Governance and Conservatism in Investment Decisions[1]

Kose John,
New York University

Diana Knyazeva,
New York University

This draft: May 2006

Abstract

This paper examines the effect of governance on investment around significant industry–wide shocks to profitability and investment opportunities. We argue that entrenched managers are conservative as they are unwilling to bet on the continued project success (risk aversion) and send a negative signal to the shareholders about their project choice. This conservatism of entrenched managers drives lower investment around significant shocks, as they are more likely to cut investment (or increase it by less) than their well-governed counterparts. We find that conservatism of entrenched managers leads to underinvestment by poorly governed firms. Corporate governance is also associated with greater sensitivity of investment to investment opportunities in bad times. Finally, we find that good internal governance deters managerial conservatism. External governance is of little significance because the high degree of uncertainty in bad times lowers the informativeness and decreases the quality of external monitoring.

[1] We are grateful to Joseph Stiglitz, Daniel Wolfenzon, David Yermack and Bernard Yeung for comments and suggestions. Diana Knyazeva acknowledge financial support from Stern School of Business, New York University. The usual disclaimer applies.

The effect of ownership structure, executive compensation and market for corporate control on firm investment has been an important issue in theoretical and empirical corporate finance. Existing literature (for a detailed survey, see Stein, 2003) develops several competing theories, including empire building, quiet life and managerial shirking (private benefits) hypotheses. However, most of the existing literature does not explain investment adjustment (changes) or firm behavior outside the steady state (significant shocks). We address the relation between governance and investment in a new framework, examining changes in investment following temporary significant industry-wide shocks to cash flow and investment opportunities. We further ask which (internal or external) mechanisms of governance are more significant in determining firm-level investment response to such events.

Existing research proposes several alternative theories of the relation between corporate governance and firm investment. First, the empire building hypothesis based on the free cash flow theory (Jensen, 1986, 1993) suggests that poorly monitored CEOs increase the size of their firms due to higher managerial power, compensation, perquisites and other private benefits (further developed by Stulz, 1990; Harris and Raviv, 1990; Aggarwal and Samwick, 2003). The implications of this theory for firm behavior include suboptimally high level of acquisitions and investments by poorly monitored managers (Lang, Stulz, and Walkling, 1991; Blanchard, Lopez-de-Silanes, and Shleifer, 1994; Morck, Shleifer, and Vishny, 1990; Harford, 1999 etc.).

The empire building / overinvestment literature does not produce clear predictions for out-of-equilibrium firm behavior. The empirical implication of empire building for shock response is that poorly governed firms would increase investment more when faced with a

cash windfall. However, the predictions for response to negative cash flow shocks are not clear. On the one hand, since entrenched managers overinvest in the long-term, they maintain more suboptimal investment which may be discontinued in case of a negative shock (hence, greater investment cuts). On the other hand, poorly monitored managers could continue to overinvest.

Second, the quiet life hypothesis formulated in Bertrand and Mullanaithan (2003) suggests that entrenched CEOs prefer to preserve current levels of investment and avoid both new investments and liquidation of old investments. They find lower plant closures and creations following the passage of state anti-takeover laws. The empirical prediction of this body of literature is that weakly governed managers will react less than well governed managers both to positive and negative shocks.

Third, a related branch of corporate finance literature focuses on underinvestment (that can arise in the context of leverage, asymmetric information etc.). In the agency context, underinvestment can also arise because the manager faces a private cost of undertaking investment projects (e.g., Myers, 1977; Aggarwal and Samwick, 1999). For instance, Aggarwal and Samwick (1999) argue that CEOs underinvest to avoid privately costly effort into screening new investments and responsibility for oversight of undertaken projects. If managers are weakly governed, they will in general undertake a lower level of effort, resulting in lower investment. For our analysis, shirking would predict a lower increase in investment among weakly governed firms following a positive shock to investment opportunities.

We argue that managerial conservatism is responsible for the observed response to shocks by poorly governed managers. The conjecture is that all CEOs are risk averse as a

result of unwillingness to trigger downward updating of beliefs regarding managerial ability (Hirshleifer and Thakor, 1992). The implications of conservatism for investment behavior, however, are most prominent among weakly governed managers due to greater discretion in investment decisions for poorly monitored and governed CEOs. Further, entrenched managers have higher aversion to market scrutiny (associated with large new investment projects), which cuts into their private benefits. As a result, the empirical prediction is that weakly governed managers are excessively conservative in investment decisions, reflected by discontinuation of investments in bad times, and lack of investment growth in good times.

Empirically, we do not find support for the overinvestment or quiet life hypotheses. The shirking hypothesis also cannot explain our findings. Empirical results lend support to our conservatism hypothesis. In particular, entrenchment is associated with lower investment growth when a firm is faced with a temporary negative cash flow shock. When reacting to temporary negative investment opportunity shocks, weakly governed firms' investment is less elastic and more damaging to long-term firm value: investment cuts are smaller in one year, but far larger in three years, when investment opportunities have already recovered.

Unlike Wurgler (2000), however, the lower elasticity of weakly governed managers' investment to investment opportunities is observed only in bad times. With good shocks, entrenchment is not correlated with higher investment growth. Results show little significance of governance, and when the term enters significantly it bears the opposite sign: governance is associated with lower investment growth following positive shocks in cash flow or investment opportunities.

Further, the paper sheds light on the advantages and tradeoffs of internal and external governance mechanisms. We use both measures of internal governance and market for

corporate control and find that presence of a takeover threat does not significantly affect firm investment policies. Internal governance plays a more important role during negative shocks since internal monitors retain their access to sensitive firm-level information. As predicted, internal, but not external governance is a significant determinant of investment behavior around large exogenous shocks.

The remainder of the paper is organized as follows. Section 1 develops the hypotheses and addresses their relation to existing work. Section 2 describes shock definition, variables, and sample. Section 3 presents results of univariate testing, regression estimation and robustness checks and section 4 concludes.

1. Hypotheses and Related Work

1.1. Existing theories and predictions

The underlying hypothesis behind our analysis is that corporate governance matters for firm behavior, in general, and investment behavior, in particular. In this sense, our research is generally related to a large literature on the effects of corporate governance and incentives on firm performance (e.g., Jensen and Murphy, 1990a,b; Yermack, 1996; Hadlock and Lumer, 1997; Core and Larcker, 2002; Core, Holthausen, and Larcker, 1999; Gompers, Ishii, and Metrick, 2003; Gillan, Hartzell, and Starks 2003; Cremers, Nair, and Wei, 2004; Brown and Caylor, 2004; Bebchuk, Cohen, and Ferrell, 2005). A common finding in these papers is the strong positive association between corporate governance and firm performance. Some papers look further to separate the influence of internal mechanisms and market for corporate control on performance and firm decisions (including Shleifer and Vishny, 1989; Hadlock and Lumer, 1997; Cremers and Nair, 2005). The evidence remains mixed as some papers

find the relation between internal monitoring and market for capital control is complementary, other authors find that they are substitutes.

This work is more closely related to the finance literature linking corporate governance and firm investment policies. A number of theories linking agency problems and investment decisions have been developed, including, free cash flow, underinvestment (shirking), reputation and quiet life. The existing literature mostly links corporate governance with levels of investment, constructing theories and testing predictions for the steady-state behavior of firms. With this caveat, we discuss the implications of existing theories for our analysis and propose an alternative hypothesis for firm investment behavior (section 1.2) which provides predictions for adjustment to large industry wide shocks (outside the steady state).

First, the free cash flow theory (Jensen, 1986, 1993) lends theoretical support for the prediction of overinvestment by poorly governed firms. Firms experiencing agency conflicts would overinvest, as managers undertake excessive acquisitions and overly diversify due to their preferences for power, executive compensation, perquisite consumption and other private benefits arising from higher investment or from running a large firm (see, e.g., Morck, Shleifer, and Vishny, 1990; Stulz, 1990; Harris and Raviv, 1990; Lang, Stulz, and Walkling, 1991; Blanchard, Lopez-de-Silanes, and Shleifer, 1994; Harford, 1999).

However, empirical evidence on empire building during adjustments in investment has been mixed. Blanchard, Lopez-de-Silanes, and Shleifer (1994) find that firms facing exogenous cash windfalls conduct value destroying acquisitions and preserve extra cash, rather than paying it out to shareholders. Lamont (1997) and Lamont and Polk (2002) consider the impact of diversification on investment and spending by different divisions in

case of cash windfalls or negative shocks (oil shocks). However, Aggarwal and Samwick (1999) show that better managerial alignment, which lowers agency, is associated with both higher performance and investment. This result is against the overinvestment hypothesis and provides support for the conjecture that weakly governed managers may underinvest due to private costs associated with investments. Most recently, Bertrand and Mullanaithan (2003) find that poorly governed managers are less likely to liquidate old plants or open new ones, preferring, instead, the "quiet life".

