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Does Public Ownership of Equity Improve Earnings Quality?

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ABSTRACT: We compare the quality of accounting numbers produced by two types of public firms—those with publicly traded equity and those with privately held equity that are nonetheless considered public by virtue of having publicly traded debt. We develop and test two hypotheses. The "demand" hypothesis holds that earnings of public equity firms are of higher quality than earnings of private equity firms due to stronger demand by shareholders and creditors for quality reporting. In contrast, the "opportunistic behavior" hypothesis posits that public equity firms, because their managers have a greater incentive to manage earnings, have lower earnings quality than their private equity peers. The results indicate that, consistent with the "opportunistic behavior" hypothesis, private equity firms have higher quality accruals and a lower propensity to manage income than public equity firms. We further find that public equity firms report more conservatively, in line with their greater litigation risk and agency costs.

Keywords: *accruals; conservatism; earnings management; earnings quality; private and public firms.*

Data Availability: *Data are available from sources identified in the study.*

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I. INTRODUCTION

The quality of accounting information is influenced by an array of factors, most of which stem from the demand for such information for use in contractual arrangements and from the incentives and opportunities of management to manage the reported numbers. Both the demand for quality accounting information for contractual purposes and management incentives to adjust the reported earnings are likely to be influenced by whether the equity of the company is privately held or publicly traded. In this study, we examine the differential earnings quality of private equity and public equity firms in order to shed light on how public ownership of equity affects the quality of firms' earnings. Because earnings ''quality'' has multiple dimensions, in our tests we examine a number of attributes that have been associated by previous research with the notion of earnings quality.

The influence that public or private ownership has on the quality of accounting numbers has been examined in limited contexts by past studies. Beatty et al. (2002), Burgstahler et al. (2006), and Penno and Simon (1986) focus on the difference between public and private firms with respect to one dimension of earnings quality—the extent to which earnings are managed. The association between ownership type and another earnings attribute, conservatism, is examined by Ball and Shivakumar (2005). Because financial data of privately owned firms is generally unavailable, these studies are restricted to regulated industries such as banking and insurance for which financial reports of both public and private companies are filed with industry regulators (e.g., Beatty et al. 2002) or to countries such as the U.K. in which accounting information is available for private companies because they must publicly file financial statements (e.g., Ball and Shivakumar 2005).

The results of these studies on the differential earnings quality of public versus private companies are conflicting. Beatty et al. (2002) find that public firms have a greater propensity to manage earnings than private firms, whereas Burgstahler et al. (2006) report the opposite. Further, to the extent that conservatism is viewed as an earnings quality trait, this finding by Beatty et al. (2002) is ostensibly in contrast to the finding by Ball and Shivakumar (2005), who use the extent of reporting conservatism to assess earnings quality.

The results of these studies, while insightful, cannot easily be generalized. The examination of firms in a regulated industry provides results for a single industry with unique financial reporting issues. Further, the extent to which the results based on samples consisting of European companies generalize to U.S. firms is not clear due to differences in these countries' reporting regimes.

Our study extends the literature on the effect of ownership type on earnings quality by examining a broader sample of U.S. firms (in non-regulated industries) and by considering several measures of earnings quality. Specifically, we compare the quality of accounting numbers between private and public equity firms along three dimensions: persistence of accruals, estimation error in the accrual process, and prevalence of earnings management. We also compare the degree of conservatism between these two groups of firms.

Our sample of U.S. companies consists of two types of public companies: those with publicly traded equity (hereafter, public equity firms) and those with privately held equity that are considered public companies because they have publicly traded debt (hereafter, private equity firms). Both types of firms are subject to identical SEC reporting and disclosure requirements. Hence, our tests control for many of the factors affecting the comparison of earnings quality across countries, such as legal institutions, tax laws, securities regulations and the extent of their enforcement, as well as reporting and disclosure requirements. We are thus able to identify more precisely how the ownership structure of the company affects its earnings quality. Relying on this unique sample of U.S. companies and

on a broader set of earnings quality attributes, our study sheds light on the question of the effect of ownership type on earnings quality. Further, it resolves the question of whether the apparent conflicting results of past studies are due to differences in the examined samples or an inherent negative association between the different measures employed to assess earnings quality.

Findings indicate that the accounting numbers produced by public equity and private equity firms exhibit different reporting attributes. While public equity firms have a lower quality of accruals in terms of their persistence and estimation error and further exhibit a greater propensity to manage earnings, they also report more conservatively (in terms of timely loss recognition) than their private firm counterparts.

This study is the first to analyze the quality of accounting information generated by firms whose debt, but not equity, is publicly traded, comparing such firms to public equity firms. We further examine the different incentives and opportunities that management of these two types of firms has to affect the reported numbers. By extending the literature on earnings quality and the differential quality between public versus private companies, this study enhances our understanding of how, and the extent to which, management incentives and investor demand for earnings quality impact financial reporting.

The study contributes to the existing research in two main respects. First, we consider a spectrum of attributes related to the concept of earnings quality rather than a single attribute of earnings quality such as earnings management. Second, by examining a unique sample of privately held public companies, the study highlights how the presence of public equity investors affects management's reporting behavior, controlling for the regulatory environment as well as the disclosure and reporting regimes.

In the next section, the characteristics of the sample firms are described. The hypotheses are developed in Section III, followed by a discussion of the various measures used to assess earnings quality. The sample and data are described in Section V. The results are provided in Section VI. Concluding remarks are provided in the last section.

II. PRIVATE EQUITY FIRMS WITH PUBLIC DEBT

Under Sections 13 and 15(d) of the Securities Exchange Act of 1934, firms with publicly traded equity as well as those with privately held equity and publicly traded debt are subject to identical financial reporting and disclosure regulations. While both are considered to be public firms, private equity firms differ from public equity firms in various ways because their shares are not publicly traded. For example, because of the lack of publicly traded stock, takeovers of private equity firms cannot be accomplished through open market stock purchases and their equity-based compensation is not tied to market stock prices.

There is a large body of theoretical literature examining the motivations for becoming a public company. These motivations include increased liquidity (Amihud and Mendelson 1988), having greater access to capital (Welch 1989), optimizing the exit opportunity for current shareholders (Zingales 1995; Mello and Parsons 1998; Stoughton and Zechner 1998; Black and Gilson 1998), diversifying the founding shareholders' wealth (Leland and Pyle 1977) and improving the owners' ability to monitor the firms' managers (Jensen and Meckling 1976; Pagano and Röell 1998; Holmström and Tirole 1993; Bolton and von Thadden 1998). Implicit or explicit in this literature is the assumption that becoming public means having public ownership. However, a private firm could also become public by issuing public debt. Some of the benefits of public ownership, such as creating an easier exit for the owners or generating greater liquidity for current shareholders, do not exist for private firms that issue public debt, while others, such as improving owners' monitoring

capability, might. Indeed, there has been little attention paid by the literature to the various factors that influence a firm's choice ''to go public'' by issuing public equity or public debt. Helwege and Packer (2003) show that among public debt firms, those that have private equity are younger, more leveraged, and appear to have fewer growth opportunities than public equity firms. Similar findings are reported by Katz (2009), who compares firm characteristics of privately held firms before and after their equity IPO. We confirm these results in this study. As reported later, our sample of companies with public debt that are privately owned are more leveraged, have lower growth rates, and are less profitable than firms with public debt that have publicly held equity.

The factors that lead private equity owners to issue public debt instead of, or prior to, issuing public equity, while having a bearing on the ''pecking order'' theory, have not been directly researched. However, research on the priority of financing sources suggests that issuing public debt involves more costly disclosure of propriety information than does issuing private debt (Campbell 1979; Myers 1984; Yosha 1995). All else being equal, one would thus expect firms to rely more on private debt when the public disclosure of firm-specific information is costlier (Dhaliwal et al. 2008). Credit quality also appears to play a role in firms' debt-financing decisions. Empirical evidence indicates that firms with higher credit ratings tend to borrow from public sources, those with intermediate ratings borrow from banks, and firms with the lowest credit quality borrow from private lenders (Cantillo and Wright 2000; Denis and Mihov 2003; Bharath et al. 2008). These findings suggest that firms that issue public debt are likely to be financially stronger than firms that do not have publicly held debt, an expectation confirmed in our sample.[1]

The above discussion suggests that the decision about which type of public security to issue, debt or equity, is endogenous. Therefore, as explained below, our tests on the association between financial reporting attributes and ownership type control for firm characteristics related to this choice.

III. HYPOTHESES ON EARNINGS QUALITY AND OWNERSHIP STRUCTURE

A natural starting point for developing hypotheses about the quality of financial reporting of private equity firms with publicly traded debt is to consider those posed by previous research on the differential quality of financial reports for public versus private firms. Interestingly, these hypotheses lead to conflicting predictions. On one hand, the demand for high-quality reporting by public equity firms is hypothesized to be stronger since accounting information is the main type of information contractually available to public equity holders. In addition, public equity firms have stronger incentives to improve their accounting and disclosure policies and enhance their financial transparency so as to mitigate potential lawsuits (consistent with the findings of Skinner 1997) and to reduce the cost of their equity capital.

Based on these considerations, one might expect the demand for high-quality accounting information to be greater for public equity firms than for private equity firms. This ''demand'' hypothesis is advanced by Ball and Shivakumar (2005) and, by implication, to

[1] Holders of public debt are protected by the Trust Indenture Act of 1939 which requires that firms receive the unanimous consent of the public debt holders to modify the terms of the bond indenture agreements. Given the dispersed holdings of most bond issues, this unanimity requirement is likely to make it more difficult for public debt holders to renegotiate debt contracts and to effectively monitor the borrowing firm's performance as compared to private lenders. (Smith and Warner [1979] discuss standard contractual arrangements for public and private debt.)

studies on the differential demand for financial reporting quality between countries that resolve information asymmetries via ''insider access'' as compared with countries that alleviate such asymmetries through ''arm's length'' public disclosures.

