# SARBANES-OXLEY, CORPORATE GOVERNANCE, AND STRATEGIC DIVIDEND DECISIONS

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## Abstract

This paper empirically analyzes the impact of the Sarbanes-Oxley Act on the relation between measures of corporate governance and a firm's dividend policy in the U.S. equity market. Using the IRRC database, we find that there is a statistically significant relation between governance measures and a firm's dividend policy in the years prior to the introduction of the Sarbanes-Oxley Act. However, following Sarbanes-Oxley, the relation between a firm's governance structure and dividend policy changes. In particular, shareholders' rights and the proportion of outside directors are no longer significant in explaining a firm's dividend policy.

**Keywords:** Sarbanes-Oxley, Agency Theory, Governance, Dividends

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## 1. INTRODUCTION

The early 2000s brought to the public's attention record-breaking bankruptcy filings in the U.S. While many of these failures occurred in association with the downturn in the market, many did not. Some, for example, were the result of significant fraud. Regardless of the causes of these substantial bankruptcies, and particularly in the wake of the Enron and WorldCom collapses in the early 2000s, a strong consensus emerged among policymakers and industry observers that existing management practices and government oversight were insufficient to promote a well-functioning and sound security market.

It is commonly understood that the separation of ownership and control leads to potential agency-related problems (Berle & Means, 1932; Jensen, 1986; Jensen & Meckling, 1976). These costs have persistently challenged market participants and regulators to engineer governance controls to mitigate any potential for managers to expropriate wealth from their stakeholders. Independent of government regulation, external market pressures have forced firms to develop internal and external governance measures to allow a firm's stakeholders to more accurately monitor and measure its performance. However, the perceived lapse in these mechanisms led the U.S. Congress to pass the Sarbanes-Oxley Act of 2002. Among other requirements, the Sarbanes-Oxley Act demands firms to have audit committees comprised of independent directors and forces financial officers to certify that the firm's financial statements are accurate. Moreover, the Sarbanes-Oxley Act created the Public Company Accounting Oversight Board to oversee, regulate, inspect, and discipline accounting firms in their roles as auditors.

Corporate governance, as defined by Shleifer and Vishny (1997), refers to the ways in which investors ensure that they will receive maximum return on their investments.[1] Fundamental components of an effective governance structure include managerial ownership, size, and composition of the board of directors, CEO and directors' compensation schemes, audit controls, and an external market for corporate control (Keasey & Wright, 1997). In general, effective governance controls agency conflicts between management and investors in two ways. First, the free-cash-flow problem of a firm can be reduced through dividend policy, stock repurchases, capital structure

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[1] Some other definitions of corporate governance are: "the design of institutions that induce or force management to internalize the welfare of stakeholders," (Tirole, 2001) and "the complex set of constraints that shape the ex-post bargaining over quasi-rents generated by the firm." (Zingales, 1998).

decisions, and investment in long term projects. Second, the likelihood of management entrenchment can be reduced, thus strengthening shareholders' rights.

The purpose of this paper is to investigate the impact of government regulation with respect to the Sarbanes-Oxley Act on the existing agency relation between corporate governance measures and dividend policy. Specifically, we examine the relation between dividend payout policies and various measures of governance and firm-specific characteristics for periods before and after the enactment of Sarbanes-Oxley. Empirical results show that prior to the Sarbanes-Oxley Act, shareholders' rights, board size, and the proportion of outside directors are statistically significant factors in explaining a firm's dividend policy. Following Sarbanes-Oxley, however, regulatory changes have structurally altered the impact that governance measures have in explaining dividend policies.

The paper is organized as follows. Section 2 reviews the selected literature. Section 3 discusses and summarized the data and methodology, while Section 4 presents the empirical findings and robustness tests. Section 5 provides concluding remarks.

## 2. REVIEW OF SELECTED LITERATURE

Two significant agency costs affected by dividend policy are those associated with free cash flow and managerial entrenchment. The role of an effective corporate governance structure is to ensure that managerial decisions are continually monitored. This can be achieved internally by the monitoring and auditing of managers and externally via the market for corporate control.

