# Beyond Accounting and Back:

# An Empirical Examination of the Relevance of Accounting Fundamentals and "Other" Information

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## Abstract:

The Ohlson (1995) model provides a representation of firm value in terms of accounting fundamentals and "other" information ($\nu_t$) captured by earnings expectations. Within that framework, this paper examines the following two questions. First, has "other" information become more relevant to investors in comparison to accounting fundamentals? Second, is there a relationship between the extent to which investors rely on accounting data, as opposed to "other" information, and general stock market conditions?

This study uses the price-relevant information captured by the information items identified in the Ohlson (1995) framework—rather than *any* information that affects share price—as the benchmark for measuring (proportional) relevance. Consistent with prior studies, the reported results show a temporal decline in the price-relevance of accounting fundamentals. In addition, this study finds that the proportional relevance of "other" information increased substantially over the period 1984–2009. Moreover, the results suggest that investors rely more heavily on accounting data ("other" information) during bearish (bullish) years with high (low) levels of uncertainty in capital markets. Investors' tendency to return to accounting fundamentals is particularly pronounced during years of crisis such as 1984, 1987, 1996, 2000, 2002, and 2008. Overall, the results reported in this study suggest that although "other" non-accounting information has gained in importance over time, investors still rely on accounting data as an anchor for valuation in difficult years.

Despite the large body of literature on price-relevance, there has been little discussion about the extent to which investors rely on accounting data relative to "other" information. This paper attempts to contribute to this literature by using a more comprehensive empirical specification which, in contrast to prior studies, also includes "other" forward-looking information. In light of the repeated claim that financial statements have lost their relevance and the currently ongoing deliberations by the PCAOB about whether auditors should provide assurance on other information outside the financial statements, understanding what determines the extent to which investors rely on accounting data, as opposed to "other" information, should be of interest to a wide audience comprising academics, practitioners, and standard setters.

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*Accounting provides the anchor in an ocean of expectations.*

# 1. Introduction

The Ohlson (1995) model provides a representation of firm value in terms of accounting fundamentals and "other" information ($\nu_t$) captured by earnings expectations. Within that framework, this paper examines the following two questions. First, has "other" information gained in relevance to investors? Second, is there a relationship between the extent to which investors rely on accounting data ("other" information) and general conditions in stock markets?

Prior studies have defined the price-relevance of an information item as its ability to capture or summarize any type of information that affects stock prices.[1] One widely used measure of price-relevance of accounting data is the regression R2 which represents the amount of cross-sectional variability explained by accounting variables in comparison to the total variability in stock returns. Under this approach, the total information available in the marketplace is used as the benchmark for measuring relevance. In contrast, this study uses the amount of cross-sectional stock-return variability that is explained by the information items identified by the Ohlson (1995, 2001) framework as the benchmark for measuring (proportional) relevance. In other words, this study uses the explanatory power of earnings levels, earnings changes, and changes in one-year-ahead analyst forecasts with respect to stock returns as the benchmark. Therefore, this study examines the ability of accounting data and analyst forecasts to capture price-relevant information within a clearly defined subset of publicly available information.

Numerous studies have found that the explanatory power of accounting data with respect to stock returns has decreased over time.[2] While these studies greatly enhanced our understanding of the price-relevance of accounting data, their empirical models do not account for "other" information. Given the

[1] E.g. see Lev (1989), Lev and Zarowin (1999), Francis and Schipper (1999), Barth et al. (2001) among others.
[2] E.g. see Collins et al. (1997); Ely and Waymire (1999); Francis and Schipper (1999); Brown et al. (1999); Lev and Zarowin (1999)

increasing importance of other non-accounting information to investors, omitting such information is likely to lead to a correlated omitted variable problem and biased inferences.[3] To address this issue, the tests in this study are based on the empirical model of Easterday et al. (2011) that directly derives its specification for “other” information from Ohlson (1995, 2001).

Based on data for the period 1984 to 2009, results reported in this study are consistent with extant research which has shown that the price-relevance of accounting data has declined. Using the explanatory power of the full Ohlson model as the benchmark for (proportional) relevance, this paper documents that investors’ reliance on “other” non-accounting information has increased substantially over the sample period. After controlling for this temporal trend, I find evidence consistent with the notion that investors rely more heavily on earnings expectations during “good” times, i.e. years with high market returns or low uncertainty, as measured by market volatility. Moreover, the results also show that investors return to accounting fundamentals in difficult years with low market returns or high uncertainty in the markets. The proportional relevance of accounting data is especially pronounced during periods of crisis such as 1984, 1987, 2000, 2002, and 2008.

These results are potentially of interest to a broad audience comprising academics, practitioners, and standard setters. The reported increase in the proportional relevance of “other” information complements findings by earlier studies that document the decline in the price-relevance of accounting data. Moreover, this study provides empirical evidence on the influence of market conditions on the proportional explanatory power of accounting data and “other” information. These findings could inform the ongoing deliberations by the Public Company Accounting Oversight Board (PCAOB) about whether auditors should provide assurance on other information outside the financial statements.[4]

The remainder of the paper is organized as follows. Section 2 discusses the different characteristics of the information items included in the Ohlson (1995) framework and outlines how this study relates to

[3] E.g.see Francis and Schipper (1999, p. 326) and Liu and Thomas (2000).
[4] See PCAOB Release No. 2011-003.

extant research. Section 3 briefly discusses the theory underlying the empirical model and the data used in this study. Section 4 discusses the mechanical influence of the total cross-sectional variation in annual stock returns on R2-based measures of relevance, introduces *proportional relevance* as an alternative measure, and presents the empirical results. Section 5 concludes the paper.

## 2. Background and Research Questions

According to the Ohlson (1995) framework one can think of firm value as a function of accounting data and "other" information captured by next year's earnings forecasts. While accounting numbers are the product of US-GAAP financial reporting, analyst forecasts are the result of financial analysts' efforts to gather, process, and generate value-relevant information. Within this framework investors rely on information from two different identifiable sources, each of which provides information that is different in terms of reliability and timeliness.[5]

Out of all the price-relevant information available in a fiscal period, US-GAAP financial statements capture only those economic events that satisfy certain criteria in terms of objectivity and verifiability within that fiscal period. Moreover, auditors provide an independent opinion as to whether the financial statements have been prepared in accordance with generally accepted accounting principles. As a result, audited financial statements can be characterized as a relatively reliable but less timely source of information.

In contrast, financial analysts are essentially free to use any information that is deemed to be informative with respect to future earnings. In other words, the "competitive advantage" of financial analysts as information providers is their ability to use information that is beyond the domain of current

[5] In light of the speed with which new information is impounded into prices, it is clear that investors rely on more information than what is captured by accounting data and analyst forecasts. However, whether all of this information is relevant with respect to a firm's fundamental value is a different question.

accounting numbers (e.g. Brown et al. 1987). As a result, analyst forecasts can be characterized as a relatively timely but less reliable information source.

In light of these differences between accounting data and analyst forecasts in terms of reliability and timeliness, several interesting questions emerge as to when and under what circumstances investors rely more heavily on accounting data as opposed to expectations capturing "other" non-accounting information (e.g. Hand 2001).[6]

*Relationship to prior literature:*

A vast body of literature has examined the price-relevance of accounting data (see Holthausen and Watts 2001; and Barth et al. 2001 for a review)[7]. The question of whether financial statements have lost their relevance has been of intense interest to academics and standard setters. One stream of this literature investigates temporal trends in the relevance of accounting data, measured as the explanatory power (R2) from annual cross-sectional regressions of stock returns (or price) against accounting variables. One motivation for this stream of research is the widespread concern that financial statements are inadequate and less relevant to investors in a knowledge-intensive and intangible-intensive economy (e.g. Lev and Zarowin 1999).

Collins et al. (1997) and Francis and Schipper (1999) use the R2 from annual cross-sectional regressions of stock price against accounting variables as a measure of relevance. Contrary to the claim that accounting data has become less relevant, they find that the joint explanatory power of book value and earnings has increased. However, Brown et al. (1999) argue that R2s estimated from price regressions are likely to suffer from scale effects. They show that the increase in R2 reported by Collins et al. (1997) and Francis and Schipper (1999) is driven by this scale effect which is strong enough to more than offset

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[6] To what extent is $v_t$ actually relevant? "When, where, how, and why?" (Hand 2001, p. 125).

[7] Prior studies have used the terms "price-relevance", "value-relevance", and "usefulness" of accounting information interchangeably. For instance, Collins et al. (1997), Barth et al. (2001), Holthausen and Watts (2001), among others have used "value-relevance" while Lev (1989) and Lev and Zarowin (1999) have used "usefulness" and Fung et al. (2010) have used "price-relevance" to refer to the explanatory power of accounting numbers with respect to stock returns (or prices).

the underlying decrease in explanatory power. After accounting for this scale effect, Brown et al. (1999) provide evidence consistent with a decline in the relevance of financial statements. Moreover, Lev and Zarowin (1999) and Francis and Schipper (1999) report a decrease in relevance when return regressions, rather than price regressions, are used to estimate the annual cross-sectional R2s.

As pointed out by Lev and Zarowin (1999), price-relevance provides an upper bound of relevance because association does not necessarily imply causation. Given the speed with which information is impounded into prices, it is likely that market participants gather "news" from other non-accounting sources. Consistent with prior studies, I define the price-relevance of an information item as its ability to capture or summarize any type of information that affects stock price.[8] The empirical measure of price-relevance is R2, which is defined as the sum of squares explained by the regressors (SSR) divided by the total variation in stock returns (SST). Hence, R2 represents the amount of price-relevant information in financial reports as a fraction of the total information available on the marketplace, regardless of its source or quality.