On the other hand, management of public firms is under continuous pressure by investors to meet certain performance benchmarks. For example, management has incentives to manage earnings to meet analysts' forecasts (e.g., Degeorge et al. 1999; Bartov et al. 2002) or to avoid reporting losses (e.g., Hayn 1995; Burgstahler and Dichev 1997) or earnings decreases (e.g., Burgstahler and Dichev 1997; Barth et al. 1999). Further, management may have a personal stake in the firm's stock price as a result of having stock-based compensation or stock ownership. In contrast, managers of private firms are not exposed to stock market repercussions arising from financial disclosures, nor are they as likely to be as influenced by incentives arising from stock-based compensation.[2] In addition, because private firms are more closely held, they tend to have fewer shareholders. Those owners are likely to be more closely involved in the management of the firm and thus face a lower cost of acquiring information, thereby reducing management's incentive to manage earnings. This ''opportunistic behavior'' hypothesis, which posits that managers of public equity firms have a greater propensity to manage earnings than managers of private equity firms because of stock price considerations, is supported by the findings of Beatty et al. (2002) and the survey results of Penno and Simon (1986).

Arguably, earnings management could be present among private equity firms. Managers of private firms may have incentives to manage earnings due to the presence of earnings-based bonuses as well as to avoid violating earnings-based debt covenants. Further, the latitude to manage earnings may be present, since private equity firms are likely to be less exposed than public equity firms to litigation risk and cost of equity capital considerations. The extent to which these two types of firms engage in earnings management is an empirical question. However, because of the strength of the *a priori* arguments in its favor, we formalize the ''opportunistic behavior'' hypothesis as a one-sided hypothesis, namely, that managers in public equity firms have a stronger incentive to manage earnings than their private equity counterparts. Note that the ''demand'' and ''opportunistic behavior'' hypotheses are not mutually exclusive. The observed differential in financial reporting quality likely reflects the net effect of both influences.

Even though we do not examine ''purely'' private firms, that is, firms that are privately owned and have no public debt, these firms are hypothesized to have both a weaker demand for accounting quality and weaker incentives to manage income than privately owned firms with public debt. Public debt holders of privately owned firms are likely to demand high accounting quality since the financial statements are their primary source of information about the firm. Unlike private lenders, public debt holders are not privy to inside information before extending credit, nor are they entitled to receive information on the extent of

[2] To gain insight into the compensation arrangements of private equity firms, we examined a sample of private firms with public debt that subsequently issued public equity. For each of these firms, we compared the CEO's compensation package prior to the IPO (when the firm was private but had public debt) and subsequent to the IPO. The findings indicate that earnings-based compensation is as frequent in the pre-IPO period as it is in the post-IPO period. Further, the percentage of CEOs receiving stock options as part of their compensation package does not increase significantly after the IPO although, as might be expected, the monetary value of the options is significantly larger after the IPO. Furthermore, since private equity firms lack publicly traded stock, the value of their shares is determined, if needed, through appraisals. This evidence is indicative of the differences in the compensation structure of public and private equity firms.

compliance with the terms of the debt contract beyond that contained in the prospectus and in subsequent SEC-mandated public reports and disclosures.[3]

Because they have less access to private information, less effective ways of monitoring and disciplining management, and less efficient tools for liquidation or renegotiation in the event of financial distress than private lenders, public debt holders are likely to have a greater demand for high-quality accounting numbers. Further, since public debt holders have less access to private information than private lenders, firms with public debt, whether publicly or privately owned, have stronger incentives to manage earnings than firms with no debt or with only private debt. Still, this ''opportunistic behavior'' is hypothesized to be less pronounced among private equity firms since capital market considerations are not a concern for these firms except, perhaps, in situations in which a firm is on the brink of violating its debt covenants or making a public equity offering.

Since the demand for accounting quality as well as the opportunistic behavior of managers of public equity firms may be affected by whether they have public debt, we control for the presence of public debt by comparing the accounting quality of private equity firms with public debt to the accounting quality of public equity firms with public debt.

Figure 1 summarizes the predictions of the two hypotheses with respect to the accounting quality of firms with different types of stakeholders. For completeness, we also include predictions for the group of entirely private firms (those with private equity and private debt) for which no information is publicly available in the U.S.

FIGURE 1
Type of Ownership and Expected Quality of Financial Reporting

	Type of Ownership		
	Private Firms	**Public Firms**	
Hypothesis	**Private Equity, Private Debt**	**Private Equity, Public Debt**	**Public Equity, Public Debt**
"Demand" Hypothesis	Weak demand for quality external reporting	Greater demand for quality external reporting from debt holders	Strong demand for quality external reporting from both equity and debt holders
Predicted Quality of Financial Reporting	Low	Medium	High
"Opportunistic Behavior" Hypothesis	Low incentive to manage accounting numbers	Greater incentives to manage accounting numbers	Strong incentives to manage accounting numbers
Predicted Quality of Financial Reporting	High	Medium	Low

[3] Theoretical and empirical evidence suggest that access to information and the strength of the monitoring mechanism is likely to differ between public and private debt. For example, some studies hypothesize that private debt financing has an advantage over public debt in terms of monitoring efficiency (e.g., Diamond 1984; Boyd and Prescott 1986; Berlin and Loyes 1988), access to private information (Fama 1985), and the efficiency of liquidation and renegotiation in financial distress (Chemmanur and Fulghieri 1994; Gertner and Scharfstein 1991). The empirical evidence is generally consistent with these expectations (e.g., Kwan and Carleton 2004). See Johnson (1997) for a summary of these findings.

An additional characteristic that could affect earnings management and that may differ between public and private firms is the degree of ownership concentration. High ownership concentration, while creating the ability and incentives for managers to manage reported earnings, leads at the same time to a closer and more effective scrutiny of management by major shareholders. As a result, the net effect on the extent of earnings management is not obvious. The evidence, however, is more consistent with the notion of a positive association of ownership concentration and earnings management (e.g., Leuz et al. 2003; Haw et al. 2004). Although not controlling for ownership concentration works against rejecting our null hypothesis of greater earnings management among publicly owned firms, to explore this issue further we conduct tests on a subsample of firms with sufficient data to control for the level of ownership concentration.

IV. MEASURES OF ACCOUNTING QUALITY

The concept of earnings quality is elusive. The literature on ''earnings quality'' does not provide a clear definition of that ''quality.'' It does, however, identify different attributes that are associated with or reflective of earnings quality.

Penman and Zhang (2002, 237), while recognizing the lack of consensus on the definition of earnings quality, define the term to mean that ''reported earnings ... is a good indicator of future earnings.'' They consider high-quality earnings to be ''sustainable earnings'' and, correspondingly, deem an accounting system that produces unsustainable earnings as being of poor quality. They show that, in addition to the disruptive effect on earnings sustainability caused by changes in accounting methods and estimates, hidden reserves (such as those created by the use of LIFO or expensing of R&D) reduce the sustainability of earnings by providing more opportunity for earnings management. Richardson et al. (2005) and implicitly Sloan (1996) suggest a related dimension of earnings quality—the reliability of accruals as captured by earnings persistence. Richardson et al. (2005, 438) hypothesize and find that ''less reliable accruals result in lower earnings persistence.'' Another related measure of earnings quality, the conformity with GAAP (as captured by SEC enforcement actions), is employed by Dechow et al. (1996) and Bradshaw et al. (2001).

Dechow and Dichev (2002) suggest another aspect of earnings quality—the strength of the relation between current accruals and past, present, and future cash flows. Accordingly, they propose a model for expected accruals and interpret the deviation from this ''expected'' value as the estimation error in accruals, which they use as a measure of earnings quality. This measure is affected by firm characteristics such as the length of the business cycle as well as by earnings management. Ball and Shivakumar (2005, 84) define reporting quality in general terms as ''the usefulness of financial statements to investors, creditors, managers, and all other parties contracting with the firm.'' They view accounting conservatism in the form of asymmetric timeliness in recognizing losses versus gains as a dimension of earnings quality. However, as discussed later, equating conservative reporting with earnings quality is not universally accepted.

In summary, no single measure of accounting numbers captures all of the dimensions of earnings quality. Previous studies have identified a number of attributes associated with different aspects of earnings quality such as accrual persistence, estimation errors in the accrual process, and the absence of earnings management. These quality traits as well as the conservatism attribute are discussed in the following paragraphs.

Accrual Persistence

Our first measure of earnings quality is based on the differential persistence of accruals relative to cash flows. We measure persistence using the following regression:

$$OI_{i,t+1} = \alpha + \beta_1 CF_{i,t} + \beta_2 ACCR_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *OI* is operating income after depreciation, *CF* is the operating cash flow component of earnings defined as *OI* minus *ACCR*, and *ACCR* is the accrual component of earnings measured as the change in net operating assets (NOA) from year $t-1$ to t.[4] In Regression (1) and throughout, the subscripts i and t refer to the firm and year, respectively. All variables in Regression (1) are standardized by NOA_{t-1}. The incremental contribution of accruals is determined by the magnitude and significance of β_2.

We account for the possible endogeneity in the decision to issue public equity by using the Heckman (1979) two-stage procedure, following the approach used by Ball and Shivakumar (2005) and Katz (2009). In the first stage, size (measured alternatively as total assets and sales), growth in sales, leverage (defined as total debt divided by total assets), profitability (defined as operating income divided by net operating assets, RNOA), the quick ratio (defined as current assets excluding inventory and prepaid expenses divided by current liabilities), age (years since incorporation), auditor quality (an indicator variable assigned the value 1 (0) if the firm is (is not) audited by one of the large national firms), and the length of the operating cycle (the sum of the average collection period and days in inventory) serve as predictors of the equity choice in a PROBIT model.[5] Estimates of the PROBIT model are used to compute the inverse Mills ratio for each sample firm. In the second stage, we include the inverse Mills ratio as a control variable in Regression (1), allowing the coefficient to vary between the two groups of firms.[6]

Estimation Error in the Accruals Process

Accruals provide information about future cash flows. To the extent that the accruals process is free of estimation errors, accruals and earnings will be more representative of future cash flows. Building on this notion, the second attribute of earnings quality that we consider is the degree of stability in the relation between cash flows and accruals. This measure as proposed by Dechow and Dichev (2002) and modified by McNichols (2002) and Francis et al. (2005), is based on the variance of the residuals from the following model:

$$TCA_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 \Delta Rev_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \quad (2)$$

[4] Net operating assets equal the book value of common and preferred equity, plus total debt, minus the sum of cash, short-term investments and investment and advances, plus minority interest.

