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Corporate governance and firm cash holdings in the US[☆]

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Abstract

Using governance metrics based on antitakeover provisions and inside ownership, we find that firms with weaker corporate governance structures actually have smaller cash reserves. When distributing cash to shareholders, firms with weaker governance structures choose to repurchase instead of increasing dividends, avoiding future payout commitments. The combination of excess cash and weak shareholder rights leads to increases in capital expenditures and acquisitions. Firms with low shareholder rights and excess cash have lower profitability and valuations. However, there is only limited evidence that the presence of excess cash alters the overall relation between governance and profitability. In the US, weakly controlled managers choose to spend cash quickly on acquisitions and capital expenditures, rather than hoard it.

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1. Introduction

The decision of how to deploy internal funds is central to the conflict between shareholders and managers (Jensen, 1986). Any discussion of the efficacy of corporate governance mechanisms to control managers must address this issue. During an economic expansion, as cash reserves increase, managers make strategic decisions about whether to disburse the cash to shareholders, spend it internally, use it for external acquisition, or continue to hold it. It is theoretically not clear how self-interested managers will choose between spending free cash flow and stockpiling it as cash reserves. Managers must trade off private benefits of current spending against the flexibility provided by accumulating excess cash reserves. Further, self-interested managers must

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weigh whether the likelihood of discipline is greater from excess spending or from visibly holding too much cash.

We study how agency problems affect the propensity to stockpile cash in the US. To measure agency problems, we use multiple governance measures, which encompass ownership concentration (managerial ownership and institutional holdings), executive compensation, board composition, and an index (and subsets) of shareholder rights developed by Gompers, Ishii, and Metrick (2003), referred to hereafter as the GIndex. Since these measures may substitute for each other in controlling the firm's agency problems, using multiple measures provides a more complete picture and allows us to measure their differential impact on cash holdings. In doing so, we provide evidence on the following three main questions: (i) Do higher agency conflicts, as indicated by a weak governance structure, lead managers to stockpile cash reserves in the US?, (ii) How do weak governance structures change the way cash stockpiles are deployed by managers?, and (iii) Are the differences in the deployment of cash reflected in differences in firm profitability and ultimately valuation?

Jensen (1986) and Stulz (1990) develop the free cash flow hypothesis, predicting that shareholders will choose to limit managers' access to free cash flow to mitigate agency conflicts over its deployment. The central tradeoff in these papers is providing sufficient internal capital for managers to efficiently fund all good projects, while not providing excess internal capital that allows managers to fund projects, acquisitions, or perquisite consumption that benefit managers at the expense of shareholders. Without a control threat, it is difficult, if not impossible, to convince self-interested managers to disgorge cash reserves to shareholders.

While extant research provides ample evidence on the relation between cash holdings and shareholder rights from an international perspective, there is little if any evidence on this relation in the US. Cross-country evidence shows that greater shareholder rights are associated with lower cash holdings (Dittmar, Mahrt-Smith, and Servaes, 2003; Lins and Kalcheva, 2004; Pinkowitz, Stulz, and Williamson, 2004). This suggests that shareholders want managers to disgorge cash (presumably to the shareholders) and that they force them to do so when they are so empowered.¹ In this paper, we hold constant the country-level legal setting and use multiple measures of agency problems within the US to further examine the balance of power between shareholders and managers and how this relates to corporate cash holdings. In addition to providing direct evidence of this relation in the US, we argue that our results also bear on the importance of country-level protection of rights relative to firm-level restrictions of shareholder power.

Prior work on cash reserves in the US provides mixed evidence on whether shareholders should be concerned about large reserves. For example, Opler, Pinkowitz, Stulz, and Williamson (1999) find that the transitional probabilities out of the high cash group are slow, suggesting that managers hold cash as part of a precautionary motive. Similarly, Mikkelsen and Partch (2003) find that persistent extreme cash holdings do not lead to poor performance and do not represent conflicts of interests between managers and shareholders, evidence consistent with cash reserves enhancing firm value. Alternatively, Harford (1999) suggests that there is reason for shareholders to be concerned about managers' stewardship of large pools of internal funds. He shows that cash-rich firms are more likely to make acquisitions and their acquisitions are more likely to be value-decreasing. More broadly, Dittmar and Mahrt-Smith (2007) document that shareholders assign a lower value to an additional dollar of cash reserves when agency problems are likely to be greater at the firm.

From a self-interested manager's perspective, the issue of whether to spend generated cash flow or whether to accumulate it instead is a question of the benefits of excess spending today or additional flexibility in the future versus the costs associated with the potential for discipline. While the quality of investments made is often known only ex post with delay, large stockpiles of cash can become an immediate focal point for shareholders. Kirk Kerkorian's attack on Chrysler in the mid-1990s demonstrated that large accumulations of cash reserves can draw the attention of activist shareholders who could threaten managers' positions. Faleye (2004) shows that proxy contests are increasing in excess cash reserves, and following such contests, executive turnover and cash distributions to shareholders increase while cash holdings significantly decline. Thus, both anecdotal and large sample evidence points to an incentive for managers in the US to avoid visible accumulations of excess cash.

¹Additional evidence by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) supports the conjecture that higher shareholder rights are associated with higher dividend payouts.

Using a sample of 11,645 firm-year observations for 1872 firms in the Compustat database, we examine the relation between cash holdings and firm governance structure. We find in the cross-section and over time that firms with higher insider ownership have higher cash holdings, while firms with weaker shareholder rights (higher GIndex) have lower cash holdings. Overall, firms with weaker shareholder rights and low insider ownership have lower cash reserves than those with stronger shareholder rights (low GIndex) and high insider ownership. We find no evidence that manager pay sensitivity or institutional ownership is related to the change in cash holdings.

To explain the differences in cash holdings, we first study the investment behavior of our sample firms. We find that firms with a high GIndex increase capital expenditures more and this difference is exacerbated with higher levels of excess cash. Similarly, we find that firms with excess cash are more likely to increase acquisition activity and this is exacerbated when the excess cash is combined with a high GIndex. On the other hand, we find that R&D is generally unrelated to the firm's cash position, but negatively related to its GIndex (stronger shareholder rights are related to higher R&D). However, firms with low shareholder rights and high cash invest less in R&D. Turning to payout policy, we find that the presence of excess cash alters the relation between governance and payout. While firms with weak shareholder rights tend to increase dividends in general, it is the firms with stronger shareholder rights and higher insider ownership that distribute excess cash through dividends. Conversely, for repurchases, we find that firms with strong shareholder rights or low insider ownership are more likely to increase repurchases in general. However, the low shareholder rights firms are most likely to use repurchases specifically to distribute excess cash. The payout results suggest that poor governance leads managers choosing to distribute some of the excess cash to do so in the way that establishes the least commitment.

When examining whether these differences are reflected in future profitability, we find that shareholder rights are positively related to profitability. While both a firm's cash position and its governance affect future profitability, the results show little in the way of an incremental effect of the interaction of the two on future profitability. However, we do find an effect on the value of the firm. We find that weaker shareholder rights are negatively related to firm value and that this relation is more pronounced when combined with excess cash holdings. While low insider ownership is also negatively related to firm value, the presence of excess cash does not exacerbate the relation.

Overall, we find evidence consistent with the *spending hypothesis*. That is, for a given set of firms with high levels of cash, all else equal, the firms with weaker governance will spend that cash more quickly than those with stronger governance. Our tests show that this spending is on acquisitions and capital expenditures rather than on R&D. We also test and reject the alternative hypothesis that the observed relation reflects an outcome in which shareholders with strong governance allow their managers to hold more cash because they have strong oversight of how it is deployed and the ability to punish managers who waste that cash.

While the evidence of a negative effect on value is not overwhelming, on net, the evidence here and elsewhere is most consistent with the spending decisions of poorly governed firms being suboptimal. The conclusion we draw from our study is that lower cash reserves in poorly governed firms are the result of a decision by managers to spend the cash flow and any accumulated cash quickly, rather than allowing it to accumulate even though such accumulation might provide future flexibility. Their spending, often on capital expenditures and acquisitions, reduces firm value. Nonetheless, as documented in [Bliss and Rosen \(2001\)](#) for acquisitions and [Harford and Li \(2007\)](#) for both acquisitions and large capital expenditures, CEO compensation and wealth increase after such investments, even if those investments destroy value. Given these incentives and the potential for external discipline arising from accumulating large cash reserves, weakly controlled managers choose to spend the cash quickly on acquisitions or capital expenditures.

