CORPORATE GOVERNANCE AND FINANCIAL MARKETS

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Abstract

We link corporate governance with liquidity, trading activity, and the clientele that holds the firm's stock. On the one hand high liquidity can decrease the quality of a firm's governance because it reduces costs of turning over a stock attracting too many short-term agents who have little vested in good governance. On the other hand, liquidity can attract more sophisticated agents and hence improve the quality of a firm's governance. In our cross-sectional analysis, we find that high liquidity is accompanied by poorer governance and vice versa. Further, increased institutional holdings are surprisingly associated with weaker governance in the 1990s, whereas in later years, they are not significantly related to governance. The proportion of orders transacted by small (large) traders is associated with weaker (stronger) governance, supporting the notion that a clientele consisting of small, unsophisticated investors can weaken the discipline imposed by outside investors on management. Given the known relation between corporate governance and stock returns, our results establish an indirect link between security prices and liquidity as well as trading activity, which goes beyond the direct channel described in Amihud and Mendelson (1986).

Keywords: corporate governance, financial markets, stock market

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1. Introduction

Issues surrounding corporate governance, particularly disclosure policy as well as executive compensation, have taken on increased prominence in recent times. For example, Mishel, Bernstein, and Allegretto (2005) note that CEOs in 2003 were paid 185 times as much as the average worker while the corresponding ratio was only 26 in 1965, and that average CEO compensation soared 342% between 1989 and 2000. Such high levels of compensation, coupled with practices like misrepresenting the exercise date on options as well as the backdating of options grants (Lie, 2005) have received considerable attention in the popular press.[10] Additionally, there has been concern about the apparent delinkage of compensation with financial performance.[11] Spurred by these concerns, the SEC has recently mandated clearer disclosure of executive compensation.

A separate concern has centered around increased episodes of fraudulent disclosures, exemplified by the Enron crisis, the WorldCom and Tyco revelations, as well as other indications of misrepresentation by top management. These have created a concern that investors may lose confidence in the financial markets, which may threaten

the viability of such avenues as a source of capital. In the case of Enron, revelation of the misrepresentation was accompanied by a loss of market capitalization, and a consequent erasure of about $1 billion in the retirement savings of investors.[12] The misrepresentations have led to the incarceration of top executives, and have served as

a major impetus for the Sarbanes-Oxley law aimed at curbing managerial misrepresentation. The question that arises in the above contexts is that of why the market discipline imposed by public ownership was unable to curb managerial excesses.[13]

[10] See http://online.wsj.com/public/resources/documents/info-optionsscore06-full.html for a list of companies currently under examination for options scandals. A recent article titled "Is 'Total Pay' that Tough to Grasp?," by Gretchen Morgenson, New York Times, July 9, 2006, notes that a recent report on executive compensation by a forum of executives, the Business Roundtable, excluded significant amounts of hidden compensation and that these aspects increased executive compensation well beyond the numbers provided in the report.

[11] See, for example, "Cendant Chief's Compensation Soared in 2005," by Ryan Chittum, Wall Street Journal, March 2, 2006, or "At Visteon, Bonuses Defy Gravity," by Floyd Norris, New York Times April 14, 2006.

[12] 3See "Retirement Savings Reform Sought," Financial Times, February 11, 2002, available at http://specials.ft.com/enron/FT3NM3FQKXC.html.

[13] Frieder and Subrahmanyam (2006) relate the sophistication of investor clientele to executive compensation levels. They argue that investor na¨ıvet´e can lead to inadequate monitoring of CEOs and

One noteworthy point is that large segments of the investing population (which determine the equilibrium stock price) scan the public disclosure statements, so it reasonable to suppose that they should have been able to discern the extent of corporate fraud from company disclosures.

However, as Subrahmanyam (2005) indicates, because of limited understanding of financial markets and accounting standards, the investing population may lack the sophistication required to curb managerial excess. In particular, if a stock attracts large numbers of short-term individual investors (e.g., day traders) governance may be weak because short-term agents do not have much vested in the long-run prospects of the company. This observation suggests that investor clientele may influence governance. On a related note, since short-term agents may be more active in more liquid stocks (Bhide, 1993, Holden and Subrahmanyam, 1996), trading costs may also affect governance.[14]

The preceding arguments imply that high liquidity may negatively affect governance quality by leading to a clientele that is overly comprised of short-term agents. An example of such a clientele is the individuals analyzed in Odean (1998, 1999) who lose money on average, but have high share turnover. It appears plausible that a clientele predominantly consisting of such agents may be too unstable to impose managerial discipline. On the other hand, a competing hypothesis is that liquidity may also allow sophisticated agents to turn over their holdings more easily in response to bad governance. This may have a positive effect on governance as management seeks to avert a stock price drop in response to sales by these agents. The central research question we thus explore is the following: Which of these opposing hypotheses on the link between liquidity and governance is best supported empirically? To address this issue, we combine summary measures of corporate governance developed by Gompers, Ishii, and Metrick (2003) with metrics for liquidity obtained from intraday transactions data.

We also test the hypothesis that higher institutional holdings imply a more sophisticated clientele and thus should lead to improved governance. Further, we proxy for clientele sophistication by an additional metric, namely, the proportion of dollar volume due to small orders.[15] We examine if this quantity is related to corporate governance.

To our knowledge, ours is the first paper to explore the relation between governance quality and market microstructure-related variables as well as aggregate institutional holdings. We find that high liquidity in the cross-section is accompanied by poorer governance and vice versa.[16] We also find, surprisingly, that increased institutional holdings are associated with weaker governance in the early 90s, whereas institutional holdings are not a significant determinant of governance in later years. We also find that the proportion of volume transacted by small (large) traders is associated with weaker (stronger) governance. Overall, the results indicate that a trading clientele composed predominantly of small, relatively unsophisticated investors may reduce the discipline exerted by outside investors on governance. Given the relation between corporate governance and stock returns described in Gompers, Ishii, and Metrick (2003) (and confirmed by us), our results establish an indirect channel wherein liquidity and trading activity can be related to stock prices, which goes beyond the direct channel described in Amihud and Mendelson (1986).

This paper is organized as follows. Section 2 briefly develops the hypotheses we explore within the paper. Section 3 describes the data. Section 4 presents a regression analysis. Section 5 presents the results of some robustness checks, and Section 6 concludes.

2 Development of Hypotheses

While the seminal paper by Gompers, Ishii, and Metrick (2003) considers the relation between a summary measure of governance and future stock returns, little research has been done on the cross-sectional determinants of governance.

excessive compensation. Of course, a vast body of earlier work studies compensation, particularly since the work of Jensen and Murphy (1990). This work (e.g., Aggarwal and Samwick, 1990, Barro and Barro, 1990, and Kaplan, 1994) generally focuses on cross-sectional variations in pay-for-performance sensitivities and does not explicitly address levels of compensation.

[14] Becht (1999) makes a related point that dispersed ownership is relevant for creating liquidity, but concentrated ownership (which is associated with less liquidity) is relevant for good governance.