[5] Extending this test, we included proxies for expected growth (average of the realized annual growth in sales in the subsequent three years), proximity to covenant violation (net income before interest divided by the standard deviation over ten years of net income before interest), and ownership concentration (an indicator variable assigned the value of 1 (0) if the firm has (does not have) concentrated ownership (defined as private equity firms, which presumably have high ownership concentration, and public equity firms in the top quartile of the distribution of the percentage of holdings by the top five institutional holders). The results of this extension (which due to data requirements is based on considerably smaller samples) are similar to those tabulated.

[6] We conducted all analyses on a subgroup of 223 private equity firms that once were, or later became, public equity firms. Each private equity firm thus serves as its own control, further mitigating endogeneity concerns. All results (untabulated) remain qualitatively similar.

where *TCA* is total current accruals,[7] *CFO* is cash flows from operations (measured as income from continuing operations less total accruals, where total accruals equal total current accruals minus the depreciation and amortization expense), ΔRev is the change in revenues from year $t-1$ to t, and *PPE* is the balance of property, plant, and equipment (on a gross basis). All variables in Regression (2) are scaled by average total assets in year t. In line with Francis et al. (2005), we estimate Regression (2) cross-sectionally for each industry (defined by two-digit SIC codes) with at least 20 firm observations in a given year.

Our second quality measure is the variability (assessed by the standard deviation) of the residuals from Regression (2). The rationale underlying use of this measure is that the higher is the variability of the relation between earnings and cash flows, the lower is the quality of the accruals and, since earnings incorporate accruals, the lower is the quality of earnings.

Because the standard deviation of accruals may reflect the volatility of the firm's operations rather than reporting quality per se (see Liu and Wysocki 2006), we follow the suggestion in Verdi (2006) an consider an additional *relative* measure of accruals quality, defined as the ratio of the standard deviation of the residuals from Regression (2) to the standard deviation of total current accruals.

Absence of Earnings Management

It is difficult to determine the presence or absence of earnings management, since the series of unmanaged earnings is not observable. However, certain patterns in earnings are indicative of the presence of earnings management. One such pattern is the concentration of earnings numbers just above some earnings threshold (Degeorge et al. 1999). For example, earnings clustered just above zero have been interpreted as reflecting earnings management to avoid reporting a loss. Earnings growth in the current quarter relative to the same quarter the previous year of zero or a slightly positive amount may suggest that the current period's earnings have been managed to avoid reporting an earnings decline. Similarly, earnings that result in no, or just a small, positive earnings surprise are often viewed as having been managed to meet or just beat analysts' earnings forecasts.

In line with Burgstahler and Dichev (1997), we identify earnings management cases as those for which the observed relative frequency of earnings that are just above (just below) an earnings threshold exceed (fall below) their theoretical values. For the purpose of this analysis, we divide the distribution of the earnings measure into "bins," with bin widths determined by the formula suggested by Degeorge et al. (1999). We test for the significance of the difference between the actual and theoretical frequency in a bin based on the procedure proposed by Burgstahler and Dichev (1997) whereby we calculate the standardized differences for the interval just below zero and the interval just above zero. Under the assumption of no earnings management, the expected number of observations in any given interval is equal to the average of the number of observations in the two adjacent intervals. If managers succeed in meeting the threshold, we would expect to find a shift of observations from the bins just below the earnings threshold to the bins just above that threshold.

A number of studies have expressed concerns regarding the effectiveness of this procedure to identify earnings management (e.g., Beaver et al. 2007; Durtschi and Easton

[7] Total current accruals equal operating assets (current assets excluding cash and short-term investments) minus operating liabilities (current liabilities excluding the current portion of long-term debt). Estimating Regression (1) using total accruals and cash flows as defined in Regression (2) produces similar results to those from the estimation of Regression (1) as defined in the text (and tabulated in Section VI).

2005; Dechow et al. 2003). To increase the confidence that the cases occurring ''just above'' the identified thresholds are likely to represent earnings management, we follow Dechow et al. (2003) and investigate whether such cases have a higher proportion of positive unexpected discretionary accruals. To further refine the identification of earnings management cases, we examine the percentage of the positive unexpected accruals cases where these accruals ''made the difference'' in meeting or beating the threshold. That is, we focus on cases for which the magnitude of positive unexpected accruals was sufficiently positive, so as to turn what would otherwise be a loss (or a decline in earnings) into a small profit (or increase in earnings). We identify ''expected'' or ''nondiscretionary'' accruals using the modified Jones model (Dechow et al. 1995).[8]

Even though widely used in the earnings management literature, accruals models such as the modified Jones model are far from perfect in detecting earnings management. In particular, these models make certain assumptions about the functional relationship between accruals and activity measures such as sales or the level of plant, property, and equipment that, while plausible, may not strictly hold. The models further assume that the relationships between cash flows and accruals are linear, thus ignoring the asymmetry in the gain and loss recognition of accruals. We incorporate the improvement in accruals models proposed by Ball and Shivakumar (2006) in our estimation of the Dechow and Dichev (2002) and modified Jones (Dechow et al. 1995) models. Specifically, we augment both Regression (2) and the modified Jones model by adding an indicator variable, *DCFO* and an interactive variable *DCFO* * *CFO*, where *DCFO* receives the value 1 when $CFO < 0$, and 0 otherwise. Consistent with the results reported by Ball and Shivakumar (2006), the introduction of this proxy increases considerably the explanatory power of both accrual models.

Even with this improvement, the identification of earnings management through the various accrual models is very noisy. Patterns in earnings can be caused by a host of operational factors other than earnings management. Further, certain accruals are devoid of any earnings management implications. For example, abnormally high payments to suppliers or an abnormally high rate of collection from customers is captured by the modified Jones model as ''abnormal'' accruals, yet these may be unrelated to earnings management. Despite the absence of a proven methodology to detect earnings management, the reliance on a number of techniques, all of which are widely used in the earnings management literature, should enhance the validity of our results.

Conservatism

Another attribute of financial reporting is the extent of reporting conservatism, in the sense of a more timely recognition of economic losses as compared with the recognition of economic gains, resulting in a systematic undervaluation of the book value of the firm's equity relative to its economic value (Watts 2003; Givoly et al. 2007).

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[8] Specifically, we estimate the following regression cross-sectionally within each two-digit SIC code industry:

$$TACC_{i,t} = a_1*[1/TA_{i,t-1}] + a_2*[(\Delta REV_{i,t} - \Delta TR_{i,t})/TA_{i,t-1}] + a_3*[PPE_{i,t}/TA_{i,t-1}] + e_{i,t}$$

where *TACC* is total accruals defined as the difference between income from continuing operations and net cash flow from operating activities, excluding extraordinary items and discontinued operations, *TA* is the beginning-of-the-year total assets, ΔREV is the change in sales, *PPE* is the level of gross property, plant, and equipment and ΔTR is the change in trade receivables. For the years prior to 1988 when cash flow data are unavailable, we define total accruals as: Δcurrent assets $-$ Δcurrent liabilities $-$ Δcash $+$ Δshort-term debt $-$ depreciation and amortization expense, eliminating firm-year observations with ''non-articulating'' events (see Hribar and Collins 2002).

Public equity firms are likely to face a greater litigation risk because their stock prices are observable, making it easier for potential plaintiffs to both discover causes for lawsuits and establish damages (e.g., Kellogg 1984).[9] The higher level of litigation risk faced by public equity firms and their management can induce a greater degree of conservatism through an earlier recognition of losses (e.g., Skinner 1994, 1997).

In addition to a greater litigation risk, publicly owned firms may face a stronger demand by shareholders to reduce information asymmetry and monitor management's decisions through a more timely recognition of losses. These agency costs are less severe in privately held firms because their higher ownership concentration allows the resolution of any information asymmetry through ''insider access.'' Further, the managers and shareholders of these firms often have a special relationship with top management (Fama and Jensen 1983), allowing for closer monitoring and performance evaluation. These firms thus have less need to rely on public disclosure and less incentive to incorporate economic losses into accounting income in a timely manner (Ball et al. 2000; Ball and Shivakumar 2005; Francis et al. 2005). So, while shareholder-related agency problems exist for both types of firms, they are likely to be more severe for publicly owned firms. Our expectation, therefore, is that public equity firms will exhibit a higher degree of reporting conservatism than will private equity firms.

Its potential role in reducing litigation risk or alleviating agency costs notwithstanding, there is an ongoing debate among standard-setters and academics regarding whether accounting conservatism is a desired property that enhances reporting quality. Watts (2003) argues that conservatism is desirable because it constrains managerial opportunistic behavior, offsets managerial biases with its asymmetrical verifiability requirements, and presents an efficient contracting mechanism. A similar view is expressed by Ball and Shivakumar (2005), who suggest that conservatism improves reporting quality by making financial statements more useful to parties contracting with the firm. Timely loss recognition deters managers from taking poor projects and investments and provides debt holders with more accurate information for loan pricing. Conservatism in this form is sometimes described as improving ''transparency,'' since it reduces the information asymmetry between management and users of the financial statements (Ball et al. 2000; Bhattacharya et al. 2003).

