensitive**			**0.000**		**0.000**
Executive Contributions			[0.45]		[0.52]
*IO_Pressure_Resistant**			**0.000**		**0.000**
Executive Contributions			[0.54]		[0.62]
*IO_Pressure_Indeterminate**			**-0.000**		**0.001**
Executive Contributions			[0.22]		[0.32]
*IO_Pressure_Sensitive**				**-0.016**	**-0.011**
PAC Contributions				[0.41]	[0.25]
*IO_Pressure_Resistant*PAC*				**-0.002**	**0.000**
Contributions				[0.63]	[0.02]
*IO_Pressure_Indeterminate**				**-0.001**	**-0.001**
PAC Contributions				[0.75]	[0.79]
Constant	**-0.019**	**-0.016**	**-0.016**	**-0.017**	**-0.017**
	[1.27]	[1.00]	[1.06]	[1.09]	[1.14]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.21	0.21	0.21	0.21	0.21
N	1,722	1,722	1,722	1,722	1,722

Table 3.7: Institutional Ownership, Political Activism and Firm Value: Democratic vs Republican States

This table shows results of the effect of institutional ownership on the relation between political activism and firm value. We disentangle institutions from democratic states and those from republican states. The dependent variable is the three-day CAR (−1, +1) where day 0 is January 21st, 2010 when *Citizens United* ruling is announced. *I.O_DOM_Dem* is the institutional ownership of domestic institutions from democratic states. *I.O_DOM_Rep* is the institutional ownership of domestic institutions from republican states. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	(1)	(2)	(3)	(4)	(5)
I.O_DOM _Dem	**0.009**	**0.004**	**0.012**	**0.003**	**0.012**
	[1.39]	[0.55]	[0.81]	[0.50]	[0.78]
I.O_DOM _Rep	**-0.003**	**0.023**	**0.007**	**0.025**	**0.011**
	[0.10]	[0.65]	[0.13]	[0.78]	[0.22]
Size	**-0.000**	**-0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.32]	[0.20]	[0.25]	[0.22]	[0.33]
BM	**0.011**	**0.011**	**0.011**	**0.011**	**0.011**
	[1.80]*	[1.79]*	[1.79]*	[1.80]*	[1.78]*
Past Return	**-0.070**	**-0.069**	**-0.069**	**-0.069**	**-0.070**
	[1.66]*	[1.65]	[1.65]*	[1.66]*	[1.66]*
ROA	**-0.005**	**-0.003**	**-0.004**	**-0.003**	**-0.004**
	[0.29]	[0.22]	[0.26]	[0.21]	[0.26]
Debt	**0.007**	**0.008**	**0.007**	**0.008**	**0.008**
	[0.86]	[0.93]	[0.88]	[0.95]	[0.92]
Cash	**0.008**	**0.009**	**0.009**	**0.009**	**0.009**
	[0.83]	[0.94]	[0.92]	[0.96]	[0.89]
Connection	**0.001**	**-0.001**	**-0.001**	**-0.001**	**0.001**
	[0.59]	[2.72]***	[2.65]***	[2.66]***	[0.71]
Lobbying	**0.000**	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.26]	[0.33]	[0.25]	[0.20]	[0.07]
Executive Contributions	**0.000**	**0.000**	**0.001**	**0.000**	**0.001**
	[0.76]	[0.74]	[0.80]	[0.74]	[0.56]
PAC Contributions	**0.000**	**0.000**	**0.000**	**0.000**	**-0.000**
	[0.08]	[0.04]	[0.08]	[0.16]	[0.23]
*I.O_DOM_Dem*Connection*	**-0.003**				**-0.003**
	[1.94]*				[2.25]**
*I.O_DOM _Rep*Connection*	**0.005**				**0.008**
	[0.58]				[0.81]
*I.O_DOM_Dem*Lobbying*		**0.000**			**0.000**
		[0.04]			[0.43]
*I.O_DOM_Rep*Lobbying*		**-0.002**			**-0.002**
		[0.84]			[0.49]
*I.O_DOM_Dem*Executive Contributions*			**-0.001**		**-0.001**
			[0.53]		[0.34]
*I.O_DOM_Rep*Executive Contributions*			**0.000**		**0.001**
			[0.04]		[0.07]
*I.O_DOM_Dem*PAC Contributions*				**0.000**	**0.001**
				[0.28]	[0.67]
*I.O_DOM_Rep*PAC Contributions*				**-0.005**	**-0.005**
				[0.96]	[0.82]
Constant	**-0.014**	**-0.013**	**-0.017**	**-0.013**	**-0.016**
	[0.88]	[0.83]	[1.08]	[0.83]	[1.03]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.21	0.21	0.21	0.21	0.21
N	1,722	1,722	1,722	1,722	1,722

Table 3.8: Changes of Political Connections after the Citizens United Ruling

This table shows results of changes of political connections from 2007 to 2012 based on OLS regressions. The dependent variable in column (1) is the number of political connections firms had with all government organizations. In columns (2) and (3), the dependent variable is the number of contemporaneous and historical connections. From columns (4) to (6), the dependent variable is the number of connections established with government of national-, state- and local-level respectively. *Ban States* is a binary variable that equals one if the headquarter of the firm locates in the state that had bans on independent expenditures on state elections and zero otherwise. *Post Dummy* is a dummy variable that equals one from 2010 to 2012 and zero from 2007 to 2009. *I.O_DOM* is the institutional ownership of domestic institutions. *Lobbying* is the natural log of the amount of corporate lobbying expenditures. *Executive Contributions* is the natural log of the amount of managerial contributions. It captures all past contributions made by current managers and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the amount of PAC contributions. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	ALL	**Contemporary**	**Historical**	**National**	**State**	**Local**
Ban States	**-0.492**	**-0.132**	**-0.359**	**-0.376**	**-0.154**	**0.038**
	[3.87]***	[3.69]***	[3.23]***	[3.96]***	[2.76]***	[1.79]*
Post Dummy	**0.284**	**0.326**	**-0.042**	**0.086**	**0.164**	**0.034**
	[4.95]***	[10.82]***	[0.92]	[1.92]*	[6.30]***	[2.97]***
I.O_DOM	**-0.662**	**-0.231**	**-0.431**	**-0.446**	**-0.153**	**-0.063**
	[2.35]**	[2.66]***	[1.82]*	[2.15]**	[1.31]	[1.51]
*Ban States*Post Dummy*	**-0.187**	**-0.073**	**-0.114**	**-0.102**	**-0.079**	**-0.006**
	[2.54]***	[1.64]	[2.03]**	[1.84]*	[2.27]**	[0.38]
Leverage	**-0.252**	**-0.071**	**-0.180**	**-0.137**	**-0.054**	**-0.061**
	[0.73]	[0.69]	[0.62]	[0.53]	[0.39]	[1.14]
Size	**0.815**	**0.200**	**0.615**	**0.631**	**0.154**	**0.030**
	[12.38]***	[8.36]***	[12.03]***	[12.13]***	[6.54]***	[3.21]***
ROA	**-0.968**	**-0.168**	**-0.800**	**-0.922**	**-0.166**	**0.119**
	[1.07]	[0.55]	[1.10]	[1.35]	[0.44]	[1.00]
Tobin's Q	**-0.338**	**-0.089**	**-0.250**	**-0.211**	**-0.100**	**-0.028**
	[5.33]***	[4.59]***	[4.77]***	[4.34]***	[4.13]***	[3.51]***
Free Cash Flow	**-0.816**	**-0.020**	**-0.796**	**-0.872**	**0.164**	**-0.108**
	[0.90]	[0.07]	[1.08]	[1.27]	[0.40]	[0.82]
Sales Growth	**-0.371**	**-0.072**	**-0.299**	**-0.295**	**-0.061**	**-0.015**
	[2.70]***	[1.42]	[2.61]***	[2.75]***	[1.01]	[0.70]
Lobbying	**0.048**	**0.006**	**0.042**	**0.034**	**0.013**	**0.001**
	[3.67]***	[1.38]	[3.97]***	[3.29]***	[2.59]***	[0.28]
Executive Contributions	**0.054**	**0.005**	**0.049**	**0.035**	**0.015**	**0.005**
	[4.54]***	[1.22]	[4.98]***	[3.68]***	[2.55]**	[2.35]**
PAC Contributions	**0.139**	**0.035**	**0.105**	**0.072**	**0.055**	**0.012**
	[5.61]***	[4.54]***	[5.17]***	[3.98]***	[5.71]***	[3.60]***
Constant	**-2.495**	**-0.742**	**-1.753**	**-2.475**	**-0.088**	**0.068**
	[3.78]***	[3.28]***	[3.42]***	[5.15]***	[0.36]	[0.57]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.40	0.23	0.37	0.35	0.26	0.09
N	7,800	7,800	7,800	7,800	7,800	7,800

Table 3.9: Changes of Political Connections after the Citizens United Ruling: The Role of Institutional Ownership

This table shows results of the effect of institutional ownership on changes of political connections from 2007 to 2012 based on OLS regressions. The dependent variable in column (1) is the number of political connections firms had with all government organizations. In columns (2) and (3), the dependent variable is the number of contemporaneous and historical connections. From columns (4) to (6), the dependent variable is the number of connections established with government of national-, state- and local-level respectively. *Ban States* is a binary variable that equals one if the headquarter of the firm locates in the state that had bans on independent expenditures on state elections and zero otherwise. *Post Dummy* is a dummy variable that equals one from 2010 onwards and zero from 2007 to 2009. *I.O_DOM* is the institutional ownership of domestic institutions. *Lobbying* is the natural log of the amount of corporate lobbying expenditures. *Executive Contributions* is the natural log of the amount of managerial contributions. It captures all past contributions made by current managers and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the amount of PAC contributions. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	ALL	**Contemporary**	**Historical**	**National**	**State**	**Local**
Ban States	**-0.012**	**0.027**	**-0.039**	**-0.096**	**-0.034**	**0.118**
	[0.03]	[0.23]	[0.10]	[0.29]	[0.18]	[1.41]
Post Dummy	**0.573**	**0.528**	**0.045**	**0.193**	**0.272**	**0.108**
	[2.37]**	[4.44]***	[0.25]	[1.07]	[2.82]***	[2.30]**
I.O_DOM	**-0.484**	**-0.070**	**-0.415**	**-0.341**	**-0.145**	**0.001**
	[1.18]	[0.62]	[1.16]	[1.09]	[0.86]	[0.02]
*Ban States*Post Dummy*	**-0.805**	**-0.179**	**-0.626**	**-0.312**	**-0.416**	**-0.077**
	[2.13]**	[0.96]	[2.21]**	[1.19]	[2.68]***	[1.16]
*I.O_DOM*Post Dummy*	**-0.432**	**-0.285**	**-0.147**	**-0.166**	**-0.159**	**-0.107**
	[1.41]	[1.92]*	[0.64]	[0.73]	[1.27]	[1.84]*
*Ban States*I.O_DOM*	**-0.664**	**-0.222**	**-0.442**	**-0.384**	**-0.171**	**-0.109**
	[1.18]	[1.52]	[0.91]	[0.92]	[0.75]	[1.12]
*Ban States*Post*	**0.824**	**0.145**	**0.680**	**0.275**	**0.454**	**0.095**
*Dummy*I.O_DOM*	[1.73]*	[0.63]	[1.88]*	[0.83]	[2.27]**	[1.16]
Leverage	**0.076**	**-0.011**	**0.087**	**0.063**	**0.051**	**-0.038**
	[0.22]	[0.10]	[0.30]	[0.25]	[0.36]	[0.75]
Size	**1.051**	**0.247**	**0.804**	**0.771**	**0.233**	**0.046**
	[15.00]***	[10.81]***	[14.66]***	[14.58]***	[10.03]***	[4.61]***
ROA	**-0.166**	**-0.008**	**-0.157**	**-0.459**	**0.120**	**0.174**
	[0.18]	[0.03]	[0.21]	[0.66]	[0.32]	[1.44]
Tobin's Q	**-0.455**	**-0.113**	**-0.342**	**-0.279**	**-0.140**	**-0.036**
	[6.81]***	[5.72]***	[6.25]***	[5.60]***	[5.64]***	[3.96]***
Free Cash Flow	**-1.783**	**-0.229**	**-1.554**	**-1.401**	**-0.202**	**-0.180**
	[1.90]*	[0.75]	[2.03]**	[2.01]**	[0.49]	[1.35]
Sales Growth	**-0.520**	**-0.102**	**-0.418**	**-0.385**	**-0.109**	**-0.026**
	[3.69]***	[2.02]**	[3.58]***	[3.51]***	[1.86]*	[1.20]
Lobbying	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
	[0.98]	[0.95]	[0.99]	[0.92]	[1.17]	[0.78]
Executive Contributions	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
	[1.90]*	[0.59]	[2.08]**	[2.12]**	[1.53]	[0.42]
PAC Contributions	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
	[1.31]	[1.33]	[1.30]	[0.93]	[1.65]*	[2.40]**
Constant	**-3.507**	**-1.035**	**-2.473**	**-3.083**	**-0.409**	**-0.016**
	[4.89]***	[4.36]***	[4.35]***	[5.83]***	[1.55]	[0.14]
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.37	0.22	0.34	0.33	0.23	0.08
N	7,800	7,800	7,800	7,800	7,800	7,800

