Accounting Conservatism and the Temporal Trends in Current
Earnings' Ability to Predict Future Cash Flows versus Future Earnings:
Evidence on the Trade-off between Relevance and Reliability

Sati P. Bandyopadhyay, Changling Chen, Alan G. Huang, and Ranjini Jha**

*All authors are from the School of Accounting and Finance, University of Waterloo, Waterloo, Ontario, Canada, N2L 3G1. emails: Bandyopadhyay, bandy@uwaterloo.ca; Chen, clchen@uwaterloo.ca; Huang, aghuang@uwaterloo.ca; and Jha, rjha@uwaterloo.ca. We thank participants at the 2008 CAAA meetings and the 2008 CAR conference, Edward Riedl, the discussant at the CAR conference, Jeffery Callen (the associate editor), and two anonymous referees. All errors remain ours.

**Contact author: Address correspondence to Changling Chen: Phone: 519-888-4567 ext. 35731; fax: 519-888-7562; email: clchen@uwaterloo.ca.

**Accounting Conservatism and the Temporal Trends in Current
Earnings' Ability to Predict Future Cash Flows versus Future Earnings:
Evidence on the Trade-off between Relevance and Reliability**

Abstract

This research reports that an increasing level of accounting conservatism over the 1973–2005 period is associated with (1) an increase in the ability of current earnings to predict future cash flows (a measure of relevance, e.g., Kim and Kross, 2005); and (2) a decrease in the ability of current earnings to predict future earnings (a measure of reliability in the Richardson et al. [2005] sense). We also find that usefulness of earnings for explaining stock prices over book values is positively related to reliability but not to relevance. Our results hold for the constant and full samples and in both in-sample and out-of-sample analyses and are also robust to the use of different measures for relevance, reliability, earnings usefulness, and conservatism. Our findings about the relations between conservatism, relevance, reliability, and usefulness suggest a trade-off between relevance and reliability and seem to indicate that the adoption of an increasing number of conservative accounting standards possibly has an adverse impact on earnings usefulness through their negative effects on reliability.

**Key Words: Relevance, Reliability, Earnings Predictability, Cash Flow
Predictability, Earnings Usefulness and Accounting Conservatism**

JEL: M41, C23, D21, G38, N20

1. INTRODUCTION

Several recent papers find that the usefulness of earnings for explaining contemporaneous stock prices has been declining over time.¹ In particular, Collins et al. (1997, table 3) show that the incremental R^2 of earnings for explaining stock prices over book values (a proxy of earnings usefulness) declined from a high of 30% during 1953–1962 to approximately 7% during 1983–1993. Kim and Kross (2005, table 4) find the relation to have further deteriorated to 5.7% during 1992–2000. These authors also report that the ability of current earnings to predict future operating cash flows more than doubled during the same period. Because stock price is the present value of future cash flows, this intertemporal decline in earnings usefulness is called “puzzling” and “incongruous” (Barth, Cram and Nelson, 2001, p30; Kim and Kross, 2005, p754).

In this paper we examine the Kim and Kross (2005) puzzle by focusing on an idea proposed by these authors themselves that the “earnings price relationship might decline even in the absence of a decline in the relationship between earnings and future cash flows if, for example, the market forecasts a dramatic drop in persistence.”² We find that this is indeed the case.³ More interestingly, in this paper we show that increasing accounting conservatism over the past 30 years has contributed to the decline in earnings usefulness by its divergent effects on current earnings’ ability to predict (i) future cash flows and (ii) future earnings. Consistent with the findings of Kim and Kross (2005), we provide evidence that accounting conservatism *enhances* the predictive ability of current

¹ See, e.g., Amir and Lev (1996), Collins, Maydew and Weiss (1997), Brown, Lo and Lys (1999), and Francis and Schipper (1999). In addition, Kim and Kross (2005) provide an exhaustive list of related studies.

² For example, Dichev and Tang (2006) document declining earnings persistence over the past 30 years.

³ Several authors also have provided evidence that earnings usefulness is positively correlated with the ability of current earnings to predict future earnings or earnings persistence (Kormendi and Lipe 1987, Collins and Kothari 1989, Easton and Zmijewski 1989, Lipe 1990).

earnings for future cash flows. In contrast, we find that conservatism *reduces* the predictive ability of current earnings for future earnings (or persistence). The final result is a decline in earnings usefulness arising from the trade-off between future cash flow predictability and earnings persistence.

The trade-off referred to in the previous paragraph is similar in spirit to the relevance-reliability trade-off, referred to in SFAC No.2. Kim and Kross (2005, p778) consider earnings “relevance” as “the ability of earnings in year t to forecast the operating cash flows (CFO) in year $t + 1$.” The predictive notion of future cash flow is consistent with the definition of “relevance” in SFAC No. 2 (paragraph 57), namely, “prediction of outcomes.” As far as reliability is concerned, Richardson et al. (2005) argue that the SFAC 2 definition of reliability, “The quality of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent,” provides a link between accrual reliability and earnings persistence. They suggest earnings persistence as a proxy for reliability based on the argument that measurement error in accounting accruals imparts potential error in the earnings measurement process and thereby lowers the correlation between current earnings and future earnings (earnings persistence). The greater the magnitude of measurement error in current earnings, the lower is the correlation between current earnings and future earnings, and this leads to lower earnings persistence. Kirschenheiter (1997, p50) also adopts a similar approach to reliability. He suggests that reliability is linked to the estimation process in accounting measurements and is measured by the “precision of an estimate.” Consistent with the foregoing measurement error perspective, we attempt to capture the notion of “reliability” by the ability of current earnings’ to predict future

earnings, although admittedly this is a “predictive” notion, which does not map perfectly into SFAC No. 2. Our inferences are subject to this caveat.

Our study of the interaction between conservatism and the relevance-reliability trade-off is grounded in the properties of conservative accounting. Givoly and Hayn (2000) provide evidence that earnings recognition has become more conservative in the past several decades. They attribute this increase to the result of application of numerous FASB pronouncements that require early recognition of expenses and anticipated future losses in income and the deferral of gains until they are realized (see Givoly and Hayn, 2000, footnote 1), which is a probable cause for the increasing ability of current earnings to predict future cash flows (Kim and Kross, 2005). This is consistent with increasing conservatism enhancing “relevance” of earnings numbers. Alternatively, estimating future anticipated losses (conservative accounting) might impart measurement error and bias into accounting accruals arising from the uncertainty about the amount of accruals that will be recognized in earnings. This uncertainty imparts potential measurement error into accruals and hence into earnings because earnings equal cash flows plus accruals, thereby lowering earnings persistence (Richardson et al. 2005) and hence usefulness with which earnings persistence is positively correlated (see footnote 3). The foregoing discussion speaks to a possible trade-off between future cash flow predictability (relevance) versus future earnings predictability (reliability) of current earnings. To summarize, here we examine two empirical issues: (1) the effect of accounting conservatism on the trade-off between future earnings predictability (hereafter, reliability) versus future cash flow predictability (hereafter, relevance) of current earnings, and (2) the effect of this trade-off on earnings usefulness.

We focus on two different samples in tandem to examine the linkages between these earnings attributes, namely, earnings usefulness, accounting conservatism, relevance, and reliability. The first sample is the “full sample” of 97,332 firm-years of observations during our sample period of 1973–2005. The second is a subset of the first sample, namely, a “constant sample” of 448 firms that survive most of the sample period. In the second sample, firms are held constant each year while the accounting environment changes over time. Hence, the second sample achieves better control of the firm specific factors that might affect the earnings attributes examined in this paper.

Our primary measures of earnings usefulness, reliability and relevance are based on the incremental R^2 approach (in-sample) and the Theil’s U statistic (out-of-sample) used in prior related literature such as Collins et al. (1997) and Kim and Kross (2005). We use two different measures of accounting conservatism in our empirical tests, namely, cumulative nonoperating accruals and an index created from four different conservatism measures used in Givoly and Hayn (2000), namely, nonoperating accruals, earnings volatility, earnings skewness and market-to-book ratio adjusted for sales growth.

We find that conservatism is positively associated with relevance but negatively associated with reliability, consistent with the notion of a trade-off between these two earnings’ characteristics. We then estimate how relevance and reliability affect earnings usefulness. Because we find that conservatism enhances relevance but at the cost of reliability, their joint effect on earnings usefulness is an empirical matter. We find that earnings usefulness is positively related to reliability. However, we do not find any evidence of a relation between earnings usefulness and relevance. These findings hold for (1) our two samples, (2) various conservatism measures, and (3) both in-sample and out-

of-sample analyses. The findings are also robust to alternative measures we use for relevance, reliability and earnings usefulness.⁴ We conclude that the strength of any relationship between usefulness and relevance is at best, very weak. Subject to the earlier caveat on how reliability is measured, it seems that reliability dominates relevance on the effect on earnings usefulness. Our findings about the relations among conservatism, relevance, reliability, and usefulness seem to indicate that the adoption of an increasing number of conservative accounting standards possibly has an adverse impact on earnings usefulness through their negative effects on reliability.

Our inferences are also subject to a caveat relating to the measurement of accounting conservatism. Note that Givoly and Hayn (2000) attribute the increase in accounting conservatism to the various fair value rules that require early recognition of expenses and anticipated future losses in income. Thus, they are referring to *conditional* conservatism rather than *unconditional* conservatism, where “unconditional” refers to the practice of biasing earnings and assets downward before future losses occur (Qiang 2007). However, in practice it is difficult to isolate the two conservatism effects because they are negatively correlated (Beaver and Ryan 2005). For example, unconditional conservatism immunizes earnings against future bad news (Qiang 2007, p760). Thus, although our predictions are based on the effects of conditional conservatism, our empirical tests possibly capture the effects of both unconditional and conditional conservatism.

⁴ We have three different measures for these earnings attributes, namely, the incremental R^2 , the coefficients on the current earnings variable in the regressions of future earnings, future cash flows, and current price, respectively (Collins et al. 1997), and the forecasting accuracy-based Theil’s U statistic (Kim and Kross, 2005).

The remainder of the paper is organized as follows. In section 2, we review the literature and develop hypotheses. In section 3, we discuss the sample and research design issues. Results are presented in section 4, and section 5 concludes.

2. MOTIVATION AND HYPOTHESES DEVELOPMENT

Accounting standard setters have adopted several new accounting standards during the past several decades in order to improve the usefulness of financial reporting. Many of these new standards involve an earlier recognition of expenses and losses, which requires the incorporation of future estimates into current earnings.⁵ For example, SFAS 121 (subsequently amended by SFAS 144) requires that capital assets are written down to its fair value only if the undiscounted future cash flows from the asset are less than its book value. The write-down amount is recognized as a loss in current earnings. Thus, current earnings reflect future cash flows under potentially adverse circumstances (Beaver and Ryan, 2005), although not under potentially favorable circumstances.

These accounting standards taken together result in an increase in conservatism in accounting numbers⁶ and thus increase the correlation between current earnings and future cash flows. This tends to enhance the relevance of earnings numbers because

⁵ Examples of recent standards include SFAS 114, Accounting by Creditors for Impairment of a Loan, SFAS 115, Accounting for Certain Investments in Debt and Equity Securities, SFAS 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed of, SFAS 123 and 123(R), Accounting for Stock-Based Compensation, SFAS 133 Accounting for Derivative Instruments and Hedging Activities, and SFAS 142, Goodwill and Other Intangible Assets. However, two fair value accounting standards require both *mark-down* and *mark-up* to market values, namely, SFAS 115, and SFAS 133. But these standards typically affect financial statements of financial institutions. Neither the samples used in prior research such as Kim and Kross (2005) nor our sample include financial institutions because the calculation of their accruals requires data for variables that are unavailable for financial sector firms. Thus, SFAS 115 and 133 are unlikely to have much effect on our analysis of conservatism using accrual data.

⁶ In terms of prior discussions, this increased conservatism is caused by fair value accounting rules such as SFAS 121 and 144 and is conditional on the estimation of future expected reductions in cash flows, which reflects the notion of conditional conservatism.

relevance is defined in SFAC No. 2 as the extents to which accounting numbers reflect future cash flows. In contrast, estimation of uncertain future cash flows imparts measurement error in current earnings and reduces reliability of current earnings in the Richardson et al. (2005) sense. Also, anecdotally, the increasing litigious environment has probably led management to adopt a more conservative reporting stance. For example, management might have greater incentives to write off impaired assets and record option expenses based on more conservative future estimates.