The view that conservatism is a desirable property of accounting numbers is far from universal. For example, Penman and Zhang (2002) suggest that conservative accounting is undesirable because the hidden reserves that it generates facilitate earnings management, thus reducing the predictive ability of current earnings with respect to the firm's future performance. O'Connell (2007) suggests that conservatism may be beneficial for assessing stewardship but non-optimal from a valuation perspective. Contemporary accounting standard-setters clearly do not endorse conservatism as a desirable attribute of financial reporting. The FASB is quite explicit about the dangers inherent in reporting policies that lead to the consistent understatement of assets and earnings, warning that bias in estimating components of earnings ''may mislead one group of investors to the possible benefit or detriment of others'' (FASB 1984, paragraph 96, page 37). FASB's position implies that the best interest of the users is served by neutral reporting accompanied by appropriate disclosure of ''the nature and extent of the uncertainty surrounding events and transactions

[9] This is particularly true in light of the acceptance by the courts in securities law litigation of the ''fraud-on-the-market'' doctrine (as articulated by the Supreme Court in *Basic, Inc., v. Levinson*, 485 U.S. 224 1988). This doctrine assumes that in an efficient market, the market price of a stock is a direct reflection of all material information known to the market relating to the issuer. The plaintiffs are thus presumed to rely on the disclosed information, without the need to prove such reliance.

reported to stockholders and others'' (FASB 1984, paragraph 97, page 37). Wariness about the undesirable effect of unwarranted conservatism on the quality of financial reporting has also been expressed by the SEC (Levitt 1998). The very notion that there is some optimal degree of conservatism implies that ''more'' conservatism is not necessarily ''better'' for financial reporting.

In addition to conceptual concerns, there are empirical concerns regarding difficulties in identifying the presence of conservatism. These concerns stem from the fact that the observable items that are consistent with the presence and extent of conservatism are also consistent with other reporting attributes such as the presence of certain types of earnings manipulations, e.g., ''big bath'' (see Hanna 2003) or data characteristics such as frequency of losses (see Patatukas and Thomas 2009). Possibly reflecting these conflicting effects of conservatism on the quality of accounting numbers, Francis et al. (2005) fail to find a significant association between conservatism and the cost of equity capital, while finding strong support for the notion that accruals quality is priced.

Given the differing views on the link between conservatism and reporting quality, we provide results on the differential degree of conservatism between private and public equity firms without suggesting that this attribute necessarily connotes earnings quality.

We use the speed in which earnings reflect bad news as compared with good news as a measure of conservatism. This measure has been employed by a number of studies (e.g., Basu 1997; Ball and Shivakumar 2005). For the reasons explained earlier, we hypothesize that public equity firms will recognize economic losses (bad news) in a timelier manner than will those with private equity. To capture the differential timeliness of the earnings response to bad versus good news, we use a measure that captures the relative persistence of losses and gains. This measure is estimated as coefficient α_3 from the following piecewise linear regression:

$$\Delta NI_{i,t} = \alpha_0 + \alpha_1 D\Delta NI_{i,t-1} + \alpha_2 \Delta NI_{i,t-1} + \alpha_3 D\Delta NI_{i,t-1} * \Delta NI_{i,t-1} + \varepsilon_{i,t-1} \quad (3)$$

where ΔNI is the change in income (alternatively defined as including and excluding extraordinary items) from fiscal year $t-1$ to t, scaled by the beginning book value of total assets, and $D\Delta NI$ is an indicator variable set equal to 1 if ΔNI in the prior year is negative, and 0 otherwise.

Deferring the recognition of gains until their related cash flows are realized causes gains to be a ''persistent'' positive component of accounting income that tends not to reverse. An implication is that the coefficient α_2 is expected to equal 0. In contrast, the timely recognition of economic losses implies that they are recognized as transitory income decreases, resulting in subsequent earnings reversals and implying that $\alpha_2 + \alpha_3 < 0$. The hypothesis that economic losses are recognized in a more timely fashion than gains implies that $\alpha_3 < 0$.

Ball and Shivakumar (2005) develop an additional model to describe the differential timeliness of gain and loss recognition that relies on the correlation between accruals and contemporaneous cash flows, as follows:

$$ACC_{i,t} = \alpha_0 + \alpha_1 * DCFO_{i,t} + \alpha_2 * CFO_{i,t} + \alpha_3 * DCFO_{i,t} * CFO_{i,t} + \varepsilon_{i,t-1} \quad (4)$$

where ACC is total accruals in year t standardized by beginning-of-the-year total assets, CFO is cash from operations in year t adjusted for extraordinary items and discontinued

operations and standardized by beginning-of-the-year total assets,[10] and *DCFO* is an indicator variable set equal to 1 if *CFO* is negative, and 0 otherwise. The role of accruals in mitigating the noise in operating cash flows would be reflected as $\alpha_2 < 0$. Conservatism, or the more timely recognition of losses, will lead to $\alpha_3 > 0$.

Consistent with Ball and Shivakumar (2005), we hypothesize that public equity firms are more likely to recognize economic losses on a more timely basis than private equity firms. As in the estimation of Regression (1), we account for the possible endogeneity in the choice to issue public or private equity using the Heckman (1979) two-stage procedure that involves the estimate of a PROBIT model and the determination of the inverse Mills ratio in the first stage and the inclusion of that ratio as a control variable in Regressions (3) and (4).

Another form of reporting conservatism, referred to as ''unconditional conservatism,'' manifests itself in a systematic undervaluation of the firm's net assets (e.g., by the early expensing of costs, the deferral of revenues, or the creation of excessive loss provisions). Unconditional conservatism is observable by users of the financial statements, enabling them to adjust for its resulting bias. For these reasons, contracting-based demand for such a bias is unlikely (see Ball and Shivakumar 2005). Accordingly, we do not consider unconditional conservatism as an attribute demanded by investors. However, since previous studies document a negative association between conditional and unconditional conservatism (e.g., Beaver and Ryan 2005; Givoly et al. 2007; Roychowdhury and Watts 2007), we control for unconditional conservatism in testing for differences in conditional conservatism based on type of ownership.

V. SAMPLE

To form our sample, we first identify observations (firm-years) in the Compustat database (industrial, full coverage, and research) during the 26-year period from 1978–2003 that were likely to represent private equity, public debt firms using the following criteria: (1) the firm's stock price at year-end is unavailable, (2) the firm has debt (Compustat items #9 + #34) exceeding $1 million, (3) the firm is a separate, domestic company (and not an ADR or a subsidiary of another public firm), (4) the firm has at least $1 million in revenues, and (5) the firm has the data required to test the hypotheses for at least two years. We exclude firms in the financial industry (SIC codes 6000–6999) and other regulated industries (SIC 4800–4900).

The resulting initial sample consists of 2,817 distinct firms and 12,261 firm-year observations. We examine each firm in this sample to ensure that it had private equity and public debt in the identified time period, resulting in the elimination of about 80 percent of the firms that actually had public equity but met criterion (1) due to missing price data. We further eliminated some firms because their organizational and ownership structures made it likely that their reporting policies and management incentives would differ from those of private equity, public debt firms in general. Specifically, we eliminate 21 firms structured as cooperatives or subsidiaries of cooperatives (302 firm-year observations), three

[10] For the years prior to 1988, cash flow from operations is calculated as net income adjusted for depreciation and amortization as well as changes in working capital accounts.

firms structured as limited partnerships (27 firm-year observations) and two government-owned firms (16 firm-year observations). The final private equity sample consists of 531 distinct firms and 2,519 firm-year observations.[11]

To construct a sample of public equity firms, we identify firms in the same time period that met criteria (2) through (5). Similar to their private equity counterparts, we require that these firms have publicly traded debt exceeding $1 million. The presence of public debt in a given year is based on: (1) availability of S&P senior debt rating (Compustat item #280), (2) existence of debt debentures (#82), or (3) issuance of public debt according to the Mergent Fixed Income Securities database prior to the observation year with a maturity date beyond the observation year. Applying the above criteria results in a final sample of 3,954 distinct public equity firms (30,696 firm-year observations) with publicly traded debt.

Public equity and private equity firms may have different attributes in addition to ownership type that are likely to affect earnings quality, such as firm size. To control for the effect of these attributes, we use a matched-pair sample in some of our analyses. This sample is constructed by matching each private equity firm with a public equity firm in the same industry and of a similar size. To form this matched sample, we rank all firms in each sample (public equity and private equity) by their total assets at each year-end. We then partition the two samples into deciles to form ten firm-size portfolios. Each of the 2,519 firm-years in the private equity sample is then matched with an observation in the public equity firm sample drawn from the same size portfolio that (1) is the same year, (2) has the same three-digit SIC code, and (3) is closest in asset size to the private equity firm observation. The resulting matched pair sample consists of 538 matched pairs of private equity and public equity firm-years.

VI. RESULTS

Descriptive Statistics of the Private Equity, Public Debt Firm Sample

Table 1 provides descriptive statistics on the financial and other characteristics of the 531 firms (2,519 firm-years) in the private equity sample and the 3,954 firms (30,696 firm-years) in the public equity sample. Panel A shows the industry affiliation by type of owner. The private equity firms have a similar industry representation as the sample of public equity firms. Further, there is no particular industry clustering. However, as shown in Panel B, there are differences in the financial characteristics of the two samples of firms. Private equity firms are considerably smaller, less profitable, more leveraged, have a lower sales growth rate, are younger, and have a shorter operating cycle than publicly traded companies. However, in line with the notion that firms with a stronger financial position prefer and are capable of using the less costly and less restrictive public debt, note that private equity firms are generally financially sounder (with the exception of their sales growth) than those public equity firms that do not have public debt (firms shown in the rightmost column with private debt which are shown here for illustrative purposes but are not considered in the various tests). These characteristics are consistent with the economic reasons that prompt private equity firms to issue public debt: financing for a leveraged or management buyout.[12] Indeed, as Panel C of Table 1 indicates, private equity firms have a significantly higher

[11] To identify private equity firms, we used data in the SEC filings on the EDGAR database (since 1993) and information on 10KWizard (prior to 1993), bankruptcy information from BankruptcyData.com, and other historical information in the Hoover's database and several news resources including Factiva, ProQuest, and Lexis-Nexis.