For our analysis, overinvestment does not give clear predictions about firm response to exogenous shocks (out of equilibrium). The most direct implication is for adjustment following positive cash flow shocks: firms with poor corporate governance are expected to raise investment more.

Second, related research on underinvestment has developed in the corporate finance literature. More recently, underinvestment is obtained as a result of agency distortions stemming from privately costly effort of the manager required for selection and successful realization of new investment projects (see, e.g., Stoughton, 1993; Aggarwal and Samwick, 1999). If CEOs are not properly aligned with shareholders and are poorly governed, incentives to shirk may lead to underinvestment. The only direct prediction of this theory is for investment changes around positive shocks to investment opportunities: poorly governed managers are expected to raise investment less (entrenched CEOs prefer not to invest effort into selection and oversight over new investment projects despite better investment opportunities).

Third, one of the most recent links between governance and investment, formulated by Bertrand and Mullanaithan, 2003), sheds more light on incremental decisions to

discontinue old projects and initiate new investments. They find that weakly governed managers are less likely to close down old plants and open new plants. An extension of their reasoning is the prediction of insignificant investment adjustments to both good and bad shocks in investment opportunities by weakly governed CEOs. Wurgler (2000) would provide a similar prediction, but based on lower elasticity of investment to investment opportunities in countries with poor investor protections.

1.2. Managerial conservatism and investment decisions

Developing on the existing body of literature, we propose an argument linking corporate governance and managerial conservatism, yielding a set of hypotheses for investment behavior in response to unexpected, temporary events (out of equilibrium). Our conjecture is related to the work on governance and risk aversion, which provides mixed evidence. On the one hand, Hirshleifer and Thakor (1992) argue that presence of high takeover threats (good governance) causes more conservative behavior as raiders can costly observe potential failures of investment projects, making those firms targets. The conclusion relies upon the premise that outside investors other than takeover raiders cannot observe any information about firm investment realizations, which is not entirely plausible. On the other hand, John, Litov and Yeung (2005) find positive association between governance and risk, arguing that weakly governed CEOs prefer not to endanger own perquisite consumption by undertaking risky projects. While a credible explanation of firm risk differences, this does not help in predicting changes in levels of investment, as perquisite consumption is usually incomparable in size with firm capital expenditure.

In our conjecture, realizations of new investment projects cause market updating of CEO ability and no level of entrenchment is completely dismissal-proof, leading to

managerial risk aversion. However, lower quality of corporate governance provides higher discretion to the manager in firm policies and less monitoring of investment decisions. As a result, risk aversion is expected to manifest itself more strongly in investment decisions of weakly governed managers.

Further, since new investment and acquisitions cause greater market scrutiny, weakly governed CEOs may be even more averse to increases in the levels of investment since market monitoring cuts into an entrenched manager's private benefits. Managers in poorly governed firms receive higher cash compensation, perquisites and other private benefits, and may have lower future employment opportunities in the event of firing. Since entrenchment cannot guarantee job security, poorly governed managers have more to lose in the event of a dismissal, driving hire risk aversion in investment of weakly governed firms.

Hence, we expect better governed firms to be less conservative in their investment decisions. More specifically, consider firm behavior in response to cash windfalls and shortfalls. If these changes to cash flow are purely temporary (sample selection criteria), controlling for financial constraint, any significant changes to capital expenditure are suboptimal. Controlling for quality of investment opportunities, cash shortfalls should not lead to discontinuation of positive NPV projects that contribute to firm value (if financing constraint is not binding). Similarly, cash windfalls should not contribute to an increase investment if investment opportunities have not improved. If well governed managers have superior knowledge of the temporary nature of the industry fluctuations (due to better screening), they would act closer to optimality, avoiding significant changes in capital expenditure in case of cash windfalls or shortfalls.

However, behavior of weakly governed managers is expected to differ from well governed CEOs in view of the above risk aversion and conservatism argument. Since weakly governed managers have poorer information about the temporary or permanent nature of the shock, the hypothesis is that poorly governed managers are overly conservative with respect to changes in levels of investment. In the event of a cash shortfall, we expect weakly governed managers to exhibit lower investment growth, treating the negative shock is permanent. In a good cash flow shock, however, weakly governed CEOs are not expected to raise their investment more than well governed managers.

Conservatism of weakly governed managers also affects adjustment of investment and R&D following industry shocks to investment opportunities. In line with the earlier discussion, weakly governed managers would be reluctant to raise investment after temporary good shocks to limit market updating regarding managerial quality in case of a bad project realization. However, when the industry experiences a decline in investment opportunities, we expect weakly governed managers to lower long-term growth of investment (even after investment opportunities recover) and exhibit a less elastic response. Weakly governed managers do not screen as well fluctuations in investment opportunities, which is privately costly, and are unwilling to take the risk of new investments. As a result, their response to a negative investment opportunities shock is more protracted and less elastic than that of well governed managers.

Hence, poorly governed firms are expected to adjust more slowly to a fall in investment opportunities, raising investment more in the short run, but lowering it in the medium term. Our managerial conservatism hypothesis would predict that weakly governed CEOs will respond cautiously to a negative shock in investment opportunities and cut

investment and R&D as if reacting to a long-term shock. Therefore, entrenchment is expected to be associated with higher investment growth in the short term, and lower investment growth in the medium term following poor shocks in investment opportunities. For positive investment opportunities shocks, the conservatism prediction is similar to the prediction for cash windfalls: weak governance is insignificantly or negatively associated with investment growth.

Our hypotheses for adjustments in investment can be summarized as follows:

C1: Temporary negative cash flow shock: governance is positively associated with investment growth

M1: Temporary negative investment opportunities shock: governance is positively associated with subsequent *medium-term* investment growth and leads to greater elasticity in investment growth

C2: Temporary positive cash flow shock: governance is insignificant or positively associated with investment growth

M2: Temporary positive investment opportunities shock: governance is insignificant or positively associated with investment growth.

1.3. Governance mechanisms: institutional ownership and the market for corporate control

The existing corporate finance literature presents several mechanisms of managerial entrenchment, dividing them into internal and external mechanisms. Most recently, Cremers and Nair (2005) consider the relative importance of internal and external governance on accounting and stock returns. This paper uses both measures of institutional ownership and

corporate control markets to predict adjustment in investment following significant industry shocks.

The hypothesis is that in case of shocks (industry downturns, recessions etc.), information about true quality of firm investment projects is critical to optimal adjustment and successful recovery. Due to low observability of such characteristics by the market and limitations on outsiders' information production around shocks, external monitoring has lower effectiveness than internal governance mechanisms. Further, internal governance is often a more immediate (affecting directly investment rather than generally managerial policies) and less costly mechanism of disciplining value destroying CEOs. Hence, we expect internal governance to be far more significant for firm behavior and investment decisions.

CM3: Internal governance is more significant than external governance in determining investment response around industry shocks.

2. Sample and Data

2.1. Shock Definition

The main tests of empirical predictions in this paper are conducted on four separate samples of firms experiencing positive and negative shocks in cash flow and investment opportunities. Importantly, we do not consider firm specific fluctuations in cash flows or market-to-book ratios because the issue of endogeneity of such shocks would interfere with our analysis of corporate governance and investment decisions. Instead, we create subsamples based on changes in industry median cash flow and industry median investment opportunities.

Another consideration is inclusion of temporary (one-year) or longer-term (multi-year) shocks. On the one hand, multi-year industry slumps are more commonly present and may result in a higher number of observations. However, the protracted nature of the shock creates a number of issues. First, when the shock is extended over multiple years, firms may be better able to forecast the industry shock based on past performance, adjusting investment accordingly (before the shock unravels fully). As a result, we may not observe significant adjustments in subsequent shock years. Second, when firms are faced with multi-year industry booms or slumps, the optimal adjustment to cash flow shocks is far less clear. If such shock indicates a permanent shift in cash flows, permanent investment cuts may be optimal. However, if the shock is a two-year temporary cash flow shock, changes to investment constituting core firm value are suboptimal. Hence, interpretation of weakly governed CEOs' behavior would be highly problematic.

