

## Institutional ownership and conservatism

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### Abstract

Recent research suggesting that shareholders demand conservative financial reporting raises the question: Which shareholders demand conservatism? We find that higher ownership by institutions that are likely to monitor managers is associated with more conservative financial reporting. This positive association is more pronounced among firms with more growth options and higher information asymmetry, where direct monitoring is more difficult and the potential governance benefits of conservatism are greater. Further, lead-lag tests of the direction of causality suggest that ownership by monitoring institutions leads to more conservative reporting, rather than the reverse. Collectively, these results are consistent with monitoring institutions demanding conservatism.

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## 1. Introduction

In this study, we examine the relation between institutional ownership and accounting conservatism. Ball (2001) and Watts (2003) propose that equity investors are an important source of demand for conservatism as a governance device. Recent empirical evidence supports this proposition. Consistent with equity investors creating demand for conservatism, LaFond and Roychowdhury (2008) show that conservatism is greater when the separation of ownership and control is more pronounced, and LaFond and Watts (2008) find that higher information asymmetry between managers and shareholders leads to more conservative reporting. These findings raise an important question: Which equity investors demand conservatism?

A large body of research (e.g., Odean 1999; Barber and Odean 2000, 2008; Barber et al. 2009) documents that individual investors are generally small unsophisticated investors who trade primarily for reasons unrelated to information (e.g., liquidity or rank speculation). Accordingly, individuals are unlikely to be sophisticated enough to gauge whether firms consistently use conservative financial reporting. In contrast, institutional investors are both more sophisticated and more important price setters in capital markets (e.g., Hand 1990; Chan and Lakonishok 1995; Walther 1997; Sias et al. 2006). Thus, if conservative financial reporting provides governance benefits, institutional investors are more likely to understand and value such benefits, and as a result, demand conservative accounting from managers. On the other hand, as institutional investors likely have privileged access to management and inside information (Carleton et al. 1998), they may rely more on direct monitoring and less on monitoring through accounting numbers (e.g., Holmstrom 1979; Ke et al. 1999; Prendergast 2002). Thus, whether institutions demand conservative financial reports is an empirical question.

Among institutions, institutional characteristics such as investment horizons, concentration of share holdings, and independence from firm management induce higher monitoring incentives among some institutions relative to others. Further, within the set of monitoring institutions, the investee firm characteristics that influence the extent of direct monitoring possible are likely to drive the demand for conservatism as part of institutions' monitoring efforts.

More specifically, prior research (e.g., Shleifer and Vishny 1986; Brickley et al. 1988; Gaspar et al. 2005; Chen et al. 2007) suggests that institutions that have long investment horizons, concentrated share holdings, and independence from management (hereafter, monitoring institutions) are most likely to monitor managers. Institutional investors' demand for conservatism is thus more likely to emanate from monitoring institutions. In our first set of tests we examine whether monitoring institutions' ownership is positively associated with conservatism.

Within the set of monitoring institutions, direct monitoring is more difficult in investee firms with more growth options (Smith and Watts 1992) and higher information asymmetry (Prendergast 2002). Yet, for such firms, the potential governance benefits of conservatism in disciplining managers' investment decisions (Ball 2001) and reducing managers' ability to overstate earnings (Watts 2003) are likely to be greater. Thus, in our second set of tests we examine whether the association between monitoring institutions' ownership and conservatism is more positive among firms with more growth options and higher information asymmetry.

We define monitoring institutions as those that are both (1) dedicated institutions (i.e., institutions with long investment horizons and concentrated holdings), following Bushee (2001), and (2) independent from management, following Brickley et al. (1988). We use Basu's (1997) earnings-return model to gauge conservatism. To mitigate concern over the endogeneity of institutional ownership, we perform our analyses using a measure of residual ownership, defined as

the residual from a regression of ownership on its economic determinants. Based on a sample of 16,911 firm-years over 1995-2006, we find that higher residual ownership by monitoring institutions is associated with greater conservatism in firms' financial reporting, and that this positive association is more pronounced among firms with more growth options and higher information asymmetry. These results are consistent with monitoring institutions demanding conservatism, especially when the costs of direct monitoring are higher and the potential governance benefits of conservatism are greater. Our results are robust to using an alternative measure of conservatism that does not rely on stock returns to measure economic news.

While the above results are consistent with monitoring institutions demanding conservatism, it could also be the case that firms with more conservative financial reporting attract investment by monitoring institutions ("reverse causality" explanation). We conduct two tests to examine the direction of causality. First, we examine the relation between conservatism and monitoring institutions' lagged, current, and lead residual ownership. We find that conservatism is positively related to the *lagged* residual ownership, but unrelated to the current or lead residual ownership. Second, following LaFond and Watts (2008), we sort firms into quintiles based on the change in monitoring institutions' residual ownership in year  $t$ , and then for each quintile we estimate the level of conservatism in years  $t-2$ ,  $t-1$ ,  $t$  and  $t+1$ . This approach allows us to examine the change in conservatism in the pre-ownership-change period (from  $t-2$  to  $t-1$ ), during-ownership-change period (from  $t-1$  to  $t$ ), and post-ownership-change period (from  $t$  to  $t+1$ ). We find that a large increase in ownership by monitoring institutions is associated with an increase in *future* (but not past or concurrent) conservatism. These results are consistent with monitoring institutions demanding conservatism, but not conservative reporting attracting investment by

monitoring institutions. However, to the extent that we cannot perfectly correct for reverse causality, our results could be affected.

Overall, our results suggest that monitoring institutions demand conservatism in investee firms' reporting practices, and that this demand is more pronounced when both direct monitoring is more difficult and conservatism provides more governance benefits. This study contributes to our understanding of the nature of the economic forces that generate demand for conservatism (Watts 2003). In particular, building on prior studies (LaFond and Roychowdhury 2008; LaFond and Watts 2008), we provide direct evidence suggesting that monitoring institutions are an important class of investors that demands conservatism as a governance device.

The next section develops our hypotheses. Section 3 discusses our research design, and Section 4 describes our data. Section 5 reports our empirical results. Section 6 concludes.

## **2. Hypothesis development**

Conservatism is defined as the higher verifiability for recognizing good news as gains than for recognizing bad news as losses (Basu 1997).<sup>1</sup> Recent research (e.g., Ball 2001; Watts 2003) suggests that equity investors demand conservatism because it can mitigate agency problems in two ways. First, conservatism disciplines managers' investment decisions (Ball 2001). By recognizing economic losses of losing projects in a timelier manner (i.e., during managers' tenure), conservative accounting sends an early warning signal to shareholders to investigate these losses. The resulting revelation of the losing projects can damage the managers' reputation and threaten

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<sup>1</sup> This type of conservatism (timely loss recognition) is referred to as conditional conservatism in the literature. In contrast, unconditional conservatism is news-independent and involves predetermined understatement of book value of net assets (e.g., Ball and Shivakumar 2005; Ryan 2006). Ball and Shivakumar (2005, p.91) conclude that unconditional conservatism does not improve contracting efficiency if the magnitude of the bias is known and may even reduce contracting efficiency if the magnitude of the bias is unknown. In this paper, the term "conservatism" refers only to conditional conservatism.

their job security. Second, conservatism reduces managers' incentive and ability to overstate earnings (Watts 2003). To the extent that managerial compensation is tied to earnings, conservatism penalizes managers for their failures (economic losses) in a timely manner but defers rewards for their successes (economic gains) until benefits are realized, thereby reducing managers' incentive and ability to overstate the value they create.

Consistent with equity investors demanding conservatism, two recent studies find greater conservatism among firms with more agency problems. LaFond and Roychowdhury (2008) focus on the percentage of the firm owned by corporate managers, a measure of the separation of ownership and control that gives rise to agency problems between managers and investors. They predict and find that conservatism is greater when managerial ownership is lower. LaFond and Watts (2008) further show that conservatism is positively associated with information asymmetry, and that changes in information asymmetry lead changes in conservatism, but not vice versa. A question that remains unanswered, however, is which equity investors demand conservatism.

We predict that institutional investors are more likely to drive the demand for conservatism than individual investors. Since individual investors' trades on average appear to be motivated by liquidity concerns or speculation (e.g., Odean 1999; Barber and Odean 2000, 2008; Grinblatt and Keloharju 2000; Barber et al. 2009), it is unlikely that they devote significant attention to monitoring, including monitoring via financial statements. Thus, individual investors' equity holdings are unlikely to generate a significant demand for conservatism. In contrast, institutional investors are more sophisticated and also more important price-setters in capital markets (e.g., Hand 1990; Chan and Lakonishok 1995; Walther 1997; Bartov et al. 2000; Chakravarty 2001; Sias et al. 2006). Therefore, if conservative financial reporting provides governance benefits,

institutions are more likely to understand and value such benefits, and as a result, demand conservative accounting from managers.

Institutional investors' demand for conservatism is likely to vary across institutions. For example, prior research suggests that institutional characteristics such as long investment horizons, concentration of share holdings, and independence from firm management induce higher monitoring incentives (e.g., Shleifer and Vishny 1986; Brickley et al. 1988; Chen et al. 2007). Long investment horizons allow investors to remain as shareholders long enough to reap the benefits of monitoring. Concentrated holdings increase investors' influence over managers as well as their share of the gain from monitoring. And unlike independent investors, dependent investors are likely to have long-term business relationships with the firm; as a result, they are likely to have more direct access to the firm's managers and hence depend less on accounting information. Consistent with this theory, prior research (e.g., Brickley et al. 1988; Bushee 1998; Hartzell and Starks 2003; Chen et al. 2007) finds that institutions that have long investment horizons, concentrated share holdings, and independence from management (i.e., monitoring institutions) are most likely to monitor managers. Therefore, if institutional investors demand conservatism as a governance device, this demand is likely to emanate from monitoring institutions rather than non-monitoring institutions. This leads to our first hypothesis:

*H1:* Ownership by monitoring institutions is positively associated with conservatism, ceteris paribus.

Next, within the set of monitoring institutions, investee firm characteristics that constrain the extent of direct monitoring possible are likely to boost the demand for conservatism as part of institutions' monitoring efforts. It is difficult to directly monitor firms that have more growth options and higher information asymmetry. Smith and Watts (1992) point out that when firms have

more growth options, it is more difficult for shareholders to observe managers' actions and the full set of growth options from which managers choose. Further, even if shareholders can observe managers' actions, when information asymmetry between shareholders and managers is higher, shareholders have less information about which action managers should pursue in order to maximize shareholder value (Prendergast 2002). Therefore, for firms with more growth options and higher information asymmetry, direct monitoring is less effective, and hence monitoring institutions are more likely to rely on other governance mechanisms such as conservative reporting.<sup>2</sup>

Further, the governance benefits of conservative reporting are likely to be greater among firms with more growth options and higher information asymmetry. Managers of such firms likely have greater incentives and opportunities to undertake negative net present value (NPV) projects and to overstate earnings. As discussed earlier, conservatism helps discipline managers' investment decisions and reduce managers' ability to overstate earnings (Ball 2001; Watts 2003). The above discussion leads to our second hypothesis:

*H2: The relation between ownership by monitoring institutions and conservatism is more positive for firms with more growth options and higher information asymmetry, ceteris paribus.*

### **3. Research design**

#### **3.1 Measures of monitoring and other types of institutions' ownership**

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<sup>2</sup> However, to the extent that some other mechanisms substitute for conservatism and also are more efficient in addressing agency problems, monitoring institutions may not be more likely to demand conservatism among firms that have more growth options and higher information asymmetry.