To help mitigate agency costs associated with the free cash flow problem, dividends may be used to force managers to return to the capital market when they are faced with value-increasing investment opportunities (Rozeff, 1982).[2] Easterbrook (1984) echoes this view, arguing that investment bankers work on behalf of shareholders to monitor managers and ensure sound corporate governance. Similarly, Lloyd, Page, and Jahera (1989) find that greater market scrutiny, measured by the number of analysts following a particular firm, is associated with a higher dividend payout.

Other research has focused on the importance of growth opportunities on dividend policy. Wasteful spending on value-destroying projects is more likely to impact firms with fewer growth opportunities, while firms with substantial growth opportunities are likely to be investing in positive net present value projects. In support of this hypothesis, Gaver and Gaver (1993) find that dividends are inversely related to growth opportunities.

Shareholders' rights have also been known to influence dividend policy. La Porta, Lopez-De Salinas, Shleifer, and Vishny (2000) examine dividend policies across countries with differing legal protections. Globally, they find that those countries which provide stronger protection of minority shareholder rights have firms that pay higher dividends. Additionally, high growth firms are also shown to pay lower dividends in the countries with stronger protection. In lieu of legal

protection, another measure of shareholder rights is the Gompers Governance Index (Gompers, Ishii, & Metrick, 2003). Using this metric, Jiraporn and Ning (2006) find a positive relation between the Gompers Governance Index and dividend payout. They conclude that shareholder rights have a significant influence on dividend payout ratios, with more restrictive shareholder rights being associated with higher dividend payout. This, again, supports the view that firms that restrict shareholder rights cannot totally escape the scrutiny of the markets.

Another key component of effective corporate governance is mitigating problems associated with managerial entrenchment. The market for corporate control is one means for monitoring and disciplining management, thereby affecting agency costs and dividend payout (Jahera & Page, 1991). That is, one can argue that the most effective means for minimizing agency costs is for management to maximize firm value. By ensuring that a firm is fully valued, that firm becomes less of a takeover target. In other words, it is no longer a bargain. However, agency costs do indeed exist and many mangers seek to deter or block hostile takeovers by adopting antitakeover amendments (Page, Jahera, & Pugh, 1996). Proponents of antitakeover measures contend that such protection enables management to focus on longer-run decisions without the constant threat of a hostile takeover. Opponents argue that such measures only serve to entrench weak or ineffective management.

Alternatively, Borokhovich, Brunarski, Harman, and Kehr (2005) test the theory that dividends serve to reduce agency costs. They follow a standard event study methodology to examine stock price reaction around dividend increase announcements. Controlling for blockholders and poison pills as measures of agency costs, they find no evidence that the announcement of a large dividend increase results in lower agency costs.

## 3. DATA AND METHODOLOGY

### A. Data

The primary focus of this paper is to investigate the impact of regulatory changes on the relation between a firm's dividend policy and governance structure. To do so, we use data from the Investor Responsibility Research Center (IRRC) data files over the period 1998 - 2004.[3] The dataset includes a number of measures of governance, such as the governance index (Gompers et al., 2003), the size of the firm's board, the proportion of independent outside directors, and the percent of insider ownership. The percent of insider ownership is calculated from ExecuComp and we use firm-level control data from Compustat. Because the governance index is only calculated every other year, our dataset includes the years 1998, 2000, 2002, and 2004.

### B. Model

The empirical model for our analysis is similar to the model used by Jiraporn and Ning (2006). The specific model we use is of the following form:

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[2] For a recent review of the theoretical and empirical research on dividends (see Bhattacharyya, 2007).

[3] Data for the governance measures from the IRRC database dates back to 1990. However, as noted by Jiraporn and Ning (2006), the database only included large corporations before 1998. Therefore, we only use data beginning in 1998.

$$Dividends_{i,t} = a + \beta_1\,Payouts_{i,t} + \beta_2 Governance_{i,t} + \beta_3 Firms_{i,t} + \varepsilon_{i,t} \quad (1)$$