[15] Generally, it is a presumption that small shareholders will not adequately monitor management due to the free-rider problem described in Grossman and Hart (1980). However, Strickland, Wiles, and Zenner (1996) present evidence that during a brief period in which small shareholders formed a coalition called the United Shareholders Association, their ggregate influence on governance had a material effect on firm valuations.

[16] An extensive literature focuses on the interaction between corporate governance and management. For example, Hirshleifer and Thakor (1998) analyze the takeover market as a substitute to boards of directors in managerial monitoring. Noe and Rebello (1996) focus on the role of board members coalitions in blocking managerial proposals that are unlikely to enhance value. Hermalin and Weisbach (1988) find that outside investors are more prone towards bringing outsiders into the board of directors after poor firm performance, when external monitoring of managers is likely to be the most desirable. John and Knyazeva (2006) show that precommitment to a dividend policy (as opposed to a discretionary share repurchase policy) can impose discipline on management. Fich and Shivdasani (2006) show that the quality of governance is negatively associated with the number of boards to which each outside director belongs. While these papers provide important insights, they do not link corporate governance to liquidity and trading activity.

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To understand better the relation between governance and financial markets that we seek to model, we now present a simple sketch of an economic setting that we use to motivate our hypotheses. The full details of the model are not presented because the derivation is completely standard (see Kyle, 1985, Admati and Pfleiderer, 1988, or Subrahmanyam, 1991), but are provided in Appendix A. We consider a risky asset whose long-term value is $\mu + \delta$, where μ is the ex ante mean and δ is a normally distributed random variable with zero mean. There are three dates and the variable δ is revealed at date 2. At date 3, which can viewed as far into the future, the asset pays off a liquidating dividend in the amount of its long-term value.

At dates 1 and 2 a mass of short-term traders is present in the market. These agents trade the asset at time 1 and reverse out their positions completely at date 2. Their excess demand is observed and absorbed by a set of risk-neutral market makers, who set the market price. There are two classes of short-term agents. The first class of agents trades on information about δ. These agents are risk-neutral and strategic.

We assume that there is another category of risk averse but short-term agents who submits an exogenous demand of z, where z is normally distributed with zero mean, and is independent of δ. We assume that both these agent classes contribute volume in the expected amount of V. The total (combined) mass of both types of short-term agents is ρ, which can be viewed as the proportion of (non-marketmaking) short-term agents in the population.

The equilibrium in this market is a standard one wherein the equilibrium price at date 2 is simply $\mu + \delta$, while that at date 1 is μ plus a linear function of the excess demand observed by the market maker. The slope of the function is a measure of illiquidity. We rely on the comparative statics elucidated by Admati and Pfleiderer (1988) to describe our results. First, we observe that the slope is negatively related to the number of informed agents as well as the standard deviation of z (henceforth, denoted std(z)). This is because more informed agents imply greater competition, which lowers the slope, and a high std(z) simply means noise traders are more active, which also creates liquidity. Further, it is intuitive that total expected volume V is positively related to the number of short-term informed agents and std(z).[17] Since the latter two quantities are both positively related to ρ, a high V and high liquidity both imply a high ρ.

The other category of investing clientele is a mass $\rho l = 1 - \rho$ of long-term agents. These agents do not trade at either date but hold the stock for the long-term and sell out completely at date 3. Their incentive is to maximize the date 3 value so they get the maximal price when they liquidate their shares. These agents can be viewed as nontrading (buy-and-hold) investors in the sense that they can be assumed to have been allocated shares before the company went public (or very far back in the past), and their liquidation is far enough in the future that trading costs play a negligible role in determining their payoffs.

The mean μ can take on two values, $\mu 1$ and $\mu 2$, with $0 < \mu 1 < \mu 2$. The board of the firm can take an action to improve the firm's governance which will boost the mean from $\mu 1$ to $\mu 2$. To take this action, however, a threshold level of quantifiable influence has to be exerted by the firm's investing clientele. Specifically, the action will be taken if the influence exerted is a quantity Im.

However, since the short-term agents are essentially speculating on the short-run variable δ, and their payoffs do not depend on the long-term mean value of the asset, they have no incentive to attempt to improve the long-term cash flows of the firm. They therefore choose not to exert any influence. We assume that the influence exerted by the long-term investing clientele is proportional to its mass and the constant of proportionality is I. This implies that action to improve the firm's governance is taken if and only if $\rho l I > Im$.

The above discussion leads to the following:

Proposition:

1. Liquidity is increasing in ρ, the proportion of short-term agents in the population.

2. Governance improvements that enhance firm value occur under a smaller parameter set when the proportion of short-term agents is greater.

The above proposition implies that since greater illiquidity is associated with a smaller proportion of short-term agents, it should (ceteris paribus) increase the parameter set under which governance improvements happen. In addition, we also note that since V is positively related to the proportion of short-term agents, high volume from short-term agents in this setting implies a smaller parameter set under which governance improvements occur.

Our basic goal is use the above setting to explore the relation between corporate governance and parameters that seek to capture the nature of the investing clientele. We would expect governance in the cross-section to be stronger if a greater proportion of the company's stock is held by institutions. We also propose that if the clientele that trades a company's stock is primarily composed of small traders, then governance will be weakened because the traders may be more short-term oriented and lack the sophistication and influence required to keep governance in check. Indeed, Odean (1999) shows that individual investors exhibit high turnover and poor investment performance.

Since these agents are likely to trade in relatively small trade sizes, we expect the proportion of dollar volume that is comprised of small orders to have a deleterious effect on governance.

We also explore the link between corporate governance and trading costs. We recognize that opposing rationales can be provided on this

[17] See Admati and Pfleiderer (1988, pp. 14-15).

connection, which go beyond our simple setting. On the one hand, as our arguments (as well as those of Bhide, 1993, and Holden and Subrahmanyam, 1996) imply, high liquidity may attract short-term speculators, who may have little vested in the long-term financial health of a company. The presence of such agents may have a deleterious effect on managerial discipline. To the extent that our proxies for short-term investors may be imperfect, liquidity may serve as an additional proxy for the activity of such agents and may thus be negatively related to the quality of governance. On the other hand, it may be argued that high liquidity or trading costs make it easier to turn over a stock, thus imposing discipline on management who is concerned about the deleterious impact on the stock price when the stock is offloaded.[18] Our data allow us to examine these competing explanations.

3. The Data

The governance index used here is obtained from Andrew Metrick's website and is based on Gompers, Ishii, and Metrick (2003). The index is a numerical quantity based on governance provisions in several areas, e.g., director indemnifications from lawsuits stemming from their conduct, anti-greenmail provisions, shareholder voting rights, and whether the board of directors serves on staggered terms.[19] We will not discuss the merits and demerits of the index in our work, but instead, refer the reader to the original GIM paper and view the index as a reasonable representation of the quality of governance within the firm. To the extent that this measure is noisy, we would expect only that the significance of coefficients in explanatory regressions for governance would be lower than if we had a perfect measure.