We use Bushee's (2001) classification scheme to identify institutions that have long investment horizons and concentrated holdings, and follow Brickley et al. (1988) to identify institutions that are independent from corporate management. Bushee (2001) classifies institutions into three groups based on their portfolio turnover and diversification. "Dedicated" institutions exhibit low turnover and low diversification, consistent with a long-term strategy of holding large stakes in fewer companies. "Transient" institutions are characterized by high turnover and high diversification, consistent with short trading horizons and fragmented investments in a large number of firms. "Quasi-indexing" institutions exhibit low turnover and high diversification, consistent with a passive long-term buy-and-hold strategy in a wide set of firms.<sup>3</sup>

Brickley et al. (1988) gauge an institution's independence from management based on its potential business relationships with investee firms. They classify investment companies (i.e., "type 3" institutions as classified by the CDA/Spectrum database),<sup>4</sup> independent investment advisors (CDA "type 4"), and public pension funds as independent institutions because these types of institutions are less likely to have business relationships with their investee firms. In contrast, bank trusts (CDA "type 1"), insurance companies (CDA "type 2"), and others (CDA "type 5" excluding public pension funds) are identified as "non-independent" institutions because of these institutions' past or potential future business relationships with their investee firms. Thus, we classify an institution as a monitoring institution if it is a dedicated institution as defined by Bushee

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<sup>3</sup> As each institution's Bushee classification is highly stable over time, we follow Ke et al. (2008) and assign each institution to a type if the institution is classified as that type in at least half of the years from 1979 to 2005.

<sup>4</sup> The CDA/Spectrum database, which contains institutions' quarterly holding data, classifies institutions according to the majority of their assets into five types: bank trust departments (type 1), insurance companies (type 2), investment companies (type 3), independent investment advisors (type 4), and other (type 5). The "other" (type 5) type consists primarily of foundations, ESOPs, university endowments, and internally managed private and public pension funds. Following prior research, we manually identify public pension funds from the type 5 institutions.

(2001) and it is also an independent institution as defined by Brickley et al. (1988). The percentage ownership of firm  $j$  at the end of year  $t$  by monitoring institutions is denoted  $MONOWN_{jt}$ .<sup>5</sup>

Non-monitoring institutions include institutions that trade aggressively to maximize short-term trading profits (Bushee's transient institutions), institutions that follow passive indexing investment strategies (Bushee's quasi-indexing institutions), and institutions that have long-term concentrated holdings but are not independent from management (Bushee's dedicated institutions that are also classified as non-independent by Brickley et al.). Non-monitoring institutions are less likely to demand conservatism for varying reasons. Short-term-trading institutions have little monitoring incentive because of their short investment horizon, fragmented ownership, and emphasis on trading. Indexing institutions' monitoring incentive is weakened by their passive and fragmented ownership (Bushee 1998). By virtue of being non-independent, dedicated non-independent institutions are less likely to monitor and less likely to monitor via accounting (e.g., these investors are likely to have more direct access to managers and hence rely less on accounting information). We include ownership by these three types of non-monitoring institutions separately in our analyses to control for the correlation between monitoring institutions' ownership and non-monitoring institutions' ownership.<sup>6</sup> The percentage ownership of firm  $j$  at the end of year  $t$  by transient, quasi-indexing, and dedicated non-independent institutions is denoted  $TRAOWN_{jt}$ ,  $QIXOWN_{jt}$ , and  $DNIOWN_{jt}$ , respectively.

Prior research finds that institutional ownership is endogenously determined by firm characteristics such as firm size, information environment, investment opportunity sets, and firm age (Gompers and Metrick 2001). Such endogeneity can confound our tests. To the extent these

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<sup>5</sup> Our proxy for monitoring institutions can be viewed as an ex ante measure because Bushee's and Brickley et al.'s classifications are highly stable over time. Our results are robust to further requiring that each monitoring institution be among the top 5 institutional investors and have invested in the firm for at least one year (as in Chen et al. 2007).

<sup>6</sup> Our inferences remain unchanged if we group the three types of non-monitoring institutions together and include the sum of their ownership in our analyses.

economic determinants of institutional ownership also explain conservatism, they can introduce a spurious relation between conservatism and institutional ownership. To mitigate this concern, we follow prior research (e.g., LaFond and Roychowdhury 2008) and perform our analyses using a measure of residual ownership. Here, residual ownership is the residual from estimating an expected ownership model that expresses ownership as a function of economic determinants. More specifically, we first regress ownership by each type of institution (i.e.,  $MONOWN_{jt}$ ,  $TRAOWN_{jt}$ ,  $QIXOWN_{jt}$ , and  $DNIOWN_{jt}$ ) on a variety of firm characteristics that explain ownership. We then extract the regression residuals as our residual ownership measure ( $RMONOWN_{jt}$ ,  $RTRAOWN_{jt}$ ,  $RQIXOWN_{jt}$ , and  $RDNIOWN_{jt}$ , respectively). Appendix A discusses the details of estimating residual institutional ownership. Hence, all our analyses, unless otherwise indicated, use residual institutional ownership rather than raw institutional ownership. The inferences are similar, however, when raw institutional ownership is used.

### 3.2 Measure of conservatism

Our measure of conservatism is based on Basu's (1997) earnings-return model, which regresses earnings on returns and allows the return coefficient to vary with the sign of the return. This model uses positive (negative) stock returns to capture good (bad) economic news. Specifically, Basu (1997) estimates the following regression model:

$$NI_{jt} = \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} + \varepsilon \quad (1)$$

where:

- $NI_{jt}$  = Annual income before extraordinary items (IB) of firm  $j$  in year  $t$ , scaled by the market value of equity ( $CSHO*PRCC\_F$ ) at the end of year  $t-1$ ;
- $RET_{jt}$  = Buy-and-hold stock returns of firm  $j$  over year  $t$ ;
- $NEG_{jt}$  = Indicator variable equal to 1 if  $RET_{jt}$  is negative, and 0 otherwise.

In Equation (1),  $\beta_2$  captures timeliness of earnings with respect to good news, and  $\beta_3$  captures asymmetric timeliness with respect to bad news versus good news and hence is the measure of conservatism.

### 3.3 Regression model

To test the relation between monitoring institutions' ownership and conservatism, we follow prior research (e.g., LaFond and Watts 2008; LaFond and Roychowdhury 2008) and estimate the Basu model, which specifies conservatism (the Basu coefficient) as a function of monitoring institutions' residual ownership and other documented determinants of conservatism:

$$\begin{aligned}
 NI_{jt} = & \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} \\
 & + \beta_4 RMONOWN_{jt-1} + \beta_5 NEG_{jt} * RMONOWN_{jt-1} + \beta_6 RET_{jt} * RMONOWN_{jt-1} + \beta_7 RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} \\
 & + \beta_{8-17} CONTROLS_{jt-1} + \beta_{18-27} NEG_{jt} * CONTROLS_{jt-1} + \beta_{28-37} RET_{jt} * CONTROLS_{jt-1} + \beta_{38-47} RET_{jt} * NEG_{jt} * CONTROLS_{jt-1} + \varepsilon
 \end{aligned} \tag{2}$$

where:

$RMONOWN_{jt-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988) - “monitoring institutions”;

CONTROLS:

$RTRAOWN_{jt-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “transient” institutions by Bushee (2001);

$RQIXOWN_{jt-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001);

$RDNIOWN_{jt-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by

Bushee (2001) and “non-independent” institutions by Brickley et al. (1988);

- $MGROWN_{j,t-1}$  = Percentage ownership (options excluded) of firm  $j$  at the end of year  $t-1$  by the CEO;
- $STD\_RET_{j,t-1}$  = Standard deviation of daily stock returns of firm  $j$  over year  $t-1$ ;
- $AGE_{j,t-1}$  = Age of firm  $j$  at the end of year  $t-1$ , measured as the number of years a firm is listed on CRSP;
- $MV_{j,t-1}$  = Market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ ;
- $MB_{j,t-1}$  = Market-to-book ratio (MV / CEQ) of firm  $j$  at the end of year  $t-1$ ;
- $LEV_{j,t-1}$  = Leverage ((DLTT+ DLC) / MV) of firm  $j$  at the end of year  $t-1$ ; and
- $LIT_{j,t-1}$  = Dummy variable equal to 1 if firm  $j$  belongs to the following industries at the end of year  $t-1$ : Biotechnology (SIC codes 2833-2836 and 8731-8734), Computers (SIC codes 3570-3577 and 7370-7374), Electronics (SIC codes 3600-3674), and Retailing (SIC codes 5200-5961); equal to 0 otherwise.

In Equation (2), all the variables are measured at the firm-year level, and the conservatism measure (i.e., the Basu coefficient) is allowed to vary with monitoring institutions' residual ownership in each firm-year. The key coefficient of interest is  $\beta_7$ , which captures the effect of monitoring institutions' residual ownership in firm  $j$  at the end of year  $t-1$  ( $RMONOWN_{j,t-1}$ ) on conservatism in firm  $j$ 's financial reporting over year  $t$ . A positive  $\beta_7$  would be consistent with H1 and indicate that higher residual ownership by monitoring institutions is associated with a higher level of conservatism.

It is important to include residual ownership by non-monitoring institutions (i.e.,  $RTRAOWN_{j,t-1}$ ,  $RQIXOWN_{j,t-1}$ , and  $RDNIOWN_{j,t-1}$ ) in Equation (2) to control for correlated omitted variable problems. The reason is that residual ownership by monitoring institutions is *positively*

correlated with residual ownership by non-monitoring institutions,<sup>7</sup> perhaps because institutions share common preferences (Gompers and Metrick 2001; Yan and Zhang 2009). Consequently, omitting residual ownership by non-monitoring institutions from Equation (2) could bias the estimated effect of monitoring institutions' residual ownership on conservatism (i.e.,  $\beta_7$ ). We also control for managerial ownership (*MGROWN*), which is negatively related to institutional ownership as well as conservatism (LaFond and Roychowdhury 2008).

Our other control variables include firm age (*AGE*) and return volatility (*STD\_RET*) to control for characteristics of the firm's information environment that affect conservatism. LaFond and Watts (2008) find that information asymmetry between shareholders and managers leads to greater conservatism, and Khan and Watts (2009) find that conservatism is decreasing in firm age and increasing in firm-specific uncertainty. In addition, we control for firm size (*MV*), market-to-book (*MB*), leverage (*LEV*), and litigation (*LIT*) to ensure that these important firm characteristics are not driving our findings. *MV* is negatively associated with conservatism, as *MV* likely proxies for lower information asymmetry (LaFond and Watts 2008). *MB* reflects past asymmetric timeliness and growth options, both of which negatively affect future asymmetric timeliness of earnings (Roychowdhury and Watts 2007). We include *LEV* to control for debt holders' demand for conservatism. Finally, litigation risk (*LIT*) is associated with greater conservatism (Basu 1997), so following prior literature we include an indicator variable that captures firm membership in high-litigation-risk industries (Francis et al. 1994; LaFond and Roychowdhury 2008).<sup>8</sup>

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<sup>7</sup> See Table 1, Panel C for the correlations among residual ownership by different types of institutions.

<sup>8</sup> Our results are robust to (1) using sales growth and R&D+Advertising as proxies for growth, cash flow from operations as a proxy for profitability, and depreciation/total assets as a proxy for firm-specific uncertainty; (2) controlling for board characteristics including the percentage of insider directors and the percentage of outside director ownership (Ahmed and Duellman 2007); and (3) including firm fixed effects (Patatoukas and Thomas 2010; Ball et al. 2011).