The dependent variable, *Dividends*, is measured as cash dividends paid divided by the book value of assets. We use this more stable measure of dividend payout, as opposed to the more tradition dividends-to-earnings approach. The dividends-to-earnings measure is more volatile due to the variability of earnings. The *Payout* vector contains data for share repurchases to control for other means of cash distributions. The *Governance* matrix includes a variety of corporate governance mechanisms. One measure of governance is the governance index, introduced by Gompers et al. (2003). This measure quantifies the strength of shareholders' rights by accumulating points for provisions across five categories: tactics for delaying hostile bidders; voting rights; director/officer protection; other takeover defenses; and state laws, where the lower the value of the index, the stronger the shareholder rights. Two more variables of governance are included to capture the influence and importance of board structure. The first measure is board size (Lipton & Lorsch, 1992; Jensen, 1993; Yermack, 1996; Denis & Sarin, 1999), and the other is the proportion of independent outside directors (Hermalin & Weisbach, 1991; Cotter, Shivdasani, & Zenner, 1997; Mayers, Shivdasani, & Smith, 1997; Bhagat & Black, 2001). A final measure of governance is the percent of inside ownership, measured as the percent of shares owned by the top five officers. These variables are all mentioned in prior research related to dividends and agency effects.

In keeping with earlier works, we control for firm-specific variables contained in *Firm*. One control measure is the size of the firm, measured by the log of total assets. To control for financial performance, we use operating income scaled by sales. Furthermore, growth opportunities may also influence the amount of dividends paid, so we use the market-to-book ratio, where market value is the book value of assets minus the book value of equity plus the market value of equity. We also utilize the investment-to-sales ratio. Investment is measured as the sum of research and development expenditures and capital expenditures and provides an alternative proxy for growth opportunities. Lastly, since risk and leverage have been shown to influence agency costs and cash distributions, we control for the debt ratio.

## 4. RESULTS

Table 1 reports descriptive statistics for the overall sample period, as well as for each of the four individual years. The final column shows the difference between 2000, the period preceding Sarbanes-Oxley, and 2004, the period following the passage of Sarbanes-Oxley. For the payout variables, the mean (median) level of dividends and repurchases is 0.0114 (0.0021), and 0.0272 (0.0018), respectively. Over time, the level of repurchases tends to drop, but there is no significant difference in means from 2000 to 2004. Dividends, however, remain relatively stable, with only a marginal difference in means from 2000 to 2004.

The mean and median levels for the governance index, board size, proportion of outside directors, and percentage of managerial ownership are 8.9718 (9.000), 2.1607 (2.1972), 0.6338 (0.6667), and 42.5608 (8.7350), respectively. Notably, from 1998 to 2004, both the governance index and the proportion of independent outside directors monotonically increased and the differences in means and medians between the years 2000 and 2004 are significant at the one percent level. During the same time frame, the percentage of managerial ownership monotonically decreased and the difference between means and medians for the years 2000 and 2004 are significant at the one percent level. Board size remains relatively stable, though means and medians for the years 2000 to 2004 are significantly different at the ten percent level.

Table 1 shows some significant changes in firm characteristics over time, as well. Between 2000 and 2004, the size of the sample firms significantly increased, while leverage and operating income significantly decreased. The average change in market-to-book significantly decreased also, though the median change is insignificant. The opposite is true for investment, where the mean change is insignificant and the median change is a significant decline.

Table 2 contains simple correlations among the variables, as well as their associated levels of statistical significance. All four measures of governance – governance index, board size, proportion of outside directors, and percentage of managerial ownership – are significantly correlated with dividends. In addition, while the governance index, board size, and proportion of outside directors are positively related to dividends, they are also significantly related to most of the other variables. The percentage of managerial ownership is negatively related to dividends, but also significantly related to many of the other variables. These correlations reveal the need to control for various governance mechanisms and firm-specific factors when studying dividend policy.

Table 3 presents our empirical results. There are six models presented in the table: two specifications for the overall sample period, two for the years prior to Sarbanes-Oxley (1998, 2000, and 2002), and two for the year following the passage of Sarbanes-Oxley (2004).

We first note that the coefficients on firm-specific variables are consistent with the empirical findings of other studies. Firms with higher levels of repurchases tend to payout more in dividends, suggesting that repurchases and dividends are not complimentary policy variables (Jiraporn & Ning, 2006). Contrary results are apparent for the impact of leverage. Firms with higher levels of debt typically payout fewer dividends, consistent with the finding that firms who enter into contracts with creditors have controls limiting the firm's ability to make cash disbursements (Smith & Warner, 1979; John & Kalay, 1982). Profitability and growth opportunities have a significantly positive relation with dividend payouts.