These issues do not arise when we consider temporary one-year shocks. In particular, imposing restrictions on pre- and post-shock industry performance renders the industry changes during shock year temporary and more likely to be unexpected. Further, purely temporary shocks to cash flows should not entail any significant changes to investment policy of the firm as capital expenditure and R&D should remain unaffected (allowing to conclude on possible value-destroying shock responses), controlling for the financial constraint. Therefore, in order to test our hypotheses, we will only focus on temporary (one-year) shocks. Further, we attempt to account for the unexpected nature of the shock by considering past performance as one of the key determinants of market expectations.

We define shocks as an increase (decrease) in industry median cash flow (or investment opportunities) of the magnitude of 5% or more in a given year preceded and

followed by less significant changes in investment. For the positive shock, we require the change in the industry median level to be +5% or higher in the shock year and less than +5% in the year before and the year after the shock year. For the negative shock, we require the change in the industry median level to be -5% or lower in the shock year and higher than -5% in the years preceding and following the shock year. For example, to be included in a negative cash flow shock subsample, an industry has to exhibit a 5% drop in EBITDA in that year with a better than -5% growth in the years before and after the shock. For robustness, we also use a more stringent criterion: 10% threshold for the change during shock year and 0% threshold for the change in the years before and after the shock, which produces similar results (not shown in tables). Using our sample selection criterion, the median industry shock size is 19.4% for negative cash flow shocks and 24.0% for negative investment opportunities shocks, and 12.8% for positive cash flow shocks and 17.5% for positive investment opportunities shocks.

The criteria described above deal with industry cash flow and industry investment opportunities. One alternative criterion is industry median stock return. However, the drawback of this measure is its noisiness, particularly in the analysis of short-term (one-year) changes. Bankruptcies of one or several large companies in the sector, for example, can lead to a major slump in stock returns and more volatile trading of firms in the industry, leading to spurious identification of large shocks. At the same time, actual industry median cash flows would not necessarily exhibit severe declines.

Another alternative criterion for industry median performance is earnings per share. Although earnings per share are commonly reported as an indicator of performance, we do not use shocks to EPS in our analysis. Managerial entrenchment has been related to earnings

management in existing literature (Myers, Myers, and Skinner, 2001; Leuz, Nanda, and Wysocki, 2003 etc.). As a result, earnings are much smoother and less representative of the underlying decline in operating performance, so use of this variable to define an industry-wide shock is harder to justify and can introduce potential biases in industries with a higher degree of entrenchment. .

In this paper, return on assets (the ratio of earnings before interest, taxes, depreciation and amortization to book value of total assets) is the measure of cash flow used to define industry-wide shocks.

Investment opportunities are commonly measured by average Q (the ratio of market value to book value of total assets). The interpretation is that the market adequately prices in value of forward-looking investment opportunities. We recognize that the presence of information asymmetries may worsen the measurement error in average Q. However, this is likely to work against our result, causing lower statistical significance of investment changes around the shock (since shock measurement in itself may be poor).

The main empirical question is the impact of corporate governance on the change in firm investment around each of the specified industry-wide shocks. At the firm level, the main dependent variable is one-year and three-year change (the year of the shock is year 0) in capital expenditure. In robustness checks, we also use the percentage change in capital expenditure and R&D in each of the three years following the shock (data obtained from Compustat). Missing observations for R&D expenditure are substituted by zero since many firms that do not have R&D never record this item.

A common measure of governance is institutional ownership, which is associated with superior monitoring capacity. Data on institutional ownership and institutional

blockholdings is obtained from the IRRC database. Further, we use a measure of institutional ownership concentration – Herfindahl index of institutional ownership stakes – based on the data from the Thomson Financial database of 13f filings. In addition, we use the G index (Gompers, Ishii, and Metrick, 2003) of 24 anti-takeover provisions as a measure of managerial entrenchment since they reduce the likelihood of a takeover and raise managers' job security. We also use an entrenchment index of 6 anti-takeover provisions originally included in the G index (Bebchuk, Cohen, and Ferrell, 2005) as a robustness check. To mitigate the possible endogeneity of governance, we also include an index of state anti-takeover provisions as an alternative governance measure.

Since firms with poor governance are more likely to suffer from a more severe financing constraint and be unable to raise capital for new investment projects, one needs to control for this to obtain meaningful results. Several measures have been used in the past (see, e.g., Almeida, Campello, and Weisbach, 2003) – bond and commercial paper ratings, past issuance of public debt, cash holdings and asset size. For reasons of data availability, we include presence of a bond rating, volume of excess cash holdings (Dittmar and Mahrt-Smith, 2005) and firm size as measures of financing constraint.

To account for mean reversion of performance and investment, we also control for the firm accounting returns and capital expenditure in the shock year (large past investment may indicate greater overinvestment and higher propensity to cut capital expenditure). We also control for market-to-book to account for firm-level investment opportunities.

Other controls reflect shock properties, such as magnitude and number of industry shocks since some industries could be more prone to large and frequent shocks. Variable descriptions are presented in Table 1.

2.2. Sample

We use the change in the industry median of cash flow and investment opportunities to identify industry-years that enter our sample, as described above. All firm-level observations with available governance and financial data that satisfy our sample selection criteria in these industry-years are included. Data on financial performance and investment are obtained for all firms in the Compustat database. We proceed to exclude companies incorporated in American Samoa, Guam, North Mariana Islands, Puerto Rico, Trust Territories, Virgin Islands, and foreign countries, eliminating 392 observations. We further exclude firms in regulated utilities (SIC codes 4000-4999) and financial industries (SIC codes 6000-6999), following the existing literature. In order to avoid capturing small firm behavior with large percentage fluctuations in growth and operating returns, we drop all firms with asset size below 5 mln. We proceed to merge the dataset with IRRC database, which is the main source of corporate governance data.

Next, we use SIC codes to identify industries at the 3-digit level and generate industry median cash flow and investment opportunity measures. To ensure that industries with very few firms do not distort our results, we exclude all industries with fewer than 10 firms. Using the above definitions of industry shocks, we generate four subsamples (positive and negative shocks in cash flow and investment opportunities) of industries experiencing significant temporary shocks between 1991 and 2003. We obtain samples of 245 and 236 industry shock years with negative cash flow and investment opportunities shocks, respectively, and 223 and 343 industry shock years with positive cash flow and investment opportunities shocks, respectively.

[Table 2]

To analyze differences in adjustment of investment across different types of firms, we generate variables for one-year and three-year changes in capital expenditure, capital expenditure and R&D using shock year as base year. If we require the data on the Gompers, Ishii, Metrick (2003) G index and one-year change in investment in response to shocks to be available, this restricts the sample to close to two thousand observations (800 when we require data to be available to compute the 3-year adjustment in investment). The descriptive statistics on all four samples can be found in Table 3.

[Table 3]

A potential source of concern whenever downturns or negative shocks are used is survivorship bias. Since firms, which dropped out of the database (and our sample) following the industry shocks are not observed, survivorship bias may be present. However, it is commonly found that companies entering bankruptcy or being liquidated have worse corporate governance and systematically undertake suboptimal policies (good, but illiquid firms simply exchange debt as part of a private workout). Hence, if the bankruptcy and liquidation subsample of firms was more fully represented in the sample, these firms would exhibit a more significant distortionary investment response, strengthening the relation between poor quality of corporate governance and investment adjustment. Since such firms are unobservable, this bias works against the finding of significant correlation between corporate governance and optimal investment response.

However, by design we are only considering temporary industry-wide one-year shocks in performance (accounting returns or investment opportunities). Since multi-year industry slumps or recessions are excluded, most of the sample should survive a temporary negative shock. One-year survival rate is 90.8% and 90.3% in the sample of negative cash

flow shocks and negative investment opportunities shocks, respectively. The survivorship bias is expected to be even weaker for positive industry shocks since liquidations and bankruptcies primarily occur in downturns. Hence, survivorship rates in our positive shock subsamples can be used as a benchmark. We find that survival rates following positive shocks - 90.9% and 90.59% for the samples of positive cash flow shocks and positive investment opportunities shocks, respectively - are very similar to survival rates in the negative shocks samples.

Shock endogeneity is another potential concern in our analysis since the analysis hinges on the premise that occurrence of shocks is unrelated to governance and other variables of interest. Since we are considering only industry-wide shocks, the only instance in which industry performance (and shocks) is endogenous to firm level governance takes place when there are very few firms in the industry, skewing industry median. In this case, industry median would closely represent individual firm performance, which depends on governance and the potential endogeneity issue somewhat similar to the endogeneity of firm – specific shocks and governance arises. However, we address this by excluding industries with fewer than 10 companies with available data (the median number of firms in the industry is between 82 and 112 for different subsamples).