Table 3.10: Changes of Lobbying, Executive, and PAC Contributions after the Citizens United Ruling

This table shows results of changes of political expenditures from 2007 to 2012 based on OLS regressions. The dependent variable in columns (1) and (2) is the natural log of corporate lobbying expenditures. The dependent variable in columns (3) and (4) is the natural log of past political contributions made by current managers. The dependent variable in columns (5) and (6) is the natural log of PAC contributions. *Ban States* is a binary variable that equals one if the headquarter of the firm locates in the state that had bans on independent expenditures on state elections and zero otherwise. *Post Dummy* is a dummy variable that equals one from 2010 to 2012 and zero from 2007 to 2009. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations. *Lobbying* is the natural log of the amount of corporate lobbying expenditures. *Executive Contributions* is the natural log of the amount of managerial contributions. It captures all past contributions made by current managers and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the amount of PAC contributions. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	Lobbying	**Lobbying**	**Executive Contributions**	**Executive Contributions**	**PAC Contributions**	**PAC Contributions**
Ban States	**0.171**	**1.097**	**0.127**	**-0.440**	**-0.201**	**-0.149**
	[0.60]	[1.18]	[0.79]	[0.78]	[1.27]	[0.27]
Post Dummy	**0.078**	**0.525**	**-1.067**	**-0.793**	**0.001**	**0.341**
	[0.59]	[1.20]	[9.45]***	[2.25]**	[0.01]	[1.13]
I.O_DOM		**0.076**		**-0.917**		**-0.797**
		[0.10]		[2.13]**		[1.54]
*Ban States*Post Dummy*	**0.106**	**-1.116**	**-0.041**	**-0.625**	**0.151**	**-0.659**
	[0.58]	[1.44]	[0.24]	[0.92]	[1.50]	[1.39]
*I.O_DOM*Post Dummy*		**-0.625**		**-0.413**		**-0.506**
		[1.05]		[0.88]		[1.31]
*Ban States*I.O_DOM*		**-1.229**		**0.769**		**-0.053**
		[1.06]		[1.07]		[0.08]
*Ban States*Post Dummy*I.O_DOM*		**1.645**		**0.829**		**1.117**
		[1.62]		[0.96]		[1.85]*
Leverage	**1.575**	**1.571**	**1.402**	**1.365**	**0.717**	**0.689**
	[2.16]**	[2.14]**	[2.97]***	[2.88]***	[1.66]*	[1.59]
Size	**1.231**	**1.238**	**0.522**	**0.521**	**0.584**	**0.589**
	[11.00]***	[10.98]***	[8.19]***	[8.22]***	[8.81]***	[8.83]***
Free Cash Flow	**0.993**	**1.253**	**-0.915**	**-0.500**	**-6.137**	**-5.574**
	[0.44]	[0.55]	[0.64]	[0.34]	[4.37]***	[3.98]***
ROA	**1.351**	**1.317**	**1.246**	**1.176**	**3.788**	**3.699**
	[0.64]	[0.63]	[0.96]	[0.90]	[2.83]***	[2.77]***
Tobin's Q	**-0.343**	**-0.351**	**-0.123**	**-0.121**	**-0.355**	**-0.359**
	[2.48]**	[2.54]**	[1.34]	[1.31]	[4.70]***	[4.76]***
Herfindahl Index	**-1.918**	**-1.873**				
	[0.92]	[0.90]				
Sales Growth			**-0.084**	**-0.091**	**-0.204**	**-0.216**
			[0.41]	[0.45]	[1.05]	[1.12]
Connection	**0.222**	**0.219**	**0.097**	**0.094**	**0.230**	**0.226**
	[3.77]***	[3.72]***	[4.09]***	[3.99]***	[6.76]***	[6.61]***
Lobbying			**0.059**	**0.059**	**0.113**	**0.112**
			[5.07]***	[5.03]***	[7.62]***	[7.54]***
Executive Contributions	**0.172**	**0.172**			**0.091**	**0.088**
	[5.98]***	[5.95]***			[5.82]***	[5.65]***
PAC Contributions	**0.322**	**0.320**	**0.085**	**0.082**		
	[8.01]***	[7.96]***	[4.94]***	[4.80]***		
Constant	**-8.468**	**-6.684**	**5.111**	**5.720**	**-2.514**	**-2.024**
	[6.79]***	[5.84]***	[7.91]***	[8.20]***	[3.24]***	[2.47]**
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.31	0.31	0.25	0.26	0.34	0.34
N	7,810	7,810	7,800	7,800	7,800	7,800

Table 3.11: Placebo Tests: Abnormal Returns

This table shows the placebo test of abnormal returns. The dependent variable is the three day CAR from −1 to +1 where day 0 is two weeks before/after the date when the Supreme Court announced the Citizens United decision. The event dates (day 0) are reported in the column heads. Panel A shows the results of the inputs in the production of political activism whereas Panel B examines the effect of institutional ownership on the relation between political activism and firm value. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations in 2009. *Lobbying* is the natural log of the sum of all prior corporate lobbying expenditures till 2009. *Executive Contributions* is the natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the sum of all prior PAC contributions till 2009. We follow Gompers et al. (2003) and construct *G-Index* based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC). The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include industry dummies based on two-digit SIC code and cluster standard errors by industry. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A: Inputs in the Production of Political Activism

	7th January	**7th January**	**4th February**	**4th February**
I.O_DOM	**-0.007**	**-0.001**	**-0.002**	**-0.011**
	[1.22]	[0.16]	[0.51]	[2.12]**
Size	**-0.000**	**0.001**	**-0.002**	**-0.002**
	[0.33]	[0.73]	[1.58]	[2.03]**
BM	**0.012**	**0.012**	**0.003**	**0.005**
	[2.92]***	[2.23]**	[0.78]	[0.86]
Past Return	**-0.066**	**-0.084**	**-0.093**	**-0.089**
	[2.03]**	[2.23]**	[3.09]***	[2.47]**
ROA	**-0.033**	**-0.026**	**-0.003**	**-0.012**
	[2.31]**	[1.75]*	[0.36]	[1.05]
Debt	**0.009**	**-0.005**	**-0.007**	**-0.007**
	[1.27]	[0.54]	[1.13]	[0.88]
Cash	**0.008**	**-0.004**	**-0.013**	**-0.006**
	[0.67]	[0.32]	[1.39]	[0.65]
Connection	**0.000**	**0.000**	**0.000**	**0.000**
	[0.78]	[0.35]	[1.44]	[1.53]
Lobbying	**0.000**	**0.000**	**-0.000**	**0.000**
	[0.53]	[0.80]	[0.27]	[0.21]
Executive Contributions	**-0.000**	**0.000**	**0.000**	**0.000**
	[0.17]	[0.15]	[0.87]	[0.43]
PAC Contributions	**0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.18]	[0.62]	[1.38]	[0.77]
G-Index		**0.000**		**-0.000**
		[0.07]		[0.06]
Constant	**0.002**	**-0.003**	**0.019**	**0.027**
	[0.17]	[0.21]	[2.10]**	[1.76]*
Industry Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.12	0.13	0.05	0.07
N	1,721	1,429	1,721	1,429

*Panel B: Institutional Ownership*Connection*

	7th January	**7th January**	**4th February**	**4th February**
I.O_DOM	**-0.006**	**-0.002**	**0.000**	**-0.010**
	[0.97]	[0.23]	[0.06]	[1.67]*
Size	**-0.000**	**0.001**	**-0.002**	**-0.002**
	[0.34]	[0.74]	[1.64]	[2.05]**
BM	**0.012**	**0.012**	**0.003**	**0.005**
	[2.93]***	[2.23]**	[0.78]	[0.85]
Past Return	**-0.067**	**-0.084**	**-0.095**	**-0.089**
	[2.05]**	[2.23]**	[3.13]***	[2.46]**
ROA	**-0.033**	**-0.026**	**-0.004**	**-0.012**
	[2.32]**	[1.76]*	[0.37]	[1.05]
Debt	**0.009**	**-0.005**	**-0.007**	**-0.007**
	[1.28]	[0.55]	[1.14]	[0.88]
Cash	**0.008**	**-0.004**	**-0.013**	**-0.006**
	[0.66]	[0.32]	[1.41]	[0.66]
Connection	**0.001**	**-0.000**	**0.002**	**0.001**
	[0.55]	[0.10]	[2.14]**	[0.74]
Lobbying	**0.000**	**0.000**	**-0.000**	**0.000**
	[0.55]	[0.78]	[0.22]	[0.22]
Executive Contributions	**-0.000**	**0.000**	**0.000**	**0.000**
	[0.16]	[0.13]	[0.91]	[0.45]
PAC Contributions	**0.000**	**-0.000**	**-0.000**	**-0.000**
	[0.18]	[0.61]	[1.39]	[0.78]
*I.O_DOM*Connection*	**-0.001**	**0.000**	**-0.002**	**-0.000**
	[0.35]	[0.21]	[1.58]	[0.31]
G-Index		**0.000**		**-0.000**
		[0.08]		[0.07]
Constant	**0.002**	**-0.003**	**0.018**	**0.027**
	[0.14]	[0.20]	[1.97]*	[1.73]*
Industry Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.12	0.13	0.05	0.07
N	1,721	1,429	1,721	1,429

Table 3.12: Placebo Tests: Changes of Political Activism

This Table shows the placebo test in changes of political activism. We conduct OLS estimation in all columns. We eliminate the *Citizens United* effect and choose the sample period from 2004 to 2009. The dependent variable in column (1) is the number of political connections firms had with all government organizations. The dependent variable from columns (2) to (4) is the natural log of corporate lobbying expenditures, past political contributions made by current managers, and PAC political contributions respectively. *Ban States* is a binary variable that equals one if the headquarter of the firm locates in the state that had bans on independent expenditures on state elections and zero otherwise. *Post Dummy* is a dummy variable that equals one from 2007 to 2009 and zero from 2004 to 2006. *I.O_DOM* is the institutional ownership of domestic institutions. *Connection* is the number of political connections firms had with government organizations. *Lobbying* is the natural log of the amount of corporate lobbying expenditures. *Executive Contributions* is the natural log of the amount of managerial contributions. It captures all past contributions made by current managers and it does not include contributions made by past managers. *PAC Contributions* is the natural log of the amount of PAC contributions. The definitions of other financial control variables are listed in the data appendix. We winsorise each control variable at the 1st and 99th percentiles, respectively. We include 11 industry dummy variables based on Fama-French 12 industries and cluster standard errors by firm. ***, **and *represent 1%, 5% and 10% significance level, respectively.