The impact of governance measures on dividends is positive and significant. Consistent with Jiraporn and Ning (2006), our results show that, for the overall sample, as shareholder rights weaken, as measured by a higher governance index, companies tend to payout higher portions of dividends. In

essence, these results support the substitution hypothesis that firms are compensating shareholders with higher levels of dividends for their inability to control the firm. In addition, larger boards and greater representation by independent outside directors tend to further increase cash dividends.

Turning to the main focus of our study, we examine how the relation between dividend policy and governance mechanisms is affected by the Sarbanes-Oxley Act. We find that the agency relation substantially changed following this exogenous regulatory change. Indeed, while the governance index is positive and significant in relation to dividend payouts before 2002 when the Sarbanes-Oxley Act was passed into law, the governance index is statistically insignificant in explaining dividends following 2002. This exogenously imposed accountability has seemingly changed the agency cost of shareholders' rights and investors are no longer demanding compensation for their limited control. In addition to the governance index, the results show that the proportion of outside directors also no longer appears to influence dividend policy, though the size of the board still does. This is consistent with the view that Sarbanes-Oxley sufficiently increased the level of oversight and monitoring of managers through audit committee independence and accountability to the point that independent directors are no longer a significant factor in determining a firm's optimal dividend payout.

To check the robustness of our results, we run additional specifications. These results are presented in Table 4.[4] One possible explanation of our results is that they may be driven by the percentage of managerial ownership. Management with larger portions of their wealth tied to the firm may be more likely to redistribute cash back to investors. Therefore, we include the percentage of managerial ownership and we find that our results are robust and the percentage of managerial ownership has no statistical power in explaining dividends.

In Table 4, we also examine the effect of using market values, rather than book values. We replace the log of the book value of assets with the log of market value of assets and we replace the book value debt ratio with the market value debt ratio. Again, we find that while governance measures explain dividends prior to Sarbanes-Oxley, they do not after the Act is passed into law. Finally, we replace the market-to-book ratio with the investment-to-sales ratio in Table 4. This ratio provides another forward-looking measure of a firm's growth opportunities. Though this variable is less significant in explaining dividend policy, our results do not change. Our results are consistent with the agency relation being changed by the Sarbanes-Oxley Act.

## 5. CONCLUSION

It is widely recognized that agency costs borne by the separation of ownership and control influence the managerial decision process. It is also well documented that the degree of management entrenchment acts as a deterrent to sound and efficient business decisions. Poor governance and disclosure have contributed, at least in part, to large financial failures. In contrast, some studies show that the level of corporate governance promotes better management practices. To date, however, there is little evidence on how regulatory policy impacts the potential agency conflict within firms.

In light of the financial crises over the last decade, an emerging consensus between policymakers and industry participants is that a new approach to governance and regulation needs to be applied. In response to this need, the U.S. legislature has provided regulation addressing auditor and audit committee independence, information disclosure, and managerial accountability.

Using data from the IRRC, ExecuComp, and Compustat, we measure the impact of regulatory changes on the agency relations of a firm's dividend policy. We find that the agency relation between governance measures and a firm's dividend policy are statistically significant before the introduction of the Sarbanes-Oxley Act. However, following Sarbanes-Oxley, the relation between a firm's governance and dividend policy changes. In particular, shareholders' rights and the proportion of outside directors are no longer significant in explaining a firm's dividend policy. This implies that investors, who demanded compensation for limited control over a firm, seem to rely more on the Sarbanes-Oxley Act to serve as an effective internal control to force managers to operate a firm in their best interests. One explanation may be that greater transparency and accountability resulting from Sarbanes-Oxley has indeed had an early effect on agency costs. As more time passes, future research can examine whether the effect is simply a short-term anomaly or a long-lasting effect.

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[4] One may question whether a potential of endogeneity problem exists with our analysis. It is pointed out by Jiraporn and Ning (2006) that governance tends to explain dividends but dividends do not explain governance.