The liquidity and trading activity data are obtained as follows.[20] The transactions data sources are the Institute for the Study of Securities Markets (ISSM) and the NYSE Trades and Automated Quotations (TAQ) databases. The ISSM data cover the period up to 1992 inclusive while the TAQ data are for 1993-2005. We use only NYSE stocks to avoid any possibility of the results being influenced by differences in trading protocols.

3.1 Inclusion Requirements

Stocks are included or excluded depending on the following criteria:

1. To be included in any given year, a stock had to be present at the beginning and at the end of the year in both the Center for Research in Security Prices (CRSP) and the intraday databases.

2. If a firm changed exchanges from Nasdaq to NYSE during the year (no firms switched from the NYSE to the Nasdaq during our sample period), it is dropped from the sample for that year.

3. Since their trading characteristics might differ from those for ordinary equities, assets in the following categories are also expunged: certificates, American Depositary Receipts, shares of beneficial interest, units, companies incorporated outside the U.S., Americus Trust components, closed-end funds, preferred stocks and Real Estate Investment Trusts.

4. To avoid the influence of unduly high-priced stocks, if the price at any month-end during the year was greater than $999, the stock was deleted from the sample for the year.

5. Stock-days on which there are stock splits, reverse splits, stock dividends, repurchases or a secondary offering are eliminated from the sample.

Next, intraday data are purged for one of the following reasons: trades out of sequence, trades recorded before the open or after the closing time, and trades with special settlement conditions (because they might be subject to distinct liquidity considerations). Our preliminary investigation revealed that auto-quotes (passive quotes by secondary market dealers) were eliminated in the ISSM database but not in TAQ.

This caused the quoted spread to be artificially inflated in TAQ. Since there is no reliable way to filter out auto-quotes in TAQ, only BBO (best bid or offer)-eligible primary market (NYSE) quotes are used in calculating imbalances and mid-point returns. Also, quotes established before the opening of the market or after the close were discarded. Negative bid-ask spread quotations, transaction prices, and quoted depths were discarded.

Following Lee and Ready (1991), any quote less than five seconds prior to the trade is ignored and the first one at least five seconds prior to the trade is retained. We sign trades using the Lee and Ready (1991) procedure: if a transaction occurs above the prevailing quote mid-point, it is regarded as a purchase and vice versa. If a transaction occurs exactly at the quote mid-point, it is signed using the previous transaction price according to the tick test (i.e., buys if the sign of the last non-zero price change is positive and vice versa).

We recognize that our algorithm generally allows us to sign only market orders, so that our net imbalance measures the aggregate demand of agents

[18] See Edmans (2006) for an analysis of this argument. Parrino, Sias, and Starks (2003) provide evidence of institutional selling around an important governance-related event, namely, a forced CEO turnover.

[19] Gompers, Ishii, and Metrick (2003) note that 22 out of their 24 measures are firm-level provisions, and six are in the form of laws passed by the state of incorporation (four state-level measures are similar to firm-level provisions). We do not separate firm-level from state-level attributes in our main analysis because of two reasons. First, the number of attributes at the sole discretion of the firm is far greater than that at the state level. Second, the corporation is free to alter its state of incorporation to alter shareholder rights, and our relatively long time-period of seventeen years provides ample time for such changes to be reflected in the data. Nonetheless, our results are robust to the exclusion of state-level attributes of the governance index, as we will see in Section 5.

[20] Here, we repeat part of the description from Chordia, Roll, and Subrahmanyam (2002) for completeness.

that require immediacy. While this caveat is worth mentioning, we believe that the standard microstructure paradigm is of patient market makers (which include limit order traders) who absorb the demands of traders that have relatively urgent needs to trade.

As per Barclay and Warner (1993), who categorize orders less than 500 shares as small orders, we separately calculate the buys and sells due to orders of 500 shares or less, and that resulting from orders greater than 500 shares. The measured small or large order volume is the sum of the dollar values of buys and sells in each category.

For each stock we also define the following variables:

QuotedSpread: the quoted bid-ask spread associated with the transaction.

EffectiveSpread: the effective spread, i.e., the difference between the execution price and the mid-point of the prevailing bid-ask quote.

Our initial scanning of the intraday data revealed a number of anomalous records that appeared to be keypunching errors. We thus applied filters to the transaction data by deleting records that satisfied the following conditions:

1. QuotedSpread > $5
2. EffectiveSpread/QuotedSpread > 4.0
3. RelEffectiveSpread/RelQuotedSpread[21] > 4.0
4. QuotedSpread/Transaction Price > 0.4

Once the transactions data have been assembled, the quoted and effective spreads are calculated by averaging the values of each observed spread for each stock for each day. The institutional holdings variables are obtained from the Thomson Financial database available through Wharton Research Data Services. The aggregate shares held

by institutions as of the fourth quarter of every year is divided by the total number of shares outstanding to obtain our variable. Further, size is obtained as end-of-year market capitalization from CRSP. The governance index is not updated every year but in only the years 1990, 1993, 1995, 1998, 2002, 2004, and 2006. The transactions data end as of the year 2005.

Before proceeding with the analysis, a reasonable issue that arises is whether liquidity and small order volume can add additional information as explanators of governance over and above institutional holdings data already available. Our response is that the governance of a firm depends not only on the proportion of stock held by institutions but also on the type of clientele that holds the remainder of a stock. To take an extreme case, if 100% of the stock of a company is held by moderately capitalized day-traders with a horizon of a few weeks and a focus on short-term price trends, then such a stock is likely to be very liquid because of considerable amounts of trading activity (albeit in small individual trade sizes). It is highly unlikely, however, that there will be a lot of pressure on management to change the governance structure in such a company. This is because the opportunity costs of such agents in monitoring management are likely to be high and the incentives to do so likely to be low. On the other hand, if all of the shares are held by a large institution such as a pension fund, clearly the incentives to monitor are much stronger. But even in some intermediate case, if, say 20% of the shares are held by the institution, it still matters whether the other 80% are unsophisticated day-traders or online individual investors (viz. Odean, 1998, 1999, or Barber and Odean, 2002) or wealthy, relatively sophisticated individuals. The latter class are far more likely to be activists in shareholder meetings and be pro-active at governance.

The clientele of individual investors thus can matter for governance quality, cannot be captured by simply the proportion of stock held by institutions. Thus, our liquidity measure and the proportion of volume due to small traders serve as proxies which fulfill the role of capturing the activities of those agents who are less likely to be involved in governance.

In Table 1 we provide summary statistics for the variables we use within our study.

These variables are calculated as averages for the years in which the governance index is updated. The mean of the governance index is quite close to its median. The mean and median proportion of stock held by institutions is about 60%. The percentage of dollar volume due to small orders is about 12% for the entire sample period, while its median is 6%. The mean and median values of the effective spread are both about 10 cents over the entire sample period.

To examine trends in our variables, we examine the year-by-year averages for the variables in Table 2 (for the years in which the governance index was updated). The mean value of the index itself remains steady throughout the sample period. Institutional holdings have steadily increased. Quite evident is a substantial increase in the proportion of dollar volume due to small orders during the latter years of our sample (following decimalization). The effective spread has shown a steady decline through the period, consistent with Chordia, Roll, and Subrahmanyam (2001).