Under the premise that accounting data is supposed to provide information that is relevant with respect to a firm's fundamental value, an approach based on R2 implicitly assumes that the extent to which stock price is an appropriate measure of value remains constant over time.[9] In other words, the amount of annual cross-sectional variation in the dependent variable (i.e. price or returns) attributable to non-information-based (or noise) trading is either zero or at least constant over time. As pointed out by Francis and Schipper (1999), a temporal increase in the annual cross-sectional variability of stock returns (or price) would mechanically reduce the R2s even if the ability of financial statements to capture value-relevant information were truly constant over time. To the extent that stock prices capture noise, empirical tests based on R2s understate the importance of accounting data and create the appearance that the value-relevance of accounting data has declined. Consistent with this view, recent evidence suggests that the

[8] This is consistent with prior studies such as Lev (1989), Lev and Zarowin (1999), Francis and Schipper (1999), Barth et al. (2001) among others.

[9] Throughout this paper, I will use the term "value" to refer to a firm's fundamental or intrinsic value.

decline of annual R2s is at least partly driven by an increase in stock market volatility which is attributable to trading activity based on non-information or noise (e.g. Dontoh et al. 2004; Dontoh et al. 2007; Fung et al. 2010).

In contrast to prior studies–which use R2 to examine the price-relevance of financial statements—this study is interested in what I will refer to as the *proportional relevance* of accounting data and earnings expectations over time. To be clear, I define the proportional relevance of an information item (denoted by R2%) as its ability to capture or summarize price-relevant information, within a subset of publicly available information. More specifically, this paper uses the explanatory power of the full Ohlson model (*full model*) as the "benchmark" for measuring the relevance of accounting data and "other" information captured by analyst forecasts.

Within this simple valuation framework based on *identifiable* information items, this study seeks to examine the following research questions:

1) Has the price-relevance of analyst forecasts changed over time?
2) Has the proportional relevance of accounting data (forecasts) changed over time?
3) Is there a relationship between the proportional relevance of accounting data (forecasts) and general stock market conditions?

It is important to note two key differences between the empirical approach used in this paper and the methodology applied in prior studies. The first difference is that this study uses an empirical specification that explicitly includes both accounting data as well as "other" information captured by earnings expectations. Given the importance and increasing availability of non-accounting information to investors, omitting such "other" information is likely to lead to a misspecified regression model. (see Liu and Thomas 2000; Hand 2001; and Easterday et al. 2011) The methodology used in this study is an attempt to overcome this issue.

The second difference is that an approach based on R2% only assumes semi-strong efficient markets where prices reflect all publicly available information, *including noise*. Since the denominator of R2% is the explanatory power of the full model, all R2% measures are not sensitive to temporal trends in stock return volatility attributable to noise.

*Does "other" information ($\nu_t$) matter?*

Ohlson (1995) models firm value as a linear closed-form function of accounting fundamentals and so-called "other" information ($\nu_t$). This scalar variable summarizes all "value-relevant events that have yet to have an impact on the financial statements" (Ohlson 1995, p. 668). Specifically, $\nu_t$ captures all currently available non-accounting information used by investors (and analysts) to form expectations of next period's abnormal earnings. Although many of the empirical studies discussed above rely on Ohlson's valuation framework as their theoretical foundation, the term for "other" information has been generally omitted. One possible explanation is that $\nu_t$ has been thought of as lacking empirical content and/or being difficult to measure. Hand (2001) argues that the Ohlson model "is as much about the potential importance of expected future accounting data in explaining price as it is about the role of current accounting data" (p. 125) and that "setting $\nu_t$ to zero is equivalent to making the heroic assumption that only publicly available financial accounting data matter in the setting of equity prices" (p. 123).

Extant empirical evidence strongly suggests that "other" information is relevant to investors. Based on the residual income model (RIV), Liu and Thomas (2000) show empirically that omitting "other" information is likely to lead to misspecified returns/earnings regressions. Although theoretically appealing, the RIV model still requires estimates of future residual income. Specifically, its empirical implementation can be difficult for at least three reasons. First, computation of residual income requires an estimate of the discount rate. Second, estimation of future residual income requires a forecast of book value, which requires an implicit forecast of dividends. Third, one has to make an assumption about terminal value at the end of the forecast horizon. One advantage of the RIV-based approach is that it attempts to capture value-relevant information beyond period t+1. However, it is reasonable to assume that the degree of measurement error introduced by the estimates and assumptions necessary to empirically measure expected future residual income is likely to increase with the length of the forecast horizon (e.g. see Liu and Thomas 2000, p. 85).

In contrast to the RIV model—which assumes PVED and CSR—the Ohlson model invokes the linear information dynamics (LED) as a third assumption about the stochastic process of how current residual income and $\nu_t$ map into next period's residual income. Specifically, LED assumes that both residual income and "other" information follow an autoregressive AR(1) process. Under the premise that expectations of next period's earnings are "objectively observable" Ohlson (2001) argues that $\nu_t$ can be inferred from its impact on earnings expectations and identifies analysts' consensus forecast of next year's earnings as an appropriate variable to capture $\nu_t$. Based on Ohlson (1995, 2001), several studies have documented the relevance of "other" information in stock markets. For instance, Easterday, Sen, and Stephan (2011) (henceforth ESS) derive a return-specification that captures accounting fundamentals as well as "other" information with readily observable variables. Using forecasts of next year's earnings issued by managers of Japanese firms, Ota (2002) documents the relative and incremental relevance of "other" information for companies outside the USA.

## 3. The theoretical model and its empirical implementation

The purpose of this section is to describe the theory underlying the empirical model used in this study. The following discussion is based on Ohlson (1995, 2001), Ota (2002), and Easterday, Sen, and Stephan (2011).

Ohlson (1995) provides a rigorous analysis of the link between accounting data and value. The model is based on the following three assumptions. First, current firm value ($V_t$) is the present value of future expected dividends (PVED). Second, clean surplus accounting applies (CSR), meaning that the change in book value of equity (i.e. $B_t - B_{t-1}$) is explained entirely by current period earnings ($X_t$) and current dividends ($D_t$). It is assumed that current dividends do not affect current earnings; that is, dividends are paid out of book value. Third, the linear earnings dynamics (LED) describes the first-order autoregressive AR(1) process of how current residual income ($RI_t$) and other currently available value-relevant information ($\nu_t$) map into next period's residual income ($RI_{t+1}$). Residual income is the difference between actual earnings ($X_t$) and normal earnings ($r\ B_{t-1}$), where normal earnings represent a capital charge on book value.

$$V_t = \sum_{\tau=1}^{\infty} {R_t}^{-\tau}\, E_t[D_{t+\tau}] \qquad \textit{(PVED)}$$

$$B_t = B_{t-1} + X_t - D_t \qquad \textit{(CSR)}$$

*Where:* $R_t = 1+r$

*r = the cost of equity capital*

*$E_t$[.] = the expected value of [.] conditional on information available at time t*

Assuming fairly general conditions and invoking CSR, one can restate PVED as the residual income model (RIV):

$$V_t = B_t + \sum_{\tau=1}^{\infty} E_t\left[\frac{RI_{t+\tau}}{R^{\tau}}\right] \qquad \textit{(RIV)}$$

However, RIV is silent about what determines future residual income. In contrast to RIV, Ohlson (1995) explicitly models how current residual income ($RI_t$) and other value-relevant information ($\nu_t$) map into next period's residual income ($RI_{t+1}$)

$$RI_{t+1} = \omega\, RI_t + \nu_t + \varepsilon_1 \qquad (LED1)$$

$$\nu_{t+1} = \gamma\, \nu_t + \varepsilon_2 \qquad (LED2)$$

*Where:* $\omega$ = *persistence of Residual Income*
$\gamma$ = *persistence of* $\nu_t$
$RI_t = X_t - r\, B_{t-1}$

Invoking the linear information dynamics (LED), Ohlson (1995) derives the following two equivalent valuation functions:

$$V_t = B_t + \alpha_1 RI_t + \alpha_2 \nu_t \qquad (1a)$$

$$V_t = (1-k)B_t + k\,[\theta\, X_t - D_t] + \alpha_2 \nu_t \qquad (1b)$$

*Where:*

$$\alpha_1 = \frac{\omega}{(R-\omega)}, \quad \alpha_2 = \frac{R}{(R-\omega)(R-\gamma)}, \quad \theta = 1 + \frac{1}{r}, \quad k = \frac{r\,\omega}{R-\omega} \quad (0 \le k \le 1)$$

While (1a) expresses firm value in terms of current book value, current residual income, and $\nu_t$, equation (1b) is based on current book value, current earnings, current dividends, and $\nu_t$. Although both models theoretically lead to the same firm value, (1b) offers an important advantage for empiricists: all variables, except for $\nu_t$, are readily observable. Given this advantage, it is not surprising that numerous empirical studies have used the following two specifications based on equation (1b):[10]

$$P_t = \lambda_0 + \lambda_1 B_t + \lambda_2 X_t + \varepsilon_t \qquad (2a)$$

$$RET_t = \lambda_0 + \lambda_1 \frac{X_t}{P_{t-1}} + \lambda_2 \frac{\Delta X_t}{P_{t-1}} + \varepsilon_t \qquad (2b)$$

*Where:* $RET_t = (P_t - P_{t-1} + D_t) / P_{t-1}$ *and* $\Delta X_t = X_t - X_{t-1}$

[10] For ease of exposition, the coefficients and error terms in all regression equations are denoted by λ's and ε's, although they are likely to differ across equations.

