UNIVERSITY OF CALIFORNIA, SAN DIEGO

Understanding and Managing Corporate Agency Problems

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by

Cindy M. Vojtech

Committee in charge:

Professor Roger Gordon, Chair
Professor Silke Forbes
Professor Nikolay Halov
Professor Takeo Hoshi
Professor Garey Ramey

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The dissertation of Cindy M. Vojtech is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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Chair

University of California, San Diego

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VITA AND PUBLICATIONS

2000	B. S. in Business Administration–Finance/Economics, *summa cum laude*, Fordham University, Bronx, NY
2000-2003	Investment Banking Analyst, Lehman Brothers, New York, NY
2003-2006	Economist, Bureau of Economic Analysis, Washington, DC
2007-2011	Teaching Assistant, University of California, San Diego, La Jolla, CA
2008	M. A. in Economics, University of California, San Diego, La Jolla, CA
2011	Ph. D. in Economics, University of California, San Diego, La Jolla, CA

PUBLICATIONS

"Accounting for Household Production: A Prototype Satellite Account Using the American Time Use Survey" (with J. Steven Landefeld and Barbara M. Fraumeni), Review of Income and Wealth, 55(2), pp. 205-225, (June) 2009.

"Chained-Dollar Indexes: Issues, Tips on Their Use, and Upcoming Changes" (with J. Steven Landefeld and Brent R. Moulton), Survey of Current Business, 83(11), pp. 8-16, 2003.

ABSTRACT OF THE DISSERTATION

Understanding and Managing Corporate Agency Problems

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This dissertation examines the relationships between agency problems and mechanisms that mitigate those problems. The first chapter examines both theoretically and empirically how the quality of firm information disclosure affects shareholders' use of dividend policies to mitigate agency problems. As a first step to induce the manager to behave in the interests of shareholders, managerial compensation is linked to the value of the firm. However, the manager and shareholders are asymmetrically informed. As a result, the manager can manipulate the firm's accounting information through earnings management to increase perceived firm value. This chapter shows how dividends can limit earnings management practices, by adding to the cost faced by a manager who inflates earnings. Dividend payers show less evidence of earnings management and show less evidence of a change in

behavior after the Sarbanes-Oxley Act of 2002 (SOX), a law that increased financial disclosures. This suggests that dividends had indeed been useful in limiting earnings management.

The second chapter analyzes how firms switch between monitoring tools. SOX and contemporaneous changes by NYSE and NASDAQ created minimum requirements on board composition. This chapter analyzes how treated and untreated firms changed other monitoring tools such as CEO ownership, CEO compensation, firm leverage, and dividend policy. The results suggest that independent board members are substitutes for monitoring that comes from CEO ownership and debt. Some evidence is also found that firms forced to create an independent audit committee increased leverage and decreased dividends.

The third chapter examines bank dividend policy responses to SOX and the passage of the Jobs and Growth Tax Relief Act of 2003 (Tax Reform). Agency models predict that the monitoring from SOX induces firms to lower dividends and that a dividend tax rate decrease induces firms to adopt or increase dividends. I find no evidence of a change in dividend behavior in the banking sector after SOX or after the Tax Reform.

Chapter 1

The Relationship Between Information Asymmetry and Dividend Policy

Abstract: This paper examines both theoretically and empirically how the quality of firm information disclosure affects shareholders' use of dividend policies to mitigate agency problems. As a first step to induce the manager to behave in the interests of shareholders, managerial compensation is linked to the value of the firm. However, the manager and shareholders are asymmetrically informed. As a result, the manager can manipulate the firm's accounting information through earnings management to increase perceived firm value. This paper shows how dividends can limit such practices, by adding to the cost faced by a manager who inflates earnings. Empirical tests match model predictions. Dividend paying firms show less evidence of earnings management. Furthermore, non-dividend payers appear to have changed earnings announcement behavior more than dividend payers following the passage of the Sarbanes-Oxley Act of 2002 (SOX), a law that increased financial disclosures. This suggests that dividends had indeed been useful in limiting earnings management.

1.1 Introduction

The use of dividends is a common practice by U.S. public firms, totalling around $630 billion in 2008.[1] From a tax perspective, paying dividends is inefficient because managers can use the same cash to invest in firm growth.[2] This paper provides an explanation of dividend behavior by showing how dividend policy helps mitigate agency problems. Dividend policy limits a manager's discretion over accounting reports. Dividends therefore make reported earnings more informative.

A manager of a public company makes many investment decisions that are not seen by shareholders. Shareholders do not generally see the individual projects adopted or specific assets purchased by a manager nor can shareholders see all the investment opportunities available to a manager. Financial reports are a primary source of information about the performance of firm investments, but the manager influences that information.

Beginning with Easterbrook (1984) and Jensen (1986), researchers began explaining dividend policy as a result of agency problems. Agency problems arise because the manager has different incentives than simply maximizing shareholder value. Dividends pull "free cash flow" out of the firm so that the manager has less funds to misinvest (Jensen, 1986).

Gordon and Dietz (2006) and Chetty and Saez (2007) developed incentive conflict models and showed that agency models perform better than other types of dividend models by having predictions that better match the empirical data. These agency models can predict behavior around tax changes, can explain the heterogeneity of payout policies across firms, and can explain how high levels of ownership by the management and the board of directors (hereafter, "board") influence payout policy. This paper contributes to this literature by showing theoretically and empirically how information asymmetry interacts with mechanisms that mitigate agency problems.

In order to align the incentives of managers with shareholder interests, man-

[1] This figure is based on firms that trade on the NYSE, AMEX, or NASDAQ and are in the Compustat database.

[2] The dividend tax rate has generally been higher than the capital gains tax rate that applies when shareholders sell their shares. Dividends also create a tax event for all taxable shareholders.

agerial compensation is linked to firm value. However, the manager and shareholders are asymmetrically informed. As a result, the manager can manipulate the firm's accounting information to increase perceived firm value. Because the board selects the dividend, my model shows how dividends can induce managers to reveal more information in accounting reports. Dividends lower the available funds for new investment which raises the marginal product of firm capital. Any earnings manipulation reduces funds further, causing a drop in future profits proportional to the marginal product of capital. Dividends make the manipulations more expensive, inducing more accurate reporting.

I test my model by examining how proxies of earnings management (EM) are affected by dividend policy. EM is the purposeful movement of earnings from one period to another for a private benefit.[3] More EM is possible when there is more information asymmetry. According to my model, dividend payers should use less EM. The empirical tests match this prediction. Dividend payers have less evidence of EM than non-dividend payers. This is the first paper to empirically test for EM by U.S. firms across dividend policy type and to document a difference in the size of apparent EM behavior across dividend policy type.[4]

The model predictions also hold when there is an exogenous shock to financial disclosure. The Sarbanes-Oxley Act of 2002 (SOX) was designed to decrease the size of the information gap between the manager and shareholders by increasing financial disclosures and by establishing severe penalties for managers if reports do not "fairly represent" the financial condition of the firm. Tests using EM proxies show that non-dividend payers appear to have changed earnings announcement behavior more than dividend payers following the passage of SOX. This suggests that dividends had indeed been useful in limiting earnings management.

[3]This definition is based on Schipper (1989).

[4]Researchers have looked at EM behavior by dividend payers. Kasanen, Kinnunen and Niskanen (1996) look at dividend payers in Finland and find evidence that firms use EM to meet dividend-based targets for earnings. Daniel, Denis and Naveen (2008) look at dividend payers in the U.S. and find evidence that dividend payers use EM to meet debt covenant targets so that dividends can be paid. Chaney and Lewis (1995) have a footnote mentioning that dividends could be used as a cost to over-reporting but do not model or test the idea. Savov (2006) uses a sample of German companies to test the relationship among EM, investment, and dividends. Regressions of EM proxies on dividends and other firm characteristics show a negative relationship between dividends and EM, but results are not statistically significant.

The proxies for EM used in this paper rely on a large accounting and finance literature. Prior researchers have developed ways to proxy for EM by estimating discretionary accruals (DA). Positive (negative) DA indicate inflating (deflating) earnings. Because there is no consensus on the best method for estimating DA, four primary measures of DA are used in this paper.

Because EM involves either inflating or deflating earnings, the absolute value of DA is then regressed on dividend policy, the interaction between SOX and dividends, firm characteristics, and year dummies. Dividend payers have 1-2% lower absolute DA than non-dividend payers. This is evidence that dividend payers use less EM. Absolute DA fell by 1% after SOX, but dividend payers did not experience this same drop.

The next section reviews the stylized facts of dividend behavior and of EM behavior and provides more background on SOX. Section 1.3 develops a model with several testable predictions regarding the interaction among dividends, information asymmetry, and EM. Section 1.4 tests these predictions by first estimating DA with various methods and then using these EM proxies in regressions. Section 1.5 concludes.

1.2 Stylized Facts and Background

1.2.1 Dividend Behavior

Past research has shown several stylized facts about the pattern of dividend payments that a robust model should be able to explain. Dividend levels (per share) tend to be stable over time with slow increases and rare decreases (Lintner, 1956; Brav, Graham, Harvey and Michaely, 2005). More specifically, the management survey data in Brav, Graham, Harvey and Michaely (2005) revealed a two-step process where maintaining the current dividend level was a first priority. Second, a possible increase in the dividend was considered but only if current and future expected excess cash flows could support it.

As mentioned above, dividends are inefficient from a tax perspective, but they do respond to tax changes. Chetty and Saez (2005) studied dividend behavior

around the 2003 tax reform.[5] They found that dividend tax decreases lead to large and immediate increases in dividends.

To try to explain dividend behavior, researchers have proposed several theories. Many theories can be categorized as explaining dividend payment as either an agency cost or as a signal of quality (manager or earnings). Overall, the predictions of agency models better match empirical data than those of signaling models.

The application of signaling models is varied. Bhattacharya (1979) and Miller and Rock (1985) separately develop theoretical models that connect dividends with future earnings. However, empirical support of this is weak. DeAngelo, DeAngelo and Skinner (1996) did not find evidence that dividends could identify firms with superior earnings. This should not be surprising given that dividends tend to be stable while earnings are more volatile. Brav, Graham, Harvey and Michaely (2005) also reject the signaling explanation based on their survey data.

Dividends can be paid because the company has a history of being profitable. The firm pays dividends out of past earnings. In fact, DeAngelo, DeAngelo and Stulz (2006) connect dividend payment with the life cycle of the firm. Established firms with high retained earnings to equity ratios are more likely to pay dividends. Fama and French (2001) found that dividend payers tend to be large, highly profitable, slow growth, and established firms.

However, signaling models can explain some important relationships seen in the data. Dividends are not only backward-looking. This paper contributes to the literature by building upon agency models and showing how dividends can signal true earnings. My model and results are related to the empirical findings of Skinner and Soltes (2011). These authors show that dividends provide information about earnings sustainability. Dividends provide information about which reported earnings are permanent.

[5]Prior to the 2003 law change, dividends were taxed at the personal income rate of the investor (a high of 35%), and the top capital gains tax rate was 20%. The 2003 dividend tax reform created a top dividend tax rate of 15% and lowered the top capital gains tax rate to match (Auerbach and Hassett, 2005). Even though the rates are equal, dividends create tax liabilities for all taxable agents but capital gains only apply for those taxable agents willing to sell their shares. Taxes can be deferred and only apply to the difference between the selling price and the basis for capital gains. It is likely that the shares sold are those with a low fraction of capital gains, implying a tax advantage for capital gains relative to dividends even with equal rates.

John and Knyazeva (2006) explain payout policies from the perspective of agency problems but frame payout policies as a type of pre-commitment. They study the interaction between payout policies and the level of monitoring from corporate governance. According to their hypothesis and test results, managers with weak governance commit to dividend payments to satisfy the market. Firms with weak governance have potentially large agency problems, and dividends impose a major commitment given the negative market reaction to a dividend omission or decrease. My model uses dividends as a commitment device, but the board makes the commitment.

Allen, Bernardo and Welch (2000) develop a tax clientele model that is a type of agency model which uses some signaling. They argue that dividends attract institutional investors. Because these types of investors actively monitor firms, a firm adopting a dividend is signaling its willingness to be scrutinized. Monitoring and reforms pushed by institutional investors further improve the firm. This mechanism is related to the model in this paper. In my model, the dividend is not attracting outside investors to monitor the firm but instead directly induces managers to issue more informative earnings reports.

1.2.2 Reported Earnings Behavior

A large amount of the information that current and prospective shareholders receive about a firm comes through financial statements mandated by the Securities and Exchange Commission (SEC). Financial statements must use Generally Accepted Accounting Principles (GAAP). Under GAAP, the manager has the flexibility to influence such things as when bad customer credit is written off, how inventory is expensed, how capital goods are depreciated, and how to value pension liabilities. The manager can also influence the timing of real transactions such as by deciding when new investments are made and by pushing through large volume sales near the end of a reporting period.

Earnings management (EM) involves any combination of these tactics with the purpose of achieving an earnings target. Given managerial incentives, the earnings target is the one that maximizes the combined value of such things as

bonuses, stock options, and share holdings. Notice that managers' and shareholders' incentives are only aligned in the last item, assuming that both the manager and shareholders sell their shares at the same time.

Many methods of EM are not illegal, and researchers generally believe that EM is utilized in varying degrees by many firms. Manager decisions regarding EM are motivated by capital market events such as initial public offerings (IPOs), secondary offerings, or management buyouts (Teoh, Wong and Rao, 1998b; Teoh, Welch and Wong, 1998a; Perry and Williams, 1994). EM decisions are also influenced by the use of options and firm value in managerial compensation packages and by the manager's desire to remain employed. These decisions in turn affect how managers inform shareholders about the firm's financial performance (Healy, 1985; Chaney and Lewis, 1995; Healy and Palepu, 2001; Aboody and Kasznik, 2000).

The EM literature has also found evidence that managers have earnings thresholds. Managers avoid earnings decreases, losses, and surprises (Degeorge, Patel and Zeckhauser, 1999; Burgstahler and Dichev, 1997).[6] There are not specific earnings targets in the model presented in section 1.3, but given that shareholders have an expectation of firm earnings, the value-maximizing manager will base announced earnings on earnings expectations and on the costs of EM.

Chaney and Lewis (1995) have a model similar to the one presented here. Managers have compensation tied to firm value, have private information on firm value, and can announce earnings away from true earnings. Chaney and Lewis do not allow dividends, but the authors recognize that dividends could be used as a cost of EM.

1.2.3 Background on the Sarbanes-Oxley Act of 2002

SOX significantly increased the reporting requirements of U.S. public firms. The stated motivation behind SOX was to improve the quality of information disclosed to investors. According to the title page of the act, SOX is "an act to

[6]An earnings decrease is not meeting the level of earnings in the prior year or the same quarter last year. An earnings surprise is the difference between reported earnings and the earnings predicted by Wall Street analysts, also called the consensus estimate.

protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes" (Congress, 2002).

To improve corporate disclosures, SOX implemented several changes. Key changes include a requirement for the manager to certify financial statements, a requirement that all audit committee members of the board be outsiders, and a requirement for firms to disclose details of their internal controls.[7] This paper will not test the separate features of SOX but will assume that overall the law decreased the information asymmetry between the manager and shareholders.[8]

A key component of SOX, Section 302, requires CEOs and CFOs to certify firm financial reports. This certification confirms that the financial reports do not "contain any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements made" and that the statements "fairly present in all material respects the financial condition and results of operations."[9] If the certification is proven to be incorrect, the officers are liable for a $5 million fine or 20 years in jail.[10]

While the language of the law only prohibits "untrue" statements and requires "fair" presentation, the severity of the punishments and the uncertainty of enforcement could make managers push for more conservative estimates in the publishing of financial reports. Securities and Exchange Commission (SEC) litigation is more likely when earnings are overstated (Watts, 2003). This asymmetry in enforcement and overall uncertainty could lead to a significant change in reported earnings behavior.

President George W. Bush signed SOX into law on July 30, 2002, in the midst of several corporate financial restatements and of several allegations of fraud. The uproar over these announcements could have also suppressed aggressive accounting. Furthermore, the dissolution of Arthur Anderson may have led the remaining auditors to be more assertive in their auditing work.

[7]SOX also mandated the creation of a quasi-government agency to oversee the audit industry, but on June 28, 2010, the Supreme Court ruled 5-4 that the this was unconstitutional. The ruling only affected that agency, the Public Company Accounting Oversight Board (PCAOB), and directed the PCAOB to be placed under the control of the SEC.

[8]See Coates (2007) for a more detailed discussion of the various components of SOX.

[9]Congress (2002) Sec. 302(a)(2) & (a)(3).

[10]Congress (2002) Sec. 906.

While the true cause is unknown, prior research and the tests reported in this paper suggest that there has been a change in reported earnings around the time SOX was passed. Earnings management behavior decreased. Cohen, Dey and Lys (2005) find an increase in the absolute value of discretionary accruals before SOX followed by a reversal of the trend after SOX. Lobo and Zhou (2006) focus on the manager's choice to lower earnings after the passage of SOX and find evidence that managers significantly decreased discretionary accruals in the post-SOX period, suggesting less inflation of earnings.

1.3 Model

1.3.1 Overview and Set-up

In this model there are three periods (0, 1, 2) and two players: the manager and the shareholders. All players are risk neutral.

The manager's objective is to maximize the value of his/her compensation package. The shareholders will be represented by the board. Because the board and the shareholders have the same objective of maximizing the value of the firm, they can be considered as the same player. The board helps monitor the manager by setting the firm dividend policy.

In period zero, the board and the manager establish a contract covering the next two periods. The contract specifies an allocation of n_M shares for the manager to be paid at the end of the first period. A portion of these shares ω will vest and will be sold after the announcement of first period earnings.[11] The balance of shares $(1-\omega)$ cannot be sold until the end of the second period when the firm is liquidated. All shares are assumed to retain dividend rights.[12] The

[11]Because all managers sell these shares, this event does not provide shareholders additional information. Managers tend to hold a large amount of equity ownership. While there are restrictions to when trades can be executed, managers are able to sell options, and they are generally free to sell shares. Bettis, Coles and Lemmon (2000) find that many firms have explicit blackout periods. Other firm level policies may include ownership requirements that mandate a minimum ownership level. Firms may also place restrictions on the size of transactions or have an approval process.

[12]Similar assumptions are adopted by Miller and Rock (1985) and Chaney and Lewis (1995). Managerial compensation is linear in the value of the firm with exogenous weights. The expected

terms of the manager's contract are public knowledge and cannot be renegotiated.

Once the contract is set, the board commits to a dividend policy. The policy designates a specific level of dividends.

The manager's contract also includes the assignment of an initial capital stock K_0 which determines the distribution of earnings in period one. Only the manager sees true earnings. The manager has the option of using firm cash flows for productive investment or for earnings management (EM), announcing earnings different from true earnings. Announcing higher earnings can potentially raise the value of the shares sold after the earnings announcement. However, the board has already established a dividend policy. Because dividends are paid out of firm cash flows, dividends limit the resources available for EM, limiting the amount of price manipulation that managers can exert on firm value. Figure 1.1 shows the order of events for this model.

Notice that equity-based compensation is the only source of compensation. The manager can only earn more by increasing firm value. While this form of compensation aligns the interests of the manager with shareholders, the agency problems are not entirely solved. The manager has more information about the true performance of firm operations and has control over the release of firm information. This information asymmetry could allow the manager to push the market value away from true value.[13]

It is important to note that manager compensation is not linked to an effort or ability type. All hired managers are equally capable in identifying new investments for the firm. While this model only uses shares for compensation, the incentives are similar to managers with option portfolios. Managers will want to

value of the early vesting shares can be considered as the labor market price the firm must pay for the manager. It is set equal to an outside option the manager has when signing the contract.

[13]This model is not designed to find the optimal contract for shareholder wealth maximization. Rather, the managerial compensation design is meant to mimic compensation structures seen in the data. Actual contracts tie pay to performance or to long-term results much less than optimal contract models suggest. Based on contract theory, the optimal contract for a risk-neutral agent with unobserved actions is to "sell the firm to the manager." Lucas and McDonald (1990) offer several explanations why contracts can limit but not eliminate problems associated with information asymmetry, including timing considerations. For a comprehensive survey of managerial compensation practices see Murphy (1999).

improve firm valuations around the time when options are exercisable.[14]

To simplify the analysis, this model does not allow for the possibility of share repurchases and does not allow for further financing from debt or equity. This model generally follows the "new view" modeling assumption that investment is done primarily out of retained earnings.[15] For purposes of modeling dividend behavior, this funding assumption follows the empirical evidence that dividend payers tend to be large, highly profitable, and established firms.

1.3.2 True Earnings, Earnings Announcements, and Firm Valuation

Shareholders develop expectations of firm earnings based on observing industry performance and knowing initial capital. Their unconditional expectation of earnings can be denoted as $f(K_{t-1})$, where K_{t-1} is the level of capital in period $t-1$ and $f(\cdot)$ is the production function of the firm.

The true earnings of the firm are only known by the manager. True earnings for period one and period two and the change in capital over time are

$$\begin{aligned} \pi_1 &= f(K_0) + \varepsilon_1 \\ \pi_2 &= f(K_1) \\ K_1 &= (1-\delta)K_0 + I_1, \end{aligned} \tag{1.1}$$

where $\delta \in [0, 1)$ is the depreciation rate of capital and ε_1 is a production shock seen only by the manager. When period two starts, only the manager knows the amount of additional investment in capital I_1. Only production from period one capital determines period two earnings. At the end of the second period, the firm is liquidated.

The production function has the following properties: $f \in C^\infty$; $f(K) \geq 0$; $f(0) = 0$; $f' > 0$; and $f'' < 0$. The production shock has two possible values: $\varepsilon_{1,H}$

[14] The use of options in compensation also changes the risk profile of the compensation package. This model has no incentive or mechanism for the manager to increase or decrease risk.

[15] The "new view" model is described in Auerbach (1979) and Bradford (1981).

(high) and $\varepsilon_{1,L}$ (low). The probability of a low shock is ρ.

After seeing true earnings in the first period, the manager must announce a level of earnings a_1. The announcement can be different than the true earnings, but there is a cost of lying. The relationship between announced earnings and true earnings for the two periods can be written as

$$\begin{aligned} a_1 &= \pi_1 + \nu \\ &= f(K_0) + \varepsilon_1 + \nu \\ a_2 &= \pi_2 - \nu \\ &= f(K_1) - \nu. \end{aligned}$$

Empirically, the manager has flexibility in controlling reported earnings through accounting rules and the timing of real transactions. As suggested by the formulas above, many of these practices just change how things are counted so the timing of earnings moves from one period to another. The inflation (deflation) ν in period one is reversed in period two. However, these efforts distract the manager from identifying optimal projects, creating real costs.

The suboptimal investment cost lowers the amount of investment which, in turn, lowers period two earnings.[16] The cost has the following properties: $c \in C^{\infty}$; $c(\nu) \geq 0$; $c(0) = 0$; $c(-x) = c(x)$; and $c'' > 0$. Notice that costs are symmetric. The same cost is incurred whether the manager is inflating or deflating earnings.[17] The cost of changing earnings also increases at an increasing rate.

The cash flow generated by the firm is assumed to be equal to the true earnings of the firm minus the taxes payable based on announced earnings. The cash-flow constraint is therefore

$$D_1 + I_1 + c(\nu) = f(K_0) + \varepsilon_1 - \tau a_1, \tag{1.2}$$

[16]The cost of EM can also be understood as using programs such as volume discounts to improve sales which undercut future sales or incurring extra fees to get additional capacity on line.

[17]In reality, it may be cheaper to deflate earnings because auditors may be less worried about "conservative" practices (Watts, 2003).

where D_1 is the dividend paid in the first period and τ is the corporate tax rate. Cash flow can be used for the dividend, for investment, or for covering the costs associated with inflating (or deflating) earnings.[18]

The model assumes that reported earnings are taxable. While this is not explicitly true for U.S. firms, this assumption avoids the potential problem that outsiders can use the information in GAAP accounting statements and tax statements to better understand the level of EM.[19]

Given the order of the decisions, investment is a residual. Period one capital can be calculated by combining (Eq. 1.1) and (Eq. 1.2).

$$K_1 = (1-\delta)K_0 + f(K_0) + \varepsilon_1 - \tau a_1 - c[a_1 - f(K_0) - \varepsilon_1] - D_1 \qquad (1.3)$$

If shareholders have perfect information about firm earnings, firm value in period zero is determined by the present value of the firm's expected payouts. To simplify the analysis, the differential tax treatment between dividends and capital gains are dropped. Let d be the discount factor based on the net-of-tax rate of return an investor can get on a similar risk asset. Under perfect information, the firm value in period zero equals

$$\begin{aligned} V_0^* &= E_0\Big[dD_1 + d^2 V_2^*\Big] \\ V_2^* &= E_0\Bigg[(1-\tau)f\Big((1-\delta)K_0 + f(K_0) + \varepsilon_1 - \tau a_1 - c(\nu) - D_1\Big) \\ &\quad + \tau\nu\Bigg]. \end{aligned} \qquad (1.4)$$

Equation (1.4) shows that even if shareholders were perfectly informed, managers

[18]Some methods of EM may speed up the receipt of cash. For instance volume sales near the end of the period. However, most of the earnings gains from volume sales come in the form of credit sales which provide no cash. EM methods such as changing inventory methods, writing off debt, or changing the composition of depreciated assets do not provide cash except to the extent that taxes change.

