

**ESSAYS ON THE VALUE RELEVANCE OF EARNINGS  
MEASURES**

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**University of Saskatchewan**

**by**

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To “likwe and ejims”

**ABSTRACT**  
**ESSAYS ON THE VALUE RELEVANCE OF EARNINGS MEASURES**

**By**

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at the University of Saskatchewan*

This dissertation presents two studies on the value relevance and perceived credibility of pro forma earnings. In the first study, I investigate the value relevance of pro forma earnings relative to two alternative earnings measures – GAAP earnings and analysts’ actual earnings. Value relevance is assessed using two approaches. The first approach examines whether the market’s expectations (contemporaneous returns or price) is best reflected in future pro forma earnings, future GAAP earnings, or future analyst’s actual earnings. The second approach is to determine through pair-wise comparisons of the three earnings measures (e.g., pro forma earnings versus GAAP earnings), which has the greatest explanatory power (comparing adjusted R<sup>2</sup>s) in explaining price and returns. Across approaches and models, each of the three earnings measures tends to be value relevant. However, Pro forma is consistently the most value relevant, followed by analysts’ actuals, with GAAP earnings having the least value relevance. That is, pro forma earnings have the greatest information content. This finding is consistent with managers, in aggregate, using pro forma to inform rather than to manage expectations or to mislead.

In the second study, I examine the impact of credibility attributes – board characteristics, auditor quality and overall information quality – on the value relevance of pro forma earnings. It is hypothesized that the credibility attributes will have a statistically significant impact on investors’ reaction to pro forma earnings. Consistent with the predictions, I find that stronger board characteristics, higher auditor quality and higher overall information quality are positively associated with higher market reaction to

the pro forma announcement. That is, credibility attributes increase the value relevance of pro forma earnings. This finding is consistent with some firms providing pro forma earnings that are perceived to be credible and others providing pro formas that are perceived as less credible and possibly provided to manage expectations or to mislead.

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## CHAPTER 1: INTRODUCTION

Arguably, the single most important financial information reported by a firm is its earnings. Historically, when the term “earnings” has been used it has referred to GAAP earnings – the traditional bottom-line number prepared according to generally accepted accounting principles. However, the disclosure of non-GAAP earnings – any earnings number which deviates from generally accepted accounting principles – has become more common. The primary focus of this study is on a non-GAAP earnings measure, pro forma earnings.

This dissertation reports the results of two studies that examine pro forma earnings. In the first study presented in Chapter Two, the value relevance of pro forma earnings is compared to that of GAAP earnings and analysts’ actual earnings (a second measure of non-GAAP earnings also referred to as economic earnings). This comparison is performed in two ways. First, the market’s ability to predict future earnings (future pro forma, GAAP, and analyst actual earnings) is examined. This approach provides a joint test of value relevance and the market’s expectation of future earnings. The second approach is to determine through pair-wise comparisons of the three earnings measures (e.g., pro forma earnings versus GAAP earnings), which has the greatest explanatory power (comparing adjusted  $R^2$ s) in explaining returns and price.

The second study, presented in Chapter Three, introduces three credibility attributes which investors may consider in determining the credibility of pro forma earnings. The credibility of pro forma earnings is measured by the association between cumulative abnormal returns and the interaction of pro forma and the credibility attributes. Thus, this study examines the value relevance of pro forma earnings conditioned on these credibility attributes.

Earnings measures – GAAP, analysts’ actuals and pro forma earnings – provide information about current period wealth creation as well as provide a basis for predicting future earnings. Ball and Brown (1968), which studies the association between GAAP-

based earnings and changes in share prices, pioneered information studies that demonstrate that earnings have information content and thus affect stock prices. Since this seminal study, numerous academic articles have examined the relationship between share prices and GAAP-based earnings.<sup>1</sup> As a result, a theory has emerged on the informational affects of earnings on firm value. As part of this theory, Beaver (1989) specifies three links needed to establish the relationship between financial statement data or earnings and firm value. These links are: (1) from current earnings to future earnings (i.e., current period earnings provides information to predict future period's earnings); (2) from future financial statement earnings to future expected dividends (i.e., expectations of future earnings provides expectations of what future dividends will be); and (3) from future dividends to firm value (i.e., a firm's share price represents the present value of expected future dividends). These three links – from current earnings to future earnings, from future earnings to future dividends, and from future dividends to share value – provide an intuitive framework for understanding the relation between earnings and share value and are theoretically and empirically established to varying degrees in accounting research. For example, the dividend discount model is widely accepted in accounting and finance as a valid representation of the third link, while the Clean Surplus Relationship (CSR) of Ohlson (1995) and Feltham and Ohlson (1995) attempt to establish the second link. However, there does not appear to be a widely accepted representation of the first link, even though it lies at the heart of valuation. This link assumes that current period earnings provide information useful for forecasting future earnings, in addition to providing information about current wealth creation. Frankel and Lee (1989) argue that the forecasting of future earnings is the most important and difficult task in a valuation exercise. In summary, it is these links that help explain why many capital market participants focus on current earnings numbers and why analysts develop and publish earnings forecasts. It is this first link that is explored in this dissertation. That is, I explore the relationship between the above three measures of earnings and valuation using an approach that relies on the first link and

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<sup>1</sup> Lev (1989), Bernard (1989), Kothari (2001) and Scott (2003), to name a few, provide detailed surveys of research investigating the relationship between earnings and stock returns.

examine whether the non-GAAP earnings measures are perceived to be more credible given certain credibility attributes.

In the first study, I examine the relative value relevance of GAAP earnings, analysts' actuals and pro forma earnings. Earnings prepared according to GAAP are not defined solely to provide value relevant accounting information. Other objectives underlie our financial accounting system, such as contracting, which may reduce the value relevance of accounting-based earnings. Alternative earnings measures, such as analysts' actuals or pro forma earnings, could therefore provide greater value relevance than GAAP based earnings. The reason being that the application of GAAP adds noise to true economic earnings – that is, GAAP earnings is neither intended nor presented as a true or unbiased measure of the change in economic value of the firm. Therefore, by providing alternative measures which focus on value relevance (e.g., recurring earnings or cash income) investors are better able to understand and evaluate a firm's performance. It may be argued that analysts' actuals should be the most value relevant of the three earnings measures as its sole purpose is to measure the sustainable earnings power of the firm. The potential dual motive in creating pro forma – to provide value relevant information or to mislead – may lead to firms providing measures which are more or less value relevant than are GAAP-based earnings. Note, however, that if the primary purpose of reporting pro forma by management is to provide value relevant information, this information may in fact be more value relevant than analysts' actuals as it is expected that management will have a greater sense as to which adjustments better reflect sustainable earnings. Consistent with management providing pro forma to inform investors, the results of the first study find that pro forma earnings are informative and more value relevant than either GAAP or analysts' actuals. This result is robust to alternative model specifications and extensions.

Following from the results in the first study, the second study examines whether board characteristics, auditor quality and overall information quality – collectively referred to as credibility attributes – affect the perceived credibility of pro forma earnings. While the first study demonstrates that collectively pro forma provides value relevant information, particular managers may provide pro forma measures to

inform, or to manage perceptions. Does the market distinguish between these objectives? The credibility of the non-GAAP earnings measure (i.e., that it reflects true economic fundamentals) should be a function of the credibility attributes that are observable. Where a firm has strong board characteristics, a high quality external auditor and high overall information quality, we may expect an increase in the value relevance of its pro forma earnings. That is, a firm with strong governance characteristics is more likely to provide value relevant information (is less likely to provide a misleading measure), and the market should recognize the pro forma as evidence that the manager has observed an information signal. The results of the second study suggest that the credibility attributes do matter and that investors perceive pro formas of firms with higher credibility attributes to be more credible than those of firms with lower credibility attributes. For example, pro formas of firms with higher quality board characteristics are perceived to be more credible than those with lower quality board characteristics.

This dissertation is motivated by the increased emphasis that has been placed on non-GAAP earnings measures – analysts’ actuals and pro forma earnings. The earnings measures are important because it is believed that they provide information about current period wealth creation, as well as providing a basis for predicting future earnings. In support of the importance of earnings measures, the FASB’s Conceptual Framework states in its Statements of Financial Accounting Concepts (SFAC) No. 1

*“Financial reporting should provide information to help present and potential investors, creditors and other users in assessing the amounts, timing and uncertainty in prospective cash receipts from dividends or interest and the proceeds from the sale, redemption or maturity of securities or loans” (FASB 1978).*

In reporting earnings information, traditionally referred to as Net Income (NI), firms have relied on Generally Accepted Accounting Principles (GAAP) as a basis for measurement. However, recently there have been arguments among academics that

accounting earnings (GAAP earnings) have lost their relevance (see for example, Lev and Zarowin, 1999; Francis and Schipper, 1999 and Brown et al. 1999).<sup>2</sup> As a result of this decline in value relevance, non-GAAP earnings are being provided by both managers and analysts to shore up accounting information.

Over the past few years, pro forma earnings measures have become common in earnings press releases. While those who provide analysts' actual earnings claim that it is a measure of true economic earnings, it is unclear that this is the principal purpose behind managers' reporting of pro forma earnings. It is the investigation of the claims regarding the usefulness of the earnings measures that motivates this dissertation. While the value relevance of earnings measures have been studied in the past, prior studies do not distinguish between the three earnings measures used in this dissertation – pro forma earnings, GAAP earnings, and analysts' actuals. Most have compared only GAAP earnings and a proxy for pro forma earnings (typically analysts' actuals). This dissertation examines the value relevance of each of these three measures using two different approaches.

Another factor that motivates this dissertation is the perceived credibility of pro forma earnings. Prior research has not examined this issue. As it is, there is no evidence that the market takes the credibility of the pro forma earnings measure into consideration when it is impounded in price. This study therefore examines whether perceived credibility is associated with an increase in value relevance. In this thesis, perceived credibility is based on three observable credibility attributes – board characteristics, external auditor quality, and overall information quality.