It is important to note that in order to get from equation (1b) to equations (2a) and (2b) one has to drop the other information term ($\nu_t$). In light of extant empirical evidence on the importance of "other" information, dropping $\nu_t$ can be problematic. [11]

Under the premise that "expected earnings are no less observable than are realizations of accounting data" (Ohlson 2001, 112), expected residual income can be expressed as the difference between observable earnings forecasts and normal earnings. Let $\bar{X}_t^{t+1}$ denote expected earnings for period t+1, conditional on information available at time t ($E_t[X_{t+1}]$). Then expected residual income can be written as follows:

$$\overline{RI}_t^{t+1} = E_t[RI_{t+1}] = \bar{X}_t^{t+1} - rB_t \qquad (3)$$

To the extent that financial analysts rely on accounting data as well as $\nu_t$ to generate their forecasts of next period's earnings, one can use the observable $\bar{X}_t^{t+1}$ to capture $\nu_t$ empirically. Substituting (3) into LED1 yields equation (4) which models $\nu_t$ as the difference between the expected residual income conditional on all available information and expected residual income conditional only on the information captured by current residual earnings (i.e. $\omega\ RI_t$).[12]

$$v_t = \overline{RI}_t^{t+1} - \omega\ RI_t \qquad (4)$$

Substituting (4) into (1a) yields equation (5), which models firm value as a function of current book value, current residual income, and expected future residual income.

$$V_t = B_t + (\alpha_1 - \omega\alpha_2)RI_t + \alpha_2\overline{RI}_t^{t+1} \qquad (5)$$

*Where $\alpha_1$ and $\alpha_2$ are defined as above*

[11] See Dechow et al. (1999), Liu and Thomas (2000), Ota (2002), Bryan and Tiras (2007), Easterday, Sen, and Stephan (2011).
[12] See Dechow et al. (1999) and Easterday, Sen, and Stephan (2011).

From an empirical standpoint, it is important to note that $RI_t$ and $\overline{RI}_t^{t+1}$ are not directly observable. To calculate $RI_t$ and $\overline{RI}_t^{t+1}$ one would need the actual cost of capital for period t (ex post) and the expected cost of capital for period t+1 (ex ante). To the empiricist's delight, Ohlson (2001) presents equation (6) which models firm value as a function of readily observable variables.

$$V_t = \beta_1 B_t + (\beta_2 \theta) X_t - \beta_2 D_t + \frac{\beta_3}{r} \bar{X}_t^{t+1} \qquad (6)$$

*Where:*

$$\Delta X_t = X_t - X_{t-1}\,, \quad \Delta \bar{X}_t^{t+1} = \bar{X}_t^{t+1} - \bar{X}_{t-1}^{t}\,, \quad \theta = 1 + \frac{1}{r}$$

$$\beta_1 = \frac{R(1-\omega)(1-\gamma)}{(R-\omega)(R-\gamma)}, \quad \beta_2 = \frac{-r\omega\gamma}{(R-\omega)(R-\gamma)}\,, \quad \beta_3 = \frac{Rr}{(R-\omega)(R-\gamma)}$$

As discussed previously, Brown et al. (1999) demonstrate the implications of the scale-effect in price-regressions. Easton (1999) argues that by first-differencing price-regressions one can mitigate problems related to omitted variables and nonstationarity in prices. Based on (6), ESS derive the following return regression:

$$RET_t = \beta_1 \frac{X_t}{P_{t-1}} + \beta_2 \theta \frac{\Delta X_t}{P_{t-1}} + \left(\frac{\beta_3}{r}\right) \frac{\Delta \bar{X}_t^{t+1}}{P_{t-1}} + \beta_3 \frac{D_t}{P_{t-1}} + \beta_2 \frac{D_{t-1}}{P_{t-1}} \qquad (7)$$

*Where all variables are as defined above.*

Moreover, ESS show empirically how $\Delta\bar{X}_t^{t+1}$—which captures the "other" information term $\Delta\nu_t$—substantially improves the model's explanatory power with respect to annual (quarterly) stock returns.

*Empirical Implementation of the full Ohlson (1995) model*

As shown by ESS, the last two dividend terms in equation (7) are small and should therefore not affect the results in any meaningful way.[13] Hence, the main empirical model used in this study takes the following form: [14]

$$RET_{it} = \lambda_0 + \lambda_1 E_{it} + \lambda_2 \Delta E_{it} + \lambda_3 \Delta F_{it} + \varepsilon \qquad (8)$$

$$where \;\; E_t = \frac{X_t}{P_{t-1}} \;, \quad \Delta E_t = \frac{\Delta X_t}{P_{t-1}} \;\; and \;\; \Delta F_t = \frac{\Delta \bar{X}_t^{t+1}}{P_{t-1}}$$

$$for\ firm\ i\ in\ year\ t.$$

This empirical specification, which will be referred to as the *full* model, is consistent with the notion that value-relevant information is captured by audited financial statements and other sources such as financial analysts. As discussed previously, these sources of information are likely to be different in terms of reliability and timeliness. Let $R2_t[E,\Delta E,\Delta F]$ denote the explanatory power of the full model.

To measure the explanatory power attributable to each identifiable information source, I use the R2s from regressions (9) and (10).[15] Let $R2_t[E,\Delta E]$ and $R2_t[\Delta F]$ denote the explanatory power of the *earnings model* and the *forecast model* respectively.

$$RET_{it} = \lambda_0 + \lambda_1 E_{it} + \lambda_2 \Delta E_{it} + \varepsilon \qquad (9)$$

$$RET_{it} = \lambda_0 + \lambda_3 \Delta F_{it} + \varepsilon \qquad (10)$$

*Where all variables are as described above.*

[13] Dropping the dividend term(s) is consistent with prior studies such as Easton and Harris (1991) and Easterday et al. (2011).

[14] For ease of exposition, the coefficients and error terms in all regression equations are denoted by λ's and ε's, although they are likely to differ across equations.

[15] Please note that regression (9) is the classical return-earnings specification introduced by Easton and Harris (1991).

*Sample Composition*

The main analysis requires data from IBES, Compustat, and CRSP for the years 1984 to 2009. The specific data requirements are as follows:

- US firms trading on NYSE, AMEX, or NASDAQ
- December 31st fiscal year end firm
- CRSP monthly returns and beginning-of-period price are available
- Where appropriate, variables are adjusted for stock-dividends and stock-splits using the provided adjustment factors.
- Current book value of equity has to be positive

The variables used for the annual cross-sectional regressions are defined as follows.

| | |
|---|---|
| $RET_t$ | The 12-month holding return for April 1st in period t to March 31st in period t+1. |
| $X_t$ | Earnings per share excluding extraordinary items. |
| $\Delta X_t$ | $X_t – X_{t-1}$ |
| $\Delta\overline{X}_t^{t+1}$ | The difference between one-year-ahead earnings forecasts from the IBES detail file issued in period t-1 and period t.[16] |
| $P_{t-1}$ | The price per share at the beginning of period t adjusted for stock splits and stock dividends. |

After all independent variables are scaled by $P_{t-1}$, two types of outliers are identified and dealt with as follows. First, I winsorize all variables included in regressions (8), (9), and (10) at the 1st/99th percentile based on the pooled sample. Second, observations that are identified as outliers in any of those three annual regressions (i.e. studentized residual is > 4) are eliminated.[17] The final sample contains 35,938 firm-year observations covering the years 1984 to 2009. To measure the overall market conditions in each year, I use the following two variables:

[16] Consistent with Easterday et al. (2011) I am using the most recent (i.e. closest to the day when current earnings are announced) individual forecast of next year's earnings.

[17] This approach is consistent with prior literature: see Collins et al. (1997), Francis and Schipper (1999), Brown et al. (1999)

$MKT_t$ the CRSP value-weighted market return calculated for April 1st in period t to March 31st in period t+1.

$\sigma DMKT_t$ the standard deviation of the daily CRSP value-weighted market returns for April 1st in period t to March 31st in period t+1.

Panel A of Table 1 presents the descriptive statistics for these variables. Panel B of Table 1 presents the correlation coefficients (p-values in parentheses) for the variables used to estimate the annual cross-sectional regressions (8), (9), and (10). The following discussion is based on the Pearson correlation coefficients presented in the bottom-left triangle of Table B. For the pooled sample, all the correlation coefficients are positive and significant. A comparison of the correlation coefficients shows that the linear relationship between $RET_t$ and $\Delta F_t$ is about 40% stronger than the correlation between $RET_t$ and $E_t$ or $\Delta E_t$.[18] Moreover, $\Delta F_t$ is positively correlated with $E_t$ (0.166, p<.0001) and $\Delta E_t$ (0.372, p<.0001). Given that $\Delta F_t$ is correlated with the dependent as well as the independent variables, omitting $\Delta F_t$ can potentially lead to biased inferences. Panel B also presents the correlation coefficients for $TREND_t$, $MKT_t$, and $\sigma DMKT_t$.

*Insert Table 1 about here*

Table 2 reports coefficients and the explanatory power estimated annually for regressions (8), (8'), (9), and (10). The number of observations in the annual regressions ranges from 652 in 1984 to 2,288 in 2007. For the earnings model, both slope coefficients are positive and significant; $R2_t[E,\Delta E]$ ranges from 31.2% in 1984 to 4.3% in 1999, with earnings numbers explaining an average of 11.6% of the total cross-sectional variation in annual stock returns ($SST_t$). For the forecast model, the slope coefficient is positive and statistically significant (average 3.91, p<.001); $R2_t[\Delta F]$ ranges from 26.7% in 1992 to 6.7% in 1986, with the change in one-year-ahead forecasts explaining an average of 14.1% of the total cross-sectional variation in annual stock returns. This suggests that, on average, the forecast model outperforms the earnings model by 2.5 percentage points.