[19]See Erickson, Hanlon and Maydew (2004) for a more extensive discussion of tax earnings versus GAAP earnings. These authors study firms that restated earnings when original reports were higher. They find evidence that firms overstating earnings paid higher taxes. However, these cases are tied to allegations of fraud. The use of fraud is outside the scope of this paper.

will report earnings that differ from true earnings in order to minimize the present value of corporate tax payments. Let $a_1 = a^*_{1,\theta}$ be the optimal announcement strategy given a θ production shock (high or low) and perfect information. The first order condition is

$$\frac{\partial V_2^*}{\partial a_1} = -(1-\tau)f'(K_1)[\tau + c'] + \tau = 0.$$

Deflating earnings by one dollar will increase the value of the firm if the after-tax marginal product of τ more dollars of capital from tax savings covers both the marginal cost of EM from moving that dollar and the delayed tax payment. If there was no corporate tax and if shareholders have perfect information, there would be no reason to misreport. See the appendix (1.6) for details on the characteristics of the solution for the perfect information problem.

However, shareholders do not have perfect information about true earnings. They will use the announced earnings to update their beliefs about whether the firm received a low ($\hat{\rho}$) or high ($1-\hat{\rho}$) production shock. Firm value in period one following the earnings announcement is therefore

$$V_1(a_1) = D_1 + \hat{\rho}V_{1,L}(a_1) + (1-\hat{\rho})V_{1,H}(a_1),$$

where $V_{1,\theta}(a_1)$ is the firm value in period one given that the manager reports earnings of a_1 and has a θ-type production shock.

Shareholders can value each production shock type firm independently

$$\begin{aligned} V_{1,\theta'}(a_1) &= dV_{2,\theta'} \\ &= d\Big[(1-\tau) \\ &\quad *f\Big((1-\delta)K_0 + f(K_0) + \varepsilon_{1,\theta'} - \tau a_1 - c[a_1 - f(K_0) - \varepsilon_{1,\theta'}] - D_1\Big) \\ &\quad +\tau[a_1 - f(K_0) - \varepsilon_{1,\theta'}]\Big], \end{aligned}$$

where θ' is the production shock type that shareholders infer. Notice that earnings announcement depends on the production shock ε_1.

1.3.3 Managerial Incentives

The manager uses the earnings announcement to maximize the payoff from the compensation package. The optimal earnings announcement for a manager with θ-type production shock will depend on the type θ' shareholders infer. There will be two levels of earnings announcements in a separating equilibrium, and one announcement in a pooling equilibrium. Shareholders will value a firm assuming a low production shock for any off-the-equilibrium-path announcements. The manager's maximization formula is

$$U_{1,\theta}(a_1, \theta') \;=\; n_M D_1 + n_M\Big(\omega V_{1,\theta'}(a_1) + d(1-\omega)V_{2,\theta}(a_1)\Big).$$

Perfect Information

Define $\hat{a}_{1,\theta}$ as a manager's announcement strategy. If shareholders know the production shock ε_1 perfectly, every manager will have an announcement strategy that is optimal for tax purposes $\hat{a}_{1,\theta} = a^*_{1,\theta}$. There is no incentive to exaggerate earnings further. Each manager's compensation will depend on the production shock type.

Imperfect Information

If shareholders do not know the value of the production shock, managers will want to use the first-best announcement strategy.[20]

Low Production Shock Manager

Under a separating equilibrium, managers with a low production shock know that shareholders will correctly infer from the earnings announcement that there was a low production shock. These managers will therefore optimize firm value conditional on a low shock.

$$U_{1,L}(\hat{a}_{1,L}, L) \;\geq\; U_{1,L}(a_{1,L}, L).$$

The best strategy in this case is to choose the tax optimizing announcement $\hat{a}_{1,L} = a^*_{1,L}$.

A separating equilibrium is supported only if a manager facing a low pro-

[20] Attention focuses on stable equilibria by restricting out-of-equilibrium beliefs which eliminate many unintuitive equilibria. This solution strategy is discussed by Cho and Kreps (1987).

duction shock does not do better by mimicking the announcement made by a high-shock manager. The low-shock manager will not imitate as long as

$$U_{1,L}(a^*_{1,L}, L) \;\geq\; U_{1,L}(\hat{a}_{1,H}, H). \tag{1.5}$$

High Production Shock Manager

Because $U_{1,L}(\hat{a}_{1,H}, H)$ is a declining function in $\hat{a}_{1,H}$, this incentive constraint (Eq. 1.5) defines the minimum value for the high-shock manager's announcement, denoted $a^{min}_{1,H}$.

Ignoring this incentive constraint, a manager with a high-type shock can choose the tax optimizing announcement and not worry about the low type mimicking. Any further exaggeration of earnings would lower investment, lowering firm value.

$$\hat{a}_{1,H} \;=\; a^*_{1,H}$$

However, to support the equilibrium requires that

$$U_{1,H}(a^{min}_{1,H}, H) \;\geq\; U_{1,H}(a^*_{1,H}, L).$$

The announcement by a high-shock manager then satisfies

$$\hat{a}_{1,H} \;=\; \max\Big(U_{1,H}(a^{min}_{1,H}, H),\; U_{1,H}(a^*_{1,H}, L)\Big).$$

There are also pooling equilibria if the incentive constraints do not hold. A manager with a high-type shock will make the tax optimizing earnings announcement, and that announcement can be mimicked by a manager with a low-type shock. See the appendix (1.6) for more details on the solution of optimal announcement policy.

1.3.4 Optimal Dividend Policy

Because the board is trying to maximize firm value, the dividend policy is designed to optimize ex ante value. The optimal dividend depends on the value of the firm in the expected equilibrium: separating or pooling. The dividend is set to help minimize taxes and minimize exaggerated earnings announcements.

Complete Information

Optimal investment depends on the marginal product of firm capital. Under perfect information (Eq. 1.4), the first order condition for the board's maximization problem becomes

$$\begin{aligned} \frac{\partial V_0^*}{\partial D_1} &= d - d^2(1-\tau)E_0[f'(K_1)] = 0 \\ 1 &= d(1-\tau)E_0[f'(K_1)]. \end{aligned}$$

Dividends will be used to pull cash out of the firm if the discounted after-tax marginal return is less than one.

Let r equal the after-tax rate of return available for a similar risk asset. Then the board will use dividends to manage firm capital such that

$$E_0[f'(K_1)] \geq 1 + r.$$

This equation will hold as an inequality when all earnings are left in the firm to be invested in capital. This relationship is well established in the dividend model literature.[21] Given the cash flow constraint, the only role of the dividend is to determine the level of new investment.

Incomplete Information

Because the dividend policy is announced before the earnings announcement, the board will set policy using the initial probabilities of the production shock. To optimize dividends, the board will recognize how the dividend affects the nature of the equilibrium.

The effect of dividends on firm valuation has two channels. There is direct

[21] See Gordon and Dietz (2006) and Chetty and Saez (2007) for further discussion.

effect, and the effect through a change in earnings announcement.

$$\begin{aligned} V_1 &= D_1 + \rho V_{1,L}(a_{1,L}(D_1), D_1) + (1-\rho)V_{1,H}(a_{1,H}(D_1), D_1) \\ \frac{\partial V_1}{\partial D_1} &= 1 + \rho\Big(\frac{\partial V_{1,L}}{\partial a_{1,L}}\frac{\partial a_{1,L}}{\partial D_1} + \frac{\partial V_{1,L}}{\partial D_1}\Big) + (1-\rho)\Big(\frac{\partial V_{1,H}}{\partial a_{1,H}}\frac{\partial a_{1,H}}{\partial D_1} + \frac{\partial V_{1,H}}{\partial D_1}\Big) \quad (1.6) \\ &= 0 \end{aligned}$$

If there is a pooling equilibrium, the board will simply use dividends to set $E_0[f'(K_1)] \geq 1 + r$, where there is a strict inequality when $D_1 = 0$. Because the board maximizes ex ante firm value, the ex post investment will be too high if the production shock is high, and the ex post investment will be too low if the production shock is low.

If a separating equilibrium exists such that both manager types announce the tax optimizing level of earnings, the board will again choose the dividend so that $E_0[f'(K_1)] \geq 1 + r$, where there is a strict inequality when $D_1 = 0$. Notice that the first term in each set of parenthesis (Eq. 1.6) equals zero due to the envelope rule.

If a separating equilibrium is supported by high types announcing exaggerated earnings $a_{1,H}^{min}$, earnings higher than the optimal for tax purposes, the value of the firm is not optimized $\Big(\frac{\partial V_{1,H}}{\partial a_{1,H}^{min}}\frac{\partial a_{1,H}^{min}}{\partial D_1} > 0\Big)$. In these cases, dividends have an added benefit on firm value. Dividends lower announcements, lowering EM costs.

$$\begin{aligned} U_{1,L}(a_{1,L}^*, L) &\equiv U_{1,L}(a_{1,H}^{min}, H) \\ \frac{\partial a_{1,H}^{min}}{\partial D_1} &= \frac{\frac{\partial U_{1,L}(a_{1,L}^*, L)}{\partial D_1} - \frac{\partial U_{1,L}(a_{1,H}^{min}, H)}{\partial D_1}}{\frac{U_{1,L}(a_{1,H}^{min}, H)}{\partial a_{1,H}^{min}}} < 0 \end{aligned}$$

Proof of this relationship is in the appendix (1.6). Because low types have a higher marginal product of capital, mimicking low types face higher costs to exaggerating earnings and are harmed more by dividends. A higher dividend causes the incentive constraint to hold at a lower value for $a_{1,H}^{min}$. Dividends allow high types to make lower earnings announcements and still separate from low types. Less value is lost because the self-selection constraint becomes less binding.

1.3.5 Sudden Decrease in the Size of Information Asymmetry

Now assume there is a large decrease in the amount of information asymmetry between the manager and shareholders. Auditors could have become instantaneously more vigilant or law changes could make earnings management (EM) more costly. The Sarbanes-Oxley Act of 2002 (SOX) and the overall change in the corporate environment in the early 2000s have aspects of these two pressures. These forces would cause the EM cost function to increase to $\tilde{c}$ such that: $\tilde{c}(x) \geq c(x)$, $\forall\, x$; $\tilde{c} \in C^{\infty}$; $\tilde{c}(0) = 0$; $\tilde{c}(-x) = \tilde{c}(x)$; and $\tilde{c}'' > 0$.

Under this new information regime, EM is more expensive. The new regulations force more reporting and make it harder to change the timing of earnings. As a result, managers report earnings closer to the truth.

The information shock affects all firms, but managers at dividend paying firms were already being constrained by board dividend policy. As shown in the last subsection (1.3.4), a manager at a non-dividend paying firm has more freedom to manage earnings. As a result, the information regime change is more likely to constrain the earnings announcement of managers at non-dividend paying firms than dividend paying firms.

1.3.6 Predictions

Based on the model described above, the following relationships are predicted. These relationships will be tested in the next section (1.4).

P1: If dividends help limit the use of earnings management (EM), managers at dividend paying firms will show less EM behavior than those at non-dividend paying firms.

P2: If the Sarbanes-Oxley Act (SOX) or the overall change in the accounting environment increased the amount of financial disclosure in company financial statements, the information asymmetry between shareholders and the manager should have decreased. Given that EM is a proxy for the size of the information gap, the amount of EM should have decreased following SOX.

P3: Given that managers at dividend paying firms are more constrained in their use of EM, the drop in EM will be less for dividend paying firms than non-dividend paying firms following the passage of SOX.

1.4 Testing for Earnings Management

1.4.1 Data

The data for all of the analyses in this paper come from the Compustat North America Fundamentals Annual database and the Center for Research in Security Prices (CRSP) database available through Wharton Research Data Services. The Compustat database contains market and financial data on public U.S. firms. The CRSP database has daily stock price and dividend data for U.S. firms. Both databases are primary data sources for archival research in the finance and accounting literature. Only data on the public firms trading on the NYSE, AMEX, or NASDAQ are used for this paper. In statistical terms, the general data set is an unbalanced panel because firms enter and leave the data set as firms get listed on these exchanges, delist, go bankrupt, or are acquired. I also create balanced panel data sets from the general sample for some robustness tests.[22]

Following past research, the samples exclude financial companies and utilities because these industries have regulations on capital. These regulations influence earnings motives and the ability to return earnings to shareholders through dividends (Chetty and Saez, 2005).[23]

1.4.2 Estimates of Discretionary Accruals

An extensive amount of accounting research has focused on ways to model or detect earnings management (EM). The general type of model used in this paper is the expected accrual model. Because modeling techniques can only proxy for

[22]See the data appendix (1.7) for more details on the data sets and on the specific Compustat and CRSP variables used.

[23]The specific SIC codes excluded are 4900-4949 and 6000-6999. This matches Fama and French (2001); Chetty and Saez (2005); and DeAngelo, DeAngelo and Stulz (2006).

actual EM, using these methods is a test of both the detection model and the use of EM.

Despite these limitations, expected accrual models are widely adopted by researchers.[24] Because there is no consensus on the best model to use, four primary methods of proxying for EM are used in this paper.

While managers can influence the timing of earnings, if reported earnings are not realized, later financial reports must show reversals. In other words, there is no fraud-free way of creating earnings from nothing, and financial reports can provide information on whether a manager appears to be inflating or deflating earnings.

The obvious suspects for manipulation are balance sheet items which involve estimation but also immediately affect earnings. These accrual accounts include items such as accounts receivable, inventory, accounts payable, and depreciation. The seminal work by Jones (1991) showed a method to estimate the amount of manipulation by comparing a firm's reported accruals to expected accruals. Several papers since then have improved upon this method. Four primary models are used in the tests that follow: three models are variations of the Jones model and one model is a performance matching model suggested by Kothari, Leone and Wasley (2005).

The overall goal of these expected accrual models is to obtain a measure of discretionary accruals (DA), accruals that are more easily controlled by managers. There will always be some amount of accruals. The important question for measuring EM is to find out which accruals can be manipulated by managers. Any change in total accruals (TA) comes from changes in DA and normal accruals (NA), accruals that come about through standard firm operations and that are less open to control.

$$\Delta TA_t = (DA_t - DA_{t-1}) + (NA_t - NA_{t-1})$$

Jones modeled expected accruals based on observable firm characteristics.

[24] See Dechow and Dichev (2002); Kothari, Leone and Wasley (2005) and Cohen, Dey and Lys (2005) for more discussion.

The first model in this paper will follow her basic technique except a constant is included in the regression to help reduce heteroskedasticity not handled by deflating the variables with lagged assets and to help control for problems related to an omitted scale variable (Kothari, Leone and Wasley, 2005; Brown, Lo and Lys, 1999). The primary regression is

$$\frac{TA_{i,t}}{A_{i,t-1}(6)} = \alpha_0 + \alpha_1\Big(\frac{1}{A_{i,t-1}(6)}\Big) + \beta_1\Big(\frac{\Delta REV_{i,t}(12)}{A_{i,t-1}(6)}\Big) + \beta_2\Big(\frac{PPE_{i,t}(7)}{A_{i,t-1}(6)}\Big) + \varepsilon_{i,t}. \quad (1.7)$$

The parenthetical numbers in the formulas for this section are the Compustat annual data numbers. The level of total accruals required by firm i depends on firm size measured by lagged total assets (A), on the change in firm revenues (ΔREV), and on the firm's fixed capital. Fixed capital is measured by property, plant, and equipment (PPE), and everything is scaled by lagged total assets. Regressions are run at the two-digit SIC level for each year. Each year-industry regression must have at least ten firm-year observations to be included in this analysis.[25]

Total accruals for all the models reported in this paper are defined following Kothari, Leone and Wasley (2005) (KLW).[26]

$$\begin{aligned} TA \;=\; & [\Delta\text{Current Assets}(4) - \Delta\text{Cash}(1)] \\ & -[\Delta\text{Current Liabilities}(5) - \Delta\text{Current Maturities of LT Debt}(34)] \\ & -\text{Depreciation and Amortization Expense}(14) \end{aligned}$$

DA are calculated by taking the difference between reported accruals and expected accruals.

$$\begin{aligned} \hat{DA}_{i,t} &= \hat{\varepsilon}_{i,t} \\ &= \frac{TA_{i,t}}{A_{i,t-1}} - \hat{\alpha}_0 - \hat{\alpha}_1\Big(\frac{1}{A_{i,t-1}}\Big) - \hat{\beta}_1\Big(\frac{\Delta REV_{i,t}}{A_{i,t-1}}\Big) - \hat{\beta}_2\Big(\frac{PPE_{i,t}}{A_{i,t-1}}\Big) \end{aligned}$$

[25] Due to this constraint, analysis is limited to only firms that have a fiscal year end date of December 31.

[26] Jones does not include current maturities of long-term debt in her calculation (see page 213, Table 4 for formula). Using Jones' definition for the first model does not qualitatively affect the results reported in this paper.

Positive DA are evidence of *inflating* earnings. *Negative* DA are evidence of *deflating* earnings.

Notice that the residuals are based on annual cross-sectional industry regressions. The dividend model in this paper does not have an event-specific test. Dividend and non-dividend paying firms will have differing levels of EM depending on the marginal product of firm capital and the production shock. Given a hypothesis about managing earnings for a specific event, some researchers use an alternative strategy of using a pre-event estimation period to model accruals.

The Sarbanes-Oxley Act of 2002 (SOX) is a testable event, but SOX also changed the disclosure rules. Using a pre-event estimation technique assumes a non-time varying relationship between normal accruals and firm characteristics. It is likely that SOX changed these relationships, making the results from a pre-event estimation strategy biased.

The second Jones model ("Modified Jones") works the same except the total accruals regression formula (Eq. 1.7) has a change in the revenue term to become

$$\begin{aligned}\frac{TA_{i,t}}{A_{i,t-1}(6)} &= \alpha_0 + \alpha_1\Big(\frac{1}{A_{i,t-1}(6)}\Big) + \beta_1\Big(\frac{\Delta REV_{i,t}(12) - \Delta REC_{i,t}(2)}{A_{i,t-1}(6)}\Big) \\ &\quad + \beta_2\Big(\frac{PPE_{i,t}(7)}{A_{i,t-1}(6)}\Big) + \varepsilon_{i,t},\end{aligned}$$

where REC is accounts receivable. By taking out the change in receivables, this form of the model assumes that changes in credit sales are discretionary. This type of model is better suited to detect EM achieved through methods such as volume sales near the end of a reporting period.[27]

The third Jones model ("Jones with ROA") is another variation of the total accruals regression formula. It includes return on assets (ROA) on the right hand

[27] This EM tactic is also known as "channel stuffing."

side.[28]

$$\frac{TA_{i,t}}{A_{i,t-1}(6)} = \alpha_0 + \alpha_1\Big(\frac{1}{A_{i,t-1}(6)}\Big) + \beta_1\Big(\frac{\Delta REV_{i,t}(12)}{A_{i,t-1}(6)}\Big) + \beta_2\Big(\frac{PPE_{i,t}(7)}{A_{i,t-1}(6)}\Big) + \beta_3 ROA_{i,t} + \varepsilon_{i,t}.$$

KLW argue that including ROA helps improve specifications where there are periods of abnormal returns. However, KLW also point out that there are many reasons to expect that ROA does not affect accruals linearly. According to their tests, a model matching on performance (current year ROA) performs the best.

This performance matching model ("Performance KLW") is the fourth DA measure used in this paper. The Performance KLW DA for firm i in year t is defined as the Jones DA for firm i in year t minus the Jones DA for the firm with the closest ROA in the same 2-digit SIC code and the same year.[29] This proxy of EM defines DA relative to a firm's closest industry peer by ROA.

In summary, the actual discretionary accruals that managers control are not seen. Expected accrual models proxy for DA by calculating the difference between reported accruals and expected accruals. Expected accruals are estimated from firm characteristics such as size, sales growth, performance, and industry. The size and direction of the estimated DA provide evidence for the size and direction of earnings management. Positive (negative) DA indicate inflating (deflating) earnings.

1.4.3 Initial Results of Discretionary Accruals (DA) Testing

Because DA is positive or negative depending on whether the manager is inflating or deflating earnings, evidence of earnings management will be proxied by the absolute value of DA. Figure 1.2 shows how the median absolute value of DA has changed between 1980 and 2008 using the four models and variations of those models described in section 1.4.2. Across all models, non-dividend payers

[28] This model is also tested using the Modified Jones variation "Modified Jones with ROA."
[29] This model is also tested using the Modified Jones variation "Performance KLW Modified."

consistently have a higher level of absolute DA. Non-dividend payers show more evidence of inflating or deflating earnings than dividend payers. This remains the case as the composition of firms in the sample changes. The bottom panel shows the composition of observations by payout policy. As prior research has documented, dividend payers are the minority.[30]

Figure 1.3 focuses on the time period around the passage of the Sarbanes-Oxley Act (SOX). The vertical line separates the pre-SOX and post-SOX periods. Recall that SOX was passed in July 2002. Given that all the firms in this sample have a December fiscal year end, December 2002 was the first financial report under the new law. Not all of the aspects of SOX were phased in by this point, but the officers did have to certify their financial reports.

For each model, dividend payers have roughly the same median absolute value of DA throughout the period, but there is a drop in the same measure for non-dividend payers between the pre- and post-SOX periods. The graphs suggest that the peak of EM behavior was around 2000, well before SOX. This early change in behavior may have been in response to a changing environment. The stock market had peaked, and the Arthur Andersen-Enron case was unfolding. According to all of the models, absolute DA fell both in 2001 and in 2002. These results are consistent with other research on DA and SOX. Both Cohen, Dey and Lys (2005) and Lobo and Zhou (2006) find evidence of lower DA after SOX.

Overall, this initial DA evidence supports the three predictions developed from the theoretical model. Dividend payers use less EM than non-dividend payers (P1). Firms use less EM after SOX (P2). SOX changed the behavior of non-dividend payers more than dividend payers (P3).

[30]Due to the required data to run the DA regressions, many firm-year observations are dropped from the original database. These excluded firms are generally small and younger firms that are more likely to be non-dividend payers. The exclusions create a non-representative sample of the market, including a relatively high composition of dividend payers. Given the prediction of the model that non-dividend payers are more likely to use EM, results from tests using a sample composed of more established firms are likely to be conservative.

1.4.4 Regressions with Discretionary Accruals (DA)

To further examine a possible behavior change following SOX and the relationship between dividends and EM, this section reports regressions of DA on payout policy and firm characteristics.

Table 1.1 shows the summary statistics of the data used in the discretionary accrual models and for the regressions in this section. The time window is narrowed to the four annual reports before and after SOX (data from December 1998 to December 2005). Table 1.2 shows the DA measures broken down for all firms, for non-dividend payers, and for dividend payers. Notice that the mean discretionary accrual for all firms is zero. This is by design because the discretionary accrual is the regression residual.

As expected based on the prior graphs, the mean and median of absolute DA for non-dividend payers are higher than those of dividend payers. The standard deviations are also higher. The mean/standard deviation ratio is shown in the last column of Table 1.2. According to all models, dividend payers have lower relative variation in the absolute level of DA (mean/standard deviation is higher).[31]

The baseline regression is constructed to test the three predictions.

$$\begin{aligned} abs(DA_{i,t}) &= \alpha_i + \text{ Dividend payer}_{i,t} + \text{ SOX}_t * \text{Dividend payer}_{i,t} \\ &\quad + \text{year dummies} \end{aligned} \tag{1.8}$$

Dividend payer$_{i,t}$ and SOX$_t$ are dummy variables. Dividend payer$_{i,t}$ equals one if the firm i paid a dividend in year t and equals zero otherwise. SOX$_t$ equals one for all periods after the passage of SOX (December 2002 is the first year.). The baseline model specification (Eq. 1.8) also includes firm fixed effects and year dummies.

According to the theoretical model, dividend payers use less EM. Because absolute DA is a proxy for EM, dividend payers should have lower absolute DA (P1). The expected sign of the coefficient on Dividend payer$_{i,t}$ is negative. The

[31]For space considerations, the detailed results of the Modified Jones with ROA and Performance KLW Modified are not reported in this section. Those results are qualitatively similar to the tests reported.

theoretical model shows that managers should use less EM after SOX due to its higher cost. Absolute DA should be lower following SOX (P2). Therefore, the coefficients for the year dummies should be lower for years following SOX than for those pre-SOX. Given that dividend payers are already constrained by the dividend, SOX should not affect DA behavior as much as for non-dividend payers (P3). The interacted term should counteract the SOX term. The expected sign on the interacted term is positive.

Table 1.3 reports the results of the baseline regression. The successive columns separately test the four primary absolute DA measures. The signs of all the coefficients are as expected and are significant at the 0.1% level. Dividend payers have absolute DA 2-3% lower than non-dividend payers. The difference between the 2001 and 2002 dummy variables is 2% across all models, and tests of whether the coefficients are equal are rejected. Also notice that absolute DA fell by roughly 3% between 2000 and 2001. However, dividend payers did not experience the same drop. As expected, the coefficient on the interacted term offsets the SOX decrease. In fact, the coefficient ranges between 4-5%, more than offsetting the SOX drop. This excess may be due to large drop in absolute DA between 2000 and 2001.

Recall that the DA measures are scaled by assets. The units are DA as a share of assets. The regression results in Table 1.3 show that non-dividend payers shrank the composition of their assets consisting of DA by 2% after SOX. Dividend payers have 2-3% less of their assets consisting of DA.