## REFERENCES

1. Berle, A. A., & Means, G. C. (1932). *The modern corporation and private property.* New York: Macmillan
2. Bhagat, S., & Black, B. (2001). The non-correlation between board independence and long term performance. *Journal of Corporate Law, 27,* 231-274.
3. Bhattacharyya, N. (2007). Dividend policy: A review. *Managerial Finance, 33*(1), 4-13. https://doi.org/10.1108/03074350710715773
4. Borokhovich, K., Brunarski, K. R., Harman, Y., & Kehr, J. B. (2005). Dividends, corporate monitors and agency costs. *Financial Review, 40*(1), 37-65. https://doi.org/10.1111/j.0732-8516.2005.00092.x
5. Cotter, J., Shivdasani, A., & Zenner, M. (1997). Do independent directors enhance target shareholder wealth during tender offers? *Journal of Financial Economics, 43*(2), 195-218. https://doi.org/10.1016/S0304-405X(96)00886-0
6. Denis, D. J., & Sarin, A. (1999). Ownership and board structures in publicly traded corporations. *Journal of Financial Economics, 52*(2), 187-223. https://doi.org/10.1016/S0304-405X(99)00008-2
7. Easterbrook, F. H. (1984). Two agency-cost explanations of dividends. *American Economic Review, 74*(4), 221-230.
8. Gaver, J. J., & Gaver, K. M. (1993). Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Accounting and Economics, 16*(1-3), 125-160. https://doi.org/10.1016/0165-4101(93)90007-3
9. Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics, 118*(1), 107-156. https://doi.org/10.1162/00335530360535162
10. Hermalin, B., & Weisbach, M. (1991). The effects of board composition and direct incentives on firm value. *Financial Management, 20,* 101-112. Retrieved from https://www.jstor.org/stable/3665716
11. Jahera, J. S., & Page, D. E. (1991). Management entrenchment versus shareholder wealth: The case of dividends. *Mid-Atlantic Journal of Business, 27*(2), 139-147.
12. Jensen, M. (1986). Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review, 76*(2), 323-339. Retrieved from https://www.jstor.org/stable/1818789
13. Jensen, M. (1993).The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance, 48*(3), 831-880. https://doi.org/10.1111/j.1540-6261.1993.tb04022.x
14. Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs, and capital structure. *Journal of Financial Economics, 3*(4), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X
15. Jiraporn, P., & Ning, Y. (2006). Dividend policy, shareholder rights, and corporate governance. *Journal of Applied Finance, 16*(2), 24-36. https://doi.org/10.2139/ssrn.931290
16. John, K., & Kalay, A. (1982). Costly contracting and optimal payout constraints. *Journal of Finance, 37*(2), 457-470. https://doi.org/10.1111/j.1540-6261.1982.tb03567.x
17. Keasey, K., & Wright, M. (1997). *Corporate governance: Responsibilities, risks and remuneration.* New York: John Willey & Sons Ltd.
18. La Porta, R., Lopez-De Salinas, F., Shleifer, A., & Vishny, R. (2000). Agency problems and dividend policy around the world. *Journal of Finance, 55*(1), 1-33. https://doi.org/10.1111/0022-1082.00199
19. Lipton, M., & Lorsch, J. (1992). A modest proposal for improved corporate governance. *Business Lawyer, 48*(1), 59-77. Retrieved from https://www.jstor.org/stable/40687360
20. Lloyd, W. P., Page, D. E., & Jahera, J. S. (1989). An empirical investigation of cross-sectional differences in dividend payout ratios. *Journal of Business & Economic Perspectives, 15*(2), 101-112.
21. Mayers, D., Shivdasani, A., & Smith, C. (1997). Board composition and corporate control: Evidence from the insurance industry. *Journal of Business, 70*(1), 33-62. https://doi.org/10.1086/209707
22. Page, D. E., Jahera, Jr., J. S., & Pugh, W. N. (1996). The effect of takeover defenses on the firm dividend decision. *Journal of Economics and Finance, 20*(3), 49-58. https://doi.org/10.1007/BF02920606
23. Rozeff, M. S. (1982). Growth, beta and agency costs as determinants of dividend payout ratios. *Journal of Financial Research, 5*(3), 249-259. https://doi.org/10.1111/j.1475-6803.1982.tb00299.x
24. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance, 52*(2), 737-783. https://doi.org/10.1111/j.1540-6261.1997.tb04820.x
25. Smith, C., & Warner, J. (1979). On financial contracting: An analysis of bond covenants. *Journal of Financial Economics, 7*(2), 117-161. https://doi.org/10.1016/0304-405X(79)90011-4
26. Tirole, J. (2001). Corporate governance. *Econometrica, 69*(1), 1-35. https://doi.org/10.1111/1468-0262.00177
27. Yermack, D. (1996). Higher market valuation of companies with a smaller board of directors. *Journal of Financial Economics, 40*(2), 185-211. https://doi.org/10.1016/0304-405X(95)00844-5
28. Zingales, L. (1998). Corporate Governance. In P. Newman (Ed.), *The New Palgrave Dictionary of Economics and the Law.* New York: Macmillan.