[18] 41.17% = (0.336 - 0.198) / 0.336

For the full model, the coefficients on $E_t$ and $\Delta F_t$ are positive and significant (0.81, p<.001 and 3.33 p<.001 respectively). Interestingly, the coefficient on $\Delta E_t$ is positive but statistically insignificant. Although this result appears to be counterintuitive and inconsistent with prior studies that have generally found a positive coefficient on $\Delta E_t$, it is important to keep in mind that equation (7) predicts a negative coefficient on $\Delta E_t$ in regression (8).[19] To make the empirical results more intuitive, Easterday et al. (2011) add and subtract the term $(\beta_3/r)*\Delta X_t$ on the RHS of equation (7) to arrive at equation (7'). Regression (8') represents the empirical specification for (7').

$$RET_t = \beta_1 \frac{X_t}{P_{t-1}} + \left(\beta_2\theta + \frac{\beta_3}{r}\right)\frac{\Delta X_t}{P_{t-1}} + \left(\frac{\beta_3}{r}\right)\frac{\Delta \bar{X}_t^{t+1} - \Delta X_t}{P_{t-1}} + \beta_3 \frac{D_t}{P_{t-1}} + \beta_2 \frac{D_{t-1}}{P_{t-1}} \qquad (7')$$

$$RET_t = \lambda_0 + \lambda_1 E_t + \lambda_2 \Delta E_t + \lambda_3(\Delta F_t - \Delta E_t) + \varepsilon \qquad (8')$$

*Where all variables are as described above.*

Table 2 reports estimated coefficients and the explanatory power estimated by year for regressions (8) and (8'). Under this alternative specification used by Easterday et al. (2011), all three slope coefficients are positive and significant (2.04, 1.64, and 2.14 respecitvely, with p<.001 for all).[20] Moreover, it is important to note that model (8) and (8') explain the identical percentage of SST. More specifically, $R2_t$[E,ΔE,ΔF] ranges from 36.3% in 1984 to 7.9% in 2009, with the full-model explaining an average of 20.1% of the total cross-sectional variation in annual stock returns. A comparison of $R2_t$[E,ΔE,ΔF] and $R2_t$[E,ΔE] shows that adding $\Delta F_t$ improves the explanatory power of the widely used earnings model by 73%.[21]

[19] Theoretically, the $\lambda_2$ coefficient in regression (8) equals $\beta_2*\theta$ where $\theta = 1 + \frac{1}{r}$ and $\beta_2 = \frac{-r\omega\gamma}{(R-\omega)(R-\gamma)}$.

[20] This finding by Easterday et al. (2011) provides a potential explanation for the negative coefficient on the variable Δfy1, i.e. revisions in 1 year ahead earnings forecasts, by Liu and Thomas (2001, p. 91).

[21] (20.1%-11.6%)/20.1%)=73%

# 4. Methodology and Results

*Temporal trends in price-relevance (R2):*

The coefficient of determination, denoted by R2[.], measures what fraction of the total variation in the dependent variable is explained by the regressors [.]. Let $SST_t$ denote the total cross-sectional variation of annual stock returns ($RET_t$) and $SSR_t$[.] the amount of $SST_t$ which is explained by the regressors in the model. In this context, $R2_t$[.] measures what fraction of the total information available in the marketplace has been captured by information items in the regression model. Hence, $R2_t[E,\Delta E,\Delta F]$, $R2_t[E,\Delta E]$, and $R2_t[\Delta F]$ are defined as follows:

$$R2_t[E,\Delta E,\Delta F] = \frac{SSR_t[E,\Delta E,\Delta F]}{SST_t}$$

$$R2_t[E,\Delta E] = \frac{SSR_t[E,\Delta E]}{SST_t}$$

$$R2_t[\Delta F] = \frac{SSR_t[\Delta F]}{SST_t}$$

It is important to note that $R2_t[E,\Delta E,\Delta F]$, $R2_t[E,\Delta E]$, and $R2_t[\Delta F]$ are estimated based on identical samples where each regression has the same dependent variable ($RET_t$). As a result, $R2_t[E,\Delta E,\Delta F]$, $R2_t[E,\Delta E]$, and $R2_t[\Delta F]$ have identical denominators. Since $R2_t$[.] is defined as a ratio, any temporal trends in $R2_t$[.] can be due to trends in its numerator ($SSR_t$[.]), its denominator ($SST_t$), or both. More specifically, if $SST_t$ follows an increasing trend while $SSR_t$[.] does not, $R2_t$[.] would decline mechanically.[22] To illustrate the implications of temporal trends in SST, Figure 1 shows the graphs of $SST_t$ and $SSR_t[E,\Delta E]$ over the period 1951 to 2009 and $SSR_t[E,\Delta E,\Delta F]$ over the period 1984 to 2009, where all variables are scaled by the number of observations to enhance comparability over time.[23,24]

[22] See Francis and Schipper (1999, p. 341) for a similar argument.

[23] Since estimation of $SSR_t[E,\Delta E]$ only requires data from Compustat and CRSP I was able to obtain reasonable number of observations per year for the period 1951 to 2009. Estimation of $SSR_t[E,\Delta E,\Delta F]$ also requires forecast data from IBES, where 1984 is the first year where I was able to obtain the required data for a reasonable number of firms.

*Insert Figure 1 about here*

From Figure 1a it is apparent that $SST_t$ displays a significant upward trend while $SSR_t[E,\Delta E]$ has remained fairly stable. The dotted graph in Figure 1b shows how the proportion of SST explained by earnings ($R2_t[E,\Delta E]$) has decreased over time; the average of 17.63% in the first half (1951-1980) declined by roughly a third down to 12.34% in the second half (1981-2009) ($p<.01$).[25,26] To test the significance of this temporal trend, I follow prior studies and regress the variables of interest against a trend-variable as follows:[27]

$$DEPVAR_t = \psi_0 + \psi_1\, TREND_t + \varepsilon$$

*Where* *$DEPVAR_t$ denotes the dependent variable of interest, $TREND_t$ = 1 to 26 for the main sample (1984-2009) and 1 to 59 for the extended sample (1951-2009).*

*Insert Table 3 about here*

Table 3 shows the results from trend-regressions with the variables shown in Figures 1a and 1b as the dependent variables. Consistent with prior studies, I find that the explanatory power of earnings $R2_t[E,\Delta E]$ has decreased significantly over time ($\psi_1$ = -0.002, $p<.001$). A look at the numerator and denominator of $R2_t[E,\Delta E]$ provides a more nuanced view on what drives this temporal decline. While $SST_t$ has increased significantly over time ($\psi_1$ = 0.0028, $p<.001$), $SSR_t[E,\Delta E]$ does not follow a significant linear trend ($p$=.192). These results also hold, although less significantly, for the main sample period (1984-2009); the temporal decline in $R2_t[E,\Delta E]$ ($\psi_1$ = 0.004, $p<.1$) is largely driven by the

[24] Since $SST_t$, $SSR_t[E,\Delta E]$ and $SSR_t[E,\Delta E\ \Delta F]$ are "sums of squares" one would observe an increase over time simply because the number of observations included in the sample has increased from 157 in 1951 to 1,889 in 2009. Hence, the values shown in Figure 1 are all scaled by the number of observations in a given year to enhance comparability over time.

[25] (12.24 - 17.63) / 17.63 = -30.56.

[26] The average for the entire extend sample period (1951-2009) is 14.98.

[27] For instance see Collins et al. (1997), Francis and Schipper (1999), Brown et al. (1999), Lev and Zarowin (1999), among others.

temporal increase in the cross-sectional variation in annual stock returns ($\psi_1$ = -0.004, p<.05). Moreover, the results presented in Table 3 do not show a significant temporal trend for the amount (i.e. $SSR_t[E,\Delta E,\Delta F]$) nor the fraction (i.e. $R2_t[E,\Delta E,\Delta F]$) of the total variability in annual stock returns which is explained by the full model.

To summarize, the findings presented in Figure 1 and Table 3 corroborate and update prior research that has found evidence consistent with the view that the relevance of accounting numbers has decreased over time. Moreover, the findings do not show a temporal trend for the explanatory power of the full model nor the explanatory power of the forecast model. Also, these findings highlight the upward trend in SST and its mechanical impact on the R2-based measures of relevance.

*From price-relevance (R2) to proportional relevance (R2%):*

Prior studies have used $R2_t[E,\Delta E]$ to examine the ability of financial statements to capture or summarize any information that affects stock prices regardless of its source. In contrast, this paper uses the explanatory power of the full model to examine the (proportional) relevance of accounting data and analyst forecasts. Hence, I replace the total cross-sectional variation in annual sock returns ($SST_t$)—which was the "benchmark" used in previous studies—with $SSR_t[E,\Delta E,\Delta F]$, i.e. the amount of $SST_t$ which is explained by the full model. For the remainder of the paper, and for the sake of clarity, I will use the term *proportional relevance* (*price-relevance*) to refer to variables that have $SSR_t[E,\Delta E,\Delta F]$ ($SST_t$) as denominator. Specifically, the proportional relevance of accounting data ($R2\%_t[E,\Delta E]$), and the proportional relevance of earnings forecasts ($R2\%_t[\Delta F]$) are calculated as follows:

$$R2\%_t[E,\Delta E] \equiv \frac{R2_t[E,\Delta E]}{R2_t[E,\Delta E,\Delta F]} = \frac{SSR_t[E,\Delta E]}{SSR_t[E,\Delta E,\Delta F]}$$

$$R2\%_t[\Delta F] \equiv \frac{R2_t[\Delta F]}{R2_t[E,\Delta E,\Delta F]} = \frac{SSR_t[\Delta F]}{SSR_t[E,\Delta E,\Delta F]}$$

Given that $R2_t[E,\Delta E,\Delta F]$ measures the price-relevance of the full model, one can think of $R2\%_t[E,\Delta E]$ ($R2\%_t[\Delta F]$) as the proportion of $R2_t[E,\Delta E,\Delta F]$ attributable to accounting data (analyst forecasts). To better understand which of those two information sources drives the price-relevance of the full model, I decompose $R2\%_t[E,\Delta E,\Delta F]$ into three distinct *incremental* information components: [28]

- $incR2\%_t[E,\Delta E]$ the increment of $R2_t[E,\Delta E,\Delta F]$ attributable to earnings
- $incR2\%_t[\Delta F]$) the increment of $R2_t[E,\Delta E,\Delta F]$ attributable to forecasts
- $incR2\%_t[\cap]$ the increment of $R2_t[E,\Delta E,\Delta F]$ attributable to both sources

