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Information consequences of accounting conservatism*

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ABSTRACT

We study the information consequences of conservatism in accounting. Prior research shows that information asymmetries in capital markets lead to firm-level increases in conservatism. In this paper, we further argue that increases in conservatism improve the firm information environment and lead to subsequent decreases in information asymmetries between firm insiders and outsiders. We predict and test if this decrease in information asymmetries manifests itself through: (a) a decrease in the bid-ask spread and in stock returns volatility, and (b) an improved information environment for financial analysts, leading to more precise and less dispersed forecasts, and to more analysts following the firm. Using a large US sample for the period 1977-2007 and several proxies for conservatism we find robust evidence consistent with our expectations. Our results are in line with conservatism being useful not only for debt-holders, but also for equity-holders.

Keywords: *Accounting conservatism, asymmetric reporting, information asymmetry, information precision.*

Data Availability: *Data is available from the sources identified in the paper.*

JEL Classification: *G10, G38, M41.*

1. Introduction

We study the information consequences of conservatism in accounting. In particular, we analyze whether conservatism reduces information asymmetries between firm insiders and outside equity investors. In doing so, we try to shed light into the controversial issue of whether conservative accounting is useful for equity holders.

Conservatism in accounting leads to the recognition of losses in a timelier manner than gains (Basu, 1997). In recent years, both the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB) have opposed the notion of conservatism, regarding neutrality as a higher order objective than prudence (FASB, 2008; Crump, 2013).[1] It has been argued that conservatism may introduce a bias of an unknown magnitude into accounting numbers, thereby increasing information asymmetry amongst financial statements users. This opposition of FASB and IASB has resulted in conservatism no longer being considered a desirable qualitative characteristic of accounting in their joint conceptual framework (FASB, 2010; IASB, 2010).

Contrary to this view, a significant body of academic research provides evidence that conservatism plays an important economic role in debt contracting, benefiting both lenders and borrowers (Ahmed *et al*., 2002; Ball *et al*., 2008b; Beatty *et al*., 2008; Wittenberg-Moerman, 2008; Zhang, 2008; Göx and Wagenhofer, 2009, 2010; Nikolaev, 2010; Gormley *et al.*, 2012). This prior work shows that conservatism increases the debt-contracting value of accounting information and reduces information asymmetries between borrowers and lenders, and also, amongst lenders. In particular, the work of Ball *et al*. (2008a), analyzing the

[1] In particular, the FASB's Exposure Draft for the conceptual framework dated May 29, 2008, in its paragraph BC2.21, contains an explanation about the negative effects of conservatism that make neutrality a higher order characteristic of accounting information than prudence.

syndicated loan market shows that conservatism enhances transparency, contributing to more efficient debt contracting.

Despite this mounting body of research on the contracting benefits of conservatism, the evidence as to whether conservatism benefits stockholders and other users of financial information is more limited. Attempts at reconciling the role of conservatism for debt contracting with its role in other types of contracting and, particularly, in valuation, are scarce (see, e.g., O'Connell, 2006; Beja and Weiss, 2006). Thus, whether the aggregate consequences of conservatism are beneficial for capital markets as a whole remains a controversial issue. Particularly, given that conservatism delays the incorporation of difficult-to-verify gains in the income statement, it could be argued that it might lead to increased information asymmetries about the future positive prospects of the firm. Then, if the benefits of conservatism are limited to contracting, and particularly, to debt-contracting, it could be argued that there is no need to impose conservatism into general purpose financial statements, because financial statement users could make conservative adjustments to general purpose (neutral) financial statements for debt contracting purposes if needed (Kothari *et al*., 2010).

To shed some light into this issue, in this paper, we evaluate the informational properties of accounting conservatism, focusing on whether conservatism reduces information asymmetries between firm insiders and outside equity holders. In the study that is closest to our research, LaFond and Watts (2008) report a positive association between conservatism and the existence of information asymmetries. Khan and Watts (2009) also document this association using an event study that leads them to conclude that an increase in information asymmetry leads to an increase in conservatism. These authors interpret this positive association as evidence that conservatism appears as a reaction to the existence of information asymmetries. However, they do not address the issue of whether the information

environment of the firm subsequently improves, nor do they provide evidence that stockholders face less information asymmetry once firms increase conservatism.

Our study thus differs from those of LaFond and Watts (2008) and Khan and Watts (2009) in that we do not look at whether managers react to the existence of information asymmetries by increasing conservatism, but at the consequences of conservatism on information. We focus on information effects to better understand the benefits of conservatism for equity markets, which are not yet well understood.

We expect that conservatism decreases information asymmetries between managers and investors, allowing investors to better assess the future firm performance. We argue that conservatism triggers these improvements through a number of channels: directly, by limiting earnings management and permitting other sources of information to flourish, and more indirectly, through increased investment efficiency.

Regarding the first channel –the decrease in earnings management and the impact on other information channels–, managers have incentives to bias financial reports upwards, and this manipulation obfuscates the information content of the earnings signal (Rajgopal and Venkatachalam, 2011). The idea that conservatism constrains earnings management is a common assumption in prior research (i.e. Watts, 2003, Guay and Verrecchia, 2006) that is supported by both analytical and empirical evidence (Chen *et al*., 2007; García Lara *et al*., 2012; Gao, 2013). By constraining earnings management, conservatism is predicted to contribute to reduce information asymmetries between managers and investors and to increase the precision of the earnings signal. In addition, given that conservatism introduces constraints to the recognition of difficult-to-verify gains in the financial statements, managers will use other *softer* information channels to provide timely information on unrealized gains (LaFond and Watts, 2008). Thus, a conservative reporting system, through the recognition of

difficult-to-verify losses in the financial statements and the disclosure of difficult-to-verify gains through other channels, leads to a more complete information environment (Guay and Verrecchia, 2007).

Regarding the second channel, –the investment-related effects of conservatism–, the timely recognition of losses in the financial statements is predicted to discourage managers from engaging in inefficient investment projects and expropriating investors (Francis and Martin, 2010; Bushman *et al*., 2011). Indirectly, this reduces the occurrence of information asymmetries created by managers when they withhold negative information about their inefficient investment policies.

We test the effects of conservatism on the information environment of the firm using a large US sample for the period 1977-2007. To measure conservatism we use the firm-specific proxy developed by Khan and Watts (2009), which is based on the Basu (1997) model. In sensitivity tests we also use the proxy of Callen *et al*. (2010), which is based on the Vuolteenaho (2002) return decomposition model. Information effects are inferred from a number of proxies measuring future firm information asymmetry. The analysis yields the following key results. We find that an increase in firm-level conservatism leads to a future decrease in the bid-ask spread and in stock returns volatility, consistent with conservatism decreasing information asymmetry. We also find that increases in conservatism are followed by more accurate and less dispersed analysts' forecasts, and greater analyst following. This is consistent with conservatism helping these expert users of financial statements. When we change the definition of our dependent variable to assess the timing and persistence of the documented effects, we find evidence consistent with information asymmetries decreasing in the year following the increase in conservatism, and also, that the improvement in the information environment driven by conservatism is persistent. Our main results are robust to

the use of an alternative proxy for conservatism and to the inclusion of additional control variables in the models. The results are stable over time and robust to subdividing the sample period into two, three, four and even five equal-length sub-periods.

We contribute to the growing body of research on the economic consequences of conservatism in accounting by showing that conservatism is also useful for equity holders, and not only for debt-holders. In particular, our evidence complements and adds to the work of LaFond and Watts (2008) and Khan and Watts (2009) by showing that increases in conservatism are followed by reduced future information asymmetry. This is consistent with conservatism in accounting improving the information environment. To the best of our knowledge, this is a novel result. Closely related evidence is reported by Ball *et al*. (2012). These authors study the more specific issue of whether the implementation of mark-to-market (MTM) accounting for securities, a policy that reduces conservatism, results in information asymmetry amongst bank investors. MTM, relative to historical cost, incorporates more timely information of economic gains into financial statements (and similar timeliness of economic losses). Their evidence suggests that the use of MTM increased bid-ask spreads and is, thus, in line with our more general evidence on the information effects of conservatism.