To test whether the relation between monitoring institutions' ownership and conservatism is more positive for firms with more growth options and higher information asymmetry (H2), we use Tobin's Q (*TobinQ*) to measure firms' growth options and bid-ask spread (*SPREAD*) to measure information asymmetry. Consistent with Gompers et al. (2003), Tobin's Q is computed as the market value of assets divided by the book value of assets (Compustat AT). The market value of assets is computed as the book value of assets (AT) plus the market value of common stock ( $CSHO * PRCC\_F$ ), less the sum of the book value of common stock (CEQ) and balance sheet deferred taxes (TXDB). Bid-ask spread is the yearly average of the daily bid-ask spread, computed as  $(ask - bid) / [(ask + bid) / 2]$ .

#### **4. Data and descriptive statistics**

We obtain institutional ownership data from Thomson Financial's CDA/Spectrum database, which contains institutions' quarterly shareholding data based on their 13-F filings to the U.S. Securities and Exchange Commission (see Gompers and Metrick 2001 for a detailed discussion of this database). Our sample includes all U.S. public companies with institutional ownership data from CDA/Spectrum, accounting data from Compustat, stock price data from CRSP, and managerial ownership data from S&P ExecuComp. Our final sample consists of 16,911 firm-years over 1995-2006. We summarize our sample selection process in Table 1, Panel A.

Table 1, Panel B reports descriptive statistics. The average raw ownership by monitoring (*MONOWN*), transient (*TRAOWN*), quasi-indexing (*QIXOWN*), and dedicated non-independent (*DNIOWN*) institutions is 9.32%, 14.87%, 31.87%, and 4.84% respectively. Thus, institutional investors own on average 60.90% (i.e.,  $9.32\% + 14.87\% + 31.87\% + 4.84\%$ ) of investee firms' shares. There is considerable over-time variation in monitoring institutions' ownership. The standard

deviation of the year-to-year change in monitoring institutions' ownership ( $\Delta MONOWN$ ) is 5.25%, which represents 56% of monitoring institutions' mean ownership (i.e., 5.25%/9.32%). Further, untabulated results indicate that over a one-year period, about 53% (24%) of our sample firms experience an absolute change in monitoring institution's ownership of more than 2% (5%).<sup>9</sup>

Table 1, Panel C reports the Pearson and Spearman correlations among the variables in Equation (2). Monitoring institutions' residual ownership ( $RMONOWN$ ) is significantly positively correlated with residual ownership by all three types of non-monitoring institutions ( $RTRAOWN$ ,  $RQIXOWN$ ,  $RDNIOWN$ ), and is significantly negatively correlated with managerial ownership ( $MGROWN$ ). These correlations highlight the importance of controlling for non-monitoring institutions' residual ownership and managerial ownership when testing the relation between monitoring institutions' residual ownership and conservatism.

## 5. Results

### 5.1 Tests of the relation between conservatism and monitoring institutions' residual ownership (H1)

To test H1, we estimate Equation (2) using pooled OLS regressions. We correct standard errors for correlation across observations of a given firm and across observations of a given year by clustering on both firm and year (Peterson 2009).<sup>10</sup> To facilitate interpretation of the coefficient estimates, we follow LaFond and Roychowdhury (2008) and use scaled decile ranks for all variables except  $NI_{jt}$ ,  $RET_{jt}$ ,  $NEG_{jt}$  and  $LIT_{jt-1}$ . To compute the scaled decile ranks, we first rank observations by year into 10 groups from 0 to 9, and then divide by 9 so that the rank variable

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<sup>9</sup> Prior research also finds significant over-time variation in institutional ownership. For example, Sias et al. (2006) show that the average institutional ownership in a firm increased from 24% in 1980 to 44% in 1996, and that the over-time change in institutional ownership varies greatly across firms (see also Gompers and Metrick 2001).

<sup>10</sup> The results (untabulated) are similar if we use the Fama-MacBeth (1973) annual regression method and adjust the standard errors using the Newey-West (1987) procedure. Because the regressions are run for each year separately and do not depend on time-series data, the Fama-MacBeth results help us rule out the possibility that our findings are driven by trends in conservatism and institutional ownership.

ranges from 0 to 1. The coefficients on the three-way interactions in Equation (2) therefore capture how a change in a particular factor from the bottom decile to the top decile affects conservatism. To mitigate the influence of outliers, we use Cook's (1977) distance (Cook's D) method to remove outliers.<sup>11</sup>

Table 2, Column 1 reports the estimation results. For brevity, the results on the stand-alone control variables and on the two-way interactions between controls and *NEG* or *RET* are not reported. We find that the coefficient on  $RET_{jt} * NEG_{jt} * RMONOWN_{jt-1}$ ,  $\beta_7$ , is positive (0.129) and significant (one tailed  $p=0.01$ ). This result indicates that higher residual ownership by monitoring institutions is related to greater conservatism, consistent with H1. Turning to the three types of non-monitoring institutions, we find a significant negative association between transient institutions' residual ownership and conservatism,<sup>12</sup> whereas we find no evidence that residual ownership by quasi-indexing or dedicated non-independent institutions is related to conservatism. We also find that the relation between conservatism and monitoring institutions' residual ownership is significantly more positive than the relation between conservatism and residual ownership by each of the three types of non-monitoring institutions (untabulated). The results on the other control variables are consistent with prior research (e.g., LaFond and Roychowdhury 2008; Khan and Watts 2009).

To gauge the economic significance of our finding for monitoring institutions, we compare it to that of other previously documented determinants of conservatism. The results in Table 2

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<sup>11</sup> Our results are qualitatively similar if we do not remove the outliers.

<sup>12</sup> One possible explanation is that transient institutions liquidate their holdings in year  $t-1$  in anticipation of large losses and negative returns in year  $t$ . We test this explanation by re-estimating Equation (2) after removing firm-years with large negative returns and losses in  $t$ , and large decreases in transient institutions' ownership in  $t-1$ . We find that the negative association continues to hold. In the following sections, we test and rule out several other possible explanations, such as transient institutions' self-selection into firms with lower conservatism (Section 5.3) and their effect on the extent to which stock prices reflect unrecognized gains/losses (Section 5.4.1). Another possibility is that transient institutions may have weaker monitoring incentives than individuals. However, we refrain from drawing inferences because this last explanation is difficult to test directly and there may be other possible explanations.

suggest that the magnitude of the effect of monitoring institutions' residual ownership (*RMONOWN*) on conservatism is very similar to that of managerial ownership (*MGROWN*) and firm size (*MV*). Specifically, increases in *RMONOWN*, *MGROWN*, and *MV* from the bottom decile to the top decile of their corresponding distributions are associated with a 0.129 increase, a 0.121 decrease, and a 0.152 decrease in conservatism, respectively.

## 5.2 Cross-sectional tests based on investee firm characteristics (H2)

Columns 2 and 3 of Table 2 report the results for the cross-sectional test of the relation between monitoring institutions' residual ownership and conservatism (H2). Each year, we group firms with above-median Tobin's Q (*TobinQ*) and above-median bid-ask spread (*SPREAD*) into a “high” sub-sample to identify firms with more growth options and high information asymmetry. Firms whose *TobinQ* and *SPREAD* are less than or equal to the respective median form the “low” sub-sample. The distribution of monitoring institutions' residual ownership (*RMONOWN*) appears to be comparable across the two groups: The mean, median, and standard deviation of monitoring institutions' residual ownership for the high (low) group are 10.030 (9.016), 8.423 (7.894), and 7.984 (6.964), respectively (untabulated). We estimate Equation (2) in a pooled regression, allowing the coefficients to vary between the high and low groups.

We find that the coefficient on  $RET_{jt} * NEG_{jt} * RMONOWN_{jt-1}$ ,  $\beta_7$ , is positive and significant (0.199, one-tailed  $p=0.00$ ) for the high group, but insignificant (-0.014, two-tailed  $p=0.52$ ) for the low group, indicating that conservatism is positively related to monitoring institutions' residual ownership only in firms with more growth options and higher information asymmetry. Further, the difference between the two coefficients is significant (one-tailed  $p=0.00$ ). This result indicates that the association between monitoring institutions' residual ownership and conservatism is more

positive among firms with more growth options and higher information asymmetry, consistent with H2.

For the three types of non-monitoring institutions, we find that the association between transient institutions' residual ownership ( $RTRAOWN_{jt-1}$ ) and conservatism is more negative for the high group. There is no evidence that the association between conservatism and residual ownership by quasi-indexing ( $RQIXOWN_{jt-1}$ ) or dedicated non-independent institutions ( $RDNIOWN_{jt-1}$ ) differs significantly across the high and low groups.

### 5.3 Causality tests

The results above point to a positive relation between monitoring institutions' ownership and conservatism. This finding is consistent with monitoring institutions demanding conservative financial reporting. However, it may be the case that firms with more conservative financial reporting attract investment by monitoring institutions. This "reverse causality" explanation is plausible as monitoring institutions may prefer firms with stronger governance mechanisms, such as conservative reporting, to reduce their own monitoring costs. In addition, conservative reporting and institutions' monitoring could arise simultaneously, driven by some unknown underlying factor (the "simultaneity" explanation). In this subsection, we perform two tests to provide evidence on the direction of causality between monitoring institutions and conservatism.

First, we add monitoring institutions' *current* and *lead* residual ownership (i.e.,  $RMONOWN_{jt}$  and  $RMONOWN_{jt+1}$ ) into Equation (2) to examine how the level of conservatism is related to lagged, current, and lead residual ownership by monitoring institutions:

$$\begin{aligned}
NI_{jt} = & \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} \\
& + \beta_4 RMONOWN_{jt-1} + \beta_5 NEG_{jt} * RMONOWN_{jt-1} + \beta_6 RET_{jt} * RMONOWN_{jt-1} + \beta_7 RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} \\
& + \beta_8 RMONOWN_{jt} + \beta_9 NEG_{jt} * RMONOWN_{jt} + \beta_{10} RET_{jt} * RMONOWN_{jt} + \beta_{11} RET_{jt} * NEG_{jt} * RMONOWN_{jt} \\
& + \beta_{12} RMONOWN_{jt+1} + \beta_{13} NEG_{jt} * RMONOWN_{jt+1} + \beta_{14} RET_{jt} * RMONOWN_{jt+1} + \beta_{15} RET_{jt} * NEG_{jt} * RMONOWN_{jt+1} \\
& + \beta_{16-25} CONTROLS_{jt-1} + \beta_{26-35} NEG_{jt} * CONTROLS_{jt-1} + \beta_{36-45} RET_{jt} * CONTROLS_{jt-1} + \beta_{46-55} RET_{jt} * NEG_{jt} * CONTROLS_{jt-1} + \varepsilon
\end{aligned} \tag{3}$$

In Equation (3),  $\beta_7$ ,  $\beta_{11}$ , and  $\beta_{15}$  capture the relation between conservatism and monitoring institutions' lagged, current, and lead residual ownership, respectively. If monitoring institutions demand conservatism, we would expect  $\beta_7 > 0$ . In contrast, the reverse causality explanation would predict  $\beta_{15} > 0$ . Evidence of  $\beta_{11} > 0$  would be consistent with the simultaneity explanation.

Table 3 reports the results from estimating Equation (3). The results for the control variables are similar to those in Table 2 and thus are not reported for brevity. Consistent with monitoring institutions demanding conservatism, we find a significant positive relation between conservatism and *lagged* residual ownership by monitoring institutions (coefficient on  $RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} = 0.140$ , one-tailed  $p=0.01$ ). In contrast, inconsistent with the reverse causality explanation, we find no significant relation between conservatism and *lead* residual ownership by monitoring institutions (coefficient on  $RET_{jt} * NEG_{jt} * RMONOWN_{jt+1} = -0.037$ , two-tailed  $p=0.35$ ). In addition, the relation between conservatism and current residual ownership by monitoring institutions is insignificant, providing no support for the simultaneity explanation.