Our results, in the context of the international findings (e.g., [La Porta, Lopez-De-Silanes, Shleifer, and Vishny, 2000](#); [Dittmar, Mahrt-Smith, and Servaes, 2003](#)), also bear on country-level and firm-level limitations on shareholder rights. The question is how the two interact and which dominates? We show that in the US managers who appear to be entrenched act to avoid drawing the attention of activists and raiders. Thus, in a country such as the US, with strong shareholder protection and strong enforcement of that protection,

measures of managerial entrenchment may be better viewed as signals of managers' propensity toward self-interested action rather than as indications of their complete invulnerability to oversight.²

Comparing our results with those from other countries suggests that true entrenchment requires low legal shareholder rights. In the US firm-imposed restrictions on shareholder rights only go so far; there is always a point at which shareholders will move to replace managers. In contrast, in firms in countries with poor shareholder protection, managers can hoard cash and pay low dividends with relative impunity. Dittmar, Mahrt-Smith, and Servaes (2003) compare average cash holdings across countries to a variety of shareholder protection and capital market development measures and find that firms hold less cash in countries where shareholders have greater rights and when external capital markets are highly developed. This indicates that shareholders want to limit the cash at managers' discretion and move to do so when they have sufficient power. Pinkowitz, Stulz, and Williamson (2004) also examine the effect that country-level protection of rights has on cash holdings and show that cash is worth less to the minority shareholders of firms in countries with low investor protection. This finding is consistent with the hypothesis that poor protection of investor rights makes it easier for management and controlling shareholders to expropriate corporate resources for their own benefit. Lins and Kalcheva (2004) include corporate governance controls at the firm level and examine how country-level investor protection marginally affects cash holdings. They find that internationally, firms with weaker shareholder rights hold more cash and this relation is especially magnified in countries with weak shareholder protection. In addition, they find that cash holdings are more negatively related to firm value, the greater the managerial control (a proxy for poor firm-level governance) and the lesser the external shareholder protection.

The differences we find in the way managers behave in the US imply that country-level granting and enforcing of shareholder rights are more important than firm-level variation determinants of managerial incentives in controlling agency conflicts. More research in this area is needed to confirm or refute our interpretation of the implications of the results for understanding country-level versus firm-level constraints on managers.

The remainder of the paper is organized as follows. Section 2 develops the hypotheses. Section 3 describes the data, variables, and control measures, and provides descriptive statistics for the sample. Section 4 presents univariate as well as multivariate results of our empirical tests and provides alternative specifications. Section 5 discusses the implications of this research and concludes.

2. Hypothesis development

We test the following three hypotheses related to the control of agency conflicts and the management of firm cash resources.

Flexibility Hypothesis: Self-interested managers value flexibility and freedom from capital market discipline (Easterbrook, 1984; Jensen, 1986). In trading off current overinvestment versus future flexibility, they put some weight on the latter. Thus, when the firm generates excess cash flow, these managers do not invest it all. Rather, they stockpile some of it, preferring to hold large cash reserves. The less effective is shareholders' control of managers, the greater will be the cash reserves.

Spending Hypothesis: Self-interested managers prefer expansion of the firm and will spend excess cash flow when generated (Jensen and Meckling, 1976). In the event that these managers accumulate excess cash reserves, they will look for an acquisition or other means to quickly deploy the cash. In general, they will prefer spending in the present and will discount the ability to invest more in the future.

Shareholder Power Hypothesis: Shareholders who have more effective control of managers will allow those managers to stockpile excess internal funds to prevent underinvestment due to potentially costly external funds (because of capital market frictions including, for example, information asymmetry). The models in Stulz (1990) and Myers and Majluf (1984) demonstrate the tradeoffs facing shareholders in determining how much liquidity should be at managers' disposal and of the potential for underinvestment due to information asymmetry between managers and capital providers.

²In a contemporaneous paper, John and Knyazeva (2006) make a similar argument to explain why U.S. firms with low shareholder rights pay higher dividends, a result also shown here.

The flexibility and spending hypotheses predict opposite relations between the control of agency conflicts and cash reserves. The flexibility hypothesis predicts that poorly controlled managers will be observed to have larger cash reserves and the spending hypothesis predicts they will have smaller cash reserves. As we noted in the introduction, which one is correct depends on managers' tradeoff between current overinvestment versus future flexibility and the probability of discipline associated with each alternative. The shareholder power hypothesis predicts that there will be a negative relation between agency problems and cash reserves, similar to the spending hypothesis, but its prediction is primarily driven by better-controlled managers holding larger cash reserves rather than worse-controlled managers holding smaller reserves.

3. Data description

3.1. Cash holdings

For our analysis, we view cash as a liquid investment necessary to support the working capital needs of the firm, which is closely related to its sales. Therefore, the primary ratio that we examine in our study is the ratio of cash to sales, computed as the log of cash and cash equivalents to total sales. Though not tabulated, we also look at two alternative methods to measure cash holdings. First, we compute cash holdings using the ratio of cash and marketable securities to net assets computed as total assets minus cash and marketable securities, similar to Opler, Pinkowitz, Stulz, and Williamson (1999). Second, given that industry classification is a significant factor in the determination of cash holdings, we also create an industry-adjusted measure of the firm's cash to sales ratio (cash holdings). To do this, we compute the median levels of the ratio of cash to sales within the Fama and French 48 industry categories (described below). The industry-adjusted measure is then calculated as the firm's variable minus the median industry level of the cash to sales ratio. Using either measure, we find similar results to those reported using the cash to sales ratio.

3.2. Measuring corporate governance

We use a number of corporate governance measures to gauge the severity of the firm's agency costs. These include: an index of antitakeover provisions, ownership concentration (insider and institutional), compensation to top management (pay sensitivity), and board structure (size and independence). We describe each in more detail below.

3.2.1. Antitakeover provisions and governance

The first set of governance proxies is related to the prevalence of antitakeover provisions. There is debate on whether antitakeover provisions isolate managers from the discipline of the market for corporate control or in fact are optimal devices that allow managers to maximize takeover bids and minimize opportunism. The inclusion or exclusion of these provisions is commonly used in the literature to measure the balance of power between shareholders and managers. Gompers, Ishii, and Metrick (2003) construct a broad index (GIndex) of antitakeover provisions using five governance rules (delay, protection, voting, state, and other) for a total of 24 possible provisions. The delay rules contain four provisions designed to slow down a hostile bidder. The protection rules contain six provisions designed to insure officers and directors against liability, or compensate them following termination. The voting rules contain six provisions related to shareholder rights in election. The state rules contain provisions designed to protect firms incorporated in certain states (e.g., Delaware). The remaining six provisions not included in the above rules are included in the other group category. The index uses a point scale from one to 24, where for every firm the index adds one point for every added provision that restricts shareholder rights (increases managerial power). The index with highest values has the weakest shareholder rights, and the index with the lowest values has the strongest shareholder rights.³

Recently, Bebchuk, Cohen, and Ferrell (2005) construct an alternative antitakeover index based on a subsample of relevant variables shown to impact shareholder value from the Gompers, Ishii, and Metrick (2003) index. These include: blank check preferred stock, classified board, limits to amend charter, limits to

³For a complete description on the construction of the GIndex see Gompers, Ishii, and Metrick (2003).

amend bylaws, supermajority, and poison pill. They label this index an entrenchment index (EIndex). In a separate paper, [Bebchuk and Cohen \(2005\)](#) refine their earlier specification and examine the role of classified boards in isolation arguing that it is the most significant antitakeover provision in terms of impact on firm value. We follow both articles and use the entrenchment index of [Bebchuk, Cohen, and Ferrell \(2005\)](#) and classified board in isolation as a robustness check.

While there is debate on how antitakeover provisions impact stockholders, the GIndex and the EIndex are related to the economic fundamentals of the firm and its decision making. [Gompers, Ishii, and Metrick \(2003\)](#) and [Core, Guay, and Rusticus \(2006\)](#) document that firms with a large number of antitakeover provisions have lower operating performance compared to those with a small number of provisions. Consistent with this notion, [Bebchuk, Cohen, and Ferrell \(2005\)](#), use a subset of the antitakeover provisions and find that firms with a high number of provisions have lower valuations, measured by Tobin's Q, and [Bebchuk and Cohen \(2005\)](#) document a similar relation between Q and classified boards. [Masulis, Wang, and Xie \(2007\)](#) find that the GIndex is related to stockholder reaction of merger announcements, with high GIndex firms suffering larger losses on the announcement of a takeover attempt. [Litov \(2005\)](#) finds that firms with large antitakeover provisions have higher debt ratios than those with low provisions, while [John and Knyazeva \(2006\)](#) find that the GIndex is related to firm payout policy. Overall, the evidence suggests that antitakeover provisions have an impact on various aspects of firm decisions and therefore provide researchers a view of the overall balance of power between shareholders and managers.

3.2.2. Ownership concentration and executive compensation

We attempt to control for the agency problems that arise as a result of ownership concentration and executive compensation using insider ownership, institutional holdings, and top management pay mix. [Jensen and Meckling \(1976\)](#) suggest that because of the separation of ownership and control, managers have power over the firm's resources and with this vast discretion managers are free to pursue activities that can directly expropriate wealth from other stakeholders and from the firm. Therefore, to mitigate some of the problems associated with managerial opportunism, firms should increase managerial equity ownership ([Jensen, 1993](#)), and as a result we expect that the incentives of managers to retain higher cash levels diminishes.

The presence of a large shareholder, or blockholder, plays an important role in resolving (or exacerbating) some of the firm's agency problems. [Shleifer and Vishny \(1986\)](#) suggest that blockholders mitigate the free-rider problem, perform a monitoring function, and reduce the scope of managerial opportunism. Alternatively, large shareholders can also act to promote their self interest ([Shleifer and Vishny, 1997](#)), reduce managerial initiative ([Burkart, Gromb, and Panunzi, 1997](#)), or suffer from under-diversification ([Demsetz and Lehn, 1985](#)). Overall, the use of ownership concentration in our analysis provides a gauge of managerial opportunism.

We measure insider ownership as the ratio of top-five insider holdings of common stocks to the total shares outstanding, and institutional ownership as the ratio of shares that institutions owned in the firm divided by the total number of shares outstanding. We measure top management pay mix, or the fraction of top pay for the top five managers received in equity-based forms, as the ratio of stock option grants (SOG) divided by the summation of SOG, salary, and bonus compensation.