Finally, since some industries are more volatile than others, our samples include firms from industries with up to six temporary shocks. As a result, the dataset is an unbalanced panel of data with some firms having up to six observations in the sample (average changes in investment and returns in response to shocks). Ideally, this problem would be addressed by panel estimation, such as fixed effects regressions, estimating firm-level effects. However, most companies in the sample have only two or three observations, so we do not use panel

data estimation. To account for this effect, we include a control for the number of industry shocks in all regressions. At the same time, to account for industry-specific and year effects, we include the year of shock dummies and industry dummies based on 2-digit SIC codes.

3. Results

3.1. Univariate tests, regression estimation

Tables 4 through 9 present empirical evidence on the effect of governance on investment changes in response to significant industry events.

First, we tabulate percentage changes in capital expenditure following different types of shocks based on firms' governance characteristics. As predicted, firms with better corporate governance (high institutional ownership and low anti-takeover provisions) exhibit higher investment growth following negative ROA shocks. For example, firms with high institutional ownership raise investment by 7.3% within one year after the shock, while low institutional ownership firms cut capital expenditure by 1.2%. Similarly, firms facing high takeover threats raise investment by 12.6% one year after a cash shortfall compared with only 3.6% for more entrenched firms

[Table 4]

In case of a drop in investment opportunities, entrenchment is associated with more investment immediately following the shock and less investment later on. This provides partial support for the earlier hypothesis of less elastic adjustment in investment, leading to far greater investment cuts in the long-term by entrenched CEOs. In particular, well governed firms (institutional ownership) raise investment by only 3.3% the year after the shock, and by 39.1% 3 years later when investment opportunities recover. However, entrenched managers

smooth investment growth with a 14.3% growth in the first year and 11.9% growth during the third year after the shock. Since investment opportunities are poor around the shock year, continuing to take on new projects leads to initiation of negative NPV investments. At the same time, lack of substantial growth when investment opportunities rise again (2-3 years later) leads to a further failure to start new investments when attractive projects are available.

Differences in firm behavior after positive shocks are insignificant. This is in line with the earlier hypothesis that entrenched managers are conservative with respect to initiation of new investment and do not have a strong empire building preference.

Second, results of regression estimation are presented in Table 5. While internal governance measured by institutional shareholdings is significantly correlated with investment decisions, external governance is not significant. In addition to superior monitoring features, internal governance is a more flexible, immediate and less costly mechanism of disciplining managers (when compared with external governance). In addition to being highly costly to realize, takeovers have also become a far less effective disciplining mechanism due to the almost complete disappearance of hostile takeovers.

Consider firm response to negative industry shocks in cash flow. Institutional ownership is associated with higher investment growth immediately after the shock and several years following the shock (weak significance). In particular, a 10% increase in institutional ownership is associated with a 1.86% higher capital expenditure one year after the shock and a 2.99% higher investment three years after the shock year. This result appears to be against the quiet life hypothesis, which suggests that entrenched managers prefer not to terminate or initiate new investment (Bertrand and Mullanaithan, 2003) and supports our C1 hypothesis.

Confirming earlier results of univariate testing, entrenchment is associated with less elastic investment response in case of a fall in investment opportunities. Firms with lower monitoring from institutional owners show higher investment immediately after the shock, and lower investment 3 years after shock year. In particular, a 10% increase in institutional ownership is associated with a 1.9% lower capital expenditure in the first year and 7.0% higher capital expenditure in the third year following an industry event, supporting the M1 hypothesis.

[Table 5]

However, we do not find similar investment smoothing patterns by entrenched CEOs in good times. When we consider positive shocks in investment opportunities, entrenched CEOs do not limit investment growth in the short term and raise investment in the long-term (in line with the M2 hypothesis). This result is against Wurgler (2000), which finds that countries with poorer investor protection have investment less elastic to changes in value added.

Finally, we test the C2 hypothesis of conservatism in investment behavior of firms facing positive cash flow shocks (cash windfalls). Contrary to the empire building hypothesis, entrenched CEOs do not raise investment in one or three years following a positive shock more than less entrenched managers. Neither internal governance (institutional shareholding) nor external governance (anti-takeover provisions) enters significantly in the regressions.

[Table 6]

In order to account for other possible determinants of the observed effects of governance on investment, a number of controls are included in the regressions. First, we

include a measure of investment opportunities (firm level market-to-book ratio) and capital expenditure to account for overinvestment prior to shocks and mean reversion. As expected, capital expenditure at the time of the shock is negatively and significantly associated with investment adjustment.

Second, it is important to account for investment opportunities when considering determinants of changes in capital expenditure. Since we use a measure of market-to-book ratio the year of shock, we expect stronger significance for one year investment changes. For negative shocks in ROA, the variable is significant for one year adjustment in investment, with a coefficient of 5.8%, significant at 1% level. Similar result holds for negative shocks in investment opportunities (coefficient estimate of 5.2%, 1% significance level) and positive shocks in cash flow and market-to-book (with coefficients of 3.4% and 2.0% respectively).

Third, capital constraint may be driving our result of lower investment for entrenched managers. Poorly governed firms face higher financing constraints, which may be reflected in lower investment levels even in presence of good investment opportunities. If capital constraint is the main driving factor of our results, we should not see any significance whenever this variable is controlled for. We use a measure of excess cash holdings to capture capital constraint. As expected, excess cash holdings are positively associated with longer-term growth in capital expenditure (three years after the shock) in all samples. Inclusion of excess cash holdings as one of the predictors of investment changes does not eliminate the significance of corporate governance.

Finally, we account for size and firm cash flow as other controls in investment adjustment regressions. Logged sales enter significantly and negatively in most models, while the measure of cash flow is mostly insignificant.

Our results lend support to the argument that poor corporate governance is associated with highly conservative behavior in terms of expansion of investment around significant events. In particular, we find that corporate governance is associated with higher investment growth after negative cash flow shocks, and higher investment growth (with less elastic response) in three years after negative investment opportunity shocks. Regression results for positive shocks subsamples suggest that poorly governed firms do not overinvest in the event of cash windfalls and do not invest more in positive shocks to investment opportunities. Further, when we account for ownership structure and market for corporate control, it is institutional shareholdings that are significant for investment adjustment. In line with our conservatism argument, internal governance provides a mechanism of superior monitoring and more immediate and less costly disciplining of value destroying managers (CM3 hypothesis).

3.2. Robustness

We check robustness of our results by using alternative governance measures, additional controls, an alternative measure of investment and a different estimation method. To account for potential endogeneity of investment and governance, we include an alternative governance measure that is more exogenous than the G index: the index of state anti-takeover provisions. In addition, institutional shareholdings are measured during the year of shock, rather than during post-shock adjustment period. Hence, changes in governance (such as a takeover and reshuffling of an entrenched board) resulting from suboptimal investment response to shocks are not captured, partially mitigating possible endogeneity.

Inclusion of the state takeover law index does not affect our results. Consistent with prior findings, internal governance retains its sign and significance, while the threat from the market for corporate control does not significantly affect investment changes. For negative cash flow shocks, firms with better internal governance exhibit higher investment growth one year later, which is a more optimal response to the temporary cash flow shock, controlling for other factors. Governance-related differences in adjustment to negative market-to-book shocks preserve: better governed firms lower short-term growth rate of investment and raise it more several years after the shock, when investment opportunities recover (with a 1.88% lower investment growth in one year and 6.63% higher investment growth in three years for each 10% increase in institutional ownership). As before, entrenched firms do not engage in empire building in case of positive cash flow shocks and do not invest more than better governed firms in case of positive market-to-book shocks.

We include additional controls to better measure capital constraint (bond rating), industry volatility and market expectations (number of industry shocks) and magnitude of the shock (shock size). While the first two controls are insignificant, shock size enters significantly in positive shocks subsamples. In particular, an increase in shock magnitude by 10% (positive market-to-book shocks) is associated with a 4.4% higher growth of investment one year later. However, for positive cash flow shocks higher magnitude of the windfall is associated with lower investment (3.8% lower investment per 10% increase in shock magnitude).