The theoretical model also showed that the amount of earnings management depends on the marginal product of firm capital. Dividend paying firms can effectively choose the marginal product of capital through dividend policy. The marginal product of capital is therefore more important for non-dividend payers and can be proxied by firm characteristics such as size, life cycle, and profitability. The next set of specifications use the four firm characteristic variables Fama and

French (2001) included in their study on dividend payers.[32]

$$\begin{aligned} abs(DA_{i,t}) &= \alpha_i + \text{ Dividend payer}_{i,t} + \text{ SOX}_t * \text{Dividend payer}_{i,t} \\ &\quad + \text{NYSE market capitalization}_{i,t} + \frac{\text{Value}_{i,t}}{\text{Assets}_{i,t-1}} \\ &\quad + \text{Asset growth}_{i,t} + \frac{\text{Earnings}_{i,t}}{\text{Assets}_{i,t-1}} \\ &\quad + \text{year dummies} \end{aligned} \tag{1.9}$$

NYSE market capitalization is a proxy of size. It is equal to the percentage of NYSE firms that have the same or a lower market capitalization. The Value/Lagged assets measure, also known as the market-to-book ratio, is similar to Tobin's q. Young firms that are expected to grow and become more profitable in the future are highly valued by the market. These firms tend to trade at a higher ratio than older firms. It is a proxy for life cycle and size. Asset growth is another proxy for life cycle under the assumption that younger firms grow faster than older firms. Earnings/Lagged assets is a profitability measure and provides another measure for the opportunity cost of capital.[33]

The expected sign on NYSE market capitalization is positive. Larger firms tend to be more mature and have a lower opportunity cost of earnings management. It may also be easier for large firms to move earnings. The signs on the life-cycle variables of market-to-book and asset growth are expected to be negative. Younger firms should have a high marginal product of capital. The expected sign of the profitability measure is also negative. Profitable firms have a higher opportunity cost, making EM more expensive for the manager.

Table 1.4 reports the regression results of this new specification with firm characteristics. The coefficients on the life cycle variables are not significantly different from zero. With a correlation of 0.5007, these variables are positively

[32]Because the theoretical model did not have any causal predictions between EM and dividends, the regression test can be reversed to regress the likelihood of being a dividend payer on absolute DA and firm characteristics. For instance the logit regressions run by Fama and French (2001) could be replicated and include absolute DA. This type of test shows the same qualitative results. More absolute DA lowers the likelihood of being a dividend payer.

[33]Variable definitions are in the data appendix (1.7).

linked but control for slightly different characteristics. The size and profitability measures are significant. As expected, more profitable firms have lower absolute DA, and larger firms have higher absolute DA. Profitability is also negatively correlated with both life cycle variables.

The signs on the baseline coefficients remain as expected and are statistically significant. However, the magnitudes fall. According to this specification, dividend payers have absolute DA 1-2% lower than non-dividend payers. Absolute DA fell by 1% in 2002 when SOX was passed and by 2-3% in 2001. Again, tests that the coefficient on 2001 equals that on 2002 are rejected. The coefficient on the interacted term remains positive, significant, and larger than the 2001-2002 drop in absolute DA. Dividend payers did not experience the same drop in absolute DA following SOX as non-dividend payers.

Given that EM is by definition moving earnings across time periods, a firm using EM this period likely used EM last period. Recall that in the theoretical model any EM was reversed in period two. This structure suggests that lagged DA should be included in the specification to further control for firm level behavior.

Adding lagged absolute DA introduces serial correlation to a regression using fixed effects. To control for this an Arellano-Bond estimator regression is used. This is a first difference regression which uses the prior lags of absolute DA as instruments. The results of the new specification that includes lagged DA are reported in Table 1.5.

The magnitudes of the coefficients are not comparable to the prior tables because the variables are first differences. Therefore, the focus is on the signs of the coefficients. As expected, the coefficient on lagged absolute DA is positive, but it is not statistically different from zero. The point estimate suggests that an increase in EM this year is positively related to an increase last year.

The signs on the firm characteristic coefficients are generally as expected except the asset growth coefficient is positive and significant at the 5% level for all of the models. Managers at rapidly growing firms should generally be more cash strapped and not want to use EM. A positive coefficient does not support this. This may indicate that the DA measure is biased upward for rapidly growing

firms. The coefficients on Value/Lagged assets and on profitability are negative as expected but not significant. The coefficient on size remains positive but is not statistically significant.

The signs on the baseline coefficients remain as expected, and there is still a statistically significant drop in absolute DA in between 2001 and 2002. The coefficient on the interacted term continues to counteract this drop. Dividend payers changed behavior less than than non-dividend payers. However, the significance of the coefficient on dividend payer goes away. Dividend policy provides less explanatory power controlling for past EM behavior.

All of the model specifications supported the three predictions. Because the Table 1.4 results have have coefficients that are the easiest to interpret, these results are used to summarize the findings. First, dividend payers use less EM with absolute DA of 1-2% lower than non-dividend payers. Second, EM behavior drops following SOX with a drop in absolute DA of 1%, and finally, dividend payers changed behavior less than non-dividend payers. The coefficient on the interaction of SOX_t and $\text{Dividend payer}_{i,t}$ offsets the difference between the coefficients on the 2001 and 2002 year dummies.

As suggested by the graphs in Figure 1.3 and the regression tests, firms began lowering absolute DA in 2001. This early change in behavior may have been a result of a change in the corporate environment. Managers were using less aggressive accounting because of such things as the Arthur Andersen-Enron scandal. Were these early adopters also non-dividend payers? As a robustness check, the SOX cut-off is switched to 2001, and the tests are rerun. Tables 1.6 and 1.7 show these results. Table 1.6 is the specification with firm characteristics. Table 1.7 is the model specification with firm characteristics and lagged absolute DA.

In Table 1.6, the signs on all the coefficients are as expected, and overall, evidence supporting the three predictions is more clear. Dividend payers have absolute DA 2-3% lower than non-dividend payers. Absolute DA fell by 3-4% between 2000 and 2001, but dividend payers did not experience this drop. Tests of whether the coefficient on the interacted variable equals the difference between

the coefficients on 2000 and 2001 cannot be rejected. The results suggest that dividend payers did not change their earnings announcement behavior.

The results reported in Table 1.7 using lagged absolute DA and using 2001 as the cut-off are similar to those using 2002 (Table 1.5). The coefficient on lagged absolute DA is positive but remains statistically insignificant. The significance of being a dividend payer still goes away. However, as in Table 1.6, the coefficient on the interacted term equals the difference between the coefficients on the 2000 and 2001 year dummies, the change in absolute DA behavior between 2000 and 2001. The hypothesis that they add to zero cannot be rejected for all models.

As another robustness check, balanced panel data sets created from the 1998-2005 general sample. For space considerations only the results using a 2000-2003 balanced panel are reported. The SOX_t dummy variable follows the original definition, taking the value of one beginning in 2002. Table 1.8 shows the results of the regression with firm characteristics, and Table 1.9 shows the results when lagged absolute DA is included.

The same general results hold. In Table 1.8, dividend payers still have lower absolute DA but the significance falls. The results also continue to support the predictions that SOX changed the behavior of non-dividend payers more than dividend payers. The sign of the coefficient on the interacted variable is positive and significant. For all models, the hypothesis that the coefficient on the 2001 year dummy equals that of the 2002 year dummy are rejected at the 1% level. Absolute DA falls by 1% between 2001 and 2002.

1.5 Concluding Remarks

The challenge of optimizing manager behavior for shareholder value has two primary parts. First, the manager has different incentives than shareholders, agency problems. Second, the manager knows much more about the financial viability of the firm than shareholders, information asymmetry. Both of these elements need to be incorporated into dividend models to understand the dynamics of payout selection. Conflicting incentives explain manager behavior given compensa-

tion packages and ownership structure, but incentives alone do not explain payout dynamics following tougher reporting standards or explain how shareholders might learn more about the extent of agency problems.

The model presented in this paper was designed to explore the relationships between dividend policy decisions, information asymmetry, and managerial incentives. The model shows and the tests confirm that earnings management (EM) behavior is different depending on payout policy. According to the discretionary accruals (DA) tests, dividend payers did not appear to change their reporting behavior as much as non-dividend payers after the passage of the Sarbanes-Oxley Act (SOX). Furthermore, dividend payers consistently have lower absolute DA. This is evidence that dividend payers inflate and deflate earnings less than non-dividend payers.

The model presented here posits that dividends help limit the discretion of management, leading to more truthful earnings reports. The dividend commitment is possible through a board that is perfectly aligned with shareholders. Further work is needed to evaluate how board composition relates to monitoring levels and payout policy.[34] Overall, the findings presented here suggest that dividend policies are effective at limiting information asymmetries.

1.6 Model Details

Maximizing firm value through earnings announcement policy

The first order conditions for the situation of perfect information were given above.

[34]Kay and Vojtech (2011) examine this relationship by examining the relationship between board composition and other monitoring devices such as dividends, CEO ownership, incentive pay, and leverage. They find some evidence that dividends, CEO ownership, and leverage are substitutes for the monitoring provided by independent board members.

Now the second order conditions are tested.

$$\begin{aligned}
\frac{\partial^2 V_{2,\theta}}{\partial^2 a_1} &= (1-\tau)f''[\tau + c']^2 - (1-\tau)f'c'' \\
&\quad \text{Since } f'' < 0,\ f' > 0, \text{ and } c'' > 0 \\
\frac{\partial^2 V_{2,\theta}}{\partial^2 a_1} &< 0 \\
\frac{\partial^2 V_{2,\theta}}{\partial a_1 \partial \varepsilon_1} &= -(1-\tau)f''[\tau + c'][1 + c'] + (1-\tau)f'c'' > 0 \\
\frac{\partial a_1}{\partial \varepsilon_1} &= \frac{f''[\tau + c'][1 + c'] - f'c''}{f''[\tau + c']^2 - f'c''}
\end{aligned}$$

From the first order condition

$$\begin{aligned}
\tau + c' &= \frac{\tau}{(1-\tau)f'} > 0 \\
&\Rightarrow\ 1 + c' > \tau + c' > 0 \\
&\Rightarrow\ \frac{\partial a_1}{\partial \varepsilon_1} > 0
\end{aligned}$$

Conditions for a signaling equilibrium for announced earnings

To check the necessary conditions for announcement strategies that maximize compensation, test the first order conditions and cross partials. The subscripts on utility denote partial derivatives.

$$\begin{aligned}
U_{V_1} &= n_M \omega > 0 \\
U_{V_1 \varepsilon_1} &= 0 \\
U_{a_1} &= \omega \frac{\partial V_{1,\theta'}}{\partial a_1} + d(1-\omega)\frac{\partial V_{2,\theta}}{\partial a_1} = 0 \\
U_{a_1 \varepsilon_1} &= \omega \frac{\partial^2 V_{1,\theta'}}{\partial a_1 \partial \varepsilon_1} + d(1-\omega)\frac{\partial^2 V_{2,\theta}}{\partial a_1 \partial \varepsilon_1} \\
\text{Because} &\quad \frac{\partial^2 V_{1,\theta'}}{\partial a_1 \partial \varepsilon_1} > 0, \quad \frac{\partial^2 V_{2,\theta}}{\partial a_1 \partial \varepsilon_1} > 0 \\
&\Rightarrow\ U_{a_1 \varepsilon_1} > 0
\end{aligned}$$

To satisfy the single crossing condition assumption, it must be that $U_{a_1\varepsilon_1} U_{V_1} >$

$U_{V_1\varepsilon_1}U_{a_1}$.

$$U_{a_1\varepsilon_1}U_{V_1} - U_{V_1\varepsilon_1}U_{a_1} \quad = \quad \Big[\omega\frac{\partial^2 V_{1,\theta'}}{\partial a_1 \partial \varepsilon_1} + d(1-\omega)\frac{\partial^2 V_{2,\theta}}{\partial a_1 \partial \varepsilon_1}\Big] n_M \omega - 0 > 0$$

The second order condition must also be tested.

$$\begin{aligned} U_{a_1a_1} \quad &= \quad \omega\frac{\partial^2 V_{1,\theta'}}{\partial^2 a_1} + d(1-\omega)\frac{\partial^2 V_{2,\theta}}{\partial^2 a_1} \\ \text{Because} \qquad & \frac{\partial^2 V_{1,\theta'}}{\partial^2 a_1} < 0, \quad \frac{\partial^2 V_{2,\theta}}{\partial^2 a_1} < 0 \\ \Rightarrow \quad & U_{a_1a_1} < 0 \end{aligned}$$

Proof that a higher dividend lowers the earnings announcement by an exaggerating high type

To simplify notation, let

$$U_{1,L}\Big(a^*_{1,L}(D_1), L, D_1\Big) = U_{1,L}(L) \text{ and } U_{1,L}\Big(a^{min}_{1,H}(D_1), H, D_1\Big) = U_{1,L}(H).$$

To check how announcements will change, differentiate the incentive constraint with respect to a change in the dividend. Denote period one capital as K_{Hmin} if the firm received a high shock and the manager needed to exaggerate earnings, as K_{Lmin} if the firm received a low shock and the manager is mimicking, and as K_{L*} if the firm received a low shock and the manager makes the announcement optimal

for taxes.

$$
\begin{aligned}
U_{1,L}(L) &\equiv U_{1,L}(H) \\
\frac{\partial U_{1,L}(L)}{\partial a^*_{1,L}(D_1)}\frac{\partial a^*_{1,L}(D_1)}{\partial D_1} + \frac{\partial U_{1,L}(L)}{\partial D_1} &= \frac{\partial U_{1,L}(H)}{\partial a^{min}_{1,H}(D_1)}\frac{\partial a^{min}_{1,H}(D_1)}{\partial D_1} + \frac{\partial U_{1,L}(H)}{\partial D_1} \\
\text{Envelope rule} \qquad & \frac{\partial U_{1,L}(L)}{\partial a^*_{1,L}(D_1)}\frac{\partial a^*_{1,L}(D_1)}{\partial D_1} = 0 \\
\frac{\partial a^{min}_{1,H}(D_1)}{\partial D_1} &= \frac{\frac{\partial U_{1,L}(L)}{\partial D_1} - \frac{\partial U_{1,L}(H)}{\partial D_1}}{\frac{U_{1,L}(H)}{\partial a^{min}_{1,H}(D_1)}} \\
\text{Because} \qquad & f'(K_{Hmin}) \leq f'(K_{Lmin}) < f'(K_{L*}) \\
\Rightarrow \quad & \frac{\partial U_{1,L}(L)}{\partial D_1} - \frac{\partial U_{1,L}(H)}{\partial D_1} > 0 \\
\text{Because} \qquad & a^{min}_{1,H} > a^*_{1,H}; \quad f' > 0; \quad f'' < 0 \\
\Rightarrow \quad & \frac{U_{1,L}(H)}{\partial a^{min}_{1,H}(D_1)} < 0 \\
\Rightarrow \quad & \frac{\partial a^{min}_{1,H}(D_1)}{\partial D_1} < 0
\end{aligned}
$$

1.7 Data Appendix

The sampling method used in this paper generally follows the practices of Fama and French (2001) and DeAngelo, DeAngelo and Stulz (2006). The broadest initial Compustat sample uses firm-year data from 1979-2008. Firms must be publicly traded on the NYSE, AMEX, or NASDAQ. Utilities and financial firms are excluded (SIC codes 4900-4949 and 6000-6999).

Observations must have data for total assets (6,at),[35] stock price at the end of the year (199,prcc_f), common shares outstanding (25,csho), income before extraordinary items (18,ib), interest expense (15,xint), dividends per share by ex date (26,dvpsx_f), preferred dividends (19,dvp), and (a) preferred stock liquidating value (10,pstkl), (b) preferred stock redemption value (56,pstkrv), or (c) preferred stock carrying value (130,pstk). Firms must have book equity as defined below. Observations are also required to have total assets at the beginning of the year.

[35]The parenthetical notation contains the Compustat annual number code and the WRDS data code, respectively.

Observations with total assets below $500,000 or book equity below $250,000 were excluded. To ensure that firms are publicly traded, the firms must have share codes of 10 or 11 in the CRSP database by fiscal year-end.

Discretionary Accrual Data

Observations must also have the data needed for the discretionary accrual regressions: change in sales (12,sale), change in receivables (2,rect), plant, property, & equipment, gross (7,ppegt), change in current assets (4,act), change in cash (1,che), change in current liabilities (5,lct), change in current maturities of long-term debt (34,dlc), and depreciation and amortization expense (14,dp). Ten firm-year observations for a two-digit SIC code are needed to run the discretionary accrual regression. Due to this constraint, only firms with fiscal year-ends the same as the calendar year-end are used.

Derived Variables

Dividend Payer = 1, if the firm had a dividend by ex-date in the current year (=0, otherwise)

Preferred stock = preferred stock liquidating value (10,pstkl) [or preferred stock redemption value (56,pstkrv), or preferred stock par value (130,pstk)]

Book equity = stockholders' equity (216,seq) [or common equity (60,ceq) + preferred equity, or total assets (6,at) − total liabilities (181,lt)] − preferred stock + balance sheet deferred taxes and investment tax credit (35,txditc) if available

Market capitalization = stock price at the end of the year (199,prcc_f) ∗ common shares outstanding (25,csho)

Market value of the firm (Value) = total assets (6,at) − book equity + market capitalization

Earnings (E) = income before extraordinary items (18,ib) + interest expense (15,xint) + income statement deferred taxes (50,txdi) if available

Asset growth = $\frac{A_t}{A_{t-1}} - 1$

Return on assets (ROA) = $\frac{E_t}{0.5*(A_t+A_{t-1})}$

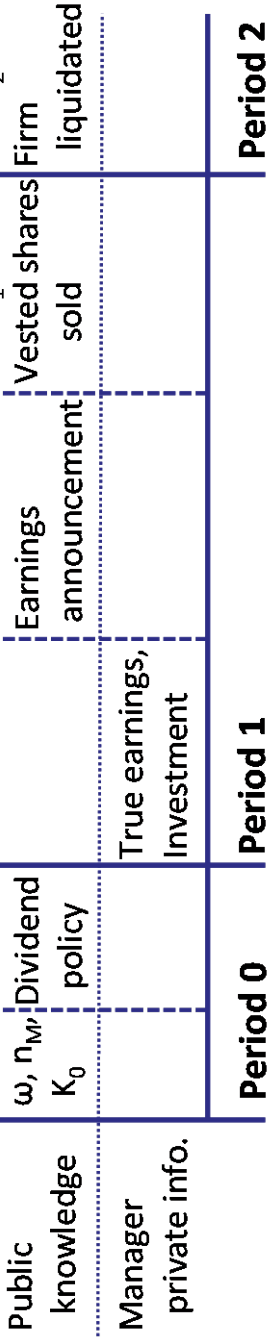

Figure 1.1: Order of Events

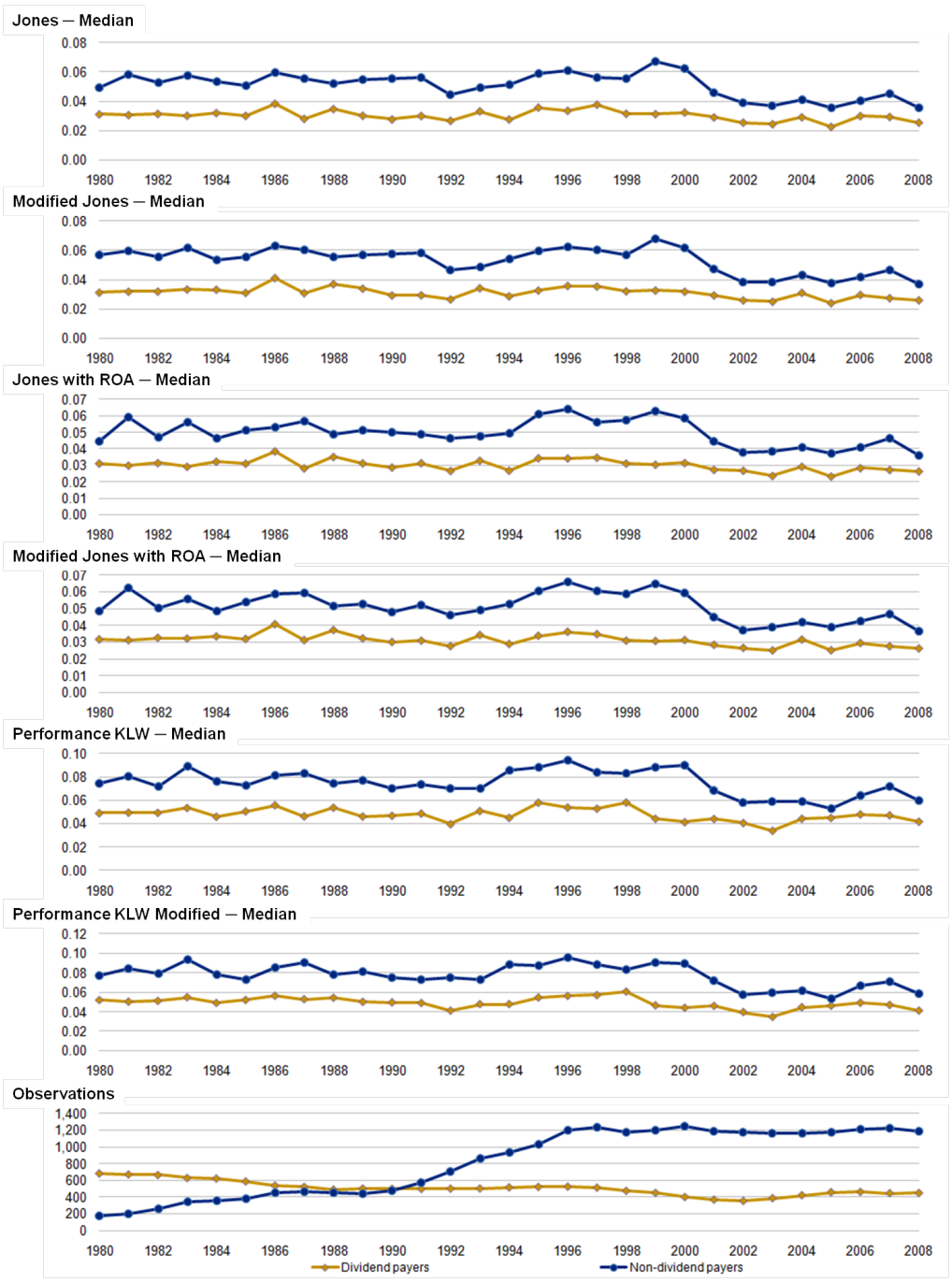

Figure 1.2: DA Over Time (1980-2008), [DA/lagged assets]

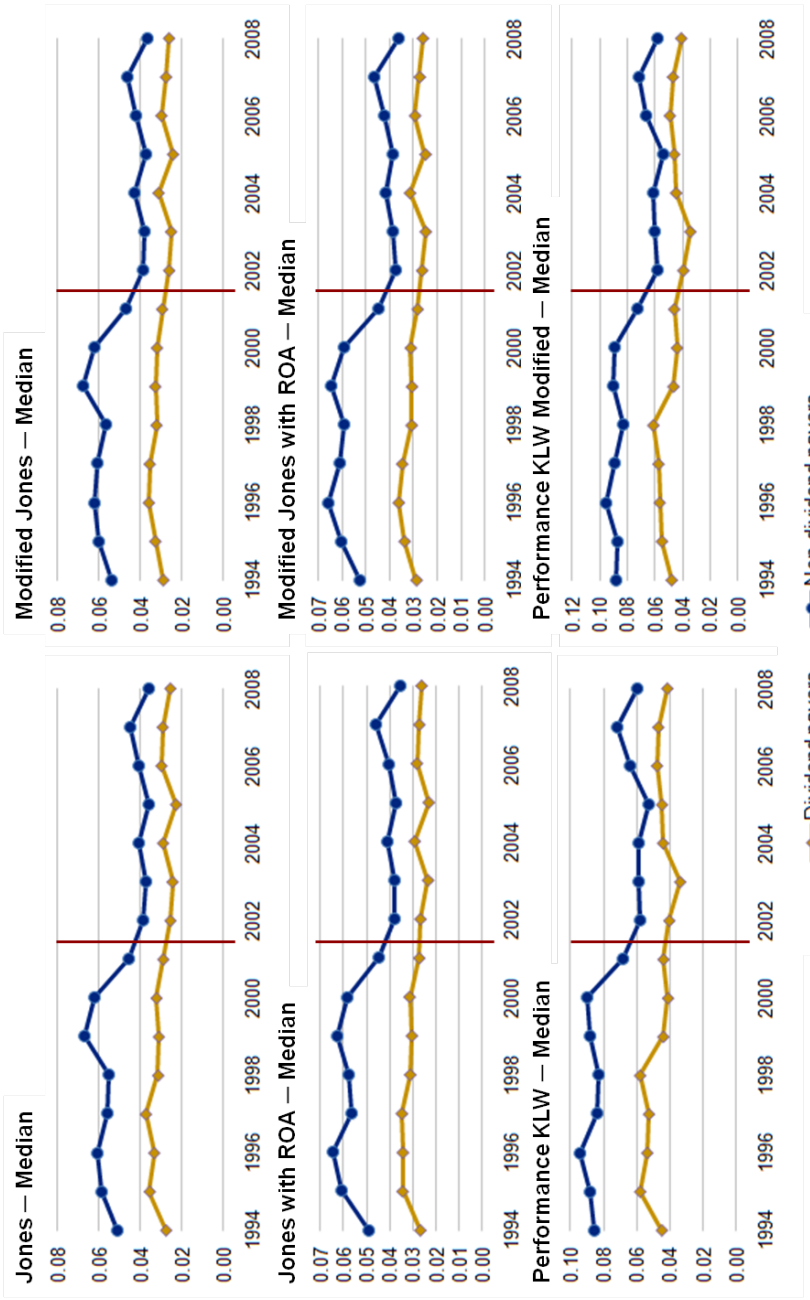

Figure 1.3: DA Over Time (1994-2008), [DA/lagged assets]

Table 1.1: Summary of Data for DA Models and Regression Tests (1998-2005)

Variable	**Mean**	**Median**	**Std. dev.**
Total accrual/ Lagged assets	-0.057	-0.047	0.647
1/ Lagged assets	0.020	0.004	0.066
Sales Chg/ Lagged assets	0.195	0.081	1.693
(Sales Chg - Rec Chg)/ Lagged assets	0.160	0.069	1.558
PPE/ Lagged assets	0.587	0.438	0.585
ROA	-0.032	0.031	0.246
NYSE market capitalization	0.294	0.178	0.299
Value/ Lagged assets	5.288	1.768	36.155
Asset growth	0.460	0.074	3.235
Earnings/ Lagged assets	-0.048	0.056	0.685