3.2.3. Board characteristics and governance

A firm's board of directors is responsible for monitoring and evaluating senior management. Central to the board's effectiveness is the question of board structure (size and independence). The literature on the impact of board size on firm value is mixed. The literature suggests that increased board size has two competing effects: greater monitoring versus more rigid decision-making. [Yermack \(1996\)](#) finds that smaller boards are more efficient as they provide greater decision making. In contrast, [Harris and Raviv's \(2006\)](#) model of boards trades off additional monitoring services with free-riding and predicts that larger boards will provide optimal monitoring when managers' opportunities to consume private benefits are high. [Boone, Field, Karpoff, and Raheja \(2007\)](#) find evidence consistent with Harris and Raviv's predictions.

In addition to board size, board independence should also have an impact on firm value. Inside directors provide firm- and project-specific knowledge that assists the board in understanding the detailed aspects of the firm's business. In contrast, outside (or independent) directors contribute expertise and objectivity that

ostensibly mitigates managerial entrenchment and expropriation of firm resources. The governance literature generally suggests that as boards become increasingly independent of managers, their monitoring effectiveness increases, thereby decreasing managerial opportunism and enhancing firm performance.

To control for board-of-directors effects we use both board size and independence. Board size is generally measured using the number of directors on the board. However, because of the high correlation between board size and firm size, we divide board size by the log of total assets. We measure board independence as the ratio of independent directors to total directors.

3.2.4. Control variables

The remaining variables are firm-specific controls motivated by Opler, Pinkowitz, Stulz, and Williamson (1999). These variables include firm size, leverage, market to book, cash flow to total assets, standard deviation of cash flow for the past ten years, net working capital to total assets, research and development (R&D) to sales, capital expenditures to assets, acquisition spending to assets, a dividend dummy that takes a value of one if a company pays a dividend and zero otherwise, and a bond dummy that takes a value of one if the firm has S&P long-term ratings and zero otherwise. For the purpose of this research, assets are defined as total assets net of cash and cash equivalents.

Firm size, a proxy for takeover deterrent, is measured as the natural log of total assets. Firm leverage is measured as the ratio of total debt (short- and long-term debt) to assets. The market to book ratio, a proxy for growth opportunities, is measured as (book value of assets minus book value of equity plus the market value of equity) divided by book value of assets. The cash flow ratio is measured as earnings after interest, dividend, and taxes, but before depreciation, divided by assets. The standard deviation of the firm's cash flows, a proxy for business conditions, is computed using the firm's standard deviation of the cash flow ratio for the past ten years. Net working capital to total assets, a proxy for liquidity, is the ratio of current assets net of cash minus current liabilities divided by assets. The ratio of R&D to sales is used as a proxy for financial distress costs. The ratios of capital expenditures to assets and acquisition to assets indicate whether managers attempt to increase the size of their firms.⁴ Given a small number of extreme observations and to ensure that outliers are not driving any of our results, we winsorize the variables cash to sales, leverage, market to book, cash flow to assets, standard deviation of cash flow to assets, net working capital to assets, R&D to sales, capital expenditures to assets, and acquisition to assets at the 0.5% level on each tail. Though not reported, we also estimate all reported models using the unadjusted variables and find similar results.

Given that cash holdings are time period specific as they are related to economic conditions, and that cash holdings are industry specific, we include indicator variables for both the time period and the industry. We report our results using the Fama and French (1997) 48 industry categories, although, using a two-digit SIC classification instead does not impact our inferences.

3.2.5. The sample

We utilize four databases to create our sample: the Investor Responsibility Research Center (IRRC) database, the Compustat Industrial Annual database, the executive compensation (Execucomp) database, and the Thomson Financial Institutional Ownership (Thomson) database.

The IRRC database provides annual data for the years 1990, 1993, 1995, 1998, 2000, 2002, and 2004 on corporate antitakeover provisions for about 1,500 firms primarily drawn from the S&P 500 and other large corporations, derived from proxy statements, annual reports, and SEC filings such as 10-K's and 10-Q's.⁵ Following Gompers, Ishii, and Metrick (2003) and Bebchuk and Cohen (2005), we fill in observations of the GIndex in missing years. We use this data to construct the GIndex, EIndex (described above), and an indicator variable for firms with classified boards. In addition, we use the IRRC data to collect director information continuously for the period from 1996 through 2004.

We use the Compustat database to collect firm-specific financial information such as total assets, sales, book and market value of equity, free cash flow, research and development expenditures, capital expenditures,

⁴For robustness, we also include two additional variables, namely, the number of business segments the firm operates in and a dividend payout ratio, and find consistent results. We do not tabulate the corresponding findings.

⁵We exclude the year 1990 from our analysis since our insider holdings data starts in the year 1992.

Table 1
Sample statistics

This panel provides summary statistics for the sample. The data set comprises 11,645 firm-year observations from 1872 firms covering the period from 1993 to 2004. The descriptive statistics include: ratio of cash to sales (Cash Holdings), the Gompers, Ishii, and Metrick (2003) antitakeover index (GIndex), the Bebchuk, Cohen, and Ferrell (2005) entrenchment index (EIndex), classified board, equity ownership of the top five officers (Inside Ownership), institutional ownership, top management pay for performance (Pay Sensitivity), ratio of number of directors to natural log of assets (Board Size), ratio of independent directors on the board to total directors (Board Independence), sales, total assets, firm leverage (Leverage), ratio of the market value to book value of assets (Market-to-Book), ratio of cash flow to net assets (CF/Assets), ratio of net working capital to net assets (Working Capital/Assets), standard deviation of cash flows for the past ten years (CF Volatility), ratio of research and development to sales (R&D/Sales), ratio of capital expenditures to net assets (CapEx/Assets), and ratio of acquisition to sales (Acquisition/Sales). Net assets comprise total assets minus cash holdings. The variables Cash Holdings, Leverage, Market-to-Book, CF/Assets, CF Volatility, Working Capital/Assets, R&D/Sales, CapEx/Assets, Acquisition/Sales, and Institutional Ownership are winsorized at the 0.5% level on either tail.

	Mean	Median	Standard Deviation	25th Percentile	75th Percentile
Cash Holdings	0.180	0.049	0.479	0.015	0.153
GIndex	9.23	9.00	2.69	7.00	11.00
EIndex	2.42	2.00	1.18	2.00	3.00
Classified Board	0.60	1.00	0.49	0.00	1.00
Inside Ownership	0.039	0.007	0.079	0.003	0.029
Institutional Ownership	0.600	0.619	0.213	0.471	0.749
Pay Sensitivity	0.369	0.355	0.260	0.153	0.569
Board Size	9.38	9.00	2.55	11.00	7.00
Board Independence	0.645	0.667	0.175	0.538	0.778
Sales(\$MM)	4,749	1,351	13,365	551	3,800
Assets(\$MM)	5,762	1,350	21,952	539	3,944
Leverage	0.205	0.195	0.165	0.062	0.306
Market-to-Book	1.95	1.53	1.28	1.20	2.20
Cash Flow/Assets	0.164	0.151	0.145	0.104	0.214
Working Capital/Assets	0.066	0.051	0.158	-0.035	0.16
CF Volatility	0.040	0.027	0.042	0.015	0.049
R&D/Sales	0.043	0.000	0.134	0.000	0.035
CapEx/Assets	0.062	0.049	0.049	0.029	0.078
Acquisition/Sales	0.024	0.000	0.055	0.000	0.019

acquisition spending, dividend distribution, and S&P long-term ratings. Additional information regarding insider and institutional holdings is collected from Compustat's Execucomp database and Thomson Financial database (Form 13-F), respectively. Variables include insider holdings of CEO and five top officers, institutional holdings of firms, and top management pay mix information.

To include a firm-year observation in our analysis, the GIndex data must be available in the IRRC data set. Information on the book and market value of equity, total assets, sales, long-term debt, common shares outstanding, net working capital, research and development expenditures, capital expenditures, acquisitions, dividends, and repurchases must be available in the Compustat database. Additional information on institutional ownership, insider ownership, and executive compensation must also be available from the Execucomp and Thomson Financial databases. Finally, we delete all firms that are subject to regulation and firms with SIC codes between 6000 and 6999 because of their involvement in inventories of marketable securities. Merging the databases and applying these requirements yields a data set of 11,645 firm-year observations on 1872 firms for the years 1993 through 2004.⁶

3.2.6. Descriptive statistics

Table 1 provides statistics for the sample. Included are the mean, median, standard deviation, and 25th and 75th percentiles. Our main variable in the analysis, cash holdings, has a mean of 18% and a median of 4.9% with a standard deviation of 47.9%. Because of the skewness of the variable, we use the log of cash holdings. The GIndex in the sample has a mean and a median of about nine, and 75th and 25th percentile values of 11

⁶To minimize survivorship bias, we allow firms to exit and reenter the data set.

and seven. A similar pattern is observed for the EIndex since it is a subset of the GIndex. The majority of the firms in the sample, about 60%, have classified boards. Insiders, on average, own about 4% of the outstanding shares, while institutions hold about 60% of the outstanding shares. The insider ownership variable is highly skewed (median ownership of 0.7%), as expected. Top management pay mix is more symmetric with mean and median values of about 37% and 35.5%. Turning to board characteristics, the mean board size is about nine directors and the ratio of independent to total directors on the board is about 65%. In terms of financial data, the average firm in the sample has sales of about \$4.7 billion, with assets of about \$5.8 billion, leverage ratio of 21%, market to book of about 1.95, cash flows to assets of about 16%, capital expenditures to assets of about 6.2%, and acquisition to assets of about 2.4%.