Barth (2006, pp272–273) makes the following assertion about the relation between incorporating more future estimates into current earnings and different earnings attributes:

“...[how] estimates of the future are incorporated into financial statements today affects the characteristics of income and its interpretation. For example, with more estimates of future incorporated into today’s measures of assets and liabilities, income will be less predictable. However, predictability of income itself is not an objective of financial reporting. Rather, income’s ability to predict future cash flow is important. Including more current estimates of the future likely enhances income’s predictive ability (of future cash flows).”

Barth’s (2006) comments imply that by prerecognizing unrealized future expenses and losses, accounting conservatism could improve the relation between current earnings and future cash flows but at the cost of earnings predictability. This leads to our hypothesis 1, expressed in two parts:

H1a. Accounting conservatism is positively associated with the ability of current earnings to predict future cash flows (relevance).

H1b. Accounting conservatism is negatively associated with the ability of current earnings to predict future earnings (reliability).

A puzzle raised by Kim and Kross (2005) is that if stock price is the present value of future cash flows, then with the increasing ability of current earnings to predict future cash flows, the ability of earnings to explain stock price should increase rather than decrease as found in prior research (e.g., Amir and Lev, 1996; Collins et al., 1997; Brown, Lo, and Lys, 1999; Francis and Schipper, 1999). To address this puzzle, we argue that the strength of the price-earnings relation depends not only on relevance but also on reliability. Prior research shows that contemporaneous relation between prices and earnings is positively related to the ability of current earnings to predict future earnings (Kormendi and Lipe, 1987; Collins and Kothari, 1989; Easton and Zmijewski, 1989; Lipe, 1990). Also, prior research has shown that the earnings forecasts by analysts are widely used by investors in stock valuation (e.g., Liu and Thomas, 2000; Cheng, 2005). So the trend in earnings usefulness is not only affected by the trend in cash flow predictability but is also affected by the trend in earnings predictability. Thus, we propose the following hypothesis 2, again in two parts:

H2a. The relation between stock price and earnings is positively related to the ability of current earnings to predict future cash flows (relevance).

H2b. The relation between stock price and earnings is positively related to the ability of current earnings to predict future earnings (reliability).

Hypotheses 2a and 2b suggest that price-earnings relation could be declining over time if the decrease in earnings predictability is taking place at a faster pace than the increase in cash flow predictability. Our two hypotheses imply that conservatism affects earnings usefulness via its effects on both cash flow and earnings predictability.

3. SAMPLE AND RESEARCH DESIGN

Prior related research (Givoly and Hayn, 2000; Kim and Kross, 2005) is typically conducted at the aggregate market or industry level using cross-sectional estimates of earnings attributes such as cash flow predictability and accounting conservatism. This aggregate approach enables limited control of the heterogeneity of firm-specific characteristics. In contrast, our research conducts both industry- and firm-level analyses by assessing the inter-relations among predictability of future cash flows, predictability of future earnings, and earnings usefulness, which enables the control of heterogeneity at the industry and firm levels, respectively. This section lays out the sample selection criteria, variable measurement, and the research method.

3.1 Sample Data

Our sample is derived from the annual COMPUSTAT industrial and CRSP files for the period from 1972 to 2006. We require 1-year-lag variables for computing accrual variables and 1-year-lead data of earnings and cash flows for the forecasting models. Thus our final sample period for the test is the 33-year period from 1973 to 2005. The

starting year of our sample period coincides with that of Kim and Kross (2005) and falls within the standard-setting regime of FASB.

We largely follow the data-screening procedures of Kim and Kross (2005). Panel A of Table 1 summarizes the procedures of our sample selection and the resulting sample size. Notably, we exclude financial firms (SIC 6000s) since they do not have the required accrual data.⁷ We also exclude the top and bottom 0.5 percentiles of distributions of the key variables in this study, such as price, earnings, cash flows, and accruals. We focus on two samples: a full sample and a constant sample. For our full sample, we require each industry (defined by the first two-digits of the SIC code) to have at least 12 observations for each fiscal year and to exist over at least 80% of our sample period.⁸ This procedure results in the “full sample” to consist of 41 unique industries with a total 97,332 firm-year observations. To derive our “constant sample,” we eliminate from the full sample, those firms that have fewer than 12 observations during each of the two following subperiods, namely, from 1973 to 1988 and from 1989 to 2005. Our constant sample includes a total of 13,750 firm-year observations for 448 firms. The sizes of the full and constant samples are comparable to those used in Kim and Kross (2005).⁹

[Table 1 about here.]

We use the full sample for standard cross-sectional analysis and the constant sample for time-series analysis. For our time-series analysis, we need to derive relevance/reliability/earnings usefulness measures based on firm-specific regressions.

⁷ For example, the variable “other current liability” (COMPUSTAT data item 72) and the variable “deferred tax” (74) are unavailable for financial sector firms.

⁸ This procedure ensures that the full sample consists of roughly the survivor industries, helping us address the concern that changes in industry composition in the sample may be driving the results.

⁹ In comparison, Kim and Kross (2005, table 6, p765) examined the 1973–2000 sample period to obtain a full sample of 100,266 firm-year observations and a constant sample of 11,788 firm-year observations consisting of about 420 unique firms for each fiscal year.

Using the full sample for firm specific analyses is problematic because of the relatively few time-series observations available for most firms in this sample. Thus, we use the constant sample, which consists of firms that survive most of the sample period. Because we also are interested in the time-series properties of the above-mentioned measures, we split the entire sample period of 1973–2005 into the following four rolling subperiods with a roughly equal length of 16 years and an interperiod gap of approximately 5 years: 1973–1988, 1978–1993, 1983–1998, and 1989–2005. Our results remain qualitatively similar when we use two nonoverlapping subperiods of 1973–1988 and 1989–2005.

To show sample comparability, we summarize the distribution of operating cash flows (*CFO*), earnings (*E*), and total assets (*Assets*) of the full sample versus the constant sample in panels B and C of Table 1. The average amount of assets of the constant sample (\$2,590 million) is twice the average of the full sample (\$1,277 million). Firms in the constant sample, on average, also have higher earnings and operating cash flows relative to the full sample firms.

3.2 Variable Measurement

3.2.1 Cash Flow from Operations

Following prior research (Dechow, Kothari, and Watts, 1998; Kim and Kross, 2005), we measure the cash flow from operations (*CFO*) as follows:

$$\begin{aligned} CFO = & \text{income before depreciation (COMPUSTAT annual data item \#13)} \\ & - \text{interest expense (\#15)} + \text{interest revenue (\#62)} - \text{tax expense (\#16)} - \\ & \Delta WC, \end{aligned}$$

where ΔWC is the change in working capital, which equals the change in account receivables (#2), inventory (#3), and other current assets (#68), minus the changes in

accounting payable (#70), taxes payable (#71), other current liabilities (#72), and deferred taxes (#74). All variables are deflated by the average of total assets (#6) between the beginning and the end of the year.¹⁰

3.2.2 Definition of Earnings

We define earnings throughout this paper as the net income before extraordinary items, which is similar to the “bottom line” net income used in Givoly and Hayn (2000, footnote 12) except that their earnings measure excludes unusual infrequent items. We believe that to characterize the relation between conservatism and relevance/reliability, earnings definition should incorporate line items that reflect conservatism, such as nonrecurring/one-time items (including special and nonoperating items).

However, other measures have been used in the literature. For example, analysts may include or exclude nonrecurring items to predict earnings (Gu and Chen, 2004). In addition, prior research suggests a shift from extraordinary items to special items over time, as well as a dramatic increase in firms reporting special items (Elliott and Hanna, 1996; Riedl and Srinivasan, 2007). Burgstahler et al. (2002) find that prices do not fully impound the implications of special items for future earnings. Consistent with this strand of the literature, we also use earnings before special items in our sensitivity tests.

3.2.3 Measuring Accounting Conservatism

Givoly and Hayn (2000) suggest that the application of various fair value rules that require early recognition of expenses has resulted in increased accounting conservatism in the United States, indicating that they are referring to conditional

¹⁰ Total assets are affected by accruals and hence by conservatism. Thus, we also use sales (#12) as an alternative deflator and find that all our results are robust to the use of this deflator.

conservatism rather than unconditional conservatism, which is the practice of biasing earnings and assets downward before future losses occur (Qiang, 2007). Although unconditional conservatism immunizes earnings against future bad news (Qiang, 2007, p760), it is not clear whether biasing accounting numbers downward before anticipated future losses occur actually enhances “relevance”. In contrast, under conditional conservatism, anticipated reduction of future cash flows are recognized in current earnings enhancing their “relevance.” Also, it is the uncertainty in estimating future anticipated losses (under conditional conservatism) that impart measurement error to accruals and thereby reduces earnings persistence (Richardson et al., 2005). It is not clear that the application of unconditional conservatism has the same effect on earnings persistence (reliability). Our paper does not attempt to disentangle the effect of conditional versus unconditional conservatism.

In this paper, we use two measures of conservatism, namely, cumulative nonoperating accruals and an accounting conservatism index consisting of nonoperating accruals, earnings volatility, earnings skewness and market-to-book ratio. The last three measures in the foregoing index can be affected by the application of unconditional conservatism. Moreover, the magnitude of cumulative nonoperating accruals, the other measure of conditional conservatism, is influenced by unconditional conservatism, because it reduces the amount and frequency of writedowns. Thus, although our predictions are based on the effects of conditional conservatism, our empirical tests possibly capture the effects of both unconditional and conditional conservatism.

First measure of conservatism (CSV1): Cumulative nonoperating accruals

Following Givoly and Hayn (2000), we measure accounting conservatism using nonoperating accruals (total accruals minus operating accruals). The detailed calculation of nonoperating accruals (*NOACC*) is described in Appendix 1. Nonoperating accruals mainly include elements that capture conservative prerecognition of accounting losses but not gains, such as loss provisions on inventory and receivables, restructuring charges, and asset write-downs. Because accounting accruals of firms in a steady state tend to be mean-reverting over time, the extent that accumulated nonoperating accruals over a designated period deviate negatively from zero indicates the degree of accounting conservatism during this period (Givoly and Hayn, 2000).

Our first conservatism measure, *CSV1*, is therefore cumulative nonoperating accruals. For the constant sample, we compute *CSV1* for each subperiod as follows:

$$CSV1_{i,p} = \sum_{j=beg.year}^{end.year} (-NOACC_{i,j}) / n,$$

where i is the firm subscript for each of our 448 sample firms, j is the year subscript, p is the period subscript, and n is the number of nonmissing firm observations in subperiod p . Thus, *CSV1* for firm i is its cumulative nonoperating accruals during subperiod p . All accrual variables are scaled by the average of total assets between the beginning and the end of the year. Because increasingly negative accumulated nonoperating accruals imply more conservative financial reporting, the negative of *NOACC* is used in the computation.

For the full sample analysis, we compute *CSV1* as the cross-sectional mean of nonoperating accruals for each industry-year and then assign the industry *CSV1* to the firms in that industry for that year. The rationale is that for an industry in a steady state, the mean-reversion of accruals should occur in firms in the industry in a random rather

than systematic manner. If in aggregate, firms in an industry show negative nonoperating accruals, it implies that this industry exhibits conservatism on average.

Second measure of conservatism (CSV2): An index

Aside from nonoperating accruals, we also consider the following three conservatism measures used in Givoly and Hayn (2000, 2002): the skewness of earnings, earnings volatility relative to cash flow volatility, and the market-to-book ratio adjusted by sales growth.¹¹ To capture the overall information revealed in these conservatism measures, we design a combined measure of conservatism, *CSV2*, calculated as the sum of standardized values of all four individual conservatism measures including nonoperating accruals. The standardization of each measure takes the form of a linear transformation, namely, $[(\text{original value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value})]$, and results in a minimum of 0 and a maximum of 1 for each variable. The derivation of each individual conservatism measure for each firm-subperiod of our constant sample, and each industry-year of our full sample is similar to the method in computing *CSV1*. The detailed calculation of each of the individual conservatism measures is described in Appendix 1.