4 Regression Results

4.1 Basic Regressions

The governance measure, as already noted, is not updated every year. In order to understand the cross-sectional determinants of governance, we use lagged values of the explanatory variables, to avoid a look-ahead bias. This also allows us to address the inevitable complaint of endogeneity that some readers are sure to raise. In particular, we calculate the

[21] The prefix "Rel" refers to the spread divided by the midpoint of the matched quote.

explanatory variables as averages of the measures in the intervening years between the updates and ending just prior to the year in which the governance index is measured. For the first year in the sample, 1990, the explanatory variables are measured as averages across the years 1988 and 1989.

We include (the logarithm of) firm size as an explanatory variable in addition to the other variables whose summary statistics we report in Tables 1 and 2. We use logistic transforms of proportional small order volume and institutional holdings,[22] and logarithms of firm size and effective spreads. We use the Poisson regression method because the governance index is a count variable. The details of the regression procedure appear in Appendix B. Note that large values of the governance index imply poorer governance, as per the convention used by Gompers, Ishii and Metrick (2003).

In Table 3 we present the results of year-by-year regressions of the governance index on holdings, size, and the proportion of dollar volume due to large orders. The sample size (consisting of firms with nonmissing values for all of our variables) ranges from 1037 firms in 1990 to 1257 firms in 2006. The coefficients of firm size are omitted for brevity.

As can be seen, holdings are positively and significantly related to the governance index up to 1998 (and are not significant at 5% beyond), indicating that greater levels of institutional holdings imply poorer governance in the earlier years of our sample. This intriguing result is difficult to understand, because one would presume that institutions would exert greater discipline on management than individuals. It may, however, be the case that social networks are more common between the CEOs of firms and the leadership of large institutions (viz. Larcker, Richardson, Seary, and Tuna, 2005, or Subrahmanyam, 2007), and this social connection may preclude good governance. In addition, certain specific types of institutions (e.g., pension funds) may exert better control on governance and our data may not be able to pick up the effect of such institutions on governance; we will return to this issue in the next section. It can also be seen that institutional holdings have gradually lost importance as a determinant of governance, a result that deserves further investigation in future research. In totality, the results call into question the informal wisdom that institutions improve governance.

It can also be seen that in every year but the first (1990) small order volume tends to be associated with low quality of governance. This result can be explained by noting our initial hypothesis that improvement in trading technologies in recent years may have led to the entry of short-run traders.[23] Since these agents have less of a stake in long-term governance, market discipline on governance may weaken. Note that since the proportion volume due to large orders is the complementary proportion of the variable used in Table 3, our results also imply that a greater proportion of dollar volume due to large orders implies better governance.

We also find that low effective spreads are associated with high values of the governance index in every year of the sample period except 1990, and one other exception wherein significance obtains at the 10% level (in 2006). Overall, this implies that high liquidity implies poorer governance. Again, this somewhat paradoxical result can be explained by noting that high liquidity can encourage the entry of short-run traders (Holden and Subrahmanyam, 1996). Since these agents have less of a stake in long-term governance, market discipline on governance may weaken.[24] The weaker significance in the last year of the sample is to be understood in conjunction with the fact that the Sarbanes-Oxley Act came into effect towards the end of the sample period. In the presence of such exogenous pressures to be accountable, it is less likely that corporate boards would let governance deteriorate because of inattentive short-term traders.

In Table 4, we present the time-series averages of the cross-sectional regression coefficients reported in Table 4. Newey-West corrected t-statistics are also reported.[25] The results confirm that holdings are positively (but weakly) related to governance, while small order volume and liquidity are both negatively related to the quality of corporate governance. Finally, larger firms tend to have worse governance. We speculate that this may be because social networks may be more likely to form between the CEOs of visible companies, since such visibility may facilitate communication at common gatherings of visible agents. If such agents also belong to each others' boards; this phenomenon may lead to poorer governance. Future research should shed more light on this result.[26]

[22] The logistic transform of a variable y that falls in the interval (0,1) is ln[y/(1 − y)]. This implies that only observations with nonzero values of holdings are included in our sample.

[23] As another proxy for short-term traders, we tried including total share turnover in the regression of Table 3, but found that this variable was not consistently significant. This suggests that it is the trading activity of agents who trade small orders (and who are more likely to be naıve) that is negatively associated with governance.

[24] While the governance index does not change substantively over time, executive compensation levels have indeed increased over time (as we pointed out in the introduction). It is interesting that the steep rises in compensation levels have been accompanied by steep increases in liquidity (viz. Table 2). Assuming that the governance index does not capture all aspects of governing a firm (such as a full characterization of compensation policy), this observation also is consistent with the notion that high liquidity may have been accompanied by more short-term traders, thus causing shareholder control on compensation to weaken.

[25] As suggested by Newey and West (1994), we use the lag-length L to equal the integer portion of $4\left(\frac{T}{100}\right)^{2/9}$, where T is the number of observations.

[26] We do not present the results of panel data estimation in our main text because of two reasons. First, we view our arguments as

4.2 Size-Based Results

We now explore whether our results obtain differentially for small and large firms. For example, cross-sectional variations in clientele may be bigger for large firms. This is because for small firms, much of the clientele may be relatively unsophisticated since large, sophisticated traders may eschew such firms. To test this notion, we divide firms each year into terciles (three equal groups up to rounding) by firm size, i.e., the variable presented in the last row of Table 4. Then, we estimate the regressions of Tables 3 and 4 separately for these size groups and present the time-series averages of the coefficients in Table 5.[27]

The table indicates that the variables representing institutional holdings, liquidity, and small order volume are significant only for the large and midcap terciles. This supports our conjecture that clientele effects on governance are more apparent when there is greater cross-sectional heterogeneity in the clientele, and such heterogeneity is like to be greater in the larger firms. An intriguing result is that firm size appears to be negatively associated with governance quality for the small-cap tercile; while this result may deserve further study, note that the relevant coefficient is only marginally significant.

Overall, our results show that financial market liquidity and trading activity influence governance in intriguing ways. Specifically, high effective spreads imply better governance suggesting a potentially harmful effect of liquidity on governance. We hypothesize that this effect arises because high liquidity encourages short-term traders who have little vested in improving governance for the longer term. Supporting this notion, governance is weaker in stocks where small orders form a greater portion of trading volume, and stronger in stocks where large orders are predominant in the total dollar volume.

5. Robustness Checks

In this section, we present the results of various robustness checks we conducted to ascertain the reliability of our basic results.

5.1 Exclusion of State Level Attributes

The governance index includes attributes at the firmlevel as well as provisions imposed by the state of incorporation. As argued in Footnote 10, provisions at the firm level are more easily altered than those at the state level. Specifically, to alter the state level attributes the firm may well have to reincorporate in a different state which may be quite costly. Thus, we recalculate the governance index excluding the state level attributes (see Appendix A of Gompers, Ishii, and Metrick, 2004 for details of these attributes). We then re-run the regressions of Tables 3 and 4 using the revised governance index.