4. Firm cash holdings and shareholder rights

4.1. Univariate analysis

Prior work suggests a strong relation between firm size and cash holdings. We posit that a similar relation exists between size and governance variables. To examine if this in fact the case, we sort firms into size

Table 2

Cash holdings and governance variables relative to firm size

In Panel A, we examine the relation between cash holdings and the governance metrics based on firm size. We sort firms into size quintiles each year. We report the median levels of cash holdings and the governance variables within the 1st, 3rd, and 5th size quintiles. In Panel B, we sort the data within each size quintile based on GIndex quartiles. We report the median levels for the 1st (low) and 4th quartiles (high) of the GIndex within each size quintile. In both panels, we use the Wilcoxon rank-sum test to examine whether the medians are significantly different between the 1st and 5th quintiles for Panel A, and the 1st and 4th quartiles in Panel B. The data set comprises 11,645 firm-year observations from 1872 firms covering the period from 1993 to 2004. The variables of interest include: ratio of cash to sales (Cash Holdings), Gompers, Ishii, and Metrick (2003) antitakeover index (GIndex), institutional ownership, equity ownership of the top five officers (Inside Ownership), top management pay for performance (Pay Sensitivity), ratio of number of directors to natural log of assets (Board Size), and ratio of independent directors on the board to total directors (Board Independence). Data in bold represent statistical significance at the 95% confidence level.

	Cash Holdings	Inside Ownership	Institutional Ownership	Pay Sensitivity	Board Independence	Board Size
<i>Panel A: Cash and governance variables by yearly size quintiles</i>						
Size Quintile = 1 (smallest)	11.96%	2.05%	54.46%	29.22%	62.50%	7
Size Quintile = 3	4.41%	0.98%	64.64%	34.97%	66.67%	9
Size Quintile = 5 (largest)	3.79%	0.24%	61.46%	42.91%	72.73%	11
<i>Panel B: Cash and governance variables within GIndex quartiles controlling for firm size (by size quintile)</i>						
Size Quintile = 1						
Low GIndex (Strong Rights)	14.40%	2.53%	51.45%	29.64%	60.00%	7
High GIndex (Weak Rights)	5.83%	1.37%	54.08%	23.20%	66.67%	9
Size Quintile = 2						
Low GIndex (Strong Rights)	7.31%	2.16%	62.36%	36.30%	57.14%	7
High GIndex (Weak Rights)	3.18%	1.15%	58.29%	23.99%	70.00%	9
Size Quintile = 3						
Low GIndex (Strong Rights)	4.50%	1.48%	61.41%	37.08%	57.14%	8
High GIndex (Weak Rights)	2.76%	0.84%	64.14%	31.89%	71.43%	9
Size Quintile = 4						
Low GIndex (Strong Rights)	5.27%	0.90%	59.09%	34.50%	57.14%	9
High GIndex (Weak Rights)	3.16%	0.49%	65.72%	35.51%	72.73%	10
Size Quintile = 5						
Low GIndex (Strong Rights)	5.58%	0.19%	55.61%	45.18%	66.67%	11
High GIndex (Weak Rights)	2.35%	0.31%	63.92%	40.17%	75.00%	12

quintiles each year. The median levels of cash holdings and the governance variables within the 1st, 3rd, and 5th size quintiles are then reported in Panel A of Table 2 (to keep the table manageable, we do not report the 2nd and 4th quintiles). We perform the Wilcoxon rank-sum test to examine whether the reported medians are significantly different across the 1st and 5th quintiles. The results suggest significant differences between the 1st and 5th quintiles for all of the variables. Smaller firms have more cash, higher inside ownership, lower institutional ownership, lower pay mix, lower board independence, and smaller boards. Though not reported, when examining all the quintiles, we find a monotonic relation between all of the variables with the exception of institutional ownership which has an inverted u-shaped distribution.

Next, we examine the relation among the governance variables using a double sort. We sort using firm size quintiles and then the GIndex. We sort the GIndex into quartiles and examine the median levels of the other governance variables between the 1st (strong shareholder rights) and the 4th (weak shareholder rights) quartiles within each of the five size quintiles (again for brevity, we only report the extreme quartiles).⁷ To test for significance across GIndex quartiles, we perform the Wilcoxon rank-sum test and bold the reported statistics when they differ significantly, at a minimum 95% confidence level. Panel B of Table 2 presents the results of this analysis. We find that firms with stronger shareholder rights (1st quartile GIndex) have higher inside ownership, lower board independence across all size quintiles, and generally higher pay for performance and smaller boards across quintiles.

The panel also provides evidence on the univariate relation between cash holdings and the governance variables while controlling for firm size. In the first column, we report the median cash holdings by GIndex quartiles within the size quintiles. We find large, statistically significant differences between cash holdings based on GIndex quartiles. For example, in the smallest size quintile, firms with strong shareholder rights (1st quartile) have median cash holdings of 14% relative to 6% with weak shareholder rights. In fact, firms with strong shareholder rights hold significantly more cash across all size quintiles, and though not reported in the table, we find a monotonic relation across all GIndex quartiles. Thus, these univariate results are consistent with the spending and shareholder power hypotheses, but inconsistent with the flexibility hypothesis.

4.2. Multivariate analysis

We examine the relation between shareholder rights and cash holdings and various controls for firm-specific variables in a multivariate setting using cross-sectional time-series models. For estimation methods, we follow Petersen (2006) and report *t*-statistics for the pooled results using standard errors corrected for clustering at the firm level.⁸ The dependent variable is corporate cash holdings, the log of the cash to sales ratio. The independent variables are governance-related variables and firm specific factors affecting cash holdings. The variables of interest in this study are the governance proxies discussed above. The coefficients on the governance variables directly address the predictions of our hypotheses relating governance to cash ratios.

4.2.1. Cash holdings and shareholder rights

Model 1 of Table 3 provides the analysis of the general relation between corporate cash holdings and the governance variables. The results in model 1 suggest that cash holdings is negatively related to the GIndex and positively related to inside ownership and pay sensitivity, all significant at the 99% confidence level. We find a positive relation between cash holdings and institutional ownership but the *t*-statistic is only marginally significant, at the 90% confidence level. The nongovernance-related control variables have their expected signs. Firms with low cash holdings tend to have high leverage and net working capital, pay dividends, have a bond rating, and make significant investments through capital expenditures and acquisitions. On the other hand, high cash holding firms are characterized by higher growth options (market-to-book and R&D), cash flows, and cash flow volatility.

⁷We use GIndex quartiles because of sample size when looking within size quintiles.

⁸In a prior version of the paper, we estimated all of our models correcting for serial and autocorrelation using a Newey and West (1987) procedure, which Petersen (2006) finds to be upwardly biased. While correcting for clustered errors resulted in the reduced *t*-statistics reported in this version of the paper, the results remain significant.

Table 3

Multivariate analysis of cash holdings, changes in cash holdings, and corporate governance

This table examines the relation of governance metrics to current cash holdings and the changes in cash holdings over time. To do this, we regress corporate cash holdings on various governance metrics and control variables in column 1. As an endogeneity control, we then include the lagged cash holdings of the firm in the remaining models. The data covers the period 1993 through 2004. The dependent variable is the natural log of the cash/sales ratio (Cash Holdings). The independent variables include: the lagged Gompers, Ishii, and Metrick (2003) antitakeover index ($GIndex_{t-1}$), lagged indicator variables for firms within the top (4th) and bottom (1st) quartiles of the GIndex, the lagged Bebchuk, Cohen, and Ferrell (2005) entrenchment index ($EIndex_{t-1}$), a lagged variable that subtracts the EIndex from the GIndex ($GIndex$ minus $EIndex_{t-1}$), a lagged classified board indicator ($Classified\ Board_{t-1}$), a lagged variable that includes all the variables in the EIndex but without classified board ($EIndex$ minus $Classified\ Board_{t-1}$), lagged equity ownership of the top five officers ($Inside\ Ownership_{t-1}$), lagged ratio of directors to the natural log of assets ($Board\ Size_{t-1}$), lagged ratio of independent directors on the board to total directors ($Board\ Independence_{t-1}$), lagged top management pay for performance ($Pay\ Sensitivity_{t-1}$), and lagged institutional equity holding ($institutional\ ownership_{t-1}$). Additional firm-specific controls include: sales, total assets, firm leverage ($Leverage$), ratio of the market value to book value of assets ($Market\text{-}to\text{-}Book$), ratio of cash flow to net assets ($CF/Assets$), ratio of net working capital to net assets ($Working\ Capital/Assets$), standard deviation of cash flows for the past five years ($CF\ Volatility$), ratio of research and development to sales ($R\&D/Sales$), ratio of capital expenditures to net assets ($CapEx/Assets$), and ratio of acquisition to sales ($Acquisition/Sales$). Net assets comprises total assets minus cash holdings. Further, we include indicator variables for firms that pay dividends ($Dividend$) and for firms with long-term S&P ratings ($Bond$). Models 1 through 4 employ the same sample using different categories of the GIndex. Model 5 applies the primary specification (model 1) but uses a subset of observations for which board characteristic information is available. Standard errors are estimated with clustered errors at the firm level. *T*-Statistics are reported in parentheses. Superscripts a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively. Though not reported, all models include industry and year indicators as well as an intercept term.