In our second test, we follow LaFond and Watts (2008) to examine the relation between changes in monitoring institutions' residual ownership and lagged, concurrent, and lead changes in conservatism. Prior research documents considerable variation in conservatism over time. For example, Basu (1997) finds a substantial increase in conservatism over the past several decades

(see also Givoly and Hayn 2000 and Holthausen and Watts 2001). Basu (1997) further shows that conservatism varies over time with changes in auditors' legal liability exposure. LaFond and Watts (2008) suggest that conservatism can change promptly in reaction to events such as a change in information asymmetry, and find evidence of a significant increase in conservatism in the year following a significant increase in information asymmetry. As discussed in Section 4, prior literature and our descriptive statistics also suggest considerable over-time variation in monitoring institutions' ownership.

For each year  $t$ , we sort firms into quintiles based on the change in monitoring institutions' residual ownership from  $t-1$  to  $t$  (i.e.,  $RMONOWN_{jt} - RMONOWN_{jt-1}$ ).<sup>13</sup> Then, for each quintile, we estimate the level of conservatism (i.e.,  $\beta_3$  in Equation (1)) for each of the years  $t-2$  to  $t+1$ . This approach allows us to estimate the year-to-year change in conservatism prior to the ownership change ( $\beta_{3,t-1} - \beta_{3,t-2}$ ), concurrent with the ownership change ( $\beta_{3,t} - \beta_{3,t-1}$ ), and after the ownership change ( $\beta_{3,t+1} - \beta_{3,t}$ ).<sup>14</sup> If monitoring institutions demand conservatism, we would expect a positive association between changes in monitoring institutions' residual ownership and *lead* changes in conservatism. In contrast, the reverse causality (simultaneity) explanation would predict a positive relation between changes in monitoring institutions' residual ownership and *lagged* (concurrent) changes in conservatism.

Table 4 presents the results. Column 1 reports the mean year-to-year change in monitoring institutions' residual ownership for each quintile. The ownership changes in quintiles 1 (most negative) and 5 (most positive) are substantial. Specifically, for the firms in quintile 1 (5), monitoring institutions' residual ownership on average decreases (increases) by 6.88% (6.93%) over the one-year period, representing a 74% decrease (increase) from the average raw ownership

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<sup>13</sup> The inferences are unchanged if we use quartiles or deciles.

<sup>14</sup> The changes in conservatism are estimated using pooled OLS regressions and the standard errors are corrected for clustering by both firm and year (Peterson 2009). The results are similar if we use the Fama-MacBeth method.

level of 9.32% for the whole sample (see Table 1).<sup>15</sup> Columns 2, 3, and 4 report the change in the conservatism measure (i.e., the Basu coefficient) *prior to* the ownership change ( $\beta_{3,t-1} - \beta_{3,t-2}$ ), *concurrent* with the ownership change ( $\beta_{3,t} - \beta_{3,t-1}$ ), and *after* the ownership change ( $\beta_{3,t+1} - \beta_{3,t}$ ), respectively. The results in Columns 2 and 3 indicate no significant change in conservatism over the periods prior to or concurrent with the largest ownership changes (quintiles 1 and 5).

In contrast, as shown in Column 4, for quintiles 4 and 5 (i.e., the firms with the largest ownership increase), conservatism increases by 0.024 (two-tailed  $p=0.06$ ) and 0.054 (two-tailed  $p=0.01$ ), respectively, in the year after the ownership change. The yearly increase in conservatism for quintile 5 is also economically meaningful: It represents a 37% increase in conservatism over the year (compared to the pre-change level of conservatism of 0.145 for quintile 5, untabulated). We see a decrease in conservatism in the year after the largest ownership decrease (quintile 1), albeit the decrease is statistically insignificant. The difference in the change in conservatism between quintiles 5 and 1 is significant at the 0.01 level. Taken together, the results in Table 4 indicate that changes in monitoring institutions' residual ownership are positively associated with lead (but not lagged or concurrent) changes in conservatism. These results are consistent with monitoring institutions demanding conservatism, but inconsistent with the reverse causality or simultaneity explanations.<sup>16 17</sup>

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<sup>15</sup> The ownership changes for quintiles 1 and 5 are also significant in comparison to prior research. For example, using a sample of large firms with AIMR ratings, Bushee and Noe (2000) report that the annual change in dedicated institutions' ownership has a mean of 0.45% and a standard deviation of 6.20%.

<sup>16</sup> We also repeat this lead-lag analysis for other institutions (untabulated). We find that changes in transient institutions' residual ownership are negatively associated with lead changes (but unrelated to lagged or concurrent changes) in conservatism. The correlation between the residual ownership change quintiles for transient and monitoring institutions is slightly negative, suggesting that the lead-lag results for transient and monitoring institutions are independent from each other. We find no evidence that changes in residual ownership by quasi-indexing or dedicated non-independent institutions are associated with lagged, concurrent, or lead changes in conservatism.

<sup>17</sup> We also examine the joint effect of the level and change in monitoring institutions' ownership (untabulated). We sort firms in the top ownership increase (from  $t-1$  to  $t$ ) quintile evenly into three groups based on the pre-change ownership level (ownership at  $t-1$ ). Although these three groups have similar ownership increases from  $t-1$  to  $t$ , they have different ownership levels at  $t-1$ . We find that conservatism increases in the low group (0.081, two-tailed  $p<0.01$ ) and middle group (0.055, two-tailed  $p=0.07$ ), but does not change for the high group (-0.003, two-tailed  $p=0.93$ ). However,

Overall, the above two lead-lag tests yield consistent evidence that the direction of the relation goes from monitoring institutions to conservatism, rather than the reverse. However, to the extent that we cannot perfectly correct for reverse causality, our results could be affected.

## 5.4 Additional analyses

### 5.4.1 Alternative measure of conservatism

So far we have used Basu's (1997) earnings-return model to measure conservatism.<sup>18</sup> In this subsection, we examine the robustness of our results to another commonly used measure of (conditional) conservatism that does not rely on stock returns: the earnings-change model (Basu 1997; Ball and Shivakumar 2005).<sup>19</sup> Specifically, similar to Equation (2), we extend the basic earnings-change model as follows:

$$\begin{aligned}
 \Delta NI_{jt+1} = & \beta_0 + \beta_1 NEGI_{jt} + \beta_2 \Delta NI_{jt} + \beta_3 \Delta NI_{jt} * NEGI_{jt} \\
 & + \beta_4 RMONOWN_{jt-1} + \beta_5 NEGI_{jt} * RMONOWN_{jt-1} + \beta_6 \Delta NI_{jt} * RMONOWN_{jt-1} + \beta_7 \Delta NI_{jt} * NEGI_{jt} * RMONOWN_{jt-1} \\
 & + \beta_{8-17} CONTROLS_{jt-1} + \beta_{18-27} NEGI_{jt} * CONTROLS_{jt-1} + \beta_{28-37} \Delta NI_{jt} * CONTROLS_{jt-1} \\
 & + \beta_{38-47} \Delta NI_{jt} * NEGI_{jt} * CONTROLS_{jt-1} + \varepsilon
 \end{aligned} \tag{4}$$

where (the control variables are the same as in Equation (2)):

$\Delta NI_{jt}$  = Change in annual net income before extraordinary items of firm  $j$  from year  $t-1$  to  $t$  (IB), scaled by total assets (AT) for at the end of year  $t-1$ ; and

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the difference in the change in conservatism between the middle and high groups is not statistically significant (two tailed  $p=0.17$ ). The results are similar when we form groups differently. Therefore, we find no conclusive evidence of a joint effect.

<sup>18</sup> One potential concern with using the earnings-return model in our study is that institutional ownership structure can influence the earnings-return relation (e.g., Ayers and Freeman 2003; Ke and Petroni 2004). Also, recent studies discuss the difficulty in measuring conservatism (Ryan 2006, Givoly et al. 2007, Dietrich et al. 2007, Roychowdhury and Watts 2007, Ball et al. 2010).

<sup>19</sup> Other studies that use this model include Ball et al. (2003), Nichols et al. (2008), and Chung and Wynn (2008).

$NEGI_{jt}$  = Indicator variable equal to 1 if  $\Delta NI_{jt}$  is negative, and 0 otherwise.

In Equation (4),  $\beta_7$  measures the association between monitoring institutions' residual ownership and conservatism. Because greater conservatism leads to lower persistence of earnings changes,  $\beta_7 < 0$  would indicate that conservatism increases with monitoring institutions' residual ownership. Table 5 reports the results of estimating Equation (4). For brevity we do not report the results for the control variables.<sup>20</sup> Column 1 reports the test of H1, and Columns 2 and 3 report the test of H2. Overall, the results from the earnings-change model are consistent with those from the earnings-return model.

#### 5.4.2 Non-linearity

Prior research finds that managers' incentives may vary nonlinearly with their ownership of the firm (e.g., Morck et al. 1988; Hermalin and Weisbach 1991). Similarly, a non-linear relation may exist between monitoring institutions' incentives and their ownership of the firm. We follow Morck et al. (1988) and run a piecewise linear regression to examine how the conservatism-ownership relation changes across different ownership ranges. To facilitate interpretation of the results, we use raw ownership (e.g.,  $MONOWN$ ) rather than residual ownership (e.g.,  $RMONOWN$ ), although the results using residual ownership are similar. Because using ranked variables reduces the influence of non-linearity, we do not rank the variables in these tests. We replace monitoring institutions' residual ownership ( $RMONOWN$ ) in Equation (2) with the following three variables:

$$\begin{aligned} MONOWN1 &= MONOWN \text{ (monitoring institutions' ownership) if } MONOWN < 5\%, \\ &= 5\% \text{ if } MONOWN \geq 5\%; \\ MONOWN2 &= 0 \text{ if } MONOWN < 5\%, \\ &= MONOWN - 5\% \text{ if } 5\% \leq MONOWN < 10\%, \end{aligned}$$

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<sup>20</sup> The results for the other types of institutions are similar to those obtained using the earnings-return model.

$$\begin{aligned}
&= 5\% \text{ if } MONOWN \geq 10\%; \text{ and} \\
MONOWN3 &= 0 \text{ if } MONOWN < 10\%, \\
&= MONOWN - 10\% \text{ if } MONOWN \geq 10\%;
\end{aligned}$$

The 5% and 10% cut-off points are consistent with Morck et al. (1988) and correspond to the 33<sup>rd</sup> and 61<sup>st</sup> percentile of the ownership distribution in our sample, respectively.<sup>21</sup> We find that the coefficients on  $RET_{jt} * NEG_{jt} * MONOWN1_{jt-1}$ ,  $RET_{jt} * NEG_{jt} * MONOWN2_{jt-1}$ , and  $RET_{jt} * NEG_{jt} * MONOWN3_{jt-1}$  are 0.012 (one-tailed  $p=0.02$ ), 0.010 (one-tailed  $p=0.04$ ), and 0.004 (one-tailed  $p=0.31$ ), respectively. However, the difference between any two of these three coefficients is not statistically significant at the 0.10 level. Thus, this test provides no conclusive evidence that the conservatism-ownership relation changes across different ownership ranges.<sup>22</sup> In other words, the evidence is inconclusive as to whether the positive relation between monitoring institutions' ownership and conservatism is stronger within certain ownership ranges than others. Overall, we are unable to infer that an increase in monitoring institutions' ownership will increase the demand for conservatism to a greater extent when monitoring institutions' ownership falls within certain ranges.