By answering questions about the value relevance and credibility of pro forma earnings measures, the dissertation makes two main contributions. First, it provides evidence on the value relevance of earnings measures by examining which of the three earnings measures is closest to the markets' expectations of future earnings. By studying the value relevance of earnings measures, additional evidence is provided on the usefulness of different earnings measures for valuation. Better understanding the valuation properties of earnings categories is both of academic

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<sup>2</sup> By this, the authors mean the declining relationship between accounting earnings and stock price measured in terms of the declining  $R^2$ .

and practical interest. Recall that according to the three links espoused by Beaver (1968), investors form expectations of what future earnings will be in valuing a firm's shares. Accordingly, knowing which earnings measure is closest to investors' expectations of future earnings is important in ensuring appropriate resource allocation.

Second, this dissertation supports the hypotheses that credibility is reflected in the pricing of pro forma earnings. That is, pro forma from firms with better governance, better auditors, and better overall information quality have greater value relevance. This finding is consistent with expectations of regulators that strengthening governance mechanisms will increase the likelihood that earnings will be more credible and consequently, investor confidence.

Collectively, this dissertation provides new insights into the markets' expectations of pro forma earnings measures, and the role of credibility in these expectations.

## CHAPTER 2: PAPER 1

### THE VALUE RELEVANCE OF PRO FORMA EARNINGS

#### 2.1. INTRODUCTION

Arguably the single most important piece of financial information regarding a firm is its earnings. Earnings measures are important because they provide to shareholders, and to the broader financial markets, an indication of both current and future firm performance. In this paper, the value relevance of three different earnings measures – traditional accounting (or GAAP) earnings, analysts’ actual earnings, and pro forma earnings – is examined.<sup>3</sup>

##### 2.1.1. Three Alternative Earnings Measures

Traditional accounting earnings – henceforth “GAAP earnings” – are determined using generally accepted accounting principles. These principles are promulgated by formal accounting standard setting bodies including the Financial Accounting Standards Board (FASB) in the U.S and the Accounting Standards Board (AcSB) in Canada. Public companies are required to report GAAP earnings to the financial markets on both a quarterly and an annual basis, and must have a qualified public accounting firm audit the annual figure.

A second earnings measure is analysts’ actual earnings – henceforth “analysts’ actuals”<sup>4</sup>. This non-GAAP measure refers to earnings provided – on both a quarterly and an annual basis – by a financial intermediary, independent of management which includes data tracking services such as Standard and Poor’s (S&P). Unlike GAAP earnings, analysts’ actuals are not constrained by generally accepted accounting principles, and are determined using proprietary models which attempt to measure the core or sustainable earnings potential of a firm (also referred to as economic earnings). Also unlike GAAP earnings, analysts’ actuals are unaudited.

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<sup>3</sup> In the extant literature, an accounting measure is defined as value relevant if it has an association with share prices.

<sup>4</sup> This measure differs from analysts’ forecasted earnings. Forecasted earnings are ex ante predictions of a firm’s performance provided in advance of the end of the forecasted period. Analysts’ actuals are ex post measures of the firm’s performance during the period.

A third earnings measure – and the measure of primary interest in this study – is pro forma earnings (henceforth “pro forma”). Like analysts’ actuals, this category of earnings measure is unaudited and unconstrained by generally accepted accounting principles. However, unlike analysts’ actuals, pro formas are determined by firm management. That is, management will determine whether to issue a pro forma, and its calculation. The use of pro forma earnings is very common, with Entwistle et al. (2006) finding that in 2003 over 50 per cent of S&P 500 firms report a pro forma measure.

### ***2.1.2. Research Objective and Questions***

The primary objective of this research is to contribute to the existing literature on the value relevance of pro forma earnings relative to other earnings measures. This is done by empirically examining whether the market impounds information about future pro formas in estimates of price and by comparing the relative value relevance of pro formas to both GAAP earnings and analysts’ actuals. This study uses S&P 500 firms during the period 2000 to 2004 (i.e., five fiscal year ends). This period covers the introduction of significant regulation – Sarbanes Oxley – into the financial reporting environment. The research design uses both a returns model and a price model. The following research questions are explored:

*RQ1: Are pro forma earnings, GAAP earnings, and analysts’ actual earnings informative?*

*RQ2: Are pro forma earnings more value relevant than GAAP earnings and analysts’ actuals?*

The study of earnings measures is important. As earlier mentioned, investors and other market watchers fixate on earnings numbers because they perceive that the numbers provide an important measure of a firm’s current and potential future profitability. This current and future profitability is reflected in stock prices, hence the association between earnings and stock prices first documented in Ball and



Brown (1968). Importantly for this study is that accounting academics have recently argued that GAAP earnings have lost their relevance.<sup>5</sup> For example, Lev and Zarowin (1999) document the declining relation between annual stock returns and contemporaneous annual GAAP earnings. Further, Elliot and Jacobson (1991) and Jenkins (1994) argue that GAAP earnings do not provide useful measures in the new knowledge economy. Gelb and Zarowin (2002) and Lundholm and Myers (2002) among others also document that GAAP earnings appear to have lost relevance, although this may be compensated for by increased disclosure. These latter findings are consistent with a strand of analytical research which argues that, as a result of the poor quality of GAAP earnings and the information asymmetry which exists between managers and shareholders, there is an added incentive to disclose more information (Milgrom, 1981; Verrecchia, 1983).<sup>6</sup> In these settings, the value of the additional information is greater because of the poor quality of GAAP earnings. It is against this backdrop of information asymmetry and the limitations of GAAP earnings that this present study is framed.

In the search for additional information, investors are interested in measures that closely approximate true economic earnings. In this paper one such measure, analysts' actuals, is used. While analysts' forecasts receive significant attention in the literature, analysts' actuals are also important because they form the basis for computing analysts' forecast accuracy (see Kanagaretnam et al. 2005). That is, analysts are not forecasting GAAP earnings, but rather a measure they claim reflects the firm's true economic earnings – analysts' actuals. Also analysts' earnings, unlike pro formas, are substantially independent (of management) and therefore less likely to be managed.

Another means through which additional information is provided is by management reporting pro forma earnings in their earnings press releases. Such reporting, however, has come under fire in recent times. While pro forma earnings is one of the more recent disclosure tools used by managers to supplement mandated

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<sup>5</sup> This decrease in relevance is measured by the adjusted R<sup>2</sup> in a price - earnings regression.

<sup>6</sup> There is an opposing argument which is that firms with good information quality will disclose more (Verrecchia, 1990). In this thesis, my primary interest is in the value relevance of non-GAAP earnings measures relative to GAAP earnings and not with the role voluntary disclosures play in terms of their substitutive or complementary affect.

earnings computed using GAAP, the debate surrounding its use relates to managers' motivation; is it to provide an informative and value relevant measure, or is it to affect perceptions? If it is the former, pro forma earnings may arguably be more value relevant than GAAP earnings (due to GAAP's limitations), and perhaps analysts' actual earnings (as managers may have a better sense of what adjustments to make). If it is the latter (i.e. to affect perceptions or to mislead), pro forma measures may not be value relevant, or may have low value relevance compared to both GAAP and analysts' actual earnings.

### ***2.1.3. Motivation for and Importance of the Research***

This research is motivated by the debate in both the academic literature and the business press between whether the purpose of pro forma earnings is to provide value relevant information or to manage investors' perceptions of firm performance. The majority of business articles suggest that managers disclose pro forma earnings to manage perceptions or to mislead investors (Derby, 2001; Dreiman, 2001; Elstein, 2001). This view is consistent with the findings of Schrand and Walther (2000) that managers are opportunistic in their disclosure decisions – emphasizing metrics that influence stakeholders' perceptions of earnings. Managers, however, counter these claims suggesting that firms disclose pro formas because they provide a complementary or even an improved metric over existing firm performance measures for assessing future cash flows and firm value (Bray 2001 and Weil, 2001). Relatedly, while some previous studies (Bradshaw and Sloan, 2002; Bhattacharya et al. 2003; Brown and Sivakumar, 2003) provide evidence that pro forma earnings are more value relevant than are GAAP earnings, this evidence, based on various data limitations, is not conclusive. As Berger states (2005, 968), "... none of the prior papers seem able to provide convincing evidence on the key issue of whether pro forma earnings are used to mislead or inform." This research is therefore also motivated by this inconclusive evidence.

Investigating the value relevance of pro forma earnings is important because it adds to the normative debate regarding the appropriate regulation of firm's voluntary disclosures. It is also important because the valuation effects of pro forma

earnings are to date largely unknown. If pro forma earnings enable market participants to form more accurate expectations of future performance (i.e., are better reflected in price) than does GAAP earnings or analysts' actual earnings, then pro forma measures may be useful for resource allocation decisions. However, prior studies have not examined the importance of pro forma disclosure in terms of its affect on the amount of information it provides about future fundamentals as reflected in stock prices.<sup>7</sup> In this regard, this paper presents a new approach to studying the informativeness and value relevance of earnings measures. It is also one of the few studies which compares GAAP earnings, analysts' actuals and pro forma earnings. Finally, the study is important because it examines whether the value relevance of pro forma earnings has changed in the pre- and post-SOX period.

#### ***2.1.4. Research Design***

Prior studies that seek to measure value relevance do so by relating a firms' performance, however measured, to its stock price. This method requires that researchers make assumptions about market expectations of future levels of the performance measures even though little is known about the time series properties of the measures. As such, lags of varying orders are used even when there is no theoretical justification (Lorek et al., 1993; Schaefer and Willinger, 1993). This study contributes to the literature by shedding new light on this information versus distortion debate. The value relevance of pro formas is assessed in this study through both a returns model and a price model.