*Where:*

$$incR2\%_t[E,\Delta E] = R2\%_t[E,\Delta E,\Delta F] - incR2\%_t[\Delta F]$$

$$incR2\%_t[\Delta F] = R2\%_t[E,\Delta E,\Delta F] - incR2\%_t[E,\Delta E]$$

$$incR2\%_t[\cap] = R2\%_t[E,\Delta E,\Delta F] - incR2\%_t[E,\Delta E] - incR2\%_t[\Delta F]$$ [29]

*Temporal trends in the proportional relevance of each incremental information component*

The next research question this study seeks to address is whether there are any temporal trends in the proportional relevance for each identifiable information source included in the full model. On an intuitive level, one can think of the following discussion as a look inside the explanatory power of the full model. Figure 2 provides a graphical illustration of the findings reported in Table 4. For the proportional relevance of accounting data, the $\psi_1$ coefficient is statistically insignificant; the average $incR2\%_t[E,\Delta E]$ remains fairly constant at 27.04% during the first half of the sample period (1984-1996) and 27.40% during the second half (1997-2009). For the proportional relevance of "other" information, $\psi_1$ is significantly positive (0.011, p<.01); the average $incR2\%_t[\Delta F]$ increases from an average of 39.71% during the first half to an average of 50.8% during the second half of the sample period. For the proportional relevance of information attributable to both information sources, the $\psi_1$ coefficient is significantly negative ($\psi_1$=-0.009, p<.001); the average $incR2\%_t[\cap]$ has dropped from an average of

[28] Prior studies that have used R2 decomposition are Easton (1985), Collins et al. (1997), Graham et al. (2000), Hand (2005), Ayers et al (2001), Ota (2002),among others.

[29] Please note that $R2_t[E,\Delta E,\Delta F]$ equals 1 by construction.

33.25% during the first half to an average of 21.80% during the second half of the main sample period. Together, these findings are consistent with the view that "other" information ($\nu_t$) has gained in importance relative to accounting numbers. The findings suggest, however, that this gain did not come at the expense of accounting data. The decline in incR2%$_t$[∩] indicates that the extent to which analysts rely on "other" information beyond the domain of financial reporting has increased over time.

*Insert Figure 2 about here*

*Insert Table 4 about here*

*The influence of market conditions*

The prior analysis has examined temporal trends in the proportional relevance of accounting earnings and "other" information captured by analyst forecasts. Despite the significant temporal trends, the graphs in Figure 2 and the results reported in Table 4 suggest that factors other than the time trend could explain the extent to which investors rely on accounting data (forecasts).

As discussed previously, the information set captured by financial reports is different from the information set captured by financial analysts in terms of reliability and timeliness. Financial reports prepared in accordance with US-GAAP are primarily based on historical information that is auditable and can be verified by an independent third party. Consequently, information that is more forward-looking or even speculative in nature is largely excluded from such financial statements. In contrast, financial analysts, who are not bound by US-GAAP, can incorporate information that is timelier, forward-looking, and possibly speculative. The term "anchor" provides an intuitive analogy for the relatively hard and reliable nature of the information presented in financial statements.[30] Given these two different information sources, the question arises as to when do investors rely on this anchor of value as opposed to

[30] This anchor analogy is in reference to Penman (2006): "Anchor a valuation on what you know rather than speculation. Much of what we know is found in the financial statements, so the maxim might read: Anchor a valuation on the financial statements" (p.20).

expectations of future earnings? In other words, under what circumstances do accounting fundamentals, as opposed to earnings forecasts, matter most?

*Insert Figure 3 about here*

Figure 3 presents the annual difference between $incR2\%_t[E,\Delta E]$ and $incR2\%_t[\Delta F]$.[31] A value of zero would indicate that both information sources are equally important to investors. In contrast, a positive (negative) value suggests that investors rely more heavily on accounting data (earnings expectations). Out of the 26 years covered by the sample, earnings expectations dominate accounting data in all but the following 5 years: 1984, 1987, 1996, 2000, and 2002, four of which display difficult conditions on the capital markets.[32,33] In 1984, the U.S. experienced the savings and loan crisis. October 19, 1987, is commonly known as "*Black Monday*". On this day, stock indices all over the world dropped substantially, and the Dow Jones Industrial Average (DJIA) lost 22.61%. Early in 2000, AOL acquired Time Warner; the NASDAQ reached its peak of 5,132.52 on March 10, 2000. Over the next two years, investors witnessed the fallout from the burst of the so-called Dot-Com bubble; the NASDAQ lost roughly 280% and closed with 1,340.33 points on March 10, 2003. The recent burst of the housing and credit bubble is still affecting capital markets today. On October 9, 2007, the DJIA closed at 14,164.53, the highest close in its history. In less than 2 years the Dow lost half its value and closed at 6,547 on March 9, 2009.

These findings suggest that the conditions on capital markets influence the extent to which investors rely on accounting data as opposed to earnings expectations. To formally investigate this relationship, I estimate the following regressions:

[31] Please note that $incR2\%_t[E,\Delta E] - incR2\%_t[\Delta F] = R2\%_t[E,\Delta E] - R2\%_t[\Delta F]$

[32] See Kaminsky and Reinhart (1999) and Reinhart and Rogoff (2008) for an overview of post-war financial crisis.

[33] On December 5$^{th}$ 1996, the then-Chairman of the Federal Reserve Bank, Alan Greenspan, coined the term *irrational exuberance*.

$$DEPVAR_t = \psi_0 + \psi_1\, TREND_t + \psi_2\, MKT_t + \varepsilon \qquad (11a)$$

$$DEPVAR_t = \psi_0 + \psi_1\, TREND_t + \psi_2\, \sigma DMKT_t + \varepsilon \qquad (11b)$$

*Where* $DEPVAR_t$ *denotes the dependent variable of interest,*
$TREND_t = 1$ *to 26 for the main sample (1984-2009)*
$MKT_t$ *= cumulated 12-month return for CRSP value-weighted index*
$\sigma DMKT_t$ *= standard deviation of daily CRSP value-weighted index over 12 months*

Table 5 Panel A presents the coefficient estimates based on regression (11a). The negative coefficient on $MKT_t$ in Column (1) (-1.025, p<.001) suggests that the mix of information used by investors shifts toward expectations (accounting data) in bullish (bearish) years with high (low) market returns. More specifically, the results reported in columns 2 and 3 show that, on average, an increase by 10 percentage points in $MKT_t$ is associated with a 5.8 point decrease in $incR2\%_t[E,\Delta E]$ (-0.583, p<.001) and a 4.4 point increase in $incR2\%_t[\Delta F]$ (0.442, p<.001). Panel B reports the coefficient estimates based on regression (11b). The positive coefficient on $\sigma DMKT_t$ in Column (1) (35.062, p<.01) is consistent with the view that investors tend to "return to accounting fundamentals" in years with high uncertainty, as measured by market volatility. More specifically, the results presented in columns 2 and 3 show a significantly positive (negative) association between $incR2\%_t[E,\Delta E]$ ($incR2\%_t[\Delta F]$) and $\sigma DMKT_t$.

To summarize, the evidence presented in Table 5 is consistent with the notion that accounting data provides an anchor for value in comparison to more timely, but less reliable, "other" information reflected in earnings expectations. The findings suggest that "other" information has gained in importance in comparison to accounting data over the sample period examined. However, despite the temporal decline, I find that investors tend to rely on accounting as an anchor for value during periods with low market returns or high uncertainty.

# 5. Concluding remarks

Using the price-relevant information captured by the information items identified in the Ohlson (1995) framework as the benchmark for measuring relevance, this study examined the temporal trends in the (proportional) relevance of accounting data and "other" information. The results show that the proportional relevance of "other" information increased substantially over the period 1984 – 2009. After controlling for this temporal trend, I find evidence consistent with the notion that investors rely more heavily on "other" non-accounting information during "good" times, i.e. years with high market returns or low uncertainty, as measured by market volatility. Moreover, the results also show that investors return to accounting fundamentals in years with low market returns or high uncertainty in the markets. The proportional relevance of accounting data is especially pronounced during periods of crisis such as 1984, 1987, 2000, 2002, and 2008.

Overall, the results reported in this study suggest that although "other" non-accounting information has gained in importance over time, investors still rely on accounting data as an anchor for valuation in difficult periods.

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**Table 1: Descriptive Statistics and Correlations**

**Panel A - Descriptive Statistics**

| | Mean | Std.Dev. | Min | P25 | P50 | P75 | Max |
|---|---|---|---|---|---|---|---|
| *Firm-Year Observations (Pooled Sample)* | | | | | | | |
| $RET_{it}$ | 0.139 | 0.475 | -0.813 | -0.162 | 0.089 | 0.361 | 3.048 |
| $E_{it}$ | 0.038 | 0.089 | -0.686 | 0.021 | 0.055 | 0.082 | 0.259 |
| $\Delta E_{it}$ | 0.004 | 0.088 | -0.508 | -0.014 | 0.006 | 0.022 | 0.774 |
| $\Delta F_{it}$ | 0.005 | 0.038 | -0.180 | -0.008 | 0.006 | 0.017 | 0.243 |
| *Market Conditions (measured annually)* | | | | | | | |
| $MKT_t$ | 0.100 | 0.202 | -0.397 | -0.011 | 0.121 | 0.173 | 0.466 |
| $\sigma MKT_t$ | 0.010 | 0.005 | 0.005 | 0.007 | 0.008 | 0.012 | 0.028 |

**Panel B - Correlation Coefficients**

*Bottom Left: Pearson Correlation, Top Right Spearman Correlation Coefficients. (p-values in italics).*

| *Firm-year (pooled sample)* | $RET_{it}$ | $E_{it}$ | $\Delta E_{it}$ | $\Delta F_{it}$ |
|---|---|---|---|---|
| $RET_{it}$ | | 0.340 | 0.276 | 0.386 |
| | | *<.0001* | *<.0001* | *<.0001* |
| $E_{it}$ | 0.198 | | 0.405 | 0.270 |
| | *<.0001* | | *<.0001* | *<.0001* |
| $\Delta E_{it}$ | 0.197 | 0.349 | | 0.480 |
| | *<.0001* | *<.0001* | | *<.0001* |
| $\Delta F_{it}$ | 0.336 | 0.166 | 0.372 | |
| | *<.0001* | *<.0001* | *<.0001* | |

| *Market Conditions (annual)* | $TREND_t$ | $MKT_t$ | $\sigma DMKT_t$ |
|---|---|---|---|
| $TREND_t$ | | -0.223 | 0.333 |
| | | *0.2745* | *0.0961* |
| $MKT_t$ | -0.207 | | -0.273 |
| | *0.3097* | | *0.177* |
| $\sigma DMKT_t$ | 0.395 | -0.623 | |
| | *0.0456* | *0.0007* | |

RETit = The 12-month cumulative returns for April 1st in period t to March 31st in period t+1 Eit = Earnings per share excluding extraordinary items, scaled by beginning of period price. ΔEit = Current EPSt minus prior periods EPSt-1, scaled by beginning of period price. ΔFit = Change in one-year ahead analyst forecasts. for firm i in year t TRENDt = Equals 1 to 26 for the period 1984 to 2009, and 1 to 59 for the period extended sample (1951-2009) MKTt = Cumulative CRSP value-weighted market return for April 1st in period t to March 31st in period t+1. sDMKTt = The standard deviaton of the daily CRSP value-weighed market return for April 1st in period to March 31st in period t+1.