12,784 firm-year observations

Table 1.2: DA Model Results—Detail by Payer Type (1998-2005)

Variable	Mean	Median	Std. dev.	Mean/ Std. dev.
Discretionary accruals (scaled by lagged assets)				
All				
Jones	0.000	0.003	0.167	0.000
Modified Jones	0.000	0.002	0.169	0.000
Jones with ROA	0.000	0.001	0.162	0.000
Performance KLW	-0.001	-0.001	0.214	-0.006
abs(Jones)	0.072	0.040	0.151	0.479
abs(Modified Jones)	0.073	0.041	0.152	0.484
abs(Jones with ROA)	0.070	0.040	0.146	0.479
abs(Performance KLW)	0.105	0.061	0.186	0.563
Non-dividend payers (9,479 firm-year observations)				
abs(Jones)	0.0831	0.0463	0.1719	0.483
abs(Modified Jones)	0.0844	0.0475	0.1729	0.488
abs(Jones with ROA)	0.0802	0.0458	0.1664	0.482
abs(Performance KLW)	0.1183	0.0692	0.2102	0.563
Dividend payers (3,305 firm-year observations)				
abs(Jones)	0.0414	0.0283	0.0454	0.912
abs(Modified Jones)	0.0421	0.0293	0.0461	0.912
abs(Jones with ROA)	0.0405	0.0280	0.0439	0.923
abs(Performance KLW)	0.0663	0.0435	0.0730	0.908

Table 1.3: Baseline—abs(DA) Regression (1998-2005)

Fixed Effects		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.0214***	-0.0222***	-0.0205***	-0.0302***
		(0.00539)	(0.00553)	(0.00516)	(0.00698)
SOX*Div. payer	+	0.0393***	0.0403***	0.0383***	0.0451***
		(0.00563)	(0.00565)	(0.00548)	(0.00681)
Yr_99		0.0105	0.00868	0.00438	0.00660
		(0.00636)	(0.00634)	(0.00625)	(0.00845)
Yr_00		-0.000910	-0.00269	-0.00596	-0.00902
		(0.00777)	(0.00781)	(0.00749)	(0.00909)
Yr_01		-0.0354***	-0.0360***	-0.0370***	-0.0537***
		(0.00532)	(0.00530)	(0.00516)	(0.00697)
Yr_02		-0.0513***	-0.0535***	-0.0525***	-0.0742***
		(0.00634)	(0.00636)	(0.00622)	(0.00785)
Yr_03		-0.0535***	-0.0544***	-0.0532***	-0.0758***
		(0.00619)	(0.00621)	(0.00609)	(0.00785)
Yr_04		-0.0522***	-0.0534***	-0.0509***	-0.0697***
		(0.00688)	(0.00690)	(0.00672)	(0.00850)
Yr_05		-0.0583***	-0.0598***	-0.0573***	-0.0791***
		(0.00691)	(0.00695)	(0.00680)	(0.00842)
Constant		0.102***	0.105***	0.101***	0.151***
		(0.00465)	(0.00467)	(0.00454)	(0.00593)
Observations		12,784	12,784	12,784	12,784
Number of id		2,525	2,525	2,525	2,525
R-squared		0.355	0.359	0.349	0.377
Adj. R-squared		0.179	0.184	0.171	0.207

Robust standard errors in parentheses clustered at the firm level
*** p<0.001, ** p<0.01, * p<0.05

Table 1.4: abs(DA) Regression with Firm Characteristics (1998-2005)

Fixed Effects		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.0150**	-0.0162**	-0.0142**	-0.0242***
		(0.00520)	(0.00533)	(0.00493)	(0.00682)
SOX*Div. payer	+	0.0227***	0.0242***	0.0226***	0.0281***
		(0.00426)	(0.00430)	(0.00411)	(0.00569)
NYSE market	+	0.133**	0.136**	0.121*	0.154**
capitalization		(0.0495)	(0.0497)	(0.0484)	(0.0510)
Value /	-	-0.000206	-0.000211	-0.000196	-0.000211
Lagged assets		(0.000368)	(0.000362)	(0.000367)	(0.000371)
Asset growth	-	0.00880	0.00897	0.00880	0.00909
		(0.00647)	(0.00660)	(0.00645)	(0.00617)
Earnings/	-	-0.0640*	-0.0603*	-0.0600*	-0.0623*
Lagged assets		(0.0274)	(0.0277)	(0.0268)	(0.0281)
Yr_99		0.000985	-0.000845	-0.00455	-0.00382
		(0.00609)	(0.00611)	(0.00604)	(0.00802)
Yr_00		-0.00631	-0.00802	-0.0110*	-0.0147*
		(0.00567)	(0.00571)	(0.00546)	(0.00736)
Yr_01		-0.0274***	-0.0281***	-0.0291***	-0.0457***
		(0.00493)	(0.00500)	(0.00481)	(0.00658)
Yr_02		-0.0345***	-0.0370***	-0.0365***	-0.0567***
		(0.00557)	(0.00567)	(0.00547)	(0.00714)
Yr_03		-0.0398***	-0.0411***	-0.0400***	-0.0620***
		(0.00560)	(0.00570)	(0.00551)	(0.00726)
Yr_04		-0.0361***	-0.0378***	-0.0356***	-0.0533***
		(0.00570)	(0.00578)	(0.00561)	(0.00748)
Yr_05		-0.0419***	-0.0439***	-0.0417***	-0.0625***
		(0.00590)	(0.00601)	(0.00580)	(0.00743)
Constant		0.0508**	0.0530***	0.0537***	0.0930***
		(0.0155)	(0.0156)	(0.0152)	(0.0164)
Observations		12,784	12,784	12,784	12,784
Number of id		2,525	2,525	2,525	2,525
R-squared		0.455	0.453	0.447	0.444
Adj. R-squared		0.306	0.304	0.296	0.292

Robust standard errors in parentheses clustered at the firm level
*** p<0.001, ** p<0.01, * p<0.05

Table 1.5: abs(DA) Regression with Firm Characteristics & a Lag (1998-2005)

Arellano-Bond		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.00519	-0.00496	-0.00658	-0.0126
		(0.00558)	(0.00564)	(0.00532)	(0.00762)
SOX*Div. payer	+	0.0139***	0.0148***	0.0147***	0.0194**
		(0.00402)	(0.00407)	(0.00408)	(0.00627)
NYSE market	+	0.0328	0.0358	0.0269	0.0517
capitalization		(0.0281)	(0.0286)	(0.0271)	(0.0443)
Value /	-	-0.00178	-0.00178	-0.00129	-0.00146
Lagged assets		(0.00178)	(0.00182)	(0.00179)	(0.00189)
Asset growth	-	0.0575*	0.0577*	0.0552*	0.0544*
		(0.0258)	(0.0262)	(0.0261)	(0.0265)
Earnings/	-	-0.0936	-0.0960	-0.0804	-0.0816
Lagged assets		(0.0640)	(0.0649)	(0.0647)	(0.0680)
Yr_00		-0.00529	-0.00554	-0.00636	-0.00716
		(0.00419)	(0.00420)	(0.00409)	(0.00583)
Yr_01		-0.0155***	-0.0152***	-0.0126***	-0.0252***
		(0.00335)	(0.00340)	(0.00310)	(0.00521)
Yr_02		-0.0215***	-0.0226***	-0.0195***	-0.0372***
		(0.00356)	(0.00364)	(0.00352)	(0.00600)
Yr_03		-0.0291***	-0.0290***	-0.0258***	-0.0478***
		(0.00358)	(0.00366)	(0.00348)	(0.00601)
Yr_04		-0.0257***	-0.0257***	-0.0220***	-0.0390***
		(0.00410)	(0.00418)	(0.00406)	(0.00658)
Yr_05		-0.0271***	-0.0275***	-0.0245***	-0.0434***
		(0.00399)	(0.00407)	(0.00405)	(0.00668)
Lagged	+	0.0385	0.0398	0.0102	0.0232
abs(DA Measure)		(0.0233)	(0.0235)	(0.0230)	(0.0151)
Constant		0.0587***	0.0585***	0.0577***	0.0938***
		(0.00712)	(0.00720)	(0.00744)	(0.0129)
Observations		8,687	8,687	8,687	8,687
Number of id		1,983	1,983	1,983	1,983

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 1.6: abs(DA) Regression with Firm Characteristics using Early "SOX" (1998-2005)

Fixed Effects		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.0209***	-0.0223***	-0.0197***	-0.0327***
		(0.00579)	(0.00590)	(0.00547)	(0.00750)
SOX*Div. payer	+	0.0288***	0.0304***	0.0281***	0.0375***
		(0.00480)	(0.00484)	(0.00457)	(0.00661)
NYSE market	+	0.133**	0.136**	0.121*	0.154**
capitalization		(0.0494)	(0.0496)	(0.0483)	(0.0509)
Value /	-	-0.000208	-0.000214	-0.000199	-0.000214
Lagged assets		(0.000368)	(0.000362)	(0.000367)	(0.000371)
Asset growth	-	0.00877	0.00894	0.00877	0.00905
		(0.00645)	(0.00658)	(0.00643)	(0.00615)
Earnings/	-	-0.0639*	-0.0602*	-0.0599*	-0.0621*
Lagged assets		(0.0273)	(0.0277)	(0.0268)	(0.0280)
Yr_99		0.000827	-0.00101	-0.00470	-0.00403
		(0.00608)	(0.00610)	(0.00604)	(0.00801)
Yr_00		-0.00686	-0.00860	-0.0115*	-0.0155*
		(0.00569)	(0.00573)	(0.00548)	(0.00738)
Yr_01		-0.0349***	-0.0361***	-0.0365***	-0.0556***
		(0.00568)	(0.00574)	(0.00551)	(0.00752)
Yr_02		-0.0366***	-0.0392***	-0.0385***	-0.0600***
		(0.00576)	(0.00586)	(0.00564)	(0.00744)
Yr_03		-0.0419***	-0.0433***	-0.0419***	-0.0652***
		(0.00577)	(0.00588)	(0.00566)	(0.00754)
Yr_04		-0.0382***	-0.0399***	-0.0375***	-0.0566***
		(0.00583)	(0.00591)	(0.00572)	(0.00771)
Yr_05		-0.0440***	-0.0461***	-0.0436***	-0.0657***
		(0.00607)	(0.00618)	(0.00595)	(0.00771)
Constant		0.0528***	0.0550***	0.0556***	0.0959***
		(0.0154)	(0.0155)	(0.0151)	(0.0164)
Observations		12,784	12,784	12,784	12,784
Number of id		2,525	2,525	2,525	2,525
R-squared		0.456	0.454	0.448	0.445
Adj. R-squared		0.307	0.304	0.297	0.293

Robust standard errors in parentheses clustered at the firm level
*** p<0.001, ** p<0.01, * p<0.05

Table 1.7: abs(DA) Regression with Firm Characteristics & a Lag using Early "SOX" (1998-2005)

Arellano-Bond		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.00787	-0.00744	-0.00734	-0.0220*
		(0.00607)	(0.00611)	(0.00577)	(0.00867)
SOX*Div. payer	+	0.0154**	0.0159***	0.0132**	0.0302***
		(0.00475)	(0.00482)	(0.00457)	(0.00765)
NYSE market	+	0.0344	0.0374	0.0286	0.0548
capitalization		(0.0282)	(0.0286)	(0.0271)	(0.0443)
Value /	-	-0.00180	-0.00180	-0.00131	-0.00150
Lagged assets		(0.00178)	(0.00182)	(0.00179)	(0.00189)
Asset growth	-	0.0574*	0.0576*	0.0551*	0.0541*
		(0.0258)	(0.0263)	(0.0261)	(0.0265)
Earnings/	-	-0.0939	-0.0964	-0.0808	-0.0819
Lagged assets		(0.0640)	(0.0650)	(0.0647)	(0.0680)
Yr_00		-0.00552	-0.00576	-0.00647	-0.00770
		(0.00416)	(0.00417)	(0.00406)	(0.00581)
Yr_01		-0.0200***	-0.0199***	-0.0164***	-0.0346***
		(0.00425)	(0.00431)	(0.00390)	(0.00674)
Yr_02		-0.0225***	-0.0234***	-0.0193***	-0.0415***
		(0.00399)	(0.00408)	(0.00382)	(0.00663)
Yr_03		-0.0299***	-0.0297***	-0.0255***	-0.0521***
		(0.00387)	(0.00394)	(0.00366)	(0.00659)
Yr_04		-0.0265***	-0.0263***	-0.0216***	-0.0433***
		(0.00417)	(0.00425)	(0.00406)	(0.00696)
Yr_05		-0.0278***	-0.0280***	-0.0240***	-0.0477***
		(0.00426)	(0.00433)	(0.00419)	(0.00716)
Lagged	+	0.0385	0.0399	0.0107	0.0222
abs(DA Measure)		(0.0232)	(0.0234)	(0.0229)	(0.0150)
Constant		0.0594***	0.0592***	0.0576***	0.0969***
		(0.00689)	(0.00697)	(0.00720)	(0.0127)
Observations		8,687	8,687	8,687	8,687
Number of id		1,983	1,983	1,983	1,983

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 1.8: Balanced Panel—abs(DA) Regression with Firm Characteristics (2000-2003)

Fixed Effects		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	-0.00536	-0.00500	-0.00807	-0.0161
		(0.00719)	(0.00737)	(0.00653)	(0.00950)
SOX*Div. payer	+	0.0136***	0.0142***	0.0144***	0.0219***
		(0.00410)	(0.00413)	(0.00385)	(0.00611)
NYSE market	+	0.0809**	0.0780*	0.0638*	0.0945**
capitalization		(0.0304)	(0.0305)	(0.0257)	(0.0322)
Value /	-	-0.00173	-0.00200	-0.00138	-0.00230*
Lagged assets		(0.00106)	(0.00108)	(0.000928)	(0.00110)
Asset growth	-	0.0180*	0.0191**	0.0174**	0.0178*
		(0.00717)	(0.00740)	(0.00627)	(0.00744)
Earnings/	-	-0.00249	-0.00367	0.00217	-0.00688
Lagged assets		(0.0108)	(0.0107)	(0.00995)	(0.0144)
Yr_01		-0.0204***	-0.0196***	-0.0170***	-0.0294***
		(0.00370)	(0.00365)	(0.00347)	(0.00586)
Yr_02		-0.0287***	-0.0294***	-0.0251***	-0.0441***
		(0.00436)	(0.00434)	(0.00408)	(0.00650)
Yr_03		-0.0336***	-0.0328***	-0.0285***	-0.0503***
		(0.00438)	(0.00439)	(0.00415)	(0.00677)
Constant		0.0544***	0.0562***	0.0544***	0.0922***
		(0.00944)	(0.00953)	(0.00800)	(0.0106)
Observations		4,684	4,684	4,684	4,684
Number of id		1,171	1,171	1,171	1,171
R-squared		0.438	0.441	0.440	0.381
Adj. R-squared		0.249	0.253	0.251	0.173

Robust standard errors in parentheses clustered at the firm level
*** p<0.001, ** p<0.01, * p<0.05

Table 1.9: Balanced Panel—abs(DA) Regression with Firm Characteristics & a Lag (2000-2003)

Arellano-Bond		(1)	(2)	(3)	(4)
			abs	abs	abs
	Exp.	abs	(Mod.	(Jones	(Perform
VARIABLES	sign	(Jones)	Jones)	w/ ROA)	KLW)
Dividend payer	-	0.00201	0.000785	-0.00253	0.00217
		(0.00818)	(0.00818)	(0.00778)	(0.00911)
SOX*Div. payer	+	0.00961*	0.0110*	0.0121**	0.0142*
		(0.00438)	(0.00445)	(0.00409)	(0.00642)
NYSE market	+	0.0442	0.0420	0.0321	0.00770
capitalization		(0.0332)	(0.0338)	(0.0306)	(0.0418)
Value /	-	-1.01e-05	-7.92e-05	0.000118	-0.000196
Lagged assets		(0.00146)	(0.00149)	(0.00137)	(0.00146)
Asset growth	-	0.0303**	0.0300**	0.0291**	0.0343***
		(0.0102)	(0.0102)	(0.00954)	(0.00987)
Earnings/	-	0.00925	0.00735	0.0200	0.0297
Lagged assets		(0.0221)	(0.0220)	(0.0205)	(0.0289)
Yr_02		-0.0137***	-0.0152***	-0.0134***	-0.0221***
		(0.00333)	(0.00334)	(0.00309)	(0.00440)
Yr_03		-0.0202***	-0.0201***	-0.0186***	-0.0297***
		(0.00341)	(0.00345)	(0.00327)	(0.00471)
Lagged	+	0.0985**	0.104**	0.0690*	0.0860**
abs(DA Measure)		(0.0375)	(0.0365)	(0.0321)	(0.0262)
Constant		0.0379***	0.0398***	0.0422***	0.0792***
		(0.00946)	(0.00944)	(0.00853)	(0.0127)
Observations		4,220	4,220	4,220	4,220
Number of id		1,171	1,171	1,171	1,171

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Chapter 2

How Do Firms Switch Among Tools Used to Monitor Agency Problems?

Abstract: The primary purpose of monitoring and managing executive behavior is to increase shareholder value by controlling agency problems. Since firms face differing monitoring costs and levels of agency problems, the portfolio of monitoring tools selected is endogenous to firm characteristics. The minimum requirements on board composition established by the Sarbanes-Oxley Act (SOX) and contemporaneous changes in NASDAQ and NYSE rules provide exogenous variation in monitoring. We study how treated firms adjust their choice and magnitude of monitoring methods in response to this natural experiment using a difference-in-differences estimation strategy. We find that firms forced to increase board independence lowered CEO ownership by 1.9% and lowered leverage by 1.6%. This evidence supports the hypothesis that independent board members are substitutes for monitoring that comes from CEO ownership and debt. We also find some evidence that firms forced to create an independent audit committee increased leverage and decreased dividends.

2.1 Introduction

There are many strategies for owners to control agency problems, ways to align an agent's actions with owner preferences. U.S. publicly traded firms have adopted several practices to control CEO behavior with the intent of directing CEO actions to increase shareholder value. The principal strategies used include: 1) incentive pay, 2) debt financing, 3) equity ownership structure (by CEO, by large outside blockholder, or by institutional investors), 4) dividends, and 5) independent directors on the board. An optimizing firm will choose the combination of strategies that minimizes the cost of a given level of monitoring and control. This paper examines how firms switch among these strategies. We find that firms forced to increase board independence lowered CEO ownership by 1.9% and lowered leverage by 1.6%. We also find some evidence that firms forced to create an independent audit committee increased leverage and decreased dividends.

There is no reason to believe that firms face the same cost functions for agency control tools. As such, each firm will optimize given the specifics of its situation—industry, manager, financing options, company complexity, etc. Therefore, the portfolio of monitoring tools selected is endogenous to the company. Any cross-sectional analysis of monitoring strategies will not then uncover the marginal costs of or the relationships among the different strategies. Exogenous variation is needed to reveal which monitoring tools are complements, which tools are substitutes, and what are the marginal rates of substitution between these tools.

The Sarbanes-Oxley Act (SOX) of 2002 and contemporaneous stock exchange rule changes are just such sources of exogenous variation. SOX required that all directors on the audit committee be independent. The audit committee oversees firm auditors and monitors the veracity of firm financial statements. Around the same time as SOX, the regulatory bodies of the New York Stock Exchange (NYSE) and NASDAQ stock exchange required that all boards have a majority of independent directors. Overall, these laws constrain the floor level of monitoring done through the use of independent directors.

The cost and benefit functions of monitoring strategies determine how firms will respond to the independence and audit regulations. In principle, it is possible

that mandating an increase in monitoring along one dimension can result in firms re-optimizing by increasing, decreasing, or maintaining the level of monitoring along each of the other dimensions.

Consider a profit maximizing firm with continuous governance tools A and B. Under the usual assumptions (positive and decreasing marginal returns to A and B, positive cost, price takers in inputs), if regulators mandate an increase in A above current levels and if A and B are weak substitutes, then this should weakly reduce the firm's choice of B. If A and B are weak complements, this should weakly increase the choice of B.

Though more complex settings may give alternative adjustment patterns, independent directors seem unlikely to to satisfy these assumptions. For instance, independent directors should not change the costs of other forms of monitoring. Therefore, we can interpret a decrease in other monitoring tools in response to these regulations as substitutability in governance tools. This paper can be understood as both an empirical test of these substitutability relationships as well as a summary of firm reactions to these rules.

Prior research has shown some relationships between board composition and firm characteristics. In theory work by Fama and Jensen (1983), the authors argue that outsiders have reputational incentives to carry out their tasks to resolve agency problems between managers and shareholders.[1] Outsiders will be more vigilant than insiders who will lean toward supporting manager decisions.

Klein (2002) finds a negative relationship between audit committee independence and abnormal accruals. This is evidence that firms with independent audit committees are less likely to use earnings management, a practice of timing the release of earnings information. Audit committee independence is more effective for monitoring financial accounting practices.

A high proportion of insiders is also correlated with law enforcement actions. Beasley (1996) looks at the relationship between financial statement fraud and board composition. He finds that fraud firms have boards with significantly higher percentages of insiders than no-fraud firms. Dechow, Sloan and Sweeney (1996)

[1] In this paper, we use the terms independent and outsider interchangeably.

find that firms subject to SEC enforcement actions for manipulating earnings are more likely to have boards with a majority of insiders.

Anderson, Mansi and Reeb (2004) find that the cost of debt is lower for firms with independent audit committees and for companies with larger boards. The latter finding is in slight conflict with Yermack (1996) who finds an inverse relationship between firm value (Tobin's q) and board size. However, researchers have shown conflicting results on the relationship between board characteristics and firm value.

A large part of the research on board composition has focused on this issue: How does board composition relate to firm valuation and firm performance? Many of the studies find little association between firm performance and board composition or have conflicting results.[2] However, this should not be surprising given the endogenous nature of board composition. Board composition and other mechanisms designed to limit agency problems work together to maximize firm value. Most of the earlier research has been plagued by the endogeneity problem and until the recent rule changes, there were few viable alternatives for a clean test.

This paper adds to the literature by examining how firms switch between mechanisms that monitor management. Board composition is only one of the many mechanisms available to limit agency problems. Fama and Jensen (1983) discuss how market and organizational mechanisms help limit agency problems. Some of these mechanisms are established by the board. The board sets management compensation, establishes management hiring and firing practices, and approves major corporate decisions. Corporate policies regarding capital structure and payout policies can also mitigate agency problems. Jensen (1986) explains how dividends can pull "free cash flow" out of the firm, and many researchers have pointed out how debt can discipline management behavior by establishing debt covenants, by forcing debt service payments, and by creating a threat of bankruptcy.[3]

The overall goal of this paper is to examine how firms combine and sub-

[2]See Hermalin and Weisbach (1991), Klein (1998), Bhagat and Black (1999) for some examples testing firm performance measures and Tobin's q measures.

[3]See Jensen and Meckling (1976) or Harris and Raviv (1990) for further discussion.

stitute mechanisms that monitor management. It will specifically examine the relationship between board composition, management compensation, leverage, and dividend policy. We find some evidence that treated firms lowered dividends, CEO ownership, and leverage in response to the law changes. Responses differ by treatment from SOX and from the exchange rules. This evidence supports the hypothesis that independent board members are substitutes for monitoring that comes from dividends, CEO ownership, and debt.

The next section provides more background on SOX and the exchange rule changes. Section 2.3 will review more of the related literature. Section 2.4 discusses the data available. Testing results are reported in sections 2.5 and 2.6. Section 2.5 tests the change in governance mix, and section 2.6 tests the change in governance outcome. Section 2.7 concludes.

2.2 Overview of Regulation Changes

2.2.1 The Sarbanes-Oxley Act (SOX)

SOX was signed into law on July 30, 2002 in the midst of earnings restatements by several firms and many allegations of fraud. Those announcements arguably helped propel the law through Congress relatively quickly (Oppel, 2002; Oppel and Altman, 2002; Li, Pincus and Rego, 2008). Representative Oxley introduced his bill to the House on February 14, 2002, and Senator Sarbanes introduced S. 2673 in the Senate on June 25, 2002. About a month later, these bills were reconciled into law.

As other papers have discussed at length (for example, Coates (2007) and Romano (2005)), SOX increased reporting requirements of U.S. public firms. The stated motivation behind SOX was to improve the quality of information disclosed to investors.[4]

This paper examines a less researched requirement covering audit commit-

[4]According to the title page of the act, SOX is "an act to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes" (Congress, 2002).

tees (Section 301). In addition to improvements in the audit process (Section 404), all firms were required to have an audit committee, and the members of that committee must now be independent. To be independent, the director could not "(i) accept any consulting, advisory, or other compensatory fee from the issuer; or (ii) be an affiliated person of the issuer or any subsidiary thereof."[5]

SOX required the SEC to implement an audit committee rule by April 26, 2003. The SEC finalized the rule by early April, but the firms did not have to comply until roughly a year later. Firms had to be in compliance by which ever came first, their first annual shareholders meeting after January 15, 2004, or October 31, 2004.[6]

2.2.2 Exchange Rule Changes

While SOX was working its way through Congress, the NYSE and NASDAQ were in the process of changing the corporate governance rules required for firms listed on those exchanges. Among the new rules was a mandate requiring that listed firms have a majority of independent directors on their board. This meant that *more than* 50% of the board had to be independent. The exchanges also passed audit committee rules similar to SOX.

These rule changes by the exchanges then had to be passed by the SEC. The SEC approved the rules in November 2003. The new rules generally took effect with a firm's first annual meeting occurring after January 15, 2004, but not later than October 31, 2004.[7]

This paper will adopt the terminology "independence criteria" and "audit criteria" to refer to regulations on board structure from the exchanges and from SOX, respectively. Note that these regulations have both a treatment aspect and a distance aspect. A firm may have been near compliance and just had to do one of the following: hire one independent director, fire one inside director, or

[5] 15 U.S.C. 78f(m)(3)(B)

[6] SEC final rule "Standards Relating to Listed Company Audit Committees," April 9, 2003, file no. S7-02-03.