[Table 7]

To control for potentially significant effect of R&D in some firms, we use changes in capital expenditure plus R&D as an alternative dependent variable (Table 8). Our results for

adjustment to bad times are unchanged. However, we find that in good times entrenched managers underinvest, rather than overinvest, both in case of cash windfalls and market-to-book shocks.

[Table 8]

We also alter our sample selection criteria and use a different institutional ownership measure to check for robustness of results. First, we use terciles of institutional shareholdings to define the internal governance dummy variable to obtain consistent results (Table 9). We further confirm our result that better governed firms invest less following bad shocks. Further, we find a negative association between capital expenditure and corporate governance for good shocks, consistent with expected underinvestment behavior.

[Table 9]

Second, small sample size may be an issue. We alter our definition of the dependent variable to include continuous adjustment of capital expenditure and R&D for 3 years after the shock and use a more available internal governance measure from Thomson Financial. Instead of total institutional ownership, we include a Herfindahl index of institutional ownership concentration to reflect higher monitoring incentives by larger concentrated institutional owners. We avoid use of a blockholder dummy due to the arbitrary nature of the thresholds. In particular, it is not clear why 5% ownership by an institutional owner induces higher monitoring incentives than 4.9% ownership stake). Alternating the use of state law anti-takeover index and entrenchment anti-takeover index (Bebchuk, Cohen, and Ferrell, 2005), we find strong support for our results on a large sample. As before, the effect of the market for corporate control appears to be insignificant, while institutional ownership concentration is associated with higher investment growth following shocks.

[Tables 10 and 11]

Finally, controlling for past capital expenditure when the dependent variable is the growth rate of investment may create biased estimates. Exclusion of this control does not affect our results. We raise the shock threshold to 10% drop or increase in industry median cash flow or market-to-book, which does not change the main results (not shown in tables).

Our empirical evidence supports the hypothesis that entrenched managers act conservatively in response to negative or positive shocks, translating into unwillingness to start new projects and natural discontinuation of old projects. This results in an overall lower investment by entrenched CEOs, going against the overinvestment or quiet life hypotheses.

Conclusions

This paper has considered the role of corporate governance for changes in investment decisions around significant industry-wide shocks to cash flows and investment opportunities. We propose the conservatism hypothesis, which provides predictions for the adjustment of firm investment to shocks. We conjecture that entrenched managers are averse to expansion of investment due to aversion to market scrutiny stemming from new investments and greater managerial discretion over the choice of investment policy. One implication of such conservative behavior by poorly governed CEOs is lower investment growth following negative and positive investment opportunities shocks. We also find that the response of investment to investment opportunities shocks is less elastic for poorly governed firms; however, this only holds for negative shocks in investment opportunities.

Finally, we compare two different mechanisms of managerial monitoring – internal monitoring by institutional shareholders, and monitoring by the market for corporate control.

Since the high degree of uncertainty in bad times lowers the informativeness and decreases the quality of external monitoring, we find that external governance is of little significance. However, institutional blockholdings and institutional ownership concentration are significant determinants of firm investment policy.

References

Aggarwal, R., Samwick, A., 1999. Empire-builders and Shirkers: Investment, Firm Performance, and Managerial Incentives. Unpublished working paper. National Bureau of Economic Research.

Almeida, H., Campello, M., Weisbach, M., 2004. The Cash Flow Sensitivity of Cash. Journal of Finance 59, 1777-1804.

Bebchuk, L., Cohen A., Ferrell, A., 2005. What Matters in Corporate Governance?. Unpublished working paper. Washington University in St. Louis.

Bertrand, M., Mullainathan, S., 2003. Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. Journal of Political Economy 111 (5), 1043-1075.

Blanchard, O., F. Lopez-de-Silanes, Shleifer, A., 1994. What Do Firms Do with Cash Windfalls? Journal of Financial Economics 36, 337-360.

Brown, L., Caylor, M., 2004. Corporate Governance and Firm Performance. Unpublished working paper. Georgia State University.

Core, J., Larcker, D., 2002. Performance Consequences of Mandatory Increases in Executive Stock Ownership. Journal of Financial Economics 64, 317-340.

Core, J., Holthausen, R., Larcker, D., 1999. Corporate Governance, CEO Compensation, and Firm Performance. Journal of Financial Economics 51, 371–406.

Cremers, M., Nair V., Wei C., 2004. The Congruence of Bondholder and Shareholder Governance. Unpublished working paper. University of Pennsylvania.

Cremers, M., Nair, V., 2005. Governance Mechanisms and Equity Prices. Journal of Finance 60, 2859-2894.

Dittmar, A., Mahrt-Smith, J., 2005. Corporate governance and the value of cash holdings. Unpublished working paper. University of Michigan.

Gillan, S., Hartzell J., Starks, L., 2003. Industries, Investment Opportunities and Corporate Governance Structures. Unpublished working paper. University of Texas.

Gompers, P., Ishii, J., Metrick, A., 2003. Corporate Governance and Equity Prices. Quarterly Journal of Economics 118(1), 107-155.

Grinstein, Y., Hribar, P., 2004. CEO Compensation and Incentives: Evidence from M&A Bonuses. Journal of Financial Economics 73(1), 119-143

Hadlock, C., Lumer, G., 1997. Compensation, Turnover and Top Management Incentives: Historical Evidence. Journal of Business 70, 153-187.

Harford, J., 1999. Corporate Cash Reserves and Acquisitions. Journal of Finance 54(6), 1969-1997.

Harris, M., Raviv, A., 1990. Capital Structure and the Informational Role of Debt. Journal of Finance 45, 321-350.

Hirshleifer, D., Thakor, A., 1992. Managerial Conservatism, Project Choice, and Debt. Review of Financial Studies 5, 437-470.

Jensen, M., 1986. Takeovers: The Controversy and the Evidence. In: Proceedings of the William G. Karnes Symposium on Mergers and Acquisitions. Bureau of Economic and Business Research, University of Illinois, 1986.

Jensen, M., 1993. The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems. Journal of Finance 48, 831-880.

Jensen, M., Murphy, K., 1990a. CEO Incentives-It's Not How Much You Pay, But How. Harvard Business Review 68 (3), 138-153.

Jensen, M., Murphy, K., 1990b. Performance Pay and Top-Management Incentives. Journal of Political Economy 98, 225-264.

John, K., Litov, L., Yeung, B., 2004. Corporate Governance, Risk-Taking, and Growth. Unpublished working paper.

Lamont, O., 1997. Cash Flow and Investment: Evidence from Internal Capital Markets. Journal of Finance 52, 83-109.

Lamont, O., Polk, C., 2002. Does Diversification Destroy Value? Evidence from Industry Shocks. Journal of Financial Economics 63(1), 51-77.

Lang, L., Stulz, R., Walkling, R., 1991. A Test of the Free Cash Flow Hypothesis: The Case of Bidder Returns. Journal of Financial Economics 29, 315-335.

Leuz, C., Nanda, D., Wysocki, P., 2003. Earnings Management and Investor Protection: an International Comparison. Journal of Financial Economics 69, 505-527.

Morck, R., Shleifer, A., Vishny, R., 1990. Do Managerial Objectives Drive Bad Acquisitions? Journal of Finance 45, 31-48.

Myers, S., 1977. Determinants of Corporate Borrowing. Journal of Financial Economics 5, 147-175.

Myers, J., Myers, L., Skinner, D., 2005. Earnings Momentum and Earnings Management. Unpublished working paper.

Shleifer, A., Vishny, R., 1989. Management Entrenchment: The Case of Manager-Specific Investments. Journal of Financial Economics 25, 123-139.

Stein, J., 2003. Agency, Information and Corporate Investment. Handbook of the Economics of Finance / eds. G. Constantinides, M. Harris and R. Stulz, 111-165.

Stoughton, N., 1993. Moral Hazard and the Portfolio Management Problem. Journal of Finance 48(5), 2009-2028

Stulz, R., 1990. Managerial Discretion and Optimal Financing Policies. Journal of Financial Economics 26, 3-27.