## 6. Conclusion

This study examines the relation between institutional ownership and accounting conservatism. Our main findings can be summarized as follows. First, higher ownership by institutions that likely monitor managers is associated with more conservative financial reporting. Second, this positive association is more pronounced among firms with more growth options and higher information asymmetry. Third, lead-lag tests yield consistent evidence that monitoring

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<sup>21</sup> The results are similar if we use 15% (80<sup>th</sup> percentile) or 20% (91<sup>st</sup> percentile) rather than 10% as the cut-off.

<sup>22</sup> In another test, we add the square of monitoring institutions' ownership ( $MONOWN$ )<sup>2</sup> to Equation (2). We find that the coefficient on the three-way interaction,  $RET * NEG * (MONOWN)^2$ , is insignificant (untabulated).

institutions' ownership leads to conservatism, rather than the other way around. Taken together, these results are consistent with monitoring institutions demanding conservatism.

This study joins an emerging empirical literature examining equity investors' demand for conservatism (e.g., LaFond and Roychowdhury 2008; LaFond and Watts 2008). In particular, we build on prior studies by providing direct evidence that monitoring institutions are an important class of investors that demands conservatism as a governance device. Our findings thus shed additional light on the nature of the economic forces that generate demand for conservatism (Watts 2003). This study also adds to the acquisition-investment literature. Recent research (Chen et al. 2007; Francis and Martin 2010) shows that both conservatism and monitoring institutions improve the efficiency of mergers and acquisitions (M&A). We provide evidence of a potential mechanism via which monitoring institutions lead to better M&A efficiency; that is, monitoring institutions improve investment efficiency by demanding more conservatism from management.

## Appendix A. Estimation of residual ownership by different types of institutions

This appendix describes how we construct the measure of residual ownership, defined as the residual from an expected ownership model that expresses ownership as a function of its economic determinants. Our benchmark model is based on Gompers and Metrick (2001) who attribute cross-sectional variation in institutional ownership to three sources and use multiple proxies to capture each of these sources. First, as fiduciaries institutions prefer firms that the courts consider to be prudent investments. This "prudence" motive is captured by firm age, dividend yield, S&P membership, and stock price volatility. Second, because institutions tend to make larger investments, they prefer firms that have high liquidity and low transaction costs. These liquidity and transaction-cost motives are captured by firm size, stock price, and share turnover. Third, institutions prefer to invest in firms based on historical return patterns. This preference is captured by firm size, book-to-market ratio, and momentum. In addition to these ten explanatory variables in Gompers and Metrick (2001), we include two additional variables, namely, Tobin's Q and bid-ask spread, to further capture the influence of growth options and information asymmetry.<sup>23</sup> Specifically, our expected institutional ownership model is as follows (firm subscript omitted for brevity):

$$\begin{aligned}
 TypeOwn_t = & \beta_0 + \beta_1 BM_{t-1} + \beta_2 MV_t + \beta_3 Volatility_{t-2,t} + \beta_4 Turnover_{-3} + \beta_5 price_t \\
 & + \beta_6 SP500_t + \beta_7 Momentum_{-2,0} + \beta_8 Momentum_{-12,-3} + \beta_9 Age_t + \beta_{10} Yield_{t-1} \\
 & + \beta_{11} Spread_{t-1} + \beta_{12} TobinQ_{t-1} + \varepsilon_t
 \end{aligned} \tag{A1}$$

where:

$TypeOwn_t$  = Percentage ownership at the end of year  $t$  by monitoring (*MONOWN*), transient (*TRAOWN*), quasi-indexing (*QIXOWN*), or dedicated non-independent (*DNIOWN*) institutions;

$BM_{t-1}$  = Book-to-market ratio measured at the end of year  $t-1$ ;

<sup>23</sup> The results are similar if these two additional variables are not included.

$MV_t$	=	Market value of equity at the end of year $t$ ;
$Volatility_{t-2,t}$	=	Variance of monthly returns from year $t-2$ to $t$ ;
$Turnover_{-3}$	=	Monthly volume divided by shares outstanding, measured three months prior to the end of year $t$ ;
$Price_t$	=	Share price measured at the end of year $t$ ;
$SP500_t$	=	Dummy equal to 1 if the firm is included in the SP 500 index at the end of year $t$ , and 0 otherwise;
$Momentum_{-2,0}$	=	Firm's gross return for the three months prior to the end of year $t$ ;
$Momentum_{-12,-3}$	=	Firm's gross return for the nine months ending three months prior to the end of year $t$ ;
$Age_t$	=	Firm age measured as the number of years a firm is listed on CRSP at the end of year $t$ ;
$Yield_{t-1}$	=	Dividends of year $t-1$ , scaled by market value of equity at the end of year $t-1$ ;
$Spread_{t-1}$	=	Average of daily bid-ask spread over year $t-1$ , computed as $(ask-bid) / [(ask+bid)/2]$ ; and
$Tobin's Q_{t-1}$	=	Market value of assets divided by the book value of assets, where the market value of assets is computed as the book value of assets plus the market value of equity less the sum of the book value of equity and balance sheet deferred taxes.

Following Gompers and Metrick (2001), we estimate Equation (A1) using Fama-MacBeth annual cross-sectional regressions. We then extract regression residuals for each of the four institutions' ownership variables (*MONOWN*, *TRAOWN*, *QIXOWN*, or *DNIOWN*) as our residual ownership measure (denoted *RMONOWN*, *RTRAOWN*, *RQIXOWN*, or *RDNIOWN*, respectively). Thus, by construction, our residual ownership measure captures the component of ownership unexplained by the economic determinants included in Equation (A1).

Table A1 reports the results of estimating Equation (A1) for monitoring institutions' ownership (Column 1), transient institutions' ownership (Column 2), quasi-indexing institutions' ownership (Column 3), and dedicated non-independent institutions' ownership (Column 4). Following Gompers and Metrick (2001), Table 1A reports the time-series average of the coefficient estimates and the number of significant positive and significant negative coefficients. We find that all four types of institutions tend to invest more in firms that are larger and that have larger book-to-market ratios, higher share turnover, lower dividend yields, or lower bid-ask spread. However, there are also significant differences across different types of institutions. For example, while transient institutions prefer younger firms, the other three types of institutions invest more in older firms. Further, transient institutions tend to invest more in firms with more growth options, while the other three types tend to invest less in those firms. These results are consistent with prior studies (e.g., Gompers and Metrick 2001; Yan and Zhang 2009).

**Table A1**  
**Annual cross-sectional Fama-MacBeth regressions of institutional ownership (by type) on its economic determinants**  
**(first stage regression)**

$$TypeOwn_t = \beta_0 + \beta_1 BM_{t-1} + \beta_2 MV_t + \beta_3 Volatility_{t-2,t} + \beta_4 Turnover_{-3} + \beta_5 price_t + \beta_6 SP500_t + \beta_7 Momentum_{-2,0} + \beta_8 Momentum_{-12,-3} + \beta_9 Age_t + \beta_{10} Yield_{t-1} + \beta_{11} Spread_{t-1} + \beta_{12} TobinQ_{t-1} + \varepsilon_t \quad (A1)$$

	MONOWN <sub>t</sub>		TRAOWN <sub>t</sub>		QIXOWN <sub>t</sub>		DNIOWN <sub>t</sub>	
	Coefficient	[+significant, - significant]						
<i>BM<sub>t-1</sub></i>	1.122	[11, 0]	0.767	[10, 0]	0.736	[8, 0]	0.301	[7, 0]
<i>MV<sub>t</sub></i>	0.684	[12, 0]	1.278	[11, 0]	2.092	[12, 0]	0.675	[12, 0]
<i>Volatility<sub>t-2,t</sub></i>	0.630	[10, 0]	1.434	[12, 0]	-0.408	[3, 7]	0.196	[9, 0]
<i>Turnover<sub>-3</sub></i>	0.317	[10, 0]	1.207	[12, 0]	1.244	[12, 0]	0.160	[8, 0]
<i>Price<sub>t</sub></i>	1.019	[11, 0]	1.813	[12, 0]	2.608	[12, 0]	-0.099	[1, 4]
<i>SP500<sub>t</sub></i>	-1.664	[0, 12]	-3.412	[0, 12]	2.716	[11, 0]	1.078	[8, 0]
<i>Momentum<sub>-2,0</sub></i>	-0.014	[0, 11]	-0.004	[1, 7]	-0.034	[0, 11]	-0.005	[0, 10]
<i>Momentum<sub>-12,-3</sub></i>	-0.012	[0, 12]	0.005	[7, 1]	-0.026	[0, 12]	-0.005	[0, 11]
<i>Age<sub>t</sub></i>	0.548	[10, 0]	-0.657	[0, 12]	1.389	[12, 0]	0.149	[6, 1]
<i>Yield<sub>t-1</sub></i>	-0.065	[0, 10]	-0.044	[0, 5]	-0.038	[0, 4]	-0.013	[0, 2]
<i>Spread<sub>t-1</sub></i>	-0.299	[0, 6]	-1.478	[0, 11]	-2.490	[0, 11]	-0.076	[1, 2]
<i>TobinQ<sub>t-1</sub></i>	-0.568	[0, 6]	0.497	[4, 0]	-1.416	[0, 7]	-0.261	[0, 4]
<i>Constant</i>	-10.591	[0, 12]	-26.483	[0, 12]	-42.605	[0, 12]	-10.944	[0, 12]
<i>Avg adjusted R2</i>	0.10		0.30		0.43		0.10	

This table summarizes the annual cross-sectional Fama-MacBeth regressions of ownership by different types of institutions on its economic determinants (Equation (A1)). Firm subscripts ' $j$ ' are omitted for brevity. Following Gompers and Metrick (2001), the table reports the average coefficients and the number of significant positive and negative coefficients at the 5% level.  $MONOWN_t$ =Percentage ownership at the end of year  $t$  by institutional investors classified as both "dedicated" institutions by Bushee (2001) and "independent" institutions by Brickley et al. (1988).  $TRAOWN_t$ =Percentage ownership at the end of year  $t$  by institutional investors classified as "transient" institutions by Bushee (2001).  $QIXOWN_t$ =Percentage ownership at the end of year  $t$  by institutional investors classified as "quasi-indexing" institutions by Bushee (2001).  $DNOWN_t$ =Percentage ownership at the end of year  $t$  by institutional investors classified as both "dedicated" institutions by Bushee (2001) and "non-independent" institutions by Brickley et al. (1988).  $BM_{t-1}$ =Book to market ratio at the end of year  $t-1$ .  $MV_t$ =Market value of equity at the end of year  $t$ .  $Volatility_{t-2,t}$ =Variance of monthly returns from year  $t-2$  to  $t$ .  $Turnover_{t-3}$ =Monthly volume divided by shares outstanding, measured three months prior to the end of year  $t$ .  $Price_t$ =Share price measured at the end of year  $t$ .  $SP500_t$ =Dummy equal to 1 if the firm is included in the SP 500 index at the end of year  $t$ , and 0 otherwise.  $Momentum_{-2,-0}$ =Firm's three months' gross return prior to the end of year  $t$ .  $Momentum_{-12,-3}$ =Firm's nine months' gross return ending three months prior to the end of year  $t$ .  $Age_t$ =Age of firm at the end of year  $t$  measured as number of years a firm is listed on CRSP.  $Yield_{t-1}$ =Dividends of year  $t-1$ , scaled by market value of equity at the end of year  $t-1$ .  $Spread_{t-1}$ =Average of daily bid ask spread over year  $t-1$ , computed as  $(ask-bid) / [(ask+bid)/2]$ .  $TobinQ_{t-1}$ =Market value of assets at the end of year  $t-1$  divided by the book value of assets (AT) at the end of year  $t-1$ , where the market value of assets is computed as book value of assets (AT) plus the market value of common stock (CSHO\*PRCC\_F) less the sum of the book value of common stock (CEQ) and balance sheet deferred taxes (TXDB).