Dependent variable: cash holdings	(1)	(2)	(3)	(4)	(5)	(6)
Cash Holdings _(t-1)		0.727 ^a (79.57)	0.727 ^a (79.56)	0.727 ^a (79.54)	0.727 ^a (79.55)	0.728 ^a (70.10)
Gindex _(t-1)	-0.037 ^a (3.61)	-0.011 ^a (3.18)				-0.010 ^a (2.77)
1st Qtile GIndex _(t-1)					0.040 ^b (2.05)	
4th Qtile GIndex _(t-1)					-0.042 ^c (1.92)	
EIndex _(t-1)			-0.013 (1.62)			
GIndex minus EIndex _(t-1)			-0.010 ^b (2.11)	-0.010 ^b (2.13)		
Classified Board _(t-1)				-0.014 (0.76)		
EIndex minus Classified Board _(t-1)				-0.016 (1.55)		
Inside Ownership _(t-1)	1.315 ^a (3.48)	0.343 ^a (2.96)	0.342 ^a (2.96)	0.338 ^a (2.93)		0.389 ^a (3.00)
1st Qtile (Size Adj.) Insider Ownership _(t-1)					0.012 (0.60)	
4th Qtile (Size Adj.) Insider Ownership _(t-1)					0.062 ^a (2.92)	
Board Size _(t-1)						-0.035 (0.99)
Board Independence _(t-1)						-0.021 (0.33)
Pay Sensitivity _(t-1)	0.292 ^a (3.86)	0.045 (1.16)	0.046 (1.18)	0.046 (1.17)	0.043 (1.09)	0.008 (0.19)
Institutional ownership _(t-1)	0.201 ^c (1.67)	0.033 (0.74)	0.034 (0.75)	0.035 (0.77)	0.023 (0.52)	0.064 (1.21)
Size	0.003 (0.16)	0.011 (1.39)	0.011 (1.36)	0.011 (1.37)	0.008 (0.92)	0.021 ^b (2.19)
Leverage	-1.571 ^a (11.30)	-0.422 ^a (5.77)	-0.422 ^a (5.77)	-0.421 ^a (5.75)	-0.428 ^a (5.85)	-0.401 ^a (4.80)
Market-to-Book	0.038 ^b (2.31)	0.003 (0.36)	0.003 (0.35)	0.003 (0.35)	0.003 (0.32)	0.010 (1.04)

Table 3 (continued)

Dependent variable: cash holdings	(1)	(2)	(3)	(4)	(5)	(6)
Cash Flow/Assets	1.224 ^a (7.83)	0.491 ^a (6.17)	0.490 ^a (6.17)	0.492 ^a (6.17)	0.500 ^a (6.27)	0.463 ^a (5.03)
Working Capital/Assets	-1.478 ^a (10.25)	-0.657 ^a (8.06)	-0.658 ^a (8.06)	-0.657 ^a (8.06)	-0.654 ^a (8.02)	-0.509 ^a (5.36)
CF Volatility	3.534 ^a (7.76)	0.582 ^b (2.31)	0.582 ^b (2.31)	0.587 ^b (2.33)	0.590 ^b (2.35)	0.789 ^b (2.54)
R&D/Sales	3.083 ^a (16.01)	0.913 ^a (9.70)	0.914 ^a (9.69)	0.914 ^a (9.65)	0.917 ^a (9.69)	0.919 ^a (8.54)
CapEx/Assets	-5.115 ^a (13.03)	-3.001 ^a (12.49)	-2.997 ^a (12.53)	-2.998 ^a (12.53)	-2.990 ^a (12.51)	-2.787 ^a (10.11)
Acquisition/Sales	-1.741 ^a (7.33)	-2.150 ^a (11.56)	-2.150 ^a (11.55)	-2.149 ^a (11.56)	-2.161 ^a (11.61)	-2.084 ^a (10.21)
Dividend Indicator	-0.289 ^a (7.06)	-0.084 ^a (3.91)	-0.084 ^a (3.92)	-0.085 ^a (3.93)	-0.082 ^a (3.81)	-0.076 ^a (3.11)
Bond Indicator	-0.102 ^b (2.37)	-0.015 (0.68)	-0.015 (0.68)	-0.015 (0.67)	-0.017 (0.76)	-0.016 (0.63)
Firm-Year Observations	11,645	9662	9662	9662	9662	7108
Adj. R^2	0.470	0.770	0.770	0.770	0.770	0.776

4.2.2. The changes in cash holdings and shareholder rights

Although we find that weaker governance structures are negatively related to cash holdings, the OLS regressions may not fully account for potential endogeneity in the sample. Modeling the relation between governance and cash holdings may be problematic if there is an endogenous feedback from cash holdings to governance because cash holdings and governance are jointly determined. Prior theory suggests that the causality between governance and cash holdings is more likely to be influenced by the firm's governance structure than vice versa. Nevertheless, estimation employing alternative methodology bolsters the integrity of the analysis. One common approach to controlling for endogeneity is two-stage least squares. However, the validity and sensitivity of the 2SLS estimation is related to the ability to identify exogenous variables in the first stage that are not related to the second-stage dependent variable. Unfortunately, prior empirical and theoretical work on corporate governance and cash holdings use similar control variables, which leaves us with little insight in determining reasonable instrument variables.

In a similar vein to the optimal capital structure literature, we use an alternative approach and examine whether the governance variables are related to the change in a firm's cash holdings. This provides evidence on the ability of a firm's governance variables to predict the future cash holdings of the firm by controlling for the lagged value of the firm's cash holdings. To implement this analysis, we add lagged cash holdings of the firm to our regression models. In addition, we lag the governance variables to represent the historical value, again controlling for the endogenous choice.

The results of this analysis are presented in models 2 through 6 found in Table 3. Model 2 is similar to the cash holdings analysis found in model 1 but the lagged cash holdings of the firm is included in the model. Not surprisingly, we find that lagged cash holdings explain a great deal of the current cash holdings (coefficient = 0.73 and t -statistic = 80). This is also reflected in the increase of the adjusted- R^2 from 0.47 in model 1 to 0.77 in model 2. We also note the drop in the t -statistics across the board for all the control variables when moving from model 1 to 2. When examining the results for the governance metrics in model 2, we find that the GIndex remains negative and statistically significant (at the 99% confidence level). Insider ownership remains positive and statistically significant (at the 99% confidence level). However, both pay for performance and institutional ownership are insignificant in this model.

In models 3 and 4, we break the GIndex down into smaller components. Model 3 reports the result using the Bebchuk, Cohen, and Ferrell (2005) EIndex and the remaining antitakeover provisions (computed as the difference between the GIndex and EIndex), hereafter labeled as RIndex. We find that the EIndex is statistically insignificant but the RIndex is significant at the 95% confidence level. Model 4 breaks down the

GIndex into three subcategories: classified boards, EIndex (minus classified boards), and remaining antitakeover provisions. In this case, we find that both the classified board variable and the EIndex minus the classified board variable are insignificant but again the RIndex remains significant at the 95% confidence level.

In models above, we assume a linear type of relation between cash holdings and the governance variables. Next, we examine if the relation is nonlinear. To do this, we classify firms using the GIndex into the highest and lowest quartiles. We similarly classify insider ownership (given the large variation of insider ownership by firm size documented in Table 2, we create the insider quartiles with the size quintiles). The results of this analysis are found in model 5. For the GIndex, the coefficients on both the 1st and 4th quartile variables are significant and similar in the size, which suggests that a linear specification may indeed correctly capture the relation. For the inside ownership quartiles, we only find the coefficient representing the 4th quartile to be significant. This suggests that the true relation is asymmetric and that the inferences implied from the linear coefficient could be inaccurate. We further examine the similar types of cuts for both pay sensitivity and institutional ownership but find insignificant results, and as such we continue to report the linear specifications.

Finally, we add the board characteristics to our basic model. The results are reported in model 6 of Table 3. We find that the GIndex and the inside ownership variables remain significant. For board characteristics, we find that both board size and board independence are insignificantly related to cash holdings. The remaining control variables have the expected signs.

Overall, the results in Table 3 suggest that the GIndex and insider ownership not only provide information in the cross-section, but are also related to changes in a firm's cash position over time as cash holdings are negatively related to the GIndex and positively related to inside ownership. Firms with a higher GIndex hold less cash and firms with a lower GIndex hold more cash. For inside ownership, we document a positive relation between cash holdings and inside ownership. But the results are driven by firms with high inside ownership holding more cash and not by firms with low insider ownership holding less. Also, as it relates to cash holdings, researchers may be discarding valuable information by solely focusing on the EIndex or classified board, since the other factors in the GIndex provides information about a firm's cash holdings.

In addition to the results reported above, we perform a number of robustness checks but do not tabulate the results. We examine whether refined institutional blockholdings influence our results (e.g., Dlugosz, Fahlenbrach, Gompers, and Metrick, 2006). We obtain blockholder data from Andrew Metrick's website and reestimate the models using his measure of blockholders and find similar results. To assess the adequacy of accounting for industry specific factors, we estimate the different models but require that at least 30 firms are in the industry category to be included in the analysis. While this reduces the sample by one-third, the point estimates are similar to the reported values and both the *t*-statistics and model fit increases. Again, the results corroborate with our earlier findings that firms with weaker shareholder rights have lower cash holdings than firms with stronger shareholder rights.