Wurgler, J., 2000. Financial Markets and the Allocation of Capital. Journal of Financial Economics 58, 187-214

Yermack, D., 1996. Higher Market Valuation of Companies With a Small Board of Directors. Journal of Financial Economics 40, 185-211

Table 1. Variable description

Variable name	Variable definition
Capital expenditure (1 year change)	Change in capital expenditure (CAPEX / assets); between year of shock and the following year (set capital expenditure equal to zero when missing)
Capital expenditure (3 year change)	Change in capital expenditure (CAPEX / assets); between year of shock and year of shock+3 (set capital expenditure equal to zero when missing)
Capital expenditure and R&D (1 year change)	Change in capital expenditure (CAPEX + R&D / assets); between year of shock and the following year (set capital expenditure and R&D expense equal to zero when missing)
Capital expenditure and R&D (3 year change)	Change in capital expenditure (CAPEX + R&D / assets); between year of shock and year of shock+3 (set capital expenditure and R&D expense equal to zero when missing)
G index	Index of anti-takeover provisions (out of 24) based on Gompers, Ishii and Metrick (2003)
G state index	Index of state anti-takeover laws (out of 6) based on Gompers, Ishii and Metrick (2003)
G entrenchment index	Index of state anti-takeover laws (out of 6) based on Bebchuk, Cohen and Ferrell (2004): staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, supermajority for charter amendments, poison pills and golden parachutes
Institutional shareholding	Institutional ownership, % of common shares outstanding
MTB	Market value of assets / book value during shock year
Ln(Sales)	Logged sales during shock year
Past EBITDA / Total Assets, %	Earnings before interest and taxes over total assets during shock year, %
Past capital expenditure / assets, %	Capital expenditure over total assets during shock year, %
Cash holdings (excess)	Residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, MTB, G index, institutional ownership, year and firm effects; Dittmar and Mahrt-Smith (2005).
Bond rating	Dummy variable for presence of bond rating in the Compustat database.
Shock magnitude	Net change in industry median ROA between the year before and the year of the shock
Shock year	Year of the industry shock, defined per sample selection criteria.

Table 2. Descriptive Statistics: Shocks

Year	Negative (ROA)		Negative (MTB)		Positive (ROA)		Positive (MTB)	
	Number (industry)	Size (median, %)	Number (industry)	Size (median, %)	Number (industry)	Size (median, %)	Number (industry)	Size (median, %)
1991	22	-17.797	0	NA	12	16.656	72	21.561
1992	18	-9.024	9	-12.950	18	13.532	8	11.088
1993	19	-24.995	4	-12.615	14	12.875	26	11.920
1994	15	-14.777	44	-11.530	26	13.867	12	7.975
1995	27	-17.182	10	-26.171	21	15.743	41	25.752
1996	25	-12.730	20	-9.757	13	9.021	39	12.416
1997	21	-10.231	8	-13.601	19	12.577	31	7.493
1998	21	-20.578	40	-25.623	18	17.947	6	13.959
1999	21	-25.432	4	-42.909	22	8.773	27	35.681
2000	18	-19.412	34	-82.580	25	11.463	13	18.390
2001	29	-22.190	4	-19.998	9	7.187	63	14.590
2002	9	-83.114	56	-32.889	26	11.116	5	19.169
Total	245	-19.352	236	-24.143	223	12.808	343	17.536

Table 3. Descriptive Statistics: Investment Changes and Governance

Panel A. Negative shocks: ROA

	Obs	Mean	Median	25th %-ile	75th %-ile	St. Dev.
Capital expenditure (1 year change)	1813	3.885	-6.397	-30.686	21.042	372.043
Capital expenditure (3 year change)	786	15.708	-6.356	-39.610	39.521	663.991
Capital expenditure + R&D (1 year change)	1813	2.373	-5.172	-24.585	17.627	286.925
Capital expenditure + R&D (3 year change)	786	10.796	-5.433	-32.942	32.729	473.465
G index	1813	8.604	8.500	6.556	10.462	17.615
G state index	1813	1.644	1.000	1.000	2.000	6.000
G entrenchment index	1813	1.962	2.000	1.000	3.000	6.000
Institutional shareholding	1813	59.654	62.400	47.800	75.300	99.200
Institutional ownership concentration	1810	0.083	0.068	0.051	0.098	0.054

Panel B. Negative shocks: MTB

	Obs	Mean	Median	25th %-ile	75th %-ile	St. Dev.
Capital expenditure (1 year change)	2061	5.776	-7.891	-31.567	23.863	65.294
Capital expenditure (3 year change)	535	21.066	0.133	-32.461	39.245	94.305
Capital expenditure + R&D (1 year change)	2061	3.251	-4.992	-24.215	17.833	49.984
Capital expenditure + R&D (3 year change)	535	17.765	-0.861	-28.098	35.077	83.273
G index	2061	8.377	8.167	6.364	10.077	2.564
G state index	2061	1.593	1.000	1.000	2.000	1.164
G entrenchment index	2061	1.868	2.000	1.000	3.000	1.238
Institutional shareholding	2061	60.488	62.900	48.000	75.900	20.052
Institutional ownership concentration	2060	0.081	0.068	0.051	0.098	0.051

Panel C. Positive shocks: ROA

	N	Mean	Median	25th %-ile	75th %-ile	St. Dev.
Capital expenditure (1 year change)	1546	10.304	0.441	-22.966	30.316	56.183
Capital expenditure (3 year change)	766	-1.922	-17.067	-47.152	16.964	79.692
Capital expenditure + R&D (1 year change)	1546	7.956	0.378	-18.230	24.228	46.348
Capital expenditure + R&D (3 year change)	766	1.123	-13.406	-38.767	17.053	70.422
G index	1546	8.672	8.538	6.667	10.615	2.694
G state index	1546	1.646	1.000	1.000	2.000	1.225
G entrenchment index	1546	1.993	2.000	1.000	3.000	1.266
Institutional shareholding	1546	60.390	62.900	49.000	75.100	19.360
Institutional ownership concentration	1544	0.082	0.067	0.050	0.099	0.055

Panel D. Positive shocks: MTB

	N	Mean	Median	25th %-ile	75th %-ile	St. Dev.
Capital expenditure (1 year change)	2830	11.558	-0.960	-25.542	29.786	68.926
Capital expenditure (3 year change)	1429	18.563	-5.843	-38.437	39.776	99.718
Capital expenditure + R&D (1 year change)	2830	7.406	-0.946	-20.512	22.584	51.622
Capital expenditure + R&D (3 year change)	1429	13.342	-4.830	-29.478	34.476	73.857
G index	2830	8.602	8.462	6.667	10.385	2.561
G state index	2830	1.637	1.000	1.000	2.000	1.198
G entrenchment index	2830	1.951	2.000	1.000	3.000	1.224
Institutional shareholding	2830	59.997	62.800	47.700	75.400	19.907
Institutional ownership concentration	2827	0.082	0.067	0.050	0.099	0.052

Table 4. Investment Response to Shocks: Institutional Ownership and Anti-takeover Provisions [a]

	High Institutional Ownership	Low Institutional Ownership	High G	Low G
A. Negative ROA Shock				
Capital expenditure (1 year change)	**7.313**	**-1.156**	**3.578**	**12.631**
Capital expenditure (3 year change)	20.425	13.634	16.627	24.186
B. Negative MTB Shock				
Capital expenditure (1 year change)	**3.299**	**14.259**	3.342	6.816
Capital expenditure (3 year change)	**39.079**	**11.857**	16.235	30.032
C. Positive ROA Shock				
Capital expenditure (1 year change)	7.098	11.052	9.077	14.809
Capital expenditure (3 year change)	-1.523	5.157	-0.665	7.059
D. Positive MTB Shock				
Capital expenditure (1 year change)	8.656	13.500	9.231	13.834
Capital expenditure (3 year change)	16.522	22.877	14.038	25.566

[a] Tabulation of mean 1 and 3 year changes in capital expenditure. When the test of differences in means is significant at 5%, the difference is in bold face. Governance subsamples are based on sample median.

Table 5. Regressions of Capital Expenditure on Institutional Shareholdings and Anti-takeover Provisions: Negative Shocks [a]

	ROA				MTB			
Variable	1 year		3 year		1 year		3 year	
	I		II		III		IV	
Institutional shareholding	0.186	**	0.299	*	-0.190	**	0.704	***
	(.08)		(.18)		(.08)		(.26)	
G index	-0.232		-0.281		0.048		-0.556	
	(.08)		(.18)		(.08)		(.26)	
MTB	5.808	***	5.866		5.189	***	4.031	
	(.08)		(.18)		(.08)		(.26)	
(Ln)Sales	-5.112	***	-6.049	**	-1.793		-11.750	***
	(.08)		(.18)		(.08)		(.26)	
EBITDA / Total Assets, %	-0.039		-1.282	**	-0.070		-0.768	
	(.23)		(.60)		(.20)		(.49)	
CAPEX / Total Assets, %	-3.636	***	-7.009	***	-3.538	***	-7.507	***
	(.28)		(.75)		(.27)		(1.00)	
Cash holdings (excess)	-0.045		15.636	**	-4.367		11.805	*
	(.08)		(.18)		(.08)		(.26)	
Obs	1813		787		2061		535	
R^2	0.169		0.292		0.125		0.324	

[a] Ordinary least squares estimation, robust standard errors are in parentheses. Coefficients on an intercept, 56 industry and 11 year dummy variables not shown. Dependent variables are changes in capital expenditure one and three years following shock year. Institutional shareholding is the sum of all shares belonging to institutions. G index is the sum of all anti-takeover provisions (out of 24) based on Gompers, Ishii and Metrick (2003). MTB is the market-to-book ratio. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005).