[7] November 2003 NASDAQ press release, "NASDAQ Corporate Governance Summary of Rules Changes."

switch the directors on the audit committee. Alternatively, a firm may have been far away from compliance, needing to hire multiple independent directors. Test specifications include variables for treatment and distance.

The two treatment groups also have different remedies. The independence criteria can only be met by increasing the share of directors that are independent by hiring new outside or dismissing inside directors. In contrast, firms can meet audit requirements by simply changing the responsibilities of current directors or by hiring new outside directors. If the quantity of monitoring is determined by the proportion or number of outside directors rather than their responsibilities then this would explain the generally weak evidence of a change in behavior from the audit criteria.

2.3 Related Literature and Agency Problems

We assume that investors are rational principals and managers are their rational agents. They negotiate a package of monitoring tools whereby each party maximizes their utility. Investors care only about firm value. The manager cares about firm value as well as private benefits such as compensation and perquisites. Agents and principals have divergent interests, but they can use a variety of contracting and supervisory mechanisms to generate surplus which they can then split. The costs of various forms of contracting and monitoring differ by firm characteristics like industry, firm life cycle stage, managerial attributes, and other difficult to measure attributes. Regardless of the level of supervision they choose, both parties have the proper incentives to minimize the costs (pecuniary and not) of achieving a particular level of monitoring.

Under these assumptions, we are restricted in how much we can learn from cross sectional surveys of contracting and governance like Shleifer and Vishny (1997), Gompers, Ishii and Metrick (2003), and Core, Holthausen and Larcker (1999). We must worry that firm and managerial fixed effects obscure the true trade-offs that each firm faces. The regulatory reforms of the Sarbanes-Oxley Act and the roughly contemporaneous exchange rules (both rules referred to as the

Director Rules, hereafter) constrain the floor level of monitoring from independent directors through the audit committee and through the composition of the board. This provides exogenous variation in independent board member monitoring, solving the problem of selection on unobserved criteria in cross-sectional studies.

If the Director Rules are a genuine channel for monitoring, then some mixture of retrenchment of other monitoring tools and of improvement in total governance will result. If some governance measures are complements with the Director Rules then they too should increase when the Director Rules are implemented.

Our hypothesis (H1a) is that the mixture of governance tools should adjust to leave no net effect on the level of governance from the law. Firms forced to hire independent directors will lower other forms of monitoring to keep the same level of governance. Since the resulting bundle of monitoring was in the pre-law change choice set, we must infer that management and owners must weakly prefer their old bundle to the one they currently consume. If there is some negotiating asymmetry then at least one of the two must be worse off.

There are several alternative hypothesizes. If variables reflecting the quality of governance (not mechanisms of governance) show improvement in response to the Director Rules, this would be evidence that the laws improved total governance. H1b is that while the mix of governance may change (again inferred from changes in the governance mix after SOX), the total governance increases. H0 is that changing the mix of inside and outside directors does not improve governance. There should be no adjustment in the mix of governance in response to the Director Rules.

While an exhaustive list of governance tools is impossible, they fall into three primary categories: capital structure of the firm, contracts that align managerial incentives with owners, and direct managerial monitoring. Capital structure tools include regular debt payments, debt covenants, and dividend payments. Contracting mechanisms include equity based compensation plans (with stock or options), non-equity incentive plans (various performance bonuses), and requiring executives to hold an investment portfolio concentrated in the employer's stock. Direct monitoring is perhaps the largest category but includes such mechanisms as independent auditors, credit rating and equity research opinions, and supervisory

boards of directors.[8] We have no strong beliefs on which governance measures should be complements or substitutes.

Current research suggests that the net benefits of the financial reporting aspects of SOX exceeded their costs for a subset of firms depending on firm characteristics (Wintoki, 2007; Li, Pincus and Rego, 2008). Small firms especially have seen costs exceed benefits (Wolkoff, 2005; Kamar, Karaca-Mandic and Talley, 2006; Engel, Hayes and Wang, 2007). Since the firms treated by the governance rules are on average only 35% of the size of the untreated firms (by assets, 50% by market capitalization), we expect them to have negative net benefits from the financial controls section of SOX (Section 404).

In scale, SOX internal control and financial certification costs have been estimated as one million dollars per billion dollars of revenues (Coates, 2007). There is reason to believe that the pecuniary costs of compliance with the independence rules and audit committee rules are much lower. A Conference Board survey of outside directors contemporaneous to the implementation of the SOX governance rules (HR Magazine, 2004) suggests that the cost of an independent director was on the order of $50-70$ thousand dollars. This is relatively inexpensive for most treated firms. Further, if inside directors are also compensated for their board activities and the risk they take in serving, then the pecuniary costs may be approximately zero.

2.4 Data

Firm financial statement data come from the Compustat North America Fundamentals Annual database. These data contain information on firm characteristics and financial statement metrics for U.S. public firms. To focus on the companies treated by both SOX and the exchange rules, only firms that trade on either the NYSE or NASDAQ are included in this study.

[8]Other examples of additional monitoring of the manager include punching a time clock (the Mars Corporation—http://www.fundinguniverse.com/company-histories/Mars-Inc-Company-History.html), retention of all employee emails, splitting the job of CEO and chairman of the board, and mandatory retirement ages.

Data on CEO compensation and ownership comes from ExecuComp. This database includes details on the composition of compensation—salary, bonus, options, restricted shares, and shares. We use these data to predict compensation and to create variables of governance mix.

Board of director information comes from the Directors Database Archive (DDA). DDA has detailed information on the composition of the board, including which directors are independent, and the composition of the audit committee. The data are recorded historically approximately every two months.

In order to create our sample, we linked firms in the DDA as of January 2002 to firms in the DDA as of January 2005. January 2002 is the latest database snapshot prior to drafts of SOX being discussed before Congress. The January 2005 snapshot is the first snapshot after both the exchange regulations and SOX audit committee rules were in full force and when the DDA is completely updated with any board composition changes.

We exclude firms that are not in the DDA for both periods (January 2002 and January 2005). This provides us board information on nearly 4800 firms. In the tests below, the SOX dummy variable matches when the Director Rules are is full force. The dummy variable takes a value of one if the financial reporting period ends in November 2004 or later.

We then merge the board data with the Compustat Data and ExecuComp data from 1998 to 2006. About 4000 firms were matched between Compustat and DDA. We exclude firms that have boards with fewer than four directors (likely abnormal firms or firms with bad data), that are missing primary regression data, and that have fewer than six years of data.[9] This leaves 3774 firms in our testing sample.

In our testing sample, there are 261 firms treated by the independence criteria (exchange rules) and 122 firms treated by the audit rule (SOX). Table 2.1 summarizes the characteristics of the two treatment groups and of firms not

[9]Primary variables include market capitalization, asset growth, firm value, and earnings. There were 9 firms with fewer than four directors, 69 firms do not have Compustat data available before and after SOX, 163 firms with fewer than six years of primary regression data. Notice that some firms are in more than one exclusion category.

treated by the Director Rules. All data are as of the last fiscal report prior to the Director Rules being in full force.

The treated and untreated firms under the independence criteria appear to be significantly different types of firms (top panel). The treated firms are much smaller by market capitalization and firm value, have lower leverage, and have much higher levels of CEO ownership. The treated companies trade at a slightly higher Tobin's q (market-to-book ratio) and have higher profitability as measured by Earnings/Assets.

The treated and untreated firms under the audit criteria also appear to be different types of firms (bottom panel). Note that 41 firms are in both treatment groups. Treated firms under the audit rule are much smaller than the untreated firms, have lower leverage, and grow faster. CEO ownership is again higher but not as much as the firms treated by the independence criteria. Treated companies under the audit rule trade at a lower Tobin's q and have slightly lower profitability.

The treated companies come from a wide range of industries. Table 2.2 shows an industry breakdown for the two treatment groups, the entire testing sample, and the composition of all U.S. firms. Most of the firms treated by the independence rule come from manufacturing or service industries. A majority of the firms treated by the audit rule are either manufacturing or financial companies, and this composition generally matches the composition of all the firms in the testing sample. Notice that the composition of all U.S. firms is much different than the testing groups and is heavily weighted in the retail and service industries. This difference in composition is not surprising given the large number of non-public, family-owned businesses such as restaurants, grocery stores, and service providers (e.g., dry cleaning, lawn maintenance, plumbing repairs, barber).

In order to comply with the two criteria, firms have several ways to change board composition. Firms can hire more outsiders, fire insiders, or do some type of combination. Table 2.3 summarizes firm behavior in our sample. Of the firms treated by the independence rule, 75% decrease the number of insiders on their board, and 75% increase the number of outsiders. For the firms treated by the audit rule, 60% decrease the number of insiders, and 61% increase the number

of outsiders. These are much stronger shifts in board composition than the untreated firms. For the untreated firms, 34% decrease the number of insiders, and 47% increase the number of outsiders. Furthermore, more than half (56%) of all untreated firms did not change the number of their insiders.

2.5 Testing on Governance Mix

In this first testing section we test to see how firms switched between the different monitoring tools: incentive pay, CEO ownership, debt (leverage), and dividends.

Each monitoring tool is regressed on a panel of firm variables that control for firm size, life cycle, and profitability.[10] Log market capitalization is used to proxy for firm size. Value/Assets and Asset growth proxy for investment opportunity and life cycle. The Value/Assets measure, also known as the market-to-book ratio, is similar to Tobin's q. Young companies that are expected to grow and become more profitable in the future are highly valued by the market. These companies tend to trade at a higher ratio than older firms. Earnings/Assets is used as a profitability measure. The regressions also include industry (2-digit SIC) and year fixed effects and a dummy for the 2003 dividend tax change.

The SOX dummy is set to one for data after the Director Rules are in full force (>October 2004) and is set to zero otherwise. The treatment variables (Independence and Audit) take a value of one if the firm is treated by the respective law. Due to the nature of the law requirement, there is also a distance characteristic to the treatment. A firm could be close to the independent requirement (e.g., have an insider percentage of 50%) or be much further away (e.g., an insider percentage of 80%). To test for distance, we also create variables to capture the distance

[10]The variables roughly follow Fama and French (2001) which studied the likelihood of being a dividend payer.

element. Definitions for all treatment variables are below.

$$\begin{aligned}
\text{Ind. Treatment} &= 1 \quad \text{if \# Outsiders} \leq \text{\# Insiders} \\
\text{Ind. Distance} &= \max(0.5\text{-\% Independent}_{2002}, 0) \\
\text{Audit Treatment} &= 1 \quad \text{if \# Audit_insiders}_{2002} > 0 \\
\text{Audit Distance} &= \text{Audit_insiders}_{2002}/\text{Audit_members}_{2002}
\end{aligned}$$

The coefficients on the interacted terms, treatment (or treatment distance) and SOX is the point of interest for determining the impact of the law on changing governance mix. The first specification for each treatment group includes the SOX dummy, the treatment dummy, and a treatment-SOX interaction. The second specification adds a treatment distance-SOX interaction. The third specification has the distance-SOX interaction only (not the treatment-SOX interaction).

2.5.1 Incentive Pay

Optimal contracting solutions to the principal-agent problem solve the problem by tying CEO remuneration to firm performance. Stock options and grants are real world attempts to align CEO incentives with that of the owners. This section uses the fraction of a CEOs opportunity pay that comes from stock options and stock grants as a proxy for how dependent the firms governance strategy is on optimal-contracting.[11] Higher fractions of CEO pay represent greater dependence on this monitoring method.

Table 2.4 shows the results of regressing percent risky pay on our control panel of firm variables, year and firm fixed effects, and our difference-in-differences measurement of the treatment. Notice that there are no statistically significant results for any of the treatment variables. There is no evidence to reject the null-hypothesis of no treatment of incentive pay from either of the governance rule

[11]Opportunity pay is the value of disclosed compensation at *award date*. This is different than realizable pay, the ex post value of compensation actually received. We use opportunity pay throughout this paper because this shows the value of compensation when the contract was negotiated. Ex post valuations are not as clear for interpretation. A high level of ex post incentive pay could be due to high manager effort in raising firm value or it could be that the original compensation package used a high percentage of incentive pay.

changes.

Based solely on the point estimates, treatment by the independence rule changes leads to an increase in the use of incentive pay while treatment by the audit rule change leads to decreases in incentive pay of approximately the same size. The sign of the independence results are consistent with a complementary story and the audit results are consistent with a substitutability story. In total, the strongest evidence is for no adjustment to incentive pay from the rule changes.

2.5.2 CEO Ownership

CEO stock ownership is another optimal contracting method of controlling the principal-agent problem. By making CEOs owners they hopefully will behave like them. Though CEOs typically own only a few percent of a publicly traded company, this stake is usually a large fraction of the CEO's wealth. This provides an incentive to maximize risk adjusted returns.

Table 2.5 shows the results of regressing CEO ownership on our control panel of firm variables, year and firm fixed effects along with our difference-in-differences measurement of the treatment. The first three columns show different specifications testing the independence rule, and the last three columns show similar specifications for testing the audit rule.

The coefficient on the interaction of independence treatment and SOX is negative and statistically significant. CEO ownership adjusts in response to the independence treatment. Firms treated by the independence rule lowered their use of CEO ownership by 1.9% after the rule went into effect.

The coefficient on the audit treatment interaction is not statistically different from zero. The point estimates for the audit treatment are the opposite (positive) of the independence treatment.

Overall, this is evidence that there was a governance effect from the exchange rules. Having a majority of independent directors is a substitute for CEO ownership as a agency-control tool.

2.5.3 Leverage

Leverage represents both the commitment to pay future coupons on firm debt as well as to debt covenants, financial controls that are a condition of borrowing money. As such, leverage is another form of monitoring and control of executive behavior in the face of principal-agent problems where greater leverage represents greater monitoring.

Table 2.6 summarizes the results of the leverage regressions. Again, we find that the independent directors treatment has a statistically significant treatment on this governance. These firms lowered their leverage by 1.6% in response to the law. These results provide evidence that a majority independent board is a substitute for leverage.

The audit treatment shows the opposite effect. The firms treated by the audit criteria raise leverage by 2.0%. An independent audit committee is a complement to leverage. This is consistent with the relationships found by Anderson, Mansi and Reeb (2004). They showed that the cost of debt is lower for firms with independent audit committees.

However, recall that the firms treated by the audit criteria had much less leverage than the rest of the sample (Table 2.1). This 2.0% is a small increase in leverage in economic terms and may be more indicative of the differences in characteristics between the treated and untreated firms.

These results may understate the total effect because firms are limited in how quickly they can change their capital structure by their free cash-flow and the amount of debt rolling over. These firms may have wanted to shift more out of debt and into equity (substitution) but transaction costs may have limited the adjustment.

2.5.4 Dividends

Though different theories have been proposed to explain why firms pay dividends, many relate to agency problems. Easterbrook (1984) and Jensen (1986) point out that dividends restrict manager behavior by limiting access to free cash flow, forcing managers to go back to the market for additional capital.

More recent research has focused on dividends as a commitment device for the manager to show good behavior. Fluck (1998) develops a model where the manager and shareholders have an agreement. Shareholders offer continued employment of the manager in return for good behavior that includes dividend payments. John and Knyazeva (2006) and Knyazeva (2006) argue that firms with poor governance are more likely to have payout policy pre-commitments in order to mitigate agency problems.

The treated firms in our sample are less likely to pay dividends prior to the Director Rules than untreated firms. Of the firms treated by the independence criteria, 30% (78 of 261) paid a dividend in the fiscal year before the law went into effect. This compares to 42% of the untreated firms.[12] For firms treated by the audit rule, 34% (42 of 122) of them paid a dividend.

Table 2.7 summarizes the results of the logit regression of dividends on our control panel of firm variables, year and *industry* fixed effects along with the treatment dummies. Based on Fama and French (2001), dividend payers tend to be large and highly profitable companies with low growth opportunities. The signs on the coefficients for firm characteristics are as expected for all tests. Large, highly profitable firms are more likely to pay dividends. Faster growing firms trading at a high Tobin's q are less likely to pay dividends.

The coefficients on the independence treatment and on the audit treatment are not statistically significant for all specifications. The point estimates indicate that firms treated by the independence rule are more likely to pay dividends while firms treated by the audit rule are less likely to pay dividends.

All of the interaction coefficients are not statistically different than zero across the specifications. All of the signs are positive except on the audit treatment interaction in column 5. The positive sign on the point estimates is interpreted as firms treated by the law are more likely to pay a dividend after the law went into effect.

[12]Note that our testing sample contains more dividend payers than the overall market. The databases used for this paper tend to focus on larger firms which are more likely to pay dividends. Our data cleanup process further eliminates the youngest, smallest firms that are less likely to pay dividends.

We next look at actual changes in dividend policy. It is well understood that dividend policy is sticky. Once a firm adopts a dividend, it generally continues to pay dividends. Firms slowly increase dividends over time, and decreases are rare (Brav, Graham, Harvey and Michaely, 2005; Allen and Michaely, 2003; Fama and French, 2001). To test for change in dividend behavior, we therefore want to look at changes in the dividend paid. Simply maintaining a dividend does not show a change in policy or a change in information.

We test for specific behavior: dividend increase and dividend decrease. The results are shown in Table 2.8. For each logit test (increase or decrease), we run the same specifications shown in Table 2.7. Only the treatment specifications are reported for space reasons (columns 1 and 4 in Table 2.7). The distance specifications show qualitatively similar results.

The coefficients on the interacted terms are not statistically different from zero for either treatment at the 5% level. The point estimates suggest that independence treated firms were more likely to increase dividends after the law change while audit treated firms were less likely to increase dividends. The dividend decrease test for the audit treatment is consistent with this result. Firms treated by the audit rule are more likely to decrease their dividend after the law was in effect. The positive coefficient on the interacted term in column 4 is statistically different from zero at the 6% level. This provides some evidence that the monitoring provided by an independent audit committee is a substitute for dividends.

Overall, these results on governance mix are consistent with CEO ownership, leverage, and dividends being substitutes for outside director monitoring. The effects were different for the two treatment groups. We find some evidence of substitution between a majority independent board and CEO ownership and of substitution between a majority independent board and leverage. We also find some evidence of substitution between an independent audit committee and dividends. The fact that the treatment groups differ in responses may be related to the selection of those types of governance mix and the endogeneity of governance and firm specific characteristics. There is also reason to believe that the type of monitoring performed by an independent audit committee is different from the

monitoring performed by a majority independent board.

2.6 Testing on Governance Outcome

The previous section provided evidence to reject H0, that there was no change in governance mix from the Director Rules. This section tests if the total quantity of governance increased in response to the new Director Rules and thereby distinguish between H1a (no change in level of governance) and H1b (increase in level of governance).

2.6.1 Compensation Residual

This section measures the response of CEO overpayment to the Director Rules. The basic measure of CEO compensation used is opportunity pay, the value of disclosed compensation at award date. Opportunity pay provides the clearest measure of the cost to the firm of employing the executive at the time the compensation decision was made. CEO opportunity pay and pay mix is set by the board's compensation subcommittee typically in consultation with outside compensation consultants. The pay package is then approved by the entire board.[13]

To measure overpayment, this paper uses the major determinants of CEO compensation. Major determinants studied in the literature include labor market effects, firm size, performance, and industry (Murphy, 1999; Gabaix and Landier, 2008).

Because CEOs are risk adverse, firms must pay executives more for bearing the firms idiosyncratic risk not generally priced into the stock price and for the inability of executives to hedge their options. We measure the riskiness of a compensation package by the percentage of its value from restricted stock and stock options.[14]

[13]Recall that opportunity pay is better suited than realizable pay to measure cost of manager compensation. Realizable pay is an ex post valuation of the compensation. If incentive pay (stock and options) is effective at altering agent behavior, then pay will be worth more to the executive then the opportunity value implies.

[14]Other methods were tried including using measures for compensation sensitivity to stock price changes. The specification used here had the greatest predictive power.

We develop an overpayment measure by regressing (log) total opportunity pay on determinants of firm size (log market capitalization and log debt), riskiness of compensation (measured by percentage of pay value from stock and option grants) and fixed effects from industry (2 digit SIC) and from year. The year and industry fixed effects help proxy for labor market effects. Table 2.9 reports the regression results. Notice that the linear model captures about 64% in pay variation. The resulting residual is positive if these risk and labor market factors predict that the CEO should be paid less than they were. While this is not a perfect measure of overpayment, this is a generous counter-factual proxy for the pay that CEOs would earn in a competitive market.

We regress this residual on the difference-in-differences variables as before. Because we only have a theoretical prediction for firms that over pay (as a result of the Director Rules they will overpay less), we restrict our data to only firms that tended to overpay during the period before November 2004.[15] The resulting sample consists of 716 firms. Of the firms treated by the independence rule, 52% (33 of 64) showed a tendency to overpay. The same is true for 56% (9 of 16) of the firms treated by the audit rule.[16]

Unlike in the previous section there is no year and firm fixed effects in this second regression. The former are already proxied for in the first stage to control for labor market effects. For the latter, recall that the purpose of the first stage is to remove variation that is unquestionably from labor market factors. Firm fixed effects might capture the particular labor market factors that justify paying the CEO more, but just as easily represents a board that systematically overpays their CEO due to capture. Therefore, it is not unquestionably a labor market factor and is excluded.

Table 2.10 shows the results of the regression. None of the interacted variables are statistically significant. The point estimates in the basic model (columns 1 and 4) range from decreasing overpayment by 1% to increasing overpayment by

[15]The regression only includes firms that had a positive average residual during the pre-Director Rules period.

[16]Note that the lower number of treated firms is due to the limitations of the compensation data. The ExecuComp data does not cover as many firms as Compustat and DDA.

14%. The standard errors are large for all the interacted terms and the treatment terms. It is interesting to note that the coefficient on the SOX dummy is negative and statistically significant for all model specifications. All firms (treated and untreated) that showed evidence of overpaying the CEO before SOX tended to lower compensation after SOX.

2.7 Conclusion

Much of the corporate governance literature has been plagued by the endogeneity problem. Firms optimize governance over time based on the changing characteristics of the firm, the manager, and the ownership structure. This paper adds to the literature by using a law change as a natural experiment to test how firms adjust the choice and magnitude of governance tools given a floor level of monitoring from independent directors.

We have separately tested several types of governance tools used to monitor agency problems. We found some evidence of substitution between independent directors and dividends, CEO ownership, and leverage. The type of substitution varied across the two treatment groups. Firms treated by the independence rule showed evidence of decreasing CEO ownership and leverage. Firms treated by the audit rule showed evidence of lowering dividends and increasing leverage.

We also tested a variable for overpayment of the manager. Overpayment is a measurement of governance outcomes. We tested this variable with the laws increasing monitoring from independent directors. We did not find any evidence of a relationship. Firms that appeared to be overpaying their managers and that were treated by the law did not appear to change behavior after the Director Rules went into effect. The lack of evidence may be due to the small sample size.

A major policy implication of this work is that regulators must take into account countervailing corporate action when trying to improve specific areas of governance. Failing to do so is likely to raise costs without improving governance. Instead, we advocate a holistic approach where governance is assessed based on the portfolio of governance strategies employed and taking into account the life

cycle of the firm.

We suggest a system modeled on the Leadership in Energy and Environmental Design (LEED) certification for buildings. Under the LEED system firms are rated from worst to best as Uncertified, Certified, Silver, Gold, and Platinum based on a hundred point system with points awarded for various building technological and design features. Designers can choose an optimal bundle of features to cost effectively achieve a desired level of certification which is then assessed independently. Under a similar system in governance, firms might choose among varying financial, incentive, monitoring, and other governance strategies with points awarded for each to achieve a baseline level of governance. Regulators would raise overall governance by raising the minimum required score for listed firms rather than specifying methods per se, ensuring cost effective better governance.

I thank my co-author Benjamin Kay for collaborating on the second chapter, and I look forward to future research efforts.

Table 2.1: Summary Data by Treatment Group (medians unless otherwise noted)

Independence Criteria

Treated	# of Firms	Div. Yield (Mean)	Log Mkt Cap	Asset Growth	Firm Value	Earnings	Leverage
No	3513	1.33%	5.91	3.52%	745	5.83	0.113
Yes	261	0.74%	5.38	3.67%	381	3.30	0.078
Total	3774	1.29%	5.87	3.54%	715	5.65	0.112
Treated	**% CEO Ownership**	**% Risky Comp**	**Tobin's Q**	**Earnings / Assets**	**# Insiders 2002**	**Board Size 2002**	**% Insiders 2002**
No	0.28%	57.4%	1.305	0.0129	2	8	20%
Yes	4.98%	12.9%	1.341	0.0255	4	7	55%
Total	0.28%	56.4%	1.308	0.0132	2	8	20%

Audit Criteria

Treated	# of Firms	Div. Yield (Mean)	Log Mkt Cap	Asset Growth	Firm Value	Earnings	Leverage
No	3652	1.30%	5.91	3.52%	736	5.99	0.116
Yes	122	0.91%	4.59	3.95%	262	1.71	0.036
Total	3774	1.29%	5.87	3.54%	715	5.65	0.112
Treated	**% CEO Ownership**	**% Risky Comp**	**Tobin's Q**	**Earnings / Assets**	**# Insiders 2002**	**Board Size 2002**	**% Insiders 2002**
No	0.28%	56.4%	1.315	0.0133	2	8	20%
Yes	0.55%	46.9%	1.176	0.0111	3	7	40%
Total	0.28%	56.4%	1.308	0.0132	2	8	20%

Firm value and earnings in millions of dollars. Log market capitalization is the log of the levels in millions.