**Table 2: The association between current earnings, earnings forecasts, and stock returns.**

| Year | N | *Full* | | | | *ESS-Specification* | | | | *Earnings* | | | *Forecast* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $E_t$ | $\Delta E_t$ | $\Delta F_t$ | R2[E,ΔE,ΔF] | $E_t$ | $\Delta E_t$ | $\Delta F_t$ | R2[E,ΔE,ΔF] | $E_t$ | $\Delta E_t$ | R2[E,ΔE] | $\Delta F_t$ | R2[ΔF] |
| 1984 | 652 | 2.04 | -0.52 | 2.16 | 36.3% | 2.04 | 1.64 | 2.16 | 36.3% | 2.39 | -0.26 | 31.2% | 3.54 | 17.9% |
| 1985 | 668 | 1.68 | -0.52 | 3.72 | 31.9% | 1.68 | 3.20 | 3.72 | 31.9% | 1.97 | 0.28 | 21.8% | 4.61 | 22.7% |
| 1986 | 712 | 0.68 | -0.20 | 1.60 | 9.7% | 0.68 | 1.40 | 1.60 | 9.7% | 0.72 | 0.09 | 5.4% | 1.83 | 6.7% |
| 1987 | 721 | 0.77 | 0.21 | 1.15 | 15.9% | 0.77 | 1.36 | 1.15 | 15.9% | 0.86 | 0.33 | 13.2% | 1.80 | 7.6% |
| 1988 | 748 | 0.59 | 0.17 | 1.76 | 14.0% | 0.59 | 1.93 | 1.76 | 14.0% | 0.73 | 0.42 | 9.3% | 2.34 | 10.4% |
| 1989 | 802 | 0.88 | 0.33 | 2.75 | 22.3% | 0.88 | 3.08 | 2.75 | 22.3% | 0.86 | 0.91 | 14.2% | 3.49 | 16.1% |
| 1990 | 835 | 1.03 | -0.02 | 3.13 | 22.0% | 1.03 | 3.11 | 3.13 | 22.0% | 1.11 | 0.45 | 12.4% | 3.71 | 16.0% |
| 1991 | 892 | 0.40 | 0.40 | 3.87 | 20.3% | 0.40 | 4.28 | 3.87 | 20.3% | 0.55 | 0.83 | 8.4% | 4.45 | 17.9% |
| 1992 | 931 | 1.31 | 0.18 | 5.31 | 32.8% | 1.31 | 5.49 | 5.31 | 32.8% | 1.80 | 0.84 | 19.9% | 6.74 | 26.7% |
| 1993 | 1,053 | -0.02 | 0.61 | 3.15 | 15.2% | -0.02 | 3.76 | 3.15 | 15.2% | 0.25 | 0.98 | 7.1% | 3.68 | 13.5% |
| 1994 | 1,240 | 0.92 | 0.01 | 3.32 | 21.2% | 0.92 | 3.32 | 3.32 | 21.2% | 1.10 | 0.51 | 10.4% | 3.79 | 17.0% |
| 1995 | 1,328 | 0.16 | 0.46 | 4.61 | 16.3% | 0.16 | 5.06 | 4.61 | 16.3% | 0.16 | 1.37 | 6.2% | 5.12 | 15.6% |
| 1996 | 1,463 | 2.01 | -0.50 | 3.70 | 27.0% | 2.01 | 3.20 | 3.70 | 27.0% | 2.22 | 0.00 | 18.8% | 4.68 | 15.7% |
| 1997 | 1,637 | 0.92 | 0.41 | 5.66 | 21.1% | 0.92 | 6.07 | 5.66 | 21.1% | 1.37 | 0.92 | 9.7% | 6.66 | 18.1% |
| 1998 | 1,689 | 0.49 | 0.30 | 2.99 | 11.2% | 0.49 | 3.29 | 2.99 | 11.2% | 0.59 | 0.82 | 5.9% | 3.60 | 9.6% |
| 1999 | 1,569 | -0.95 | 0.68 | 4.41 | 10.1% | -0.95 | 5.09 | 4.41 | 10.1% | -0.86 | 1.55 | 4.3% | 4.69 | 8.4% |
| 2000 | 1,514 | 2.18 | -0.53 | 2.90 | 23.9% | 2.18 | 2.36 | 2.90 | 23.9% | 2.21 | 0.04 | 19.1% | 3.39 | 8.1% |
| 2001 | 1,550 | 0.70 | 0.23 | 2.47 | 12.6% | 0.70 | 2.70 | 2.47 | 12.6% | 0.79 | 0.67 | 7.2% | 2.98 | 9.5% |
| 2002 | 1,682 | 1.40 | -0.11 | 2.65 | 28.3% | 1.40 | 2.54 | 2.65 | 28.3% | 1.42 | 0.23 | 19.3% | 2.80 | 11.0% |
| 2003 | 1,704 | -0.45 | 0.93 | 5.16 | 22.6% | -0.45 | 6.09 | 5.16 | 22.6% | -0.58 | 1.52 | 8.2% | 5.79 | 19.5% |
| 2004 | 1,929 | 1.61 | -0.01 | 4.34 | 31.9% | 1.61 | 4.33 | 4.34 | 31.9% | 1.80 | 0.71 | 19.2% | 5.08 | 21.1% |
| 2005 | 2,124 | 0.08 | 0.82 | 4.19 | 18.3% | 0.08 | 5.00 | 4.19 | 18.3% | 0.24 | 1.37 | 6.5% | 4.70 | 16.3% |
| 2006 | 2,220 | 0.74 | -0.03 | 3.35 | 15.5% | 0.74 | 3.33 | 3.35 | 15.5% | 0.69 | 0.54 | 5.4% | 3.49 | 12.4% |
| 2007 | 2,288 | 1.20 | -0.16 | 3.80 | 23.3% | 1.20 | 3.64 | 3.80 | 23.3% | 1.24 | 0.45 | 11.5% | 4.08 | 15.7% |
| 2008 | 2,098 | 0.49 | 0.07 | 1.63 | 11.8% | 0.49 | 1.70 | 1.63 | 11.8% | 0.38 | 0.33 | 6.4% | 1.72 | 6.9% |
| 2009 | 1,889 | 0.25 | 0.16 | 2.76 | 7.9% | 0.25 | 2.92 | 2.76 | 7.9% | 0.14 | 0.50 | 1.7% | 2.86 | 7.4% |
| Mean | 1,382 | 0.81 | 0.13 | 3.33 | 20.1% | 0.81 | 3.46 | 3.33 | 20.1% | 0.93 | 0.63 | 11.6% | 3.91 | 14.1% |
| *p-value* | | *0.000* | *0.110* | *0.000* | | *0.000* | *0.000* | *0.000* | | *0.000* | *0.000* | | *0.000* | |
| Std. Dev | 534 | 0.75 | 0.40 | 1.18 | 7.8% | 0.75 | 1.38 | 1.18 | 7.8% | 0.82 | 0.47 | 6.9% | 1.34 | 5.3% |
| Median | 1,489 | 0.76 | 0.17 | 3.23 | 20.7% | 0.76 | 3.25 | 3.23 | 20.7% | 0.83 | 0.53 | 9.5% | 3.70 | 15.6% |

This table presentes the coefficient estimates for the following regressions, run annually: Full-model: RETit = λ0 + λ1 Eit + λ2 ΔEit + λ3 ΔFit + εit ESS-specification: RETit = λ0 + λ1 Eit + λ2 ΔEit + λ3 (ΔFit-ΔEit)+ εit Earnings-model: RETit = λ0 + λ1 Eit + λ2 ΔEit + εit Forecast-model: RETit = λ0 + λ1 ΔFit + εit. The variables are defined as follows: RETit = The 12-month cumulative returns for April 1st in period t to March 31st in period t+1Eit = Earnings per share excluding extraordinary items, scaled by beginning of period price. ΔEit = Current EPSt minus prior periods EPSt-1, scaled by beginning of period price. ΔFit = Change in one-year ahead analyst forecasts. For firm i in year t

**Table 3**

Time-Trends: total cross-sectional variaton of stock returns and the amount of variation explained by accounting data (and forecasts).