The correlation coefficients between *CSV2* and *CSV1*, skewness, earnings volatility, and market to book are 0.66, 0.77, 0.82, and 0.30, respectively, for the full sample. The

¹¹ Givoly and Hayn (2000) also use the Basu (1997) measure for conservatism. We do not choose the Basu (1997) asymmetric timeliness measure of conservatism because this measure captures the asymmetric relation between earnings and positive versus negative returns. Our research tests earnings usefulness based on the price-earnings relation. The Basu (1997) measure might introduce endogeneity in the estimation process and thus is not used in this paper. As an extension to Basu (1997), Ball and Shivakumar (2005) measure conservatism with the asymmetric reversal of good news earnings versus bad news earnings as well as the asymmetric mapping of accruals to positive and negative cash flows. We find that the Ball and Shivakumar (2005) measures (as well as the Basu measure) do not fit our industry and firm-based research design because there are too few bad news or negative cash flow observations in either sample. This is not an issue for the conservatism measures we have chosen in our paper because they are not based on the asymmetric characteristics of good and bad news.

corresponding figures for the constant sample are similar. These correlations indicate that *CSV2* provides a sufficient degree of mapping for its four distinct conservatism components.

3.2.4 Measuring Future Cash Flow Predictability (Relevance)

For our constant sample, we regress one-year-ahead cash flows on current operating cash flows and current earnings by *firm and subperiod*:

$$CFO_{t+1} = \alpha_0 + \alpha_1 CFO_t + \alpha_2 E_t + \varepsilon_t, \quad (1)$$

where E is earnings before extraordinary items (#18), CFO is operating cash flows, and t is the year subscript. Both E and CFO are scaled by average assets. For each firm we run a time-series regression within each subperiod to estimate equation 1. We use $R_{1,p}^2$ to denote the R^2 of equation 1 in subperiod p .

We then re-run equation 1 by including only CFO as the independent variable, i.e.,

$$CFO_{t+1} = \beta_0 + \beta_1 CFO_t + \eta_t. \quad (2)$$

Denote the R^2 from equation 2 for subperiod p , as $R_{2,p}^2$ and define $FCFO_p = R_{1,p}^2 - R_{2,p}^2$.

$FCFO$ represents the incremental contribution of earnings in explaining future cash flows for firm i in subperiod p . We use $FCFO$ as our primary measure of cash flow predictability (relevance).¹²

For our full sample, we use a cross-sectional approach consistent with prior research methods (e.g., Collins et al., 1997; Kim and Kross, 2005). To estimate the value

¹² In the context of equation 1, a positive estimate of α_2 indicates that current earnings have incremental explanatory power in predicting future cash flows beyond current cash flows. We therefore also use the α_2 estimate as an alternative measure for cash flow predictability, and analogously the coefficient estimate of a_2 in equation 3 for earnings predictability and the coefficient estimate of h_2 of equation 5 for earnings usefulness.

of relevance, we estimate regression equations 1 and 2 at the industry level (two-digit SIC level for a total of 41 industries) for each year. We obtain the relevance measure for each industry-year and assign this relevance measure to each firm in the industry for that year.¹³ We estimate the two cash flow predictability equations analogously for the constant sample.

The subperiod analysis and cross-sectional analysis give rise to different number of observations in *FCFO* between the constant and full samples. For the constant sample analysis, there are 1,792 unique firm-subperiod observations (448 firms $\times$ 4 subperiods) of *FCFO*. For the cross-sectional analysis, there are 1,353 unique industry-year observations (41 industries $\times$ 33 years) of *FCFO* for the full sample.

In addition to *FCFO*, following Kim and Kross (2005), we also use Theil's *U* as a measure of relevance (*UFCFO*). Theil's *U* differs from the in-sample estimate of *FCFO* by emphasizing out-of-sample predictability.

For the constant sample, the Theil's *UFCFO* for firm *i*, *UFCFO_i*, is calculated as

$$UFCFO_i = \sqrt{\frac{\sum_t (CFO_{i,t} - predictedCFO_{i,t})^2}{\sum_t (CFO_{i,t})^2}},$$

where *predicted CFO* is the predicted *CFO* based on the regression of 1-year leading cash flow on current earnings from an estimating period, and *t* indexes the forecasting year ($t = 1989, \dots, 2005$). For example, our first estimating period is 1973–1988, and we use the coefficient estimates from this estimation period to calculate the predicted *CFO* in

¹³ Studies such as Collins et al. (1997), which conduct yearly cross-sectional regressions to draw inferences at the aggregate level, do not have cross-sectional dispersions in relevance. Our approach creates cross sectional dispersions in relevance at the industry level. This way of estimating relevance, i.e., estimating a parameter based on a certain portfolio of firms and then assigning the estimate to the firms in the portfolio is similar in spirit to estimating stock beta's in Fama and MacBeth (1973), and Fama and French (1992).

year 1989. We roll over the forecasting period of an equal 16-year length until we use the estimating period of 1989–2004 for the predicted value of 2005. The Theil's U statistic captures the average forecast accuracy for each firm over the 17-year period of 1989–2005. A low U statistic indicates high predictability or high relevance, and vice versa. Therefore, Theil's U should be negatively correlated with $FCFO$.

For the full sample, the Theil's $UFCFO$ statistic is calculated for each industry-year from 1974 to 2005 (32 years). For example, the Theil's $UFCFO$ statistic for

relevance is calculated for each industry-year as $UFCFO_j = \sqrt{\frac{\sum_i (CFO_{i,j} - predictedCFO_{i,j})^2}{\sum_i (CFO_{i,j})^2}}$,

where i indexes the firm and j indexes the industry, and the predicted cash flows are based on the forecasting regression for each industry year of 1-year leading cash flow on current earnings.

3.2.5 Measuring Future Earnings Predictability (Reliability)

The measure of the ability of current earnings to predict future earnings (FE) is computed in a manner similar to the ability of current earnings to predict future cash flows ($FCFO$). We estimate the following earnings forecast models:

$$E_{t+1} = a_0 + a_1 CFO_t + a_2 E_t + \tau_t, \quad (3)$$

and

$$E_{t+1} = b_0 + b_1 CFO_t + \nu_t. \quad (4)$$

Consistent with the measurement of cash flow predictability ($FCFO$), the difference between the explanatory power of equation 3 in each period (R_3^2) and that of equation 4 (R_4^2) represents the incremental contribution of current earnings in explaining future earnings: $FE = R_3^2 - R_4^2$. This measure and a Theil's U (UFE) analogously derived

from the regression of 1-year leading earnings on current earnings are our proxies for earnings reliability. Again, regressions 3 and 4 are estimated on the constant sample by firm and subperiod to derive 448 firms $\times$ 4 subperiods (1792) earnings predictability observations of R^2 , and on the full sample by year and industry to derive 41 industries $\times$ 33 years (1353) earnings predictability observations of R^2 .

3.2.6 Measuring Price-Earnings Relation (Earnings Usefulness)

Consistent with Collins et al. (1997), the measure of earnings usefulness is estimated from the following equations:

$$PRC_t = h_0 + h_1 BVS_t + h_2 EPS_t + \chi_t, \quad (5)$$

and

$$PRC_t = g_0 + g_1 BVS_t + \nu_t. \quad (6)$$

Similar to the above-mentioned incremental R^2 computation, earnings usefulness (EU) is measured as the difference between the R^2 of equation 5 and the R^2 of equation 6. We do not have a Theil's U measure for earnings usefulness because equations 5 and 6 are not forecasting models.

3.3 Research Method

In-sample analysis

In hypothesis 1, we examine the impact of accounting conservatism on cash flow predictability and earnings predictability. We test the relation between cash flow predictability and conservatism using the following regression,

$$FCFO_{i,j} = d_0 + d_1 CSV_{i,j} + d_2 SIZE_{i,j} + d_3 HERF_{i,j} + d_4 OC_{i,j} + d_5 INT_{i,j} + d_6 TIME_j + \mu_{i,j}; \quad (7)$$

and the relation between earnings predictability and conservatism using the following regression,

$$FE_{i,j} = e_0 + e_1 CSV_{i,j} + e_2 SIZE_{i,j} + e_3 HERF_{i,j} + e_4 OC_{i,j} + e_5 INT_{i,j} + e_6 TIME_j + \mu_{i,j}; \quad (8)$$

where i indexes the firm and j indexes the period (year) in the constant (full) sample analysis, and CSV is the conservatism measure ($CSV1$ and $CSV2$). The control variables in the equations are based on Lev (1983), Dechow et al. (1998), and Asthana and Zhang (2006), and include size (log of inflation-adjusted assets in 1973 \$, $SIZE$), Herfindahl index for industry concentration (sum of squared market shares in the industry, $HERF$), operating cycle (the sum of the number of days' of sales in average receivables plus the number of days' of sales in average inventory, OC), an indicator variable that equals 1 for intangible intensive industries (INT),¹⁴ and a time variable for the period (year) for the constant sample ($TIME$).¹⁵ Throughout this paper, for the constant-sample analysis, we take the average of each of the control variables by firm and subperiod; and for the full-sample analysis, we keep the individual values of each control variable for each firm-year observation. We run pooled regressions for the constant sample and Fama-MacBeth cross sectional regressions for the full sample. Following Collins et al. (1997), we correct for potential autocorrelations in residuals using the generalized least squares (GLS) method.

Hypothesis 1a predicts that accounting conservatism is positively related to the ability of current earnings to predict future cash flows, and hypothesis 1b predicts that accounting conservatism is negatively related to the ability of current earnings to predict

¹⁴ Following Collins et al. (1997), the intangible industries are firms with the following first two or three digits of SIC code: 282 plastics and synthetics materials; 283 drugs; 357 computer and office equipment; 367 electronic components and accessories; 48 communications; 73 business services; 87 engineering, accounting, R&D and management related services.

¹⁵ The cross-sectional yearly regression design of the Fama-MacBeth method in the full sample analysis does not permit us to estimate the year trends ($TIME$) for relevance and reliability.

future earnings. Therefore, the predicted sign of *CSV* is positive in equation 7 ($d_1 > 0$), and negative in equation 8 ($e_1 < 0$). As far as control variables are concerned for equations 7 and 8, we expect to observe that firm size (*SIZE*), and industry concentration (*HERF*) to be positively associated with earnings predictability (Lev, 1983). We extend this prediction to cash flow predictability because larger firms of high industry concentration are more likely to enjoy economic rents and thus likely to have more sustainable cash flows as well. Following Dechow et al. (1998), the operating cycle variable is expected to have a positive sign. Asthana and Zhang (2006) suggest that intangible expenditures such as research and development (R&D) investments have a net positive effect on the persistence of abnormal earnings as a trade-off between the competition mitigation effect and the risk associated with the uncertainty of R&D expenditures. Finally, considering that we are not measuring the persistence of abnormal earnings and no prior research provides evidence on how this trade-off affects earnings reliability, we make no explicit prediction of the sign of *INT*.

Hypotheses 2a and 2b investigate the pricing effect of the cash flow and earnings predictability, respectively. We test these hypotheses by estimating the following regression:

$$EU_{i,j} = g_0 + g_1FCFO_{i,j} + g_2FE_{i,j} + g_3SIZE_{i,j} + g_4INT_{i,j} + g_5ONE_{i,j} + g_6NE_{i,j} + g_7TIME_j + \zeta_{i,j}. \quad (9)$$

Following Collins et al. (1997), control variables in equation 9 include *SIZE*, *INT*, percentage of onetime items (the absolute value of onetime items over earnings, *ONE*), and the indicator variable for negative earnings (1 if $E < 0$ and 0 otherwise, *NE*). Hypothesis 2a (2b) indicates that earnings usefulness is positively related to cash flow predictability (earnings predictability). Thus, coefficients g_1 and g_2 of equation 9 are both

predicted to be positive. As discussed in Collins et al. (1997), the expected signs are positive for *SIZE*, and negative for *ONE*, *NE*, and *INT*.

Out-of-sample analysis

We replace FCFO and FE with the corresponding Theil's *U* measures, UFCFO and UFE in equations 7, 8, and 9 in the out-of-sample analysis for both the constant and full samples. We use similar specifications for both the in-sample and out-of-sample analysis.

Finally, as a robustness check, we estimate a system of equations where cash flow predictability and earnings predictability, while affecting earnings usefulness, are endogenously driven by conservatism. We treat regressions 7 and 8 as structural equations in a simultaneous-equations system and we run simultaneous-equations regressions of equations 7, 8, and 9 with cash flow predictability, earnings predictability, and earnings usefulness as endogenous variables using 2SLS.

4. PRIMARY RESEARCH FINDINGS

This section first discusses the comparability of earnings trends in our two samples with those documented in prior research. To provide preliminary evidence for hypothesis 1, we first report the tests of the univariate correlation analysis and the bivariate frequency analysis. We formalize our tests with multivariate single-equation analysis.