Our results also add to the prior literature that identifies debt markets as the main origin for the demand for conservatism (see, e.g., Ball *et al*., 2008b) by providing evidence that equity markets may also benefit from conservatism. The evidence is of particular interest in light of the current academic and regulatory debate as to whether general purpose financial statements should be prepared on a conservative basis.

The remainder of the paper is structured as follows. Section 2 reviews prior literature in this area and presents our predictions. Section 3 describes the empirical methods and the

sample. Section 4 presents the main results and discusses the evidence, while Section 5 contains the robustness tests. Finally, Section 6 concludes.

2. Information consequences of conservatism in accounting

Accounting conservatism imposes timely recognition of economic losses and delayed recognition of economic gains, which are not recognized into earnings until their associated cash flows are realized.[2] This asymmetry generates financial reports that incorporate losses in a timelier manner than gains, leading to an asymmetric persistence of gains versus losses and a cumulative understatement of net assets. While most prior research focuses on the benefits of conservatism for debt-holders, we expect conservatism to benefit other users of financial statements, such as financial analysts and equity-holders, by decreasing information asymmetries with managers and thus, facilitating the estimation of firm future performance. In this section we identify two channels through which conservatism promotes these benefits for equity holders. We discuss them in turn.

2.1. The link between conservatism and earnings management and its effect on the information environment of the firm

Conservatism makes it costly for managers to deviate from the firm's true earnings in accounting reports, constraining management's opportunistic financial reporting behavior. The prior work of Watts (2003) and Guay and Verrecchia (2006) emphasize the importance of this role of conservatism. Consistent with this view, Chen *et al*. (2007) analytically demonstrate that conservatism reduces managers' incentives to engage in earnings manipulation. This is so because the expected benefits of manipulation decrease as

[2] Examples of these economic gains and losses are changes in the value of goodwill or other long-lived assets.

conservatism increases. They show that because managers cannot credibly commit to not managing earnings, investors will discount the manipulation, thereby forcing managers into manipulating earnings to keep up with investors' expectations. In their framework, a credible commitment to conservatism leads to a reduction in the discount applied to firm value because of fears of accounting manipulation.

The analytical work of Gao (2013) is also consistent with conservatism limiting earnings management. Gao (2013) shows that, to safeguard against managerial *ex post* opportunism, the optimal *ex ante* measurement rule is conservative, because in the face of managerial optimism and opportunism, a conservative rule requires more verification of the transaction characteristics that are favorable to managers. The recent empirical work of García Lara *et al*. (2012) confirms these analytical findings and provides empirical evidence that conservatism reduces earnings management.

This role of conservatism in limiting earnings management is predicted to reduce information asymmetry. Earnings management occurs when managers use the discretion inherent to accrual calculation with the intent to mislead firm stakeholders about the underlying economic performance of the firm (Healy and Wahlen, 1999; Dechow and Skinner, 2000). This reduces the precision of the earnings signal about future firm performance (Rajgopal and Venkatachalam, 2011). Earnings management is not only predicted to reduce average information precision, but also to increase information asymmetries between managers and equity-holders. Prior research in accounting provides evidence of a positive association between information asymmetry and earnings management (Dye, 1988; Trueman and Titman, 1988; Richardson, 2000). Earnings management can also create information asymmetries between managers and other parties, like independent directors, whose task is to protect the interests of minority shareholders. According to the

evidence in McNichols and Stubben (2008), earnings management does not only conceal the company's actual performance during the period, but it also masks underlying trends in revenue and earnings growth, which help to build expectations of future growth and product demand. These authors argue that earnings management misleads even firm insiders, leading them to make inefficient investment decisions during the period when earnings are manipulated.

In line with the idea that earnings management both obfuscates the earnings signal and increases information asymmetry, Burgstahler and Eames (2003) provide evidence consistent with analysts not entirely seeing through earnings management practices. In particular, they report that analysts are unable to identify firms that engage in earnings management and often predict earnings management that is not realized. Similarly, Givoly *et al*. (2011) show that, in the wake of upward earnings management, analysts issue upward-biased earnings forecasts and stock recommendations. These authors conclude that, when firms manage earnings, the usefulness of analysts' forecasts and recommendations is limited. Thus, earnings management leads to lower average information precision and to greater information asymmetries between managers and a wide range of financial statement users.

Given that conservatism delays the incorporation of difficult-to-verify gains in the income statement, a potential concern is whether conservatism could lead to increased information asymmetries about future positive prospects for the firm. However, the evidence in Guay and Verrecchia (2007) and LaFond and Watts (2008) is not consistent with this concern. These authors argue that managers will find other communication channels to inform about these positive prospects. In particular, Guay and Verrecchia (2007) show that in the absence of regulatory enforcement of conservative reporting, managers recognize good news in earnings on a timely basis and voluntarily disclose higher bounds for future expected

cash flows, while they defer the recognition of difficult-to-verify losses and withhold information about low realizations of expected future cash flows. When conservative reporting is enforced, market participants have timely information both on the lower and upper bounds of firm future performance. Good and bad news is disclosed on a timely basis, although through different channels. Bad news is recognized in the income statement, while good news is disclosed through the notes to the financial statements, conference calls, management guidance, press releases, etc. These sources of information are predicted to flourish under conservatism (LaFond and Watts, 2008). This, in turn, is predicted to increase the precision with which investors and other intermediaries can assess firm future performance and facilitates information-gathering by outsiders. Hence, this consequence of conservatism serves to directly reduce information asymmetry between insiders and outsiders.

2.2. Indirect effects of conservatism on the firm information environment: improved investment policies

Managers may deviate from optimal investment policies to increase their compensation, their reputation, and for other self-serving motives. Under an accounting regime that does not enforce conservative accounting, managers find it easier to delay the recognition of the negative consequences of their inefficient investment decisions. When these negative effects are not recognized, additional information asymmetries arise between managers and investors, as investors make assessments of firm future prospects based on incorrect assumptions about the investment portfolio of the firm.

Prior research by Francis and Martin (2010), Ahmed and Duellman (2011), Bushman *et al*. (2011), Louis *et al*. (2012) and García Lara *et al*. (2013) shows that conservatism plays

an important role in reducing investment inefficiencies. Conservatism constrains *ex ante* the investment in negative net present value projects as it does not permit current managers to defer the recognition of losses to the next generation of managers. *Ex post*, conservatism triggers the early abandonment of poorly performing projects before they accumulate into large losses on abandonment. Overall, conservatism reduces management incentives to engage in self-serving projects and expropriate investors. Indirectly, this reduces the information asymmetries created by managers when they withhold negative information about their inefficient investment policies.

3. Empirical methods and data

This section presents the method used to test our prediction that conservatism has information consequences. First, we describe our firm-specific measure of conservatism. Then, we present the models used to study the association between firm-level conservatism and different measures of information asymmetry, which are our outcome variables. Finally, we describe the sample used to conduct our analyses. Similar to Ball *et al*. (2012), we focus on proxies that capture the impact of accounting properties on information asymmetry and on the performance of equity analysts. In our tests of the association between conservatism and information asymmetry, and to facilitate identifying the effects of conservatism, we estimate all our models in changes rather than in levels. An important advantage of the changes specification is that it allows to make inferences about causality. Also, the estimation in changes permits controlling for firm-specific factors that are unchanged over time, and reduces the omitted-variable bias.