[12] Most of the private equity firms are owned by financial sponsors (e.g., Kohlberg, Kravis Roberts & Co.), management, or a combination of the two. These owner types suggest that the impetus for these firms to issue public debt was to affect a leveraged or management buyout.

TABLE 1
Descriptive Statistics of Private Equity and Public Equity Sample Firms

Panel A: Industry Affiliation of Sample Firms by Ownership Type

	Private Equity Firms		Public Equity Firms	
Industry (two-digit SIC codes)	**No. of Obs.**	**% of Sample**	**No. of Obs.**	**% of Sample**
Mining and Construction (10–14, 15–17)	18	3.4	318	8.0
Manufacturing I (20–29)	125	23.5	849	21.5
Manufacturing II (30–39)	164	30.9	1,439	36.4
Transportation and Public Utilities (40–49)	21	4.0	158	4.0
Retail and Wholesale Trade (50–59)	117	22.0	517	13.1
Services (70–89)	84	15.8	628	15.9
Other	2	0.4	45	1.1
Total Number of Firms	531	100.0	3,954	100.0

Panel B: Financial Characteristics of the Sample Firms by Ownership Type[a]

		Private Equity Firms with Public Debt	Public Equity Firms with Public Debt	Public Equity Firms with Private Debt
Number of Firms		531	3,954	10,673
Number of Firm-Year Observations		2,519	30,696	65,772
Total Assets ($ millions)	Mean	637	1,990	128
	Median	337	483	39
Total Sales ($ millions)	Mean	803	2,087	153
	Median	405	512	41
Leverage	Mean	67.2%	32.2%	25.5%
	Median	66.5%	29.5%	21.2%
Annual Sales Growth (%)	Mean	5.6%	9.9%	15.3%
	Median	4.6%	7.2%	8.5%
Return on Assets (%)	Mean	0.2%	3.2%	−3.7%
	Median	0.9%	4.3%	2.4%
Age of Firm (years)	Mean	8.9	19.9	10.2
	Median	4.0	18.0	7.0
Operating Cycle (days)	Mean	102	135	148
	Median	96	122	128
"Big" Auditor		93.8%	93.0%	76.6%

Panel C: Debt Rating of Private Equity and Public Equity Firms

	Private Equity Firms		Public Equity Firms	
S&P Debt Rating	**No. of Obs.**	**% of Sample**	**No. of Obs.**	**% of Sample**
BBB or Better	78	3.1	7,403	24.1
BB	241	9.6	3,471	11.3
B	1,001	39.7	2,890	9.4
C–CCC	100	4.0	318	1.0
D and Selective Default	9	0.4	187	0.6
Not Rated	1,090	43.2	16,427	53.6
Total Number of Firm-Years	2,519	100.0	30,696	100.0

(*continued on next page*)

TABLE 1 (continued)

[a] The distribution of each variable is truncated at the extreme ±1% values.

Leverage = total debt/total assets;
Sales Growth = [($Sales_t/Sales_{t-1}$) − 1.0] * 100;
Return on Assets = [net income/total assets] * 100;
Age = number of years since first appearance on Compustat;
Operating Cycle Days = receivable collection period plus inventory turnover (in days); (calculated as: [yearly average accounts receivables/(total revenues/360) + yearly average inventory/(cost of goods sold/360)]); and
"Big" Auditor = percentage of firms audited by one of the big national auditing firms.

concentration of S&P-rated debt in the BB–D range, as compared to public equity firms (53.6 percent and 22.4 percent, respectively).

Accrual Persistence

We assess the persistence of accruals through Regression (1). As noted earlier, we estimate this regression from the matched-pair sample described in Section V, controlling for the endogenous nature of the choice of ownership (public versus private) using the Heckman (1979) approach.[13]

Table 2 shows the coefficients from estimating an expanded version of Regression (1) that includes an indicator variable for ownership type (private equity or public equity) and, in Panel B, three control variables: leverage, growth, and firm size. The high level of significance of virtually all of the cash flow and accrual coefficients as well as the relatively high explanatory of the regression suggest that it captures well the relation between cash flows and accruals in the current year, and the operating income in the following year, for both groups of firms.

Our focus is on the coefficients on the cash flow and accrual components of operating income as well as the difference in these coefficients between private equity and public equity firms. If the accrual component of earnings causes earnings to be relatively less persistent than the cash flow component of earnings, then the coefficients on the accrual components of earnings will be smaller than those on the cash flow component of earnings. Using an F-test to test the equality of these coefficients (that is, testing whether $q_1 = q_2$ for public equity firms and whether $(q_1 + q_4) = (q_2 + q_5)$ for private equity firms), the hypothesis that they are equal is rejected for both types of firms.

More central to our hypotheses, note that private equity firms exhibit a greater persistence of both cash flows and accruals than do public equity firms. The incremental coefficient of cash flows (q_4) is positive and significant for both the regressions in Panels A and B of Table 2. The incremental coefficient of accruals (q_5), while positive for both regressions, is statistically significant only in Panel A. These results suggest that the quality of earnings of private equity firms, as captured by earnings persistence, is at least on par with, if not better than, that of public equity firms. This is consistent with the "opportunistic behavior" hypothesis, which suggests that financial reporting by public equity firms, because of capital market and managerial compensation incentives, is more susceptible to management intervention.

[13] To obtain more efficient estimates for the cash flow and accrual variables, we also estimate Regression (1) augmented by variables that are likely to relate to future profitability (i.e., leverage, sales growth, and firm size).

TABLE 2
Persistence of Accruals Results from Estimating Regression (1)

$$OI_{t+1} = q_0 + q_1 * CF_t + q_2 * ACCR_t + q_3 PRIVATE + q_4 * PRIVATE * CF_t + q_5 * PRIVATE * ACCR_t + \varepsilon_t$$ [a]

	Panel A: Primary Variables		Panel B: Primary Variables and Additional Control Variables	
Variable	**Coefficient**	**t-statistic**	**Coefficient**	**t-statistic**
Intercept (q_0)	0.031	3.64***	0.015	0.82
CF_t (q_1)	0.797	26.49***	0.783	24.67***
$ACCR_t$ (q_2)	0.689	25.04***	0.638	18.14***
PRIVATE (q_3)	0.002	0.13	0.029	1.67*
PRIVATE * CF_t (q_4)	0.122	2.86***	0.132	3.10***
PRIVATE * $ACCR_t$ (q_5)	0.071	1.68*	0.061	1.48
LAMBDA	0.007	0.63	−0.005	−0.37
PRIVATE * *LAMBDA*	−0.015	−1.02	−0.023	−1.56
$LEVERAGE_t$			−0.035	−2.05***
$GROWTH_t$			0.084	2.93***
$SIZE_t$			0.003	1.26
Adjusted R^2	65.47%		67.97%	
Statistical Tests:				
F-test: $q_4 = q_5$	4.1**		7.6***	
F-test: $q_1 = q_2$	36.7***		36.1***	
F-test: $(q_1 + q_4) = (q_2 + q_5)$	77.1***		83.1***	
Number of Observations	896		865	

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively.

[a] This regression is an expanded version of Regression (1) that incorporates the ownership type (public or private equity). It is estimated on the 538 firm-years in the matched-pair sample.

Variable Definitions:

OI_{t+1} = operating income after depreciation deflated by NOA in year t;
$ACCR_t$ = change in net operating assets from year $t-1$ to t, deflated by NOA in year $t-1$;
CF_t = operating profit after depreciation in year t divided by NOA in year $t-1$, minus $ACCR_t$;
$PRIVATE_t$ = indicator variable set to 1 for private equity firms and 0 for public equity firms;
$LEVERAGE_t$ = total debt divided by total assets at the end of year t;
$GROWTH_t$ = growth in total assets at the end of year t;
NOA = net operating assets computed as the book value of common and preferred equity plus long-term debt minus financial assets plus minority interest; and
LAMBDA = following Heckman (1979), a probit model is estimated with size (alternatively defined as total assets or sales), growth (in sales), leverage, profitability (operating income divided by net operating assets), the quick ratio, age, length of the operating cycle, and audit quality (an indicator for the big national accounting firms) as predictors; estimates of the probit model are used to compute an inverse Mills ratio for each firm; this ratio is included in Regression (1) as a control variable along with an interactive variable, *PRIVATE* * *LAMBDA*, to allow the coefficient to vary between the two groups of firms.

Estimation Error in the Accrual Process

The estimation error in the accrual process is gauged by the variability of the accruals that remain unexplained by Regression (2). We estimate this regression cross-sectionally within each industry separately for public equity and private equity firms. The separate

estimation is needed because the basic relationship between accruals and cash flows may differ across the two types of firms.

The results from estimating this regression are provided in Table 3 for the full sample and for the 23 industries that had a sufficient number (at least 20) of both public equity and private equity firms to perform the analysis. The table presents the mean values of the estimation errors; the median values (not reported) are not significantly different from the mean values.

Examining the first row of results, note that for the overall sample both measures of variability, the standard deviation of the residuals shown in columns 1 and 3 (2.57 percent and 4.05 percent, respectively) and the ratio of this standard deviation to the standard deviation of total current accruals shown in columns 2 and 4 (47.15 percent and 61.91 percent, respectively), are significantly higher for public equity firms as compared with private equity firms. Both of these differences are statistically significant as shown in columns 5 and 6. Significant differences also exist at the industry level. As indicated by the industry differences shown in column 5, for the majority of industries (21 of 23), the standard deviation of the residuals from Regression (2) (the unexplained accrual variability) is higher for public equity firms than for those with private equity. Similar results characterize the ratio of the standard deviation of the regression residuals to the standard deviation of the total current accruals (the dependent variable), as shown in column 6. Both differences are statistically significant in 13 of the industries and are further confirmed by a number of nonparametric tests.