Table 2.2: Industry Composition of Treatment Groups

	% of Firms			
	Independ. Criteria	**Audit Criteria**	**All Firms**	**U.S. Census ***
Ag., Forestry, & Fisheries	0.4	0.0	0.3	0.0
Construction Industries	1.1	0.8	0.9	11.2
Finance, Insur., & RE	10.7	26.2	21.4	11.6
Manufacturing	37.2	42.6	39.4	6.6
Mineral Industries	4.6	3.3	3.8	0.4
Other	0.8	0.0	0.3	0.8
Retail Trade	8.0	5.7	5.6	27.5
Service Industries	25.7	14.8	16.8	36.5
Trans., Comm., & Utilities	6.5	4.1	8.8	5.2
Wholesale Trade	5.0	2.5	2.8	9.2
Grand Total	261	122	3,774	5,684,526

* Based on industry of establishments in the 1997 Economic Census.
http://www.census.gov/epcd/ec97sic/E97SUS.HTM
Results use the number of establishments excluding tax-exempt service establishments.

Table 2.3: Board Composition Changes by Treatment Group

	Number of firms adjusting this way														
	-5 or less	**-4**	**-3**	**-2**	**-1**	**0**	**1**	**2**	**3**	**4**	**5 or more**	**Total**	**% decr.**	**% incr.**	**% no chg.**
All Firms															
Outsiders	39	42	104	212	519	1024	894	549	255	98	38	3774	24	**49**	27
Insiders	18	17	75	296	991	2015	297	33	11	14	7	3774	**37**	10	**53**
Total	65	61	143	292	633	1126	792	409	172	48	33	3774	32	39	30
Treated: Independence															
Outsiders	1	0	0	4	5	54	61	66	34	23	13	261	4	**75**	21
Insiders	14	12	34	60	76	52	9	0	0	1	3	261	**75**	5	20
Total	8	3	13	18	39	69	59	27	14	5	6	261	31	43	26
Treated: Audit															
Outsiders	0	0	4	3	9	31	29	25	11	7	3	122	13	**61**	25
Insiders	1	1	11	27	33	42	4	0	0	1	2	122	**60**	6	34
Total	1	1	5	11	25	34	21	11	8	3	2	122	35	37	28
Not Treated by Either Rule Change															
Outsiders	38	42	100	206	505	945	812	472	215	72	25	3432	26	**47**	28
Insiders	4	5	38	218	891	1930	285	33	11	13	4	3432	**34**	10	**56**
Total	56	57	125	266	579	1029	719	377	155	42	27	3432	32	38	30

Table 2.4: Incentive Pay Regression

VARIABLES	(1) Indep Adj	(2) Indep Dist	(3) Indep Dist2	(4) Audit Adj	(5) Audit Dist	(6) Audit Dist2
SOX Dummy	-0.0418**	-0.0418**	-0.0410*	-0.0401*	-0.0437**	-0.0437**
	(0.0162)	(0.0162)	(0.0161)	(0.0161)	(0.0162)	(0.0162)
Ind. Treatment	0.0238	0.0238				
* SOX	(0.0297)	(0.0398)				
Ind. Distance		-0.000280	0.170			
* SOX		(0.387)	(0.287)			
Audit Treatment				-0.0331	-0.0229	
* SOX				(0.0545)	(0.169)	
Audit Distance					-0.0386	-0.114
* SOX					(0.637)	(0.202)
Log Market Cap.	0.0506***	0.0506***	0.0507***	0.0507***	0.0496***	0.0496***
	(0.00616)	(0.00616)	(0.00615)	(0.00615)	(0.00641)	(0.00641)
Asset Growth	-0.00829	-0.00829	-0.00830	-0.00836	-0.00867	-0.00868
	(0.00439)	(0.00439)	(0.00439)	(0.00440)	(0.00447)	(0.00447)
Value/Assets	-0.00262	-0.00262	-0.00262	-0.00263	-0.00264	-0.00264
	(0.00135)	(0.00135)	(0.00135)	(0.00135)	(0.00137)	(0.00137)
Earnings/Assets	-0.0234	-0.0234	-0.0234	-0.0234	-0.0221	-0.0221
	(0.0160)	(0.0160)	(0.0160)	(0.0159)	(0.0232)	(0.0232)
Observations	11,036	11,036	11,036	11,036	10,775	10,775
R-squared	0.472	0.472	0.472	0.472	0.474	0.474
Adj. R-squared	0.384	0.384	0.384	0.384	0.387	0.387

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Year and firm fixed effects, constant, and 2003 tax change dummy suppressed

Table 2.5: CEO Ownership Regression

VARIABLES	(1) Indep Adj	(2) Indep Dist	(3) Indep Dist2	(4) Audit Adj	(5) Audit Dist	(6) Audit Dist2
SOX Dummy	0.00397	0.00400	0.00320	0.00279	0.00319	0.00319
	(0.00227)	(0.00227)	(0.00233)	(0.00229)	(0.00231)	(0.00234)
Ind. Treatment	-0.0188*	-0.0237*				
* SOX	(0.00736)	(0.0115)				
Ind. Distance		0.0819	-0.0853*			
* SOX		(0.0846)	(0.0397)			
Audit Treatment				0.0120	0.000122	
* SOX				(0.0168)	(0.0439)	
Audit Distance					0.0434	0.0438
* SOX					(0.106)	(0.0480)
Log Market Cap.	-0.00265	-0.00264	-0.00266	-0.00266	-0.00277	-0.00277
	(0.00166)	(0.00166)	(0.00166)	(0.00166)	(0.00174)	(0.00174)
Asset Growth	0.000926*	0.000923*	0.000923*	0.000945*	0.000936*	0.000936*
	(0.000402)	(0.000401)	(0.000402)	(0.000397)	(0.000401)	(0.000401)
Value/Assets	0.000507**	0.000507**	0.000509**	0.000509**	0.000517**	0.000517**
	(0.000177)	(0.000177)	(0.000177)	(0.000176)	(0.000178)	(0.000178)
Earnings/Assets	0.000966	0.000972	0.00101	0.00102	0.00158	0.00158
	(0.00138)	(0.00138)	(0.00139)	(0.00139)	(0.00205)	(0.00205)
Observations	10,458	10,458	10,458	10,458	10,211	10,211
R-squared	0.750	0.750	0.750	0.749	0.751	0.751
Adj. R-squared	0.708	0.708	0.707	0.707	0.709	0.709

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Year and firm fixed effects, constant, and 2003 tax change dummy suppressed

Table 2.6: Leverage Regression

VARIABLES	(1) Indep Adj	(2) Indep Dist	(3) Indep Dist2	(4) Audit Adj	(5) Audit Dist	(6) Audit Dist2
SOX Dummy	0.00196	0.00197	0.00159	0.000157	0.000365	0.000433
	(0.00417)	(0.00417)	(0.00416)	(0.00416)	(0.00429)	(0.00429)
Ind. Treatment	-0.0164***	-0.00824				
* SOX	(0.00440)	(0.00525)				
Ind. Distance		-0.134*	-0.181***			
* SOX		(0.0524)	(0.0438)			
Audit Treatment				0.0201**	0.0146	
* SOX				(0.00704)	(0.0159)	
Audit Distance					0.0172	0.0551**
* SOX					(0.0361)	(0.0174)
Log Market Cap.	-0.0181***	-0.0181***	-0.0182***	-0.0183***	-0.0184***	-0.0184***
	(0.00173)	(0.00173)	(0.00173)	(0.00172)	(0.00178)	(0.00178)
Asset Growth	-0.000332*	-0.000329*	-0.000327*	-0.000326*	-0.000277	-0.000278
	(0.000150)	(0.000150)	(0.000150)	(0.000149)	(0.000162)	(0.000162)
Value/Assets	-0.000473	-0.000471	-0.000466	-0.000454	-0.000509	-0.000510
	(0.000584)	(0.000584)	(0.000584)	(0.000585)	(0.000640)	(0.000640)
Earnings/Assets	-0.0220**	-0.0219**	-0.0219**	-0.0218**	-0.0272***	-0.0272***
Observations	32,024	32,024	32,024	32,024	30,104	30,104
R-squared	0.763	0.763	0.763	0.763	0.763	0.763
Adj. R-squared	0.732	0.732	0.732	0.732	0.732	0.732

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Year and firm fixed effects, constant, and 2003 tax change dummy suppressed

Table 2.7: Dividend Payer Logit Regression

(Div. Payer=1)	(1)	(2)	(3)	(4)	(5)	(6)
	Indep	Indep	Indep	Audit	Audit	Audit
VARIABLES	Adj	Dist	Dist2	Adj	Dist	Dist2
SOX Dummy	-0.214	-0.214	-0.203	-0.204	-0.209	-0.210
	(0.113)	(0.113)	(0.113)	(0.113)	(0.116)	(0.116)
Ind. Treatment	0.0733	0.0734	0.121			
	(0.0762)	(0.0762)	(0.0673)			
Ind. Treatment	0.227	0.200				
* SOX	(0.131)	(0.158)				
Ind. Distance		0.448	1.358			
* SOX		(1.281)	(1.079)			
Audit Treatment				-0.0644	-0.0838	-0.0896
				(0.111)	(0.113)	(0.109)
Audit Treatment				0.185	-0.103	
* SOX				(0.202)	(0.449)	
Audit Distance					0.902	0.642
* SOX					(1.173)	(0.540)
Log Market Cap.	0.521***	0.520***	0.520***	0.519***	0.511***	0.511***
	(0.0106)	(0.0106)	(0.0106)	(0.0106)	(0.0111)	(0.0111)
Asset Growth	-0.0148	-0.0148	-0.0149	-0.0147	-0.0136	-0.0136
	(0.0416)	(0.0416)	(0.0415)	(0.0417)	(0.0408)	(0.0408)
Value/Assets	-0.447***	-0.446***	-0.446***	-0.446***	-0.482***	-0.482***
	(0.0366)	(0.0366)	(0.0365)	(0.0366)	(0.0340)	(0.0340)
Earnings/Assets	6.361***	6.360***	6.356***	6.367***	6.780***	6.780***
	(0.594)	(0.594)	(0.594)	(0.594)	(0.343)	(0.343)
Observations	32,008	32,008	32,008	32,008	30,087	30,087
Pseudo R-squared	0.391	0.391	0.391	0.391	0.389	0.389

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Year and industry (2-digit SIC) fixed effects, constant, and 2003 tax change dummy suppressed

Table 2.8: Dividend Change Logit Regression

	(Dividend Incr=1)		(Dividend Decr=1)	
	(1)	(2)	(3)	(4)
VARIABLES	Indep Adj	Audit Adj	Indep Adj	Audit Adj
SOX Dummy	-0.288*	-0.274*	0.483	0.484
	(0.115)	(0.115)	(0.285)	(0.285)
Ind. Treatment	0.131		0.320*	
	(0.0800)		(0.124)	
Ind. Treatment	0.227		0.320	
* SOX	(0.128)		(0.210)	
Audit Treatment		-0.0135		-0.274
		(0.109)		(0.205)
Audit Treatment		-0.00639		0.625
* SOX		(0.200)		(0.332)
Log Market Cap.	0.426***	0.423***	0.0167	0.0115
	(0.0111)	(0.0112)	(0.0152)	(0.0152)
Asset Growth	-0.109	-0.108	-0.00431	-0.00419
	(0.171)	(0.170)	(0.0222)	(0.0215)
Value/Assets	-0.259***	-0.259***	-0.114**	-0.115**
	(0.0394)	(0.0395)	(0.0414)	(0.0415)
Earnings/Assets	6.046***	6.054***	1.191*	1.213*
	(0.864)	(0.862)	(0.499)	(0.499)
Observations	31,477	31,477	30,828	30,828
Pseudo R-squared	0.303	0.302	0.0686	0.0675

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Year and industry (2-digit SIC) fixed effects, constant,
and 2003 tax change dummy suppressed

Table 2.9: Compensation Regression to Create Overpayment Residual

VARIABLES	(1) Main
Log Market Capitalization	0.183***
	(0.0067)
Log Debt	0.137***
	(0.0048)
Percent Risky Compensation	2.160***
	(0.0279)
Constant	4.315***
	(0.0315)
Observations	18798
R-squared	0.637
Adj. R-squared	0.635

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Industry and year fixed effects suppressed

Table 2.10: Compensation Residual Regression

VARIABLES	(1) Indep Adj	(2) Indep Dist	(3) Indep Dist2	(4) Audit Adj	(5) Audit Dist	(6) Audit Dist2
SOX Dummy	-0.129***	-0.129***	-0.129***	-0.132***	-0.135***	-0.134***
	(0.0159)	(0.0159)	(0.0157)	(0.0157)	(0.0159)	(0.0159)
Ind. Treatment	0.0229	0.0229	0.0234			
	(0.0376)	(0.0376)	(0.0346)			
Ind. Treatment	-0.00918	0.00253				
* SOX	(0.0729)	(0.0941)				
Ind. Distance		-0.160	-0.147			
* SOX		(0.973)	(0.758)			
Audit Treatment				-0.0860	-0.0865	-0.0725
				(0.0518)	(0.0519)	(0.0511)
Audit Treatment				0.143	0.281	
* SOX				(0.103)	(0.278)	
Audit Distance					-0.510	0.397
* SOX					(1.007)	(0.361)
Constant	0.320***	0.320***	0.320***	0.322***	0.322***	0.322***
	(0.00807)	(0.00807)	(0.00804)	(0.00796)	(0.00806)	(0.00805)
Observations	5,455	5,455	5,455	5,455	5,314	5,314
R-squared	0.014	0.014	0.014	0.014	0.015	0.014
Adj. R-squared	0.0130	0.0129	0.0130	0.0133	0.0138	0.0139

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
No fixed effects

Chapter 3

Bank Dividend Policy Responses to the Sarbanes-Oxley Act and the 2003 Tax Changes

Abstract: This paper examines bank dividend policy responses to two significant law changes: the passage of the Sarbanes-Oxley Act (hereafter, "SOX," passed July 2002) and the passage of the Jobs and Growth Tax Relief Act of 2003 (hereafter, "Tax Reform," passed May 2003). According to agency models (e.g., Easterbrook (1984) and Jensen (1986)), dividends provide a way for shareholders to monitor managers. Because SOX mandated controls on all U.S. public firms, these agency models predict a lowering of dividends after SOX. The Tax Reform lowered the dividend tax rate and set it equal to the capital gains tax rate. The same agency models predict that a dividend tax rate decrease induces firms to adopt or increase dividends. Researchers find a large increase in the incidence and size of dividends after the Tax Reform in most major industries (e.g., Chetty and Saez (2005); Blouin, Raedy and Shackelford (2004)). I find no evidence of a change in dividend behavior in the banking sector after SOX or after the Tax Reform.

3.1 Introduction

When examining the payment of dividends by public firms, most researchers exclude banks (for example, Fama and French (2001); Grullon and Michaely (2002); Chetty and Saez (2005), and DeAngelo, DeAngelo and Stulz (2006)). Researchers often cite the regulation of banks as the reason for exclusion. Regulatory demands create different incentives and controls on dividend payment. Historically, banks have also had a much different pattern of dividend payment. Banks must balance both the need of capital to cover credit issues and the use of leverage to improve shareholder gains. The strong majority of banks pay regular dividends, but only 25% of firms in Chetty and Saez (2005) do.[1]

Banks are required to maintain capitalization ratios. Because dividends are paid out of capital, these ratios constrain the amount of dividends that can be paid. Given the importance of bank capital for the stability of the financial system, it is important to better understand how banks determine their dividend policies. The recent financial crisis has increased the focus on bank capital. Many researchers have suggested increasing capitalization requirements for financial stability (e.g., BIS (2009); Acharya, Gujral and Shin (2009)). Berger and Bouwman (2009) analyze crises in the U.S. and find that higher capital allows banks to improve market share gains and survival probability during banking crises.

This paper provides insight on bank dividend policy by examining banks' responses to two significant law changes: the passage of the Sarbanes-Oxley Act (hereafter, "SOX," passed July 2002) and the passage of the Jobs and Growth Tax Relief Act of 2003 (hereafter, "Tax Reform," passed May 2003). These sharp changes in the operating environment of public firms provide opportunities to explore the dividend behavior of banks, an industry often ignored by the dividend literature.[2] This paper also continues the work of Vojtech (2011) by specifically examining the relationship between information asymmetry and dividend policy at banks. Financial institutions and utilities were excluded from that paper.

[1] This percent of firms is based on dividend payers after the tax change (p. 793).

[2] Chetty and Saez (2005) (p. 798) specifically leave understanding the response of the financial and utility industries to the Tax Reform as a question for future research.

According to agency models (e.g., Easterbrook (1984) and Jensen (1986)), dividends provide a way for shareholders to mitigate agency problems. Dividends pull "free cash flow" out of the firm, limiting the misinvestment of funds by managers (Jensen, 1986). Because SOX mandated more controls on all U.S. public firms such as independent directors and internal controls, these models predict a lowering of dividends after the law change. Less monitoring from dividends was needed after SOX.

Macey and O'Hara (2003) discuss the importance of corporate governance for banks. Banks generally play an important role in governing other firms. The authors also describe bank balance sheets as "notoriously opaque." There has been a lot of innovation in financial products and services which can make banks complex firms. This complexity increases the information asymmetry between managers and shareholders. I include proxies for the level of information asymmetry in my testing, but I find little evidence of a relationship between dividend policy and information asymmetry.

Akhigbe and Martin (2006) study the market valuation of financial services firms during the SOX legislation. They find that the wealth-effect changes can be explained by the information disclosure practices and governance characteristics of the firm. This matches a compliance cost hypothesis. In response to the law, firms incurring compliance costs may have lowered other monitoring tools. This paper will test if banks with relatively more information asymmetry lowered dividends after SOX.

Dividend agency models also predict an increase in dividends when the dividend tax rate is lowered. Lower tax rates decrease the marginal cost of paying dividends. Prior to the 2003 law change, dividends were taxed at the personal income rate of the investor (a high of 35%), and the top capital gains tax rate was 20%. The Tax Reform created a top dividend tax rate of 15% and lowered the top capital gains tax rate to match (Auerbach and Hassett, 2005).[3] I do not find evidence that bank dividend behavior changed after the Tax Reform. The

[3]Even though the rates are equal, dividends create tax liabilities for all taxable agents, but capital gains only apply for those taxable agents willing to sell their shares. Tax treatment through capital gains has the further advantage of being deferrable.

aggregate amount of dividends rose a large amount between 2003 and 2004, but this was led by a handful of the largest banks.

Other researchers have found a change in behavior around the Tax Reform when examining a broad set of firms from various industries (e.g., Chetty and Saez (2005); Blouin, Raedy and Shackelford (2004)). These papers document an immediate response to the law change through increases in dividends paid and increases in dividend initiations. While the sample used by Blouin, Raedy and Shackelford (2004) includes financial firms, the overall change in behavior may have been driven by non-bank firms.

My results are also contrary to what Casey and Dickens (2000) found when looking at bank dividend policy following an earlier dividend tax change, the Tax Reform Act of 1986 (TRA).[4] These authors find some evidence of increases in dividend payout rates in the years directly following the tax change.

The next section briefly reviews the law changes and the timing. Section 3.3 shows the patterns of dividend payment by banks around the passage of SOX and the Tax Reform. Because this industry is often excluded in the literature, this section helps show some of the patterns of bank dividends and the characteristics of bank dividend payers. Section 3.4 separately tests for change in dividend behavior following the two law changes. Section 3.5 concludes.

3.2 Overview of Law Changes and Timing

SOX was designed to improve corporate disclosure. The title page describes SOX as "an act to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes" (Congress, 2002). SOX significantly increased the reporting requirements of U.S. public firms.

Important aspects of the law include a requirement for the manager to certify financial statements, a requirement that all audit committee members be

[4]TRA lowered the difference between the dividend tax rate and the capital gains tax rate. Before TRA, the maximum marginal rate for dividends was 50% while capital gains was 20%. TRA changed the rates to 38.5% and 28%, respectively (Casey and Dickens, 2000).

independent, and a requirement for firms to disclose details of their internal controls.[5] This paper assumes that the combination of these measures helped decrease the information asymmetry between the manager and shareholders. Because this regulation created and increased the use of monitoring mechanisms, agency models predict firms to decrease other monitoring tools such as dividends. This paper tests to see if dividend policy changed.

SOX progressed through Congress in the midst of earnings restatements by several firms. Researchers have argued that those announcements helped the law pass through Congress relatively quickly (Oppel, 2002; Oppel and Altman, 2002; Li, Pincus and Rego, 2008). Representative Oxley introduced his bill to the House on February 14, 2002, and Senator Sarbanes introduced S. 2673 in the Senate on June 25, 2002. President George Bush signed SOX into law on July 30, 2002.

As detailed in Auerbach and Hassett (2005), the passage the Tax Reform was also quick by Congressional standards. The dividend tax change was officially proposed by President George Bush in January 7, 2003, and he signed the Jobs and Growth Tax Relief Reconciliation Act of 2003 into law on May 28, 2003. The eventual law was different from the original proposal, but both included a significant lowering of dividend taxes. The final law also included a provision to retroactively lower the dividend tax to the beginning of 2003.

The Tax Reform significantly lowered the tax costs of dividends for investors. Dividend agency models predict that the lower cost will induce firms to increase dividends.

3.3 Dividend Policy

3.3.1 Data

The data for all of the analyses in this paper come from the Compustat Bank Fundamentals Annual database (Bank Compustat), Compustat North America Fundamentals Annual database (Compustat), and the Center for Research in Security Prices (CRSP) database. All of these data sets were accessed through

[5]See Coates (2007) for a more detailed discussion of SOX.

Wharton Research Data Services. The Compustat databases contain market and financial data on U.S. banks and on public U.S. firms. The CRSP database has daily stock price and dividend data for U.S. firms. Compustat and CRSP are primary data sources for archival research in the finance and accounting literature.[6]

The Bank Fundamental database includes primarily depository institutions. This paper uses data for firms in SIC codes 6020, 6035, and 6036.[7] The Bank Samples begin from this database which is merged with the Compustat and the CRSP data. Only public banks are examined which is defined as having a CRSP share code of 10 or 11 (ordinary common shares).[8] Observations must have assets, lagged assets, market capitalization, book equity, dividends, earnings before extraordinary, provision for loan losses, and gross loans. Observations must be present in the data set from fiscal year 1999 through fiscal year 2005. This leaves 287 banks. To simplify testing of behavior after the law changes, firms with non-calendar fiscal years are also excluded, leaving 252 banks in the Bank Sample.

The CRSP Monthly File provides detailed data on dividends including a classification of the dividend type. In order to focus on ordinary dividends, dividends classified with a distribution code 1222, 1232, 1242, and 1252 are the focus of this analysis.[9] Special dividends are also included in some of the analyses (distribution code=1272).

3.3.2 Overview of Annual Dividends–Bank Compustat

Unlike most industrial firms, most banks pay a dividend.[10] In the Bank Sample, most firms were dividend payers. Over 95% of the firms (242) paid a dividend at least one dividend during the sample period, and over 85% of the

[6]See the data appendix for more details on the data sets and on the specific Compustat and CRSP variables used.

[7]Descriptions of these SIC codes are commercial banks; savings institutions, federally chartered; and savings institutions, not federally chartered. This paper will use the term "banks" to refer to all depository institutions in the sample.

[8]This follows Fama and French (2001).

[9]The first digit=1 designates ordinary dividend, the second digit=2 means paid in cash in U.S. dollars, and the third digit refers to frequency (2=monthly, 3=quarterly, 4=semi-annual, and 5=annual. The fourth digit refers to tax status (2=taxable at same rate as dividends).

[10]This paper uses the term "industrial" to refer to firms generally included in research on dividends. Industrial firms include all publicly traded firms excluding financial firms and utilities.

firms (218) paid a dividend each year.

For industrial firms, dividend payers tend to be large, well-established, and profitable firms (Fama and French, 2001). These patterns also hold for the Bank Sample. Table 3.1 summarizes the key characteristics of dividend payers and non-dividend payers for the years between 2000 and 2005. Panel A shows the summary data for banks that paid a dividend each year in the sample period. Panel B shows the same statistics for banks that did not pay a dividend each year.

The annual dividend payers (Panel A) are larger in market capitalization than the non-annual paying firms (Panel B), and annual dividend payers have higher profitability as measured as earnings before extraordinary items divided by assets. Asset growth is lower for annual dividend payers. These metrics match the Fama and French (2001) patterns. However, the relationship of Value/Assets and dividend payers for banks is different than industrial firms. The value-to-assets ratio is slightly higher for annual dividend payers. Also called the market-to-book ratio, this ratio is constructed similarly to Tobin's q. A higher ratio indicates that the market is expecting high earnings growth. For industrial firms, dividend payers tend to have a lower ratio than non-payers.

The other statistics are used in the testing section and many are more specific to bank characteristics. These metrics also show the differences between dividend paying firms and non-dividend paying firms. Loan growth is stronger for non-annual payers and earnings growth is lower. Non-annual dividend payers have on average a slightly larger percent of their assets consisting of loans. The capitalization of non-dividend payers is also higher as shown by common equity.

Most notably, non-annual dividend payers have much higher relative loan loss provisions (LLP) and realized gains(/losses). LLP is an expense taken to create reserves for loans that are written off. A higher percent of LLP to earnings suggests that the loan portfolio is risky relative to funding sources. The first definition of realized gains consists of investment securities. The second definition includes investment securities and other sales.[11] Large provisions and large realized gains can also be used to manage earnings which can increase information asymmetry

[11] See the data appendix (3.6) for more details.

(for example see Beatty, Chamberlain and Magliolo (1995) and Collins, Shackelford and Wahlen (1995)). I construct proxies from these metrics for the testing section.