3.1. Firm-specific measure of conservatism

Our main proxy for conservatism is based on Khan and Watts (2009). It is defined as the

beginning-of-the-period incremental timeliness of earnings to bad news, with respect to the timeliness in the recognition of good news. We denote this proxy as Conservatism(KW). This is a well-known and widely used proxy. The empirical evidence in Ettredge *et al*. (2012) and Jayaraman (2012), among others, shows that the Khan and Watts proxy captures well variation in conservatism at the firm level. In our robustness tests, we also use the firm-year specific ratio of conservatism (CR) developed by Callen *et al*. (2010).

In building their proxy, Khan and Watts draw from the Basu (1997) model. The Basu (1997) cross sectional specification is as follows:

$$Earn_j = \beta_0 + \beta_1 Neg_j + \beta_2 Ret_j + \beta_3 Neg_j Ret_j + \varepsilon_j, \quad (1)$$

where Earn is net income before extraordinary items, scaled by lagged market value of equity, Ret is annual stock returns (a measure of news) obtained by cumulating monthly returns starting from the fourth month after the firm's fiscal year end, and Neg is a dummy variable that equals 1 when Ret is negative, 0 otherwise. In model (1) above, β_2 is the good news timeliness measure, and β_3 is the incremental timeliness of earnings to bad news over good news. Khan and Watts modify this model to obtain a firm-level measure of the timeliness of earnings to good news (G_Score) and of the incremental timeliness of bad news with respect to good news (C_Score), a proxy for conservatism, as follows:

$$\text{G\_Score} = \beta_2 = \mu_1 + \mu_2 Size_j + \mu_3 MTB_j + \mu_4 Leverage_j, \quad (2)$$

$$\text{C\_Score} = \beta_3 = \lambda_1 + \lambda_2 Size_j + \lambda_3 MTB_j + \lambda_4 Leverage_j, \quad (3)$$

where μ_i and λ_i (i=1-4) are estimated using annual cross-sectional regressions, by substituting (2) and (3) into (1). Thus, these coefficients are constant across firms, but vary over time. Size is the natural log of market value of equity, MTB is the market-to-book value of equity ratio, and Leverage is defined as long-term and short-term debt deflated by market value of

equity. C_Score and G_Score also vary across firms and time through cross-sectional variation in the firm characteristics (Size, MTB and Leverage). The annual cross-section model used is as follows:

$$Earn_j = \beta_0 + \beta_1 Neg_j + Ret_j (\mu_1 + \mu_2 Size_j + \mu_3 MTB_j + \mu_4 Leverage_j) + Neg_j Ret_j (\lambda_1 + \lambda_2 Size_j + \lambda_3 MTB_j + \lambda_4 Leverage_j) + (\delta_1 Size_j + \delta_2 MTB_j + \delta_3 Leverage_j + \delta_4 Neg_j Size_j + \delta_5 Neg_j MTB_j + \delta_6 Neg_j Leverage_j) + \varepsilon_j, \quad (4)$$

We refer to C_Score as Conservatism(KW). As demonstrated in Ettredge *et al*. (2012), variation in Conservatism(KW) captures variations in accounting conservatism.

3.2. Information effects of conservatism

We analyze the association between current changes in conservatism and future changes in information asymmetry. To do so, we study the effects of conservatism on a) two market-based proxies for information asymmetry (the bid-ask spread and returns volatility), and b) the performance of financial analysts. We explain our tests in detail below.

3.2.1. Conservatism and market-based proxies for information asymmetry

Prior research uses bid-ask spreads and stock-returns volatility as proxies for the existence of information asymmetries between managers and equity holders. Studies analyzing how these two proxies for information asymmetries are affected by certain attributes of the financial reporting system include Leuz and Verrecchia (2000), Daske *et al*. (2008), LaFond and Watts (2008) and Ball *et al*. (2012), among others. In our first test, we look at the association between changes in firm-level conservatism and future changes in the bid-ask spread. The model that we use is as follows:

$$\Delta BidAsk\ spread_{t+1} = \alpha + \beta\ \Delta Conservatism_t + \delta\ \Delta Controls_t + \mu_{t+1}, \quad (5)$$

the Bid-Ask spread is defined as the natural log of one plus the average daily

bid-ask spread over the fiscal year scaled by the midpoint of the spread, as a percentage. Conservatism is our firm-year specific measure of accounting conservatism (Conservatism(KW)). It is measured at the beginning of the period to avoid overlapping with the outcome variable. We use the following controls: a) Litigation, b) Leverage, c) Size, d) Market-to-Book, e) Beta, and f) Credit risk. We include proxies for the determinants of the measures of information asymmetry that we consider: bid-ask spreads and returns volatility. In particular, we include Leverage, Size and Market-to-Book as in Pastor and Veronesi (2003) and Rajgopal and Venkatachalam (2011). We also include risk proxies as Brown and Kapadia (2007) argue that risk influences recent trends in idiosyncratic volatility. Finally, we also include litigation as prior accounting research (Watts, 2003) argues it is one of the main drivers of conservatism and it might also be a source of risk.[3] In addition, we also control for current period Bid-Ask spread and current Returns volatility. These variables are defined in Appendix 1. In model (5), the main coefficient of interest is β, which captures the association between current changes in conservatism and future changes in information asymmetry, and it is expected to be significantly negative.

Given our expectation that conservatism reduces information asymmetry amongst investors, we also expect that increases in current conservatism lead to reduced stock returns volatility in the future. We thus use stock returns volatility as our second proxy for information asymmetry. Prior work by Diamond and Verrecchia (1991) and Healy *et al*. (1999) provide evidence that improvements in financial reporting quality and disclosure mitigate information asymmetries, reducing the volatility of stock prices. Also, the work of Pastor and Veronesi (2003) shows that uncertainty about firm average profitability influences stock return volatility. More recently, Rajgopal and Venkatachalam (2011) document a

[3] In sensitivity tests described in Section 5.5 we also control for stock returns and trading volume (Ball *et al*., 2012).

negative association between idiosyncratic return volatility and financial reporting quality as measured by the Dechow and Dichev (2002) accruals quality model.

There is no prior empirical evidence on the association between conservatism and future stock returns volatility. However, in an analytical paper, Suijs (2008) shows that conservatism in accounting can reduce the cost of capital through a decrease in future returns volatility. In his model, overlapping generations of shareholders invest in a firm with a life cycle that exceeds shareholders' investment horizons. In such a setting, the volatility of firm future prices determines investment risk (and not the volatility of firm future cash flows). Consequently, Suijs (2008) shows that firm reporting policies become a primary determinant of investment risk. More informative disclosure of bad news reduces the cost of capital by improving risk sharing across generations of investors and reducing future stock returns volatility. In line with his model and with our previous predictions, we expect that conservatism leads to lower stock returns volatility.

To empirically test the association between conservatism and future stock returns volatility, we analyze whether increases in current conservatism lead to reduced returns volatility over the coming year. To do so, we use the following model:

$$\Delta Returns\ volatility_{t+1} = \alpha + \beta\ \Delta Conservatism_{t} + \delta\ \Delta Controls_{t} + \mu_{t+1,} \quad (6)$$

where Returns volatility is stock returns volatility, measured as the natural log of one plus the standard deviation of one year of daily stock returns ending at the end of the fiscal year, as a percentage. Conservatism is our measure of conservatism. We use the same set of control variables as in equation (5), in particular: a) Litigation, b) Leverage, c) Size, d) Market-to-Book, e) Beta and f) Credit risk. In addition, we also control for the current period change in Bid-Ask spread and Returns volatility. These variables are defined in Appendix 1. In model (6), the main coefficient of interest is β, which captures the association between changes in

current conservatism and future changes in stock return volatility, and is expected to be significantly negative.