These results indicate that public equity firms exhibit significantly greater accrual variability as well as relative accrual variability (that is a higher ratio of the standard deviation of residuals from Regression (2) to that of total current accruals) than their privately owned peers operating in the same industries.

As a robustness check, we re-estimate Regression (2) including controls for size (alternatively defined as total assets or sales), growth in sales, leverage, profitability (RNOA), firm age, audit quality, and operating cycle. The main results remain intact.

Based on these results, we conclude that the accrual estimation of public equity firms is of a lower quality than that of private equity firms. This is consistent with our earlier findings on the persistence of accruals, and lends further support to the ''opportunistic behavior'' hypothesis.

Absence of Earnings Management

As explained in Section IV, we identify the presence of earnings management in the two groups of firms using two tests. The first test is based on the distributional properties of earnings around two earnings thresholds: zero earnings and zero earnings growth. We refer to this test as the ''threshold analysis.'' The second test is based on the sign and magnitude of unexpected accruals of those observations that fall just above the two earnings thresholds.

The two compared groups of firms, those with private equity and those with public equity, may have different industry and operational characteristics that could potentially affect the earnings distribution around the thresholds and influence our inferences. To control for these characteristics, we conduct the threshold analysis using a matched-pair approach. Specifically, we match each of the private equity firm-years with an observation in the public equity firm sample that occurs (1) in the same year, (2) has the same three-digit SIC code, and (3) is closest in the probability of being private to the private equity firm observation. We estimate the probability of being private from the PROBIT model described in Section IV. The resulting sample consists of 1,193 pairs of matched firm-years.

TABLE 3
Mean Values of the Estimation Error of the Accrual Process Variability and Relative Variability of the Residuals from Regression (2)

$$TCA_t = \beta_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta Rev_t + \beta_5 PPE_t + \beta_6 DCFO_t + \beta_7 DCFO_t * CFO_t + \varepsilon_t$$

	Private Equity Firms			Public Equity Firms			Difference between Public Equity and Private Equity Firms	
Industry (two-digit SIC)	No. of Obs.	(1) Std Dev. of Residuals	(2) Ratio of S.D.[a]	No. of Obs.	(3) Std Dev. of Residuals	(4) Ratio of S.D.[a]	(5) = (3) − (1) Difference in Std Dev. of Residuals	(6) = (4) − (2) Difference in Ratio of S.D.[a]
All Obs.	843	2.57%	47.15%	13,527	4.05%	61.91%	1.48%***	14.76%***
22	26	1.45	28.79	306	4.17	57.97	2.73***	29.18***
23	27	3.35	50.58	272	5.21	56.19	1.86	5.60
25	22	4.17	67.03	294	3.61	51.13	−0.56	−15.91
27	41	1.41	51.13	508	3.90	62.86	2.48***	11.72
28	61	2.60	58.53	1,878	4.22	72.44	1.62***	13.91**
30	25	2.24	32.24	496	3.76	63.39	1.53	31.15***
33	24	2.87	48.45	855	3.79	64.36	0.92**	15.90
34	39	2.59	44.18	627	4.46	62.84	1.87***	18.67**
35	43	3.06	47.23	1,716	5.12	67.38	2.05***	20.14***
36	27	2.97	44.65	1,710	5.08	64.07	2.11**	19.43**
37	59	4.23	68.40	951	4.14	60.63	−0.09	−7.76
42	36	1.75	34.61	170	2.44	58.53	0.69	23.92***
47	23	0.70	44.58	46	3.07	51.76	2.37***	7.17

(*continued on next page*)

TABLE 3 (continued)

Industry (two-digit SIC)	Private Equity Firms			Public Equity Firms			Difference between Public Equity and Private Equity Firms	
	No. of Obs.	(1) Std Dev. of Residuals	(2) Ratio of S.D.[a]	No. of Obs.	(3) Std Dev. of Residuals	(4) Ratio of S.D.[a]	(5) = (3) − (1) Difference in Std Dev. of Residuals	(6) = (4) − (2) Difference in Ratio of S.D.[a]
50	54	3.12	49.23	658	4.74	53.43	1.63***	4.20
51	27	2.07	23.23	392	4.00	50.17	1.93**	26.94***
53	20	3.21	45.58	383	3.61	53.43	0.40	7.85
54	60	1.76	50.08	312	2.35	61.70	0.59**	11.62*
58	65	3.11	54.51	286	3.48	70.62	0.37	16.11**
59	27	1.28	25.78	414	4.92	67.01	3.65***	41.22***
70	24	2.31	60.94	135	2.51	62.58	0.20	1.63
73	34	2.65	47.53	651	5.72	76.27	3.07***	28.74***
79	30	1.77	45.67	298	3.23	70.02	1.45**	24.35***
87	49	4.45	61.50	169	5.55	65.28	1.10	3.78

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively. Significance is determined using an F-test for equality of variances.

[a] Ratio of S.D. refers to the ratio of the standard deviation of the residuals from estimating Regression (2) (in the previous column) divided by the standard deviation of total current accruals.

Variable Definitions:

TCA_t = total current accruals computed as $\Delta CA - \Delta CL - \Delta Cash + \Delta STDEBT$; *CA* is current assets, *CL* is current liabilities, and *STDEBT* is the current portion of long-term debt, and changes are computed from year $t-1$ to year t;

CFO_t = cash flow from operations computed as income from continuing operations in year t minus total accruals in year t where total accruals in year t equals TCA_t − depreciation and amortization in year t;

ΔRev_t = change in revenues from year $t-1$ to year t;

PPE_t = PPE (gross) in year t; and

$DCFO_t$ = indicator variable that is set to 1 if $CFO_t < 0$, and to 0 otherwise.

Table 4 presents the results of the threshold analysis using this matched-pair sample. These results are for earnings thresholds, where earnings are defined as income from continuing operations[14] and to intervals just above and just below the thresholds that correspond to two bin-widths using the bin definition employed by Degeorge et al. (1999).[15]

Panels A and B of Table 4 indicate that, for public equity firms, the actual frequency of cases just below (just above) the zero threshold of both earnings levels and earnings changes is lower (higher) than the expected frequency for that interval. The standardized difference between the expected and actual frequency, which under the null hypothesis would be distributed approximately Normal (0,1), is larger than 4.22 for the ''just-above''

TABLE 4
Frequency Distribution of Earnings around Zero-Earnings and Zero-Earnings-Growth Thresholds[a]

Panel A: Zero Earnings Threshold (number of observations = 1,193 matched pairs)

	Private Equity Firms			Public Equity Firms		
	Frequency of Observations			Frequency of Observations		
Interval[b]	Actual	Expected[c]	Standardized Difference[d]	Actual	Expected	Standardized Difference
Just below zero	211	202	0.59	101	160.5	−4.34
Just above zero	285	209.5	4.89	244	182	4.22

Panel B: Zero Earnings Growth Threshold (number of observations = 792 matched pairs)

	Private Equity Firms			Public Equity Firms		
	Frequency of Observations			Frequency of Observations		
Interval	Actual	Expected	Standardized Difference	Actual	Expected	Standardized Difference
Just below zero	145	155	−0.78	117	140.5	−1.91
Just above zero	240	131.5	8.68	208	109	8.40

[a] In Panel A, the distribution of income from continuing operations in year t divided by total assets at the end of year $t-1$ (Income/Total Assets) is examined to assess potential earnings management around this threshold. In Panel B, the distribution of the change in income from continuing operations from year $t-1$ to year t divided by total assets at the end of year $t-2$ (ΔIncome/Assets) is examined.

[b] Following Degeorge et al. (1999), the bin width is calculated as $2 * 2(\text{IQR})n^{-1/3}$, where IQR is the sample inter-quartile range and n is the number of observations. The resulting bin width for the distribution of Income/Assets and ΔIncome/Assets is 0.028 and 0.020, respectively.

[c] The expected frequency in the interval is computed as the average of the number of observations in the two adjacent intervals.

[d] The standardized difference is the difference between the actual and expected frequency in the interval, divided by the standard deviation of the difference. The standard deviation of the difference is computed as the square root of $[n * P_i * (1 - P_i) + (1/4) * N * (P_{i-1} + P_{i+1})(1 - P_{i-1} - P_{i+1})]$, where N is the total number of observations and P_i is the probability that an observation will fall into interval i (see Burgstahler and Dichev 1997).

[14] Although this definition most likely corresponds to the threshold that investors and management emphasize, we repeated the threshold analysis using both bottom-line net income and operating income. The findings were essentially the same.

[15] The determination of the width of the interval represents a tradeoff between fineness and precision and relies in part on the examination of the earnings distribution around the threshold. For further discussion of the ''bin width'' see Dichev and Skinner (2002, 1108). The use of single-bin-width intervals leads to very similar results.

regions. This finding, which is comparable with previous findings (e.g., Burgstahler and Dichev 1997), is consistent with upward earnings management in cases that otherwise would have fallen slightly short of the earnings thresholds.

While there is a significant excess concentration of cases ''just above'' the threshold for public and private firms, the shift from ''just below'' to ''just above'' the threshold is more pronounced for the public equity firms. In fact, there is not a significant underrepresentation of cases in the interval ''just below'' either of the examined thresholds for private equity firms, as indicated by the 0.59 and −0.78 standardized differences. This last finding makes the interpretation of the concentration of cases in the ''just above'' interval as a manifestation of earnings management less obvious for privately owned companies.

If earnings management takes the form of converting small losses to zero or small profits (or converting small earnings declines to the same earnings levels or small earnings increases), then we would expect to observe abnormal positive accruals in the interval just above the threshold. Table 5 shows the extent of abnormal accruals in that interval.