We find that the results are largely unaltered when the re-calculated index is used as the dependent variable. Specifically, the coefficient estimate of the effective spread (the analog of that in Table 4) is −0.271 (t=−2.94, p-value=0.022), and that of small order volume is 0.083 (t=3.43, p-value=0.011). The size and significance of these coefficients are slightly larger than those in Table 4. Thus, the results are not only robust to the exclusion of the less easily altered state-level attributes of the governance index, but are actually slightly strengthened when one uses the revised index that excludes state-level provisions.

5.2 Additional Control Variables

Next, we examine the impact of several control variables that could potentially influence governance. One of these is return volatility. The notion is that information on firms with uncertain prospects would be harder to come by, hence managers would have more leeway in misallocating resources. This implies that stronger governance may be required for such firms. For similar reasons, beta is also a potential determinant of governance.

We also include measures of the firm's profitability as well as the market's assessment of the productivity of the firm's tangible and intangible assets. We measure by the return on equity (net income divided by stockholders' equity) and the book-to-market ratio (stockholders' equity divided by market capitalization). The notion is that high values of these variables could attract sophisticated clientele who may then commence procedures to try and improve governance.

We compute the annual standard deviation of returns (based on daily data) for firms in our sample. We then average this quantity during the intervening years between updates of the governance index (averaging across 1988 and 1989 for the 1990 index, as in the previous section). Our beta estimate is calculated using between 36 to 60 months of data ending in December 1990, using as much data as available (so is volatility, measured by return variance), and is based on the CRSP value-weighted index. Also, we report results from using Dimson (1979) betas with one lead and one lag to account for non-synchronous price adjustment across firms, but virtually identical results are obtained using simple

principally cross-sectional and nature, because governance changes in response to liquidity and volume changes may be slow and hard to discern in the time-series.

Second, the left-hand variable is takes on discrete values in a finite range, and as such, standard panel procedures which assume normally distributed error terms are less than appropriate for our purposes. Nonetheless, in unreported analyses, we estimated a standard panel model with random effects, assuming normal errors. Consistent with Table 4, the coefficients of effective spread and small order volume remained significant in this estimation, with negative and positive signs, respectively.

[27] Year-by-year coefficients as in Table 3 present the same overall picture as the time-series averages
and hence are omitted for brevity.

beta coefficients. The ROE and book/market variables are obtained from the merged CRSP/Compustat database available from Wharton Research Data Services.

Results using this expanded set of characteristics are reported in Table 6. As can be seen the inclusion of the additional variables does not materially change the significance of the coefficients relative to that in Table 4. Firm size becomes less significant in the presence of the expanded set of variables, possibly because of multicollinearity between market capitalization and some of the other regressors. Note that multicollinearity typically increases standard errors, and results in loss of significance. Thus, the significant coefficients on effective spreads and relative small order volume imply that multicollinearity does not affect our principal conclusions on the relation between governance and liquidity as well as trading activity.

Our measure of institutional holdings is simply the aggregate proportion of shares held by all institutions reported in the Thomson Financial database. However, the literature suggests that pension funds are particularly prone to activism because of their long horizons and their fiduciary duties towards protecting retirement income (see, for example, Woidtke, 2002, Del Gurcio and Hawkins, 1999, or Wahal, 1996).

To address this issue, we calculate the aggregate holdings of the 18 largest pension funds as used in Cremers and Nair (2004), who, in turn, obtain this list from Lily Qiu of Brown University. These funds are listed in Appendix C. Since the holdings of the funds are zero for a large number of stocks, logistic transformations are not appropriate. We therefore use the logarithm of one plus the (aggregate) proportional holdings of these funds as our independent variable. Upon inclusion of this variable in the regressions of Table 4, we find its coefficient to be positive and significant, just as that of aggregate institutional holdings. The significance and sign of liquidity and small order volume remain virtually unchanged upon the inclusion of the pension fund variable.[28]

Doubtless, even finer gradations of institutions could shed further light on the role of institutions on governance; we leave further analysis of this topic for future research.

We also try to ascertain whether the governance index is significantly different for the computer/high-tech sector as defined by Fama and French (1997) (SIC codes 3570- 3579, 3680-3689, 3695, and 7373). The rationale is that high tech companies with a high emphasis on human capital for success may require stronger governance. However, inclusion of a high tech indicator variable made no material difference to the regression in Table 4; the dummy was insignificant in all years and the other coefficients were materially unaltered.

Note that our basic argument is that governance would be weaker in stocks dominated by relatively unsophisticated agents. However, our small order volume and effective spread variables are imperfect proxies for trader unsophistication; for example, the latter variable is open to question if sophisticated institutions split their orders.

An alternative proxy for sophistication is the extent of informed trading in the stock. We use the PIN measure of information asymmetry considered, for example, in Easley, Hvidkjaer, and O'Hara (2002) as an additional explanatory variable in the regressions of Table 4. The PIN measure is obtained from Soeren Hvidkjaer's website at the University of Maryland and spans the years 1983 to 2001. The time-period for the regressions is correspondingly restricted in that the governance measures for 2004 and 2006 are not utilized in this robustness check. Time-series aggregated coefficients from annual cross-sectional regressions are presented in Table 7. In spite of the restricted sample period, we find that both the effective spread and small order volume remain significant. PIN is significant with the expected sign, which indicates that stocks with lesser information asymmetry and thus, unsophisticated traders have worse governance, and vice versa.[29]

5.3 Endogeneity

By lagging the right-hand variables, we already have addressed endogeneity to some extent. Nonetheless, to pursue the issue further, we perform the following exercise. We model the effective spread as a function of governance, size, turnover, proportion of volume due to small orders and return volatility. These explanatory variables are intuitive determinants of liquidity (see, for example, Benston and Hagerman, 1974, or Stoll, 1978). The governance index, as before, is modeled as a function of the effective spread, size, small order volume, and institutional holdings. The volatility variable is calculated as in the above robustness check. All other variables are measured as per the previous section, and share turnover is log-transformed.

We estimate the equations by two-stage least squares (2SLS) and present the results from the first and last years of our sample (1990 and 2006) as well as the Newey-West corrected t-statistics and the time-series averages of the coefficients for the governance equation in Table 8. (Results for intervening years are similar to those in Table 3 and hence are omitted for brevity.) We find that the significance of the coefficients of our key variables (liquidity and the proportion of volume due to small orders) is materially unaltered relative to Tables 3 and 4, building confidence in our results.[30]

[28] Adding the variable to the Table 6 regression also leads to identical conclusions

[29] In the unreported year-by-year cross-sectional regressions, PIN is negative and significant in all but one year of the sample period.

[30] The Poisson regression models the logarithm of the governance index, whereas the two-stage least-squares method uses the untransformed version of the variable. Hence the magnitude of the

5.4 Varying Sample Size

Recall that the size of our cross-sectional is not constant year-to-year since we simply take the intersection of firms that contain data on all of our variables within each year. We perform a robustness check wherein we follow a sample of firms from the beginning to the end of our sample period. There are 415 firms present in every year of our sample period. Results analogous to those in Table 4 for this sample of firms are presented in Table 9.