4.1 Univariate Statistics

The distribution statistics and the correlation matrix of all dependent and independent variables in the full and constant samples are presented in panels A to D of

Table 2. We make two brief observations on the univariate statistics of the variables directly related to the hypotheses. First, the two samples have roughly the same mean and standard deviation with respect to the key accounting attributes, namely, earnings usefulness (*EU*), relevance (*FCFO*), and reliability (*FE*). Second, the correlation matrices of full and constant samples are largely similar. Consistent with our hypotheses 1a and 1b, both conservatism measures (*CSV1* and *CSV2*) are positively related to relevance (*FCFO*) but negatively related to reliability (*FE*). This suggests a possible trade-off between *FE* and *FCFO* when contingent upon conservatism.

[Table 2 about here.]

It is also useful to examine the time-series trends in *FCFO*, *FE*, *EU*, and conservatism for the full sample and the constant sample. We find that observed trends in *FCFO*, *FE*, and conservatism trends are consistent with what has been reported in the literature. Consistent with the prior literature (e.g., Collins et al. 1997), *EU* is declining over the past three decades for the *full sample*; however, it is increasing over the same time period for the *constant sample*. Table 3 details these results.

[Table 3 about here.]

Table 3 applies the research methods in Kim and Kross (2005) and Collins et al. (1997) to analyze the trend of yearly cross-sectional estimates of *FCFO*, *FE*, and *EU*. For example, the first column of Table 3 replicates the Kim and Kross (2005, panel A of table 4, p761) cross-sectional estimates of *FCFO* for their three periods plus the additional sample period of 2001–2005. Clearly, *FCFO* has been increasing over the past 33 years for both samples, consistent with Kim and Kross (2005) and Collins et al. (1997). Consistent with Dichev and Tang (2006), *FE* has been decreasing over the past 33 years

for both samples. In addition, the declining *FE* trend of the full sample is much steeper than that of the constant sample (estimated coefficient on the time trend of -0.011 for the full sample versus -0.005 for the constant sample, respectively). The diverging trends between *FCFO* and *FE* are further corroborated in Figure 1, where we show the trailing 5-year moving average of both series. In this figure, *FCFO* is generally increasing and *FE* is almost unambiguously decreasing for both the full and constant samples.

[Figure 1 about here.]

The third column of Table 3 shows the earnings usefulness (*EU*) trend. Consistent with the prior literature (e.g., Collins et al. 1997), earnings usefulness has been declining over the past three decades over the full sample (t -stat on time trend = -2.30). However, in the constant sample, earnings usefulness has been significantly increasing over time (t -stat = 4.20). Figure 2 plots these diverging trends of earnings usefulness in our constant versus full samples. Not surprisingly, the figure also shows that the nonsurvivor sample, defined as the full sample excluding the constant sample, exhibits an even steeper decline in *EU* than the full sample. In Section 5.3, we provide further evidence to reconcile the diverging earnings usefulness trends in the constant and full samples.

[Figure 2 about here.]

Finally, Figure 3 plots the trend of accounting conservatism as proxied by *CSV2*.¹⁶ Consistent with Givoly and Hayn (2000), conservatism has increased over the sample period regardless of the sample used.

[Figure 3 about here.]

Collectively, the trends of *FCFO*, *FE*, and *CSV2* in Figures 1 and 3 display patterns consistent with our hypotheses 1a and 1b and suggest that a trade-off may exist

¹⁶ The *CSV1* measure shows a similar trend.

between *FCFO* and *FE* over our sample period and that this trade-off may be caused by increasing conservatism.

4.2 Bivariate Frequency Analysis

To bring together the time trends exhibited by *EU*, *FCFO*, and *FE* in Table 3 and Figures 1 and 2, we test the hypothesis that there is a trade-off between *FCFO* (relevance) and *FE* (reliability) and that this trade-off is caused by increasing levels of conservatism. Table 4 provides a univariate analysis of the trade-off based on our constant sample. In panel A, 810 off-diagonal observations (out of a total of 1,792) have contrasting relevance and reliability values. Of these, 405 observations have low relevance (below median) but high reliability (above median) and another 405 observations have high relevance but low reliability. These observations apparently indicate a trade-off between relevance and reliability. We call this the trade-off subsample. In panel B, we examine the distribution of the trade-off subsample conditional on their conservatism attributes. We show that high conservatism observations (above median) are more likely (231 observed versus 194 expected firm-periods) to have high relevance but low reliability. However, low conservatism observations (below median) are more likely (249 observed versus 212 expected firm-periods) to have low relevance but high reliability. These findings are consistent with the notion that increasing accounting conservatism enhances relevance at the cost of reliability. A chi-square test rejects the null hypothesis of no relation between the levels of conservatism and incidence of high/low relevance/reliability (chi-square statistic of 27.83, $p < .0001$).

[Table 4 about here]

4.3 Multivariate Regression Analysis

4.3.1 In-sample Analysis

The bivariate frequency analysis provides preliminary evidence on the relation between conservatism and the earnings relevance/reliability trade-off. We now formally test our two hypotheses with multivariate regression analysis. To correct for potential autocorrelations in residuals, we follow Collins et al. (1997) to use the general least square (GLS) method for equations 7, 8, and 9 for both the constant and full samples.

Table 5 presents the test results for hypotheses 1a and 1b, which predict a positive relation between conservatism (*CSV1* and *CSV2*) and earnings relevance (*FCFO*) and a negative relation between conservatism and earnings reliability (*FE*). Because the results are similar across different conservatism measures and samples, for the sake of brevity, we focus the discussion on the constant sample and on the *CSV1* conservatism measure. We find that as predicted by hypothesis 1a, the coefficient on *CSV1* is positive and significant (a coefficient of 0.26 with $t = 2.31$) for *FCFO* (relevance) in equation 7. In equation 8, *FE* (reliability) is negatively related to *CSV1* (-1.20 with $t = 6.96$). The signs of the control variables in table 5 are all in the hypothesized directions when they are significant. In presence of *CSV1* and the control variables, the time trend variable, *TIME*, is insignificant in both the relevance and reliability regression. Because we use the cross-sectional yearly regression design in the full sample analysis, we do not estimate the year trends (*TIME*) for relevance and reliability.

Collectively, the results reported in Table 5 support our hypotheses 1a and 1b that conservatism drives up relevance but drives down reliability. Our results in Table 5 are

consistent with the notion of a trade-off between relevance and reliability in that relevance is enhanced with increasing conservatism but at the cost of reliability.

[Table 5 about here.]

Table 6 shows the test results for hypotheses 2a and 2b. As predicted by hypothesis 2b, earnings usefulness variable (*EU*) is positively related to reliability (a coefficient of 0.15 with $t = 7.66$) for the constant sample. However, inconsistent with hypothesis 2a, relevance is insignificantly related to earnings usefulness for this sample. The positive coefficient on *TIME* in the constant sample (0.01 and $t = 4.61$) indicates that earnings usefulness has increased over time for the constant sample after controlling for all other variables. The findings for the full sample are consistent with the findings for the constant sample, namely, that earnings usefulness is positively related to reliability (0.12, with $t = 7.02$) but not to relevance. In the full sample, we also find that negative earnings (*NE*) reduce earnings usefulness.¹⁷

[Table 6 about here.]

In summary, Table 5 supports hypotheses 1a and 1b; that is, increasing conservatism drives up relevance at the cost of reliability, leading perhaps to a trade-off between relevance and reliability. As for hypotheses 2a and 2b, the table 6 results support the hypothesized positive relation between earnings usefulness and reliability but not the hypothesized positive relation between earnings usefulness and relevance.

4.3.2 Out-of-sample Analysis

¹⁷ In the full sample, we find a negative coefficient on the variable *SIZE* (-0.01 , $t = 3.39$). Further analysis indicates that this negative coefficient on the size variable is mainly caused by very large firms included in the constant sample. When we add a variable that interacts size and an indicator variable for above-median-sized firms, the interaction term shows a significantly negative coefficient, and the size variable itself has an insignificant coefficient.

We next report the results of our out-of-sample tests by using the predictive Theil's U measure for relevance and reliability. Table 7 reports the results for both the constant and full samples. For the sake of brevity, we only report the results using *CSV1* as the conservatism measure.¹⁸

[Table 7 about here.]

The results in Table 7 are similar to the results derived earlier from using incremental R^2 variables, namely, that conservatism is positively (negatively) related to earnings relevance (reliability), and earnings usefulness increases with reliability but is insensitive to relevance. Note that the smaller the Theil's U statistic, the better the forecast accuracy and the higher the relevance and reliability. In column 1, we find that the coefficient on *CSV1* is negative and significant (-1.73 , with $t = 5.25$), suggesting that increasing conservatism is associated with a smaller Theil's U value of *FCFO*, or higher relevance. Similarly, we find that conservatism is negatively associated with reliability, as shown in column 2 that the coefficient of Theil's U is positive and significant (3.41 , with $t = 7.11$). Moreover, column 3 shows a significant coefficient of Theil's U for *FE* (-0.11 , with $t = 3.04$) but not for *FCFO*, which is consistent with our prior results that earnings usefulness is positively associated with reliability but not with relevance. Columns 4-6 indicate that these findings are even more significant for the full sample. Overall, the out-of-sample analysis results support the in-sample results and provide a strong test of our hypotheses.

5. SENSITIVITY ANALYSES

5.1 Alternative Measures for Relevance and Reliability

¹⁸ The results of using *CSV2* are qualitatively similar to the statistics reported in Table 7.

We also test our hypotheses by using one additional proxy of relevance, reliability, and earnings usefulness, namely, the coefficients on current earnings in equations 1 (cash flow forecasting model), 3 (earnings forecasting model), and 5 (earnings pricing model). In untabulated results, we find that the results using the coefficient measures are similar to the results derived from using incremental R^2 variables, namely, that conservatism is positively (negatively) related to earnings relevance (reliability), and earnings usefulness increases with reliability but is insensitive to relevance.

5.2 2SLS Regression Analysis—Simultaneous-Equations System Framework

We next estimate simultaneous regressions of equations 7, 8, and 9 using the two-stage least square (2SLS) method. The underlying rationale is that relevance and reliability may be endogenous variables. The results reported in Table 8 relate to the conservatism measure *CSV1*.¹⁹ For our constant sample, the results of estimating equations 7, 8, and 9 (columns 1-3) reinforce the findings reported in Tables 5-7, suggesting that increasing conservatism drives up cash flow predictability (relevance) at the cost of decreasing earnings predictability (reliability). In this framework where relevance and reliability are endogenously determined, we also find that earnings usefulness is positively related to reliability, but insensitive to relevance for the constant sample. The full sample results in table 8 (columns 4-6) are consistent with the results of the constant sample. The simultaneous regression specification for the full sample includes the time variable, in contrast to the analyses in Table 6 and 7, which were cross-sectional tests.

¹⁹ The results are qualitatively similar when we use *CSV2* instead.

[Table 8 about here.]

The simultaneous-regression results allow us to gauge the impact of increasing conservatism on earnings usefulness. Combining the results of equations 8 and 9, for the constant sample, we find that one unit increase in the conservatism measure reduces reliability by 1.20 and this in turn causes a 0.28 ($= -1.20 \times 0.23$) unit reduction in earnings usefulness. The corresponding figure for the full sample is a 0.21 ($= -1.41 \times 0.15$) unit decrease in earnings usefulness per unit increase in conservatism.

5.3 Reconciling the Diverging Trends of Earnings Usefulness in the Two Samples

In this section, we report the results of our attempts to reconcile the findings in table 3 that earnings usefulness of the constant sample is increasing while that of the full sample is decreasing over time. To do this, we examine whether the diverging time trends in earnings usefulness are driven by certain firm characteristics. Table 9 reports the time series trend of earnings usefulness of different portfolios based on various firm characteristics.

[Table 9 about here.]

In particular, we form portfolios composed of the following *combination* of variables, namely, (1) changes in earnings reliability (ΔFE) and changes in conservatism ($\Delta CSVI$), and (2) changes in onetime items (ΔONE) and changes in the frequency of negative earnings (ΔNE). Note that the latter two conditioning variables are known to affect earnings usefulness in prior literature (Givoly and Hayn, 1994; Collins et al., 1999). For the constant sample, each firm's ΔFE equals the difference in FE between the 1989–2005 subperiod and the 1973–1989 subperiod. For the full sample, ΔFE is calculated as the yearly FE difference by industry. The other variables are analogously

defined. We sort firms into portfolios using median values of these firm characteristics as breakpoints. Specifically, we form portfolios with low reliability *but* high conservatism scores versus portfolios with high reliability but low conservatism scores (panel A). Similarly, we examine portfolios with high ΔONE and high ΔNE scores *versus* portfolios with low ΔONE and low ΔNE scores (panel B).^{20 21}

After we form the portfolios, we estimate the regression, $EU_t = \tau_0 + \tau_1 * YEAR_t + \delta_t$ for each portfolio, where $YEAR$ is the year variable. We then test whether the portfolios formed with the same characteristics have different trends in earnings usefulness across the constant and full samples (reported in the “Difference” columns in Table 9). The difference in the EU trend is combined with the portfolio weights (reported in the “No. of Obs.” row in Table 9) to determine the relative impact of each portfolio on EU .