**APPENDIX**

**Table 1.** Descriptive statistics

| | *Overall sample* | *1998* | *2000* | *2002* | *2004* | *2004-2000* |
|---|---|---|---|---|---|---|
| **Payout variables** | | | | | | |
| Dividends / Assets | 0.0114 (0.0021) | 0.0116 (0.0040) | 0.0100 (0.0021) | 0.0075 (0.0000) | 0.0130 (0.0000) | 0.0014* (0.0000) |
| Repurchases / Assets | 0.0272 (0.0018) | 0.0400 (0.0086) | 0.0308 (0.0076) | 0.0207 (0.0001) | 0.0273 (0.0004) | -0.0035 (0.0000)*** |
| **Governance variables** | | | | | | |
| Governance index | 8.9718 (9.0000) | 8.6397 (8.0000) | 8.8743 (9.0000) | 8.9228 (9.0000) | 9.0335 (9.0000) | 0.4164*** (0.0000)*** |
| Log of board size | 2.1607 (2.1972) | 2.1639 (2.1972) | 2.1606 (2.1972) | 2.1518 (2.1972) | 2.1656 (2.1972) | 0.0132* (0.0000)* |
| Proportion of independent outside directors | 0.6338 (0.6667) | 0.5828 (0.6000) | 0.6118 (0.6364) | 0.6560 (0.6667) | 0.6993 (0.7143) | 0.0730*** (0.0635)*** |
| Percentage of managerial ownership | 42.5608 (8.7350) | 49.2625 (9.9147) | 45.2899 (9.5064) | 39.1455 (8.1534) | 35.4508 (7.6306) | -10.1138*** (-1.2364)*** |
| **Firm characteristics** | | | | | | |
| Log of assets | 7.1072 (6.9325) | 6.9934 (6.8441) | 7.2236 (7.0525) | 7.0459 (6.8582) | 7.2973 (7.1307) | 0.2552*** (0.2428)*** |
| Long-term debt / Assets | 0.2078 (0.1807) | 0.2229 (0.1984) | 0.2230 (0.2003) | 0.2061 (0.1782) | 0.1888 (0.1617) | -0.0268*** (-0.0166)*** |
| EBIT / Assets | 0.1299 (0.1351) | 0.1421 (0.1451) | 0.1414 (0.1444) | 0.0969 (0.1141) | 0.1265 (0.1269) | -0.0226*** (-0.0213)*** |
| Market-to-book | 1.9865 (1.5325) | 2.1863 (1.6116) | 2.1602 (1.4699) | 1.6758 (1.3858) | 2.0610 (1.6974) | -0.3019*** (0.0992) |
| Investment / Sales | 0.3761 (0.0863) | 0.1720 (0.0960) | 0.2482 (0.0819) | 0.8388 (0.0901) | 0.3406 (0.0843) | 0.0523 (-0.0088)*** |

*Note: The data for corporate governance measures come from the Investor Responsibility Research Center (IRRC). Ownership data come from ExecuComp, and firm-specific control variables are from the Compustat database. All data are for the years 1998, 2000, 2002, and 2004. The governance index is that from Gompers et al. (2003). Investment is defined as the sum of research and development expenditures and capital expenditures. Medians are presented in parentheses below means. The 2004-2000 column reports mean and median differences between 2004 and 2000, where \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.*