To more precisely pinpoint earnings management cases, we examine the percentage of the positive unexpected accruals cases for which these accruals' magnitude was sufficiently positive so as to turn what would have otherwise been a loss into a small profit (or to offset what would otherwise be an earnings decrease). Table 5 shows the proportion of cases in the ''just above zero'' interval for which the amount of unexpected positive accruals was larger than the amount by which reported income exceeded the threshold.

Two main findings emerge from this analysis. First, the percentage of cases with positive unexpected accruals in the interval just above the threshold is higher for the public equity firms than for the private equity firms. As shown on the first row of the results, 42.7 percent of the public equity observations classified as being in the ''just above zero'' interval of the earnings distribution contain unexpected positive accruals, while 39.5 percent of the private equity firms in this interval had unexpected positive accruals. This difference of 3.2 percent is not statistically significant. However, the difference pertaining to the ''zero earnings change'' threshold shown in Table 5, Panel B of 15.9 percent is statistically significant at the 1 percent level. The other finding that emerges from this analysis is that, among the cases with positive unexpected accruals that fall in the ''just above zero'' range, the frequency of cases in which unexpected accruals alone explain the excess of earnings over the threshold is larger for the public equity than for the private equity firms. To illustrate, for public equity observations, the magnitude of the unexpected accruals was sufficient to turn a loss into a profit for 28.4 percent of the cases and to turn an earnings decrease into an earnings increase for 46.1 percent of the cases. The corresponding percentages for the private equity firms are lower, 25.3 percent and 36.1 percent, respectively. The difference between the two groups in the percentage of cases where abnormal positive accruals were large enough to enable the firm to meet the threshold of zero or positive earnings growth is significant at the 1 percent level.

Table 5 also presents the magnitude of unexpected accruals (standardized by total assets) in the regions just above the zero threshold (as shown in the last line of each panel). The mean and median values of the public equity firms' unexpected accruals are more positive than those of the private equity firms. The overall tenor of the results in Table 5 is consistent with more pronounced earnings management for public equity firms, in line with the ''opportunistic behavior'' hypothesis.[16]

[16] Repeating the analysis in Table 5 using different bin-widths or using the full sample produces similar results.

TABLE 5
Unexpected Accruals Behavior in the "Just above Zero" Interval[a]

Panel A: Zero Earnings Threshold (number of observations = 1,108 matched pairs)[b]

	Percentage of Observations[c]		
	Private Equity Firms	**Public Equity Firms**	**Difference in Percentage of Observations**
Percentage of Cases with Positive Unexpected Accruals[c] (out of all cases in the interval; no. of observations equals 225 and 261 for public equity and private equity firms, respectively)	39.5%	42.7%	3.2%
Percentage of Cases with Positive Unexpected Accruals Larger than the Excess over the Threshold[d] (out of all cases in the interval)	25.3%	28.4%	3.2%
Mean (Median) Unexpected Accruals Standardized by Total Assets	−0.43% (−0.72%)	−0.31% (−0.37%)	0.11% (0.35%)

Panel B: Zero Earnings Growth Threshold (number of observations = 740 matched pairs)

	Percentage of Observations[c]		
	Private Equity Firms	**Public Equity Firms**	**Difference in Percentage of Observations**
Percentage of Cases with Positive Unexpected Accruals[c] (out of all cases in the interval; no. of observations equals 191 and 216 for public equity and private equity firms, respectively)	41.7%	57.6%	15.9%***
Percentage of Cases with Positive Unexpected Accruals Larger than the Excess over the Threshold[d] (out of all cases in the interval)	36.1%	46.1%	10.0%***
Mean (Median) Unexpected Accruals Standardized by Total Assets	−0.58% (−0.78%)	0.63% (0.68%)	1.22%*** (1.46%)***

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively. Statistical significance is assessed using the t-test for differences in proportions.

[a] The interval just above (just below) zero is defined as the first positive (first negative) "bin" of the distribution. The bin widths are 0.028 and 0.020 for the distributions of Income/Total Assets and ΔIncome/Assets, respectively. Bin widths (BW) are determined by the formula: $2 * BW = 2 * 2(IQR)n^{-1/3}$, where IQR is the sample inter-quartile range and n is the number of observations.

[b] In Panel A, the distribution of income from continuing operations in year t divided by total assets at the end of year $t-1$ (Income/Total Assets) is examined to assess potential earnings management around this threshold. In Panel B, the distribution of the change in income from continuing operations in from year $t-1$ to year t divided by total assets at the end of year $t-2$ (ΔIncome/Assets) is examined.

[c] Unexpected accruals are derived from the cross-sectional modified Jones model (see Section IV). To control for the asymmetric recognition of gains and losses, we augmented the modified Jones model with the following independent variables: cash flow from operations in year t (CF_t), an indicator variable set to 1 if $CF_t < 1$ and 0 otherwise (DCF_t), and an interactive variable, $CF_t \times DCF_t$ (Ball and Shivakumar 2006).

[d] Cases where the threshold would not have been met in the absence of positive unexpected accruals.

Conservatism

As explained in Section IV, we measure conservatism by the differential timeliness of loss versus gain recognition, referred to in the literature as ''conditional conservatism.'' We employ a measure proposed by Basu (1997) as well as an accrual-based model used by Ball and Shivakumar (2005) to assess the extent of such conservatism in the two groups of firms, and to further account for possible endogeneity. The results from estimating Regressions (3) and (4) are presented in Tables 6 and 7, respectively. The coefficients of interest in Regression (3) are those relating to the differential persistence of earnings declines versus earnings increases (a_3 for public equity firms and $a_3 + a_7$ for private equity firms) as well as the difference in this differential between these two groups of firms (a_7). We evaluate two earnings measures, net income and income from continuing operations.

Two main results are evident from the results presented in Table 6. First, consistent with previous research, financial reporting in general is conservative. Earnings increases are significantly more persistent than earnings decreases for both groups of firms. Both a_3 for public equity firms and $a_3 + a_7$ for private equity firms are negative and statistically significant for the earnings measures (a_3 of -0.537 for both earnings measures and $a_3 + a_7$ of -0.181 and -0.286 for the two earnings measures, respectively). Second, the extent of conservatism is greater for public equity firms as compared to that of private equity firms. The coefficient a_7, which indicates the excess persistence of earnings declines over earnings increases for public equity firms, is positive (0.357 and 0.251 for the two earnings measures, respectively) and statistically significant. Note that the coefficient of the inverse Mills variable (*LAMBDA*) is significant for both types of firms, suggesting the presence of, and appropriateness of controlling for, endogeneity.

Table 7 presents the results from Regression (4), in which accruals are regressed on contemporaneous cash flow variables. The coefficient of *CFO*, b_2, is significantly negative, indicating the strong role that accruals play in mitigating the noise in operating cash flows. The coefficient of the interactive variable *DCFO* * *CFO*, b_3, is significantly positive, suggesting that accruals are less negatively correlated with earnings in periods with ''bad news'' (as gauged by negative cash flows), suggesting a more timely incorporation of bad news as compared to good news in earnings. The coefficient of *PRIVATE* * *DCFO* * *CFO*, b_7, our variable of interest, is significantly negative at the 1 percent significance level, indicating a greater degree of conservative reporting by public equity firms as compared to private equity firms. These results confirm the findings regarding conditional conservatism reported in Table 6.

These results are consistent with those reported by Ball and Shivakumar (2005) for private and public companies in the U.K. We interpret this finding as indicating that public equity firms, because of their greater exposure to litigation risk and more severe agency problems, report more conservatively than do private equity firms in the sense of a more pronounced earlier recognition of losses relative to gains.

Prior research suggests that the extent of conditional conservatism may be related to the degree of unconditional conservatism. Since unconditional conservatism is also likely to be driven by certain firm characteristics (e.g., intensity of investment in intangible assets) that may vary between public and private firms, we control for unconditional conservatism in testing for differences in conditional conservatism between public and private firms. We accomplish this control by estimating for each firm the amount of its ''hidden'' reserves, as captured by the Q-score devised by Penman and Zhang (2002) that gauges the difference

TABLE 6
Differential Persistence of Profits versus Losses by Firm Ownership Type
Summary Results for Expanded Version of Regression (3):

$$\Delta NI_t = a_0 + a_1 * D\Delta NI_{t-1} + a_2 * \Delta NI_{t-1} + a_3 * D\Delta NI_{t-1} * \Delta NI_{t-1} + a_4 * PRIVATE + a_5 * PRIVATE * D\Delta NI_{t-1} + a_6 * PRIVATE * \Delta NI_{t-1} + a_7 * PRIVATE * D\Delta NI_{t-1} * \Delta NI_{t-1} + e_t$$

			Earnings Measure			
			Net Income		Income from Continuing Operations	
Variable[a]	(Coefficient)	Predicted Sign under Conservatism and the "Demand" Hypothesis	Coefficient	t-statistic	Coefficient	t-statistic
Intercept	(a_0)	?	0.002	2.82***	0.002	2.72***
$D\Delta NI_{t-1}$	(a_1)	?	−0.012	−8.99***	−0.010	−8.48***
ΔNI_{t-1}	(a_2)	0	−0.067	−5.20***	0.008	0.65
$D\Delta NI_{t-1} * \Delta NI_{t-1}$	(a_3)	−	−0.537	−27.9***	−0.537	−27.7***
PRIVATE	(a_4)	?	−0.015	−2.91***	−0.015	−3.34***
PRIVATE * $D\Delta NI_{t-1}$	(a_5)	?	−0.005	−1.45	0.000	−0.08
PRIVATE * ΔNI_{t-1}	(a_6)	−	−0.253	−7.04***	−0.194	−4.72***
PRIVATE * $D\Delta NI_{t-1} * \Delta NI_{t-1}$	(a_7)	+	0.357	6.30***	0.251	3.89***
$a_3 + a_7$[b]		−	−0.181	4.93**	−0.286	9.98***
LAMBDA	(a_8)		0.067	18.12***	0.055	17.59***
PRIVATE * *LAMBDA*	(a_9)		−0.055	−13.74***	−0.045	−12.88***
Adjusted R^2			10.44%		7.75%	
Number of Observations			21,501		21,441	

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively.