	Connection	**Lobbying**	**Executive Contributions**	**PAC Contributions**
Ban States	**0.010**	**0.660**	**-1.100**	**-0.835**
	[0.02]	[0.58]	[1.32]	[1.21]
Post Dummy	**-0.277**	**0.164**	**0.683**	**-1.989**
	[1.12]	[0.27]	[1.31]	[4.84]***
I.O_DOM	**-0.620**	**-0.390**	**-0.045**	**-1.615**
	[1.66]*	[0.42]	[0.07]	[2.60]***
*Ban States*Post Dummy*	**-0.153**	**0.088**	**0.828**	**0.682**
	[0.45]	[0.10]	[1.02]	[1.23]
*I.O_DOM*Post Dummy*	**0.197**	**0.482**	**-1.007**	**0.774**
	[0.68]	[0.61]	[1.55]	[1.67]*
*Ban States*I.O_DOM*	**-0.525**	**-0.695**	**1.977**	**0.983**
	[0.98]	[0.50]	[1.91]*	[1.13]
*Ban States*Post Dummy*I.O_DOM*	**0.132**	**-0.042**	**-1.357**	**-1.013**
	[0.32]	[0.04]	[1.35]	[1.45]
Leverage	**0.288**	**1.697**	**1.269**	**0.399**
	[0.88]	[2.28]**	[2.74]***	[0.93]
Size	**0.848**	**1.211**	**0.694**	**0.614**
	[14.92]***	[10.47]***	[12.34]***	[9.15]***
Free Cash Flow	**-1.718**	**2.288**	**0.586**	**-4.156**
	[2.00]**	[0.94]	[0.40]	[2.91]***
ROA	**-0.572**	**0.138**	**0.615**	**3.406**
	[0.72]	[0.06]	[0.48]	[2.53]**
Tobin's Q	**-0.256**	**-0.240**	**-0.147**	**-0.382**
	[4.91]***	[1.71]*	[1.79]*	[5.24]***
Herfindahl Index		**-2.454**		
		[1.19]		
Sales Growth	**-0.573**		**-0.076**	**-0.277**
	[3.43]***		[0.29]	[1.17]
Connection		**0.224**	**0.099**	**0.291**
		[3.64]***	[4.16]***	[7.68]***
Lobbying	**0.000**		**0.051**	**0.102**
	[3.62]***		[4.65]***	[6.88]***
Executive Contributions	**0.000**	**0.203**		**0.071**
	[1.37]	[6.12]***		[4.13]***
PAC Contributions	**0.000**	**0.325**	**0.067**	
	[0.71]	[7.82]***	[4.26]***	
Constant	**-2.286**	**-6.725**	**3.622**	**-0.569**
	[3.86]***	[5.33]***	[4.31]***	[0.68]
Industry Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.42	0.31	0.26	0.32
N	5,427	5,427	5,427	5,427

Appendix: Variable Definitions

Panel A: Inputs in the Production of Political Activism	
Connection	The number of political connections firms had with government organizations in 2009. We count it as one political connection if individuals with political background currently hold a position in the firm. *Source: BoardEx database*
Lobbying	The natural log of the sum of all prior corporate lobbying expenditures till 2009. *Source: Center for Responsive Politics*
Executive Contributions	The natural log of the total amount of managerial contributions. It captures all past contributions made by current managers in 2009 and does not include contributions made by past managers. *Source: ExecuComp & FEC*
PAC Contributions	The natural log of the sum of all prior political contributions from corporate Political Action Committees (PACs) to state elections till 2009. *Source: Follow The Money*
Panel B: Institutional Ownership	
I.O_DOM	The sum of the holdings of all institutions domiciled in US where the stock is listed divided by the firm's market capitalization. *Source: FactSet/LionShares Database*
IO_Pressure_Sensitive	The percentage of shares held by insurance companies, banks, and nonbank trusts. The current or prospective business relationships of these types of institutions with corporations tend to make this group more "pressure-sensitive" with respect to corporate management. *Source: FactSet/LionShares Database*
IO_Pressure_Resistant	The percentage of shares held by public pension funds, mutual funds, endowments, and foundations. These institutions are more likely to collect information, are subject to fewer regulatory restrictions, and have fewer potential business relationships with the corporations in which they invest. *Source: FactSet/LionShares Database*
IO_Pressure_Indeterminate	The percentage of shares held by brokerage houses, investment counsel firms, miscellaneous and unidentified institutions. *Source: FactSet/LionShares Database*
Panel C: Corporate Governance	
G-Index	An equally-weighted index based on 24 governance provisions provided by Investor Responsibility Research Center (IRRC) (Gompers et al. (2003)). High G-Index indicates weak corporate governance. *Source: IRRC & RiskMetrics Database*
E-Index	An entrenchment index based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for charter amendments and mergers (Bebchuk et al (2009)). High E-Index indicates weak corporate governance. *Source: RiskMetrics Database*

Excesspay	The difference between CEO compensation and the median compensation of a set of peer firms in the same industry and of similar size as that of the firm (Larcker et al (2011)). Specifically, it is calculated as the natural logarithm of total compensation (variable *TDC1* from ExecuComp) for the CEO less the natural logarithm of the median total annual pay for all remaining firms on ExecuComp that are in the same Fama and French (1997) 12 industry group and size quintile of the firm for the same year. High Excesspay indicates weak corporate governance. *Source: ExecuComp*
CEO Duality	A binary variable that equals one if the CEO held the position of chairman of the board as of December 31, 2009 and zero otherwise. If CEO Duality equals one, it indicates weak corporate governance. *Source: RiskMetrics Database*
Panel D: Financial Control Variables	
Size	The natural log of market value of equity (item 25*item 24) *Source: Compustat*
BM	The book value of equity (item 60) divided by market value of equity (item 25*item 24) *Source: Compustat*
Past Return	The past stock return for the previous twelve months *Source: Center for Research in Securities Prices (CRSP) files*
ROA	Operating income (item 13) divided by book assets (item 6) *Source: Compustat*
Debt	Book value of debt (item 9+ item 34) divided by book assets (item 6) *Source: Compustat*
Cash	Cash holdings (item 1) over book assets (item 6) *Source: Compustat*
Leverage	Book value of debt (item 9+ item 34) divided by the sum of book value of debt (item 9+ item 34) and market value of equity (item 25* item 24) *Source: Compustat*
Tobin's Q	The book value of assets (item 6) minus book value of equity (item144) plus market value of equity (item 25* item 24), all divided by book value of assets (item 6) *Source: Compustat*
Free Cash Flow	The gross operating income (item 13) minus the sum of depreciation (item 14), tax paid (item 16), interest expenses (item 15) and dividends paid (item19+item 21) *Source: Compustat*
Sales Growth	The difference between current sales (item 12) and lagged sales, all divided by lagged sales. *Source: Compustat*
Herfindahl Index	The annual sum of squared market shares for all Compustat firms in each industry based on two-digit SIC code, and it approaches a maximum value of one as the industry concentration approaches a monopoly. *Source: Compustat*

Chapter 4

A Direct Test of Catering Theory of Dividends

4.1 Introduction

A growing literature in corporate payout policy examines the potential driver of firm's dividend policy. In particular, Baker and Wurgler (2004a, 2004b) provide a catering explanation. They propose that investors have time-varying demand for dividend-paying stocks and managers cater to investor demand. Academic scholars then apply the catering theory to dividend increase or decrease (Li and Lie, 2006) and share repurchases (Jiang, Kim, Lie, and Yang, 2013; Kulchania, 2013). Empirical research on the catering effect of corporate payout policy has typically used dividend/repurchase premium to measure investor demand.

In this paper, we study how the time-variation in investors' dividend attitudes affects firm's dividend policy. We conjecture that investors' attention to dividend-paying stocks may motivate managers to change firm's dividend policy consequently.

In particular, we posit that managers initiate or increase (cut) dividends when investors search more (less) on dividends via Internet. To test the conjecture, we develop a direct measure of dividend sentiment using the Internet search volume for dividend-related keywords.

We first examine whether investors' dividend sentiment predicts firm's dividend policy from 2004 to 2013. Consistent with our prediction, we find that when the dividend sentiment of investors becomes stronger (weaker), managers initiate or increase (decrease) dividends in the next quarter. In economic terms, a one-standard-deviation increase in investors' dividend sentiment leads to a 0.4% higher dividend initiation rate in the following quarter. These results are economically significant as the increase is 9.1% of the average dividend initiation rate in our sample. Results are robust after controlling the dividend premium proposed by Baker and Wurgler (2004b).

We next examine whether the dividend sentiment of investors helps explain the residual variation of dividend policies after controlling for firm characteristics and risk. We calculate the propensity to pay dividends (*PTP*) based on the logit estimates and find that the dividend sentiment effect is as predicted by catering after controlling for firm characteristics and risk. When dividends attract more (less) retail investors, firms have higher propensity to pay, initiate or increase (decrease) dividends.

In the third set of tests, we investigate the extent to which geographical differences in dividend sentiment influence firm's dividend policy. As local investors' dividend sentiment varies across regions, we conjecture that the effects of dividend sentiment on firm's dividend policy would be stronger among U.S. states with stronger dividend sentiment. In these states, investors pay more attention to

dividends and managers are more likely to cater. To test our prediction, we use each firm's headquarter state to define its location and use the average state-level *SVI* to measure the dividend sentiment of local investors.

Consistently, we find that managers cater to investors' dividend sentiment in states with strong dividend sentiment. In economic terms, a one-standard-deviation increase in investors' dividend sentiment in states with strong dividend sentiment is associated with 0.5% increase in the propensity to pay dividends in the following quarter. These results are economically significant as the increase is 32.7% of the average propensity to pay in states with strong dividend sentiment. In contrast, in weak dividend sentiment states, managers choose not to cater to the dividend sentiment of individual investors. Results are similar after controlling the dividend premium proposed by Baker and Wurgler (2004b).

We conduct a number of robustness checks and other tests. As an alternative measure of dividend sentiment, we construct a topic index which includes searches in different languages and various text strings as long as they are dividend-related. We find similar results except dividend decrease. We examine the relation between the dividend sentiment and the dividend premium and find that the correlation is low (0.04).

Overall, these findings suggest that changes in investors' dividend attitudes affect firm's dividend policy. Specifically, when investors' dividend sentiment becomes stronger (weaker), firms are more likely to initiate or increase (decrease) dividends in the following quarter. The effects of the dividend sentiment on firm's dividend policy are stronger among U.S. states with stronger dividend sentiment.

Our paper contributes to different strands of finance literature. First, it relates to the papers that examine the catering theory of payout policy. Baker and Wurgler

(2004b) and Li and Lie (2006) find that when investors put a stock price premium on dividend-paying firms, managers initiate or increase dividends in order to capture this dividend premium. Jiang, Kim, Lie, and Yang (2013) and Kulchania (2013) extend the catering theory to share repurchase and find that managers cater to investor demand for share repurchases. Recent literature has typically used dividend/repurchase premium to measure investor demand and we develop a more direct measure of investors' dividend sentiment. We find that shifts in investors' dividend attitudes over time affect firm's dividend policy.

Second, our paper is related to the catering theory in other corporate decisions. Baker, Greenwood, and Wurgler (2009) propose a catering theory of nominal share prices and show that when investors place a premium on low-price firms, managers respond by supplying shares at lower price through stock split. Polk and Sapienza (2009) suggest that the stock market might misprice firms based on their investment level. Mangers cater to the mispricing by inflating stock price through investment decisions. Aghion and Stein (2008) find that managers either maximizing sales growth or improving profit margins depending on which is preferred by the stock market. We test the dividend catering theory by using the Internet search volume for dividend-related keywords as a direct measure of investors' dividend sentiment.

Finally, our paper provides new evidence on the economic effects of investor attention. There is a large literature using indirect proxies for investor attention such as news and headlines (Baber and Odean, 2008), extreme returns (Baber and Odean, 2008), advertising expense (Grullon, Kanatas, and Weston, 2004) and trading volume (Gervais, Kaniel, and Mingelgrin, 2001). Da, Engelberg, and Gao (2011) propose a direct measure of investor attention by aggregating search frequency in Google and report that it measures the attention of retail investors and captures

investor attention in a more timely manner. We show that managers initiate or increase dividends when the dividend sentiment of retail investors becomes stronger.

The rest of the paper is organized in the following manner. Section 4.2 presents the data. Section 4.3 gives our main results. Section 4.4 concludes the paper.

4.2 Data and Sample Construction

We collect data from various sources to test our conjectures. In this section, we describe the data sets and our measure of dividend sentiment.

4.2.1 Dividend Sentiment

Google provides data on search term frequency via the product Google Trends from January 2004.[43] The search data from Google Trends are normalized and scaled to a range of 0 to 100.[44] We use the search volume index (*SVI*) of dividend-related searches at both national- and state-levels in the U.S. to capture retail investors' dividend sentiment.[45] *SVI* indicates the popularity of a search term relative to all other terms from the same location at the same time. An increase in *SVI* indicates that individual investors pay more attention to the search than they normally do. Weekly *SVI* for a search term is the number of searches for that term scaled by its time series average. We aggregate weekly *SVI* to monthly *SVI* by linear interpolation as in Da, Engelberg, and Gao (2011).

[43] Google Trends is available at https://www.google.com/trends/

[44] Da, Engelberg, and Gao (2011) report that Google accounted for 72.1% of all search queries in the U.S. The search volume data is thus representative of the searching behavior of the general population.

[45] The Internet search volume is proper to test the dividend catering theory. Hoberg and Prabhala (2009) show that dividend catering theory rests on the assumption that the time-varying demands for dividends are driven by individual investors. Da, Engelberg, and Gao (2011) find that the Internet search volume in Google captures the attention of retail investors.