As can be seen they change little for holdings, small order volume, and effective spreads, except that the institutional holdings variable is now more strongly significant, building confidence in our results. However, for this sample, larger firms are associated with better governance. This suggests that within the relatively larger firms present throughout the sample, greater complexity associated with larger firms may limit investors' understanding of such firms, and as such, may require stronger checks and balances imposed by governance procedures.

5.5 Alternative Illiquidity Measures

Note that we have used effective spreads as an illiquidity measure. The idea here is to use actual transactions data to compute illiquidity. It can be argue that a better crosssectional measure of illiquidity is the effective spread scaled by share price because this represents trading cost per dollar traded. However, this creates a potential issue

that inferences may be due to cross-sectional variation in share price rather than the spread. This issue notwithstanding, we tried including the effective spread scaled by the year-end share price in our regression. The coefficient of this variable remained negative and strongly significant in the regression of Table 4.

In unreported regressions, we also consider the commonly-used Amihud (2002) measure of illiquidity, which is defined as the absolute return divided by the volume of trade. We obtain estimates of this illiquidity proxy from Joel Hasbrouck's website at New York University. We use the measure (log-transformed, like the effective spread) in the regressions of Tables 3 and 4. We find the results so obtained to also be quite convincing. The coefficient of the Amihud measure is negative and significant at the 0.001 level in every one of the sample years, and the overall average coefficient is significant with a Newey-West adjusted t-statistic of −12.95 (and the coefficient on small order volume remains positive and significant). Thus, the governance-illiquidity relation is even stronger when the Amihud (2002) measure is used in place of the effective spread.

As an additional check, we use the absolute value of order imbalance as an illiquidity proxy, in the sense that turning around a position is likely to be more difficult in stocks with higher absolute imbalances (Chordia, Huh, and Subrahmanyam, 2006). We run regressions similar to those in Tables 3 and 4, adding absolute order imbalances for large and small orders. These measures are defined as the absolute values of dollar buys less sells divided by the total dollar volume emanating from a specific type of order (large and small). The mean coefficients on both order imbalances are negative, while that on small order imbalance is significant at the 5% level (and the coefficients of the variables in Tables 3 and 4 remain qualitatively unaltered.) This indicates that low absolute imbalance is associated with worse governance, which again supports the notion that high illiquidity implies better governance.

To explore the impact of our results on expected returns, we also performed an exercise where we regressed monthly stock returns on lagged values of the governance index. Prior to using the returns, we adjusted them for the Fama and French (1993) and momentum factors, i.e., we used the intercept plus residual obtained from regressing excess returns on these factors.[31] The index was used from the last calendar year prior to the year of the return in which it was measured. We obtained a negative coefficient on the index with a marginally significant t-statistic of −1.87.[32] This result is consistent with that of Gompers, Ishii, and Metrick (2003).[33] The authors imply that this negative sign can viewed as a delayed response of stock prices to changes in governance, so that low values of the governance index (and thus good governance) leads to subsequent positive returns. Accepting this reasoning, our analysis indicates that quite apart from the standard channel of Amihud and Mendelson (1986), wherein liquidity directly influences the cost of capital by way of lowering trading costs, liquidity and trading activity can also be related to future stock returns by their effect on governance.

From the perspective of economic significance, it is most straightforward to focus on the 2SLS regression coefficients in Table 8. We find that a three-fold increase in the proportion volume due to small orders (say from 6.5% to 19.5%, corresponding to a one-standard deviation move - viz. Table 1)

coefficients in Table 6 are not directly comparable to that in Table 4.

[31] The factors were obtained from the Wharton Research Data Services website, which, in turn, obtains them from Kenneth French.

[32] The effective spread and small order volume variables were not significant in the presence of the governance index, though the sign of small order volume was negative and significant at the 10% level in the absence of the governance index, implying that low levels of small order volume are linked to higher expected returns. Our analysis suggests that this link operates by way of the small order volume's impact on governance.

[33] Cremers and Nair (2006) argue that the relation between governance and returns is more subtle and requires the additional consideration of the external market for corporate control as well as activism by large shareholders.

implies an increase in the governance index of about 4.5 index points. With regard to the effect of liquidity, a doubling of the effective spread (e.g., from 1 cent to 2 cents) is associated with a drop in the index of 5.8 points. Both of these impacts seem material relative to the cross-sectional mean of the governance index, which is around 9.[34]

5.6 Valuation

Finally, it worth considering the implications of our results on stock valuation. While it is not the goal of our paper to pursue these issues in detail, we briefly consider the impacts of small order volume and the effective spread on Tobin's q, a commonly used valuation metric. The notion is that if governance is impacted by liquidity and small order volume, the impact should carry over to company valuations. To address this issue, we compute q as follows. We calculate the sum of the market capitalization of the firm's common equity, the liquidation value of preferred stock, and the book value of long-term debt and divide this total by the book value of the firm's assets. We then perform regressions of the type considered in Table 4 with q as the dependent variable.

Our analysis includes the following control variables. First, we use a proxy for the firm's leverage, long-term debt to total assets, as a measure of the likelihood of distress. We also use a measure of profitability, namely, return on assets (computed as net income divided by the book value of assets). In addition, we consider a measure of investment opportunities, computed as capital expenditures divided by sales, and a dummy for whether the firm pays a dividend, which proxies for capital constraints (firms which pay dividends may have more free cash flow which may potentially be used to overinvest in marginal projects). The preceding controls have been used in previous literature, e.g., Allayannis and Weston (2001) as well as Carter, Rogers, and Simkins (2006). In addition to these variables, we include the effective spread as well as our measure of volume due to small orders. Results from this regression appear in Table 10.

Most of the variables have an impact on q in the hypothesized direction. Thus, the dividend dummy is negative and strongly significant, while ROA is positive and also highly significant. Further, leverage has a significantly negative impact on valuations.

It is intriguing, however, that small order volume has a significantly negative impact on q, whereas the effective spread's impact is of the opposite sign.[35] From an economic standpoint, summary statistics reveal that a one-standard deviation move in small order volume changes Tobin's q by 0.27, which is 19% of its sample mean.[36]

These results indicate that the impact of financial markets on governance spills over to corporate valuations in the expected way (less trading by small investors is associated with more effective governance and improved firm valuations, and vice versa). Further and detailed exploration of this issue is left for future research.

6. Conclusion

We examine the link between corporate governance and financial markets. More specifically, we address how governance is linked to liquidity as well as the clientele that holds the firm's stock. The hypotheses are as follows. High liquidity can decrease the quality of a firm's governance because it causes the stability of the clientele to decline (i.e., it is cheap to turn over a stock if it is liquid, hence too many short-term oriented agents

such as day traders invest in the stock). On the other hand, liquidity can also attract more sophisticated agents and hence improve the quality of a firm's governance. We empirically address the question of which of these competing hypotheses has stronger support. The data analysis validates the former hypothesis in that high liquidity in the cross-section is accompanied by poorer governance and vice versa. We also find, surprisingly, that increased institutional holdings are associated with weaker governance in the 1990s, whereas institutional holdings are not a significant determinant of governance in later years. This result runs counter to the informal wisdom that institutional ownership promotes better governance. However, future studies using stratifications by type of institution may be able to shed further light on this issue.