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**Table 1: Sample Selection and Descriptive Statistics**

**Panel A: Sample Selection**

<i>Selection Process</i>	<i># of observations</i>
Firm-years in CRSP/Compustat merged file from 1995-2006 with required data to compute net income, leverage, and market-to-book ratio.	67,264
<i>Less:</i>	
Firm-years in CRSP with missing data on returns, returns volatility, firm age, and bid-ask spread	9,720
Firm-years in CDA/Spectrum with missing data on institutional ownership	2,201
Firm-years in S&P ExecuComp with missing data on managerial ownership	38,432
Final sample over 1995-2006 (2,572 firms)	16,911

**Panel B: Descriptive statistics of 16,911 observations over 1995-2006**

	<i>Mean</i>	<i>Std Dev</i>	<i>P10</i>	<i>P25</i>	<i>Median</i>	<i>P75</i>	<i>P90</i>
$MONOWN_{jt-1}$	9.319	7.393	1.118	3.503	7.912	13.547	19.221
$TRAOWN_{jt-1}$	14.872	10.527	2.875	6.792	13.022	20.882	29.418
$QIXOWN_{jt-1}$	31.866	13.682	13.016	22.831	32.991	41.466	48.535
$DNIOWN_{jt-1}$	4.837	6.325	0.547	1.385	2.748	5.604	11.423
$RMONOWN_{jt-1}$	0.440	7.348	-7.516	-4.983	-1.009	4.506	10.230
$RTRAOWN_{jt-1}$	1.597	9.413	-8.301	-4.814	0.139	6.803	14.060
$RQIXOWN_{jt-1}$	3.599	12.961	-11.401	-4.752	3.348	12.180	20.035
$RDNIOWN_{jt-1}$	0.825	6.200	-2.979	-2.135	-1.210	1.119	7.149
$\Delta MONOWN_{jt, jt-1}$	0.322	5.249	-5.130	-1.796	0.157	2.581	6.020
$\Delta TRAOWN_{jt, jt-1}$	0.058	8.594	-8.078	-3.017	0.167	3.362	8.328
$\Delta QIXOWN_{jt, jt-1}$	0.661	10.369	-7.825	-2.586	0.865	4.772	9.798
$\Delta DNIOWN_{jt, jt-1}$	0.590	5.851	-2.439	-0.444	0.203	1.127	3.718
$\Delta RMONOWN_{jt, jt-1}$	0.022	5.402	-5.666	-2.325	-0.080	2.384	5.888
$\Delta RTRAOWN_{jt, jt-1}$	-0.182	8.216	-7.846	-3.225	0.008	3.164	7.706
$\Delta RQIXOWN_{jt, jt-1}$	-0.101	10.489	-9.012	-3.591	0.241	4.211	9.166
$\Delta RDNIOWN_{jt, jt-1}$	0.290	5.883	-2.928	-0.985	-0.022	0.938	3.450
$RET_{jt}$	0.171	0.540	-0.353	-0.119	0.115	0.362	0.685
$NI_{jt}$	0.034	0.136	-0.035	0.025	0.054	0.078	0.105
$NEG_{jt}$	0.365	0.482	0.000	0.000	0.000	1.000	1.000
$MGROWN_{jt-1}$	2.597	6.365	0.000	0.000	0.020	1.600	8.200
$STD\_RET_{jt-1}$	0.026	0.013	0.013	0.017	0.023	0.032	0.044
$AGE_{jt-1}$	22.174	18.016	4.000	8.000	17.000	31.000	48.000
$MV_{jt-1}$	3778.246	7120.394	227.813	496.981	1245.242	3636.053	9732.422
$MB_{jt-1}$	3.022	2.649	1.118	1.545	2.237	3.502	5.661
$LEV_{jt-1}$	0.459	0.724	0.000	0.050	0.216	0.570	1.128
$LIT_{jt-1}$	0.266	0.442	0.000	0.000	0.000	1.000	1.000

**Panel C: Pearson (top) and Spearman (bottom) Correlations**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
$RMOWN_{j,t-1}$ (1)		<b>0.203</b>	<b>0.182</b>	<b>0.145</b>	<b>0.372</b>	<b>0.023</b>	<b>-0.021</b>	<b>-0.022</b>	<b>-0.052</b>	<b>0.015</b>	<b>-0.009</b>	<b>0.004</b>	<b>-0.052</b>	<b>0.017</b>	<b>0.002</b>
$RTRAWN_{j,t-1}$ (2)	<b>0.238</b>		<b>0.234</b>	<b>0.041</b>	<b>0.011</b>	<b>-0.019</b>	<b>0.016</b>	<b>0.061</b>	<b>-0.095</b>	<b>0.205</b>	<b>-0.184</b>	<b>-0.026</b>	<b>0.194</b>	<b>-0.140</b>	<b>0.165</b>
$RQXOWN_{j,t-1}$ (3)	<b>0.186</b>	<b>0.289</b>		<b>-0.109</b>	<b>0.079</b>	<b>-0.034</b>	<b>0.208</b>	<b>-0.080</b>	<b>-0.171</b>	<b>-0.281</b>	<b>0.142</b>	<b>0.145</b>	<b>0.004</b>	<b>-0.091</b>	<b>-0.095</b>
$RDNOWN_{j,t-1}$ (4)	<b>0.189</b>	<b>0.208</b>	<b>0.172</b>		<b>0.014</b>	<b>-0.028</b>	<b>-0.242</b>	<b>0.095</b>	<b>-0.089</b>	<b>0.074</b>	<b>0.057</b>	<b>0.100</b>	<b>-0.058</b>	<b>0.132</b>	<b>0.019</b>
$\Delta RMOWN_{j,t,j,t-1}$ (5)	<b>0.350</b>	<b>-0.010</b>	<b>0.012</b>	<b>0.015</b>		<b>0.018</b>	<b>-0.023</b>	<b>-0.025</b>	<b>0.002</b>	<b>0.013</b>	<b>-0.011</b>	<b>-0.007</b>	<b>-0.029</b>	<b>0.013</b>	<b>0.004</b>
$RET_{j,t}$ (6)	<b>0.036</b>	<b>-0.035</b>	<b>0.045</b>	<b>-0.049</b>	<b>0.021</b>		<b>0.207</b>	<b>-0.602</b>	<b>0.012</b>	<b>0.016</b>	<b>-0.030</b>	<b>-0.043</b>	<b>-0.039</b>	<b>0.045</b>	<b>0.036</b>
$NI_{j,t}$ (7)	<b>-0.031</b>	<b>-0.078</b>	<b>0.124</b>	<b>-0.094</b>	<b>-0.017</b>	<b>0.411</b>		<b>-0.226</b>	<b>-0.003</b>	<b>-0.303</b>	<b>0.097</b>	<b>0.053</b>	<b>0.018</b>	<b>-0.073</b>	<b>-0.119</b>
$NEG_{j,t}$ (8)	<b>-0.024</b>	<b>0.055</b>	<b>-0.075</b>	<b>0.039</b>	<b>-0.022</b>	<b>-0.834</b>	<b>-0.376</b>		<b>0.019</b>	<b>0.189</b>	<b>-0.073</b>	<b>-0.008</b>	<b>0.076</b>	<b>-0.051</b>	<b>0.076</b>
$MGROWN_{j,t-1}$ (9)	<b>-0.036</b>	<b>0.015</b>	<b>-0.158</b>	<b>-0.153</b>	<b>0.002</b>	<b>-0.015</b>	<b>-0.066</b>	<b>0.047</b>		<b>0.092</b>	<b>-0.147</b>	<b>-0.099</b>	<b>0.059</b>	<b>-0.066</b>	<b>0.042</b>
$STD\_RET_{j,t-1}$ (10)	<b>0.065</b>	<b>0.232</b>	<b>-0.249</b>	<b>-0.023</b>	<b>0.019</b>	<b>-0.113</b>	<b>-0.353</b>	<b>0.197</b>	<b>0.248</b>		<b>-0.347</b>	<b>-0.150</b>	<b>0.124</b>	<b>-0.074</b>	<b>0.383</b>
$AGE_{j,t-1}$ (11)	<b>0.008</b>	<b>-0.188</b>	<b>0.166</b>	<b>0.132</b>	<b>-0.016</b>	<b>0.032</b>	<b>0.173</b>	<b>-0.082</b>	<b>-0.267</b>	<b>-0.407</b>		<b>0.267</b>	<b>-0.092</b>	<b>0.117</b>	<b>-0.204</b>
$MV_{j,t-1}$ (12)	<b>0.018</b>	<b>0.128</b>	<b>0.288</b>	<b>0.271</b>	<b>-0.029</b>	<b>-0.020</b>	<b>0.053</b>	<b>-0.036</b>	<b>-0.318</b>	<b>-0.350</b>	<b>0.287</b>		<b>0.225</b>	<b>0.002</b>	<b>-0.001</b>
$MB_{j,t-1}$ (13)	<b>-0.067</b>	<b>0.217</b>	<b>0.101</b>	<b>-0.034</b>	<b>-0.043</b>	<b>-0.100</b>	<b>-0.150</b>	<b>0.084</b>	<b>0.045</b>	<b>0.043</b>	<b>-0.126</b>	<b>0.378</b>		<b>-0.248</b>	<b>0.157</b>
$LEV_{j,t-1}$ (14)	<b>0.015</b>	<b>-0.184</b>	<b>-0.038</b>	<b>0.078</b>	<b>0.010</b>	<b>0.056</b>	<b>0.214</b>	<b>-0.077</b>	<b>-0.185</b>	<b>-0.264</b>	<b>0.259</b>	<b>0.026</b>	<b>-0.478</b>		<b>-0.226</b>
$LIT_{j,t-1}$ (15)	<b>0.013</b>	<b>0.152</b>	<b>-0.086</b>	<b>0.017</b>	<b>0.003</b>	<b>-0.035</b>	<b>-0.221</b>	<b>0.076</b>	<b>0.102</b>	<b>0.375</b>	<b>-0.222</b>	<b>-0.059</b>	<b>0.167</b>	<b>-0.359</b>	

Bold text indicates significance at the 0.05 level or better, two-tailed.

$MONOWN_{j,t-1}$  = Percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988).  $TRAWN_{j,t-1}$  = Percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “transient” institutions by Bushee (2001).  $QXOWN_{j,t-1}$  = Percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001).  $DNOWN_{j,t-1}$  = Percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Brickley et al. (1988).  $RMOWN_{j,t-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating the Equation (A1) in Appendix A.  $RTRAWN_{j,t-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “transient” institutions by Bushee (2001).  $RQXOWN_{j,t-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001).  $RDNOWN_{j,t-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “non-independent” institutions by Brickley et al. (1988).  $\Delta MONOWN_{j,t,j,t-1}$  = Change in percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988).  $\Delta TRAWN_{j,t,j,t-1}$  = Change in percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as “transient” institutions by Brickley et al. (1988).  $\Delta QXOWN_{j,t,j,t-1}$  = Change in percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001).  $\Delta DNOWN_{j,t,j,t-1}$  = Change in percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “non-independent” institutions by Brickley et al. (1988).  $\Delta RMOWN_{j,t,j,t-1}$  = Change in residual percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating the

Equation (A1) in Appendix A.  $\Delta RTRAOWN_{jt,t-1}$  = Change in residual percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as “transient” institutions by Bushee (2001).  $\Delta RQIXOWN_{jt,t-1}$  = Change in residual percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001).  $\Delta RDNOWN_{jt,t-1}$  = Change in residual percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “non-independent” institutions by Brickley et al. (1988).  $RET_{jt}$  = Buy-and-hold stock returns of firm  $j$  in year  $t$ .  $NI_{jt}$  = Annual income before extraordinary items (IB) of firm  $j$  in year  $t$ , scaled by the market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $NEG_{jt}$  = Indicator variable equal to 1 if  $RET_{jt}$  is negative, and 0 otherwise.  $MGROWN_{jt,t-1}$  = Percentage ownership (options excluded) of firm  $j$  at the end of year  $t-1$  by the CEO.  $STD\_RET_{jt,t-1}$  = Standard deviation of daily stock returns of firm  $j$  over year  $t-1$ .  $AGE_{jt,t-1}$  = Age of firm  $j$  at the end of year  $t-1$ , measured as the number of years a firm is listed on CRSP.  $MV_{jt,t-1}$  = Market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $MB_{jt,t-1}$  = Market to book ratio (MV / CEQ) of firm  $j$  at the end of year  $t-1$ .  $LEV_{jt,t-1}$  = Leverage ((DLTT+ DLC) / MV) of firm  $j$  at the end of year  $t-1$ .  $LIT_{jt,t-1}$  = Dummy variable equal to 1 if firm  $j$  belongs to the following industries at the end of year  $t-1$ : Biotechnology (SIC codes 2833-2836 and 8731-8734), Computers (SIC codes 3570-3577 and 7370-7374), Electronics (SIC codes 3600-3674), and Retailing (SIC codes 5200-5961); and 0 otherwise.