Google Trends provides top searches that are most frequently searched with the term we entered (for instance, "dividend") in the same search session within the chosen category, country, or region. We then pick up dividend-related searches with available data and construct a keyword-based index *SVI_Div*, to capture retail investors' dividend sentiment (Da, Engelberg, and Gao, 2011, 2015).[46] *SVI_Div* is the search volume index if the search term in Google Trends includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*.

To study the geographical variation in dividend attitudes, we manually collect the monthly Internet search volume from Google Trends for each U.S. state from 2004 to 2013. We define a state as a zero dividend sentiment state if the median value of *SVI_Div* is zero within the sample period. We next rank the remaining non-zero states by averaging *SVI_Div* from 2004 to 2013. The top 10 dividend sentiment states are those with the highest average *SVI_Div* while the bottom 10 states with non-zero dividend sentiment are these with the lowest but positive average *SVI_Div*.[47]

Following Da, Engelberg, and Gao (2011), our key variable of interest is the change in *SVI*, i.e. abnormal search volume index (*ASVI*).[48] We define *ASVI* for search term *j* at time *t* as:

$$ASVI_{j,t} = \log\left(SVI_{j,t}\right) - \log\left(SVI_{j,t-1}\right) \quad (8)$$

[46] Google Trends does not return a valid search volume index if the dividend-related term is rarely searched. Instead, Google Trends will return a zero value for that search.
[47] The top 10 dividend sentiment states are Texas, Florida, Colorado, Maryland, Missouri, Massachusetts, North Carolina, Georgia, Illinois and Arizona. The bottom 10 states with non-zero dividend sentiment are Kansas, Nevada, Oklahoma, Kentucky, Arkansas, Louisiana, Iowa, South Carolina, Utah and Virginia.
[48] *ASVI* has the merit that low-frequency seasonality and time trends are removed.

Where log ($SVI_{j,t}$) and log ($SVI_{j,t-1}$) represent the natural logarithm of *SVIs* during month *t* and month *t-1*,respectively.[49] The time series of *ASVI* start from February 2004 and it measures changes in investors' dividend sentiment.

Da, Engelberg, and Gao (2015) show that one of the important features of the search data in Google Trends is seasonality. Then, to eliminate seasonality from $ASVI_{j,t}$, we regress $ASVI_{j,t}$ on month dummies and keep the residual (Da, Engelberg, and Gao, 2015). Quarterly $ASVI_{j,t}$ is the median value of the monthly $ASVI_{j,t}$ within each quarter.

4.2.2 Validation Tests

We conduct two validation tests to verify whether our measure of dividend sentiment is reasonable. Table 4.1 reports the median value of the state-level search volume index of dividend-related searches from Google Trends. Panel A lists the top 10 dividend sentiment states. Florida has the strongest dividend sentiment (i.e., with the highest *SVI_Div*) across all U.S. states with the largest fraction of seniors (Becker, Ivkovic, and Weisbenner, 2011). This is consistent with the findings of Graham and Kumar (2006) who show that older investors like dividend-paying stocks.[50]

We then visually examine the time-series variation of the Internet search volume from 2004 to 2013. We posit that investors may prefer dividend-paying stocks when economy slumps. Figure 4.1 depicts the natural log of *SVI_Div* and *SVI_DT* from 2004 to 2013. To eliminate seasonality from the natural log of the *SVIs*, we regress the ratio on month dummies and keep the residual. We follow the National Bureau of

[49] We also define *ASVI* as the natural logarithm of *SVI* during month *t* minus the average natural logarithm of *SVI* in month *t-1* and *t-2*. Results are similar.

[50] Similarly, Alaska is one of the zero dividend sentiment states with the smallest fraction of seniors (Becker, Ivkovic, and Weisbenner, 2011). This is consistent with the findings of Graham and Kumar (2006) who report that younger investors prefer dividend nonpayers.

Economic Research (NBER)[51] and define recession period from December 2007 to June 2009. Indeed, we find that individual investors search more on dividends during the financial crisis period than the pre-crisis period. The search spikes on October 2008 shortly after US investment banks are pummeled on the stock markets and two American banks collapse. This again validates that the Internet search volume intuitively captures investors' attention to dividends and represents a reasonable measure of dividend sentiment.

4.2.3 Sample Construction

We analyze the dividend policy of firms from 2004 to 2013. We use quarterly dividend data rather than annual dividends to enrich our observations. The Compustat sample for quarter *t* includes those firms that have the following data (Compustat data items in parentheses): total assets (44), stock price (12), and shares outstanding (61) at the end of each quarter, income before extraordinary items (8), interest expenses (22), dividends per share by ex date (16), preferred dividends (24), and preferred stock carrying value (55). Firms must also have (i) stockholder's equity (60), (ii) liabilities (54), or (iii) common equity (59) and preferred stock par value (55). Total assets must be available in quarter *t* and *t-1*. The other items must be available in quarter *t*. We also use, but do not require, balance sheet deferred taxed and investment tax credit (52), income statement deferred taxes (35), purchases of common and preferred stock (93), sale of common and preferred stock (84), and common treasury stock (98). We exclude firms with book equity below $250,000 or assets below $500,000. To ensure that firms are publicly traded, the Compustat sample includes only firms with CRSP share codes of 10 or 11. The

[51] Business Cycle Dates are available at http://www.nber.org/cycles/cyclesmain.html

CRSP sample includes NYSE, AMEX, and NASDAQ securities with CRSP codes of 10 or 11. We exclude utilities (SIC codes 4900 to 4949) and financial firms (SIC codes 6000 to 6999).

4.2.4 Summary Statistics

Panel A of Table 4.2 lists the summary statistics of each variable. The average dividend initiation rate is 4.3% from 2004 to 2013. Our dividend sentiment measure, *ASVI_Div*, has significant variation with the 90th percentile value being 0.045 and the 10th percentile number being -0.067. Firm and risk controls are comparable to those reported in the previous literature (Fama and French, 2001; Hoberg and Prabhala, 2009). Panel B of Table 4.2 reports the correlation matrix of our key variables. The correlations between the dividend premium and the dividend sentiment are low. Specifically, the correlation between *ASVI_Div* and the dividend premium is about 4%. Such low correlation suggests that *ASVI_Div* might capture investors' dividend sentiment that is not included in the dividend premium.

In terms of firm and risk controls, both risk variables have absolute correlations of less than 20% with the four firm characteristics proposed by Fama and French (2001) with two exceptions. Idiosyncratic risk has a correlation of -41% with *NYP*, which is in align with smaller firms being more risky. Idiosyncratic risk has a correlation of -32% with Earnings/Assets, consistent with less profitable firms being more risky. Overall, the correlations among these firms and risk controls are similar to those reported in the previous literature and indicate that multicollinearity is not an issue for our analysis.

4.3 Empirical Results

4.3.1 Dividend Sentiment and Dividend Payment

We follow Baker and Wurgler (2004b) and define a firm-quarter observation as a dividend payer if it has positive dividends per share by ex date, or else it is a dividend nonpayer. We then define *Payers* and *Old Payers* as follows:

$$Payers_t = New\ Payers_t + Old\ Payers_t + List\ Payers_t \quad (9)$$

$$Old\ Payers_t = Payers_{t-1} - New\ Nonpayers_t - Delist\ Payers_t \quad (10)$$

Payers is the total number of dividend payers at quarter *t*, *New Payers* is the number of firms that initiate dividend among last quarter's dividend nonpayers, *Old Payers* is the number of dividend payers among last quarter's payers, *List Payers* is the number of dividend payers this quarter that were not in the sample last quarter, *New Nonpayers* is the number of dividend omitters that paid last quarter. *Delist Payers* is the number of last quarter's dividend payers not in the sample this quarter.

We then define three measures to capture dividend payment dynamics:

$$Initiate_t = \frac{New\ Payers_t}{Nonpayers_{t-1} - Delist\ Nonpayers_t} \quad (11)$$

$$Increase_t = \frac{Increase\ Payers_t}{Payers_{t-1} - Delist\ Payers_t} \quad (12)$$

$$Decrease_t = \frac{Decrease\ Payers_t}{Payers_{t-1} - Delist\ Payers_t} \quad (13)$$

Where *Increase Payers (Decrease Payers)* is the number of firms increase (decrease) dividends this quarter among last quarter's dividend payers. We count a firm-quarter observation as an increase (decrease) payer if this quarter's dividend per share by ex date is higher (lower) than that in last quarter. *Initiate* is the fraction of surviving nonpayers that starts paying dividends. *Increase (Decrease)* is the fraction

of surviving payers that increase (decrease) dividends. These variables capture whether to pay dividends rather than how much to pay as dividends.[52]

Unlike annual dividends that are typically used in the previous literature (Baker and Wurgler, 2004b; Li and Lie, 2006; Hoberg and Prabhala, 2009), quarterly dividend payment has seasonality features (Verdelhan, 2010). Then, to eliminate seasonality from dividend payment measures, we regress *Initiate*, *Increase*, and *Decrease* on quarter dummies respectively and keep the residual (Da, Engelberg, and Gao, 2015).

We first investigate whether time-varying dividend attitudes affect dividend payment. Figure 4.2 relates investors' dividend sentiment to the dividend initiation (Panel A) and increase ratio (Panel B) in the following quarter. The dividend initiation and increase ratios reach the lowest level at the end of 2008 as managers are reluctant to initiate or increase dividends when economy slumps. Both panel A and B reveal a strong positive relation between one-quarter lagged dividend sentiment (*ASVI_Div*) and the dividend initiation or increase rate.

We then formally examine whether dividend sentiment predicts firm's dividend policy from 2004 to 2013. If elevated dividend sentiment increases the demand for dividend-paying stocks, we expect *ASVI* to have a positive (negative) impact on the subsequent dividend initiation or increase (decrease) ratio. We regress dividend payment measures on one-quarter lagged *ASVI_Div*. All standard errors are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987).

Panel A of Table 4.3 reports results. The dependent variable in column (1) is the fraction of new dividend payers at quarter *t* as a percentage of surviving nonpayers

[52] Baker and Wurgler (2004b) argue that the dividend payout ratio is sensitive to profitability while the decision to initiate dividend is always a policy decision.

from *t-1*. The coefficient on *ASVI_Div* is significantly positive at the 1% level. This suggests that *ASVI_Div,* on a stand-alone basis, strongly predicts the dividend initiation ratio in the next quarter. The regression coefficient of 0.086 suggests that a one-standard-deviation increase in *ASVI_Div* leads to a 0.39% (0.045*0.086) higher dividend initiation rate in the following quarter. These results are economically significant as the increase is 9.1% of the average dividend initiation rate in our sample (0.043).

Column (2) reports the regression for the rate of dividend increase. The dependent variable is the fraction of payers that increase dividends at quarter *t.* we find that one-quarter lagged *ASVI_Div* is positively associated with the dividend increase rate. This suggests that firms cater to increase dividends when individual investors have stronger dividend sentiment. In economic terms, a one-standard-deviation increase in *ASVI_Div* is associated with a 1.37% (0.045*0.305) increase in the dividend increase rate in the following quarter.

Column (3) shows that the dividend decrease rate is negatively associated with *ASVI_Div*. When retail investors have weaker dividend sentiment, firms are more likely to decrease dividends. The regression coefficient of 0.314 shows that a one-standard-deviation decrease in *ASVI_Div* is associated with a 1.41% (0.045*0.314) increase in the dividend decrease rate in the following quarter.

Prior dividend catering literature has typically used the dividend premium to measure investor demand for dividends. We next examine whether dividend sentiment predicts firm's dividend policy after controlling for the dividend premium. The quarterly dividend premium is the difference between the logs of the value-

weighted market-to-book ratio for dividend payers and nonpayers each quarter.[53] We regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP).*

We repeat the analysis in Panel A using *ASVI_Div_DP* and report results in Panel B of Table 4.3. We find that *ASVI_Div_DP* is positively (negatively) associated with dividend initiation and increase (decrease) rate. The economic significance remains similar in all specifications. This suggests that managers cater to investor demand by initiating or increasing (cutting) dividends when retail investors search more (less) on dividends via Internet. The results are consistent with dividend catering even after controlling for the dividend premium.

In summary, dividend sentiment strongly predicts firm's dividend policy. Managers initiate or increase (decrease) dividends when individual investors have stronger (weaker) dividend sentiment. Results are robust after controlling for the dividend premium proposed by Baker and Wurgler (2004b).