With regards to the returns approach, an important contribution of this study is to use the Collins et al. (1994) model which investigates the association between current stock returns and future earnings. This model employs an alternative approach to assess the informativeness of earnings measures by examining the market's ability to predict future earnings based on the expectations of the future earnings embedded in prices. Thus, price is used to infer a characterization of the

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<sup>7</sup> Lougee and Marquardt (2004) examine the predictive power of pro forma earnings for year ahead returns, however, they use the expenses excluded from GAAP as their independent variable and not actual pro forma earnings. In addition, their use of a long window provides the possibility that their findings are due to other events that occurred between the measurement of the pro forma earnings and the measurement of the returns. Also the small sample size may be a factor for their results.

earnings generating process. This enables statements to be made about the relationship between earnings and returns without making assumptions about investors' expectations of future earnings. This association is identified in the prior literature as the future earnings response coefficient (FERC), and is based on the maintained assumption of efficient markets. Essentially, this approach suggests that prices impound information regarding both current and future expected earnings. If managers use their discretion to communicate a pro forma assessment of current and sustainable future performance, and prices are found to reflect information regarding the future pro formas, then pro forma earnings are informative. However if managers use pro formas to manage perceptions – and thus distort reported earnings – then future pro formas will be found to only add noise. The returns model is used to compare the relative explanatory power of pro forma, GAAP and analysts' actuals.<sup>8</sup> These “relative” comparisons include both the Akaike Information Criterion (AIC) and a comparison of adjusted R squares, achieved using both the Biddle et al. (1995)  $\chi^2$  test and the Vuong (1989) test.<sup>9</sup>

To complement the returns approach, this study also addresses the two research questions using a price model. This model expresses stock price as a linear function of the variables of interest, being the three different earnings measures. While the returns models used earlier is less subject to econometric problems such as scale effects, the price model yields less biased coefficients (Kothari and Zimmerman, 1995). Therefore this second approach – the price model – is used to strengthen the evidence.

In terms of research design, this study is related to two recent papers on the value relevance of pro forma earnings. Bhattacharya et al. (2003) find that both pro forma and analyst's actual earnings are more value relevant than GAAP earnings, while analysts' actual earnings are also more value relevant than pro forma earnings. Lougee and Marquardt (2004) meanwhile find that pro forma earnings have greater

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<sup>8</sup> According to Biddle et al. (1995) relative comparisons ask which measure has greater information content and apply when making mutually exclusive choices or when a ranking by information content is desired. Incremental information content on the other hand, is desirable when one measure is viewed as given and the additional information content provided by a second measure is being examined.

<sup>9</sup> Refer footnote 30.

relative information over GAAP earnings. Both studies, however, differ from this study in that they examine the relation between returns and *contemporaneous* accounting information. Examining the relation between returns and contemporaneous earnings is prone to such confounding factors as risk and the persistence of earnings rather than the informativeness about the future. Also, using year ahead returns, as in Lougee and Marquardt (2004), to examine value relevance provides a wide window within which these confounding factors could possibly affect the findings. Lastly, and as noted in Bradshaw and Sloan (2002), the use of I/B/E/S forecasts as the earnings expectation for all three measures (as in Bhattacharya et al., 2003) limits the conclusions that can be drawn from the study because the forecast of GAAP and pro forma earnings are likely to differ from those of “street” earnings.

This study also differs from the Bhattacharya et al. (2003) and the Lougee and Marquardt (2004) studies by using actual bottom line GAAP net income, and not diluted operating earnings (used in Bhattacharya et al.; 2003) or earnings before extraordinary items (used in Lougee and Marquardt, 2004). This feature of this study consequently allows three *bottom line* earnings measures to be compared: *bottom line* according to accountants - GAAP; *bottom line* according to analysts – analysts’ actuals; and the *bottom line* according to managers’ - pro forma.<sup>10</sup>

Two final points are important to note in terms of this study’s design. First, although managers’ discretion in terms of measuring (and reporting) earnings is examined, this study differs from prior studies on traditional (within GAAP) earnings management, (see the reviews in Healy and Wahlen, 2000; Tucker and Zarowin, 2006; Subramanyam, 1996; and Hunt et al. 2000). That is, while the traditional earnings management literature focuses on managers’ discretion within accounting regulation, this study focuses on managers’ discretion outside of regulation.<sup>11</sup> I consequently examine the informativeness of pro forma earnings prepared under managers’ full discretion.<sup>12</sup>

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<sup>10</sup> I also performed series of sensitivity tests (untabulated) using operating earnings and earnings before extraordinary items (sub-bottomline numbers) and find consistent results.

<sup>11</sup> Focusing on managers’ discretion within accounting regulation requires researchers to make estimates of what discretionary accruals will be and to back these out in order to get an estimate of

Second, the fact that differences exist between GAAP earnings and both managers' pro formas and analysts' actual earnings may be reasonably well understood. In contrast, the existence of differences between pro formas and analysts' actuals are not obvious. Indeed, these two non-GAAP earnings measures may differ in significant respects; furthermore, it is these differences that could lead to differences in value relevance of the measures. As noted earlier, one of the differences between pro forma earnings and analysts' actual earnings is that while pro formas are internally generated by managers, analysts' actuals are external measures. Managers are presumed to have more information about the operation and profitability of their business (e.g., market size and share, cost structure, profit margins, etc.), than would external monitors.<sup>13</sup> However, while they may be capable of providing information that is more value relevant, it is unclear that they will do so. Also, while pro forma earnings are prepared by management and are firm specific, analysts' actual earnings are more mechanistic (that is based on a set of pre-determined heuristics). As a result, important firm variations necessary for computing firm specific adjusted earnings (pro formas) may not be incorporated into analysts' actuals.

### ***2.1.5 Findings and Implications***

#### *Findings on RQ1*

The study finds that pro forma earnings are informative both in terms of being statistically significant and economically meaningful. The Future Earnings Response Coefficient (FERC) of pro forma earnings is positive and statistically significant. This result is robust to controlling for firm characteristics such as size, growth, timeliness of earnings, earnings variability and loss. The results also hold

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the extent of earnings smoothing or earnings management. This approach is subject to measurement error.

<sup>12</sup> Even though the SEC has stated rules governing the disclosure of pro forma earnings, these rules govern the format of presentation and the requirement for a reconciliation and not the manner in which the measure should be computed.

<sup>13</sup> Prior research documents that analysts whose earnings models are guided by management in the pre Regulation Fair Disclosure (FD) regime made more accurate forecasts than those analysts that weren't (Lim, 2001; Hutton, 2005). This suggests that managers do have information that is pertinent to predicting future performance.

when firms are partitioned by the nature of their pro forma earnings (i.e., when pro forma is greater than GAAP, when GAAP is greater than pro forma, and when firms are partitioned into pre and post-SOX periods). GAAP and analysts' actual earnings were also statistically significant in almost all tests – suggesting that GAAP has not fully lost its relevance.

### *Findings on RQ2*

With respect to the relative explanatory power, pro forma earnings models were consistently the most value relevant. In almost all cases the value relevance ordering was the same: Pro forma being more value relevant than analysts' actuals which in turn were more value relevant than GAAP earnings. These differences tended to be statistically significant, as well as economically meaningful.

I find that the future earnings response coefficients (FERC) for the pro forma earnings model has the largest adjusted R-squared and is a better model as evidenced by the Akaike Information Criterion (AIC). The Biddle et al.  $\chi^2$  test and the Vuong test also lead to the same conclusion. Pro forma earnings measures are also better than both GAAP earnings and analysts' actuals at predicting future cash flows. The only inconsistent finding arises when firms are partitioned into pre and post-SOX periods. In the post-SOX period, analysts' actuals are more value relevant than are pro forma (although pro forma continues to outperform GAAP earnings). This may indicate that the restrictions imposed under SOX have lessened the relative informativeness of pro forma. Taken together these findings suggest that pro forma earnings are, in aggregate, disclosed for value relevant reasons. Also, even though the number of firms disclosing pro formas in the post SOX period declines, the informativeness of pro forma earnings does not decline in the post SOX period.

This study has several implications. First, managers appear to provide voluntary disclosures of pro forma earnings for reasons of informativeness and not to mislead investors. That these measures are more value relevant than are analysts' actuals and GAAP earnings is consistent with managers having a better understanding of the firm's operations, and disclosing this private value relevant information in their pro formas. Second, the findings lend support to the decision by

regulators not to proscribe the reporting of pro formas but rather to suggest methods of disclosure that will limit their use in a manner that could be misleading. Lastly, for academics, this study suggests an alternative approach to examining value relevance. It addresses some of the limitations of prior studies on the value relevance of pro formas and confirms some of the findings of earlier studies. It also provides an interesting area for research which is to examine the shift in the information environment surrounding the SOX Act wherein analysts' actuals are found to be more value relevant than pro forma earnings and GAAP earnings.

### ***2.1.6 Organization of the Chapter***

The rest of this chapter is organized as follows. Section two reviews the prior literature on the motivations and effects of pro forma earnings. This review includes a discussion of the disclosure research and the value relevance literature followed by a review of the empirical pro forma research. Section three presents the research design and the data selection method. In section four, the results of the research are presented as well as comparisons to prior empirical pro forma research findings. This section also presents the sensitivity tests. Section five concludes the chapter by describing the contributions of the study's findings and also includes the study's limitations and suggestions for future research.



## ***2.2. LITERATURE REVIEW***

This study's research questions focus on the value relevance of pro forma earnings, a measure disclosed by management on a voluntary basis. The literature review consequently begins with the theoretical disclosure research that helps understand and predict manager's voluntary disclosure actions. Next, it reviews some empirical research on the general theme of voluntary disclosure. It then provides a brief overview of the value relevance literature. This is followed by a discussion of the competing motives ascribed for pro forma disclosure: value relevance or managing expectations. Finally, the empirical research examining pro forma earnings is presented. From the review, gaps in the pro forma literature are identified. These gaps motivate the questions this empirical study intends to address.