**Panel A - Descriptive Statistics**

| | 1951-2009 | | | 1984-2009 | | | | |
|---|---|---|---|---|---|---|---|---|
| | $SST_t$ | $SSR_t[E,\Delta E]$ | $R2_t[E,\Delta E]$ | $SST_t$ | $SSR_t[E,\Delta E]$ | $R2_t[E,\Delta E]$ | $R2_t[\Delta F]$ | $R2_t[E,\Delta E,\Delta F]$ |
| Mean | 0.119 | 0.016 | 14.98% | 0.156 | 0.016 | 11.64% | 14.15% | 20.13% |
| Std. Dev. | 0.077 | 0.010 | 7.76% | 0.088 | 0.010 | 6.94% | 5.34% | 7.84% |
| Max | 0.401 | 0.044 | 32.35% | 0.401 | 0.043 | 31.19% | 26.67% | 36.34% |
| P75 | 0.144 | 0.021 | 20.36% | 0.172 | 0.022 | 17.64% | 17.66% | 23.75% |
| P50 | 0.100 | 0.013 | 14.08% | 0.127 | 0.014 | 9.50% | 15.64% | 20.73% |
| P25 | 0.071 | 0.009 | 8.19% | 0.101 | 0.008 | 6.39% | 9.51% | 14.31% |
| Min | 0.030 | 0.002 | 1.73% | 0.062 | 0.005 | 1.73% | 6.73% | 7.89% |

**Panel B - Trend-Regression** $DEPVAR_t = \psi_0 + \psi_1\ TREND_t + \varepsilon$

| | 1951-2009 | | | 1984-2009 | | | | |
|---|---|---|---|---|---|---|---|---|
| | $SST_t$ | $SSR_t[E,\Delta E]$ | $R2_t[E,\Delta E]$ | $SST_t$ | $SSR_t[E,\Delta E]$ | $R2_t[E,\Delta E]$ | $R2_t[\Delta F]$ | $R2_t[E,\Delta E,\Delta F]$ |
| **Int.** | -5.510 *** | -0.190 | 4.190 *** | 0.103 *** | 0.020 *** | 0.167 *** | 0.162 *** | 0.24 *** |
| | *0.000* | *0.230* | *0.000* | *0.006* | *0.000* | *0.000* | *0.000* | *0.000* |
| **$TREND_t$** | 0.003 *** | 0.000 | -0.002 *** | 0.004 * | 0.000 | -0.004 ** | -0.002 | -0.003 |
| | *0.000* | *0.192* | *0.000* | *0.086* | *0.326* | *0.038* | *0.276* | *0.198* |
| **Adj. R2** | 36.19% | 2.97% | 22.64% | 8.10% | 0.03% | 13.33% | 0.95% | 2.91% |

Variables are defined as follows:

| | | |
|---|---|---|
| $SST_t$ | = | The total cross-sectional variation in annual stock returns. |
| $SSR_t[E,\Delta E]$ | = | The amount $SST_t$ which is explained by accounting data $[E,\Delta E]$. |
| $SSR_t[E,\Delta E,\Delta F]$ | = | The amount $SST_t$ which is explained by accounting data and forecasts $[E,\Delta E,\Delta F]$. |
| $R2_t[E,\Delta E]$ | = | The fraction of $SST_t$ which is explained by accounting data, calculated as $SSR_t[E,\Delta E]/SST_t$. |
| $R2_t[E,\Delta E,\Delta F]$ | = | The fraction of $SST_t$ which is explained by accounting data and forecasts, calculated as $SSR_t[E,\Delta E,\Delta F]/SST_t$. |

**Table 4**

Time-Trends: The proportional relevance of each incremental component.

**Panel A: The three increments of the *Full Model***

| | $incR2\%_t[E,\Delta E]$ | $incR2\%_t[\cap]$ | $incR2\%_t[\Delta F]$ |
|---|---|---|---|
| **Mean** | 27.22% | 27.53% | 45.26% |
| **Std. Dev.** | 16.54% | 9.41% | 15.80% |
| **Max** | 65.93% | 42.22% | 78.12% |
| **P75** | 33.69% | 34.74% | 56.37% |
| **P50** | 25.33% | 29.01% | 45.15% |
| **P25** | 14.16% | 23.58% | 34.44% |
| **Min** | 4.58% | 7.20% | 14.17% |

**Panel B: Trend-Regression** $DEPVAR_t = \psi_0 + \psi_1\ TREND_t + \varepsilon$

| | $incR2\%_t[E,\Delta E]$ | $incR2\%_t[\cap]$ | $incR2\%_t[\Delta F]$ |
|---|---|---|---|
| **Int.** | 0.308 *** | 0.393 *** | 0.300 *** |
| | 0.000 | 0.000 | 0.000 |
| **TREND** | -0.003 | -0.009 *** | 0.011 *** |
| | 0.555 | 0.000 | 0.004 |
| **Adj. R2** | -2.63% | 47.94% | 27.12% |

Variables are defined as follows:

| | |
|---|---|
| $incR2\%_t[.]$ | The proportion of $R2_t[E,\Delta E,\Delta F]$ which is incremental to the regressors [.]. |
| $incR2\%_t[E,\Delta E]$ | $= R2_t[E,\Delta E] / R2_t[E,\Delta E,\Delta F]$ |
| $incR2\%_t[F]$ | $= R2_t[\Delta F] / R2_t[E,\Delta E,\Delta F]$ |
| $incR2\%_t[\cap]$ | The proportion of $R2_t[E,\Delta E,\Delta F]$ that is common to accounting data and forecasts. Calculated as follows: $1 - incR2\%_t[E,\Delta E] - incR2\%_t[E,\Delta E,\Delta F]$ |

**Table 5**
The influence of market conditions on the proportional relevance of each incremental component.

**Panel A** $DEPVAR_t = \psi_0 + \psi_1\ TREND_t + \psi_2\ MKT_t + \varepsilon$

| **DEPVAR:** | (1) incR2%$_t$[E,ΔE]-incR2%$_t$[ΔF] | | (2) incR2%$_t$[E,ΔE] | | (3) incR2%$_t$[ΔF] | | (4) incR2%$_t$[∩] | |
|---|---|---|---|---|---|---|---|---|
| **Int.** | -0.088 | 0.192 * | 0.330 *** | 0.414 *** | 0.419 *** | 0.222 *** | 0.2513 *** | 0.364 *** |
| | *0.141* | *0.061* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| **TREND** | | -0.020 *** | | -0.006 * | | 0.014 *** | | -0.008 *** |
| | | *0.003* | | *0.088* | | *0.000* | | *0.000* |
| **MKT** | -0.870 *** | -1.025 *** | -0.537 *** | -0.583 *** | 0.333 ** | 0.442 *** | 0.2039 ** | 0.142 ** |
| | *0.003* | *0.000* | *0.000* | *0.000* | *0.033* | *0.000* | *0.026* | *0.038* |
| **Adj. R2** | 28.71% | 49.66% | 40.02% | 44.98% | 14.22% | 55.61% | 15.66% | 44.98% |

**Panel B** $DEPVAR_t = \psi_0 + \psi_1\ TREND_t + \psi_2\ \sigma DMKT_t + \varepsilon$

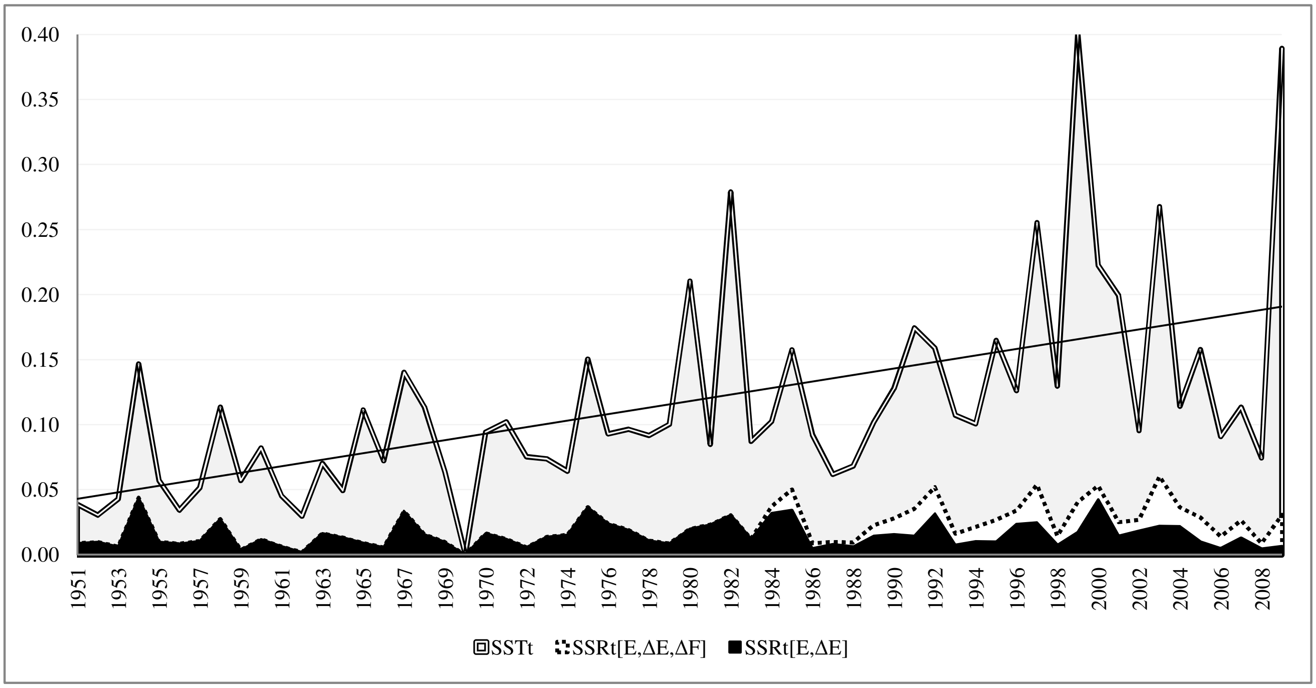
| **DEPVAR:** | (1) incR2%$_t$[E,ΔE]-incR2%$_t$[ΔF] | | (2) incR2%$_t$[E,ΔE] | | (3) incR2%$_t$[ΔF] | | (4) incR2%$_t$[∩] | |
|---|---|---|---|---|---|---|---|---|
| **Int.** | -0.387 *** | -0.208 | 0.121 * | 0.183 ** | 0.507 *** | 0.391 *** | 0.372 *** | 0.426 *** |
| | *0.007* | *0.104* | *0.074* | *0.013* | *0.000* | *0.000* | *0.000* | *0.000* |
| **TREND** | | -0.023 *** | | -0.008 * | | 0.015 *** | | -0.007 *** |
| | | *0.004* | | *0.054* | | *0.000* | | *0.001* |
| **σDMKT** | 21.291 * | 35.062 *** | 15.693 ** | 20.476 *** | -5.598 | -14.587 *** | -10.095 *** | -5.889 ** |
| | *0.081* | *0.004* | *0.012* | *0.002* | *0.381* | *0.009* | *0.004* | *0.040* |
| **Adj. R2** | 8.51% | 34.41% | 20.13% | 29.38% | -0.82% | 43.36% | 27.15% | 54.60% |