4.3.2 The Propensity to Pay Dividends with Firm Characteristics Controls

Although we find that dividend sentiment predicts firm's dividend policy, one possibility is that firm's dividend payment measures are related to the cross-sectional distribution of dividend-relevant firm characteristics. For instance, an increase in the dividend initiation rate may indicate that firms do not need to retain internal cash rather than managers cater to dividend demands when retail investors have stronger dividend sentiment.

We test this explanation by controlling for firm characteristics. We examine whether dividend sentiment helps explain the residual variation of dividend policies after controlling for firm characteristics proposed by Fama and French (2001). We

[53] To eliminate seasonality from quarterly dividend premium, we regress the ratio on quarter dummies and keep the residual.

conduct Fama and MacBeth (1973) estimates of a logit model with four control variables:

$$\Pr(Payer_{it} = 1) = \log it(a + bNYP_{it} + c\frac{M}{B_{it}} + d\frac{dA}{A_{it}} + e\frac{E}{A_{it}}) + u_{it} \quad (14)$$

where size *NYP* is the NYSE market capitalization percentile, i.e., the percentage of NYSE firms having equal or smaller capitalization than firm *i* in quarter *t*. Market-to-book ratio *M/B* is book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44). Asset Growth *dA/A* is the difference between book assets (item 44) and lagged book assets, all divided by lagged book assets. Profitability *E/A* is earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), all divided by book assets (item 44).

The test is conducted in three stages. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics. We obtain the average quarter prediction errors (actual dividend policy minus predicted policy) from the logit regressions. Then, to eliminate seasonality from the average quarter prediction errors, we regress the prediction errors on quarter dummies and keep the residual (Da, Engelberg, and Gao, 2015). We regress the seasonal-adjusted residual of average quarter prediction errors on *ASVI_Div* in the final stage.

We report first and final stage results in column (1) of Table 4.4. Consistent with Fama and French (2001) and Baker and Wurgler (2004b), we find that larger and more profitable firms are more likely to pay dividends while firms with more investment opportunities and greater asset growth are less likely to pay dividends. We then construct the propensity to pay dividends for quarter *t* based on the first stage logit estimates in column (1) of Table 4.4. The propensity to pay (*PTP*) is the difference between the actual percentage of firms that pay dividends in a given

quarter and the expected percentage, which is the average predicted probability from the logit model. Panel A of Figure 4.3 depicts that in the first half of the sample, *ASVI_Div* and subsequent propensity to pay move almost in lockstep. Then the average propensity to pay has a pronounced downward trend during the financial crisis period, which is captured by our dividend sentiment measure.

The dependent variable of the final stage is the change in the propensity to pay (*CPTP*) dividends from quarter *t-1* to *t*. The coefficient on *ASVI_Div* is significantly positive at 1% level. This suggests that *ASVI_Div* predicts firm's propensity to pay dividends in the following quarter. This is consistent with catering prediction after controlling for firm characteristics. Managers cater to pay dividends when individual investors have stronger dividend sentiment.

The supply of dividends comes from two sources in any given quarter: (i) firms that already pay dividends; and (ii) firms that newly initiate dividends. We next divide the sample to surviving nonpayers in column (2) and to surviving payers in columns (3) and (4). The dependent variable of the first-stage regression in column (2) is a binary variable that equals one if firm *i* pays dividend in quarter *t* and zero otherwise. The average quarter prediction errors in column (2) represent the propensity to initiate dividends (*PTI*). The propensity to initiate (*PTI*) is the difference between the actual percentage of previous nonpayers that initiate dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model.

The dependent variable of the first-stage regression in column (3)/(4) is a binary variable that equals one if firm *i* increase/decrease dividend in quarter *t* and zero otherwise. Hence the average quarter prediction errors in columns (3)/(4) stand for the propensity to increase/decrease dividends (*PTE/PTD*). The propensity to

increase/decrease (*PTE/PTD*) is the difference between the actual percentage of firms that increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model.

As predicted by dividend catering, *ASVI_Div* is positively associated with the changes in the propensity to initiate (*CPTI*) or increase (*CPTE*) dividends and negatively associated with the changes in the propensity to decrease dividends (*CPTD*). Firms are more (less) likely to initiate or increase dividends when retail investors search more (less) on dividends via Internet. The regression coefficient of 0.125 in column (2) suggests that a one-standard-deviation increase in *ASVI_Div* is associated with 0.56% (0.045*0.125) increase in the propensity to initiate dividends in the following quarter. These results remain after controlling for the dividend premium.

To summarize, the dividend sentiment effect is as predicted by catering after controlling for firm characteristics and the dividend premium. When dividends attract more (less) retail investors, firms have higher propensity to initiate or increase (decrease) dividends.

4.3.3 The Propensity to Pay Dividends with Risk Controls

Hoberg and Prabhala (2009) argue that risk is a significant determinant of the propensity to pay dividends, and the dividend premium becomes insignificant once we control for risk. Hence we examine whether dividend sentiment predicts firm's dividend policy after controlling for risk in the first-stage Fama-Macbeth logit regression. The tests also proceed in three stages. The only difference is that we conduct Fama and MacBeth (1973) estimates of a logit model with two additional risk controls in the first stage:

$$\Pr(Payer_{it} = 1) = \log it(a + bNYP_{it} + c\frac{M}{B_{it}} + d\frac{dA}{A_{it}} + e\frac{E}{A_{it}} + Systematic\_risk + Idiosyncratic\_risk) + u_{it} \quad (15)$$

where *Systematic_risk* is the standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate). One firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within one quarter. *Idiosyncratic_risk* is the standard deviation of residuals from the above regression used to define systematic risk.

We report first and final stage results in column (1) of Table 4.5. Consistent with Hoberg and Prabhala (2009), we find that both systematic risk and idiosyncratic risk are negatively associated with the propensity to pay dividends. The average quarter prediction errors from the first stage logit estimates are the propensity to pay dividends (*PTP*) after controlling for firm characteristics and risk. Panel B of Figure 4.3 depicts the dividend sentiment and the propensity to pay dividends. The propensity to pay dividends spikes during the financial crisis period once we control for risk. The variation trends of *ASVI_Div* and the propensity to pay are similar except the financial crisis period.

With regards to the final stage results, we find that *ASVI_Div* is positively associated with the changes in the propensity to pay dividends.[54] A one-standard-deviation increase in *ASVI_Div* leads to 0.67% (0.045*0.148) increase in the propensity to pay dividends in the following quarter. This confirms that dividend sentiment has predictive power in capturing manager's dividend catering behavior.

We then study companies that newly initiate dividends in column (2) and firms that already pay dividends in columns (3) and (4). The coefficient on *ASVI_Div* is

[54] Consistent with Hoberg and Prabhala (2009), we find that dividend premium becomes insignificant once we control for risk.

significantly positive in columns (2) and (3) and becomes significantly negative in column (4) after controlling for risk. Results are robust after controlling for the dividend premium. This again confirms that our dividend sentiment measure might capture information not reflected in the market data.

Overall, we find that investors' dividend sentiment still strongly predicts firm's subsequent dividend policy after controlling for firm characteristics, risk and the dividend premium. Managers cater to investors' demand for dividends over time by adjusting firm's payout policy.

4.3.4 Cross-Sectional Variation in Dividend Sentiment

We next examine whether cross-sectional differences in dividend sentiment affect firms' dividend policy. As local investors' dividend sentiment varies across regions, we conjecture that the effects of dividend sentiment on firm's dividend policy would be stronger among U.S. states with stronger dividend sentiment. Investors in these states are more likely to put premium on dividend-paying stocks and local managers are more likely to cater. In contrast, for firms locate in states with weak dividend attitudes, the relation between dividend sentiment and firm's dividend policy should be weaker or non-existent. To test our prediction, we use each firm's headquarter state to define its location and use the average state-level *SVI_Div* to measure the dividend sentiment of local investors.

We repeat the analysis in Table 4.5. The test is conducted in three stages. We first conduct Fama and MacBeth (1973) estimates of a logit model with firm and risk controls. We only include firms whose headquarters are located in these top/bottom 10 states with non-zero dividend sentiment. We next obtain the average quarter prediction errors (actual dividend policy minus predicted policy) from the logit

regressions for each top/bottom 10 state. Then, to eliminate seasonality from the average quarter prediction errors, we regress the prediction errors on quarter dummies and keep the residual (Da, Engelberg, and Gao, 2015). The final stage regresses the seasonal-adjusted residual of average quarter prediction errors on *ASVI_Div*. Standard errors are robust to heteroskedasticity.[55] We have 39 observations for each top/bottom 10 state and 390 observations in total from 2004 to 2013.

Table 4.6 reports results. In Panel A, we find that *ASVI_Div* is positively associated with the change in the propensity to pay dividends (*CPTP*). A one-standard-deviation increase in *ASVI_Div* leads to 0.48% (0.043*0.111) increase in the propensity to pay dividends in the following quarter for firms in top 10 dividend sentiment states. These results are economically significant as the increase is 32.7% of the average propensity to pay in top 10 dividend sentiment states (1.47%). We then restrict the sample to surviving nonpayers in column (2) and to surviving payers in columns (3) and (4). As predicted by catering for dividend initiation and increase, the coefficients on *ASVI_Div* are significantly positive at the 5% level in columns (2) and (3).

We find insignificant results in column (4) where the dependent variable is the change in the propensity to decrease dividends (*CPTD*). Firms that cut dividends experience poor prior, concurrent, and future stock returns. Hence valuation gains from catering might not be reflected in stock prices. Another possible explanation is that many firms cut dividends due to low profitability rather than catering. Hence it is not surprising to find a weaker relation between investors' dividend sentiment and

[55] Results are similar if we cluster standard errors by state or use the fixed-effects model.

the propensity to decrease dividends. Results remain similar after controlling for the dividend premium in Panel B of Table 4.6.

Panel C of Table 4.6 repeats the regressions in Table 4.5 but restricts to firms in the bottom 10 states with non-zero dividend sentiment. In the final stage, the coefficients on *ASVI_Div* are insignificant in all specifications. This suggests that the dividend sentiment lacks power in explaining firm's dividend policy for firms that located in states with weak dividend sentiment. Results are robust after controlling for the dividend premium in Panel D.

Consistent with our conjecture, in regions with strong dividend sentiment, local managers are willing to cater to investors' dividend sentiment. In contrast, in regions with weak dividend sentiment, individual investors pay less attention to dividends and managers decide not to cater.

4.3.5 Robustness Checks and Other Tests

Our dividend sentiment measure thus far is *ASVI_Div*. One concern to this measure is that the selection of the dividend-related keywords is not random. To alleviate the selection bias, we use *ASVI_DT* as an alternative measure of dividend sentiment. *ASVI_DT* is the abnormal search volume index for topic *"dividend"* from Google Trends and includes searches in different languages and various text strings as long as they are dividend-related.

We repeat our baseline analysis using *ASVI_DT* and report results in Table 4.7. We find that dividend sentiment still strongly predicts dividend initiation and increase ratio. The relation holds after controlling for firm characteristics, risk, and the dividend premium. One exception is that we find insignificant results for dividend decrease. One potential reason is that the associated negative

announcement effects for dividend cut might offset the potential benefits of catering. This makes catering less likely to apply to dividend cut.

To alleviate the concern that the search terms in *SVI_Div* are overly broad, we construct another keyword-based index, *SVI_High_Div*, which is the search volume index if the search term in Google includes *"high dividend"* or *"high dividends"* or *"high payout"* or *"high dividend stocks"* or *"high dividend yield"* or *"high dividend payout".* Searching for these high-related dividend keywords is less ambiguous. If an investor is searching *"high dividend stocks"* in Google, she is undoubtedly paying attention to high dividend-paying stocks. Again, we find that retail investors' dividend sentiment plays an important role in explaining firm's dividend policy after controlling for firm characteristics, risk and the dividend premium. (Tables are available upon request).

We include dividend omissions in our analysis and find that shifts in investors' dividend attitudes over time do not affect firm's dividend omission decision. Hoberg and Prabhala (2009) provide several reasons that catering is less likely to apply to dividend omissions. Firstly, investors react negatively to dividend omission.[56] The associated negative announcement effects might offset potential benefits of catering. Moreover, the limits to arbitrage are required for investor demand to affect stock prices. However, these constraints are less likely to apply when negative investor sentiments depress prices. Indeed, we find that results are stronger for dividend initiation and increase and the relation between the dividend sentiment and firm's dividend policy becomes weaker for dividend cut and omission.