### ***2.2.1. Theoretical Disclosure Research***<sup>14</sup>

Shareholder value can be enhanced where value relevant information is disclosed. This is easiest seen in models of unconditional disclosure. Diamond (1985) provides a general equilibrium model whereby a firm with a policy to pre-commit to disclose all relevant information makes all shareholders better off than a corresponding policy that precludes disclosure. Thus, by reducing or eliminating incentives for investors to become privately informed at some cost, costless public disclosure makes investors better off despite adverse risk sharing effects. Along the same lines of welfare improvements, Diamond and Verrecchia (1981) argue that voluntary disclosures should lower information asymmetry and consequently the cost of capital.

But what is the incentive for a manager to disclose? A manager's decision to voluntarily disclose information is influenced by how external parties without access to the information interpret its absence (Verrecchia, 1990). Information asymmetry between firm insiders and external parties (e.g., investors) creates a demand for

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<sup>14</sup> In this review, there is no distinction made between theoretical research that provides explanations/predictions of managers' behaviour (referred to as discretionary-based disclosure research) and that focusing on which disclosure arrangements are preferred unconditionally (i.e., given no knowledge of the information), referred to as efficiency-based disclosure in Verrecchia, (2001).

additional disclosure and provides firms an incentive to disclose (Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981; and Verrecchia, 1983 and 2001). This incentive relates to adverse selection. That is, in the absence of information disclosure by a firm, a rational investor will interpret this withheld information as unfavourable news and consequently discount the value of the firm.

Dye (1985) argues that managers have a greater incentive to disclose non-proprietary information when the information is value relevant to investors. Thus, if publicly available mandated disclosure (e.g., GAAP earnings) is of poor quality and there exists private information of higher quality, managers have a greater incentive to disclose the higher quality non-proprietary information that is value relevant.

But what are managements' incentives to disclose where the information is proprietary? Notable studies on this subject include Verrecchia (1983), Jovanovic (1982) and Lanen and Verrecchia (1987) who suggest that the threshold level of disclosure occurs at the level where managers can equate the costs of disclosure – in terms of revealing proprietary information – with the benefits of increased disclosure. In this model, information is withheld even though rational investors have expectations about its content – (i.e., that they assume unfavourable information).

In summary, the theoretical disclosure literature has two findings salient to this study: Firms will disclose value relevant non-proprietary information, and second, that a manager will disclose proprietary information if the benefits to the disclosure outweigh the costs. These findings help provide a frame for this dissertation which examines the voluntary disclosure of pro forma earnings.

### ***2.2.2. Empirical Disclosure Research***

Empirical disclosure research includes a large and growing literature that uses secondary or archival data to examine various aspects of a firm's voluntary disclosure.<sup>15</sup> Corporate disclosure is critical for the efficient functioning of capital markets. Both mandated (regulated) and voluntary disclosure are provided. In addition to this information, financial information intermediaries including financial

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<sup>15</sup> Verrecchia (2001) refers to these as association-based disclosure studies.

analysts, industry experts and members of the business press also provide information about a firm.

This information, which includes earnings information, is important for investors' resource allocation decisions. According to Dye (1985), managers have a greater incentive to disclose private information when mandated information is of low quality. Consistent with this, Chen et al. (2002) provide evidence that firms which report relatively less informative earnings are more likely to provide voluntary balance sheet disclosures. Tasker (1998) finds that firms with low quality reported earnings are more likely to hold quarterly conference calls. This suggests that additional information is provided to offset information deficiencies in the low quality mandated earnings.<sup>16</sup>

Healy et al. (1999) find that firms that expand disclosure experience significant increases in contemporaneous stock prices, and that these increases are unrelated to current performance. Similarly Gelb and Zarowin (2000) find that firms with high (low) disclosure ratings have high (low) stock price associations with both contemporaneous and future earnings. Bloomfield and Libby (1996) also report a stronger market reaction to information that is made widely available – for example to analysts – than to signals that are made available to a few investors.

Overall, these empirical findings suggest that managers have an incentive to voluntarily disclose when mandated information is of low quality, and that these disclosure strategies can affect stock prices. These studies consequently provide the basis to argue that mandated GAAP measures (including GAAP earnings) may not be sufficient, and need to be supplemented by non-GAAP measures. Further, these non-GAAP measures may be more effective if they are widely disseminated. The next section provides a brief discussion of the value relevance literature.

### **2.2.3. Value Relevance Literature**

Ball and Brown (1968) set the stage for subsequent studies which examine the association between accounting information, including earnings, and stock price.

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<sup>16</sup> However, Frankel, Johnson, and Skinner (1999) find that less profitable firms hold fewer conference calls. This is consistent with the theoretical disclosure that argues that lower information quality firms will provide less expansive disclosure.

Such “value relevance” studies form a substantial portion of contemporary accounting research. Topics examined include the value relevance of information revealed in new accounting standards (Ayers, 1998 and Barth 1994), in cash flows from operations (Barth et al., 1999), in research and development costs (Lev and Sougiannis, 1996), and in patents (Griliches, 1990).

In this study, similar to Vincent (1999) and Harris et al., (1994), relative association tests are performed. Relative value relevance is assessed by comparing the adjusted R<sup>2</sup>s between models that regress earnings measures against earnings (or price).

#### ***2.2.4. Motivations for Pro Forma Disclosure***

The quarterly earnings press release which managers are required to provide has become an avenue for managers to disclose not only earnings measures prepared in accordance with GAAP, but also pro forma measures. Managers often emphasize these pro forma measures in their quarterly earnings press releases with limited mention of the GAAP earnings. However, this trend has moderated with the introduction of the Sarbanes-Oxley Act in 2002 and subsequent SEC regulations aimed at controlling the disclosure of non-GAAP measures (Entwistle et al. 2006). Nevertheless, recent studies show that pro forma earnings are still being reported by managers in a large number of firms (Entwistle et al. 2006; Heflin and Hsu, 2005), fuelling continuing debate as to why these measures are provided.

In the academic literature and in the business press, there are two main reasons offered as to why managers report pro forma earnings – the provision of value relevant information (to inform) and for strategic reasons (such as to mislead investors). The first reason, advanced by managers and other proponents of pro forma, suggests that managers want to reduce information asymmetry by providing value relevant information to investors. For example managers may use pro forma to separate items in GAAP earnings between those which are transitory and/or non cash from those of a more permanent nature.<sup>17</sup> Proponents of pro forma argue that

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<sup>17</sup>Transitory items include special or one-time items such as restructuring charges or significant write downs of assets. Items which are non-cash can include depreciation and amortization expense. Each

removing these transitory items provides more value relevant information through reducing noise in the earnings measure (Bray, 2001). According to former SEC chairman Harvey Pitt, the increasing trend of pro forma disclosure may be partly driven by a legitimate desire by corporate executives to focus on areas that management thinks are important (Pitt, 2001). Academic studies that support the value relevance argument for pro forma earnings include Doyle et al. (2003), Brown and Sivakumar (2003), and Bradshaw and Sloan (2002).

Members of the financial press and regulators are, however, skeptical. They argue that pro forma earnings are provided for strategic reasons such as to mislead investors into believing that a firm's performance is better than it actually is. To this end, the financial press raised a number of red flags when the use of pro forma disclosure was increasing. The Wall Street Journal (WSJ) published articles, including: "Companies Pollute Earnings" (August 21, 2001) and "Pro forma Profits don't Impress Pros" (November 21, 2005). In these articles, the WSJ strongly criticized the use of pro forma measures by managers. Regulators echoed the same concerns. Lynn Turner, former Chief Accountant of the SEC, nicknamed pro forma "Earnings before the bad stuff" – or EBS (Turner, 2001). Also, in a cautionary release, the SEC stated "... We wish to caution public companies on their use of this 'pro forma' financial information and to alert investors to the potential dangers of such information" (SEC 2001). The release further warns managers about the importance of clearly describing the basis for calculating the pro forma and applying this basis uniformly across comparable periods. It further suggests that omitted expenses may constitute a material omission if by their omission a GAAP loss is recast as a pro forma profit. Despite this warning, the SEC did concede that such information can serve useful purposes if used properly and that "...companies may quite appropriately wish to focus investors' attention on critical issues..." (SEC, 2001). Academic studies that have found that managers use

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of these items is then adjusted from GAAP to arrive at pro forma earnings. The new SOX regulation requires that managers provide a quantitative reconciliation of their pro forma number to the comparable GAAP earnings. This is aimed at reducing the potential for the pro forma measure to mislead investors.

this disclosure strategy to hide the firm's true economic performance include Doyle et al. (2003), Schrand and Walther (2000), Degeorge et al. (1999).

### ***2.2.5. Empirical Pro Forma Research<sup>18</sup>***

#### ***2.2.5.1. Research Using Pro Forma Proxies***

These two competing motives, debated in the financial press and amongst regulators, have been a focus of several academic studies. A first group of studies use proxies for pro forma, with the inherent limitation that managers' intent is absent. Bradshaw and Sloan (2002) investigate two alternative definitions of accounting earnings: earnings computed under GAAP, and a modified Street version of accounting earnings that excludes various items recorded under GAAP (their proxy for pro forma).<sup>19</sup> For the period 1986 to 1997, they document a marked increase in the exclusion of significant expenses from the earnings reported by analyst tracking services, and a corresponding increase in firms specifically identifying large portions of their expenses as nonrecurring. Bradshaw and Sloan's findings suggest that firms and analysts have successfully refocused investor attention to modified versions of GAAP earnings, overlooking large amounts of expenses that are recorded under GAAP. Similar to Bradshaw and Sloan (2002), Brown and Sivakumar (2003) use data during 1989 to 1997 to compare the quality of three different quarterly earnings measures: two accounting measures found in required financial reports (10-Q and 10-K), these being EPS from operations and EPS before extraordinary items and discontinued operations, and one based on Street numbers. They find higher quality for street numbers in terms of predictive ability, value relevance and information content, than either EPS from operations or EPS before extraordinary items and discontinued operations. Doyle et al. (2003) investigate the informational properties of expenses excluded in determining pro forma earnings. They find that the excluded expenses are important in predicting future cash flows, although investors may not fully appreciate this at the time of the earnings announcement.

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<sup>18</sup> Details of these studies are provided in the appendix.