The proportion of orders transacted by small (large) traders is associated with weaker (stronger) governance. This indicates that an overabundance of small, unsophisticated traders can weaken the discipline exerted by the outside market on corporate governance. Overall, the results establish important links between corporate governance and microstructural variables such as liquidity and trading activity. Given the known effect of corporate governance on stock prices, our results also establish

[34] As another example of economic significance, Gompers, Ishii, and Metrick (2003) consider extreme sorts where the governance index exceeds 13 or falls below 6 and call these the "dictatorship" and "democracy" portfolios, respectively. The average effective spreads for these extreme portfolios are 12.2 cents and 10.8 cents, respectively, representing a material (and statistically significant) transaction cost differential of more than $10,000 on a single million dollar trade.

[35] For robustness, we estimated panel regressions with random effects using Tobin's q as the dependent variable, with the same explanatory variables as that in Table 10. The results so obtained were substantially similar to those in the table, and are available upon request.

[36] The sign and significance of these variables does not change when the governance index is included as an additional explanatory variable, suggesting that these variables capture effects beyond those captured by the specific governance proxy that we use in our study.

a channel by which liquidity and trading activity can influence stock prices (by way of their effect on governance), which goes beyond the direct channel elucidated by Amihud and Mendelson (1986).

Our work suggests implications for variations in corporate governance across countries. For example, our results suggest that countries where trading costs are low and where individual investors are active would tend to have poorer governance. In addition, we predict that boards of directors would tend to become less activist in countries where technological improvements (such as the advent of online trading) lead to increased liquidity and attract short-term traders. Analysis of such issues is left for future research.

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Appendix A

In this appendix, we provide details of the equilibrium corresponding to the model sketched out in Section 2. Suppose that there are k short-term informed agents and n noise traders with exogenous demands. Each noise trader i submits an independent and identically distributed demand of zi and a standard deviation d, for a total demand of z. The total standard deviation of noise trades std(z) = nd. The k informed and noise traders aggregate to a proportion ρ of the total population. Now, in the setting we consider, the market maker quotes a linear pricing rule of the form μ + λQ, where Q is the total order flow. It is standard and well-known that in the Nash equilibrium, each informed agent submits an order of the form δ/[(k+1)λ] (see Admati and Pfleiderer, 1988, or Subrahmanyam, 1991). The market maker makes zero expected profits conditional on the order flow Q. Using the projection theorem, it follows that the equilibrium value of λ is

$$\lambda = \frac{\sqrt{k}}{k+1}\frac{\mathrm{std}(\delta)}{\mathrm{std}(z)}$$

From this it immediately follows that λ is decreasing in k as well as std(z). Since ρ is increasing in both std(z) and k, it follows that greater liquidity is associated with a higher ρ.[37] Since governance improvement occurs under a larger parameter set when ρ is smaller, ceteris paribus, greater illiquidity is associated with better governance. This justifies the statements in the proposition. Turning now to volume, the total trading done between agents at dates 1 and 2 is linearly related to the quantity std(I) + std(z) + std(Q), where I is the total informed trade.[38] The above expression for volume includes trading done by informed and noise traders as well as the market maker. Now, std(I) = std(kδ/[(k + 1)λ], and substituting for λ from above, it follows that this quantity is increasing in k. The second term is increasing in z, and it is easy to show that the third term is increasing in k and z. Since both k and z are positively associated with ρ it follows that total volume at both dates 1 and 2 is increasing in ρ.

The mapping of V to small order volume emanates from the following notion. The long-term agents trade only at date 3. Suppose their expected order size tends to be very large relative to that of the short-term agents (this would be the case if the expected holdings of long-term agents are very large relative to the expectations of |δ| and |z|, which determine V). Call the total volume of long-term agents VL. Then the empirically observed ratio of small to large order volume simply proxies for V/VL. Recall that V is positively related to ρ. It follows that ceteris paribus, high observed ratios of small to large order volume would be associated with high ρ.[39] In turn, since a low ρ is associated with better governance, the ratio is inversely associated with governance quality.

Appendix B

This appendix describes the Poisson regression estimator used in the paper. This regression considers a dependent variable yi (for N observations, i = 1, . . . , N) whose mean λi is modeled as a parameter of a Poisson process:

$$\Pr(y_i) = \frac{e^{-\lambda_i}\lambda_i^{y_i}}{y_i!}$$

The parameter λi, which is the mean of this distribution is modeled as a function of, say J, explanatory variables which form a vector xi, with a slope vector of β. The mean of yi conditional on xi is given by

$$E(y_i|x_i) = M_i = e^{x_i'b},$$

[37] Our measure of illiquidity in the empirical work is the effective spread. This maps on to λ in the sense that a higher λ implies that for any given order size, the spread between buying and selling that quantity will be larger. Our results also obtain for the Amihud (2002) measure which, being the ratio of absolute return to volume, is even more directly related to λ.

[38] The expression for volume follows from the observation that for a normally distributed random variable, its expected absolute value is linearly related to its standard deviation.

[39] While our raw variable is the proportion of small order volume to total volume, in our regressions, we use the logistic transformation of this proportion, which is the logarithm of the ratio of small order volume to large order volume.

where b is the estimated value of the vector β. Note that the logarithm of Mi is linear in b, i.e.,

$$\ln(M_i) = x_i'b.$$

The log-likelihood function is written as

$$L = \sum_{i=1}^{N} y_i x_i' b - e^{x_i'b} - \ln(y_i!).$$

The first order conditions ∂L/∂b then yield J equations, one for each of the explanatory variables, of the form

$$\sum_{i=1}^{N} (y_i - e^{x_i'b}) x_i = 0.$$

These equations are nonlinear in b, necessitating the use of iterative techniques. A standard Newton-Raphson method is used to compute the value of the b vector. For assessing significance, chi-squared tests are used. Let βj be the element of the vector for which significance is to be assessed. Define

$$L^*(\beta_j) \equiv \max_{\tilde{\beta}} L(\beta)$$

where ˜ β is the vector β with the j'th element fixed at βj. If ˆL is the log-likelihood function evaluated at the maximum likelihood estimate of the estimate vector then $2[\hat{L} - L^*(\beta_j)]$ follows the usual chi-squared distribution with one degree of freedom. This property is used to evaluate the statistical significance of an individual coefficient.

Appendix C

This appendix lists the 18 pension funds whose aggregate holdings are used to perform the robustness check listed in Section 5, together with the corresponding fund codes in the Thomson Financial database. The funds are the same as the ones used in Cremers and Nair (2006), who obtain the list from Lily Qiu of Brown University.