**Table 2.** Correlation matrix

| | Dividends / Assets | Repurchases / Assets | Governance index | Log of board size | Proportion of independent outside directors | Percentage of managerial ownership | Log of assets | Long-term debt / Assets | EBIT / Assets | Market-to-book |
|---|---|---|---|---|---|---|---|---|---|---|
| Dividends / Assets | 1 | | | | | | | | | |
| Repurchases / Assets | 0.0314 (0.0150) | 1 | | | | | | | | |
| Governance index | 0.0426 (0.0006) | -0.0204 (0.1124) | 1 | | | | | | | |
| Log of board size | 0.2359 (0.0001) | -0.0118 (0.4384) | 0.2835 (0.0001) | 1 | | | | | | |
| Proportion of independent outside directors | 0.0890 (0.0001) | -0.0025 (0.8717) | 0.2818 (0.0001) | 0.1023 (0.0001) | 1 | | | | | |
| Percentage of managerial ownership | -0.0236 (0.0824) | -0.0178 (0.2031) | -0.1821 (0.0001) | -0.1691 (0.0001) | -0.2848 (0.0001) | 1 | | | | |
| Log of assets | 0.0321 (0.0101) | -0.0216 (0.0939) | 0.1837 (0.0001) | 0.5494 (0.0001) | 0.1558 (0.0001) | -0.1945 (0.0001) | 1 | | | |
| Long-term debt / Assets | -0.0405 (0.0012) | -0.0062 (0.6336) | 0.0341 (0.0061) | 0.1492 (0.0001) | -0.0124 (0.3998) | -0.0703 (0.0001) | 0.1739 (0.0001) | 1 | | |
| EBIT / Assets | 0.0561 (0.0001) | 0.2369 (0.0001) | 0.0688 (0.0001) | 0.1085 (0.0001) | -0.0116 (0.4298) | 0.0314 (0.0205) | 0.1926 (0.0001) | -0.0896 (0.0001) | 1 | |
| Market-to-book | 0.0494 (0.0001) | 0.2385 (0.0001) | -0.0765 (0.0001) | -0.0637 (0.0001) | -0.0052 (0.7251) | 0.0222 (0.1007) | -0.0034 (0.7872) | -0.1387 (0.0001) | 0.2814 (0.0001) | 1 |
| Investment / Sales | -0.0027 (0.8640) | -0.0150 (0.3596) | -0.0176 (0.2613) | -0.0781 (0.0001) | 0.0192 (0.2979) | -0.0105 (0.5364) | -0.0678 (0.0001) | 0.0276 (0.0794) | -0.2521 (0.0001) | -0.0000 (0.9992) |

*Note: The data for corporate governance measures come from the Investor Responsibility Research Center (IRRC). Ownership data come from ExecuComp, and firm-specific control variables are from the Compustat database. All data are for the years 1998, 2000, 2002, and 2004. The governance index is that from Gompers et al. (2003). Investment is defined as the sum of research and development expenditures and capital expenditures. Medians are presented in parentheses below means. Each cell contains the Pearson correlation coefficient, with p-values in parentheses.*

**Table 3.** Multivariate analysis

| | *Overall sample* | | *Pre-Sarbanes-Oxley* | | *Post-Sarbanes-Oxley* | |
|---|---|---|---|---|---|---|
| **Payout variables** | | | | | | |
| Repurchases / Assets | 0.0164 (0.1506) | 0.0124** (0.0182) | 0.0094* (0.0606) | 0.0122** (0.0218) | 0.0854 (0.1565) | 0.0076 (0.6113) |
| **Governance variables** | | | | | | |
| Governance index | 0.0008*** (0.0025) | 0.0005*** (0.0002) | 0.0009*** (0.0001) | 0.0004*** (0.0004) | 0.0005 (0.6452) | 0.0005 (0.1643) |
| Log of board size | | 0.0155*** (0.0001) | | 0.0159*** (0.0001) | | 0.0137*** (0.0006) |
| Proportion of independent outside directors | | 0.0057*** (0.0013) | | 0.0067*** (0.0002) | | 0.0013 (0.8082) |
| **Firm characteristics** | | | | | | |
| Log of Assets | 0.0009* (0.0878) | 0.0000 (0.8820) | 0.0014*** (0.0001) | 0.0001 (0.8066) | -0.0006 (0.7995) | 0.0001 (0.8667) |
| Long-term debt / Assets | -0.0108*** (0.0049) | -0.0057*** (0.0017) | -0.0077*** (0.0001) | -0.0070*** (0.0001) | -0.0145 (0.4046) | 0.0003 (0.9570) |
| EBIT / Assets | 0.0094 (0.1470) | 0.0327*** (0.0001) | 0.0273*** (0.0001) | 0.0317*** (0.0001) | -0.1512*** (0.0001) | 0.0360*** (0.0013) |
| Market-to-book | 0.0017*** (0.0018) | 0.0013*** (0.0001) | 0.0011*** (0.0001) | 0.0012*** (0.0001) | 0.0047 (0.1209) | 0.0024*** (0.0054) |
| Intercept | -0.0041 (0.3080) | -0.0373*** (0.0001) | -0.0119*** (0.0001) | -0.0381*** (0.0001) | 0.0238 (0.2133) | -0.0348*** (0.0001) |
| Number of observations | 5,923 | 4,259 | 3,653 | 3,240 | 1,296 | 1,019 |
| Adjusted $R^2$ | 0.0070 | 0.1208 | 0.0815 | 0.1549 | 0.0118 | 0.0571 |