[a] Each variable is truncated at the extreme +/−1 percent values of its distribution.

[b] The F-test is used to test the hypothesis that $a_3 + a_7 = 0$.

Variable Definitions:
ΔNI_t = change in the earnings measure from year $t-1$ to year t, divided by total assets at the end of year $t-1$;
$D\Delta NI$ = indicator variable which is set to 1 if $\Delta NI_{t-1} < 0$, and 0 otherwise;
PRIVATE = indicator variable which is set to 1 for private equity firms and 0 for public equity firms; and
LAMBDA = see the description provided in Table 2.

TABLE 7
Conservatism Measured as the Relative Timeliness of Recognizing Losses versus Gains
Summary Results for the Expanded Version of Regression (4):

$$ACC_t = b_0 + b_1 * DCFO_t + b_2 * CFO_t + b_3 * DCFO_t * CFO_t + b_4 * PRIVATE + b_5 * PRIVATE * DCFO_t + b_6 * PRIVATE * CFO_t + b_7 * PRIVATE * DCFO_t * CFO_t + e_t$$

Variable[a]	(Coefficient)	Predicted Sign	Coefficient	t-statistic
Intercept	(b_0)	?	0.002	1.82*
DCFO$_t$	(b_1)	?	0.008	3.90***
CFO$_t$	(b_2)	−	−0.442	−58.12***
DCFO$_t$ * *CFO*$_t$	(b_3)	+	0.103	3.63***
PRIVATE	(b_4)	?	−0.071	−15.73***
PRIVATE * *DCFO*$_t$	(b_5)	?	−0.018	−2.41**
PRIVATE * *CFO*$_t$	(b_6)	?	−0.068	−2.28**
PRIVATE * *DCFO*$_t$ * *CFO*$_t$	(b_7)	−	−0.340	−2.83***
$a_3 + a_7$[b]		?	−0.237	4.12**
LAMBDA	(b_8)	?	0.127	41.67***
PRIVATE * *LAMBDA*	(b_9)	?	−0.096	−23.21***
Adjusted R^2			26.12%	
Number of Observations			21,405	

*, **, *** Significant at the 0.10, 0.05, and 0.01 levels, respectively.

[a] Each variable in the table is truncated at the extreme +/−1 percent values of its distribution.

[b] The F-test is used to test the hypothesis that $a_3 + a_7 = 0$.

Variable Definitions:

ACC$_t$ = total accruals divided by total assets at end of year $t-1$; for years 1988–2003, total accruals equal [income before extraordinary items − net cash flow from operating activities + extraordinary items and discontinued operations] divided by total assets at end of year $t-1$. For years prior to 1988 total accruals equal [change in current assets in year t − change in current liabilities in year t − change in cash and cash equivalents in year t + change in current maturities of long-term debt and other short-term debt included in current liabilities in year t − depreciation and amortization expense in year t]. Firm-year observations with the following events were eliminated: (1) a merger or acquisition, (2) discontinued operations where the absolute value of the dollar impact exceeded $10,000; (3) a gain or loss on foreign currency translations where the absolute value of the dollar impact exceeded $10,000; see Hribar and Collins (2002) for a discussion of this approach;

CFO$_t$ = cash flow from operations divided by total assets at the end of year $t-1$; for years 1988–2003, net cash flow from operating activities was used. For years prior to 1988, net cash flow from operating activities was estimated as: [funds from operations − change in current assets in year t + change in cash and cash equivalent in year t + change in current liabilities in year t − change in current maturities of long-term debt and other short-term debt included in current liabilities in year t]. All variables are divided by total assets at end of year $t-1$; see Xie (2001) for a discussion of this approach;

DCFO$_t$ = indicator variable set to 1 if *CFO*$_t < 0$, and 0 otherwise;

PRIVATE = indicator variable set to 1 for private equity firms and 0 for public equity firms; and

LAMBDA = see the description provided in Table 2.

in the ratio of the hidden reserves to total assets between the firm and its industry.[17] Controlling for unconditional conservatism, we continue to find a greater degree of conditional conservatism among public firms.

Can Conservatism Co-Exist with Earnings Management?

The findings discussed above suggest that public equity firms report more conservatively than their private equity counterparts, consistent with the finding of Ball and Shivakumar (2005) for U.K. firms. At the same time, public equity firms have a greater propensity to manage income, in line with the results of U.S. firms in the banking industry reported by Beatty et al. (2002). The question arises as to whether these two findings are contradictory.

Empirically, the finding of greater conditional conservatism, that is, a more pronounced asymmetric response of earnings to bad versus good economic news, is not necessarily inconsistent with the presence of income-increasing earnings management. First, note that earnings management is situational, or episodic: it is likely to occur in situations in which unmanaged earnings would fail to meet a reporting objective considered by management to be important (such as meeting analysts' earnings forecasts, loss avoidance, or earnings decrease avoidance). If the company's accounting is generally conservative, earnings management will only temporarily interrupt the observed reporting pattern, and is therefore unlikely to render the reporting pattern to be aggressive overall. Second, earnings management typically involves small magnitudes of earnings, both because the positive accruals needed for such an activity are in short supply (Barton and Simko 2002) and because large-scale earnings management is more easily detected and undone by investors. This is why studies on earnings management consider likely earnings management cases to be those where earnings are ''just above'' the earnings threshold. Because of their small magnitude, the presence of instances of earnings management in the data is unlikely to obscure the presence, if any, of the much more prevalent phenomenon of reporting conservatism.

Note also that the presence of *unconditional* conservatism tends to increase the likelihood of earnings management because the reserves of accruals generated by this type of conservatism make it easier to engage in earnings management in case of the ''need'' to beat a particular threshold (Penman and Zhang 2002).

To more directly examine the coincidence of earnings management and conservative reporting, we perform two tests. First, we test the extent of earnings management (per our analysis in Table 4) for subsamples of firms that exhibit different levels of conditional conservatism. Specifically, we rank firms by their degree of conditional conservatism (as captured by the coefficient α_3 in Regression (3)) and partition them into quintiles. The

[17] Following Penman and Zhang (2002), the firm's hidden reserves are estimated by the C-score, which equals the sum of the value of the LIFO reserve, the research and development reserve (calculated as the estimated value of R&D assets that would have been reported on the balance sheet had R&D not been expensed), and the advertising reserve (estimated as the brand assets created by advertising expenditures). This sum is standardized by the value of net operating assets at the end of the prior year as previously defined. To determine the (hypothetical) R&D assets, we ''capitalize'' the annual R&D expenditures and amortize them using the sum-of-the-years' digits method over a five-year period. Similarly, we estimate the advertising reserve by ''capitalizing'' advertising expenses and amortizing them using the sum-of-the-years' digits method over a two-year period. The Q-score is calculated as the firm's C-score minus the median C-score of the firm's industry where industry is defined based on the two-digit SIC code. We rank firms by their Q-score and define an indicator variable that partitions the firms based on whether they are above or below the median of the Q-score distribution. Through the use of interactive indicator variables, we obtain the equivalent of a separate estimation of Regressions (3) and (4) for firms below and above the median Q-score value.

results (not tabulated) show no difference in the presence of earnings management across the conservatism quintiles.

The second test involves a simulation analysis in which we inject earnings-increasing components into earnings data generated by a process that conforms to conditional conservatism. Specifically, conservative behavior is introduced by modeling earnings as responding promptly and proportionally to contemporaneous negative economic shocks but not to contemporaneous positive economic shocks.[18] Earnings management is introduced to the simulation by adding a positive increment to unmanaged earnings whenever their value is just below zero, so as to avoid a loss. The results (not tabulated) show that the observed level of conservatism does not decrease when earnings management instances are present.

VII. CONCLUDING REMARKS

The findings of this study illustrate that both management incentives and demand by investors for earnings quality are important factors that shape the financial reporting of firms. Public ownership of the firm's equity exposes management to investors' demand for reporting quality. This demand, which is expressed by investors in the form of the regulatory and legal environment in which public equity firms operate, could lead to higher reporting quality (the ''demand'' hypothesis). At the same time, our findings support the notion that management of firms whose equity is publicly traded has stronger incentives to manage earnings, thus reducing the reliability and usefulness of financial reports. That is, the findings are more consistent with the ''opportunistic behavior'' hypothesis. We further find that public equity firms report more conservatively than privately held firms, although this result does not necessarily imply a higher quality of reporting for the former group of firms.

While we use the current methodology to measure the various proxies for earnings quality, these proxies are still subject to potential measurement errors. However, we are unaware of any systematic bias that these measurement errors introduce in our comparative analysis of the effect of ownership type on earnings quality. Overall, while public equity and private equity firms differ along various quality and financial attributes dimensions, neither type of firm dominates the other as having the higher quality of financial reports. Unless weights are assigned to different dimensions of earnings quality and attributes, one cannot conclude that the public listing of a firm's equity necessarily improves the quality of its financial reporting.

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[18] The simulation analysis uses the approach described in Givoly et al. (2007, Appendix A) for single-event periods. The degree of conservatism is assessed by the coefficient of the interactive indicator variable in the regression of return on earnings and an interactive variable of the return and an indicator variable that receives the value of 0 (1) when the return is not negative (is negative) (see Basu 1997). The estimates are based on earnings data generated by 100,000 iterations of an earnings generating process whereby earnings respond immediately to negative, but not positive, economic shocks. In order to determine whether earnings management alters the observed level of conditional conservatism, the simulation is conducted twice, once where earnings management in the form of loss avoidance exists and a second time where this form of earnings management does not exist.

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