Results of the analyses for the low reliability but high conservatism portfolios versus high reliability *but* low conservatism portfolios (panel A) are as follows: (1) For both (constant and full) samples, earnings usefulness of the former portfolio decreases over time, whereas earnings usefulness of the latter portfolio increases over time; (2) the percentage of low reliability/high conservatism observations (38,575/97,332, or 40%) is much higher for the full sample compared with the constant sample (3,439/13750, or

²⁰ We also form portfolios based on the following individual variables: change in size, intangible industry membership, change in earnings reliability, or change in conservatism. We do not find significant differences in the trend in earnings usefulness in portfolios sorted on these individual conditional variables.

²¹ One may argue that the decreasing earnings usefulness trend for the full sample may be due to the fact that stock price volatility is largely increasing during our sample period. That is, if the dispersion of the dependent variable (price) increases, whereas those of the independent variable (earnings and book value) remain constant, the goodness of fit (i.e. R^2) provided by the independent variables will be smaller (Francis and Schipper, 1999). Our research design addresses this concern, at least partially, in two ways. First, our earnings usefulness is an incremental R^2 measure between two equations that both use price as the dependent variable. A change in R^2 due to return volatility in one equation is likely to be offset by a similar change in the other equation. Second, although return volatility of the full sample is known to increase over time (see, e.g. Campbell, Lettau, Malkiel, and Xu, 2001, and Brandt, Brav, Harvey, and Kumar, 2008), return volatility for our constant sample is actually found to be trending down. Thus, our earnings usefulness results are unlikely to be driven by return volatility.

25%), indicating that there is a greater downward pressure on earnings usefulness of the full over the constant sample, and (3) the percentage of high reliability/low conservatism observations is about the same in both samples, approximately 25%, (3,500/13,750 for the constant sample and 24,945/97,332 for the full sample, respectively). This outcome suggests that this particular combination of variables (high reliability/low conservatism) is unlikely to cause a difference in the upward pressure on *EU* between the constant *versus* the full sample. Taken collectively, portfolios sorted on reliability and conservatism offer an explanation why the full sample seems to have a downward *EU* trend but not why the constant sample has an upward *EU* trend. Therefore, reliability and conservatism considerations are only partially successful in explaining the diverging trends of *EU* in the two samples.

We next form portfolios with high ΔONE and high ΔNE scores versus low ΔONE and low ΔNE scores (panel B). Again, we find the following results: (1) for both constant and full samples, earnings usefulness of the high ΔONE /high ΔNE portfolio decreases over time but earnings usefulness of the low ΔONE /low ΔNE portfolio increases over time; (2) 48% (46,559/97,332) of the full sample observations belongs to the high ΔONE /high ΔNE portfolio but the corresponding number for the constant sample is only 20% (2,668/13,750), implying a greater downward pressure on *EU* for the full relative to the constant sample from this combination of variables; and (3) 20% (19,439/97,332) of the full sample observations belongs to the low ΔONE /high ΔNE portfolio but the corresponding number for the constant sample is much higher at 41% (5,582/13,750), implying a greater upward pressure on *EU* for the constant sample. Thus, the rates at which smaller/larger onetime items coupled with few/frequent negative earnings occur in

each sample, explains, to some extent, why time-series trends in *EU* in the two samples are different.²²

5.4 Measurement Window

Our research defines relevance and reliability with respect to earnings' predictive ability for 1-year-ahead cash flows and earnings. Prior research suggests that some conservatively reported items such as goodwill impairments and other asset write-downs influence future cash flows and earnings beyond 1 year (e.g., Doyle et al., 2003). Therefore, we increase our forecasting horizon to 2 or 3 years as a robustness check.

Use of a 2-year or a 3-year forecasting horizon weakens our results. Specifically, we find that the coefficient on the conservatism variable becomes insignificant for the reliability regression (equation 8), although other results remain the same. However, when we use the sum of next 2 years or next 3 years cash flows or earnings as dependent variables in the forecasting models (equations 1 and 3) (Doyle et al., 2003), all our previous results continue to hold.

Considering the deterioration of the forecasting accuracy with a longer forecasting period, the weaker results of multiple-year forecast window are not surprising. Conservative accounting (conditional conservatism) does require managers to recognize earnings losses arising from lower than expected future cash flows beyond the immediate following year. However, potential measurement error in estimated accounting numbers increases as managers' estimation window increases from 1 year to 2 to 3 years. This, in

²² It cannot be ruled out that the reliability/conservatism effects and the onetime items/losses effects are likely different manifestations of the same underlying phenomenon because these attributes are highly correlated.

turn, imparts measurement error in the relevance measure that uses 2 to 3-year ahead realized accounting numbers, and leads to weaker results for our trade-off tests.

5.5 Definition of Earnings

We also use the following two definitions of earnings in our empirical tests, (1) earnings before special items; and (2) earnings before onetime items, namely, extraordinary items, special items, and discontinued operations. All our results are robust to the first definition of earnings. Our results are qualitatively similar but weaker when we use the second definition.

The use of earnings before onetime items merits some further discussion. We use it to analyze the extent to which our results are driven collectively by nonrecurring items. When we use this particular measure of earnings, the association between conservatism and earnings relevance (equation 7) is weakened though it still has a consistent positive sign in all of the regressions. However, this variable becomes insignificant in the constant sample regressions. The weakened results suggest that the exclusion of nonrecurring-onetime items in earnings dampens the impact of accounting conservatism on cash flow predictability. This is possibly because some earnings components, such as write-down of assets, restructuring and litigation charges, that reflect conditional conservatism, are categorized as nonrecurring onetime items by COMPUSTAT. Moreover, the recognition of the losses associated with discontinued operations may reflect conservative accounting estimates as well. Omission of nonrecurring conservative accounting items from earnings effectively strips it of any influence of conditional conservatism and weakens the association between conservatism and earnings' ability to forecast future cash flows (relevance).

6. CONCLUSION

We present robust evidence that an increasing level of accounting conservatism during the 1973–2005 period has led to an increase in relevance and a decrease in reliability of current earnings. Relevance is measured as the ability of current earnings to predict future cash flows (Kim and Kross 2005). Reliability is measured as the ability of current earnings' to predict future earnings (Richardson et al. 2005), and is subject to the caveat that this proxy is a “predictive” notion, which may not map perfectly into SFAC No. 2. We also report that usefulness of earnings for explaining stock prices over book values is positively related to reliability but not to relevance. We contribute to the debate on the costs and benefits of conservative accounting by showing that increasing conservatism enhances relevance but at the cost of reliability. Combined with the market's seemingly lower emphasis on relevance as compared to reliability, our results provides insights into the puzzle raised by Kim and Kross (2005), namely, that the earnings usefulness (price-earnings relation) seems not to increase with the increase in the ability of earnings to predict future cash flows.

Our findings about the relations between conservatism, relevance, reliability, and usefulness suggest that the adoption of an increasing number of conservative accounting standards possibly has an adverse impact on earnings usefulness through their negative effects on reliability.

REFERENCES:

- Amir, E., and B. Lev. 1996. Value-Relevance of Nonfinancial Information: The Wireless Communications Industry. *Journal of Accounting and Economics* 22 (1–3): 3–30.
- Asthana, S. C., and Y. Zhang. 2006. Effect of R&D Investments on Persistence of Abnormal Earnings. *Review of Accounting & Finance* 5 (2): 124.
- Ball, R. and L. Shivakumar. 2005. Earnings Quality in U.K. Private Firms: Comparative Loss Recognition Timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.
- Barth, M. E. 2006. Including Estimates of the Future in Today's Financial Statements. *Accounting Horizon* 20 (3): 271–285.
- Barth, M. E., D. P. Cram, and K. K. Nelson. 2001. Accruals and the Prediction of Future Cash Flows. *The Accounting Review* 76 (1): 27–58.
- Basu, S. 1997. The Conservatism Principle and Asymmetric Timeliness of Earnings. *Journal of Accounting and Economics* 24 (1): 3–37.
- Beaver, W.H., and S. Ryan. 2005. Conditional and Unconditional Conservatism: Concepts and Modeling. *Review of Accounting Studies* 10 (2–3): 269–309.
- Brandt, M. W., A. Brav, J. R. Graham, and A. Kumar. 2008. The Idiosyncratic Volatility Puzzle: Time Trend or Speculative Episode? Forthcoming, *Review of Financial Studies*.
- Brown, S., K. Lo, and T. Lys. 1999. Use of R^2 in Accounting Research: Measuring Changes in Value Relevance over the Last Four Decades. *Journal of Accounting and Economics* 28 (2): 83–115.
- Burgstahler, D., J. Jiambalvo, and T. Shevlin. 2002. Do Stock Prices Fully Reflect the Implications of Special Items for Future Earnings? *Journal of Accounting Research* 40 (3): 585–612.
- Campbell, J. Y., M. Lettau, B. G. Malkiel, Y. Xu. 2001. Have Individual Stocks Become More Volatile? An Empirical Exploration of Idiosyncratic Risk. *Journal of Finance* 56 (1): 1–43.
- Cheng, Q. 2005. The Role of Analysts' Forecasts in Accounting-based Valuation: A Critical Evaluation. *Review of Accounting Studies* 10 (1): 5–31.
- Collins, D. W., and S. P. Kothari. 1989. An Analysis of Intertemporal and Cross-Sectional Determinants of Earnings Response Coefficients. *Journal of Accounting and Economics*. 11 (2–3): 143–182.
- Collins, D. W., E. L. Maydew, and I. F. Weiss. 1997. Changes in the Value-relevance of Earnings and Book Values over the Past Forty Years. *Journal of Accounting and Economics* 24 (1): 39–67.
- Collins, D. W., M. Pincus, and H. Xie. 1999. Equity Valuation and Negative Earnings: The Role of Book Value of Equity. *The Accounting Review* 74 (1): 29–61.

- Dechow, P. M., S. P. Kothari, and R. L. Watts. 1998. The Relation Between Earnings and Cash Flows. *Journal of Accounting and Economics* 25 (2): 133–168.
- Dichev, I. D., V. W. Tang. 2006. Matching the Property of Earnings over the Last 40 Years. *Working paper. University of Michigan, Georgetown University.*
- Doyle, J. T., R. J. Lundholm and M. T. Soliman. 2003. The Predictive Value of Expenses Excluded from Pro Forma Earnings. *Review of Accounting Studies* 8 (2–3): 145–174.
- Easton, P. D., and M. E. Zmijewski. 1989. Cross-Sectional Variation in the Stock Market Response to Accounting Earnings Announcements. *Journal of Accounting and Economics* 11 (2–3): 117–142.
- Elliott, J. A., and J. D. Hanna. 1996. Repeated Accounting Write-Offs and the Information Content of Earnings. *Journal of Accounting Research* 43 (5): 753–780.
- Fama, E. F. and K. R. French. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance* 47 (2), 427–465.
- Fama, E. F. and J. D. MacBeth. 1973. Risk, Return, and Equilibrium: Empirical Tests. *Journal of Political Economy* 81 (2): 607–636.
- FASB SFAC 2. 1980. Statement of Financial Accounting Concepts No. 2: Qualitative Characteristics of Accounting Information. *Financial Accounting Standards Board.*
- Financial Accounting Standards Committee of AAA. 2007. The FASB's Conceptual Framework for Financial Reporting: A Critical Analysis. *Accounting Horizon* 21 (2): 229–238.
- Francis, J., and K. Schipper. 1999. Have Financial Statements Lost Their Relevance? *Journal of Accounting Research* 37 (1): 319–352.
- Givoly, D., and C. Hayn. 1994. Special Items—Information Content and Earnings Manipulation. *Working Paper, University of California at Irvine.*
- Givoly, D., and C. Hayn. 2000. The Changing Time-Series Properties of Earnings, Cash Flows and Accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics* 29 (3): 287–320.
- Givoly, D., and C. Hayn. 2002. Rising Conservatism: Implications for Financial Analysis. *Financial Analysts Journal* 58 (1): 56–74.
- Gu, Z. and T. Chen. 2004. Analysts' Treatment of Nonrecurring Items in Street Earnings. *Journal of Accounting and Economics* 38 (complete): 129–170.
- Kim, M., and W. Kross. 2005. The Ability of Earnings to Predict Future Operating Cash Flows Has Been Increasing—Not Decreasing. *Journal of Accounting Research* 43 (5): 753–780.
- Kirschenheiter, M. 1997. Information Quality and Correlated Signals. *Journal of Accounting Research* 35 (1): 43–59.