**Table 2: The relation between conservatism and monitoring institutions' residual ownership**

$$\begin{aligned}
 NI_{jt} = & \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} \\
 & + \beta_4 RMONOWN_{jt-1} + \beta_5 NEG_{jt} * RMONOWN_{jt-1} + \beta_6 RET_{jt} * RMONOWN_{jt-1} + \beta_7 RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} \\
 & + \beta_8 -17CONTROL_{jt-1} + \beta_18 -27NEG_{jt} * CONTROL_{jt-1} + \beta_19 -37RET_{jt} * CONTROL_{jt-1} + \beta_20 -47RET_{jt} * NEG_{jt} * CONTROL_{jt-1} + \varepsilon
 \end{aligned}$$

(2)

	Full Sample						Sample cut on Tobin's Q and bid-ask spread					
	(1)			(2)			(3)			Low Group		
	Exp Sign	Dependent Variable= $NI_{jt}$	p-value	Exp Sign	Dependent Variable= $NI_{jt}$	p-value	Exp Sign	Dependent Variable= $NI_{jt}$	p-value	Exp Sign	Dependent Variable= $NI_{jt}$	p-value
$NEG_{jt}$		-0.021	0.41		-0.016	0.54		0.018	0.09		0.018	0.09
$RET_{jt}$		0.038	0.00		0.032	0.10		0.006	0.64		0.006	0.64
$RET_{jt} * NEG_{jt}$	+	0.098	0.17	+	0.203	0.00	+	0.266	0.00		0.266	0.00
$RMONOWN_{jt-1}$		-0.009	0.10		-0.007	0.29		-0.006	0.16		-0.006	0.16
$NEG_{jt} * RMONOWN_{jt-1}$		0.027	0.06		0.032	0.08		-0.003	0.49		-0.003	0.49
$RET_{jt} * RMONOWN_{jt-1}$		-0.002	0.79		-0.010	0.22		-0.004	0.50		-0.004	0.50
<b><math>RET_{jt} * NEG_{jt} * RMONOWN_{jt-1}</math></b>	+	<b>0.129</b>	<b>0.01</b>	+	<b>0.199</b>	<b>0.00</b>	+	<b>-0.014</b>	<b>0.52</b>		<b>-0.014</b>	<b>0.52</b>
Controls		Included			Included			Included			Included	
$NEG_{jt} * Controls$		Included			Included			Included			Included	
$RET_{jt} * Controls$		Included			Included			Included			Included	
$RET_{jt} * NEG_{jt} * RTRAOWN_{jt-1}$		-0.157	0.00		-0.183	0.00		-0.028	0.09		-0.028	0.09
$RET_{jt} * NEG_{jt} * RQIXOWN_{jt-1}$		-0.038	0.32		-0.078	0.30		-0.039	0.05		-0.039	0.05

$RET_{jt} * NEG_{jt} * RDNOWN_{jt-1}$	-0.016	0.77	-0.059	0.19	0.015	0.37
$RET_{jt} * NEG_{jt} * MGROWN_{jt-1}$	-0.121	0.05	-0.287	0.00	-0.021	0.17
$RET_{jt} * NEG_{jt} * STD\_RET_{jt-1}$	0.457	0.00	0.575	0.00	0.251	0.00
$RET_{jt} * NEG_{jt} * AGE_{jt-1}$	-0.088	0.02	-0.093	0.01	-0.089	0.00
$RET_{jt} * NEG_{jt} * MV_{jt-1}$	-0.152	0.01	-0.224	0.00	0.054	0.99
$RET_{jt} * NEG_{jt} * MB_{jt-1}$	-0.353	0.00	-0.267	0.00	-0.443	0.00
$RET_{jt} * NEG_{jt} * LEV_{jt-1}$	0.386	0.00	0.250	0.00	0.021	0.62
$RET_{jt} * NEG_{jt} * LIT_{jt-1}$	0.042	0.03	-0.026	0.83	0.004	0.41
Constant	0.058	0.00	0.102	0.00	0.065	0.00
Observations	16,911		3,965		4,059	
Adjusted R <sup>2</sup>	0.28		0.37		0.41	
<b>Test of Differences between High and Low groups:</b>						
High $RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} >$ Low $RET_{jt} * NEG_{jt} * RMONOWN_{jt-1}$ p-value = 0.00						
High $RET_{jt} * NEG_{jt} * RTRAOWN_{jt-1} =$ Low $RET_{jt} * NEG_{jt} * RTRAOWN_{jt-1}$ p-value = 0.00						
High $RET_{jt} * NEG_{jt} * RQIXOWN_{jt-1} =$ Low $RET_{jt} * NEG_{jt} * RQIXOWN_{jt-1}$ p-value = 0.64						
High $RET_{jt} * NEG_{jt} * RDNOWN_{jt-1} =$ Low $RET_{jt} * NEG_{jt} * RDNOWN_{jt-1}$ p-value = 0.19						

The table reports the results of estimating Equation (2) using pooled OLS regressions over 1995-2006. Stand-alone control variables and the two-way interactions between controls and *NEG* or *RET* are included in the estimations but are not reported for brevity. *p*-values are based on standard errors adjusted for clustering on both firm and year (Peterson 2009). *p*-values are one-tailed when sign of the coefficient is predicted, and two-tailed otherwise. All variables except  $NI_{jt}$ ,  $RET_{jt}$ ,  $NEG_{jt}$ , and  $LIT_{jt-1}$  are scaled decile ranks from 0 to 1. Outliers are removed using Cook's (1977) distance statistic.

Column 1 reports results for the full sample of firms. Column 2 reports results for the firm-years whose  $TobinQ_{jt-t}$  and  $SPREAD_{jt-t}$  are above the respective yearly median (referred to as the “High” group). Column 3 reports results for the firm-years whose  $TobinQ_{jt-t}$  and  $SPREAD_{jt-t}$  are below or equal to the respective yearly median (referred to as the “Low” group).

$TobinQ_{jt-t}$  = Market value of assets of firm  $j$  at the end of year  $t-1$  divided by the book value of assets (AT) of firm  $j$  at the end of year  $t-1$ , where the market value of assets is computed as the book value of assets (AT) plus the market value of common stock (CSHO\*PRCC\_F) less the sum of the book value of common stock (CEQ) and balance sheet deferred taxes (TXDB).  $SPREAD_{jt-t}$  = Average of daily bid ask spread of firm  $j$  over year  $t-1$ , computed as (ask-bid) / [(ask+bid)/2].  $NI_{jt}$  = Annual income before extraordinary items (IB) of firm  $j$  in year  $t$ , scaled by the market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $RET_{jt}$  = Buy-and-hold stock returns of firm  $j$  in year  $t$ .  $NEG_{jt}$  = Indicator variable equal to 1 if  $RET_{jt}$  is negative, and 0 otherwise.  $RMONOWN_{jt-t}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating the Equation (A1) in Appendix A.

$RTRAWN_{jt-t}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “transient” institutions by Bushee (2001).  $RQIXOWN_{jt-t}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as “quasi-indexing” institutions by Bushee (2001).  $RDNOWN_{jt-t}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “non-independent” institutions by Brickley et al. (1988).  $MGROWN_{jt-t}$  = Percentage ownership (options excluded) of firm  $j$  at the end of year  $t-1$  by the CEO.  $STD\_RET_{jt-t}$  = Standard deviation of daily stock returns of firm  $j$  over year  $t-1$ .  $AGE_{jt-t}$  = Age of firm  $j$  at the end of year  $t-1$ , measured as the number of years a firm is listed on CRSP.  $MV_{jt-t}$  = Market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $MB_{jt-t}$  = Market to book ratio (MV/CEQ) of firm  $j$  at the end of year  $t-1$ .  $LEV_{jt-t}$  = Leverage ((DLTT+ DLC) / MV) of firm  $j$  at the end of year  $t-1$ .  $LIT_{jt-t}$  = Dummy variable equal to 1 if firm  $j$  belongs to the following industries at the end of year  $t-1$ : Biotechnology (SIC codes 2833-2836 and 8731-8734), Computers (SIC codes 3570-3577 and 7370-7374), Electronics (SIC codes 3600-3674), and Retailing (SIC codes 5200-5961); and 0 otherwise.

**Table 3: The relation between conservatism and lead, current and lagged monitoring institutions' residual ownership**

$$\begin{aligned}
 NI_{jt} = & \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} \\
 & + \beta_4 RMONOWN_{jt-1} + \beta_5 NEG_{jt} * RMONOWN_{jt-1} + \beta_6 RET_{jt} * RMONOWN_{jt-1} + \beta_7 RET_{jt} * NEG_{jt} * RMONOWN_{jt-1} \\
 & + \beta_8 RMONOWN_{jt} + \beta_9 NEG_{jt} * RMONOWN_{jt} + \beta_{10} RET_{jt} * RMONOWN_{jt} + \beta_{11} RET_{jt} * NEG_{jt} * RMONOWN_{jt} \\
 & + \beta_{12} RMONOWN_{jt+1} + \beta_{13} NEG_{jt} * RMONOWN_{jt+1} + \beta_{14} RET_{jt} * RMONOWN_{jt+1} + \beta_{15} RET_{jt} * NEG_{jt} * RMONOWN_{jt+1} \\
 & + \beta_{16-25} CONTROLS_{jt-1} + \beta_{26-35} NEG_{jt} * CONTROLS_{jt-1} + \beta_{36-45} RET_{jt} * CONTROLS_{jt-1} + \beta_{46-55} RET_{jt} * NEG_{jt} * CONTROLS_{jt-1} + \varepsilon
 \end{aligned}
 \tag{3}$$

	Expected Sign	Dependent Variable= $NI_{jt}$	
		Coefficient	p-value
$NEG_{jt}$		-0.018	0.43
$RET_{jt}$		0.036	0.01
$RET_{jt} * NEG_{jt}$	+	0.131	0.01
$RMONOWN_{jt-1}$		0.000	0.95
$NEG_{jt} * RMONOWN_{jt-1}$		0.024	0.08
$RET_{jt} * RMONOWN_{jt-1}$		0.008	0.49
<b><math>RET_{jt} * NEG_{jt} * RMONOWN_{jt-1}</math></b>	+	<b>0.140</b>	<b>0.01</b>
$RMONOWN_{jt}$		-0.001	0.87
$NEG_{jt} * RMONOWN_{jt}$		-0.016	0.34
$RET_{jt} * RMONOWN_{jt}$		-0.016	0.40
<b><math>RET_{jt} * NEG_{jt} * RMONOWN_{jt}</math></b>		<b>-0.094</b>	<b>0.19</b>
$RMONOWN_{jt+1}$		-0.011	0.09
$NEG_{jt} * RMONOWN_{jt+1}$		-0.001	0.93
$RET_{jt} * RMONOWN_{jt+1}$		-0.003	0.89
<b><math>RET_{jt} * NEG_{jt} * RMONOWN_{jt+1}</math></b>		<b>-0.037</b>	<b>0.35</b>
Controls and their interactions, and the constant		Included	

<i>Observations</i>	14,036
<i>Adjusted R<sup>2</sup></i>	0.28

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The table reports the results of estimating Equation (3) using pooled OLS regressions over 1995-2004. Control variables and their interactions, and the constant are included in the estimations but are not reported for brevity.  $p$ -values are based on standard errors adjusted for clustering on both firm and year (Peterson 2009).  $p$ -values are one-tailed when sign of the coefficient is predicted, and two-tailed otherwise. All variables except  $NI_{jt}$ ,  $RET_{jt}$ ,  $NEG_{jt}$ , and  $LIT_{j,t-1}$  are scaled decile ranks from 0 to 1. Outliers are removed using Cook's (1977) distance statistic.