<sup>19</sup> Street earnings refer to analysts' actual earnings.

It is important to note, however, that the above studies use I/B/E/S analysts' actual earnings as a proxy for pro forma earnings. They do not use actual pro forma earnings as reported by management in their earnings press releases, which may differ from the I/B/E/S amounts.<sup>20</sup> Hence, while the authors find that pro formas are of higher quality than GAAP measures (i.e., are more value relevant), they do not make this determination based on examining actual managers' pro forma disclosure. As managers are not reporting analysts' actuals, there is no incentive to mislead. That is, one cannot test between managerial motives – to inform or to mislead – when the motive to mislead is incongruent with the proxy.

#### **2.2.5.2. Research Using Actual Pro Forma Earnings**

Other studies have analyzed actual pro forma releases. One such study, Bhattacharya et al. (2003) examines 1,149 earnings press releases from 1998 to 2000. Using short-window abnormal returns and revisions in analysts' one-quarter-ahead earnings forecasts, they find that manager's pro forma measures are viewed as more informative and permanent than GAAP earnings. Their findings suggest that market participants believe pro forma earnings are more representative of "core earnings" than are GAAP operating income. However, they do note that this finding is limited by the fact that they calculate forecast errors for all three measures based on earnings forecasts made by analysts. As there are no separate expectations used for future pro forma or future GAAP earnings, this approach is subject to measurement error which biases the results in favour of analysts' actual earnings.

Using a sample of 249 press releases from 1997 to 1999, Lougee and Marquardt (2004) find that manager's pro forma earnings have greater relative and incremental information content than GAAP earnings. However, this result only

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<sup>20</sup> Bhattacharya et al. (2003) in their study find that the differences in means between  $EPS_{IBES}$  and  $EPS_{PRO\ FORMA}$  (taken from actual press releases) are significant. However, Bradshaw (2003), in commenting on Bhattacharya et al. (2003), concedes that while the differences in means between  $EPS_{IBES}$  and  $EPS_{PRO\ FORMA}$  are significant, this difference appears to be driven by the tails of the distributions because other measures of the distribution such as median difference is zero. As such, to a certain extent, overall it remains an open question whether  $EPS_{IBES} = EPS_{PRO\ FORMA}$ . In this study, I find that  $EPS_{IBES} \neq EPS_{PRO\ FORMA}$ . In addition, my findings are robust to winsorizing the data to plus or minus 3 s.d. from the mean.

holds when GAAP earnings quality is low, and when strategic considerations are absent (as measured by the direction of the earnings surprise).<sup>21</sup> Their assessment of information content is based on the earnings measure's predictive ability for future operating performance and its association with contemporaneous returns.<sup>22</sup>

Johnson and Schwartz (2005) use a market multiples approach to examine 433 firms that disclosed pro forma measures in their earnings press releases in the period June to August, 2000. This approach is used to determine if investors assign a higher multiple to pro forma firms than to other firms. They find that while pro forma firms appear to have traded at a market premium during their sample period, the magnitude of this premium is unrelated to characteristics of pro forma disclosures. Collectively, their results suggest that investors are not misled by pro forma earnings disclosures and that pro forma measures are value relevant. Of note here is that Johnson and Schwartz examine the effect of pro forma on sophisticated investors (i.e., the overall market). As a result, their results may not capture the differential effects of pro forma disclosures on less-sophisticated or smaller investors, as is suggested in the experiment by Frederickson and Miller (2002). To capture the effects of pro forma on unsophisticated investors, Bhattacharya et al. (2006) examine trading by small, and presumably less-sophisticated, investors. They find that trading by less-sophisticated investors around pro forma earnings release dates explains more of the variation in contemporaneous abnormal returns than does trading by large and sophisticated investors, suggesting that unsophisticated investors may be differentially affected by pro forma earnings.

#### ***2.2.6. Conclusions and Implication from the Literature Review***

The empirical pro forma literature has to date been unable to provide conclusive evidence on either the value relevance of pro forma earnings or the motivations behind its disclosure. That the findings are not conclusive may also arise from design limitations of the prior studies including their use of pro forma

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<sup>21</sup> Earnings quality, a measure of value relevance, is measured by the earnings-return correlation and its related  $R^2$ . Earnings surprise is measured as the change (positive or negative) in earnings.

<sup>22</sup> In their test of predictive ability the authors use expenses excluded from GAAP (special items) in the determination of pro forma, rather than actual pro forma earnings.



proxies in place of actual pro forma earnings disclosed by managers, and the empirical models employed that introduce bias. These two limitations are addressed in this study. First, rather than using a proxy (e.g., an I/B/E/S or COMPUSTAT measure), actual pro forma measures reported by firms are hand collected from their earnings press releases. Second, a returns model is used for measuring value relevance that uses actual rather than estimated future earnings, thereby avoiding the problem of an appropriate proxy for future earnings. The next section presents the research design.

### **2.3. RESEARCH DESIGN**

In this section, a detailed description of the research design is presented. First, the returns model is introduced. This is the primary empirical model used to examine both research questions. This is followed by a discussion of the control variables used in the study. Next, the price model is described. A cash flow prediction test and a test examining the introduction of SOX are then presented. This section also presents information on the sample selection procedure and the measurement of variables. Lastly, some summary statistics and correlations are provided.

#### **2.3.1. Returns Model**

In this model, informativeness relates to the amount of information about *future* earnings which is impounded in stock returns. This econometric approach examines which earnings measure best characterizes the Ohlson (1995) theoretical clean surplus relationship.<sup>23</sup> Specifically, the Collins et al.'s (1994) model is used. This model assumes that revisions in expected dividends are correlated with revisions in expected earnings. Consequently, current stock returns are a function of the current period's unexpected earnings and changes in expected future earnings. If non-GAAP earnings – either analysts' actuals or pro forma earnings – provide value relevant information about the recurring earnings of a firm, then this information will enable the market to better forecast future performance. If on the other hand, non-GAAP earnings introduce noise, then investors are unable to accurately forecast future performance. This study therefore examines whether current stock returns are more highly correlated with future GAAP, future analysts' actuals, or future pro formas.

Following Collins et al. (1994), the annual stock return is characterized as the sum of three components: the unexpected earnings for the period; the change in

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<sup>23</sup> To gain a full understanding of this characterization, refer to Ohlson (1995). By way of illustration, consider a firm with a two year life cycle, a discount rate of zero, and zero distribution of capital. Denote book value by  $BV$  and earnings by  $X$ . From this, price at time 0 and time 1, under the clean surplus relation, can be expressed as  $P_0 = BV_0 + E_0(X_1) + E_0(X_2)$  and  $P_1 = BV_1 + E_1(X_2)$ . We can substitute  $BV_0 + X_1$  for  $BV_1$ . This yields:  $P_1 = BV_0 + X_1 + E_1(X_2)$ . With this we can calculate return as  $P_1 - P_0 = BV_0 + X_1 + E_1(X_2) - BV_0 - E_0(X_1) - E_0(X_2)$  or  $R = UX_1 + \Delta E_1(X_2)$

expectations between time  $t-1$  and time  $t$  about future earnings in year  $t+1$ ; and random noise unrelated to current or future earnings. Unexpected earnings for each of the three earnings measures are defined as the annual earnings less the prior period's expectation. Mathematically this characterization is expressed as follows (ignoring firm subscripts):

$$R_t = \alpha_0 + \alpha_1 UX_t + \sum_{i=1}^{\infty} \alpha_{2i} \Delta E_t(X_{t+i}) + \varepsilon_t \quad (2.1)$$

where:

$R_t$  = annual stock return;

$UX_t$  = unexpected earnings (GAAP, analysts' actuals, or pro forma) for the period;

$\Delta E_t(X_{t+i})$  = change in expectations between time  $t-1$  and time  $t$  about future earnings in year  $t+i$ ; and

$\varepsilon_t$  = random noise.

As in Collins et al. (1994), the regression coefficients  $\alpha_1$  and  $\alpha_2$  in equation (2.1) allow for other factors such as time value, risk and the precision of the proxies used to measure unexpected current earnings and changes in expected earnings. Because the independent variables in (2.1) are unobservable, Collins et al. (1994) proxy for current unexpected earnings and changes in expected future earnings by using observed current change in earnings and changes in reported future earnings, respectively. This results in a regression of current annual stock returns  $R_t$ , on current and future annual earnings changes (ignoring firm subscripts and limiting to one year):

$$R_t = \alpha_0 + \beta_1 \Delta E_t + \beta_2 \Delta E_{t+1} + U_t \quad (2.2)$$

In the regression the earnings variables are in per-share form and scaled by share price at the beginning of the current year (Christie, 1987), and the stock returns are total annual stock returns (measured over the period from nine months prior to fiscal year end to three months after fiscal year end).<sup>24</sup>

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<sup>24</sup> A short returns window – three days after the earnings announcement – is also examined.

Using earnings changes as explanatory variables assumes that earnings follow a random walk. Rather than impose this limitation, Lundholm and Myers (2002) suggest estimating the levels form of the regression.<sup>25</sup> Also they include prior year's earnings in order to allow the regression to find the best representation of the prior expectation for current earnings. Thus the model is expressed as follows:<sup>26,27</sup>

$$R_{i,t} = \alpha + b_0 E_{i,t-1} + b_1 E_{i,t} + b_2 E_{i,t+1} + U_{i,t} \quad (2.3)$$

In equation (2.3),  $b_2$  is the future earnings response coefficient which in this study is the coefficient of interest – it is expected to be positive. Consistent with prior literature, it is also expected that the coefficient on  $E_{t-1}$  will be negative while the coefficient on  $E_t$  will be positive. This simply reflects the mean-reverting nature of earnings information. A regression is estimated for each of the three earnings measures.