3.2.2. Conservatism and the performance of financial analysts

In our second set of tests, we analyze the interrelation between accounting conservatism and the performance of analysts. To do so, we focus on three elements related to analysts' work: the precision and dispersion of their forecasts of earnings-per-share, and the number of analysts following the firm. In line with our prior arguments that conservatism improves the firm information environment, we expect that increased conservatism will lead to lower analysts' forecast errors, and lower dispersion in analysts' forecasts. We model the association between conservatism, and analysts' forecast errors and dispersion as follows:

$$\Delta Forecast\ error_{t+1} = \alpha + \beta\ \Delta Conservatism_t + \delta\ \Delta Controls_t + \mu_{t+1,} \quad (7)$$

$$\Delta Forecast\ dispersion_{t+1} = \alpha + \beta\ \Delta Conservatism_t + \delta\ \Delta Controls_t + \mu_{t+1,} \quad (8)$$

Forecast error is the earnings-per-share (EPS) forecast error, measured as the absolute value of the difference between the mean forecast of annual EPS and the actual EPS, scaled by the actual EPS.[4] Forecast dispersion is the standard deviation of the available earnings forecasts. Controls is a vector of variables capturing either proxies for the richness of the information available to the analysts to make their estimations, or firm-specific characteristics that are expected to affect the precision and dispersion of the forecasts of earnings (Lang and Lundholm, 1993; Wang, 2007; Aramov *et al*., 2009): a) Prior year forecast dispersion, b) Returns volatility, c) Bid-Ask spread, d) Litigation, e) Leverage, f) Size, g) Market-to-Book, h) Beta, i) Credit risk, j) Smoothing, k) Analyst following, and l) Prior year forecast error. All these variables are defined in detail in Appendix 1. As before, in models (7) and (8), the main

[4] The inferences are identical if we use the median forecast instead of the mean forecast.

coefficient of interest is β, which captures the association between changes in conservatism and future changes in analysts' forecasts average precision and volatility. If conservatism ameliorates information asymmetry concerns, β is expected to be significantly negative, indicating that analysts that follow more conservative firms make smaller forecast errors and issue more homogeneous forecasts.[5]

Finally, we also model analyst following. The general finding in prior literature is that accounting quality affects analysts' coverage decisions. This literature shows that analyst following is positively correlated with the quality of disclosure (see, e.g., Lang and Lundholm 1996). Particularly relevant to our research is the work of Skinner (1994). He argues that managers have incentives to preempt negative earnings news, and that firms that delay the disclosure of bad news are likely followed by fewer analysts. Tucker (2010) empirically tests this prediction, and shows that firms that fail to issue warnings experience a decrease in analyst following. In line with these studies, we expect that firms that recognize their bad news timely are followed by more analysts, and that increases in conservatism are associated with increases in analyst following. We test this idea using the following model:

$$\Delta Analyst\ following_{t+1} = \alpha + \beta\ \Delta Conservatism_{t} + \delta\ \Delta Controls_{t} + \mu_{t+1,} \qquad (9)$$

similar to the previous models, Controls is a vector of variables capturing either proxies for the richness of the information available to the analysts to make their estimations (Lang and Lundholm, 1993; Wang, 2007; Aramov *et al*., 2009), or firm-specific characteristics that are expected to affect analyst following (Hong et al., 2000): a) Forecast dispersion, b) Returns

[5] Helbok and Walker (2004) find that analysts' optimistic biases can be partly explained by conservative reporting policies. This is so as analysts, in their attempt to exclude one-time items, end up forecasting permanent earnings and not reported (conservative) earnings. If this effect reported by Helbok and Walker (2004) is present in our sample, this would work against our hypothesis. If, still, we find results in line with our expectations, this would reinforce our arguments of conservatism leading to an improved information environment.

volatility, c) Bid-Ask spread, d) Litigation, e) Leverage, f) Size, g) Market-to-Book, h) Beta, i) Credit risk, j) Smoothing, k) Prior year analyst following, and l) Forecast error. All variables are defined in Appendix 1. In model (9), the main coefficient of interest is β, which captures the association between changes in current conservatism and changes in future analyst following. If conservatism ameliorates information asymmetry concerns, β is expected to be significantly positive.

Throughout our research setting, we study the information consequences of changes in conservatism. These changes can be triggered by past corporate events that caused an increase in information asymmetry. As shown by LaFond and Watts (2008), firms react to these events by increasing conservatism. One may conclude that this fact can obscure our findings and make it difficult to determine whether any documented future information consequences are due to changes in conservatism, or to the underlying corporate events that triggered the changes in conservatism.

We partly control for the effects of these corporate events by including in the set of explanatory variables the lagged dependent variables: bid-ask spread, returns volatility, forecast error and dispersion, and analyst following. Wooldridge (2000) suggests that controlling for lagged dependent variables is one way to control for correlated omitted variables. Also, given that we estimate our models in changes, we mitigate the effect of relatively static omitted variables. These controls are intended to rule out the possibility that the improvements in the information environment are driven by the corporate events that triggered the increase in conservatism. Nevertheless, as is common in accounting research, we cannot entirely rule out any potential selection issues if certain types of corporate events trigger both changes in conservatism and corporate responses to those events that decrease information asymmetry. The fact that we measure conservatism with a lag with respect to the

outcome variables should appease some of these concerns.

3.3. The sample

We use a large sample of US firms for the period 1977-2007. Accounting data come from Compustat, market data come from CRSP, and analyst data come from IBES. To reduce the effect of influential observations, all continuous variables are winsorized at the 1 and 99 percentiles. Our main sample contains 63,579 firm-year observations. The fact that we use specifications in changes, including future and past changes, reduces slightly the sample size. The availability of certain variables (i.e., IBES analysts' forecasts or analyst following) also reduces the sample in certain specifications. To increase the robustness of our analyses, we allow the sample size to change in the different tests to maximize the number of available observations.

Table 1 presents sample descriptive statistics in levels and Table 2 the correlation matrix of the variables expressed in changes, as used in the regression analyses. Although our sample differs from the one used by Khan and Watts (2009), which spans the period 1963-2005, our results are fairly similar: the mean (median) of Conservatism(KW) is 0.098 (0.095) in our sample, while the mean (median) is 0.105 (0.097) in their sample. As it can be seen in Table 2, the correlation between our two proxies for information asymmetry (the bid-ask spread and stock returns volatility) is very high (corr=0.62, p-val<0.01). This confirms that both proxies capture a similar underlying concept, as expected. The same can be said about our proxies for the performance of analysts: forecast error and forecast dispersion are also correlated, although the coefficient is not as high (corr=0.11, p-val<0.01). Analyst following is negatively correlated with our proxies for information asymmetry, as expected, as a large analyst following should lower information asymmetry. Finally, the correlation between

Conservatism(KW) and the information proxies is as predicted. We find a negative correlation between Conservatism(KW) and future returns volatility, the bid-ask spread, forecast error and forecast dispersion, and a positive association with analyst following.

Insert Tables 1 and 2 about here

4. Main results

This section describes the empirical findings of the estimation of the models described above. All our regressions include year fixed effects, and we report *t*-statistics based on clustered standard errors that are robust to heteroskedasticity and within-firm serial correlation. Table 3 contains the results of the estimation of equations (1) through (5) testing the linkages between conservatism and information asymmetry, as measured by the Bid-Ask spread (column 1) and Returns volatility (column 2), and also, the association between conservatism and analyst performance, as measured by Forecast error (column 3), Forecast dispersion (column 4) and Analyst following (column 5).

The results in columns 1 and 2 show that changes in current conservatism lead to a reduction in future information asymmetry, as measured, respectively, by the Bid-Ask spread (ΔConservatism(KW) = -0.394, *t*-stat = -8.94), and Returns volatility (ΔConservatism(KW) = -0.251, *t*-stat = -6.79). This evidence is in line with the arguments in Suijs (2008), and validates the claim that increased conservatism contributes to reduce the information asymmetries between the firm and its stakeholders. The economic significance is such that a one-standard deviation change in Conservatism(KW) results in a reduction in future Bid-Ask Spread of 1.2 percentage points (with respect to the mean Bid-Ask spread) and a reduction in future Returns volatility of 0.9 percentage points (with respect to the mean Returns volatility).