$NI_{jt}$  = Annual income before extraordinary items (IB) of firm  $j$  in year  $t$ , scaled by the market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $RET_{jt}$  = Buy-and-hold stock returns of firm  $j$  in year  $t$ .  $NEG_{jt}$  = Indicator variable equal to 1 if  $RET_{jt}$  is negative, and 0 otherwise.  $RMOWN$  = Residual percentage ownership of firm  $j$  measured at the end of year mentioned in the subscript by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating Equation (A1) in Appendix A. The control variables included in the regression but not reported for brevity are defined below Table 2.

**Table 4: Change in conservatism prior to, concurrent with, and after the change in monitoring institutions' residual ownership**

$$NI_{jt} = \beta_0 + \beta_1 NEG_{jt} + \beta_2 RET_{jt} + \beta_3 RET_{jt} * NEG_{jt} + \varepsilon \quad (1)$$

Quintiles of change in monitoring institutions' residual percentage ownership from $t-1$ to $t$	(1)		(2)		(3)		(4)			
	Mean value of change in monitoring institutions' residual percentage ownership from $t-1$ to $t$	$\Delta RMONOWN_{jt,t-1}$	Change in conservatism in <i>pre</i> -ownership-change period (i.e., test of difference in Basu's coefficient from $t-2$ to $t-1$ )	$\beta_{3,t-2} - \beta_{3,t-1}$	$p$ -value	Change in conservatism <i>during</i> -ownership-change period (i.e., test of difference in Basu's coefficient from $t-1$ to $t$ )	$\beta_{3,t} - \beta_{3,t-1}$	$p$ -value	Change in conservatism <i>post</i> -ownership-change period (i.e., test of difference in Basu's coefficient from $t$ to $t+1$ )	$\beta_{3,t+1} - \beta_{3,t}$
<i>Quintile 1</i>	-6.88		-0.028	0.17	0.66	0.010	0.66	0.89	-0.003	0.89
<i>Quintile 2</i>	-1.69		-0.020	0.54	0.56	-0.008	0.56	0.89	0.002	0.89
<i>Quintile 3</i>	-0.04		-0.009	0.72	0.10	-0.027	0.10	0.95	-0.001	0.95
<i>Quintile 4</i>	1.72		0.017	0.58	0.09	-0.030	0.09	<b>0.06</b>	<b>0.024</b>	<b>0.06</b>
<i>Quintile 5</i>	6.93		0.010	0.68	0.47	-0.010	0.47	<b>0.01</b>	<b>0.054</b>	<b>0.01</b>
<b><i>Quintile 5- Quintile 1</i></b>			0.038	0.11	0.28	-0.020	0.28	<b>0.01</b>	<b>0.057</b>	<b>0.01</b>

We sort firm-years into quintiles based on change in monitoring institutions' residual percentage ownership from  $t-1$  to  $t$ , and then estimate Basu's asymmetric timeliness coefficient using Equation (1) for each quintile for the years  $t-2$ ,  $t-1$ ,  $t$  and  $t+1$ . This allows us to examine the change in Basu's asymmetric timeliness coefficient in the *pre*-ownership-change period (from  $t-2$  to  $t-1$ ), *during*-ownership-change period (from  $t-1$  to  $t$ ), and *post*-ownership-change period (from  $t$  to  $t+1$ ). The Table reports the test of difference in Basu's asymmetric timeliness coefficient in each quintile of change in monitoring institutions' residual percentage ownership. Column 1 reports the mean change in monitoring institutions' residual percentage ownership in each quintile. Column 2 reports the difference in Basu's asymmetric timeliness measure from  $t-2$  to  $t-1$  ( $\beta_{3,t-2} - \beta_{3,t-1}$ ) which is the *pre*-ownership-change period. Column 3 reports the difference in Basu's asymmetric timeliness measure from  $t-1$  to  $t$  ( $\beta_{3,t} - \beta_{3,t-1}$ ) which is the *during*-ownership-change period. Column 4 reports the difference in Basu's asymmetric timeliness measure from  $t$  to  $t+1$  ( $\beta_{3,t+1} - \beta_{3,t}$ ) which is the *post*-ownership-change period. The changes in conservatism are estimated using pooled OLS regressions.  $p$ -values are two-tailed and based on standard errors adjusted for clustering on both firm and year. Outliers are removed using Cook's (1977) distance statistic.

$NI_{jt}$  = Annual income before extraordinary items (IB) of firm  $j$  in year  $t$ , scaled by the market value of equity (CSHO\*PRCC\_F) of firm  $j$  at the end of year  $t-1$ .  $RET_{jt}$  = Buy-and-hold stock returns of firm  $j$  in year  $t$ .  $NEG_{jt}$  = Indicator variable equal to 1 if  $RET_{jt}$  is negative, and 0 otherwise.  $\Delta RMONOWN_{jt,t-1}$  = Change in

residual percentage ownership of firm  $j$  from year  $t-1$  to  $t$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating Equation (A1) in Appendix A.

**Table 5: The relation between conservatism measured by the earnings-change model and monitoring institutions' residual ownership**

$$\begin{aligned} \Delta NI_{jt+1} = & \beta_0 + \beta_1 NEGI_{jt} + \beta_2 \Delta NI_{jt} + \beta_3 \Delta NI_{jt} * NEGI_{jt} \\ & + \beta_4 RMONOWN_{jt-1} + \beta_5 NEGI_{jt} * RMONOWN_{jt-1} + \beta_6 \Delta NI_{jt} * NEGI_{jt} * RMONOWN_{jt-1} \\ & + \beta_{8-17} CONTROLS_{jt-1} + \beta_{18-27} NEGI_{jt} * CONTROLS_{jt-1} + \beta_{28-37} \Delta NI_{jt} * CONTROLS_{jt-1} + \beta_{38-47} \Delta NI_{jt} * NEGI_{jt} * CONTROLS_{jt-1} + \varepsilon \end{aligned} \quad (4)$$

	Full Sample (1)		Sample cut on Tobin's Q and bid-ask spread (2)		High Group (3)		Low Group	
	Exp Sign	Dependent variable= $\Delta NI_{jt+1}$ Coefficient	Exp Sign	Dependent variable= $\Delta NI_{jt+1}$ Coefficient	Exp Sign	Dependent variable= $\Delta NI_{jt+1}$ Coefficient	Exp Sign	Dependent variable= $\Delta NI_{jt+1}$ Coefficient
$NEGI_{jt}$	-	-0.013	-	-0.009	-	0.004	-	0.004
$\Delta NI_{jt}$	-	-0.305	-	-0.362	-	-0.027	-	-0.027
$\Delta NI_{jt} * NEGI_{jt}$	-	-0.282	-	0.060	-	-0.335	-	-0.335
$RMONOWN_{jt-1}$	-	0.005	-	0.005	-	0.016	-	0.016
$NEGI_{jt} * RMONOWN_{jt-1}$	-	-0.004	-	-0.003	-	-0.011	-	-0.011
$\Delta NI_{jt} * RMONOWN_{jt-1}$	-	0.064	-	0.056	-	-0.177	-	-0.177
$\Delta NI_{jt} * NEGI_{jt} * RMONOWN_{jt-1}$	-	<b>-0.209</b>	-	<b>-0.320</b>	-	<b>0.151</b>	-	<b>0.151</b>
Controls and their interactions, and the constant	Included		Included		Included		Included	
Observations		13909		3572		3673		3673
Adjusted R <sup>2</sup>		0.14		0.20		0.10		0.10

*Test of differences in variables of interest between High group and Low group*

High group  $\Delta NI_{jt} * NEGI_{jt} * RMONOWN_{jt-1} < \text{Low group } \Delta NI_{jt} * NEGI_{jt} * RMONOWN_{jt-1}$   
 $p\text{-value} = 0.03$

The table reports the results of estimating Equation (4) using pooled OLS regressions over 1995-2005. Control variables and their interactions, and the constant are included in the estimations but are not reported for brevity.  $p$ -values are based on standard errors adjusted for clustering on both firm and year (Peterson 2009).  $p$ -values are one-tailed when sign of the coefficient is predicted, and two-tailed otherwise. All variables except  $\Delta NI_{jt}$ ,  $\Delta NI_{jt+1}$ ,  $NEGI_{jt}$  and  $LIT_{jt-1}$  are scaled decile ranks from 0 to 1. Outliers are removed using Cook's (1977) distance statistic.

Column 1 reports results for the entire sample. Columns 2 and 3 report results for the “High” and “Low” groups respectively. The “High” group in column 2 consists of firm-years whose  $TobinQ_{jt-1}$  and  $SPREAD_{jt-1}$  are above the respective yearly median. The “Low” group in column 3 consists of firm-years whose  $SPREAD_{jt-1}$  and  $TobinQ_{jt-1}$  are below or equal to the respective yearly median.  $TobinQ_{jt-1}$  = Market value of assets of firm  $j$  at the end of year  $t-1$  divided by the book value of assets (AT) of firm  $j$  at the end of year  $t-1$ , where the market value of assets (AT) plus the market value of common stock (CSHO\*PRCC\_F) less the sum of the book value of common stock (CEO) and balance sheet deferred taxes (TXDB).  $SPREAD_{jt-1}$  = Average of daily bid ask spread of firm  $j$  over year  $t-1$ , computed as (ask-bid) / (ask+bid)/2.  $\Delta NI_{jt}$  = Change in annual net income before extraordinary items of firm  $j$  from year  $t$  to  $t+1$  (IB), scaled by total assets (AT) of firm  $j$  at the end of year  $t$ .  $\Delta NI_{jt}$  = Change in annual net income before extraordinary items of firm  $j$  from year  $t-1$  to  $t$  (IB), scaled by total assets (AT) of firm  $j$  at the end of year  $t-1$ .  $NEGI_{jt}$  = Indicator variable equal to 1 if  $\Delta NI_{jt}$  is negative, and 0 otherwise.  $RMONOWN_{jt-1}$  = Residual percentage ownership of firm  $j$  at the end of year  $t-1$  by institutional investors classified as both “dedicated” institutions by Bushee (2001) and “independent” institutions by Brickley et al. (1988). Residual ownership is computed based on the results of estimating Equation (A1) in Appendix A. The control variables included in the regression but not reported for brevity are defined below Table 2.