Table 6. Regressions of Capital Expenditure on Institutional Shareholdings and Anti-takeover Provisions: Positive Shocks [a]

	ROA		MTB	
Variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholding	-0.069	-0.027	-0.095	0.053
	(.07)	(.14)	(.07)	(.14)
G index	0.281	-1.019	-0.417	0.430
	(.55)	(1.08)	(.48)	(.93)
MTB	3.391 **	-2.379	2.036 **	1.374
	(1.35)	(2.45)	(.88)	(1.70)
(Ln)Sales	-5.144 ***	-5.688 **	-3.695 ***	-6.479 ***
	(1.32)	(2.73)	(1.05)	(2.01)
EBITDA / Total Assets, %	0.126	-0.208	0.006	-0.898 **
	(0.25)	(0.42)	(0.18)	(0.356)
CAPEX / Total Assets, %	-3.635 ***	-4.449 ***	-3.861 ***	-6.654 ***
	(.31)	(.59)	(.29)	(.61)
Cash holdings (excess)	3.043	14.651 *	1.086	10.758 **
	(3.89)	(7.94)	(2.75)	(4.80)
Obs	1546	766	2830	1429
R^2	0.174	0.223	0.135	0.226

[a] Ordinary least squares estimation, robust standard errors are in parentheses. Coefficients on an intercept, 56 industry and 11 year dummy variables not shown. Dependent variables are changes in capital expenditure one and three years following shock year. Institutional shareholding is the sum of all shares belonging to institutions. G index is the sum of all anti-takeover provisions (out of 24) based on Gompers, Ishii and Metrick (2003). MTB is the market-to-book ratio. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005).

Table 7. Robustness. Regressions of Capital Expenditure on Institutional Shareholdings and Index of State Law Provisions. [a]

Panel A. Negative Shocks.

	ROA		MTB	
Dependent variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholdings	0.161 **	0.301	-0.188 **	0.663 **
	(.08)	(.19)	(.08)	(.26)
G state index	0.238	-0.211	0.556	0.184
	(.95)	(2.30)	(1.13)	(2.72)
MTB	5.666 ***	5.966	5.179 ***	4.029
	(1.76)	(3.89)	(1.51)	(5.32)
(Ln)Sales	-6.728 ***	-5.990	-1.635	-14.695 ***
	(1.84)	(4.01)	(1.71)	(5.27)
EBITDA / Total Assets, %	0.014	-1.301 **	-0.073	-0.732
	(0.23)	(0.61)	(0.20)	(0.50)
CAPEX / Total Assets, %	-3.643 ***	-7.021 ***	-3.538 ***	-7.547 ***
	(.28)	(.76)	(.27)	(1.00)
Cash holdings (excess)	0.144	15.698 **	-4.460	12.301 *
	(3.70)	(7.20)	(2.72)	(7.10)
Bond rating (dummy)	7.713	-1.136	-0.436	12.786
	(5.24)	(13.01)	(5.61)	(15.03)
Number of industry shocks	-2.491	2.047	1.469	0.760
	(1.64)	(4.75)	(2.21)	(8.15)
Shock size	-0.438	-4.578	-1.453	13.574
	(.71)	(9.58)	(4.56)	(13.13)
Obs	1813	787	2061	535
R^2	0.171	0.292	0.125	0.326

Panel B. Positive Shocks.

	ROA				MTB			
Dependent variable	1 year		3 year		1 year		3 year	
	I		II		III		IV	
Institutional shareholdings	-0.057		-0.032		-0.113		0.050	
	(.07)		(.15)		(.07)		(.14)	
G state index	-0.110		-0.437		-0.566		0.204	
	(1.14)		(2.06)		(1.01)		(2.26)	
MTB	2.533	*	-2.150		1.538	*	1.793	
	(1.40)		(2.57)		(.89)		(1.81)	
(Ln)Sales	-3.706	**	-4.361		-4.911	***	-7.196	***
	(1.71)		(3.29)		(1.46)		(2.60)	
EBITDA / Total Assets, %	0.108		-0.188		0.037		-0.914	**
	(0.25)		(0.41)		(0.18)		(0.37)	
CAPEX / Total Assets, %	-3.613	***	-4.473	***	-3.811	***	-6.722	***
	(.32)		(.61)		(.29)		(.62)	
Cash holdings (excess)	2.705		14.499	*	1.270		10.635	**
	(3.82)		(8.21)		(2.75)		(4.80)	
Bond rating (dummy)	-5.235		-8.876		5.182		4.326	
	(4.78)		(8.97)		(4.21)		(7.39)	
Number of industry shocks	-1.263		-1.917		1.148		4.556	
	(1.96)		(4.49)		(2.17)		(3.97)	
Shock size	-37.837	***	77.961	*	43.669	***	-42.832	
	(8.72)		(46.85)		(14.62)		(28.98)	
Obs	1546		766		2830		1429	
R^2	0.186		0.227		0.138		0.228	

[a] Ordinary least squares estimation. Robust standard errors are in parentheses. Coefficients on an intercept, 56 industry indicator variables, and 11 year indicator variables not shown. Dependent variables are 1 and 3 year changes in capital expenditure following shock year. Institutional shareholding is the sum of all shares belonging to institutions. G state index is the sum of all state anti-takeover provisions (out of 6) based on Gompers, Ishii and Metrick (2003). MTB is the market-to-book ratio. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005). Bond rating is a dummy variable for presence of a ration on firm bonds/ Number of industry shocks is the total count of shocks in 3-digit SIC industries in 1991-2002. Shock size is the magnitude of the drop / increase in ROA / MTB during the shock year.

Table 8. Robustness. Regressions of Capital Expenditure and R&D on Institutional Shareholdings and Index of State Law Provisions [a]

Panel A. Negative Shocks

	ROA		MTB	
Dependent variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholdings	0.124 **	0.250	-0.116 *	0.455 **
	(.06)	(.17)	(.06)	(.21)
G state index	-0.942	-1.387	-0.462	-2.926
	(.76)	(1.91)	(.94)	(2.54)
MTB	4.251 ***	5.755 **	4.952 ***	9.434 **
	(1.05)	(2.48)	(1.10)	(4.31)
(Ln)Sales	-4.645 ***	-7.616 ***	-2.407 ***	-11.562 ***
	(.95)	(2.38)	(.83)	(3.46)
EBITDA / Total Assets, %	-0.144	-0.963 ***	-0.190	-1.025
	(.11)	(.32)	(.14)	(.73)
CAPEX / Total Assets, %	-1.878 ***	-3.494 ***	-1.955 ***	-4.422 ***
	(.16)	(.41)	(.17)	(.61)
Cash holdings (excess)	-1.425	8.232 *	-5.115 ***	4.290
	(1.98)	(4.58)	(1.92)	(7.35)
Obs	1822	794	2074	538
R^2	0.153	0.241	0.141	0.328

Panel B. Positive shocks

	ROA		MTB	
Dependent variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholdings	-0.077	0.026	-0.033	0.053
	(.06)	(.14)	(.05)	(.10)
G state index	-2.277 **	-3.600 *	-0.830	-2.818 **
	(.92)	(1.91)	(.81)	(1.38)
MTB	3.633 **	2.835	1.262 **	4.083 ***
	(1.12)	(2.31)	(.56)	(1.20)
(Ln)Sales	-5.030 ***	-7.286 ***	-4.119 ***	-6.503 ***
	(.93)	(2.17)	(.77)	(1.35)
EBITDA / Total Assets, %	-0.130	-0.440	-0.148	-0.809 ***
	(.15)	(.38)	(.09)	(.19)
CAPEX / Total Assets, %	-2.084 ***	-3.455 ***	-1.831 ***	-3.117 ***
	(.18)	(.40)	(.13)	(.27)
Cash holdings (excess)	-0.789	4.884	0.431	1.090
	(2.71)	(7.33)	(1.68)	(3.64)
Obs	1558	771	2850	1440
R^2	0.171	0.213	0.130	0.212

[a] Ordinary least squares estimation. Robust standard errors are in parentheses. Coefficients on an intercept, 56 industry indicator variables, and 11 year indicator variables not shown. Dependent variables are 1 and 3 year changes in capital expenditure plus R&D expense following shock year. Institutional shareholding is the sum of all shares belonging to institutions. G state index is the sum of all state anti-takeover provisions (out of 6) based on Gompers, Ishii and Metrick (2003). MTB is the market-to-book ratio. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005).