- Kormendi, R., and R. Lipe. 1987. Earnings Innovations, Earnings Persistence, and Stock Returns. *The Journal of Business* 60 (3): 323–345.
- Lev, B. 1983. Some Economic Determinants of Time-Series Properties of Earnings. *Journal of Accounting and Economics* 5 (January): 31–48.
- Lipe, R. 1990. The Relation between Stock Returns and Accounting Earnings Given Alternative Information. *The Accounting Review* 65 (1): 49–71.
- Liu, J. and J. Thomas. 2000. Stock Returns and Accounting Earnings. *Journal of Accounting Research* 38 (1): 71–101.
- Qiang, X. 2007. The Effects of Contracting, Litigation, Regulation, and Tax Costs on Conditional and Unconditional Conservatism: Cross-Sectional Evidence at the Firm Level. *The Accounting Review* 82 (3): 759–796.
- Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2005. Accrual Reliability, Earnings Persistence and Stock Prices. *Journal of Accounting and Economics* 39 (3): 437–485.
- Riedl, E. J., and S. Srinivasan. 2007. Signaling Firm Performance Through Financial Statement Presentation: An Analysis Using Special Items, Working paper, *Social Science Research Network*.

Appendix 1 Variable List

Variable Name	Variable Definition and Measurement
Panel A: Relevance, Reliability, Earnings Usefulness, and Conservatism – Constant Sample	
<u>Relevance (FCFO)</u>	
Incremental R^2	Incremental R^2 of earnings derived from the difference between the R^2 in the regression of 1-year-ahead cash flows on current earnings and cash flows and the R^2 in the regression of 1-year-ahead cash flows on current cash flows alone, by firm and subperiod.
Coefficient of earnings	The coefficient of earnings in the regression of 1-year-ahead cash flows on current earnings and cash flows by firm and subperiod.
Theil's U	$UFCFO_i = \sqrt{\frac{\sum_t (CFO_{i,t} - predictedCFO_{i,t})^2}{\sum_t (CFO_{i,t})^2}},$ where i indexes firm, and the predicted cash flows are based on the regression of 1-year leading cash flow on current earnings using past 16 years' lagged-one earnings, and $t = 1989, \dots, 2005$.
<u>Reliability (FE)</u>	
Incremental R^2	Incremental R^2 of earnings derived from the difference between the R^2 in the regression of 1-year-ahead earnings on current earnings and cash flows and the R^2 in the regression of one-year-ahead earnings on current cash flows alone, by firm and subperiod.
Coefficient of earnings	The coefficient of earnings in the regression of 1-year-ahead earnings on current earnings and cash flows by firm and subperiod.
Theil's U	$UFE_i = \sqrt{\frac{\sum_t (E_{i,t} - predictedE_{i,t})^2}{\sum_t (E_{i,t})^2}},$ where i indexes firm, and the predicted earnings are based on the regression of one-year leading earnings on current earnings using past 16 years' lagged-one earnings, and $t = 1989, \dots, 2005$.
<u>Earnings Usefulness (EU)</u>	
Incremental R^2	Incremental R^2 of earnings derived from the difference between the R^2 in the regression of stock price per share on concurrent earnings per share and book value per share and the R^2 in the regression of stock price per share on concurrent book value per share, by firm and subperiod.
Coefficient of earnings	Coefficient of earnings in the regression of stock price per share on earnings per share and book value per share by firm and subperiod.
<u>Conservatism</u>	
CSV1	The negative value of cumulative nonoperating accruals by firm and subperiod. Nonoperating accruals equals total accruals before depreciation minus operating accruals, where total accruals before depreciation ($TACC$) = earnings before extraordinary items (#18) minus cash flow from operations (CFO), and operating accruals = change in working capital. CFO = income before depreciation (COMPUSTAT annual data item #13) – interest expense (#15) + interest revenue (#62) – tax expense (#16) - ΔWC , where ΔWC is the changes in working capital, which equals the change in account receivables (#2) + the change in inventory (#3) + the change in other current assets (#68) – the change in accounting payable (#70) – the change in taxes payable (#71) – the change in other current liabilities (#72) – the change in deferred taxes (#74). All variables are deflated by the average of total assets (#6) between the beginning and the end of the year.

Appendix 1 Variable List (continued)

Variable Name	Variable Definition and Measurement
<u>Conservatism (continued)</u>	
SKEW	The negative value of earnings skewness by firm and subperiod. The skewness is calculated as $Mean(E - \mu)^3 / \sigma^3$, where E is the earnings before extraordinary items (scaled by average assets), and μ and σ are estimated by the mean and standard deviation of the variable E 's distribution, by firm subperiod.
VROA	Volatility of earnings relative to cash flows (standard deviation of earnings divided by the standard deviation of cash flows) by firm and subperiod.
MTBG	Market-to-book adjusted for sales growth by firm and subperiod.
CSV2	The sum of standardized values of <i>CSV1</i> , <i>SKEW</i> , <i>VROA</i> , and <i>MTBG</i> . The standardization takes the form [(original value – minimum value) / (maximum value – minimum value)] to arrive at a range of zero to one for each individual measure.

Panel B: Relevance, Reliability, Earnings Usefulness, and Conservatism – Full Sample

The full sample measures of relevance, reliability, earnings usefulness, and conservatism are the counterparts of the constant sample variables, measured by industry and year (instead of by firm and subperiod).

The Theil's U statistic is calculated for each industry-year from 1974-2005. For example, the Theil's U statistic for relevance is calculated for each industry-year as $U_{FCFOj} = \sqrt{\frac{\sum_i (CFO_{ij} - predictedCFO_{ij})^2}{\sum_i (CFO_{ij})^2}}$, where i indexes the firm

and j indexes the industry, and the predicted cash flows are based on the forecasting regression for each industry year of 1-year leading cash flow on current earnings.

Panel C: Control Variables for the Full Sample

SIZE	The natural logarithm of assets adjusted for inflation (in 1973 \$) for each firm-year.
HERF	The Herfindahl index representing industry concentration, measured as the sum of squared market shares in the industry formed by two-digit SIC code for each industry-year. The value is assigned to all firms in the industry.
OC	Operating cycle, measured as the sum of the number of days' of sales in average receivables plus the number of days' of sales in average inventory for each firm-year.
INT	An indicator variable that equals one for intangible intensive industries (SIC codes: 282 plastics and synthetics materials; 283 drugs; 357 computer and office equipment; 367 electronic components and accessories; 48 communications; 73 business services; 87 engineering, accounting, R&D and management related services) and zero otherwise, for each industry-year.
ONE	The absolute value of the percentage of onetime items to "core" earnings for each firm-year. Onetime items include extraordinary items, discontinued operations, and special items. Core earnings equal bottom-line earnings less onetime items.
NE	An indicator variable for negative earnings (equal one if earnings are negative and zero otherwise), by each firm-year.

Panel D: Control Variables for the Constant Sample

The constant sample measures of control variables take subperiod average of the full sample counterparts (*SIZE*, *HERF*, *OC*, *ONE*, and *NE*) by firm and subperiod. Variable *INT* has the value of one for a firm if that firm belongs to intangible intensive industries in a subperiod, otherwise the value is zero.

Table 1 Sample Selection and Descriptive Statistics

<i>Panel A: Sample Selection</i>					
Compustat Industrial /Annual Sample period: 1973-2005					Total Number of Observations
Observations with nonmissing earnings, accruals, and cash flows and excluding financial institutions (Standard Industrial Classification 6000s), Number of firm-year observations					188,204
After excluding negative or missing values of assets, sales, negative or missing book value, and missing the number of shares outstanding					166,155
After excluding observations with missing price per share of month +3 (relative to fiscal year end), earnings per share, and book value per share					118,775
After excluding (1) observations with missing one-year-ahead operating cash flows and earnings, and (2) top and bottom 0.5% of distributions of price per share, earnings per share, book value per share, contemporaneous and 1-year-ahead earnings before extraordinary items, contemporaneous and 1-year-ahead operating cash flows, and nonoperating accruals (deflated by average total assets)					
Base sample					102,701
After excluding observations with less than 12 observations for each industry (by two-digit SIC code) in each fiscal year from the base sample					
Full Sample					97,332
Number of unique industries in the full sample					41
After excluding observations with less than 12 observations respectively for two subperiods: 1973–1988 and 1989–2005 from the base sample					
Constant Sample					13,750
Number of unique firms in the constant sample					448
<i>Panel B: Summary Statistics, full sample (97,332 firm-year observations)</i>					
Variable	Mean	Std. Deviation	25%	Median	75%
<i>CFO</i>	0.04	0.17	−0.01	0.07	0.13
<i>E</i>	0.01	0.16	−0.00	0.04	0.08
Assets	1277.06	6993.43	23.24	83.91	385.29
<i>Panel C: Summary statistics, constant sample (13,750 firm-year observations)</i>					
<i>CFO</i>	0.09	0.09	0.05	0.10	0.14
<i>E</i>	0.06	0.06	0.03	0.06	0.10
Assets	2590.44	9538.46	70.44	291.06	1439.28

Panel A describes the sample selection criteria. Panels B and C present descriptive statistics of the variables including operating cash flows (*CFO*), earnings before extraordinary items (*E*), and total assets (in million \$), respectively, for the full and constant sample. Both *CFO* and *E* are deflated by average assets.

Table 2 Descriptive Statistics and Correlation Matrix

Variable	Mean	Std. Dev.	25%	Median	75%
<i>Panel A: Descriptive statistics of the constant sample (1,792 firm-period observations)</i>					
<i>EU</i>	0.15	0.15	0.02	0.09	0.22
<i>FCFO</i>	0.10	0.12	0.01	0.05	0.14
<i>FE</i>	0.22	0.19	0.06	0.17	0.36
<i>CSV1</i>	0.04	0.03	0.03	0.04	0.06
<i>CSV2</i>	1.34	0.24	1.18	1.31	1.49
<i>ASSETS</i>	835.26	2753.55	34.45	114.73	540.08
<i>HERF</i>	0.08	0.08	0.04	0.06	0.09
<i>OC</i>	32.40	60.41	11.74	15.36	24.15
<i>INT</i>	0.10	0.30	0.00	0.00	0.00
<i>ONE</i>	0.79	3.99	0.05	0.18	0.52
<i>NE</i>	0.08	0.14	0.00	0.00	0.12
<i>Panel B: Descriptive statistics of the full sample (97,332 firm-year observations)</i>					
<i>EU</i>	0.11	0.09	0.05	0.09	0.14
<i>FCFO</i>	0.07	0.07	0.02	0.05	0.09
<i>FE</i>	0.21	0.15	0.09	0.17	0.29
<i>CSV1</i>	0.05	0.06	0.02	0.04	0.06
<i>CSV2</i>	1.14	0.26	0.94	1.11	1.34
<i>ASSETS</i>	414.72	2085.50	9.47	32.88	140.91
<i>HERF</i>	0.08	0.08	0.04	0.05	0.08
<i>OC</i>	35.69	64.39	11.01	15.40	27.87
<i>INT</i>	0.21	0.41	0.00	0.00	0.00
<i>ONE</i>	1.36	52.55	0.00	0.00	0.24
<i>NE</i>	0.23	0.42	0.00	0.00	0.00

Continued on next page

Table 2 Descriptive Statistics and Correlation Matrix (continued)