It may be argued that analysts' actual earnings should be more value relevant than GAAP earnings as its purpose is to provide a measure of economic or core earnings. In contrast, the potential dual motive in disclosing pro forma – to provide value relevant information or to mislead – may lead to firms providing pro forma measures which are more or less value relevant than analysts' actuals and GAAP-based earnings. If the primary purpose of reporting pro forma by management is to provide value relevant information, this measure may be more value relevant than analysts' actuals as management arguably has a greater sense as to which adjustments to GAAP better reflect sustainable earnings for the firm. This argument is consistent with Hutton (2005) who found that analysts whose earnings models are reviewed by management provide more accurate forecasts. If managers are using pro forma to inform, we therefore would expect that pro forma would be more

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<sup>25</sup> I perform a unit root test to examine the data for stationarity prior to estimating the regressions and the results suggest stationarity of the data.

<sup>26</sup> The value relevance literature has also used only current and past earnings as its proxy for  $UX_t$ . See for example, Francis and Shipper (1999) and Lev and Zarowin (1999).

<sup>27</sup> The tables report undeflated results in order to remain close to the measure of interest (EPS). However, as earlier mentioned, I deflate the EPS numbers by price at time t-1 (Christie, 1987). My results remain substantively similar. The explanatory power of the price model and the coefficient on book value of the deflated model are closer to levels reported in prior studies that deflate the earnings measures.

informative than analysts' actuals, which in turn would be more informative than GAAP earnings. Alternatively, if managers are using pro forma to manage expectations or mislead, one may expect that pro forma will be less informative than analysts' actuals, and may be less informative than GAAP earnings.

The proxy for changes in expected future earnings,  $E_t(E_{t+i})$  is central to the the model and since this proxy is unobservable, Beaver et al. (1980) and Warfield and Wild (1992) use actual future earnings. However, actual future earnings has both expected and unexpected components. Therefore, this proxy contains measurement error and introduces an error-in-variable bias in the estimation of the future earnings response coefficient. Collins et al. (1994) control for this measurement error by introducing future returns into the model to control for the unexpected component of future earnings.<sup>28</sup>

$$R_{i,t} = \alpha + b_0 E_{i,t-1} + b_1 E_{i,t} + b_2 E_{i,t+1} + b_3 R_{t+1} + U_{i,t} \quad (2.4)$$

Collins et al. further state that the hypothesized coefficient on  $R_{t+1}$  is negative because  $R_{t+1}$  is correlated with the unexpected component of  $E_{t+1}$ . In order to maximize the  $R^2$  of the returns-earnings model, Collins et al. include three future years of earnings and returns in their regression aimed at improving the explanatory power of earnings. However, the goal of this study is to test the ordering of the explanatory power of the three regression models. Hence, the key implication of Collins et al.'s results for the test in this study is that the association between current returns and future returns is correctly measured. Since the maximization of the R-squares is not part of the objective of the tests, and also as a result of data constraints, only future earnings for one year is used in the regression. Also according to Ettredge et al. (2005) using a one year horizon is consistent with analysts who focus on year ahead earnings. This test then provides the basis to answer the first research question.

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<sup>28</sup> Lundholm and Myers (2002) provide an explanation for this. The idea being that an unexpected shock to future earnings is measurement error when using the actual future earnings to proxy for the expected future earnings. According to them, this unexpected shock will generate future returns therefore introducing future returns into the model corrects for the unexpected component in future returns.

To answer the research questions, I focus on both the standardized future earnings response coefficients in each of the three regressions and the magnitude of the adjusted R-squares. The standardized coefficients are examined because in a simple ordinary least squares (OLS) estimation, the researcher is unable to conclude that the independent variable with the largest coefficient has the greatest explanatory power for the dependent variable. This is because the magnitude of the coefficients is sensitive to the units used to measure the independent variables.<sup>29</sup> While the standardized estimated coefficients cannot be statistically compared across the models, it is possible to comment on the size of the coefficients in each of the regression models since the units are standardized. This provides an indication of the informativeness of each of the earnings measures and specifically, the pro forma measure. Also, by comparing the explanatory power of the models – as is commonly done in the value relevance literature – the relative value relevance of one measure over the other is examined. This comparison is performed using the AIC and both the Biddle et al. (1995)  $\chi^2$  test and the Vuong (1989) test. The measure that enables the market to better predict future earnings (however defined), and that in which its regression model has the greatest adjusted R-square, is considered the most value relevant earnings measure.

Note that an important difference between this study and others that have examined the value relevance of earnings is that in this study, the focus is on the future earnings response coefficients between alternative earnings measures. Previous papers have either examined cross sectional variation in the future earnings response coefficient based on certain firm characteristics (for example, Tucker and Zarowin, 2006; Piotroski and Roulstone, 2004) or tested for an intertemporal shift in the earnings response coefficient in response to a mandated accounting change (e.g. Ettredge et al. 2005). Since the informativeness of price for each of the earnings measures is examined, the same firms are used to serve as their own control for other confounding effects that may affect the results.

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<sup>29</sup> Fortunately, even though this does not apply in this case, as the same measure, EPS, is used, I still consider standardized coefficients and coefficients from standardized variables (Woolridge, 2000).

### 2.3.2. Returns Model - Controlling for Firm Characteristics

In addition to price informativeness, the relation between current returns and future earnings depends on both the timeliness and forecastability of earnings. More timely earnings implies a stronger relation to contemporaneous returns and a weaker relation to future earnings. Conversely, returns have a stronger relation to future earnings that are less variable. To ensure that the results are not due to omitted correlated variables, changes in the firms' earnings characteristics and in the firms' information environment are controlled for, as are variables that have been identified in prior literature as proxies for timeliness and forecastability. Following Ettredge et al. (2005) the market-to-book ratio is used to control for growth (*growth*). Lundholm and Myers (2002) use a dummy variable to proxy for earnings persistence (*loss*). This variable equals one if next year's earnings are negative and 0 otherwise. This variable also controls for the differential valuation of loss firms documented in Hayn (1995). To control for timeliness of earnings, similar to Basu (1997) a variable (*current*) is used for the contemporaneous return. This variable is coded one for negative returns and zero otherwise. For earnings uncertainty, a measure of firm level variability (*Var*) is included. This is a relative measure of earnings dispersion calculated by dividing the absolute standard deviation of a company's percentage change in EPS over 20 quarters by the company's average four quarter percentage for 20 quarters. The information environment is controlled for by the size of the firm (*size*). *Size* is measured as the log of market capitalization each year. Equation (2.4) is modified and the following model is estimated:

$$R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + b_4 growth_t + b_5 loss_t + b_6 current_t + b_7 Var_t + b_8 size_t + U_t \quad (2.5)$$

Recall that the coefficient of interest is  $b_2$ , and that the sign is expected to be positive. The expected signs on the control variables are as follows. Since growth firms represented by high M/B ratios tend to have high capitalized future earnings the sign on *growth* is expected to be positive. The expected sign of *loss* is negative since negative earnings are both timelier and less persistent. The expected sign on

*current* is negative because bad news is timelier than good news. The expected sign of *Var* is negative since high variance firms and high variance firms have earnings that are more difficult to forecast. Lastly, the coefficient on *size* is expected to be positive since larger firms have a richer information environment.

### 2.3.3. Price Model – Relative Value Relevance Tests

To provide further evidence on the relative value relevance of pro forma earnings, and following other value relevance studies (Barth et al., 1999), alternative price model tests are performed to examine the robustness of the results. Using a simple earnings capitalization model with price as the dependent variable, the adjusted R-squares for each of the earnings measures is subjected to pair-wise comparisons using both the Biddle et al. (1995)  $\chi^2$  test and the Vuong (1989) test. This approach was adopted by Bhattacharya et al. (2003) and Brown and Sivakumar (2003). Of note is that these previous studies use a proxy for pro forma earnings being an amount obtained from I/B/E/S, which in this study is analysts' actual earnings. These studies do not, therefore, effectively compare GAAP, analysts' actual and pro forma earnings. As analysts' actual earnings is not the same as actual management disclosed pro forma earnings there is a potential for measurement error in their tests. To address these limitations, actual manager disclosed pro forma earnings is used, as well as bottom line GAAP net income.

To compare the value relevance of the three measures ( $E_i$ ) I examine which of the three measures has the highest adjusted  $R^2$  in a simple earnings capitalization regression (Barth et al., 1999). Ignoring firm subscripts, it takes the following form:

$$P_t = \alpha + b_0 E_{it} + U_{it} \quad (2.6)$$

where  $P_t$  represents the market price per share three months after the fiscal year end and  $E_i$  represents each of the three earnings measures. This approach has the advantage of not requiring an event window.

An additional specification is used that includes past year's earnings. This allows the regression to find the best representation of expectation for current earnings (refer Lundholm and Myers, 2002)

$$P_t = \alpha + b_0 E_{i(t-1)} + b_1 E_{it} + U_{it} \quad (2.7)$$



If the coefficient on past earnings is of similar magnitude but opposite in sign to the coefficient on current earnings, this implies that the market treats earnings as if it follows a random walk. If on the other hand, the coefficient on the lagged earnings is approximately zero, then it suggests that the market treats earnings as a white noise process.

### **2.3.6. Cashflow Prediction Model**

I also examine the relationship between the earnings measures and cash flows. Examining cash flows is important because valuation models show that a firm's stock price is the present value of future dividends, which in turn can be expressed as a function of cash flows. Therefore, if pro forma provides more information about future cash flows than other earnings measures, then it is a more value relevant measure. In Equation (2.8) a model that predicts CFO in period t+1 based on information in periods t and t-1 is estimated as follows:

$$CFO_{t+1} = \alpha + b_0 E_{t-1} + b_1 E_t + U_t \quad (2.8)$$

If the earnings measure provides information about future cash flows, then I expect  $b_1$  to be positive. Relative value relevance is assessed by comparing adjusted R-squares of the cash flow prediction tests.