4.3. Governance, investment decisions, and valuation

From the analysis so far, we know that a firm's cash position is lower in firms with weak shareholder rights (captured by GIndex and insider ownership). The shareholder rights hypothesis states that equity holders with strong rights allow their managers to hold large cash reserves because they are confident about their ability to control how it will be spent. Our results so far are consistent with that hypothesis. However, we are unable to make any statements about the optimality of this outcome. Our results could be consistent with firms with weaker governance structures spending the cash on suboptimal projects or it could be the case that firms with weaker governance structures hold low cash reserves to mitigate the potential agency problems associated with excess cash holdings. To address this issue, we first examine the relation between excess cash holdings, governance characteristics, and a firm's investment and payout decisions. Second, we assess the effect of governance characteristics and excess cash holdings on firm value.

While we present results based on multivariate tests, in untabulated analysis, we also examine our main variables of interest in subsamples formed based on the top and bottom quartiles of the governance variables GIndex and inside ownership. These include: cash holdings, change in industry-adjusted capital expenditure

ratio, change in industry-adjusted R&D ratio, industry-adjusted acquisition spending, change in industry-adjusted repurchases, change in industry-adjusted profitability, and change in industry-adjusted market to book ratio. For the variables grouped by GIndex, the results show that firms in the top quartile of the GIndex have lower than average cash ratios, changes in industry-adjusted capital expenditures, industry-adjusted profitability ratios, and market to book ratios and higher than average industry-adjusted deal values. For the variables grouped by insider ownership, we find that firms in the top quartile of insider ownership have lower than average cash ratios and change in industry-adjusted repurchases, but higher than average change in industry-adjusted capital expenditure ratios, change in industry-adjusted R&D ratios, industry-adjusted deal values, change in industry-adjusted dividends, industry-adjusted profitability, and industry-adjusted market to book ratios.

4.3.1. Governance and investment decisions

In this section, we examine the relation between firms' investment decisions and governance variables. Specifically, we examine how excess cash, firm governance characteristics, and the interaction of these variables are related to firms' investment decisions. Given the insignificance of the board variables, pay sensitivity, and institutional ownership as a governance variable in Table 3, we drop these variables from the analysis. We focus on two measures to examine internal investment decisions that a firm makes: (i) capital expenditures, and (ii) R&D expenditures. We then examine how governance variables are related to firms' external investment decisions (acquisitions). It is possible that a firm's investment levels and governance could be jointly co-determined. To mitigate this problem, we focus on the change in the underlying investment decisions and relate it to the pre-existing governance characteristics of the firm. Therefore, we are examining how governance characteristics are related to changes in future decisions of the firm. This also reflects the long-term nature of investment decisions since investments are often multiyear commitments. Hence, the analysis reflects how investment decisions change over time.

To account for industry-specific factors that may drive investment decisions, we calculate the investment variables relative to the industry median value on a yearly basis. The IRRC database contains the large and more profitable firms than the universe of firms, IRRC essentially covers the S&P 500 until 1998, at which time it was expanded to the S&P 1500. If only firms in the IRRC sample were used to calculate industry average, a selection bias would occur. Hence, to mitigate this issue we calculate the industry averages and changes in these averages relative to all firms in COMPUSTAT, again defining industry at the Fama-French 48 industry level. We then examine how this measure is related to the governance variables, excess cash holdings, the interaction of the governance variables and excess cash holdings, and firm-specific control variables

We define a firm's cash position as the unexplained portion of cash holdings as well as the change in the unexplained portion. Specifically, we define unexplained cash as the residual from a regression of cash holdings on firm size, leverage, growth options, profitability, ratio of working capital to assets, cash flow volatility, R&D to sales, Capital expenditures to assets, and acquisition to sales as well as industry and year indicator variables.

For the governance variables, we include zero or one indicator variables for the extreme quartiles of the GIndex and insider ownership variable (the insider ownership quartiles are adjusted to reflect the size of the firm by creating the quartiles within the size quintiles as in Table 2). Since we are interested in how governance variables are related to future decisions, the governance variables enter as their lagged values. To examine how governance and cash holdings are jointly related to firm decisions, we create a set of interaction variables. That is, the GIndex and inside ownership extreme quartiles are interacted with the cash residuals. Additional control variables are motivated by Comment and Schwert (1995), who examine the probability of acquisition activity. These variables include: the market model residual (calculated over the estimation period), average sales growth, average net working capital (minus cash), average leverage (long-term debt to market value), average price-earnings ratio, and lagged firm size (averages are calculated over the prior four years). We continue to estimate the models with clustered standard errors as in Petersen (2006) with the year effect captured in the yearly industry adjustment.

The results of the analysis are found in Table 4. Across all the models, we find low R^2 s. This is not surprising as here we are focusing on changes in a firm's industry-adjusted position over time, which is likely to have a large idiosyncratic component. Model 1 reflects the results for the change in industry-adjusted capital

Table 4

Governance and cash holdings as they relate to firms' investment and payout decisions

This table examines the relation between investment and payout decisions and governance metrics. For investment decisions, the dependent variables are the change in industry-adjusted capital expenditures, R&D expenditures (for firms with available R&D expenditures), and acquisitions. For payout decisions, the dependent variables are the change in industry-adjusted dividends and repurchases. All the dependent variables are industry-adjusted on a yearly basis using the Fama-French 48 industry classification system. The firm's cash position is the unexplained portion of cash holdings as well as the change in this cash position. Specifically, the residual from regressing cash holdings on firm-specific characteristics represents the firm's excess cash holdings. The control variables for the cash regression in the first stage include firm size, leverage, growth options, profitability, ratio of working capital to assets, cash flow volatility, R&D to sales, capital expenditures to assets, and acquisition to sales as well as industry and year indicator variables. The governance variables include the extreme quartiles for the Gompers, Ishii, and Metrick (2003) antitakeover index (GIndex) and equity ownership of the top five officers (within the size quintiles found in Table 2). All governance metrics are lagged one period. The quartiles are interacted with the cash residuals to examine how the use of the excess cash flows and governance characteristics relate to profitability and firm valuation. Additional control variables include: the market model residual (calculated over the estimation period), average sales growth, average net working capital (minus cash), average leverage (long-term debt to market value), average price-earnings ratio, and lagged firm size (averages are calculated over the prior four years). Standard errors are estimated with clustered errors at the firm level. *T*-Statistics are reported in parentheses below the coefficient. Superscripts a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively. Though not reported, all models include industry and year indicators as well as an intercept term.

	Investment Decisions			Payout Policy	
	Δ Ind. Adjusted Capital Exp. (1)	Δ Ind. Adjusted R&D (2)	Δ Ind. Adjusted Acquisitions (3)	Δ Ind. Adjusted Dividends (4)	Δ Ind. Adjusted Repurchases (5)
<i>Cash Position of the Firms</i>					
Cash residual _(t-1)	-0.001 (0.15)	0.007 (0.81)	-0.001 (0.67)	0.001 (0.36)	0.003 (0.59)
Change in cash residual _(t-1)	0.008 (1.32)	-0.002 (0.59)	0.004 ^a (4.35)	0.003 ^a (3.31)	-0.003 (1.54)
<i>GIndex Variables</i>					
1st Qtile gindex _(t-1)	-0.005 (0.38)	0.030 ^b (2.22)	-0.001 (0.27)	-0.001 (0.12)	0.022 ^a (2.62)
1st Qtile Gindex _(t-1) * cash residual _(t-1)	-0.006 (0.51)	0.001 (0.10)	-0.001 (0.60)	0.013 ^b (2.53)	-0.005 (0.92)
4th Qtile Gindex _(t-1)	0.016 ^c (1.71)	-0.008 (0.58)	0.001 (0.39)	0.022 ^a (3.97)	-0.002 (0.25)
4th Qtile Gindex _(t-1) * cash residual _(t-1)	0.022 ^c (1.94)	-0.017 ^b (2.28)	0.006 ^b (2.33)	-0.005 ^b (2.29)	0.011 ^c (1.92)
<i>Ownership Variables</i>					
1st Qtile (Size Adjusted) Insider Ownership _(t-1)	-0.008 (0.55)	-0.017 (1.27)	-0.004 (1.36)	0.003 (0.58)	0.013 ^b (2.28)
1st Qtile Insider _(t-1) * cash residual _(t-1)	-0.003 (0.25)	0.005 (0.52)	-0.001 (0.24)	-0.004 (1.14)	-0.002 (0.27)
4th Qtile (Size Adjusted) Insider Ownership _(t-1)	-0.010 (0.83)	-0.001 (0.06)	-0.001 (0.40)	0.003 (0.64)	-0.016 ^b (2.11)
4th Qtile Insider _(t-1) * cash residual _(t-1)	0.006 (0.49)	0.009 (0.97)	0.003 (1.39)	0.009 ^b (2.00)	0.003 (0.59)
<i>Other Control Variables</i>					
Market residual	-0.025 (0.13)	0.024 (0.29)	-0.012 (0.48)	0.065 ^a (2.72)	-0.089 (1.63)
Sales growth	0.105 ^b (2.44)	-0.022 (0.78)	0.016 ^b (2.34)	-0.116 ^a (10.51)	-0.059 ^a (3.55)
Working capital (Net of Cash)	-0.011 (0.33)	-0.153 ^a (2.91)	-0.005 (0.64)	0.060 ^a (3.02)	-0.088 ^a (3.28)
Leverage	-0.001 (0.11)	0.005 (1.14)	-0.001 (0.87)	-0.030 ^a (4.13)	-0.041 ^a (4.00)
Price/earnings	0.000 (0.13)	0.000 (0.43)	0.000 (0.56)	0.000 (0.71)	0.000 (1.08)
Size _(t-1)	-0.005 (1.38)	-0.021 ^a (3.71)	0.001 (0.81)	0.010 ^a (4.43)	0.003 (1.08)
Observations	7439	3576	7652	7434	7042
Adj R ²	0.01	0.04	0.01	0.12	0.04