*Note: The data for corporate governance measures come from the Investor Responsibility Research Center (IRRC). Ownership data come from ExecuComp, and firm-specific control variables are from the Compustat database. All data are for the years 1998, 2000, 2002, and 2004. The Pre-Sarbanes-Oxley period includes 1998, 2000, and 2002. The Post-Sarbanes-Oxley period includes 2004. The governance index is that from Gompers et al. (2003). P-values are presented in parentheses below the coefficients. \*\*\*, \*\*, and \* represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.*

**Table 4.** Robustness tests

| | *Overall sample* | | *Pre-Sarbanes-Oxley* | | *Post-Sarbanes-Oxley* | |
|---|---|---|---|---|---|---|
| **Payout variables** | | | | | | |
| Repurchases / Assets | 0.0214 (0.2123) | 0.0144** (0.0149) | 0.0146** (0.0246) | 0.0180*** (0.0056) | 0.1324 (0.1343) | -0.0086 (0.5332) |
| **Governance variables** | | | | | | |
| Governance index | 0.0009** (0.0230) | 0.0005*** (0.0002) | 0.0009*** (0.0001) | 0.0005*** (0.0006) | 0.0008 (0.6300) | 0.0004 (0.1586) |
| Log of board size | | 0.0159*** (0.0001) | | 0.0162*** (0.0001) | | 0.0141*** (0.0001) |
| Proportion of independent outside directors | | 0.0063*** (0.0029) | | 0.0070*** (0.0031) | | 0.0068 (0.1946) |
| Percentage of managerial ownership | | 0.0000 (0.3980) | | 0.0000 (0.1436) | | -0.0000 (0.7448) |
| **Firm characteristics** | | | | | | |
| Log of assets | 0.0011 (0.1290) | 0.0007** (0.0141) | 0.0019*** (0.0001) | 0.0009*** (0.0042) | -0.0005 (0.8846) | 0.0003 (0.5606) |
| Long-term debt / Market value of assets | -0.0002 (0.4278) | -0.0014*** (0.0002) | -0.0001 (0.1807) | -0.0014*** (0.0001) | -0.0098 (0.2754) | -0.0024 (0.1333) |
| EBIT / Assets | -0.0075 (0.4212) | 0.0278*** (0.0001) | 0.0209*** (0.0001) | 0.0208*** (0.0001) | -0.2221*** (0.0001) | 0.0628*** (0.0001) |
| Investment / Sales | -0.0000 (0.8893) | 0.0007* (0.0534) | 0.0001 (0.1772) | 0.0005 (0.1423) | -0.0006 (0.6874) | -0.0048 (0.4993) |
| Intercept | -0.0041 (0.4791) | -0.0420*** (0.0001) | -0.0145*** (0.0001) | -0.0437*** (0.0001) | 0.0359 (0.1502) | -0.0389*** (0.0001) |
| Number of observations | 3,686 | 2,519 | 2,252 | 1,853 | 859 | 666 |
| Adjusted $R^2$ | 0.0013 | 0.1549 | 0.0653 | 0.1706 | 0.0193 | 0.1374 |

*Note: The data for corporate governance measures come from the Investor Responsibility Research Center (IRRC). Ownership data come from ExecuComp, and firm-specific control variables are from the Compustat database. All data are for the years 1998, 2000, 2002, and 2004. The Pre-Sarbanes-Oxley period includes 1998, 2000, and 2002. The Post-Sarbanes-Oxley period includes 2004. The governance index is that from Gompers et al. (2003). Investment is defined as the sum of research and development expenditures and capital expenditures. P-values are presented in parentheses below the coefficients. ***, **, and * represent significance at the 1 percent, 5 percent, and 10 percent levels, respectively.*