Insert Table 3 about here

We predict that conservatism leads to reduced information asymmetry and, therefore, to improvements in information precision that should facilitate the estimation of firm future earnings for all users of financial statements. If conservatism serves to reduce frictions in the firm information environment, we expect that increased conservatism is associated with lower analysts' forecast errors, lower forecast dispersion and more analysts following the firm. In Table 3, columns 3 and 4, we report the tests of the analysts' forecasts predictions. The results show that increases in conservatism reduce both analysts' forecast errors (ΔConservatism(KW) = -0.118, *t*-stat = -2.03) and analysts' forecast dispersion (ΔConservatism(KW) = -0.019, *t*-stat = -2.11). The economic significance is such that a one-standard deviation change in Conservatism(KW) decreases the mean future forecast error by 5.5 percent (with respect to the mean Forecast error) and decreases the standard deviation of analysts' forecasts by 2.7 percent (with respect to the mean Forecast dispersion). Finally, column 5 contains the results from the estimation of model (5). We find a positive association between conservatism and analyst following (ΔConservatism(KW) = 1.686, *t*-stat = 6.78), consistent with our predictions. The economic significance is such that a one-standard deviation change in Conservatism(KW) increases the number of analysts following the firm by 1.6 percent (with respect to the mean Analysts following).

5. Robustness tests

To assess the robustness of our findings, we carry out a number of sensitivity analyses. This section reports on the main robustness checks.

5.1. Timing and persistence of the effects of conservatism on the firm information

environment

In our first set of robustness tests, we repeat the analyses conducted in Table 3, but redefining our dependent variables (DepVar), so that the change in outcomes is measured either as the future two-year change (i.e., $DepVar_{t+2}$ - $DepVar_t$), the future three-year change (i.e., $DepVar_{t+3}$ - $DepVar_t$), the change from *t*+1 to *t*+2, and the change from *t*+2 to *t*+3. This permits assessing the timing of the previously documented information benefits attained by increasing conservatism, and also, whether they are persistent, or, alternatively, if they reverse immediately.

Khan and Watts (2009) show that conservatism is relatively stable over time. In particular, the correlation of our Conservatism proxy, Conservatism(KW), with its lags up to three years ranges between 0.56 and 0.50. Thus, *ceteris paribus*, we predict that the improvement in the information environment will be fairly persistent. If this is case, we expect to be able to replicate the findings in Table 3 using the accumulated change from *t* to *t*+2 and from *t* to *t*+3. Also, the analysis of the changes from *t*+1 to *t*+2 and from *t*+2 to *t*+3 permits establishing whether the information environment improves in the same year after the increase in conservatism, or whether the improvement takes place more slowly, over the coming years. Consistent with the above modeling and discussion, we expect the main effect to take place in the year right after the increase in conservatism (*t*+1).

Insert Table 4 about here

Table 4 presents the findings from these tests. For parsimony, we only report the coefficient of interest: ΔConservatism(KW). Panel A contains the results when the dependent variables measure the two-year ahead change (from *t* to *t*+2). Consistent with the previously reported results, we find that conservatism lowers future information asymmetry, as measured both by the Bid-Ask spread (ΔConservatism(KW) = -0.240, *t*-stat = -4.98), and Returns

volatility (ΔConservatism(KW) = -0.110, *t*-stat = -3.01). When we look at analysts' behavior, the prior results hold for two out of our three proxies. Specifically, we find evidence consistent with the previously reported negative association between conservatism and analysts' forecast errors (ΔConservatism(KW) = -0.152, *t*-stat = -2.78) and the positive association between conservatism and analyst following (ΔConservatism(KW) = 3.067, *t*-stat = 9.66). However, when we look at analysts' forecast dispersion, the coefficient is insignificantly different from zero. Panel B depicts the results when the dependent variables measure the three-year ahead change (from *t* to *t*+3). As expected, we find that conservatism lowers future information asymmetry, as measured both by the Bid-Ask spread (ΔConservatism(KW) = -0.367, *t*-stat = -6.96), and Returns volatility (ΔConservatism(KW) = -0.233, *t*-stat = -5.83). When we look at analysts' behavior, the prior results hold for two out of our three proxies. Specifically, we find evidence consistent with the previously reported negative association between conservatism and analysts' forecast errors (ΔConservatism(KW) = -0.218, *t*-stat = -3.33) and between conservatism and analysts' forecast dispersion (ΔConservatism(KW) = -0.027, *t*-stat = -2.35). However, when we look at analyst following, the coefficient is insignificantly different from zero. Overall, and despite the fact that we use a relatively long window for our outcome variables, thereby allowing for a number of unrelated events to happen subsequent to the change in conservatism at the beginning of year *t*, we still find evidence consistent with conservatism decreasing information asymmetry up to three years after the increase in conservatism. We expect that this is so because conservatism is fairly stable, guaranteeing that the information benefits attained by increasing conservatism persist over time.

In Panels C and D we analyze whether the improvements in the information environment concentrate on the year following the change in conservatism, or whether the information environment keeps improving in the years to come (in *t*+2 or *t*+3). Our results

are consistent with the effect of the change in current conservatism on the information environment concentrating in the year *t*+1. We do not find subsequent improvements beyond the improvement from year *t* to year *t*+1 as all the coefficients on ΔConservatism(KW) are insignificant. Finally, we do not find evidence of a reversal of the documented effects of conservatism.

5.2. Analysis by sub-periods

To provide evidence on the stability of the analysis, we subdivide our sample period (1977-2007) into several equal-length sub-periods (two sub-periods, three sub-periods, four sub-periods and five sub-periods) and replicate the analyses of Table 3. Table 5 provides the results from this analysis. For parsimony, we only report the coefficient on ΔConservatism(KW). As a reference, the first line reproduces the results of Table 3 for the entire sample period.

Insert Table 5 about here

Consistent with the previously reported results, we find that conservatism lowers future information asymmetry, as measured both by the Bid-Ask spread and Returns volatility in most of the sub-periods. In particular, the coefficient on ΔConservatism(KW) is significantly negative 80% (60%) of the times when the dependent variable is Bid-Ask spread (Returns volatility). The higher the number of sub-periods, the lower the number of observations per regression, which likely reduces the power of our tests, as it can be seen in Table 5. The sub-periods with the fewer observations contain fewer significant coefficients. When we look at analysts' behavior, we find evidence consistent with the previously reported negative association between conservatism and analysts' forecast errors and dispersion: the percentage of significantly negative coefficients is 73% and 40%, respectively. Here, the fact

that these two regressions contain the lowest number of observations when the number of sub-periods increases clearly contributes to reduce the power of the tests. Finally, we also find evidence of a positive association between conservatism and analyst following in several sub-periods, as the percentage of significantly negative coefficients is 53%. Overall, our results do not seem to be driven by any particular sub-period and confirm our previous findings.

5.3. Use of an alternative conservatism proxy

As a further robustness test, we repeat our main analysis using an alternative conservatism proxy: the conservatism ratio developed by Callen *et al*. (2010), which we denote as Conservatism(CR). This is a measure of conditional conservatism that shows the proportion of the total shock to current and expected future earnings recognized in current year earnings. This proxy is based on the Vuolteenaho (2002) return decomposition model. To compute Conservatism(CR), we follow the estimation details described in Callen *et al*. (2010).[6] Since conservatism is likely to be manifested when news is bad, following Callen *et al*., we restrict the sample to observations with negative unexpected returns, and also drop observations with negative Conservatism(CR) as its interpretation is ambiguous. In this way, our Conservatism(CR) measure captures the timeliness of bad news recognition and mirrors the Conservatism(KW) measure.