Researchers have documented that dividend decreases are rare and that managers will engage in many strategies including selling assets or not adopting positive NPV projects in order to avoid dividend decreases (Brav, Graham, Harvey and Michaely, 2005). A firm generally adopts a dividend per share amount and slowly raises that amount over time. The Bank Sample shows many of the same characteristics.

Figure 3.1 summarizes dividend behavior of the Bank Sample by showing the number of firms paying a dividend, increasing their dividend, and decreasing their dividend. Throughout the period a significant portion of the firms is increasing their dividends. Decreases are much less common.

Figure 3.2 shows the aggregate dividend payment by the Bank Sample. Aggregate dividends increase each year at a fairly steady rate. There is a slight leveling off of dividends in 2002 with a recovery back to trend in 2003 and 2004. These changes in behavior coincide with the law changes. Testing for the existence of this relationship is done in section 3.4.

The ability to pay dividends is tied to the amount of capital created by a firm, the amount of earnings. Figure 3.3 shows the relationship between dividends and two definitions of earnings. The top graph shows the median payout rates for all firms, and the bottom graph shows the median dividends, earnings, and operating earnings for each year. Payout rates were fairly steady across the sample period though there is a slight dip in 2002. However, based on the bottom graph, the drop in payout rate appears to be due to strong earnings in 2002.

3.3.3 Overview of Monthly Dividends–CRSP

Because the passage of SOX and the Tax Reform occur around a year apart, more frequent data than annual may be useful to test behavior. This subsection will use monthly CRSP data merged with the Bank Compustat data. In order to create the largest sample, all banks are left in the sample (none of the data exclusions listed above are used). All dividend dates are based on declaration

dates.

Figure 3.4 shows the change in behavior around the passage of SOX. In the top graph, the number of firms that increased their ordinary dividends and the number of firms that initiated ordinary dividends are plotted. The bottom graph shows the number of firms that paid a special dividend. For each year, only the months of August through December are examined. This is to make the years comparable to the months after the passage of SOX.[12]

There is no change in the discernable pattern for ordinary dividends. The number of dividend increases falls after 2003, but that is two years after SOX. This evidence suggests that SOX did not impact the dividend behavior of banks. The bottom graph shows that the number of special dividends declined in 2001 and 2002. However, given the small sample and the economic environment, this is far from conclusive evidence in support of the hypothesis that dividends fell as a result of SOX mitigating agency problems.

Figure 3.5 shows the change in behavior around the passage of the Tax Reform. The construction is similar to that of figure 3.4 except that now the months of interest for each year are June through December in order to focus on the months after the passage of the Tax Reform. Again, there is not a discernable change in ordinary dividend behavior (top graph). There is a more pronounced increase in the number of special dividends between 2002 and 2003, rising from 13 to 20, but this is not a large change in behavior given that 17 special dividends were paid during the same period in 2001.

While there has so far been little evidence of a change in the number of dividend payers or of a change in the number of firms that increase/decrease dividends, it may be that the dividend payers are making larger increases in their dividends. Figure 3.6 shows the dividend change behavior for both of the law changes. The median change in dividends does not appear to change around the passage of either law. Nor does the median of dividend increases show a distinct pattern.

[12]Dividend initiation is simply defined as a dividend between August and December of this year but no dividend during the same months in the prior year. This assumes that dividend payers use a fixed schedule of payments.

3.4 Testing with Firm Characteristics

The testing in this section uses the Bank Sample (annual Bank Compustat data). While annual data may hide some of the immediate reaction to the law changes, annual data will capture the behavior change of all firms no matter the dividend payment frequency used (quarterly, semi-annual, etc.). Furthermore, the prior section provided little to no evidence that there was an immediate reaction to the law changes.

I use four proxies of agency problems related to information asymmetry. The first proxy is the percent of gross loans to assets. Some non-loan assets are necessary for operations but do not generally provide consistent earnings. Non-loan assets can consist of things such as cash on hand, the investment and securities portfolio, and bank branches. Banks that have more assets not devoted to loans (a low percent of gross loans to assets) are likely to have a more complicated operating model. This can increase the potential for information asymmetry.

The second proxy is LLP as a percent of earnings before extraordinary and LLP. Large loan loss provisions may indicate a complex and/or risky loan portfolio. LLP can also help target earnings. Because provisions lower earnings, large provisions can be made to make up for periods where managers were inflating earnings. Beatty, Chamberlain and Magliolo (1995) and Collins, Shackelford and Wahlen (1995) mention the use of LLP or gains on sales as a way to control earnings. A higher percent of LLP to earnings before extraordinary and LLP indicates more information asymmetry.

The third and fourth proxies are different definitions of realized gains and losses as a percent of earnings before extraordinary. These realized gains are not the primary function of the bank and could be used to manage firm earnings. Banks with a higher percent of realized gains to earnings before extraordinary are likely to have more information asymmetry.

In order to identify banks with more evidence of information asymmetry, I identify those banks with relatively extreme measures of these four proxies during the pre-SOX period. These are the firms that should be most responsive to the law changes. Firms that are in the *lowest* quartile of loans-to-assets have a low gross

loans dummy value set to one. All other firms have the dummy set to zero. The other dummy variables are constructed similarly. Firms that are in the *highest* decile of LLP as a percent of earnings have a high LLP dummy set to one. Firms that are in the *highest* decile of realized gains(/losses) as a percent of earnings have a high realized gains dummy set to one for each definition of realized gains. Firms classified as "treated" by the four definitions of information asymmetry (dummy is set to one) are 119, 78, 118, 121, respectively. There are 24 firms that are classified as one across all four measures.

3.4.1 Sarbanes-Oxley Act (SOX)

Table 3.2 shows the baseline regression analysis of dividend to earnings before extraordinary. The data is limited to between the years of 2000 and 2003 to focus on the time around the passage of SOX. These regressions only include firms with dividends and firms with positive earnings before extraordinary. Each subsequent column includes the different proxies of information asymmetry.

The first four RHS variables are based on characteristics that Fama and French (2001) found to be predictive of dividend payment. I use slightly different metrics in order to capture bank behavior. Loan growth is used instead of asset growth to better capture the investment opportunities of a bank. Earnings growth also captures life cycle. The last variable controls for the regulatory requirement that a bank be well capitalized.[13] High capitalization is also related to past profitability. The signs on the coefficients are as expected and are statistically significant. Large banks with extra capital and low growth opportunities pay more of their earnings out in dividends.

Only one of the proxies for information asymmetry is statistically significant. Firms that showed a relatively high percent of loan loss provisions before SOX also pay out more of their earnings with dividends. The positive sign matches the dividend agency model prediction. Firms with more information asymmetry use more dividends.

[13]Common equity is the primary component of tier 1 capital. I use this as the control because several firms are missing the tier 1 capital ratio in the Bank Sample.

Table 3.3 shows the regression results of adding in an interaction term between the proxy and SOX. Again, only the LLP proxy is statistically significant, and both the proxy and the interacted term have the expected signs. After SOX, the firms that have relatively high LLP lower their payout rate. The coefficients on the other dummy variables and interacted terms are not statistically different from zero. Only the point estimates of the loan composition coefficients match the predicted sign for both the proxy and the interacted term. According to the point estimates, firms with a relatively low amount of their balance sheet consisting of loans pay more of their earnings out in dividends but a lower amount after SOX.

Another way to look at a change in dividend behavior is to look at dividend growth. The next set of tests uses the change in the level of the dividend scaled by lagged assets $\Big((Div_t - Div_{t-1})/Assets_{t-1}\Big)$. Table 3.4 shows the results.

The signs on two of the baseline variables are not as expected. The coefficients on loan growth and the value-to-assets ratio are positive and statistically significant. These results suggest that firms with more loan growth and trade at a high Tobin's q increase dividends more than other firms.

None of coefficients on the information asymmetry proxies or on the interacted terms are statistically significant. Only the first two proxies and interacted terms have signs that match expectations.

Overall, there is little evidence that firms with more information asymmetry changed their dividend behavior after SOX. Firms that used a high level of provisioning before SOX, possibly in an effort to manage earnings, did show some evidence of lowering payout rates after SOX.

3.4.2 Tax Reform

I next test the behavior around the tax change. The years of focus are now from 2002 to 2005.

Table 3.5 shows the regression results using dividend payout rate (dividends/earnings before extraordinary). To save space, the baseline regressions are not shown. Instead, this first set of results include the interacted terms. This time the Tax Reform is the law change. As before, firms that do not pay a dividend or

that have negative earnings are excluded.

The signs on the baseline variables are as expected and are generally statistically significant. The signs on the interacted terms and on the information proxies are also as expected, but none of them are statistically different from zero. Notice that now the interaction is expected to be positive. According to the agency models, shareholders of firms with information asymmetry will demand more dividends than those at other firms when the cost of issuing dividends decreases.

Table 3.6 shows the results testing dividend change. As seen in table 3.4, high loan growth is related to dividend growth. This is not what is expected from the perspective of investment opportunities. The signs on other baseline variables are either as expected or not statistically different from zero. Also notice that none of the year dummies are statistically different from zero. Firms are not more likely to increase dividends after the Tax Reform.

Generally, the information asymmetry proxies do not show statistically significant results. The coefficient on the LLP dummy is statistically significant but not the expected sign. Firms that used high LLP before SOX had lower dividend increases than other firms in the later period (2002-2005).

Overall, the testing results do not show a change in dividend policy after the Tax Reform. This is surprising given the strong reaction by other industrial firms as documented by Chetty and Saez (2005) and Blouin, Raedy and Shackelford (2004). Chetty and Saez (2005) even refer to an increase in dividends by financial firms. While this seems to contradict the results reported in this paper, the increase in dividends by banks in my sample is really led by the largest banks.

Recall that figure 3.2 showed a substantial increase in aggregate dividends in 2004. Throughout the sample period, the top ten dividend payers pay roughly 70% of the aggregate dividends. However, the top ten dividend payers pay 70% of dividends in 2003 but 72% in 2004. Their dividends grew by 32% as opposed to 16% for the rest of the sample.

3.5 Concluding Remarks

The dividend literature often excludes banks. This paper looked specifically at bank dividend behavior. The majority of banks regularly pay dividends, and the characteristics of bank dividend payers are similar to dividend payers in the other industries. Namely, large, highly profitable banks pay dividends.

Tests of bank dividend behavior around the Sarbanes-Oxley Act of 2002 and the 2003 tax reforms do not match the predictions of dividend agency problems. Banks with evidence of larger information asymmetry did not lower dividends after SOX nor did they increase dividends after the Tax Reform. I found some evidence of a relationship between information asymmetry and dividend payout policy but only through the proxy of LLP as a share of earnings before LLP. Aggregate dividends paid by banks did appear to respond to the Tax Reform by 2004, but the large increase in dividends was due to the largest banks.

3.6 Data Appendix

Dividends = (dvc) if using Bank Compustat. If using CRSP, dividends are based on declaration date (Distribution code 1222, 1232, 1242, 1252 for ordinary or 1272 for special).

Preferred stock = preferred stock liquidating value (pstkl) [or preferred stock redemption value (pstkrv), or preferred stock par value (pstk)]

Book equity = stockholders' equity (seq) [or common equity (ceq) + preferred equity]

Market capitalization = stock price at the end of the period (prcc_f) $*$ common shares outstanding (csho)

Market value of the firm (Value) = total assets (at) − book equity + market capitalization

Asset growth = $\frac{A_t}{A_{t-1}} - 1$

Earnings before extraordinary items (Earnings) = income before extraordinary items (ib)

Gross loans = loans, net of total allowance for loan losses (lntal) + reserve for

loan/asset losses (rll)

Loan growth $= \frac{\text{Gross loans}_t}{\text{Gross loans}_{t-1}} - 1$

Realized gains(/losses) = investment securities, total gain (loss) (isgt)

Realized gains(/losses)2 = investment securities, total gain (loss) (isgt) + gains/losses other (glo)

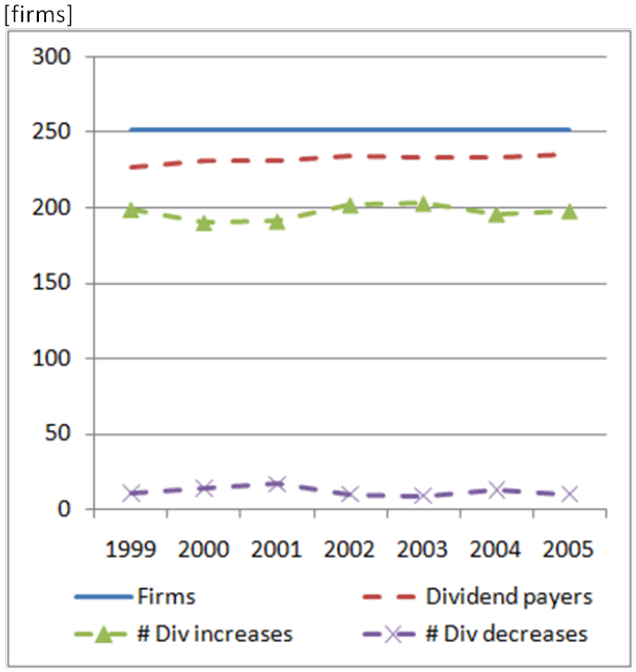

Figure 3.1: Bank Sample: Number of Dividend Payers, Dividend Increases, and Dividend Decreases

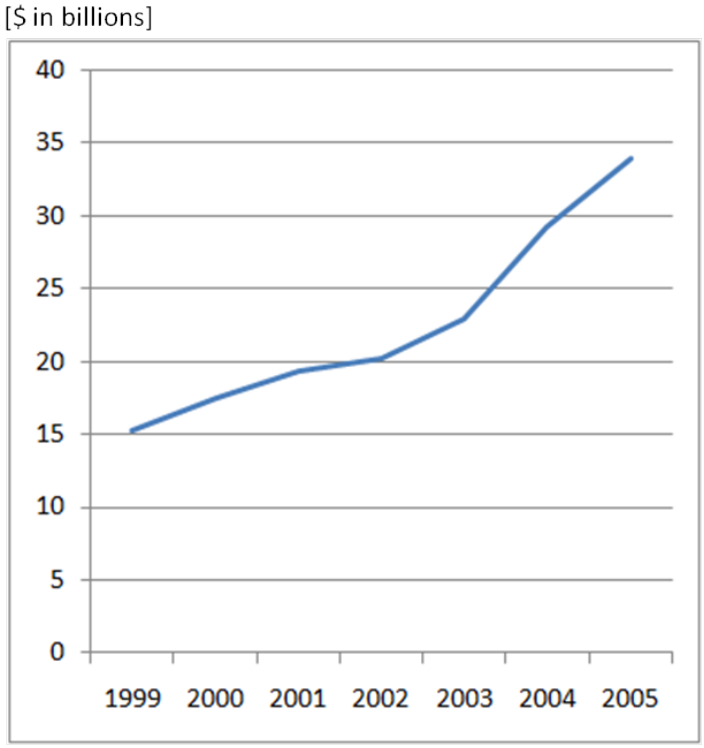

Figure 3.2: Bank Sample: Aggregate Dividends

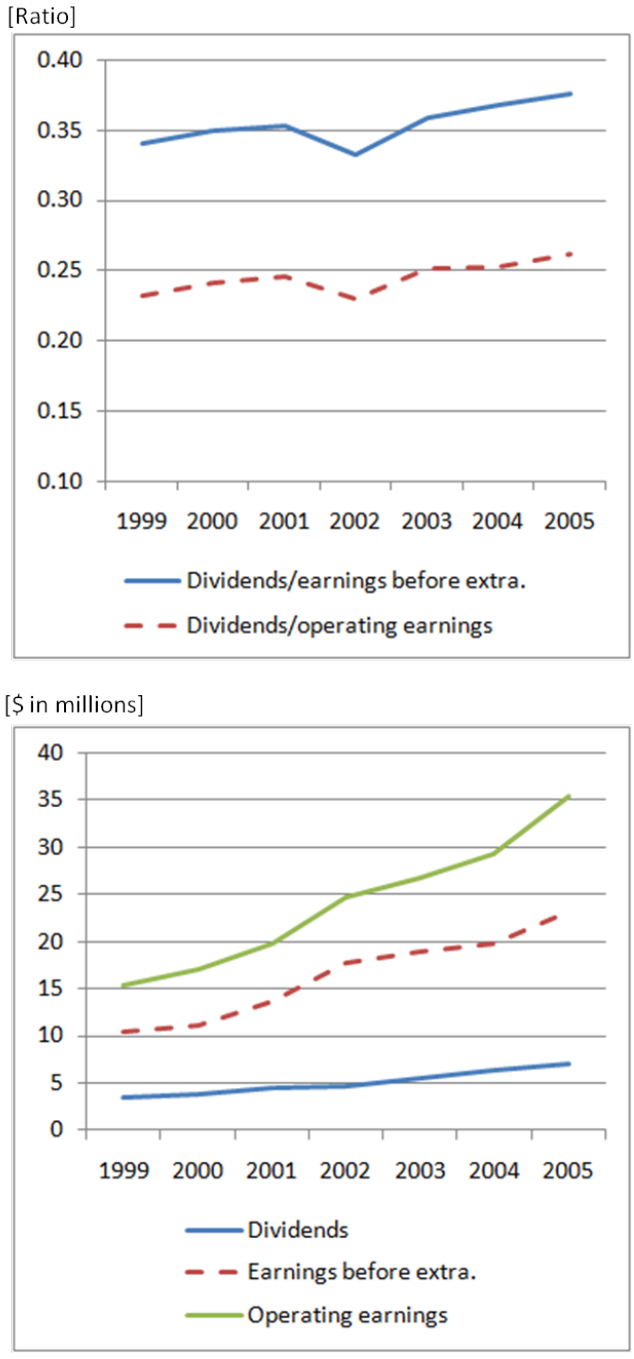

Figure 3.3: Bank Sample: Payout Rate

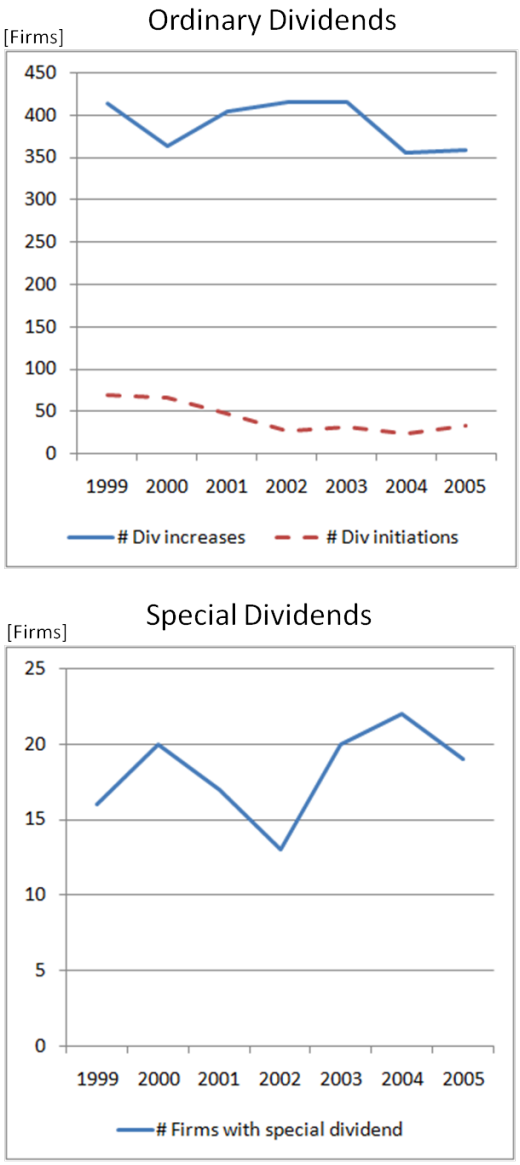

Figure 3.4: CRSP Sample: Dividends Around the Passage of SOX

Sources: CRSP and Compustat. Based on firms classified in SIC code 6020, 6035, or 6036 in Compustat. Note: Only the months of August through December are used for each year. Dividend increase defined as a larger dividends per share August-December of current year versus August-December of prior year. Dividend initiation defined as paying a dividend between August-December of this year versus nothing August-December of prior year.

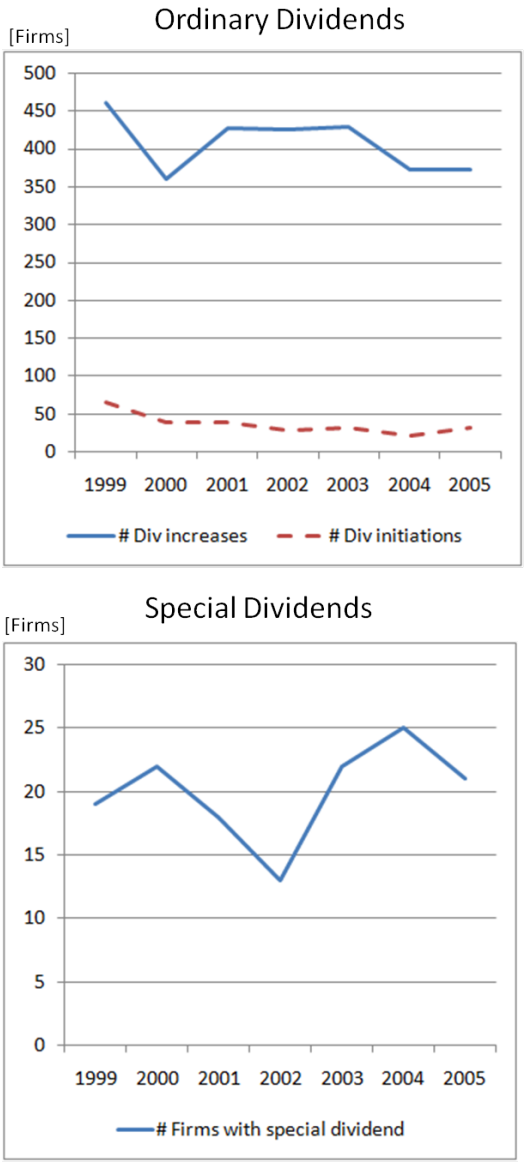

Figure 3.5: CRSP Sample: Dividends Around the Passage of the Tax Reform

Sources: CRSP and Compustat. Based on firms classified in SIC code 6020, 6035, or 6036 in Compustat. Note: Only the months of June through December are used for each year. Dividend increase defined as a larger dividends per share June-December of current year versus June-December of prior year. Dividend initiation defined as paying a dividend between June-December of this year versus nothing June-December of prior year.

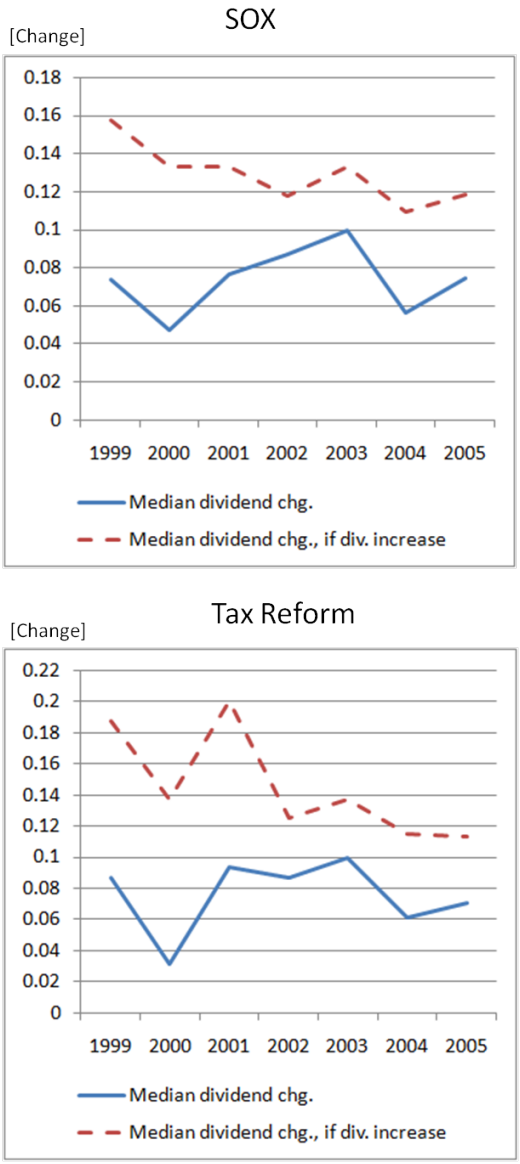

Figure 3.6: CRSP Sample: Dividend Changes

Sources: CRSP and Compustat. Based on firms classified in SIC code 6020, 6035, or 6036 in Compustat. Note: Only the months of August through December are used for SOX and July through December for Tax Reform. Dividend increase defined as a larger dividend per share in the current year versus the prior year in the months listed above.