Variable	<i>CSV1</i>	<i>CSV2</i>	<i>FCFO</i>	<i>FE</i>	<i>EU</i>	<i>SIZE</i>	<i>HERF</i>	<i>OC</i>	<i>INT</i>	<i>ONE</i>	<i>NE</i>
<i>Panel C: Correlation matrix of the constant sample (1,792 firm-period observations)</i>											
<i>CSV2</i>	0.69	1									
<i>FCFO</i>	0.05	0.07	1								
<i>FE</i>	-0.16	-0.19	0.11	1							
<i>EU</i>	-0.04	-0.03	0.00	0.18	1						
<i>SIZE</i>	0.22	0.10	0.00	0.01	-0.07	1					
<i>HERF</i>	-0.09	-0.07	0.04	0.08	0.01	-0.11	1				
<i>OC</i>	0.08	0.05	0.02	0.00	0.02	-0.02	0.06	1			
<i>INT</i>	0.04	0.03	0.06	0.01	-0.01	0.06	0.02	0.00	1		
<i>ONE</i>	0.08	0.13	-0.03	-0.09	0.03	-0.02	-0.01	0.01	-0.02	1	
<i>NE</i>	0.09	0.23	0.01	-0.20	0.03	-0.37	0.07	0.01	-0.01	0.24	1
<i>TIME</i>	0.20	0.22	0.04	-0.06	0.08	0.13	-0.07	0.06	0.00	0.06	0.06
<i>Panel D: Correlation matrix of the full sample (97,332 firm-year observations)</i>											
<i>CSV2</i>	0.66	1									
<i>FCFO</i>	0.05	0.05	1								
<i>FE</i>	-0.38	-0.37	0.23	1							
<i>EU</i>	-0.16	-0.13	0.06	0.22	1						
<i>SIZE</i>	0.01	-0.02	0.05	0.05	0.03	1					
<i>HERF</i>	-0.13	-0.16	0.02	0.25	0.07	-0.12	1				
<i>OC</i>	0.22	0.11	0.07	-0.01	0.09	0.00	0.04	1			
<i>INT</i>	0.26	0.26	-0.07	-0.25	-0.09	-0.08	-0.04	0.04	1		
<i>ONE</i>	0.01	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	1	
<i>NE</i>	0.18	0.17	-0.01	-0.17	-0.09	-0.32	-0.01	-0.03	0.17	0.01	1
<i>TIME</i>	0.56	0.55	0.10	-0.43	-0.06	0.09	-0.19	0.09	0.17	0.01	0.17

The constant sample consists of 1,792 firm-period observations of 448 firms for four rolling subperiods, from 1973 to 1988, 1978 to 1993, 1983 to 1998, and 1989 to 2005, respectively.

CSV1 = conservatism measured by negative cumulative nonoperating accruals, *CSV2* = conservatism index measure derived from four individual measures including the skewness of earnings, earnings variability, market-to-book ratio adjusted by sales growth, as well as *CSV1*, *FCFO* = earnings relevance (incremental R^2), *FE* = earnings reliability (incremental R^2), *EU* = earnings usefulness (incremental R^2), *SIZE* = log(inflation-adjusted assets), *HERF* = Herfindahl index, *OC* = operating cycle, *INT* = indicator variable for intangible intensive industry membership, *ONE* = the absolute value of onetime item to core earnings, *NE* = indicator variable for negative earnings, *TIME* = period (year) in constant (full) sample. Appendix 1 describes the detailed calculation for each listed variables. **Bold** indicates that the correlation is significantly different from zero at the 5% significance level.

Table 3 Trends in Earnings Attributes

Years	N.	<i>FCFO</i>	<i>FE</i>	<i>EU</i>
<i>Panel A: Full Sample (97,332 Observations)</i>				
1973~1982	2,413	2.32	38.49	11.96
1983~1991	2,954	6.48	24.91	7.15
1992~2000	3,588	6.21	16.11	6.56
2001~2005	2,864	4.93	12.09	9.58
Coef. on time trend (<i>t</i> -stat)		0.001*** (3.96)	-0.011*** (15.88)	-0.001** (2.30)
<i>Panel B: Constant Sample (13,750 Observations)</i>				
1973~1982	415	2.79	42.98	12.41
1983~1991	432	4.41	37.77	15.40
1992~2000	431	4.74	31.42	17.11
2001~2005	366	8.13	30.69	20.56
Coef. on time trend (<i>t</i> -stat)		0.002*** (3.66)	-0.005*** (5.06)	0.003*** (4.20)

This table reports the incremental R^2 from the cross sectional regressions of the following equations:

$$CFO_{i,t+1} = \alpha_0 + \alpha_1 CFO_{i,t} + \alpha_2 E_{i,t} + \varepsilon_t \quad (1)$$

$$CFO_{i,t+1} = \beta_0 + \beta_1 CFO_{i,t} + \eta_{i,t} \quad (2)$$

$$E_{i,t+1} = a_0 + a_1 CFO_{i,t} + a_2 E_{i,t} + \tau_{i,t} \quad (3)$$

$$E_{i,t+1} = b_0 + b_1 CFO_{i,t} + \nu_{i,t} \quad (4)$$

$$PRC_{i,t} = h_0 + h_1 EPS_{i,t} + h_2 BVS_{i,t} + \chi_{i,t} \quad (5)$$

$$PRC_{i,t} = h_0 + h_1 BVS_{i,t} + \nu_{i,t}, \quad (6)$$

where *CFO* is operating cash flows; *E* is earnings before extraordinary items (both *CFO* and *E* are deflated by average assets); *PRC* is price per share 3 months after the fiscal year end; *EPS* is earnings per share; *BVS* is book value per share. The subscripts *i* and *t* index firm and year respectively. Each year, we run cross sectional regressions of equations 1 to 6. The incremental R^2 s are defined as follows:

FCFO = time-series mean of (the adjusted R^2 of equation 1 – the adjusted R^2 of equation 2),

FE = time-series mean of (the adjusted R^2 of equation 3 – the adjusted R^2 of equation 4),

EU = time-series mean of (the adjusted R^2 of equation 5 – the adjusted R^2 of equation 6).

In each time trend test, we regress the time-series of 33 years' of the incremental R^2 measures of *FCFO*, *FE*, and *EU*, on an intercept and the year variable. The rows entitled "Coef. on time trend" report the regression coefficients of the year variable. ***, **, and * denote significance at levels of one, five and ten percents, respectively. The values of *FCFO*, *FE*, and *EU* are averages of the yearly incremental R^2 for each designated subperiod (in percentage).

Table 4 Frequency Analysis of the Trade-off

Panel A: Bivariate Analysis

Current Earnings' Ability to Predict Future Cash Flows	Current Earnings' Ability to Predict Future Earnings		Total
	Bottom 50% <i>FE</i>	Top 50% <i>FE</i>	
Bottom 50% <i>FCFO</i>			
Observed	491	405	896
Expected	448	448	
Observed-Expected	43	-43	
Percent	(27%)	(23%)	(50%)
Top 50% <i>FCFO</i>			
Observed	405	491	896
Expected	448	448	
Observed-Expected	-43	43	
Percent	(23%)	(27%)	(50%)
Total	896 (50%)	896 (50%)	1792 (100%)
Chi-Square: Value Prob.	16.51 <0.0001		

Panel B: Conditional on Conservatism (Trade-off Group)

	High Conservatism (Top 50%)	Low Conservatism (Bottom 50%)	
Trade-Off 1: Top 50% <i>FCFO</i> & Bottom 50% <i>FE</i>			
Observed	231	174	405
Expected	194	212	
Observed-Expected	37	-38	
Percent	(29%)	(21%)	(50%)
Trade-off 2: Top 50% <i>FE</i> & Bottom 50% <i>FCFO</i>			
Observed	156	249	405
Expected	194	212	
Observed-Expected	-38	37	
Percent	(19%)	(31%)	(50%)
Total	387 (48%)	423 (52%)	810 (100%)
Chi-Square: Value Prob.	27.83 <0.0001		

The frequency analysis is based on the 1,792 firm-period observations of the constant sample. The two off-diagonal cells of panel A are the trade-off cells of the top 50% in *FCFO* and the bottom 50% in *FE*, or the bottom 50% in *FCFO* and the top 50% in *FE*. Panel B presents frequency tables for firms in the trade-off cells of panel A conditional on high/low accounting conservatism (defined by the median value of *CSV2*). The expected frequency is calculated as the product of the marginal frequencies for the row and column (row and column totals) of the desired cell, divided by the total number of observations, i.e., Expected Cell Frequency = (Row Total*Column Total)/Total observations. The null hypothesis for the chi-square test is that the rows and columns of the contingency are independent.

Table 5 Relevance and Reliability Regressions

			Constant Sample				Full Sample			
			CSV1		CSV2		CSV1		CSV2	
			Equation 7 Relevance	Equation 8 Reliability	Equation 7 Relevance	Equation 8 Reliability	Equation 7 Relevance	Equation 8 Reliability	Equation 7 Relevance	Equation 8 Reliability
	Predicted Sign									
	Eq. 7	Eq. 8								
Intercept			0.08*** (7.96)	0.25*** (15.10)	0.05** (2.84)	0.40*** (15.27)	0.04*** (4.35)	0.26*** (13.16)	0.04*** (3.78)	0.26*** (13.24)
CSV1	+	–	0.26** (2.31)	–1.20*** (6.96)			0.38* (1.86)	–1.72*** (7.05)		
CSV2	+	–			0.03** (2.45)	–0.15*** (8.37)			0.02** (2.27)	–0.07*** (4.27)
SIZE	+	+	–0.01 (0.43)	0.004* (1.86)	–0.00 (0.13)	0.00 (1.03)	0.002*** (4.53)	0.003*** (3.61)	0.002*** (5.14)	0.003*** (3.27)
HERF	+	+	0.07** (2.20)	0.18*** (3.14)	0.07** (2.21)	0.18** (3.08)	0.08* (1.85)	0.49*** (5.47)	0.07* (1.80)	0.47*** (5.56)
OC	+	+	0.00 (0.75)	0.00 (0.55)	0.00 (0.82)	0.00 (0.37)	0.00004** (2.51)	0.00009*** (3.14)	0.00005*** (2.74)	0.00 (1.14)
INT	?	?	0.01 (1.39)	0.01 (0.63)	0.01 (1.41)	0.01 (0.58)	–0.01* (1.77)	–0.04*** (4.41)	–0.01 (1.66)	–0.04*** (4.67)
TIME	+	–	0.00 (0.56)	–0.01 (1.26)	0.00 (0.44)	–0.00 (0.83)				
Adj. R^2 (%)			0.44	3.16	0.50	4.07				
N			1,745	1,745	1,745	1,745	33	33	33	33

Equation 7 (the relevance equation) is: $FCFO_{i,j} = d_0 + d_1 CSV_{i,j} + d_2 SIZE_{i,j} + d_3 HERF_{i,j} + d_4 OC_{i,j} + d_5 INT_{i,j} + d_6 TIME_j + \mu_{i,j}$, and

equation 8 (the reliability equation) is: $FE_{i,j} = e_0 + e_1 CSV_{i,j} + e_2 SIZE_{i,j} + e_3 HERF_{i,j} + e_4 OC_{i,j} + e_5 INT_{i,j} + e_6 TIME_j + \mu_{i,j}$, where $FCFO$ = earnings relevance

(incremental R^2), FE = earnings reliability (incremental R^2), CSV = conservatism ($CSV1$ and $CSV2$), $SIZE$ = log(inflation-adjusted assets), $HERF$ = Herfindahl index, OC = operating cycle, INT = indicator variable for intangible intensive industries, and $TIME$ = period in constant sample analysis, the subscript i indexes firm, and the subscript j indexes period (year) in constant (full) sample analysis. We run pooled regressions for the constant sample and the Fama-MacBeth yearly cross-sectional regressions for the full sample using the generalized least squares (GLS) method. Equations 7 and 8 are estimated with 1,745 observations from the constant sample resulting from the removal of 47 observations (from the 1,792 original observations) that have missing values for the OC variable or are outliers with absolute value of the t -student statistic greater than 4. Coefficients reported for the full sample are means of the 33 yearly regression coefficients covering the 33-year sample period. Corresponding t statistics also are reported. The average number of observations for each yearly regression is approximately 2,600. The t -statistics are reported in parentheses. ***, **, and * denote significance at levels of 1, 5, and 10%, respectively.