expenditures. The level of the cash residual and the change in the cash residual are unrelated to the change in capital expenditures on their own. As to the governance variables, we find that firms with a high GIndex are more likely to increase capital investments. The interaction between high GIndex and cash residuals shows that this propensity to increase capital investments is greater in the presence of excess cash reserves. We do not find evidence relating inside ownership or the interaction of inside ownership with changes in capital expenditures. In terms of economic significance, we find that relative to their assets, firms with weak shareholder rights invest 1.6% more in capital expenditures than their industry peers. A one-standard deviation increase in excess cash increases this amount to 4.16%. Our results differ from [Gompers, Ishii, and Metrick \(2003\)](#). They find that firms with weak shareholder rights (high GIndex) have higher capital expenditures (see, e.g., their Table 10). However, their focus is on the aggregate level of investing in a univariate setting.

Model 2 presents the results for the analysis of the change in industry-adjusted R&D. Since close to half the firms in the sample do not report R&D expenditures, we focus on firms for which R&D investments are meaningful investment decisions by restricting the sample to only firms with lagged R&D greater than zero. Though not tabulated, we find similar results if we reestimate the models for the full sample. Again, the two measures of the firm's cash position are insignificant on their own. We find that firms with strong shareholder rights (firms in the lowest GIndex quartile) increase R&D expenditures. The coefficient on highest GIndex quartile is insignificant, but the interaction of the highest GIndex quartile with the cash residuals of the firm is negative and significant, which suggests that firms with weak shareholder rights decrease investments in R&D relative to their industry peers as their cash position increases. In fact, we find that while a firm with weak shareholder rights invests an insignificant 0.8% less in R&D than its industry peers, a one-standard deviation increase in excess cash results in that same firm investing 2.02% less than its peers. We do not find evidence of a relation between inside ownership and changes in R&D.

For external investment decisions, we examine the relation between the governance variables, excess cash holdings, and acquisitions. [Masulis, Wang, and Xie \(2007\)](#) study the relation of bid premiums to the acquiring firms' GIndex scores. Our focus is on firms undertaking acquisitions. For this analysis, we use the SDC database to collect information on the acquisition activity of our sample firms. We follow Masulis et al. in forming our sample with the exception of not backfilling the data. The lagged governance variables must be available before the acquisition to be included in the sample. This leaves us with a sample of 1492 unique firms and 7922 firm-year observations. We identify 921 acquisitions for these firms over the sample period.

We scale the amount of acquisition spending by the lagged market value of the firm and, to control for year and industry related factors, we industry adjust this measure. The results of the acquisition analysis are reported in column 3 of [Table 4](#). The change in the firm's cash residual is positively related to acquisition activity. For the governance variables, the only significant variable is the interaction of the 4th quartile of the GIndex and the cash residual of the firm. The positive and significant coefficient suggests that firms with low shareholder rights are more likely to use excess cash to fund acquisitions. That is, a firm with weak shareholder rights spends an insignificant 0.1% more in acquisitions than its industry peers and a one standard deviation increase in excess cash results in that same firm spending 0.71% more than its peers.

Overall, governance affects the allocation of excess cash. Poorly governed firms acquire more assets through acquisition and capital expenditures, but reduce their R&D investment relative to their industry peers. We have not yet provided evidence on whether these spending differences are optimal or not. However, other studies ([Harford, 1999](#); [Masulis, Wang, and Xie, 2007](#)) have shown that acquisitions by firms with excess cash or high GIndex scores tend to be value destroying. Further R&D on average is a value-increasing long-term investment from the shareholders' perspective ([Eberhart, Maxwell, and Siddique, 2004](#)) Thus, results elsewhere in the literature are suggestive that these decisions are more consistent with the spending hypothesis. Nonetheless, below we directly test for an effect on profitability and firm value.

4.3.2. Governance and payout policy

An alternative explanation for why firms with higher agency conflicts have low cash on average is that they distribute more to shareholders. To examine this issue, we investigate how the governance metrics are related to a firm's payout policy, specifically dividends and repurchases. Our analysis mirrors the analysis of the investment decisions. We examine changes in yearly industry-adjusted measures of dividends and repurchases.

We focus on the changes in payout ratios (dividends or repurchases) to capture the slowly changing level of dividends caused by conservative dividend policy (see e.g., Brav, Graham, Harvey, and Michaely, 2005). When examining the changes in dividends, we find that changes in a firm's cash position are positively related to changes in dividend policies; firms with an increase in their cash holdings are more likely to increase dividends (by about 2.2% on average). For the governance variables, we find that firms with a high GIndex are more likely in general to increase dividends, evidence consistent with Officer (2006). The interaction terms, however, show that this propensity does not explain their lower cash reserves. It is the low GIndex firms that react to an increase in cash by increasing dividends; in fact, high GIndex firms allocate less of any excess cash to an increase in dividend than do other firms. The results for the insider ownership interactions are consistent, indicating that firms with higher insider ownership react to high cash reserves by increasing dividends.

When we examine changes in industry-adjusted repurchases, we find no effect for cash position (using either the level or the change) on its own. For the governance variables, we find that firms in the lowest quartile of the GIndex (stronger shareholder rights) are more likely to increase repurchases in general. However, the interaction terms reveal that high GIndex firms tend to react to high cash reserves by increasing repurchases. In other words, the results suggest that while a firm with weak shareholder rights spends an insignificant amount of 0.2% less on repurchases, a one-standard deviation increase in excess cash results in that same firm repurchasing 1.51% more than its peers. Similarly, the standalone 1st and 4th Quartile Insider Ownership coefficients show that in general, while low insider ownership firms are more likely to use repurchases, high insider ownership firms are less likely to spend cash reserves on repurchases.

The payout results show that firms choosing to payout some of their excess cash differ in the method of payout depending upon their governance. Firms with stronger governance (lower GIndex or higher insider ownership) tend to choose to increase dividends, thereby committing to higher payouts in the long term. On the other hand, firms with a weaker governance structure select the more flexible option, choosing to repurchase instead and imposing no commitment to make future payouts. These results are consistent with the flexibility hypothesis. The results are generally not consistent with the shareholder power hypothesis. Firms with significant shareholder power should provide managers with flexibility, which is the opposite of what we document.

4.3.3. Governance and profitability

Table 4 shows how investment and payout decisions differ based on governance characteristics and the firm's cash position. While these relations are instructive, they tell us nothing about their effect on shareholder wealth. In this section, we turn to the impact of these relations on firm performance. That is, we ask whether the difference in investment and payout decisions harm performance.

This type of analysis is subject to endogeneity concerns as governance characteristics and profitability may be jointly determined. Thus, we examine whether pre-determined governance characteristics are related to future profitability. By doing so, we answer the question of whether governance characteristics are related to future changes in firms' performance.

Specifically, we calculate the dependent variable, profitability, relative to the industry's median values on a yearly basis. Recognizing the selection bias noted above when working with the IRRC database, we calculate the industry medians relative to all firms in the COMPUSTAT database, which in turn captures industry and yearly fixed effects. To account for the fact that firm-level characteristics may be jointly determined, we include the lagged industry-adjusted profitability in our regression models and estimate the models using firm-level fixed effects. We include the same governance, cash, and interaction variables from the allocation analysis in the prior section as well as the same control variables.

We begin by examining how a firm's governance characteristics are related to its future profitability in Table 5. Naturally, lagged industry-adjusted profitability describes a significant portion of the firm's current profitability (t -statistic = 34.6). We find that both the lagged and the change in cash residuals are negatively related to current profitability. It is possible that this reflects long-run mean reversion in profitability or that when cash reserves accumulate, it is because the firm's growth prospects are declining. The fact that firms in the lowest quartile of the GIndex have significantly greater profitability and those in the highest quartile have significantly lower profitability demonstrates a direct relation between governance and profitability. Based on the results of model 1, firms with weak shareholder rights are 1.6% less profitable than their industry peers and

Table 5

Governance and cash holdings as they relate to firms' profitability and market-to-book

This table provides regression results on whether the governance variables are related to changes in firms' profitability and market-to-book relative to industry peers. Due to endogeneity concerns, we include firms' lagged profitability or market-to-book in the models, estimate the models using firm-level fixed effects, and lag all the governance metrics. The dependent variable in models 1 and 2 are industry-adjusted profitability and industry-adjusted market-to-book, respectively. To control for a selection bias, industry medians are calculated on a yearly basis using all firms with COMPUSTAT data. The cash position of the firm is defined as the unexplained portion of cash holdings as well as the change in this position. Specifically, the residual from regressing cash holdings on firm-specific characteristics represents the firm's excess cash holdings. The control variables for the cash regression include: firm size, leverage, growth options, profitability, ratio of working capital to assets, cash flow volatility, R&D to sales, capital expenditures to assets, and acquisition to sales as well as industry and year indicator variables. The governance variables include the extreme quartiles for the Gompers, Ishii, and Metrick (2003) antitakeover index (GIndex) and equity ownership of the top five officers (within the size quintiles found in Table 2). These quartiles are then interacted with the cash residuals to examine how the use of the excess cash flows and governance characteristics are related to profitability and valuation. Additional control variables include: average sales growth, average net working capital (minus cash), average leverage (long-term debt to market value), and lagged firm size (averages are calculated over the prior four years). The models are estimated using firm-level fixed effects, and standard errors are estimated with clustered errors at the firm level. *T*-Statistics are reported in parentheses below the coefficient. Superscripts a, b, and c indicate significance at the 1%, 5%, and 10% levels, respectively. Though not reported, all models include industry and year indicators as well an intercept term.