Finally, we examine the lead-lag relation between the dividend premium and the dividend sentiment. To eliminate seasonality from quarterly dividend premium

[56] Dividend omissions have announcement effects of nearly -7%.

(*SVI_Div*), we regress the ratio on quarter (month) dummies and keep the residual. Standard errors are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987).

We first regress current *SVI_Div* on one-, two-, three-, and four-quarter lagged dividend premium respectively in Panel A of Table 4.8. The coefficients on lagged dividend premium are all positive and are statistically significant at the 1% level. This confirms the positive relation between the dividend premium and the dividend sentiment. The regression R^2 ranges from 13% to 22%, suggesting that the dividend premium only explains a small fraction of the changes in dividend sentiment. We next regress current dividend premium on one-, two-, three-, and four-quarter lagged *SVI_Div* respectively in Panel B of Table 4.8. We find positive relation between the dividend premium and the dividend sentiment in most specifications but coefficients are insignificant.

4.4 Conclusion

This paper investigates how changes in overall attitudes toward dividends affect firm's dividend policy. We propose a direct measure of investor demand for dividends using the Internet search volume for dividend-related keywords. We find that managers cater to the time-varying investor demand for dividends. Managers initiate or increase (cut) dividends when retail investors have stronger (weaker) dividend sentiment. These effects are concentrated on firms located in high dividend sentiment states. Results are robust after controlling for firm characteristics, risk, and the dividend premium.

These findings contribute to the emerging finance literature that examines the role of investor attention on corporate decisions. We directly test the dividend

catering theory by using the Internet search volume for dividend-related keywords. Previous papers have typically used the dividend premium to capture investor demand for dividends which results in controversy. In contrast, Internet search volume for dividend-related keywords intuitively captures investor attention to dividends and objectively reveals investors' dividend sentiment. In future work, it may be interesting to study the Internet search volume in other corporate decisions (for example, security issuance).

Table 4.1: Top, Bottom and Zero Dividend Sentiment States

This table reports the search volume index for dividend-related searches from Google Trends. We calculate the median value of the search volume index from 2004 to 2013 for each state. *SVI_Div* is the search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". SVI_DT* is the search volume index for the topic "dividend" from Google Trends. This includes searches in different text strings and various languages as long as they are dividend-related. We rank all U.S. states by *SVI_Div* and define a state as a zero dividend sentiment state (Panel C) if the median value of *SVI_Div* is zero within the sample period. Panel A (B) lists the top (bottom) 10 non-zero states with the highest (lowest) *SVI_Div*.

Panel A. Top 10 States in Dividend Sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Florida	FL	70	57
Texas	TX	68	58
Colorado	CO	66	54.5
Maryland	MD	66	55
Missouri	MO	65	55.5
North Carolina	NC	64	55
Illinois	IL	62.5	51
Arizona	AZ	61	53
Georgia	GA	61	49

Panel B. Bottom 10 States with non-zero Dividend Sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Virginia	VA	42	38.5
Kansas	KS	45	32
Nevada	NV	48.5	28
Oklahoma	OK	50	37
Kentucky	KY	50.5	33.5
Utah	UT	51	30.5
Arkansas	AR	52	38
Louisiana	LA	53	34.5
Iowa	IA	53.5	37
South Carolina	SC	56	28

Panel C. States with zero Dividend Sentiment

State Name	*State*	*SVI_Div*	*SVI_DT*
Wyoming	WY	0	0
North Dakota	ND	0	0
West Virginia	WV	0	0
South Dakota	SD	0	0
Montana	MT	0	0
Vermont	VT	0	0
Idaho	ID	0	0
Delaware	DE	0	0
Alaska	AK	0	0
Maine	ME	0	0

Table 4.2: Summary Statistics

This table depicts the summary statistics for each variable in Panel A and the correlation table in Panel B. *Dividend Initiation Ratio* expresses new payers at quarter *t* as a percentage of surviving nonpayers from *t-1*. *Dividend Increase Ratio* expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. *Dividend Decrease Ratio* expresses decrease payers at quarter *t* as a percentage of surviving payers from *t-1*. *ASVI_Div* is the abnormal search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". Dividend Premium* is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. We regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP)*. *ASVI_DT* is the abnormal search volume index for topic *"dividend"* from Google Trends and includes searches in different languages and various text strings as long as they are dividend-related. To eliminate seasonality from our *ASVI* measures (*Dividend Premium*), we regress the ratio on month (quarter) dummies and keep the residual. Market-to-book ratio *M/B* is book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44). Asset Growth *dA/A* is the difference between book assets (item 44) and lagged book assets, all divided by lagged book assets. Profitability *E/A* is earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), all divided by book assets (item 44). Size *NYP* is the NYSE market capitalization percentile, i.e., the percentage of NYSE firms having equal or smaller capitalization than firm *i* in year *t*. *Systematic Risk* is the standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate). One firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within one quarter. *Idiosyncratic Risk* is the standard deviation of residuals from the above regression used to define systematic risk.

Panel A. Summary Statistics

Variables	Mean	10th Perc.	Median	90th Perc.	Std. Dev
Dividend Initiation Ratio	0.043	0.019	0.038	0.071	0.021
Dividend Increase Ratio	0.297	0.185	0.295	0.404	0.082
Dividend Decrease Ratio	0.155	0.121	0.150	0.192	0.033
ASVI_Div	-0.006	-0.067	0.002	0.045	0.045
Dividend Premium	0.000	-0.082	0.013	0.062	0.056
ASVI_Div_DP	0.000	-0.060	0.006	0.051	0.045
ASVI_DT	-0.002	-0.054	-0.003	0.050	0.041
M/B	2.134	0.867	1.475	3.839	2.118
dA/A	0.027	-0.084	0.008	0.117	0.155
E/A	-0.011	-0.087	0.012	0.041	0.083
NYP	0.256	0.001	0.114	0.770	0.299
Systematic Risk	0.012	0.002	0.009	0.024	0.011
Idiosyncratic Risk	0.028	0.011	0.023	0.049	0.023

Panel B. Correlation Matrix

	ASVI_Div	*Dividend Premium*	*ASVI_DT*	*M/B*	*dA/A*	*E/A*	*NYP*	*Systematic Risk*	*Idiosyncratic Risk*
ASVI_Div	1.0000								
Dividend Premium	0.0386	1.0000							
ASVI_DT	0.6211	0.0778	1.0000						
M/B	0.0261	-0.0873	0.0261	1.0000					
dA/A	0.0360	-0.0519	0.0408	0.0851	1.0000				
E/A	0.0543	-0.0322	0.0518	-0.1837	0.1948	1.0000			
NYP	0.0053	0.0075	0.0084	0.0961	0.0451	0.2712	1.0000		
Systematic Risk	-0.2128	0.2013	-0.2739	-0.0634	-0.0534	-0.0528	0.0621	1.0000	
Idiosyncratic Risk	-0.1446	0.1324	-0.1745	-0.0046	-0.0578	-0.3230	-0.4060	0.2998	1.0000

Table 4.3: Dividend Payment and Dividend Sentiment

This table shows OLS regressions of dividend initiation, increase, and decrease rates on one-quarter lagged dividend sentiment from 2004 to 2013. The initiation rate expresses new payers at quarter *t* as a percentage of surviving nonpayers from *t-1*. The rate at which firms increase dividends expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. The rate at which firms decrease dividends expresses decrease payers at quarter *t* as a percentage of surviving payers from *t-1*. *ASVI_Div* is the abnormal search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout".* The dividend premium is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. To eliminate seasonality from dividend initiation, increase, decrease, and premium (*ASVI_Div*), we regress the ratio on quarter (month) dummies and keep the residual. We regress *ASVI_Div* on the dividend premium in Panel B and keep the residual (*ASVI_Div_DP).* Standard errors are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987). ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Abnormal Search Volume Index

	Initiate	*Increase*	*Decrease*
ASVI_Div	**0.086**	**0.305**	**-0.314**
	[4.46]***	[1.80]*	[2.94]***
Constant	**0.000**	**0.002**	**-0.000**
	[0.20]	[0.17]	[0.09]
R^2	0.18	0.09	0.25
N	39	39	39

Panel B. Controlling for the Dividend Premium: Abnormal Search Volume Index

	Initiate	*Increase*	*Decrease*
ASVI_Div_DP	**0.083**	**0.298**	**-0.320**
	[4.03]***	[1.65]*	[3.03]***
Constant	**-0.000**	0.000	**0.001**
	[0.00]	[0.02]	[0.30]
R^2	0.16	0.08	0.26
N	39	39	39

Table 4.4: Dividend Payment and Dividend Sentiment: Firm Characteristic Controls

This table reports three-stage regressions of dividend payment on firm characteristics and dividend sentiment. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics suggested by Fama and French (2001) and Baker and Wurgler (2004b). We restrict the sample to surviving nonpayers in column (2) and restrict the sample to surviving payers in columns (3) and (4). The dependent variable is a dummy variable that equals one if firm *i* pays dividend in quarter *t* and zero otherwise in columns (1) and (2). The dependent variable in column (3) ((4)) is a binary variable that equals one if firm *i* increase (decrease) dividend in quarter *t* and zero otherwise:

$$\Pr(Payer_{it} = 1) = \log it(a + bNYP_{it} + c\frac{M}{B_{it}} + d\frac{dA}{A_{it}} + e\frac{E}{A_{it}}) + u_{it}$$

We obtain the average quarter prediction errors (actual dividend policy minus predicted policy) from the first-stage logit regressions. Then, to eliminate seasonality from the average quarter prediction errors, we regress the prediction errors on quarter dummies and keep the residual (the propensity to pay/initiate/increase/decrease dividends). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. The final stage regresses the seasonal-adjusted residual of average quarter prediction errors on *ASVI_Div*. We also regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP)*. The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividends (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial variables are listed in the Appendix. Standard errors in the final stage regression are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987). ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. First Stage Regressions

	PTP	*PTI*	*PTE*	*PTD*
M/B	**-0.013**	**-0.002**	**0.014**	**0.005**
	[21.94]***	[5.14]***	[5.32]***	[3.70]***
dA/A	**-0.132**	**-0.038**	**0.128**	**-0.001**
	[13.86]***	[7.13]***	[4.37]***	[0.09]
E/A	**0.466**	**0.062**	**1.077**	**0.228**
	[28.01]***	[6.56]***	[8.94]***	[2.52]**
NYP	**0.608**	**0.161**	**0.059**	**-0.032**
	[78.96]***	[11.05]***	[5.67]***	[7.18]***
Constant	**0.137**	**0.015**	**0.094**	**0.047**
	[30.84]***	[9.19]***	[14.53]***	[11.88]***
R^2	0.21	0.05	0.02	0.01
N	135,982	101,623	34,359	34,359

Panel B. Final Stage Regressions

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.164**	**0.125**	**0.243**	**-0.120**
	[7.07]***	[4.40]***	[2.00]**	[2.56]***
Constant	**0.002**	**0.001**	**0.003**	**-0.000**
	[2.16]**	[0.57]	[1.09]	[0.17]
R^2	0.42	0.25	0.17	0.10
N	39	39	39	39

Panel C. Controlling for the Dividend Premium: Final Stage Regressions

Final Stage:	*CPTP*	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.160**	**0.118**	**0.236**	**-0.115**
	[6.76]***	[4.12]***	[1.95]*	[2.41]***
Constant	**0.001**	**-0.000**	**0.001**	**0.000**
	[1.21]	[0.10]	[0.52]	[0.22]
R^2	0.40	0.22	0.16	0.10
N	39	39	39	39

Table 4.5: Dividend Payment and Dividend Sentiment: Risk Controls

This table reports three-stage regressions of dividend payment on firm characteristics, risk and dividend sentiment. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics and risk suggested by Fama and French (2001) and Hoberg and Prabhala (2009). We restrict the sample to surviving nonpayers in column (2) and restrict the sample to surviving payers in columns (3) and (4). The dependent variable is a dummy variable that equals one if firm *i* pays dividend in quarter *t* and zero otherwise in columns (1) and (2). The dependent variable in column (3) ((4)) is a binary variable that equals one if firm *i* increase (decrease) dividend in quarter *t* and zero otherwise:

$$\Pr(Payer_{it} = 1) = \log it(a + bNYP_{it} + c\frac{M}{B_{it}} + d\frac{dA}{A_{it}} + e\frac{E}{A_{it}} + Systematic\_risk + Idiosyncratic\_risk) + u_{it}$$