Table 6 Earnings Usefulness Regression

		Constant Sample	Full Sample
	Predicted Sign	Equation 9	Equation 9
Intercept	?	0.10*** (7.98)	0.09*** (12.98)
<i>FCFO</i>	+	-0.03 (1.00)	-0.03 (0.52)
<i>FE</i>	+	0.15*** (7.66)	0.12*** (7.02)
<i>SIZE</i>	+	-0.01*** (3.39)	-0.00 (0.80)
<i>INT</i>	-	0.00 (0.78)	0.00 (0.23)
<i>ONE</i>	-	0.03 (1.18)	-0.00 (1.28)
<i>NE</i>	-	0.00 (0.18)	-0.01*** (4.45)
<i>TIME</i>	-	0.01*** (4.61)	
Adj. R^2 (%)		5.08	
N		1,779	33

The regression equation is equation 9 (the price equation):

$$EU_{i,j} = g_0 + g_1 FCFO_{i,j} + g_2 FE_{i,j} + g_3 SIZE_{i,j} + g_4 INT_{i,j} + g_5 ONE_{i,j} + g_6 NE_{i,j} + g_7 TIME_j + \zeta_{i,j},$$

where EU = earnings usefulness (incremental R^2), $FCFO$ = earnings relevance (incremental R^2), FE = earnings reliability (incremental R^2), $SIZE$ = log(inflation-adjusted assets), INT = indicator variable for intangible intensive industries, ONE = the absolute value of onetime items to core earnings, NE = indicator variable for negative earnings, $TIME$ = period in constant sample analysis, the subscript i indexes firm, and the subscript j indexes period (year) in constant (full) sample analysis. We run pooled regressions for the constant sample and Fama-MacBeth yearly cross sectional regressions for the full sample by using the generalized least squares (GLS) method. Coefficients reported for the full sample are means of the 33 yearly regression coefficients covering the 33-year sample period. Corresponding t statistics are also reported. The average number of observations for each yearly regression is approximately 2,800. The t -statistics are reported in parentheses. ***, **, and * denote significance at levels of 1, 5, and 10%, respectively.

Table 7 Results using Theil's U as Alternative Relevance and Reliability Measures

				Constant Sample			Full Sample		
	Predicted Signs			Equation 7 Relevance	Equation 8 Reliability	Equation 9 Earnings Usefulness	Equation 7 Relevance	Equation 8 Reliability	Equation 9 Earnings Usefulness
	Eq 7	Eq 8	Eq 9						
Intercept				0.87*** (28.44)	0.57*** (13.22)	0.21*** (5.54)	0.85*** (34.09)	0.62*** (48.77)	0.21*** (12.9)
<i>UFCFO</i>			+			0.04 (0.86)			0.01 (0.30)
<i>UFE</i>			+			-0.11*** (3.04)			-0.14*** (6.50)
<i>CSV1</i>	-	+		-1.73*** (5.25)	3.41*** (7.11)		-2.54*** (4.42)	0.79*** (2.97)	
<i>SIZE</i>	+	+		-0.06*** (13.76)	-0.05*** (8.70)	-0.01 (1.15)	-0.01*** (12.97)	-0.004*** (4.57)	-0.001** (2.22)
<i>HERF</i>	+	+		0.42** (2.91)	0.44** (2.55)		0.31*** (6.68)	0.03 (0.56)	
<i>OC</i>	+	+		-0.00** (2.35)	-0.000* (1.79)		-0.0003*** (9.52)	-0.0001*** (3.54)	
<i>INT</i>	?	?	-	0.04 (1.39)	0.04 (1.10)	0.01 (0.54)	-0.01 (0.84)	-0.02*** (2.80)	-0.01 (1.12)
<i>ONE</i>			-			0.00 (0.65)			0.00 (1.05)
<i>NE</i>			-			0.06 (0.94)			-0.01 (4.25)
Adj. R^2 (%)				38.29	18.83	1.05			
<i>N</i>				437	437	437	32	32	32

The equations are $UFCFO_{i,j} = d_0 + d_1 CSV_{i,j} + d_2 SIZE_{i,j} + d_3 HERF_{i,j} + d_4 OC_{i,j} + d_5 INT_{i,j} + \mu_{i,j}$, (7)

$UFE_{i,j} = e_0 + e_1 CSV_{i,j} + e_2 SIZE_{i,j} + e_3 HERF_{i,j} + e_4 OC_{i,j} + e_5 INT_{i,j} + \mu_{i,j}$, (8)

$EU_{i,j} = g_0 + g_1 UFCFO_{i,j} + g_2 UFE_{i,j} + g_3 SIZE_{i,j} + g_4 INT_{i,j} + g_5 ONE_{i,j} + g_6 NE_{i,j} + \zeta_{i,j}$, (9)

where *CSV1* = conservatism measure, *SIZE* = log(inflation-adjusted assets), *HERF* = Herfindahl index, *OC* = operating cycle, *INT* = indicator variable for intangible intensive industries, *ONE* = the absolute value of onetime items to core earnings, *NE* = indicator variable for negative earnings, *TIME* = period (year) in constant (full) sample analysis, the subscript *i* indexes firm, and the subscript *j* indexes period (year) in constant (full) sample analysis. *UFCFO* = Theil's U of cash flow predictability, *UFE* = Theil's U of earnings predictability, and *EU* = the incremental R^2 of earnings from the price regressions. We run pooled regressions for the constant sample that has a sample size of 437, instead of 448, because of missing control variables. The estimated Theil's U values are for the subperiod 1989-2005 after removing outliers. We run Fama-MacBeth yearly cross sectional regressions for the full sample by using the generalized least squares (GLS) method. Coefficients reported for the full sample are means of the 32 yearly regression coefficients covering the 32-year sample period.

Corresponding *t* statistics also are reported. The average number of observations for each yearly regression is approximately 2,858. The *t*-statistics are reported in parentheses. ***, **, and * denote significance at levels of 1, 5, and 10%, respectively.

Table 8 – Simultaneous Regressions

				Constant Sample (N=1,745)			Full Sample (N=80,789)		
				Constant Sample			Full Sample		
	Predicted Signs			Equation 7 Relevance	Equation 8 Reliability	Equation 9 Earnings Usefulness	Equation 7 Relevance	Equation 8 Reliability	Equation 9 Earnings Usefulness
	Eq 7	Eq 8	Eq 9						
Intercept				0.08*** (7.74)	0.25*** (14.64)	0.12*** (2.12)	−1.37*** (9.89)	10.59*** (37.34)	−5.38*** (10.34)
FCFO			+			−0.38 (0.85)			0.15 (0.76)
FE			+			0.23** (1.97)			0.15*** (6.21)
CSV1	−	+		0.26** (2.32)	−1.20*** (6.53)		0.14*** (4.08)	−1.41*** (21.00)	
SIZE	+	+		−0.00 (0.43)	0.004* (1.78)	−0.01*** (3.69)	0.001*** (8.88)	0.01*** (16.87)	−0.02*** (15.23)
HERF	+	+		0.07** (2.10)	0.18** (3.30)		0.01 (1.08)	0.34*** (21.49)	
OC	+	+		0.00 (0.75)	0.000 (0.59)		0.00004*** (6.69)	0.0001*** (10.66)	
INT	?	?	−	0.01 (1.45)	0.01 (0.66)	0.01 (0.79)	−0.01*** (8.60)	−0.05*** (23.69)	0.03*** (9.93)
ONE			−			0.00 (1.52)			0.00003*** (3.33)
NE			−			−0.01 (0.20)			−0.33*** (14.65)
Time	+	−	?	0.00 (0.57)	−0.01 (1.24)	0.02*** (4.97)	0.001*** (10.20)	−0.01*** (36.24)	0.003*** (10.50)
Adj. R ² (%)				0.44	3.16	1.82	2.33	28.33	2.72

The equations are

$$FCFO_{i,j} = d_0 + d_1 CSV_{i,j} + d_2 SIZE_{i,j} + d_3 HERF_{i,j} + d_4 OC_{i,j} + d_5 INT_{i,j} + d_6 TIME_j + \mu_{i,j}, \quad (7)$$

$$FE_{i,j} = e_0 + e_1 CSV_{i,j} + e_2 SIZE_{i,j} + e_3 HERF_{i,j} + e_4 OC_{i,j} + e_5 INT_{i,j} + e_6 TIME_j + \mu_{i,j}, \quad (8)$$

$$EU_{i,j} = g_0 + g_1 FCFO_{i,j} + g_2 FE_{i,j} + g_3 SIZE_{i,j} + g_4 INT_{i,j} + g_5 ONE_{i,j} + g_6 NE_{i,j} + g_7 TIME_j + \zeta_{i,j}, \quad (9)$$

where *FCFO* = earnings relevance (incremental R^2), *FE* = earnings reliability (incremental R^2), *CSV1* = conservatism measure, *SIZE* = log(inflation-adjusted assets), *HERF* = Herfindahl index, *OC* = operating cycle, *INT* = indicator variable for intangible intensive industries, *ONE* = the absolute value of onetime items to core earnings, *NE* = indicator variable for negative earnings, *TIME* = period (year) in constant (full) sample analysis, the subscript *i* indexes firm, and the subscript *j* indexes period. We estimate the above regressions in a simultaneous-equations system for both the constant and full samples using 2SLS method.

The *t*-statistics are adjusted for serial autocorrelations and are reported in parentheses. ***, **, and * denote significance at levels of 1, 5, and 10%, respectively.

Table 9 Portfolio Analysis

	Constant Sample (N = 13,750)			Full Sample (N = 97,332)		
<i>Panel A: Conditional on Earnings Reliability and Conservatism (ΔFE and $\Delta CSVI$): High ΔFE and Low $\Delta CSVI$ versus Low ΔFE and High $\Delta CSVI$</i>						
	High ΔFE and Low $\Delta CSVI$	Low ΔFE and High $\Delta CSVI$	Difference	High ΔFE and Low $\Delta CSVI$	Low ΔFE and High $\Delta CSVI$	Difference
τ_1	0.008*** (6.75)	−0.002* (1.96)	0.010*** (6.25)	0.001 (1.48)	−0.002*** (3.77)	0.003*** (3.56)
No. of Obs.	3,500	3,439		24,945	38,575	
Percentage of total obs. #	3,500/13,750 = 25%	3,439/13,750 =25%		24,945/97,332 =26%	38,575/97,332 =40%	
<i>Panel B: Conditional on Negative Earnings and Onetime Item (ΔNE and ΔONE): High ΔNE and High ΔONE versus Low ΔNE and Low ΔONE</i>						
	High ΔNE and High ΔONE	Low ΔNE and Low ΔONE	Difference	High ΔNE and High ΔONE	Low ΔNE and Low ΔONE	Difference
τ_1	−0.001 (1.63)	0.005*** (3.99)	−0.006*** (4.27)	−0.002*** (3.83)	0.002*** (3.43)	−0.004*** (5.14)
No. of Obs.	2,668	5,582		46,559	19,439	
Percentage of total obs. #	2,668/13,750 = 19%	5,582/13,750 =41%		46,559/97,332 =48%	19,439/97,332 =20%	

We first sort firms into portfolios using median values of firm characteristics as breakpoints (high = above median and low = below median). For each portfolio, we then derive the cross-sectional estimates of earnings usefulness (EU , or incremental R^2), and run the regression $EU_t = \tau_0 + \tau_1 * YEAR_t + \delta_t$, where $YEAR$ is the year variable for the 33 years of the sample period from 1973 to 2005. The firm characteristics are the change in earnings reliability (ΔFE), the change in conservatism ($\Delta CSVI$), the change in onetime items (ΔONE), and/or the change in the frequency of negative earnings (ΔNE). For the constant sample, each firm's ΔFE = 1989–2005 subperiod FE minus 1973–1989 subperiod FE . For the full sample, we first group firms by industry. We then calculate the average of ΔFE (current year FE – previous year FE) for each industry, and apply the median value of the 41 industry averages as the breakpoint for the 41 industries (and firms therein). Breakpoints for other variables are analogously defined. The “Difference” columns report the statistics for the test of the equality of the time coefficients (τ_1) of the two portfolios being compared. The t -statistics are reported in parentheses. ***, **, and * denote significance at levels of 1, 5, and 10%, respectively.

(a) Earnings' ability to predict future cash flows ($FCFO$)

(b) Earnings' ability to predict future earnings (FE)

Figure 1: **Trends in $FCFO$ and FE .** This figure plots the trailing 5-year moving average in the incremental ability of current earnings to predict next year's operating cash flows ($FCFO$, Panel a) and the incremental ability of current earnings to predict next year's earnings (FE , Panel b) beyond cash flow from operations. The dark solid (dashed) line is full (constant) sample, and the corresponding gray lines show their trends.

Figure 2: **Trends in Earnings' Ability to Explain Stock Prices (EU)**. This figure plots the trailing 5-year moving average in the incremental ability of current earnings to explain contemporary stock prices beyond book values of our full sample (97,332 firm-year observations, dark solid line), constant sample (13,750 firm-year observations, dashed solid line), and non-survivor sample (84,219 firm-year observations, dotted solid line). The corresponding gray lines show their trends.

Figure 3: **Trends in Accounting Conservatism (*CSV2*)**. This figure plots the trailing 5-year moving average in *CSV2* (the conservatism index) of our full sample (dark solid line) and constant sample (dashed solid line). The corresponding gray lines show their trends.