Variables are defined as follows:

| | |
|---|---|
| incR2%$_t$[.] | The proportion of R2$_t$[E,ΔE,ΔF] |
| incR2%$_t$[E,ΔE] | = R2$_t$[E,ΔE] / R2$_t$[E,ΔE,ΔF] |
| incR2%$_t$[F] | = R2$_t$[ΔF] / R2$_t$[E,ΔE,ΔF] |
| incR2%$_t$[∩] | The proportion of R2… that is common to accounting data and forecasts. Calculated as follows: 1 - incR2%$_t$[E,ΔE] - incR2%$_t$[E,ΔE,ΔF] |
| MKT$_t$ | Cumulative CRSP value-weighted market return for April 1st in period t to March 31st in period t+1. |
| σDMKT$_t$ | The standard deviaton of the daily CRSP value-weighed market return for April 1st in period to March 31st in period t+1. |

**Figure 1a**

The nominator and denominator of $R2_t[E,\Delta E]$ and $R2_t[E,\Delta E,\Delta F]$




**Figue 1b**

The amount of variation explained by earnings (and forecasts) as a proportion of the total variation in returns

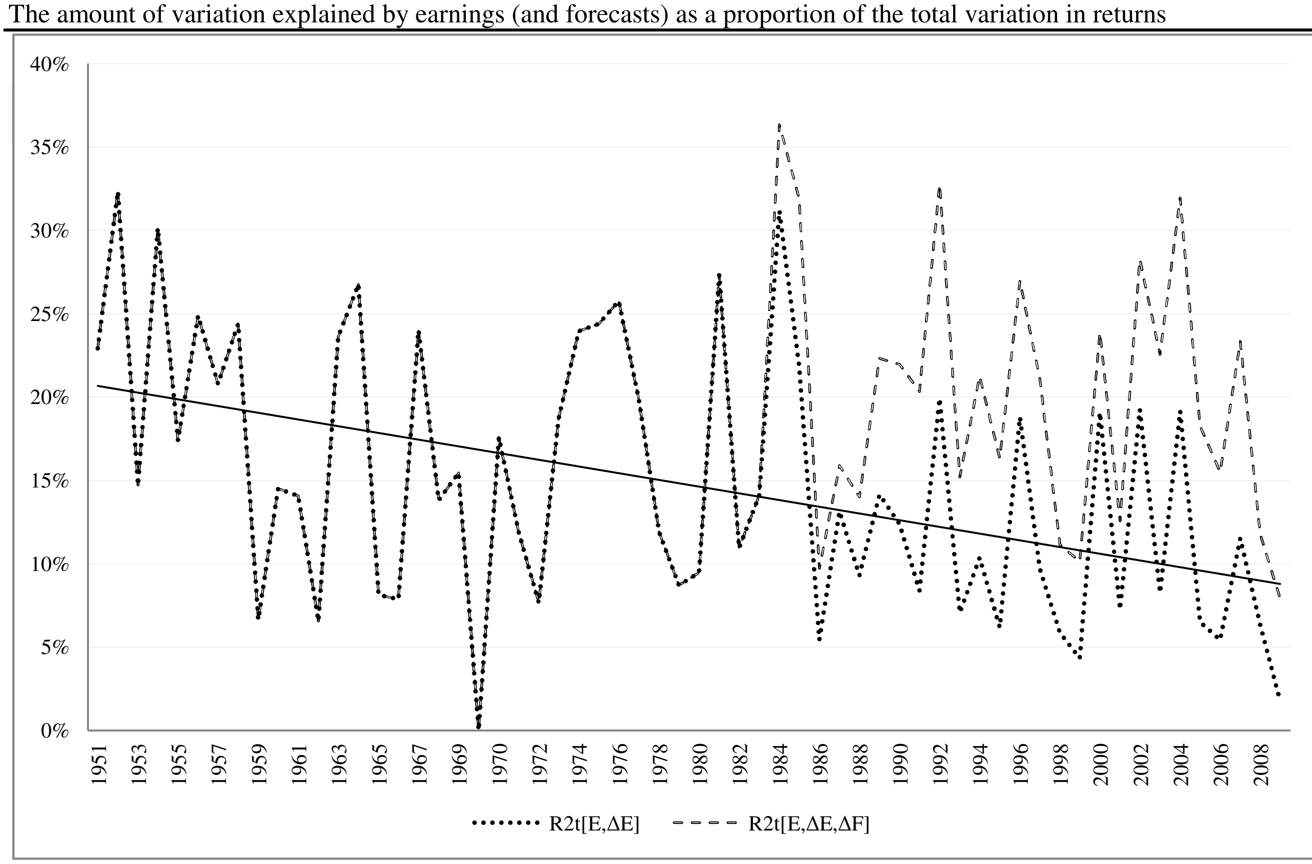


**Figure 2**

Tim Trend: The three incremental components of the Full Model.

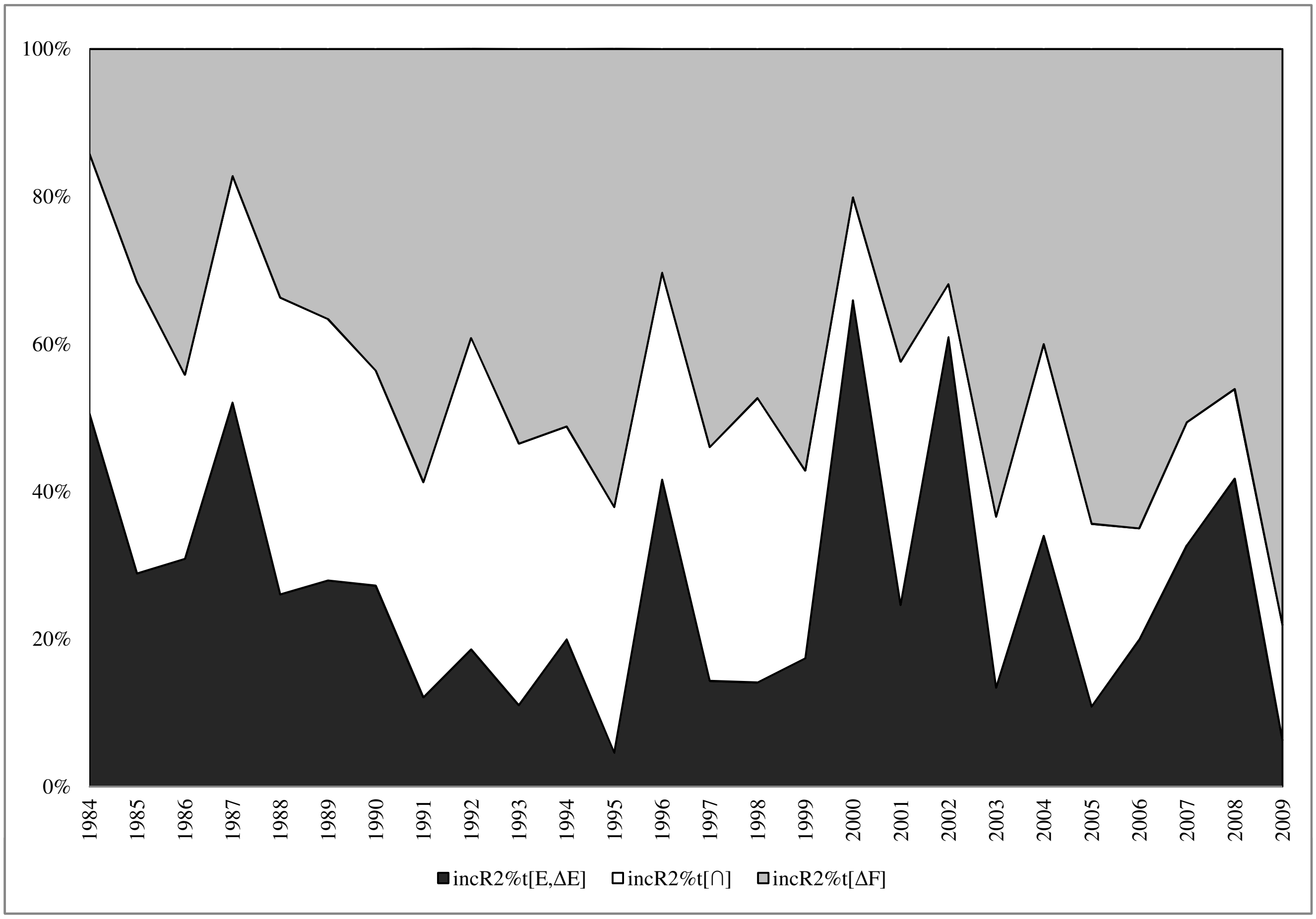


**Figure 3 - When do accounting fundamentals matter most to investors?**

*Each bar shows the difference between the relevance of accounting data and forecasts* $( R2\%_t [E, \Delta E] - R2\%_t [\Delta F] )$.

*A positive (negative) value indicates that accounting ("other") information is more important to investors*