Using this proxy, we repeat the main analyses and run models (1) through (5). The results from these tests are reported in Table 6. Consistent with the previously reported evidence, we again find that conservatism lowers future information asymmetry, as measured both by the Bid-Ask spread, and Returns volatility. When we look at analysts' behavior, we

[6] The computer code to estimate CR is available in Callen and Segal (2010).

find evidence consistent with the previously reported negative association between conservatism and analysts' forecast errors, which is significantly negative. However, we do not find significant results when the dependent variables are forecast dispersion or analyst following. This may be due to the reduced number of observations available for these final tests. Overall, the evidence supports our previous findings and confirms that conservatism has positive information consequences.

Insert Table 6 about here

5.4. Effect of rounding errors in adjustments for stock splits in IBES Summary files

We compute analysts' forecast errors using the IBES Summary Statistics file. The main advantage of using this file is that it contains the mean forecast estimates for EPS and the actual values (i.e., the realized EPS) already matched and adjusted for stock splits. However, when IBES performs the adjustment, it rounds the figures to two decimals. The adjustment and the corresponding rounding carry over the entire time-series for a given security. Payne and Thomas (2003) document that research conclusions can be severely affected by the rounding procedure in samples that have large stock splits because of incorrect estimates of the forecast errors. To ensure that our results about the association between conservatism and the precision of analysts' forecasts are not unduly affected by the rounding errors, we remove observations that had a stock split during our sample period (approximately 13 percent of cases), and repeat the estimation of our main model (equation 3). The results yield the same conclusions.

5.5. Additional control variables

In our final robustness tests, we consider additional control variables. In particular, we

include current period stock returns and the change in stock trading volume in the Bid-Ask spread, Returns volatility and Analyst following regressions. Untabulated results confirm our previous findings. In particular, we find a negative and significant coefficient on our conservatism proxy (ΔConservatism(KW)) when we model the Bid-Ask spread (coeff.= -0.386, *t*-stat = -8.81), and Returns volatility (coeff.= -0.254, *t*-stat = -6.85), and a positive and significant coefficient when we model Analyst following (coeff. = 1.803, *t*-stat = 7.23), consistent with the previously reported evidence and our expectations. This indicates that our results are not sensitive to the inclusion of these additional control variables in the models.

6. Conclusions

We study the information consequences of conservatism in accounting. Conservatism limits earnings manipulation, contributes to enhanced disclosure, and improves investment efficiency. For these reasons, we expect that conservatism ameliorates information asymmetry problems, and facilitates the assessment of future firm performance for financial statements users such as investors and analysts. To test our predictions we use a large US sample and the firm-level conservatism measure proposed by Khan and Watts (2009). Our results show that a current increase in firm-level conservatism leads to a reduction in information asymmetries in the following year. We provide evidence of this effect by showing a subsequent reduction in the bid-ask spread and the volatility of stock returns. We also show that increases in conservatism directly impact analysts' behavior. Our results indicate that subsequent to the increase in conservatism there is an improvement in the accuracy of analysts' forecasts, a decrease in the dispersion of their forecasts, and an increase in the number of analysts following the firm. All of these results are consistent with conservatism improving the information environment of the firm.

Our results complement those of LaFond and Watts (2008) and Khan and Watts (2009), who show that conservatism is a reaction to deterioration in the information environment. Our evidence differs from theirs in that we show that increases in conservatism lead to improvements in the information environment. These results shed additional light on the current debate on whether conservatism should be excluded from the conceptual frameworks of the accounting regulatory bodies. We provide evidence that conservatism provides positive economic outcomes, not only for debt-holders, but also for current and potential equity-holders.

The reported evidence is not without limitations. We report evidence on the information consequences of changes in conservatism. One possible limitation of our study is that increases in conservatism can be triggered by corporate events that decrease information asymmetries. While in our empirical models we control for this possibility, we acknowledge that we cannot rule out this possibility completely.

Appendix 1: Variables description

Continuous variables are winsorized annually at the 1 and 99 percentiles.

Conservatism(KW) is the firm-year specific conservatism proxy developed by Khan and Watts (2009), C_Score. It measures the incremental timeliness of earnings to bad news over good news.

Leverage is the ratio of interest-bearing debt to total assets.

Market-to-Book (MTB) is the ratio of market value of equity to book value of equity.

Size is the log of the market value of equity.

Bid-Ask spread is the natural log of one plus the average daily bid-ask spread over the fiscal year scaled by the midpoint of the spread, as a percentage.

Returns volatility is the natural log of one plus the standard deviation of one year of daily stock returns, as a percentage.

Forecast error. We use annual data to calculate the earnings-per-share (EPS) forecast error. It is measured as the absolute value of the difference between the mean forecast of annual EPS and the actual EPS, scaled by the actual EPS. The forecast is taken in the tenth month of the fiscal year from IBES Summary data. For instance, FE_{t+1} is the forecast error of annual EPS in year t+1 calculated as the difference between the mean forecast of EPS of year t+1 issued in the 10th month of year t+1 minus the actual, scaled by the actual value.

Forecast dispersion is the standard deviation of the earnings forecasts. We impose a minimum of three earnings forecasts per firm-year.

Beta is the slope coefficient from the regression of a firm's monthly excess returns on the monthly value-weighted market excess return (from the CRSP monthly index file) over a rolling 60-month (minimum 24 months) window ending in the current fiscal year.

Smoothing is the ratio of earnings volatility to CFO volatility. Earnings volatility is the standard deviation of the firm's rolling five-year earnings before extraordinary items scaled by average total assets. CFO volatility is the standard deviation of the firm's rolling five-year cash flows from operations scaled by average total assets.

Analyst following is the number of analysts following the firm.

Credit risk is a categorical variable that ranges from 1 (low credit risk) to 4 (high credit risk). Credit risk is based on Standard & Poor's Issuer Credit Ratings as collected by Compustat. When there is no rating available in Compustat, we use the method in Barth *et al*. (2008) to predict a credit rating.

Litigation is an indicator variable that equals one when the probability of litigation is in the top quintile, and zero otherwise, where the probability of litigation is a composite measure fitted using the non-zero parameters and variables in Table 9 of Johnson *et al*. (2001).

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TABLE 1
Descriptive statistics of the conservatism proxy and the variables of interest

Variable description	Mean	St. dev	p25	p50	p75	N. obs
Conservatism(KW)	0.098	0.102	0.040	0.095	0.152	63,579
Returns volatility (%)	2.806	1.410	1.794	2.480	3.480	63,579
Bid-Ask spread (%)	3.397	1.994	2.002	2.888	4.251	63,579
Litigation	0.059	0.236	0.000	0.000	0.000	63,577
Leverage	0.221	0.168	0.067	0.214	0.343	63,579
Size	5.562	1.943	4.101	5.504	6.949	63,579
Market-to-Book	2.286	2.034	1.114	1.697	2.714	63,579
Beta	1.080	0.673	0.630	1.013	1.425	63,579
Credit risk	2.725	1.012	2	3	4	63,579
Forecast error	0.219	0.570	0.021	0.057	0.160	20,526
Smoothing	-0.674	0.498	-0.919	-0.554	-0.307	20,526
Forecast dispersion	0.070	0.101	0.020	0.040	0.080	20,526
Analyst following	10.605	6.930	5	9	14	23,014

The sample contains firm-year observations for the period 1977-2007. Conservatism(KW) is the firm-year specific conservatism proxy developed by Khan and Watts (2009). Size is the natural log of the market value of equity. Leverage is the ratio of interest-bearing debt to total assets. Market-to-Book is the ratio of market value of equity to book value of equity. Returns volatility is the natural log of one plus the standard deviation of one year of daily stock returns, as a percentage. Bid-Ask spread is a proxy for information asymmetry defined as the natural log of one plus the average daily bid-ask spread over the fiscal year scaled by the midpoint of the spread, as a percentage. Litigation takes on the value of one when the probability of litigation is in the top decile, and zero otherwise, where the probability of litigation is a composite measure fitted using the non-zero parameters and variables in Table 9 of Johnson *et al*. (2001). Beta is the slope coefficient from the regression of a firm's monthly excess returns on the monthly value-weighted market excess return (from the CRSP monthly index file) over a rolling 60-month (minimum 24 months) window ending in the current fiscal year. Smoothing is the ratio of earnings volatility to CFO volatility, multiplied by minus one; earnings volatility is the standard deviation of the firm's rolling five-year earnings before extraordinary items scaled by average total assets; CFO volatility is the standard deviation of the firm's rolling five-year cash flows from operations scaled by average total assets. Forecast error is the earnings-per-share analysts' forecast error measured as the absolute value of the difference between the mean forecast of annual EPS and the actual EPS, scaled by the actual EPS. The forecast is taken in the tenth month of the fiscal year from IBES Summary data. Forecast dispersion is the standard deviation of the earnings forecasts. We impose a minimum of 3 earnings forecasts per firm-year. Analyst following is the number of analysts following the firm. Credit risk is a categorical variable that ranges from 1 (low credit risk) to 4 (high credit risk), based on based on Standard & Poor's Issuer Credit Ratings as collected by Compustat. When there is no rating available in Compustat, we use the method in Barth *et al*. (2008) to predict a credit rating.