We obtain the average quarter prediction errors (actual dividend policy minus predicted policy) from the first-stage logit regressions. Then, to eliminate seasonality from the average quarter prediction errors, we regress the prediction errors on quarter dummies and keep the residual (propensity to pay/initiate/increase/decrease). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. The final stage regresses the seasonal-adjusted residual of average quarter prediction errors on *ASVI_Div*. We also regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP)*. The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividends (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial and risk variables are listed in the Appendix. Standard errors in the final stage regression are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987). ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. First Stage Regressions

	PTP	*PTI*	*PTE*	*PTD*
M/B	**-0.026**	**-0.004**	**0.008**	**0.004**
	[35.05]***	[5.10]***	[2.72]***	[2.53]**
dA/A	**-0.149**	**-0.048**	**0.132**	**-0.009**
	[9.21]***	[7.07]***	[4.34]***	[0.59]
E/A	**0.496**	**0.112**	**1.145**	**0.337**
	[16.86]***	[10.63]***	[7.73]***	[3.40]***
NYP	**0.498**	**0.138**	**0.044**	**-0.014**
	[64.17]***	[12.41]***	[3.69]***	[3.02]***
Systematic Risk	**-2.111**	**-1.467**	**-5.940**	**-0.499**
	[4.08]***	[7.75]***	[8.37]***	[1.45]
Idiosyncratic Risk	**-4.169**	**-0.157**	**-1.999**	**1.435**
	[16.34]***	[2.87]***	[4.86]***	[5.61]***
Constant	**0.339**	**0.039**	**0.203**	**0.015**
	[33.26]***	[10.56]***	[15.03]***	[2.70]**
R^2	0.21	0.04	0.03	0.02
N	99,065	68,975	30,090	30,090

Panel B. Final Stage Regressions

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.148**	**0.097**	**0.350**	**-0.114**
	[2.00]**	[4.74]***	[1.83]*	[2.56]**
Constant	**0.001**	**0.000**	**0.000**	**-0.000**
	[0.29]	[0.23]	[0.07]	[0.11]
R^2	0.04	0.13	0.07	0.10
N	39	39	39	39

Panel C. Controlling for the Dividend Premium: Final Stage Regressions

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.145**	**0.092**	**0.346**	**-0.109**
	[1.87]*	[4.22]***	[1.80]*	[2.47]**
Constant	**0.000**	**-0.000**	**0.001**	**0.000**
	[0.07]	[0.21]	[0.12]	[0.31]
R^2	0.04	0.12	0.07	0.09
N	39	39	39	39

Table 4.6: Dividend Payment and Dividend Sentiment: Top/Bottom 10 Dividend Sentiment States

This table reports the final stage results of three-stage regressions of dividend payment on firm characteristics, risk and dividend sentiment for top/bottom 10 states with non-zero dividend sentiment. We collect *SVI* for each U.S. state and rank all states by averaging the *SVI* from 2004 to 2013. The top 10 states with the highest dividend sentiment (highest average *SVI*) are Texas, Florida, Colorado, Maryland, Missouri, Massachusetts, North Carolina, Georgia, Illinois and Arizona. We only include firms whose headquarters are located in these states in Panel A and B. The bottom 10 non-zero states with the lowest dividend sentiment (lowest average *SVI*) are Kansas, Nevada, Oklahoma, Kentucky, Arkansas, Louisiana, Iowa, South Carolina, Utah and Virginia. We only include firms whose headquarters are located in these states in Panel C and D. We first perform a set of Fama-Macbeth logit regression of dividend payment on firm characteristics and risk suggested by Fama and French (2001) and Hoberg and Prabhala (2009). We restrict the sample to surviving nonpayers in column (2) and restrict the sample to surviving payers in columns (3) and (4):

$$\Pr(Payer_{it} = 1) = \log it(a + bNYP_{it} + c\frac{M}{B_{it}} + d\frac{dA}{A_{it}} + e\frac{E}{A_{it}} + Systematic\_risk + Idiosyncratic\_risk) + u_{it}$$

We obtain the average quarter prediction errors (actual dividend policy minus predicted policy) for each state from the logit regressions. Then, to eliminate seasonality from the average quarter prediction errors, we regress the prediction errors on quarter dummies and keep the residual (the propensity to pay/initiate/increase/decrease dividends). The propensity to pay/initiate/increase/decrease (*PTP/PTI/PTE/PTD*) is the difference between the actual percentage of firms that pay/initiate/increase/decrease dividends in a given quarter and the expected percentage, which is the average predicted probability from the logit model. The final stage regresses the seasonal-adjusted residual of average quarter prediction errors on *ASVI_Div*. We also regress *ASVI_Div* on the dividend premium and keep the residual (*ASVI_Div_DP)*. The dependent variable in the final stage is the change in the propensity to pay/initiate/increase/decrease dividend (*CPTP/CPTI/CPTE/CPTD*). The definitions of other financial and risk variables are listed in the Appendix. Standard errors in the final stage regression are robust to heteroskedasticity. ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Top 10 Dividend Sentiment States

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.043**	**0.042**	**0.145**	**-0.019**
	[1.92]*	[2.15]**	[2.01]**	[0.52]
Constant	**-0.000**	**-0.001**	**-0.001**	**0.001**
	[0.12]	[0.26]	[0.07]	[0.19]
N	390	390	390	390

Panel B. Top 10 Dividend Sentiment States: Controlling for the Dividend Premium

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.042**	**0.042**	**0.146**	**-0.020**
	[1.92]*	[2.14]**	[2.01]**	[0.54]
Constant	**-0.000**	**-0.000**	**-0.000**	**0.001**
	[0.08]	[0.22]	[0.03]	[0.18]
N	390	390	390	390

Panel C. Bottom 10 States with non-zero Dividend Sentiment

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div	**0.015**	**-0.136**	**0.025**	**0.011**
	[0.29]	[1.34]	[0.24]	[0.22]
Constant	**-0.000**	**-0.000**	**-0.006**	**0.000**
	[0.04]	[0.01]	[0.46]	[0.01]
N	390	390	390	390

Panel D. Bottom 10 States with non-zero Dividend Sentiment: Controlling for the Dividend Premium

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_Div_DP	**0.015**	**-0.137**	**0.026**	**0.010**
	[0.29]	[1.34]	[0.25]	[0.22]
Constant	**-0.000**	**0.001**	**-0.006**	**-0.000**
	[0.06]	[0.11]	[0.47]	[0.00]
N	390	390	390	390

Table 4.7: Dividend Payment and Dividend Sentiment: Robustness Checks

This table reports our baseline results using *ASVI_DT*. *ASVI_DT* is the abnormal search volume index for the topic *"dividend"* from Google Trends. This includes searches in different text strings and various languages as long as they are dividend-related. To eliminate seasonality from *ASVI_DT*, we regress the ratio on month dummies and keep the residual. We also regress *ASVI_DT* on the dividend premium proposed by Baker and Wurgler (2004b) and keep the residual (*ASVI_DT_DP)*. Panel A shows results before controlling for firm characteristics and risk. Panel B to C list the final stage results of the three-stage regressions. Standard errors are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987). ***, **and * represent 1%, 5% and 10% significance level, respectively.

Panel A. ASVI

	Initiate	*Increase*	*Decrease*
ASVI_DT	**0.068**	**0.358**	**-0.195**
	[2.83]***	[1.90]*	[1.34]
ASVI_DT_DP	**0.064**	**0.351**	**-0.205**
	[2.61]**	[1.76]*	[1.43]

Panel B. ASVI Controlling for Firm Characteristics

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_DT	**0.161**	**0.119**	**0.348**	**-0.009**
	[4.86]***	[3.77]***	[2.66]***	[0.19]
ASVI_DT_DP	**0.156**	**0.111**	**0.342**	**-0.000**
	[4.64]***	[3.45]***	[2.66]***	[0.01]

Panel C. ASVI Controlling for Firm Characteristics and Risk

	CPTP	*CPTI*	*CPTE*	*CPTD*
ASVI_DT	**0.184**	**0.100**	**0.452**	**-0.002**
	[1.95]*	[3.43]***	[2.26]**	[0.05]
ASVI_DT_DP	**0.182**	**0.093**	**0.451**	**0.004**
	[1.86]*	[3.05]***	[2.28]**	[0.08]

Table 4.8: Lead-Lag Relation Between the Dividend Premium and the Dividend Sentiment

This table shows the lead-lag relation between the dividend premium proposed by Baker and Wurgler (2004b) and the search volume index for dividend-related keywords from Google Trends. *SVI_Div* is the search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". Dividend Premium* is the difference between the logs of the value-weighted market-to-book ratio for dividend payers and nonpayers. To eliminate seasonality from the dividend premium (*SVI_Div*), we regress the ratio on quarter (month) dummies and keep the residual. Standard errors are robust to heteroskedasticity and serial correlation to four lags using the procedure of Newey and West (1987). ***, **and *represent 1%, 5% and 10% significance level, respectively.

Panel A. Relation between Lagged Dividend Premium and Current Dividend Sentiment

	Dividend Premium			
	One-Lag	Two-Lag	Three-Lag	Four-Lag
SVI_Div	**1.011**	**1.221**	**1.071**	**0.989**
	[2.65]***	[4.07]***	[2.57]***	[2.41]***
Constant	**-0.002**	**0.003**	**0.004**	**0.008**
	[0.05]	[0.07]	[0.10]	[0.18]
R^2	0.14	0.22	0.17	0.13
N	39	38	37	36

Panel B. Relation between Lagged Dividend Sentiment and Current Dividend Premium

	SVI_Div			
	One-Lag	Two-Lag	Three-Lag	Four-Lag
Dividend Premium	**0.053**	**0.081**	**-0.006**	**0.006**
	[0.74]	[1.03]	[0.09]	[0.08]
Constant	**0.003**	**0.002**	**0.002**	**0.002**
	[0.23]	[0.16]	[0.15]	[0.11]
R^2	0.02	0.05	0.00	0.00
N	39	38	37	36

Figure 4.1: Search Volume Index from 2004 to 2013

This figure shows the natural log of the search volume index (SVI) from 2004 to 2013. We follow the National Bureau of Economic Research (NBER) and define recession period from December 2007 to June 2009. The financial crisis period is within the dashed lines. *SVI_Div* is the search volume index if the search term in Google includes *"dividend" or "dividends" or "payout" or "dividend stocks" or "dividend yield" or "dividend payout". SVI_DT* is the search volume index for the topic "dividend" from Google Trends. This includes searches in different text strings and various languages as long as they are dividend-related. To eliminate seasonality from the natural log of the search volume index, we regress the ratio on month dummies and keep the residual.