	Industry-adjusted Profitability (1)	Industry-adjusted MtB (2)
Industry-adjusted profitability (1) or MtB (2) _(t-1)	0.420 ^a (34.62)	0.441 ^a (39.06)
<i>Cash Position of the Firms</i>		
Cash residual _(t-1)	-0.007 ^a (3.87)	-0.006 (0.28)
Change in cash residual _(t-1)	-0.002 ^b (2.27)	-0.020 ^b (2.40)
<i>Gindex Variables</i>		
1st Qtile gindex _(t-1)	0.010 ^b (2.52)	0.106 ^b (2.38)
1st Qtile Gindex _(t-1) * cash residual _(t-1)	-0.005 ^b (2.46)	-0.011 (0.44)
4th Qtile Gindex _(t-1)	-0.016 ^a (3.98)	-0.122 ^b (2.50)
4th Qtile Gindex _(t-1) * cash residual _(t-1)	0.001 (0.67)	-0.040 ^c (1.69)
<i>Ownership Variables</i>		
1st Qtile (Size Adjusted) Insider Ownership _(t-1)	-0.005 ^c (1.86)	-0.045 (1.53)
1st Qtile Insider _(t-1) * cash residual _(t-1)	0.001 (0.41)	-0.025 (1.12)
4th Qtile (Size Adjusted) Insider Ownership _(t-1)	0.006 ^b (2.03)	0.088 ^b (2.33)
4th Qtile Insider _(t-1) * cash residual _(t-1)	0.001 (0.44)	0.010 (0.43)
<i>Other Control Variables</i>		
Sales Growth	-0.004 (1.22)	-0.029 (0.70)
Working Capital (Net of Cash)	-0.014 (0.80)	0.222 (1.09)
Leverage	-0.063 ^a (6.94)	-0.644 ^a (5.97)
Size	0.002 (1.22)	-0.156 ^a (8.34)
Observations	7768	7768
Adj. R ²	0.760	0.698

a one-standard deviation increase in excess cash decreases that amount further to 2.33%. Similarly, firms with low insider ownership have significantly lower profitability and firms with high ownership having significantly higher profitability. While both a firm's cash position and its governance affect future profitability, the results show little in the way of an incremental effect of the interaction of the two on the following year's profitability. The only significant interaction is for low GIndex firms with excess cash, indicating that the generally higher profitability for low GIndex firms is mitigated in the presence of excess cash. However, this relation does not bear directly on the predictions of the shareholder power or spending hypothesis for high GIndex firms.

4.3.4. Governance and market to book

Excess cash can affect the value of the firm through reduced profitability, either in the following year or much longer run, or through value-reducing actions such as acquisitions. In this section, we extend our analysis to overall firm value, examining how, on net, the market perceives the optimality of the different spending choices identified earlier. To do this, we follow the same basic approach outlined in the prior section. That is, we examine whether governance metrics are related to firms' future market to book relative to industry peers. We include firms' lagged industry-adjusted market to book in the models, estimate the models using firm-level fixed effects, and lag the governance metrics. The dependent variable is industry-adjusted market to book. The industry median market to book is calculated using all firms with COMPUSTAT data. Additional control variables for sales growth, working capital, leverage, and firm size are included.

We present the results of this analysis in model 2 of Table 5. We find that lagged industry-adjusted market to book has the greatest explanatory power for the current market to book of the firm. The lagged change in the cash residual of the firm is negatively related to the current market to book, indicating a generally lower value for firms accumulating cash. For the governance variables, we find that the GIndex index quartiles are significantly related to market valuation as the firms in the lowest quartile of the GIndex have a significantly higher market to book ratio while those in the highest quartile have a significantly lower ratio. We also find the interaction of lagged cash residuals and the fourth quartile of the GIndex to be significantly negative, at the 90% confidence level. In terms of economic significance, this suggests that firms with weak shareholder rights have 12.2% lower valuations than their industry peers, and a one-standard deviation increase in excess cash decreases that amount further to 17.81%. For the insider ownership variables, firms in the fourth quartile of ownership have a significantly higher market valuation. The interaction variables reveal that cash reserves do not alter this relation.

On the whole, the results in Table 5 show that poor governance, as measured by GIndex, is negatively related to firm value and that this relation strengthens in the presence of excess cash. While low insider ownership is also negatively related to firm value, the presence of excess cash does not enhance that relation. We cannot detect an impact of governance and cash reserves together on profitability, at least in the short run. This suggests that the reduction in value caused by the interaction of cash reserves and bad governance comes from dissipative actions such as overpaying for acquisition targets, rather than through ongoing reduced operating performance.

5. Discussion and conclusions

Our results provide a comprehensive picture of how firm governance affects the use of cash. We start by establishing that US firms with weaker governance structures tend to hold lower cash reserves. This comes about because of the way these firms spend their cash flow. While they actually invest less in R&D, they have greater capital expenditures and are more frequent acquirers. The payout results show that firms choosing to pay out some of their excess cash differ in the method of payout depending upon their governance. Firms with stronger governance structures tend to choose to increase dividends, thereby committing to higher payouts in the long term. On the other hand, firms with a weaker governance structure select the more flexible option, choosing to repurchase instead and imposing no commitment on themselves to make future payouts.

When examining if these differences are reflected in future profitability, we find a positive relation between shareholder rights and profitability. While both a firm's cash position and its governance affect future profitability, the results show little in the way of an incremental effect of the interaction of the two on future profitability. Finally, when examining valuation effects, we find that weaker governance structures are

negatively related to firm value and that this relation is more pronounced when combined with excess cash holdings. While low insider ownership is also negatively related to firm value, the presence of excess cash does not exacerbate the relation. While the effect of these spending decisions on value and profitability is weak, on net, we interpret our results, especially in the context of results elsewhere in the literature, as indicating that the spending decisions of poorly governed firms with excess cash are suboptimal.

The results for the US appear at first to be inconsistent with the results from international studies—namely, that as shareholder rights increase, cash balances decrease. However, we believe that these results help us understand how country-level shareholder rights interact with firm-level agency problems and shareholder power. The US scores highly on shareholder rights and rule of law indices, indicating that it has both high legal protection of shareholder rights and strong enforcement of those rights. This implies that in such a setting even entrenched managers are not as entrenched as their counterparts in countries with less legal protection of minority shareholders. Thus, while fewer firm-level shareholder rights are indicative of an agency problem and relatively more entrenched management in the US, this does not mean that the managers are unassailable. Large, unused cash balances are too visible an indicator and could lead to shareholder agitation (as in the case of Kirk Kerkorian and Chrysler). Faleye (2004) shows that proxy contests are increasing in excess cash reserves and that managers often lose their jobs following such contests. Thus, managers would prefer to convert the cash into real assets relatively quickly. Even if these transactions destroy value, to the extent that they are within the bounds of the cost of removing the management, the managers can successfully execute them. Further, evidence in Bliss and Rosen (2001) and Harford and Li (2007) establishes that CEO compensation and wealth increase after acquisitions, even if those acquisitions destroy value. Given these incentives and the potential penalty from accumulating large cash reserves, weakly controlled managers choose to spend the cash quickly on acquisitions and capital expenditures, rather than hoard it.

Our results, in the context of the international evidence of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) and Dittmar, Mahrt-Smith, and Servaes (2003), suggest that country-level granting and enforcing of shareholder rights is perhaps more important than firm-level attempts to limit shareholder rights. The level of entrenchment found in environments with poor shareholder protection is an order of magnitude greater than the average entrenched firm in countries with higher shareholder protection. In the former environment, managers can hoard cash and pay low dividends without fear of interference. In the latter environment, even entrenched managers are wary of actions that are too flagrant because their entrenchment only goes so far. In other words, measures of managerial entrenchment in the US are better viewed as signals of managers' propensity toward self-interested action rather than indications of their complete invulnerability to oversight. More entrenched managers have increased the transaction cost bounds within which they can operate before it becomes worthwhile to remove them, but still must be careful not to accumulate large, unused cash stockpiles. In the US, these stockpiles not only draw the attention of shareholders, but can be used to self-finance a control action against the managers.⁹ More research is needed to confirm or refute this interpretation of our results.

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⁹Kerkorian's 1995 tender offer for Chrysler was explicitly to be partly financed by the \$8 billion in cash reserves that Chrysler had accumulated. Because U.S. law allows the debt of an acquiring shareholder to be assigned to the acquired company, this is possible.

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