Fund name	Code number
California Public Employees Retirement System	12000
California State Teachers Retirement	12100
Colorado Public Employees Retirement Association	12090
Florida State Board of Administration	38330
Illinois State Universities Retirement System	81590
Kentucky Teachers Retirement System	49050
Maryland State Retirement and Pension System	54360
Michigan State Treasury	57500
Montana Board of Investment	58650
New Mexico Educational Retirement Board	63600
New York State Common Retirement Fund	63850
New York State Teachers Retirement System	63895
Ohio Public Employees Retirement System	66550
Ohio School Employees Retirement System	66610
Ohio State Teachers Retirement System	66635
Texas Teachers Retirement System	83360
Virginia Retirement System	90803
State of Wisconsin Investment Board	93405

Table 1. Summary Statistics for Corporate Governance and Its Determinants

This table presents the grand time-series, cross-sectional means for the governance index as well as its determinants (small orders are defined as orders less than 500 shares). The data are from the years 1990 to 2004.

Variable Mean Median Std. Dev.

Variable	Mean	Median	Std. Dev.
Corporate Governance Index	9.38	9.00	2.72
Percentage of Stock Held by Institutions	59.26	61.72	21.83
Percentage of Volume due to Small Orders	11.98	6.23	13.18
Effective Spread (cents)	9.54	9.91	6.55

Table 2. Annual Cross-Sectional Means For Corporate Governance and Its Determinants

This table presents the cross-sectional averages for the governance index as well as its determinants (small orders are defined as orders less than 500 shares). The data are from the years 1990 to 2004, and the means are calculated only for the years in which the governance index is updated.

Year	Governance Index	% Inst. Holdings	% Small Order Volume	Effective Spread
1990	9.21	48.04	6.80	13.84
1993	9.40	52.60	5.70	13.87
1995	9.58	55.56	5.01	12.74
1998	9.31	58.71	5.70	10.38
2000	9.39	56.75	5.91	9.62
2002	9.50	64.75	18.28	5.30
2004	9.26	74.12	30.50	3.42

Table 3. Annual Cross-Sectional Regressions for Determinants of Corporate Governance

This table presents the results of cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2006. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. The logarithm of firm size is included as an explanatory variable, but its coefficients are not reported for brevity. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

	Espr		Volusma		Hld	
Year	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
1990	−0.0049	0.915	0.0218	0.202	0.0791	0.000
1993	−0.1893	0.001	0.0707	0.001	0.0994	0.000
1995	−0.2095	0.000	0.0634	0.000	0.0630	0.000
1998	−0.3376	0.000	0.0936	0.000	0.0570	0.000
2000	−0.2629	0.000	0.0993	0.000	0.0174	0.082
2002	−0.2215	0.000	0.0892	0.000	−0.0022	0.824
2004	−0.0706	0.000	0.0357	0.002	0.0002	0.982
2006	−0.0138	0.069	0.0275	0.013	0.0014	0.862

Table 4. Annual Cross-Sectional Regressions for Determinants of Corporate Governance

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2006. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Size is the logarithm of market capitalization as of the end of a calendar year. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

Variable	Coefficient	t-statistic
Hld	0.0394	1.91
Volusma	0.0627	4.99
Espr	−0.1638	−3.19
Size	0.0090	2.86

Table 5. Annual Cross-Sectional Regressions for Determinants of Corporate Governance, by Size Groups

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2006. Each year of the regression, the sample of firms is subdivided into three groups ranked by market capitalization. Regressions are estimated for each group separately. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Size is the logarithm of market capitalization as of the end of a calendar year. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

	Large firms		Mid-cap firms		Small firms	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Hld	0.0442	2.46	0.0341	1.37	0.0126	0.35
Volusma	0.0744	6.33	0.0675	3.75	−0.0182	−0.94
Espr	−0.1763	−4.28	−0.1734	−3.02	−0.0709	−1.17
Size	−0.0019	−0.32	−0.0142	−1.78	0.0396	2.45

Table 6. Annual Cross-Sectional Regressions for Determinants of Corporate Governance, Using an Expanded Set of Explanatory Variables

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2006. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Size is the logarithm of market capitalization as of the end of a calendar year. Stdret is the annual standard deviation of returns based on daily data. ROE and BMR are return on equity and the book-to-market ratio, respectively. Beta is obtained using past five years' of monthly return data. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

Variable	Coefficient	t-statistic
Hld	0.0334	2.02
Volusma	0.0515	3.65
Espr	−0.2138	−4.93
Size	−0.0006	−0.05
Stdret	−2.676	−1.58
ROE	−0.0101	−1.10
BMR	−0.0044	−0.65
Beta	0.0037	0.66

Table 7. Annual Cross-Sectional Regressions for Determinants of Corporate Governance, Using a Proxy for Information Asymmetry

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2002. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Size is the logarithm of market capitalization as of the end of a calendar year. PIN is a measure of information asymmetry, obtained from Soeren Hvidkjaer's website at the University of Maryland. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

Variable	Coefficient	*t*-statistic
Hld	0.0544	3.99
Volusma	0.0837	4.02
Espr	−0.2597	−3.83
Size	−0.0014	−0.41
PIN	−-0.4956	−3.25

Table 8. Annual Two-Stage Least Squares Regressions for Determinants of Corporate Governance

This table presents the results of two-stage least squares regressions with governance and effective spreads as the explanatory variable. The data are from the years 1990 to 2006. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Results are reported for the first year and the last year of the sample, in addition to the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year regressions. Effective spreads are modeled as a function of Size, the logarithm of share turnover, Volusma and return volatility. Explanatory variables other than the governance index are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

	1990		2006		Full Sample	
Variable	Coefficient	*t*-statistic	Coefficient	*t*-statistic	Coefficient	*t*-statistic
Hld	1.107	6.48	−0.0300	−0.43	0.6812	2.11
Volusma	1.607	3.63	0.7959	2.89	2.044	2.68
Espr	−7.523	−3.42	−1.682	−2.54	−8.345	−2.22
Size	0.0638	0.80	0.0542	0.82	−0.0093	−0.14

Table 9. Annual Cross-Sectional Regressions for Determinants of Corporate Governance, Using a Constant Sample of 415 Firms

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional Poisson regressions with governance as the explanatory variable. The data are from the years 1990 to 2006, and the set of firms is comprised of firms present every year of the sample period. Hld is the logistic transformation of the proportion of stock held by institutions. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

Table 10. Annual Cross-Sectional Regressions for Determinants of Tobin's q

This table presents the time-series averages (with Newey-West corrected t-statistics) of the coefficients from year-by-year cross-sectional regressions with Tobin's q as the explanatory variable. The data are from the years 1990 to 2006. Tobin's q is calculated as the sum of the market capitalization of the firm's common equity, the liquidation value of preferred stock, and the book value of debt divided by the book value of the firm's assets. Volusma is the logistic transformation of the proportion of dollar volume due to small orders. Espr is the logarithm of the effective spread in dollars. Divdum is a dummy for whether the firm pays a dividend, Capxsls is capital expenditures divided by total sales, ROA is net income divided by the book value of assets, and Leverage is long-term debt over total assets. The explanatory variables are calculated as averages of the intervening years between years in which the governance is updated, up to the year just before the update. For the year 1990 the explanatory variables are averaged across the years 1988 and 1989.

Variable	Coefficient	*t*-statistic
Hld	0.0631	4.04
Volusma	0.0654	4.90
Espr	−0.1820	−3.64
Size	−0.0152	−5.40