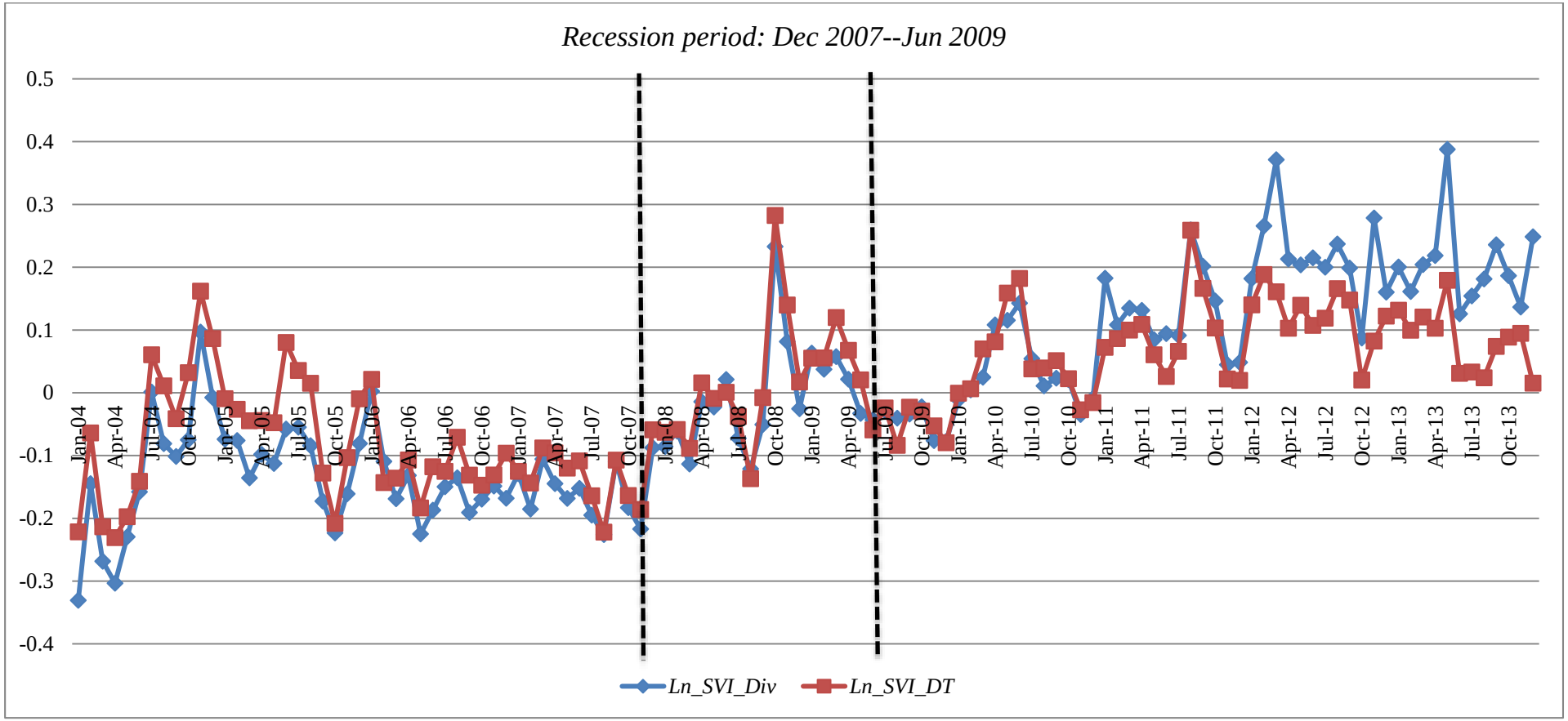
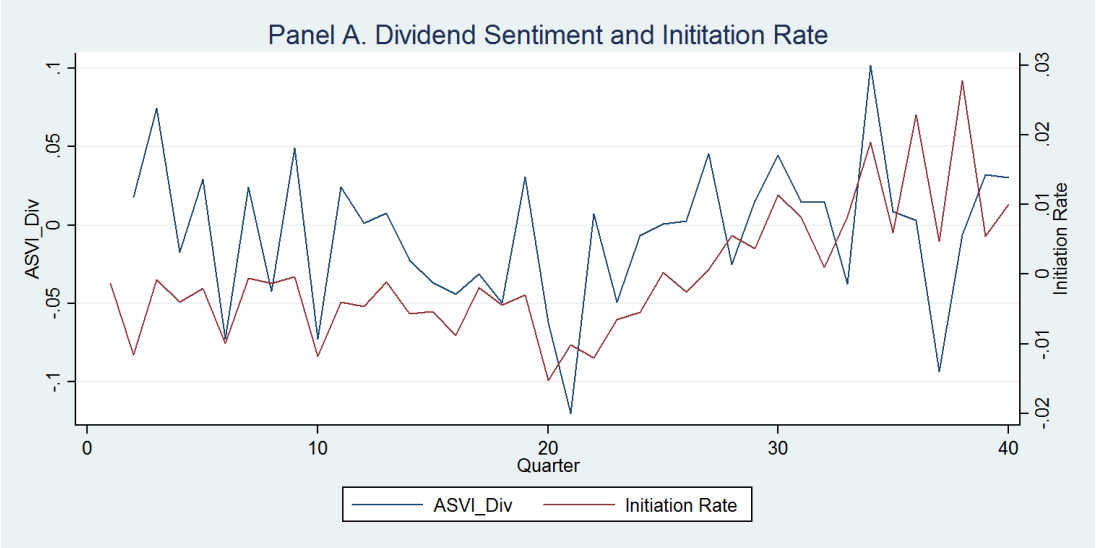


Figure 4.2: Dividend Sentiment, Dividend Initiation and Increase Rate

This figure shows the time-series relation between dividend sentiment, the dividend initiation rate, and the dividend increase rate from 2004 to 2013. *ASVI_Div* is the abnormal search volume index if the search term includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*. The initiation rate expresses new payers at quarter *t* as a percentage of surviving nonpayers from *t-1*. The rate at which firms increase dividends expresses increase payers at quarter *t* as a percentage of surviving payers from *t-1*. To eliminate seasonality from the dividend initiation rate and the dividend increase rate (*ASVI_Div*), we regress the ratio on quarter (month) dummies and keep the residual.



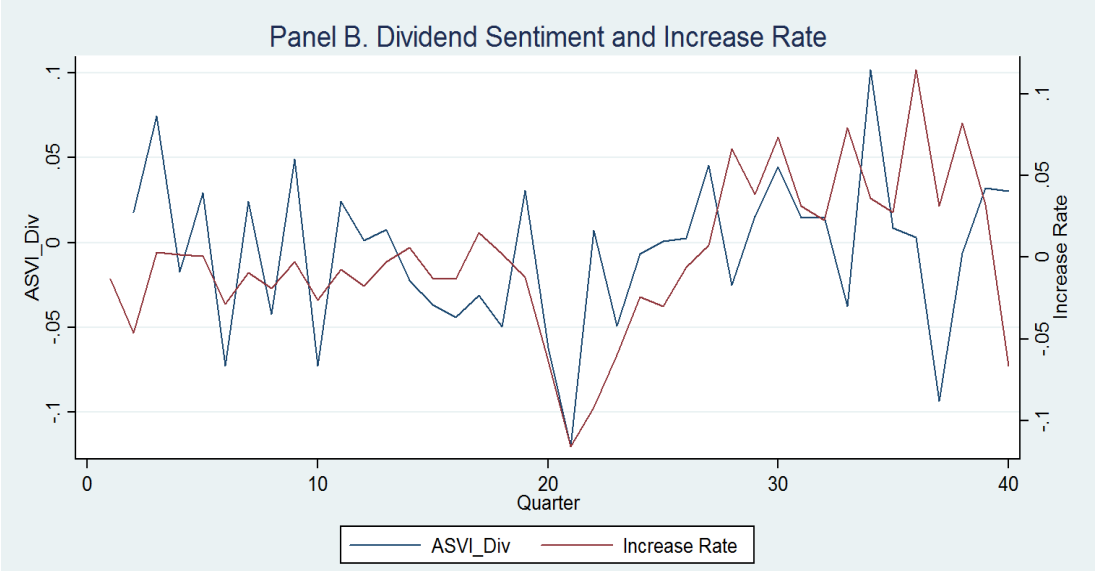
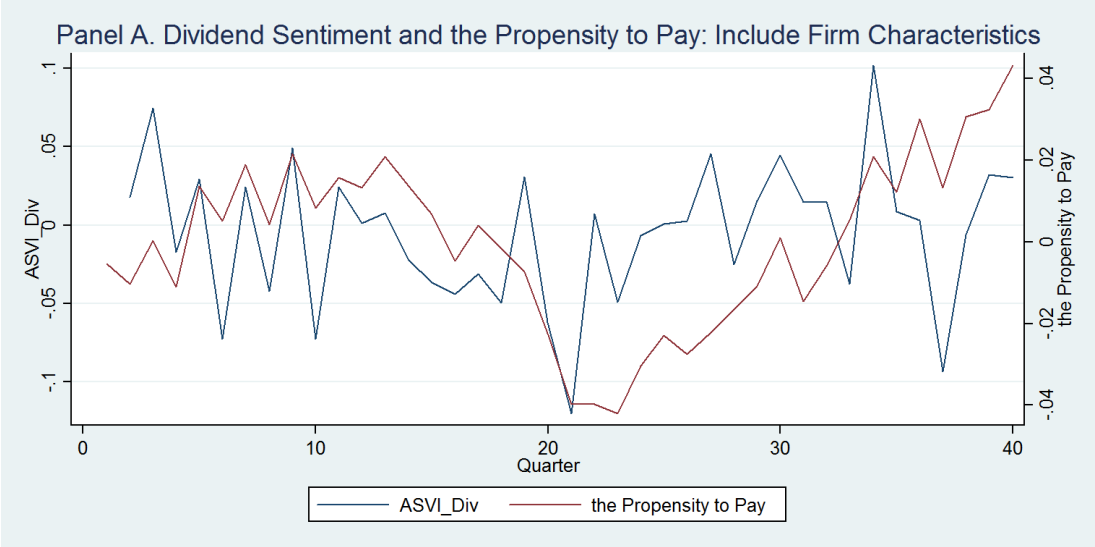
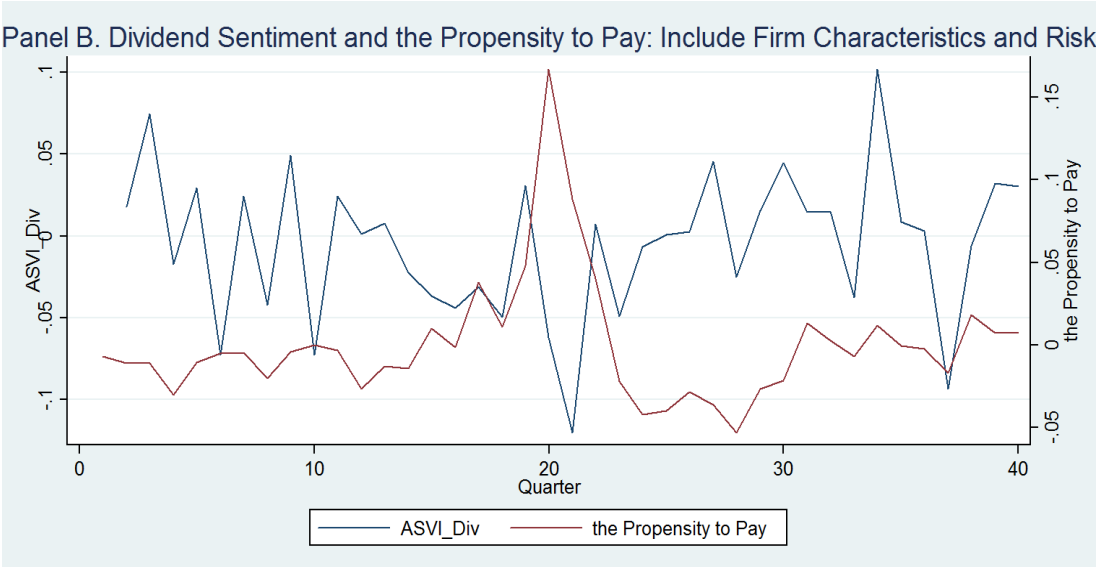


Figure 4.3: Dividend Sentiment and the Propensity to Pay Dividends

This figure shows the time series relation between dividend sentiment and the propensity to pay dividends from 2004 to 2013. *ASVI_Div* is the abnormal search volume index if the search term includes *"dividend"* or *"dividends"* or *"payout"* or *"dividend stocks"* or *"dividend yield"* or *"dividend payout"*. The propensity to pay is the difference between the actual fraction of firms paying dividends in a given quarter minus the expected fraction of firms paying dividends. The expected value equals to the average predicted value from the Fama-MacBeth logit regression including four firm characteristics suggested by Fama and French (2001) in Panel A: asset growth, firm's size percentile relative to NYSE firms, M/B and earnings divided by book assets. We include two additional risk controls suggested by Hoberg and Prabhala (2009) in Panel B: systematic risk and idiosyncratic risk. To eliminate seasonality from the propensity to pay dividends (*ASVI_Div*), we regress the ratio on quarter (month) dummies and keep the residual.





Appendix: Variable Definitions

Panel A. Firm characteristics	
NYP	The NYSE market capitalization percentile, i.e., the percentage of NYSE firms having equal or smaller capitalization than firm *i* in quarter *t*. *Source: Compustat*
M/B	Book assets (item 44) minus book value of equity (item 60+item 52) plus market value of equity (item 12*item 61), all divided by book assets (item 44) *Source: Compustat*
dA/A	The difference between book assets (item 44) and lagged book assets, all divided by lagged book assets *Source: Compustat*
E/A	Earnings before extraordinary items (item 8) plus interest expense (item 22) plus income statement deferred tax (item 35), all divided by book assets (item 44) *Source: Compustat*
Panel B. Risk	
Systematic_risk	The standard deviation of the predicted value from a regression of a firm's daily excess stock returns (raw returns less the riskless rate) on the market factor (i.e., the value-weighted market return less the riskless rate). One firm-quarter observation of systematic risk is calculated using firm-specific daily stock returns within one quarter. *Source: Center for Research in Securities Prices (CRSP)*
Idiosyncratic_risk	The standard deviation of residuals from the above regression used to define systematic risk. *Source: Center for Research in Securities Prices (CRSP)*

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