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TABLE 2
Correlation matrix between the conservatism proxy and the variables of interest

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Δ Bid-Ask spread $_{t+1}$	**1.00**											
(2)	Δ Returns volatility $_{t+1}$	**0.62**	**1.00**										
(3)	Δ Forecast error $_{t+1}$	**0.05**	**0.06**	**1.00**									
(4)	Δ Forecast dispersion $_{t+1}$	**0.09**	**0.10**	**0.11**	**1.00**								
(5)	Δ Analyst following $_{t+1}$	**-0.11**	**-0.12**	**0.03**	**0.02**	**1.00**							
(6)	Δ Conservatism(KW) $_{t}$	**-0.06**	**-0.05**	**-0.02**	-0.01	**0.05**	**1.00**						
(7)	Δ Litigation $_{t}$	-0.01	-0.01	0.00	0.01	0.00	**0.06**	**1.00**					
(8)	Δ Leverage $_{t}$	**0.07**	**0.07**	**-0.02**	0.01	**-0.02**	0.00	**-0.01**	**1.00**				
(9)	Δ Size $_{t}$	**-0.07**	**-0.07**	**0.05**	**0.03**	**0.13**	**-0.04**	**-0.01**	**-0.17**	**1.00**			
(10)	Δ Market-to-Book $_{t}$	0.01	**0.01**	-0.01	0.00	**0.03**	**0.01**	0.00	**0.08**	**0.48**	**1.00**		
(11)	Δ Beta $_{t}$	**-0.01**	**-0.04**	0.00	0.00	0.00	**-0.04**	0.01	-0.01	**0.01**	-0.01	**1.00**	
(12)	Δ Credit risk $_{t}$	**0.02**	**0.01**	**-0.07**	**-0.04**	**-0.04**	**0.02**	**0.01**	**0.23**	**-0.17**	**-0.01**	0.00	**1.00**
(13)	Δ Smoothing $_{t}$	0.00	**0.01**	**0.04**	**0.05**	0.01	**0.01**	0.00	**-0.03**	**0.06**	-0.01	**-0.01**	**-0.07**

Bold figures indicate two-tailed significance at 0.01 level or better. The sample contains firm-year observations for the period 1977-2007. The description of the variables can be found in Appendix 1.

TABLE 3
Effects of changes in accounting conservatism on future changes in information asymmetry

	(1) ΔBid-Ask spread $_{t+1}$	(2) ΔReturns volatility $_{t+1}$	(3) ΔForecast error $_{t+1}$	(4) ΔForecast dispersion $_{t+1}$	(5) ΔAnalyst following $_{t+1}$
Δ Conservatism(KW)	-0.394***	-0.251***	-0.118**	-0.019**	1.686***
	[-8.94]	[-6.79]	[-2.03]	[-2.11]	[6.78]
Δ Bid-Ask spread	-0.094***	0.037***	-0.015	0.001	-0.032
	[-8.09]	[4.95]	[-1.18]	[0.66]	[-0.65]
Δ Returns volatility	-0.080***	-0.301***	0.008	0.001	0.140**
	[-6.35]	[-35.51]	[0.57]	[0.84]	[2.46]
Δ Litigation	0.007	-0.01	-0.004	0.002	-0.224**
	[0.36]	[-0.60]	[-0.16]	[0.51]	[-2.20]
Δ Leverage	0.435***	0.301***	0.149**	0.035***	1.154***
	[6.37]	[5.71]	[2.22]	[3.77]	[3.73]
Δ Size	-0.189***	-0.204***	0.029*	0.006***	1.782***
	[-11.70]	[-15.29]	[1.79]	[2.76]	[22.60]
Δ Market-to-Book	0.051***	0.043***	-0.019***	-0.002***	-0.253***
	[10.53]	[10.71]	[-4.74]	[-3.02]	[-9.29]
Δ Beta	-0.100***	-0.138***	-0.013	0	0.283***
	[-6.42]	[-10.01]	[-0.80]	[0.19]	[3.30]
Δ Credit risk	0.043***	0.035***	-0.032***	-0.002	-0.195***
	[4.37]	[4.44]	[-2.77]	[-1.42]	[-3.89]
Δ Forecast dispersion			-0.023	-0.438***	-0.163
			[-0.25]	[-34.26]	[-0.72]
Δ Smoothing			0.036***	0.007***	0.019
			[2.81]	[4.05]	[0.34]
Δ Analyst following			0.006***	0.001***	-0.132***
			[2.90]	[6.13]	[-11.63]
Δ Forecast error			-0.407***	0.006***	-0.023
			[-27.93]	[3.48]	[-0.85]
Constant	0.087***	0.072***	0.001	0.006***	-0.511***
	[25.02]	[25.75]	[0.01]	[12.82]	[-29.41]
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.213	0.258	0.178	0.178	0.34
Observations	63,579	63,579	20,526	20,526	23,014

The sample spans the period 1977-2007. The dependent variables are the different proxies for information asymmetry defined in Appendix 1, they capture changes from t to t+1. All explanatory variables capture changes from t-1 to t. The regressions contain year fixed effects not reported for parsimony. Coefficients are based on pooled regressions. The t-statistics, in brackets, are based on standard errors clustered at the firm level, which are robust to both heteroskedasticity and within-firm serial correlation. Two-tailed significance: * p<0.10, ** p<0.05, *** p<0.01.

TABLE 4

Persistence and timing of the effects of a current change in accounting conservatism on the firm information environment

Panel A: change from year t to t+2 (Persistence)

	(1) ΔBid-Ask spread (t+2 – t)	(2) ΔReturns volatility (t+2 – t)	(3) ΔForecast Error (t+2 – t)	(4) ΔForecast dispersion (t+2 – t)	(5) ΔAnalyst following (t+2 – t)
Δ Conservatism(KW)	-0.240***	-0.110***	-0.152***	0.007	3.067***
	[-4.98]	[-3.01]	[-2.78]	[1.04]	[9.66]
Adjusted R-squared	0.237	0.312	0.248	0.226	0.327
Observations	56,218	56,218	17,642	17,642	20,436

Panel B: change from year t to t+3 (Persistence)

	ΔBid-Ask spread (t+3 – t)	ΔReturns volatility (t+3 – t)	ΔForecast Error (t+3 – t)	ΔForecast dispersion (t+3 – t)	ΔAnalyst following (t+3 – t)
Δ Conservatism(KW)	-0.367***	-0.233***	-0.218***	-0.027**	-3.845
	[-6.96]	[-5.83]	[-3.33]	[-2.35]	[-1.46]
Adjusted R-squared	0.259	0.343	0.24	0.24	0.321
Observations	50,115	50,115	15,275	15,275	18,120

Panel C: change from year t+1 to t+2 (Timing)