Table 3.1: Bank Annual: Summary Statistics Dividend Payers vs. Non-dividend Payers

Panel A
Paid a dividend each year

Variable	Obs	Mean	Std. dev.
Log market capitalization	1308	6.049	1.880
Asset growth	1308	0.120	0.166
Value / assets	1308	1.084	0.067
Earnings before extra. / assets	1308	0.011	0.004
Loan growth	1308	0.125	0.175
Earnings growth (before extra.)	1308	0.092	1.170
Lagged common equity/ assets	1308	0.088	0.026
Gross loans / assets	1308	0.653	0.116
LLP / earnings before extra. & LLP	1308	0.149	1.843
Realized gains(/losses) / earnings before extra.	1283	0.029	0.122
Realized gains(/losses)2 / earnings before extra.	1219	0.109	0.269

Panel B
Did not pay a dividend every year

Variable	Obs	Mean	Std. dev.
Log market capitalization	204	4.533	1.227
Asset growth	204	0.181	0.273
Value / assets	204	1.043	0.062
Earnings before extra. / assets	204	0.006	0.012
Loan growth	204	0.187	0.324
Earnings growth (before extra.)	204	0.073	5.377
Lagged common equity/ assets	204	0.094	0.047
Gross loans / assets	204	0.663	0.161
LLP / earnings before extra. & LLP	204	0.260	0.769
Realized gains(/losses) / earnings before extra.	202	0.058	0.522
Realized gains(/losses)2 / earnings before extra.	193	1.978	21.767

Table 3.2: SOX Testing: Baseline Dividend Payout Regressions

VARIABLES	Exp. sign	(1) Baseline	(2) Low Loan Comp.	(3) High Prov.	(4) High Realized	(5) High Realized2
Log market capitalization	+	0.0644***	0.0619***	0.0566***	0.0653***	0.0641***
		(0.0121)	(0.0123)	(0.0122)	(0.0123)	(0.0122)
Loan Growth	-	-0.291**	-0.281**	-0.257*	-0.290**	-0.289**
		(0.103)	(0.104)	(0.103)	(0.103)	(0.103)
Earnings growth	-	-0.0274*	-0.0279*	-0.0285*	-0.0279*	-0.0274*
		(0.0118)	(0.0118)	(0.0117)	(0.0118)	(0.0118)
Value/ assets	-	-1.112***	-1.094**	-0.693*	-1.142***	-1.127***
		(0.331)	(0.332)	(0.342)	(0.336)	(0.335)
Lagged common equity/ assets	+	2.061**	2.047**	2.185**	2.050**	2.064**
		(0.718)	(0.718)	(0.711)	(0.718)	(0.718)
Yr 2001		-0.0298	-0.0282	-0.0309	-0.0294	-0.0296
		(0.0518)	(0.0519)	(0.0513)	(0.0519)	(0.0519)
Yr 2002		-0.123*	-0.121*	-0.121*	-0.123*	-0.123*
		(0.0522)	(0.0522)	(0.0517)	(0.0522)	(0.0522)
Yr 2003		-0.0555	-0.0531	-0.0680	-0.0546	-0.0547
		(0.0529)	(0.0529)	(0.0524)	(0.0529)	(0.0529)
Dummy: Low gross loans	+		0.0422			
			(0.0372)			
Dummy: High LLP	+			0.182***		
				(0.0421)		
Dummy: High real. gains	+				-0.0201	
					(0.0370)	
Dummy: High real. gains 2	+					-0.0128
						(0.0374)
Constant		1.157***	1.131***	0.689*	1.194***	1.180***
		(0.320)	(0.320)	(0.334)	(0.327)	(0.327)
Observations		920	920	920	920	920
Adj. R-squared		0.0458	0.0461	0.0641	0.0451	0.0449

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 3.3: SOX Testing: Dividend Payout Regressions with Interactions

VARIABLES	Exp. sign	(1) Low Loan Comp.	(2) High Prov.	(3) High Realized	(4) High Realized2
Log market	+	0.0625***	0.0568***	0.0659***	0.0642***
capitalization		(0.0123)	(0.0121)	(0.0123)	(0.0123)
Loan Growth	-	-0.285**	-0.254*	-0.292**	-0.289**
		(0.103)	(0.102)	(0.103)	(0.103)
Earnings growth	-	-0.0287*	-0.0289*	-0.0279*	-0.0274*
		(0.0118)	(0.0117)	(0.0118)	(0.0118)
Value/ assets	-	-1.116***	-0.705*	-1.134***	-1.130***
		(0.332)	(0.341)	(0.336)	(0.337)
Lagged common	+	2.070**	2.170**	2.052**	2.063**
equity/ assets		(0.717)	(0.710)	(0.719)	(0.719)
Yr 2001		-0.0274	-0.0306	-0.0298	-0.0296
		(0.0518)	(0.0512)	(0.0519)	(0.0519)
Yr 2002		-0.0673	-0.0734	-0.139*	-0.121*
		(0.0621)	(0.0561)	(0.0578)	(0.0576)
Yr 2003		0.000411	-0.0196	-0.0705	-0.0531
		(0.0628)	(0.0570)	(0.0586)	(0.0587)
Interaction: SOX*	-	-0.115			
Low gross loans		(0.0728)			
Dummy:	+	0.0994			
Low gross loans		(0.0519)			
Interaction: SOX*	-		-0.171*		
High LLP			(0.0801)		
Dummy:	+		0.267***		
High LLP			(0.0578)		
Interaction: SOX*	-			0.0337	
High real. gains				(0.0535)	
Dummy:	+			-0.0254	
High real. gains				(0.0380)	
Interaction: SOX*	-				-0.00337
High real. gains 2					(0.0533)
Dummy:	+				-0.0122
High real. gains 2					(0.0384)
Constant		1.123***	0.678*	1.185***	1.182***
		(0.320)	(0.334)	(0.327)	(0.328)
Observations		920	920	920	920
Adj. R-squared		0.0477	0.0677	0.0445	0.0439

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 3.4: SOX Testing: Dividend Change Regressions with Interactions

VARIABLES	Exp. sign	(1) Low Loan Comp.	(2) High Prov.	(3) High Realized	(4) High Realized2
Log market capitalization	+	0.00232	0.00261	0.00295	0.00260
		(0.00201)	(0.00200)	(0.00200)	(0.00200)
Loan Growth	-	0.264***	0.263***	0.261***	0.262***
		(0.0169)	(0.0168)	(0.0168)	(0.0168)
Earnings growth	-	-0.000764	-0.000728	-0.000636	-0.000659
		(0.00192)	(0.00192)	(0.00192)	(0.00192)
Value/ assets	-	0.245***	0.249***	0.247***	0.243***
		(0.0540)	(0.0562)	(0.0547)	(0.0548)
Lagged common equity/ assets	+	0.922***	0.924***	0.926***	0.926***
		(0.117)	(0.117)	(0.117)	(0.117)
Yr 2001		0.00418	0.00390	0.00372	0.00391
		(0.00844)	(0.00843)	(0.00843)	(0.00844)
Yr 2002		-0.00414	0.000928	-0.0115	-0.00684
		(0.0101)	(0.00924)	(0.00940)	(0.00938)
Yr 2003		-0.00877	-0.00386	-0.0163	-0.0115
		(0.0102)	(0.00939)	(0.00953)	(0.00955)
Interaction: SOX* Low gross loans	-	-0.00112			
		(0.0119)			
Dummy: Low gross loans	+	0.00788			
		(0.00845)			
Interaction: SOX* High LLP	-		-0.0216		
			(0.0132)		
Dummy: High LLP	+		0.0144		
			(0.00952)		
Interaction: SOX* High real. gains	-			0.0138	
				(0.00869)	
Dummy: High real. gains	+			-0.000866	
				(0.00617)	
Interaction: SOX* High real. gains 2	-				0.00393
					(0.00867)
Dummy: High real. gains 2	+				-0.00220
					(0.00625)
Constant		-0.334***	-0.340***	-0.336***	-0.329***
		(0.0522)	(0.0549)	(0.0532)	(0.0534)
Observations		920	920	920	920
Adj. R-squared		0.294	0.295	0.295	0.293

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Note that LHS variable is in percentage point terms:
$\Big((Div_t - Div_{t-1})/Assets_{t-1}\Big) * 100$

Table 3.5: Tax Reform Testing: Dividend Payout Regressions with Interactions

VARIABLES	Exp. sign	(1) Low Loan Comp.	(2) High Prov.	(3) High Realized	(4) High Realized2
Log market	+	0.0112*	0.00993	0.0130*	0.0123*
capitalization		(0.00560)	(0.00545)	(0.00557)	(0.00557)
Loan Growth	-	-0.276***	-0.253***	-0.284***	-0.281***
		(0.0566)	(0.0559)	(0.0563)	(0.0564)
Earnings growth	-	-0.0263**	-0.0257**	-0.0269**	-0.0265**
		(0.00874)	(0.00864)	(0.00873)	(0.00875)
Value/ assets	-	-0.615***	-0.398*	-0.570**	-0.580**
		(0.177)	(0.182)	(0.180)	(0.180)
Lagged common	+	4.267***	4.408***	4.309***	4.304***
equity/ assets		(0.349)	(0.345)	(0.348)	(0.349)
Yr 2003		0.0563	0.0452	0.0409	0.0505
		(0.0315)	(0.0281)	(0.0275)	(0.0276)
Yr 2004		0.0635*	0.0505	0.0481	0.0578*
		(0.0319)	(0.0287)	(0.0280)	(0.0281)
Yr 2005		0.0605	0.0530	0.0457	0.0553*
		(0.0312)	(0.0279)	(0.0271)	(0.0271)
Interaction: Tax03*	+	0.0108			
Low gross loans		(0.0411)			
Dummy:	+	0.0125			
Low gross loans		(0.0358)			
Interaction: Tax03*	+		0.0267		
High LLP			(0.0453)		
Dummy:	+		0.0759		
High LLP			(0.0400)		
Interaction: Tax03*	+			0.0408	
High real. gains				(0.0216)	
Dummy:	+			0.0115	
High real. gains				(0.0187)	
Interaction: Tax03*	+				0.0198
High real. gains 2					(0.0214)
Dummy:	+				0.0150
High real. gains 2					(0.0189)
Constant		0.617***	0.363	0.555**	0.569**
		(0.180)	(0.187)	(0.183)	(0.184)
Observations		923	923	923	923
Adj. R-squared		0.174	0.193	0.177	0.175

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 3.6: Tax Reform Testing: Dividend Change Regressions with Interactions

VARIABLES	Exp. sign	(1) Low Loan Comp.	(2) High Prov.	(3) High Realized	(4) High Realized2
Log market	+	0.00386*	0.00408*	0.00390*	0.00392*
capitalization		(0.00174)	(0.00171)	(0.00174)	(0.00174)
Loan Growth	-	0.167***	0.166***	0.167***	0.167***
		(0.0176)	(0.0176)	(0.0176)	(0.0176)
Earnings growth	-	0.00124	0.00130	0.00116	0.00118
		(0.00272)	(0.00272)	(0.00273)	(0.00273)
Value/ assets	-	0.0719	0.0433	0.0755	0.0799
		(0.0552)	(0.0572)	(0.0561)	(0.0560)
Lagged common	+	1.447***	1.440***	1.450***	1.451***
equity/ assets		(0.109)	(0.109)	(0.109)	(0.109)
Yr 2003		-0.00179	-0.00247	0.000180	0.00225
		(0.00982)	(0.00883)	(0.00858)	(0.00860)
Yr 2004		-0.00508	-0.00565	-0.00317	-0.00110
		(0.00992)	(0.00902)	(0.00875)	(0.00876)
Yr 2005		-0.0124	-0.0136	-0.0104	-0.00823
		(0.00972)	(0.00876)	(0.00847)	(0.00845)
Interaction: Tax03*	+	0.00939			
Low gross loans		(0.0128)			
Dummy:	+	-0.00866			
Low gross loans		(0.0112)			
Interaction: Tax03*	+		0.0219		
High LLP			(0.0142)		
Dummy:	+		-0.0271*		
High LLP			(0.0126)		
Interaction: Tax03*	+			0.00477	
High real. gains				(0.00673)	
Dummy:	+			-0.000851	
High real. gains				(0.00583)	
Interaction: Tax03*	+				-0.000138
High real. gains 2					(0.00668)
Dummy:	+				0.00541
High real. gains 2					(0.00589)
Constant		-0.193***	-0.160**	-0.201***	-0.208***
		(0.0560)	(0.0587)	(0.0573)	(0.0572)
Observations		923	923	923	923
Adj. R-squared		0.246	0.250	0.246	0.247

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05
Note that LHS variable is in percentage point terms:
$\Big((Div_t - Div_{t-1})/Assets_{t-1}\Big) * 100$

Bibliography

Aboody, David and Ron Kasznik, "CEO Stock Option Awards and the Timing of Corporate Voluntary Disclosures," *Journal of Accounting and Economics*, 2000, *29*, 73–100.

Acharya, Viral V., Irvind Gujral, and Hyun Song Shin, "Dividends and Bank Capital in the Financial Crisis of 2007-2009," *Working Paper*, March 2009.

Akhigbe, Aigbe and Anna D. Martin, "Valuation Impact of Sarbanes-Oxley: Evidence from Disclosure and Governance Within the Financial Services Industry," *Journal of Banking & Finance*, 2006, *30* (3), 989–1006.

Allen, Franklin and Roni Michaely, *Chapter 7 Payout policy*, Vol. 1, Part 1 of *Handbook of the Economics of Finance*, Elsevier, 2003.

_ **, Antonio E. Bernardo, and Ivo Welch**, "A Theory of Dividends Based on Tax Clienteles," *The Journal of Finance*, December 2000, *55* (6), 2499–2536.

Anderson, Ronald C., Sattar A. Mansi, and David M. Reeb, "Board Characteristics, Accounting Report Integrity, and the Cost of Debt," *Journal of Accounting and Economics*, 2004, *37*, 315–342.

Auerbach, Alan J., "Wealth Maximization and the Cost of Capital," *The Quarterly Journal of Economics*, August 1979, *93* (3), 433–446.

_ **and Kevin A. Hassett**, "The 2003 Dividend Tax Cuts and the Value of the Firm: An Event Study," *NBER Working Paper No. 11449*, June 2005.

Beasley, Mark S., "An Empirical Analysis of the Relation Between the Board of Director Composition and Financial Statement Fraud," *The Accounting Review*, October 1996, *71* (4), 443–465.

Beatty, Anne, Sandra L. Chamberlain, and Joseph Magliolo, "Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings," *Journal of Accounting Research*, Autumn 1995, *33* (2), 231–261.

Berger, Allen N. and Christa H. S. Bouwman, "Bank Capital, Survival, and Performance Around Financial Crises," *Working Paper*, August 2009.

Bettis, J. C., J. L. Coles, and M. L. Lemmon, "Corporate Policies Restricting Trading by Insiders," *Journal of Financial Economics*, 2000, *57* (2), 191–220.

Bhagat, Sanjai and Bernard Black, "The Uncertain Relationship Between Board Composition and Firm Performance," *The Business Lawyer*, May 1999, *54*, 921–963.

Bhattacharya, Sudipto, "Imperfect Information, Dividend Policy, and "The Bird in the Hand" Fallacy," *The Bell Journal of Economics*, Spring 1979, *10* (1), 259–270.

BIS, Basel Committee on Banking Supervision, "Strengthening the Resilience of the Banking Sector," December 2009.

Blouin, Jennifer L., Jana Smith Raedy, and Douglas A. Shackelford, "The Initial Impact of the 2003 Reduction in the Dividend Tax Rate," *Working Paper*, October 2004.

Bradford, David F., "The Incidence and Allocation Effects of a Tax on Corporate Distributions," *Journal of Public Economics*, 1981, *15* (1), 1–22.

Brav, Alon, John R. Graham, Campbell R. Harvey, and Roni Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics*, 2005, *77*, 483–527.

Brown, Stephen, Kin Lo, and Thomas Lys, "Use of R^2 in Accounting Research: Measuring Changes in Value Relevance over the Last Four Decades," *Journal of Accounting and Economics*, 1999, *28* (2), 83–115.

Burgstahler, David and Ilia D. Dichev, "Earnings Management to Avoid Earnings Decreases and Losses," *Journal of Accounting and Economics*, 1997, *24*, 99–126.

Casey, K. Michael and Ross N. Dickens, "The Effects of Tax and Regulatory Changes on Commercial Bank Dividend Policy," *The Quarterly Review of Economics and Finance*, 2000, *40* (2), 279–293.

Chaney, Paul K. and Craig M. Lewis, "Earnings Management and Firm Valuation under Asymmetric Information," *Journal of Corporate Finance*, 1995, *1* (3-4), 319–345.

Chetty, Raj and Emmanuel Saez, "Dividend Taxes and Corporate Behavior: Evidence From the 2003 Dividend Tax Cut," *The Quarterly Journal of Economics*, August 2005, *120* (3), 791–833.

_ **and** _ , "An Agency Theory of Dividend Taxation," *NBER Working Paper No. 13538*, October 2007.

Cho, In-Koo and David M. Kreps, "Signaling Games and Stable Equilibria," *The Quarterly Journal of Economics*, May 1987, *102* (2), 179–222.

Coates, John C. IV, "The Goals and Promise of the Sarbanes-Oxley Act," *Journal of Economic Perspectives*, Winter 2007, *21* (1), 91–116.

Cohen, Daniel A., Aiyesha Dey, and Thomas Z. Lys, "Trends in Earnings Management and Informativeness of Earnings Announcements in the Pre- and Post-Sarbanes Oxley Periods," *Working Paper*, February 2005.

Collins, Julie H., Douglas A. Shackelford, and James M. Wahlen, "Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes," *Journal of Accounting Research*, Autumn 1995, *33* (2), 263–291.

Congress, U.S., "Sarbanes-Oxley Act of 2002," 2002.

Core, John E., Robert W. Holthausen, and David F. Larcker, "Corporate Governance, Chief Executive Officer Compensation, and Firm Performance," *Journal of Financial Economics*, 1999, *51*, 371–406.

Daniel, Naveen D., David J. Denis, and Lalitha Naveen, "Do Firms Manage Earnings to Meet Dividend Thresholds?," *Journal of Accounting and Economics*, 2008, *45*, 2–26.

DeAngelo, Harry, Linda DeAngelo, and Douglas J. Skinner, "Reversal of Fortune: Dividend Signaling and the Disappearance of Sustained Earnings Growth," *Journal of Financial Economics*, 1996, *40*, 341–371.

_ **,** _ **, and Rene M. Stulz**, "Dividend Policy and the Earned/Contributed Capital Mix: A Test of the Life-Cycle Theory," *Journal of Financial Economics*, 2006, *81*, 227–254.

Dechow, Patricia M. and Ilia D. Dichev, "The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors," *The Accounting Review*, 2002, *77*, 35–59.

_ **, Richard G. Sloan, and Amy P. Sweeney**, "Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC," *Contemporary Accounting Research*, Spring 1996, *13* (1), 1–36.

Degeorge, Francois, Jayendu Patel, and Richard Zeckhauser, "Earnings Management to Exceed Thresholds," *The Journal of Business*, January 1999, *72* (1), 1–33.

Easterbrook, Frank H., "Two Agency-Cost Explanations of Dividends," *The American Economic Review*, September 1984, *74* (4), 650–659.

Engel, Ellen, Rachel M. Hayes, and Xue Wang, "The Sarbanes-Oxley Act and Firms' Going-Private Decisions," *Journal of Accounting and Economics*, 2007, *44*, 116–145.

Erickson, Merle, Michelle Hanlon, and Edward L. Maydew, "How Much Will Firms Pay for Earnings That Do Not Exist? Evidence of Taxes Paid on Allegedly Fraudulent Earnings," *The Accounting Review*, 2004, *79* (2), 387–408.

Fama, Eugene F. and Kenneth R. French, "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?," *Journal of Financial Economics*, 2001, *60*, 3–43.

_ **and Michael C. Jensen**, "Separation of Ownership and Control," *Journal of Law and Economics*, June 1983, *26* (2), 301–325.

Fluck, Zsuzsanna, "Optimal Financial Contracting: Debt Versus Outside Equity," *The Review of Financial Studies*, Summer 1998, *11* (2), 383–418.

Gabaix, Xavier and Augustin Landier, "Why Has CEO Pay Increased So Much?," *The Quarterly Journal of Economics*, February 2008, *123* (1), 49–100.

Gompers, Paul, Joy Ishii, and Andrew Metrick, "Corporate Governance and Equity Prices," *The Quarterly Journal of Economics*, February 2003, *118* (1), 107–155.

Gordon, Roger and Martin Dietz, "Dividends and Taxes," *NBER Working Paper No. 12292*, June 2006.

Grullon, Gustavo and Roni Michaely, "Dividends, Share Repurchases, and the Substitution Hypothesis," *The Journal of Finance*, August 2002, *57* (4), 1649–1684.

Harris, Milton and Artur Raviv, "Capital Structure and the Informational Role of Debt," *The Journal of Finance*, June 1990, *45* (2), 321–349.

Healy, Paul M., "The Effect of Bonus Schemes on Accounting Decisions," *Journal of Accounting and Economics*, 1985, *7*, 85–107.

_ **and Krishna G. Palepu**, "Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Disclosure Literature," *Journal of Accounting and Economics*, 2001, *31*, 405–440.

Hermalin, Benjamin E. and Michael S. Weisbach, "The Effects of Board Composition and Direct Incentives on Firm Performance," *Financial Management*, Winter 1991, *20* (4), 101–112.

HR Magazine, "Outside directors' compensation soars following scandals," February 2004.

Jensen, Michael C., "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *The American Economic Review*, May 1986, *76* (2), 323–329.

_ **and William H. Meckling**, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," *Journal of Financial Economics*, 1976, *3*, 305–360.

John, Kose and Anzhela Knyazeva, "Payout Policy, Agency Conflicts, and Corporate Governance," *Working Paper*, July 2006.

Jones, Jennifer J., "Earnings Management During Import Relief Investigations," *Journal of Accounting Research*, Autumn 1991, *29* (2), 193–228.

Kamar, Ehud, Pinar Karaca-Mandic, and Eric Talley, "Going-Private Decisions and the Sarbanes-Oxley Act of 2002: A Cross-Country Analysis," *American Law & Economics Association Annual Meetings*, April 2006, *16* (Paper 63).

Kasanen, Eero, Juha Kinnunen, and Jyrki Niskanen, "Dividend-Based Earnings Management: Empirical Evidence from Finland," *Journal of Accounting and Economics*, 1996, *22* (1-3), 283–312.

Kay, Benjamin and Cindy M. Vojtech, "How Do Firms Switch Among Tools Used to Monitor Agency Problems?," *Working Paper*, May 2011.

Klein, April, "Firm Performance and Board Committee Structure," *Journal of Law and Economics*, April 1998, *41* (1), 275–303.

_ , "Audit Committee, Board of Director Characteristics, and Earnings Management," *Journal of Accounting and Economics*, 2002, *33* (3), 375–400.

Knyazeva, Anzhela, "Delivering on the Dividend Promise: Dynamic Dividend Behavior and Managerial Incentives," *Working Paper*, August 2006.

Kothari, S. P., Andrew J. Leone, and Charles E. Wasley, "Performance Matched Discretionary Accrual Measures," *Journal of Accounting and Economics*, 2005, *39*, 163–197.

Li, Haidan, Morton Pincus, and Sonja Olhoft Rego, "Market Reaction to Events Surrounding the Sarbanes-Oxley Act of 2002 and Earnings Management," *The Journal of Law and Economics*, February 2008, *51*, 111–134.

Lintner, John, "Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes," *The American Economic Review*, May 1956, *46* (2), 97–113.

Lobo, Gerald J. and Jian Zhou, "Did Conservatism in Financial Report Increase After the Sarbanes-Oxley Act? Initial Evidence," *Accounting Horizons*, March 2006, *20* (1), 57–73.

Lucas, Deborah J. and Robert L. McDonald, "Equity Issues and Stock Price Dynamics," *The Journal of Finance*, September 1990, *45* (4), 1019–1043.

Macey, Jonathan R. and Maureen O'Hara, "The Corporate Governance of Banks," *Federal Reserve Board of New York Economic Policy Review*, April 2003, pp. 91–107.

Miller, Merton H. and Kevin Rock, "Dividend Policy Under Asymmetric Information," *The Journal of Finance*, September 1985, *40* (4), 1031–1051.

Murphy, Keven J., *Chapter 38 Executive Compensation*, Vol. 3 of *Handbook of Labor Economics*, Elsevier, 1999.

Oppel, Richard A. Jr., "G.O.P. Bill On Auditing Clears House," *The New York Times*, April 25 2002, *Business*.

_ **and Daniel Altman**, "CORPORATE CONDUCT: LEGISLATION; In a Shift, Republicans Pledge to Pass Accounting Bill," *The New York Times*, July 18 2002, *Business*.

Perry, Susan E. and Thomas H. Williams, "Earnings Management Preceding Management Buyout Offers," *Journal of Accounting and Economics*, 1994, *18*, 157–179.

Romano, Roberta, "The Sarbanes-Oxley Act and the Making of Quack Corporate Governance," *The Yale Law Journal*, May 2005, *114* (7), 1521–1611.

Savov, Sava, "Earnings Management, Investment, and Dividend Payments," *Working Paper*, July 16 2006.

Schipper, Katherine, "Commentary on Earnings Management," *Accounting Horizons*, December 1989, pp. 91–102.

Shleifer, Andrei and Robert W. Vishny, "A Survey of Corporate Governance," *The Journal of Finance*, June 1997, *52* (2), 737–783.

Skinner, Douglas J. and Eugene Soltes, "What Do Dividends Tell Us About Earnings Quality?," *Review of Accounting Studies*, 2011, *16* (1), 1–28.

Teoh, Siew H., Ivo Welch, and T. J. Wong, "Earnings Management and the Underperformance of Seasoned Equity Offerings," *Journal of Financial Economics*, 1998, *50*, 63–99.

_ **, T. J. Wong, and Gita Rao**, "Are Accruals During Initial Public Offerings Opportunistic?," *Review of Accounting Studies*, 1998, *3*, 175–208.

Vojtech, Cindy M., "The Relationship Between Information Asymmetry and Dividend Policy," *Working Paper*, May 2011.

Watts, Ross L., "Conservatism in Accounting Part I: Explanations and Implications," *Accounting Horizons*, September 2003, *17* (3), 207–221.

Wintoki, M. Babejide, "Corporate Boards and Regulation: The Effect of the Sarbanes-Oxley Act and the Exchange Listing Requirements on Firm Value," *Journal of Corporate Finance*, 2007, *13*, 229–250.

Wolkoff, Neal L., "Sarbanes-Oxley Is a Curse For Small-Cap Companies," *The Wall Street Journal*, August 15 2005, *Business.*

Yermack, David, "Higher Market Valuation of Companies with a Small Board of Directors," *Journal of Financial Economics*, 1996, *40* (2), 185–211.