Table 9. Robustness. Regressions of Capital Expenditure on Institutional Shareholdings Dummy and Index of State Law Provisions [a]

Panel A. Negative Shocks

	ROA		MTB	
Dependent variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholdings (dummy)	7.680 **	14.051 *	-4.161	26.628 **
	(3.03)	(7.42)	(2.90)	(10.52)
G state index	0.295	0.377	0.609	-0.195
	(.99)	(2.33)	(1.10)	(2.62)
MTB	5.852 ***	5.815	5.187 ***	4.182
	(1.74)	(3.80)	(1.45)	(5.13)
(Ln)Sales	-5.070 ***	-6.118 **	-2.126 **	-10.590 ***
	(1.22)	(2.50)	(1.04)	(3.45)
EBITDA / Total Assets, %	-0.028	-1.266 **	-0.091	-0.746
	(.23)	(.60)	(.19)	(.46)
CAPEX / Total Assets, %	-3.625 ***	-6.971 ***	-3.523 ***	-7.575 ***
	(.30)	(.76)	(.28)	(1.01)
Cash holdings (excess)	0.014	15.889 **	-4.721 *	12.858 *
	(3.62)	(6.99)	(2.65)	(7.07)
Obs	1813	787	2061	535
R^2	0.169	0.293	0.123	0.321

Panel B. Positive shocks

	ROA		MTB	
Dependent variable	1 year	3 year	1 year	3 year
	I	II	III	IV
Institutional shareholdings (dummy)	-4.851 *	-4.654	-5.744 **	-3.460
	(2.72)	(5.03)	(2.72)	(5.84)
G state index	-0.018	-0.642	-0.742	-0.026
	(1.26)	(2.10)	(1.24)	(2.25)
MTB	3.401 ***	-2.219	2.047 **	1.338
	(1.36)	(2.45)	(.85)	(1.61)
(Ln)Sales	-4.913 ***	-6.147 **	-3.939 ***	-5.969 ***
	(1.21)	(2.48)	(1.07)	(1.88)
EBITDA / Total Assets, %	0.127	-0.187	0.010	-0.902 **
	(.24)	(.42)	(.18)	(.35)
CAPEX / Total Assets, %	-3.641 ***	-4.486 ***	-3.861 ***	-6.665 ***
	(.32)	(.61)	(.31)	(.62)
Cash holdings (excess)	2.872	14.94 *	1.126	10.739 **
	(3.88)	(7.89)	(2.77)	(4.81)
Obs	1546	766	2830	1429
R^2	0.175	0.223	0.135	0.226

[a] Ordinary least squares estimation. Robust standard errors are in parentheses. Coefficients on an intercept, 56 industry indicator variables, and 11 year indicator variables not shown. Dependent variables are 1 and 3 year changes in capital expenditure following shock year. Institutional shareholding (dummy) equals 1 if sum of institutional ownership belongs to a top sample tercile; 0 otherwise. G state index is the sum of all state anti-takeover provisions (out of 6) based on Gompers, Ishii and Metrick (2003). MTB is the market-to-book ratio. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005).

Table 10. Robustness. Regressions of Capital Expenditure and R&D on Institutional Ownership Concentration and Index of State Law Provisions [a]

Dependent variable	ROA (-)		MTB (-)		ROA (+)		MTB (+)	
	I		II		III		IV	
Institutional ownership concentration	42.428	*	87.338	***	61.575	**	42.250	***
	(22.79)		(21.35)		(26.04)		(14.73)	
G state index	0.620		-0.449		-1.039		0.107	
	(.85)		(.93)		(.79)		(.66)	
Investment adjustment (industry)	0.658	***	0.190		1.030	***	0.802	***
	(.15)		(.14)		(.15)		(.14)	
Change in EBITDA / Total assets, %	0.034	***	0.011	**	-0.008		-0.002	
	(.01)		(.01)		(.02)		(.01)	
MTB	0.160		4.257	***	0.254		-1.164	**
	(.79)		(1.32)		(.96)		(.47)	
Ln(Sales)	-5.369	***	-1.488	*	-3.481	***	-3.722	***
	(.81)		(.77)		(.85)		(.59)	
Cash holdings (excess)	1.707		-6.664	***	-1.818		-1.483	
	(1.69)		(1.90)		(2.14)		(1.22)	
Industry shocks (#)	-0.274		-0.937		-0.471		-1.410	
	(1.12)		(1.43)		(1.26)		(1.25)	
Number of obs (per firm, shock)	1.850		-0.625		2.420	*	2.233	*
	(1.67)		(1.83)		(1.46)		(1.30)	
Obs	5518		4898		4604		8383	
R^2	0.093		0.068		0.080		0.071	

[a] Ordinary least squares estimation. Robust standard errors are in parentheses. Coefficients on an intercept, 56 industry indicator variables, and 11 year indicator variables not shown. The dependent variable is the change in capital expenditure plus R&D expense for three years following shock year. Columns I and II reflect regressions for negative ROA and MTB shocks, III and IV – positive ROA and MTB shocks. Institutional ownership concentration is the Herfindahl index measuring concentration of institutional ownership. G state index is the sum of state anti-takeover provisions (out of 6) based on Gompers, Ishii and Metrick (2003). Investment adjustment (industry) is the median industry change in investment following a given shock. Change in EBITDA / Total assets, % is percent change in cash flow following the shock. MTB is the market-to-book ratio of the firm. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, cash flow / assets, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005). Industry shocks (#) is the total number of industry shocks in the sample

Table 11. Robustness. Regressions of Capital Expenditure and R&D on Institutional Ownership Concentration and Entrenchment Provisions [a]

Dependent variable	ROA (-)		MTB (-)		ROA (+)		MTB (+)	
	I		II		III		IV	
Institutional ownership concentration	32.051	**	43.653	***	39.574	*	47.953	***
	(15.76)		(15.39)		(21.66)		(16.79)	
G entrenchment index	0.049		-0.024		0.231		-0.189	
	(.68)		(.66)		(.64)		(.52)	
Investment adjustment (industry)	0.224		0.211		0.728	***	0.476	***
	(.17)		(.18)		(.17)		(.18)	
Change in EBITDA / Total assets, %	0.027	**	0.006		0.006		0.016	**
	(.01)		(.01)		(.01)		(.01)	
MTB	-0.290		1.794	*	-0.084		-0.192	
	(.53)		(.95)		(.65)		(.40)	
Ln(Sales)	-2.646	***	-1.901	***	-2.78	***	-2.853	***
	(.59)		(.55)		(.62)		(.48)	
Cash holdings (excess)	0.414		-4.586	***	-0.874		-1.311	
	(1.09)		(1.44)		(1.45)		(.98)	
Obs	5537		4894		4625		8398	
R^2	0.033		0.032		0.036		0.032	

[a] Ordinary least squares estimation. Robust standard errors are in parentheses. Coefficients on an intercept, 56 industry indicator variables, and 11 year indicator variables not shown. The dependent variable is the change in capital expenditure plus R&D expense for three years following shock year. Columns I and II reflect regressions for negative ROA and MTB shocks, III and IV – positive ROA and MTB shocks. Institutional ownership concentration is the Herfindahl index of stakes belonging to institutions. G entrenchment index is the sum of 6 anti-takeover provisions (staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, supermajority for charter amendments, poison pills and golden parachutes) based on Bebchuk, Cohen and Ferrell (2004). Investment adjustment (industry) is the median industry change in investment following a given shock. Change in EBITDA / Total assets, % is percent change in cash flow following the shock. MTB is the market-to-book ratio of the firm. Cash holdings (excess) is the residual from a regression of cash holdings over sales on asset size, net working capital / assets, bond rating dummy, market-to-book ratio, G index, institutional ownership, year and firm effects as in Dittmar and Mahrt-Smith (2005).