	ΔBid-Ask spread (t+2 – t+1)	ΔReturns volatility (t+2 – t+1)	ΔForecast Error (t+2 – t+1)	ΔForecast dispersion (t+2 – t+1)	ΔAnalyst following (t+2 – t+1)
Δ Conservatism(KW)	-0.07	-0.103	0.041	0.013	-0.906
	[-1.29]	[-0.78]	[0.61]	[1.44]	[-1.46]
Adjusted R-squared	0.233	0.232	0.005	0.019	0.366
Observations	54,919	54,919	17,117	17,117	20,212

Panel D: change from year t+2 to t+3 (Timing)

	ΔBid-Ask spread (t+3 – t+2)	ΔReturns volatility (t+3 – t+2)	ΔForecast Error (t+3 – t+2)	ΔForecast dispersion (t+3 – t+2)	ΔAnalysts' following (t+3 – t+2)
Δ Conservatism(KW)	-0.004	-0.047	-0.125*	-0.01	-1.019
	[-0.08]	[-1.15]	[-1.78]	[-0.91]	[-0.49]
Adjusted R-squared	0.214	0.214	0.003	0.013	0.357
Observations	48,676	48,676	14,738	14,738	17,851

The sample spans the period 1977-2007. The dependent variables are the different proxies for information asymmetry defined in Appendix 1. In Panel A (B), the change is defined as $X_{t+2} - X_t$ ($X_{t+3} - X_t$). In Panel C (D), the change is defined as $X_{t+2} - X_{t+1}$ ($X_{t+3} - X_{t+2}$). For parsimony, the Table only reports the coefficient on the variable of interest, ΔConservatism(KW), measured from t-1 to t. The independent variables are the ones in Table

3. The regressions contain year fixed effects. Coefficients are based on pooled regressions. The t-statistics, in brackets, are based on standard errors clustered at the firm level, which are robust to both heteroskedasticity and within-firm serial correlation. Two-tailed significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

TABLE 5
Effects of changes in accounting conservatism on future changes in information asymmetry by sub-periods

Sub-period	Coefficient	(1) ΔBid-Ask spread $_{t+1}$	(2) ΔReturns volatility $_{t+1}$	(3) ΔForecast error $_{t+1}$	(4) ΔForecast dispersion $_{t+1}$	(5) ΔAnalyst following $_{t+1}$
1997-2007	Δ Conservatism(KW)	-0.394***	-0.251***	-0.118**	-0.019**	1.686***
1997-1991	Δ Conservatism(KW)	-0.574***	-0.513***	-0.357**	-0.018	0.362†
1992-2007	Δ Conservatism(KW)	-0.174**	0.055	-0.118**	-0.020**	3.210***
1977-1987	Δ Conservatism(KW)	-0.363***	-0.360***	-0.390**	-0.012	0.294
1988-1996	Δ Conservatism(KW)	-0.655***	-0.247***	-0.115	-0.040***	-0.643
1997-2007	Δ Conservatism(KW)	-0.118	-0.036	-0.104*	-0.004	6.213***
1997-1984	Δ Conservatism(KW)	-0.088**	-0.011	-0.368**	-0.013	0.521*
1985-1992	Δ Conservatism(KW)	-1.738***	-1.425***	-0.469**	-0.065**	-1.195
1993-2000	Δ Conservatism(KW)	0.401	0.29	0.035	-0.02	-1.055
2001-2007	Δ Conservatism(KW)	-0.638***	-0.399***	-0.07†	-0.001	8.191***
1997-1983	Δ Conservatism(KW)	-0.137***	-0.043	-0.410**	-0.001	0.520*
1984-1989	Δ Conservatism(KW)	-0.723***	-1.308***	-0.176	-0.033	-0.042
1990-1995	Δ Conservatism(KW)	-0.725***	-0.162*	-0.188*	-0.042***	-0.777
1996-2001	Δ Conservatism(KW)	1.152	1.246*	-0.410**	-0.062*	-9.850**
2002-2007	Δ Conservatism(KW)	-0.563***	-0.416***	-0.048	0.005	8.928***
Total observations		63,579	63,579	20,526	20,526	23,014
Percentage of significant coeffs.		80.0%	60.0%	73.3%	40.0%	53.3%

The dependent variables are the different proxies for information asymmetry defined in Appendix 1, measured from t to t+1. For parsimony, the Table only reports the coefficient on the variable of interest, ΔConservatism(KW), measured from t-1 to t. The independent variables are the ones in Table 3. The regressions contain year fixed effects. Coefficients are based on pooled regressions. The t-statistics, in brackets, are based on standard errors clustered at the firm level, which are robust to both heteroskedasticity and within-firm serial correlation. Two-tailed significance: * p<0.10, ** p<0.05, *** p<0.01. († p<0.10 in one-tail test).

TABLE 6

Effects of changes in accounting conservatism on future changes in information asymmetry (conservatism as measured by Callen *et al*. 2010)

	(1) ΔBid-Ask spread $_{t+1}$	(2) ΔReturns volatility $_{t+1}$	(3) ΔForecast error $_{t+1}$	(4) ΔForecast dispersion $_{t+1}$	(5) ΔAnalyst following $_{t+1}$
Δ Conservatism(CR)	-0.025***	-0.032***	-0.024*	0.002	-0.001
	[-2.60]	[-3.82]	[-1.78]	[1.33]	[-0.01]
Δ Bid-Ask spread	-0.146***	0.064***	-0.066**	0.003	0.057
	[-6.27]	[3.78]	[-2.39]	[0.80]	[0.57]
Δ Returns volatility	-0.035	-0.344***	0.048	0	0.058
	[-1.57]	[-18.43]	[1.51]	[-0.12]	[0.51]
Δ Litigation	-0.021	-0.039	-0.019	0.01	-0.065
	[-0.56]	[-1.25]	[-0.32]	[1.42]	[-0.36]
Δ Leverage	0.651***	0.574***	0.007	0.067***	0.78
	[5.36]	[5.58]	[0.05]	[3.19]	[1.46]
Δ Size	-0.294***	-0.247***	0.135***	0.014**	1.747***
	[-8.53]	[-8.61]	[3.02]	[2.45]	[10.69]
Δ Market-to-Book	0.087***	0.077***	-0.051***	-0.006***	-0.410***
	[6.95]	[6.82]	[-4.57]	[-4.11]	[-6.37]
Δ Beta	-0.060**	-0.100***	0.025	0.002	0.308*
	[-2.07]	[-3.86]	[0.70]	[0.52]	[1.96]
Δ Credit risk	0.034**	0.035**	-0.073***	-0.004	-0.136
	[2.00]	[2.45]	[-3.00]	[-1.31]	[-1.38]
Δ Forecast dispersion			0.21	-0.492***	-0.224
			[1.39]	[-20.15]	[-0.69]
Δ Smoothing			0.088***	0.008**	-0.01
			[3.48]	[2.05]	[-0.10]
Δ Analyst following			0.009**	0.001***	-0.147***
			[2.42]	[3.46]	[-5.82]
Δ Forecast error			-0.504***	0.006**	-0.003
			[-17.68]	[2.04]	[-0.07]
Constant	0.164***	0.134***	0.015	0.004***	-0.676***
	[20.77]	[20.41]	[1.52]	[3.31]	[-17.37]
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.269	0.29	0.261	0.22	0.364
Observations	16,926	16,926	5,345	5,345	6,225

The full sample spans the period 1977-2007. The dependent variables are the different proxies for information asymmetry defined in Appendix 1, measured from t to t+1. Conservatism(CR) is the conservatism ratio proposed by Callen *et al*. (2010), measured from t-1 to t. The regressions contain year fixed effects not reported for parsimony. Coefficients are based on pooled regressions. The t-statistics, in brackets, are based on standard errors clustered at the firm level, which are robust to heteroskedasticity and within-firm serial correlation. Significance: * p<0.10, ** p<0.05, *** p<0.01.