### **2.3.7 Impact of SOX**

In this section, the possibility that the informativeness of the earnings measures may be affected by the implementation of the SOX Act is examined. The SOX Act was signed into law on July 30, 2002. Part of the Act focused on pro forma reporting, ultimately resulting in the SEC introducing regulation aimed at limiting manager's reporting of pro forma earnings for strategic reasons. If the SOX Act limits the ability of managers to report misleading pro forma earnings, then in the post (pre)-SOX period, it is expected that pro forma will (not) be informative. The returns model is reexamined to assess the potential impact of this regulation on the informativeness of the various earnings measures. A dummy variable (*post*) is therefore introduced to proxy for the introduction of the Act, where the years 2001 and 2002 are the pre-SOX period and 2003 and 2004 represent the post-SOX period.

$$R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + b_4 post + b_5 (E_{t-1} * post) + b_6 (E_t * post) + b_7 (E_{t+1} * post) + b_8 (R_{t+1} * post) + U_t \quad (2.9)$$

### ***2.3.8. Sample Selection, Variable Measurement and Data Reliability***

In this section, a detailed description of the sample of firms used in the study is provided along with how each of the variables of interest was measured. Information is also provided regarding the process used to ensure the reliability of the data. Summary statistics and correlation data are also presented.

#### ***2.3.8.1. Sample Selection***

The firms of interest are S&P 500 firms. The sample period begins in 2000 and ends in 2004 covering five successive year ends. As noted previously, an important aspect of this five year period is that it encompasses the period during which new regulation of pro forma reporting – associated with Sarbanes Oxley – was introduced into the financial markets.

As shown in Table 1 Panel A, 1,608 firms were identified as having reported a pro forma earnings measure in their annual earnings press release during the sample period. Similar to prior pro forma studies [e.g., Entwistle et al. (2006), Heflin and Hsu (2005)], a declining incidence over the five year period is found. Panel B shows the distribution of the pro forma firms by industry. While absolute numbers declined over the five year period, the relative percentages across industries were stable over time. Similar to prior studies, pro forma firms are mostly concentrated in the technology and financial services industries. Panel C reports the difference between pro forma and GAAP earnings. It demonstrates that while pro forma earnings tend to consistently exceed GAAP earnings, this difference decreases in the years following the implementation of SOX. That is, while pro forma tends to be income increasing, the magnitude of this difference decreased following SOX.

[Insert Table 1 here]

To be included in subsequent data analysis each of the firms in Table 1 must have reported pro forma earnings for three consecutive years. As noted in Table 2, Panel A this restriction eliminates 680 of the 1,608 firms. Also eliminated were 38 firms with missing CRSP data, 22 firms with missing I/B/E/S analysts' actual earnings, and 311 firms with missing COMPUSTAT data. This leaves a total of 557 firm years in the sample. Table 2, Panel B shows a breakdown of this reduced sample of pro forma firms by industry, while Panel C reports the per share differences. This reduced sample appears to be very similar to the larger set of firms presented in Table 1.

[Insert Table 2 here]

#### ***2.3.8.2 Variable Measurement and Data Reliability***

To determine whether a firm disclosed a pro forma earnings measure in its earnings press release, a full reading of the release was performed.<sup>30</sup> This involved a detailed and time intensive coding process. To be considered a pro forma earnings disclosure, an alternative measure of earnings (to GAAP earnings) for the year has to be provided somewhere in the press release, either specifically in the headline or in the narrative.<sup>31</sup> Second, this alternate measure has to be expressed on a per share basis. This pro forma per share amount is the measure used for the subsequent analysis.<sup>32</sup>

To ensure the reliability of the coding, for each of the five years a significant number of the press releases were independently coded by individuals (graduate students and accounting faculty members) well versed in the coding protocol, and the findings were compared. In only a few cases were different assessments made, and in all these cases a consensus was obtained as to whether a pro forma earnings amount was reported.

The other variables used in this paper are as follows.

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<sup>30</sup> The press releases were primarily obtained from the firms' websites, although in a few cases the firms had to be contacted directly for a copy of the release.

<sup>31</sup> The headline refers to that part of the earnings press release which is usually in bold and offset from the rest of the press release while the narrative is the body of the press release.

<sup>32</sup> Diluted EPS was used for pro forma, GAAP, and analysts' actuals.

### Primary independent variables of interest (in addition to pro forma)

- GAAP earnings per share is obtained from either the earnings press release or from the Compustat database (data item #169).
- Analysts' actual earnings is collected from the I/B/E/S annual data file.

### Dependent variables

- Annual returns is obtained from the CRSP database and is computed three months after the firm's fiscal year end. An alternative time period – one month after – is also computed.
- Price is obtained from the CRSP database. Similar to returns, it is computed three months after the firm's fiscal year end.
- Cashflow from operations for the fiscal year is obtained from Compustat (data item A308).

### Additional independent (control) variables

- Growth at time  $t$ , is proxied by market-to-book ratio. Book value is Compustat data item (#216) while market value is Compustat data items (#25\*#199).
- Loss is proxied by a dummy variable which equals 1 if next year's GAAP earnings are negative and 0 otherwise.

- Current is proxied by a dummy variable coded one for negative contemporaneous return and zero otherwise. Returns are obtained from the CRSP annual database
- Earnings uncertainty is calculated by dividing the absolute standard deviation of a company's percentage change in EPS over 20 quarters by the company's average four quarter percentage for 20 quarters. This is obtained from the Compustat annual data file.
- Size is measured as the natural log of the firm's market capitalization, and is obtained from the Compustat annual data file.

### **2.3.9. Summary Statistics and Correlations**

Table 3 presents descriptive statistics of the primary variables of interest used in the study along with some control variables. Even though the sample is composed of large firms [the S&P 500 - the mean (median) of the natural log of market capitalization is 12.305 (10.3755) which represent \$221 million (\$32 million)], there is substantial variation among the sample of firms as the standard deviation of firm size is 4.044 representing \$57 million. Regarding the performance measures, the mean (median) of the pro forma earnings measures in all three periods,  $t-1$ ,  $t$ , and  $t+1$  are greater than either GAAP or analysts' actual earnings. In period  $t$ , the mean (median) of the GAAP, analysts' actual and pro forma earnings are \$0.89 (\$1.18); \$0.53 (\$0.85) and \$1.75 (\$1.59) respectively. These amounts are consistent with prior studies that have found that pro forma measures tend to be greater than GAAP earnings measures, and that analysts' earnings measures are generally less than GAAP earnings (Matsumoto 2002).

[Insert Table 3 here]

Table 4 presents the Pearson and Spearman correlations between the variables used in the regression. Past, current and future earnings (GAAP, analysts' actual and pro forma) are all positively correlated with each other. In addition, current returns are also positively correlated with all three future performance measures but negatively related with past GAAP and analysts' actual earnings

[Insert Table 4 here]

## **2.4. RESULTS OF EMPIRICAL TESTS**

This section presents the empirical results of this study.

### **2.4.1. Relative Informativeness using Returns**

Table 5, results using returns as the dependent variable, examines the informativeness of future pro forma earnings. The future earnings response coefficient (FERC) for pro forma is 0.10866 (t-statistic = 7.42) which is both positive and statistically significant.<sup>33</sup> This suggests that the market impounds a significant amount of future pro forma earnings in forming expectations about price, and further that pro forma earnings are informative and value relevant. The FERC on analysts' actuals is 0.05861 (t-stat = 5.85) and on GAAP earnings is 0.02847 (t-stat = 4.67). That is, all three earnings measures are positive and statistically significant at the 1% level.

[Insert Table 5 here]

Table 5 also presents the relative informativeness results for the three earnings measures. Relative informativeness is assessed by examining the FERC of the earnings measures, and by examining which earnings measure yields the greatest explanatory power. The future earnings response coefficient for GAAP earnings is 0.02847 (t-stat = 4.67), for analysts' actual earnings is 0.05861 (t-statistic = 5.85), and is highest for pro forma at 0.10866 (t-statistic = 7.42). Since all three measures have the same dependent variables, a comparison of the standardized betas provides an indication of which future earnings response coefficient is greater.<sup>34</sup> Table 5 shows that pro forma has the greatest standardized beta estimate 0.4799 compared to 0.3292 for analysts' actual earnings and 0.2107 for GAAP earnings. The pro forma

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<sup>33</sup> The results reported here are based on pooled regressions with t-statistics based on Newey and West (1987). Adjusted standard errors are used to control for heteroscedasticity and autocorrelation. As a sensitivity, I estimate the regressions for each group of three years i.e. 2000, 2001, 2002 together, 2001, 2002, 2003 together and 2002, 2003, 2004 together. The untabulated results are similar to the reported results.

<sup>34</sup> Note that this is a visual comparison (not statistical) of the magnitude of beta coefficients.

earnings model also has the largest explanatory power with an adjusted  $R^2$  of 12.74% followed by analysts' actual earnings (10.38%) and lastly GAAP earnings (10.15%). According to the Akaike Information Criterion (AIC) the pro forma earnings model is superior to both the analysts' actual and GAAP earnings models. A Biddle et al. (1995)  $\chi^2$  test finds that there is a statistically significant difference between pro forma and the other two earnings models (analysts' actuals and GAAP). However, the difference between analysts' actuals and GAAP is not statistically significant.<sup>35,36,37</sup>

#### ***2.4.2. Relative Informativeness Tests Controlling for Firm Characteristics***

Firm characteristics, especially those that affect the timeliness and forecastability of earnings, could make the stock price impound more (or less) information about future earnings. Hence, omitting these variables could bias the coefficients in the model, including the future earnings coefficient. As a result, I control for various firm characteristics.

[Insert Table 6 here]

Table 6 reports that after controlling for firm characteristics, the market impounds little or no information concerning future GAAP earnings [0.00627 (t-statistic = 1.08)]. In contrast, both future analysts' actual earnings and future pro forma earnings remain significantly impounded in stock price, with future earnings response coefficient of 0.02508 (t-statistic = 2.81) and 0.06592 (t-statistic = 5.20), respectively. The explanatory power of the pro forma earnings model also continues

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<sup>35</sup> The difference between the adjusted  $R^2$  is based on the Biddle et al. (1995)  $\chi^2$  test statistic. The Vuong (1989) statistic yields identical results. Note that in this and subsequent sections of the paper and Tables, where the Biddle et al. test is referred to and reported, the Vuong test is also performed, although not reported. The results of the two tests lead to identical conclusions.

<sup>36</sup> Note that the signs on the contemporaneous and lagged earnings for both analysts' actual and pro forma earnings are negative, while for GAAP earnings it is only negative for lagged earnings. This suggests that the time series properties of analysts' actual earnings and pro forma earnings are distinct from those of GAAP earnings. The implication of this difference is an unexplored area that future research can examine.

<sup>37</sup> In untabulated results, and similar to prior studies, I use earnings before extraordinary items (EBEI) from Compustat as a proxy for GAAP earnings and re-estimate equation (2.4). Results from this test indicate that both pro forma earnings and analysts' actuals are still more informative than GAAP.



to be highest with a best fit model [AIC = -1153.8336] and with greater explanatory power – according to the Biddle test – than both GAAP and analysts’ actual earnings model. However, similar to the base model, there is no statistically significant difference between the GAAP earnings and analysts’ actual earnings models. The sign on the control variables for growth and size are in the opposite direction to that hypothesized in all three of the earnings regressions, with the coefficient on size being statistically significant. This inverse relationship between size and returns could be due to a more complex information environment for large firms and its corresponding higher risk (Lu, 2007). The signs on the coefficient loss and current are all in the predicted direction and statistically significant for all three earnings measures.

#### ***2.4.4. Value Relevance Tests using Price***

To ensure the robustness of the results, alternative tests are performed using price as the dependent variable. First, in Table 7, a simple earnings capitalization model is used.

[Insert Table 7 here]

Consistent with the returns’ tests, the coefficient of each of the earnings measures is positive and statistically significant. Using the Biddle et al. test, the adjusted  $R^2$  for the pro forma earnings regression (27.11%) is significantly greater than either GAAP (15.18%) or analysts’ actual earnings (16.79%). The AIC test also yields similar conclusions.

In Table 8 the model controls for past years’ earnings. Again, the coefficients of all three earnings measures are statistically significant and positive. The adjusted  $R^2$  of the pro forma earnings model (30.52%) is greater than that for analysts’ actual model (26.02%) and GAAP earnings model (19.13%), but the difference between the pro forma model and analysts’ actual model is not statistically significant using the Biddle et al. (1995)  $X^2$  test.

[Insert Table 8 here]

#### **2.4.5. Cashflow Prediction Tests**

Table 9 presents the results of the cash flow prediction tests. Each of the three earnings measures significantly predicts year ahead future cash flows. However, the pro forma model (13.87) significantly outperforms the other two earnings measures (GAAP - 4.39; analysts' actuals - 10.37) in terms of explaining future cash flows. That is, pro forma is not only better at predicting returns and price, but also cash flows. In fact, it has over three times the explanatory power in explaining cash flows than does GAAP earnings ( $R^2$  of 13.87% versus 4.39%).

[Insert Table 9 here]

#### **2.4.6. Tests of the Impact of SOX**

Table 10 presents the results of tests that examine the impact of SOX. These results are presented along the lines of the two research questions being the informativeness of the earnings measures (RQ1) and the relative value relevance of the earnings measures (RQ2). The informativeness of the earnings measures (RQ1) is examined in two ways. First, by using a dummy variable "Post" that represents the period after the implementation of the Act and second by dividing the data set into pre- and post-SOX periods and running the regressions for each period separately. Next, I examine the relative value relevance of the earnings measures (RQ2).

Panel A of Table 10 presents results of the informativeness of the earnings measures using the dummy variable approach. According to the table, the future earnings response coefficient for GAAP earnings is [0.03218 (t-statistic = 4.48)] while the future earnings response coefficient for the interaction between future GAAP and Post is [-0.01128 (t-statistic = -1.15)]. This interaction represents the difference in the overall level of the FERC between the post group and the omitted reference group (i.e., the informativeness of GAAP is 0.1128 smaller than the reference group which is equal to 0.0209). An F-test that the two coefficients [0.03218 and 0.0209] are equal cannot be rejected [F-test = 1.33]. This suggests that

there is no difference in the amount of information about future fundamentals that is impounded in stock returns between the pre and post-SOX periods. Similar to GAAP earnings, the market does not appear to impound any additional information regarding future pro forma in the post-SOX period, compared to the pre-SOX period. The coefficient of future pro forma earnings in the pre-SOX period is 0.08836 (t-statistic = 7.07) while in the post-SOX period the coefficient of future pro forma is 0.07861 [0.08836 - 0.00975]. A test of equality of the two coefficients cannot be rejected. This suggests that the introduction of the Act did not change the value relevance of the earnings measures.

However, with respect to analysts' actuals, the results show that there is additional information about future fundamentals impounded in analysts' actual earnings in the post-SOX period. The difference between the FERC for analysts' actuals and the omitted reference group is .05418, thus the informativeness of analysts' actuals in the post-SOX period is 0.08413 [i.e. 0.02995 + 0.05418] in the pre and post –SOX periods respectively. That is, analysts' actuals became more informative following SOX. It is unclear why analysts' actuals – with no direct link to SOX – became more informative in this period.

To control for possible multicollinearity between the interaction terms and the components, I estimate separate regressions for both the pre SOX period consisting of information for years 2000 to 2002 and the post-SOX period, consisting of information for years 2002 to 2004. While 2002 represents a possible overlap in the two periods, this does not affect the results because the coefficient of interest is 2002 in the pre-test and 2004 in the post test. Results presented in Table 10 panels B and C are qualitatively similar to the initial results presented in Panel A. In the pre-SOX period (Panel B), the future earnings response coefficient for pro forma is largest and has the largest t-stat [0.08121 (t-stat = 6.18)] compared to 0.02257 (t-stat = 4.21) for GAAP earnings and 0.03165 (t-stat = 3.75) for analysts' actuals. In the post SOX period, Panel C, the future earnings response coefficient for pro forma earnings, while larger than that for GAAP earnings (0.08271 compared to 0.03406) is not larger than the future earnings response coefficient for analysts' actuals. Overall these results suggest that the informativeness of pro

formas (and GAAP) remained constant between the pre and post-SOX periods while the informativeness of analysts' actuals increased in the post-SOX period.<sup>38</sup>

In terms of the relative value relevance of pro forma earnings (RQ2) this is examined in Panels B and C. In the pre-SOX period, the adjusted R-square for pro forma (22.38%) is greater than for both GAAP earnings and analysts' actuals at 21.77% and 21.19% respectively. Using the Biddle et al. (1995)  $X^2$  test, the difference in adjusted R-squares between pro forma and both GAAP and analysts' actuals, is weakly significant at the 10% level. However, there is no difference in the adjusted R-square between analysts' actuals and GAAP earnings. In the post-SOX period, analysts' actuals is the most value relevant measure (adjusted R-square = 19.20%) compared to 13.08% and 9.97% for both pro forma earnings and GAAP earnings respectively. These results suggest that there has been a change in the information environment following the introduction of the Act and represents an area for future research.

[Insert Table 10 here]

#### ***2.4.7. Results of Sensitivity Tests***

Several concerns have been raised about whether the motive for managers' disclosure of pro forma is to shield poor performance, for example, converting a GAAP loss into a pro forma profit. I consequently examine GAAP loss firms, which may have an incentive to report pro forma earnings that are not value relevant. The result for these GAAP loss firms are reported in Table 11.

[Insert Table 11 here]

In the first regression, the coefficient of interest, that of future GAAP earnings [0.01729 (t-statistic = 1.47)] is not statistically significant. This suggests

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<sup>38</sup> Results from both tests (i.e. the use of a dummy variable and the partitioning of the data set into the two periods) are similar. The future earnings response coefficient for analysts' actuals is 0.08413 [Panel C and Panel A (0.02995 + 0.05418)] from both tests. Coefficients for GAAP and pro formas do not significantly differ between the two tests.

that for loss firms, GAAP earnings (or in this case losses) are not value relevant. This is consistent with prior research that demonstrates that profits are more value relevant because they are more transitory than are losses (Basu, 1997), and because the liquidation option provides a lower boundary for the value of the firm (Hayn, 1995).<sup>39</sup> For analysts' actual earnings, the coefficient of interest [0.03808 (t-statistic = 1.79)] is found to be weakly significant (at the 10% level). However, the coefficient of future pro forma earnings [0.10857 (t-statistic = 3.05)] is statistically significant at the 1% level. Taken together, these findings call into question the argument that managers of loss firms disclose pro forma earnings for strategic reasons.

I also consider a set of firms whose GAAP earnings are greater than their pro forma earnings. If, as is argued by critics, pro forma is reported to enable the firm to meet or exceed earnings targets, then this group of firms – where pro forma is less than GAAP – should have the least incentive to disclose pro forma earnings. I expect that in this group of firms pro forma will be least informative, if it is not disclosed for value relevance reasons. The results for these firms are presented in Table 12.

[Insert Table 12 here]

The coefficient of future GAAP earnings [0.01808 (t-statistic = 1.87)] is weakly significant, at the 10% level. However, the coefficient of future pro forma earnings [0.07105 (t-statistic = 2.91)] is statistically significant at the 1% level. These results counter the argument that pro formas are reported for strategic reasons.

Also, prior research documents that in price-earnings regressions, the omission of book value may lead to model misspecification (Collins et al., 1997). As a result, the price model equation is re-estimated, this time including book value of equity at time  $t$ . The results are presented in Table 13.

[Insert Table 13 here]

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<sup>39</sup> In untabulated results, GAAP earnings are found to be positive and significant for the firms with profits.

Similar to the initial contemporaneous price-earnings regression (refer Table 7), the signs on the earnings measures are positive and statistically significant. The pro forma earnings regression still yields the greatest explanatory power (36.16%) compared to 32.92% for the GAAP earnings model and 33.43% for the analysts' actual earnings model. A comparison of the adjusted  $R^2$  shows that the pro forma earnings model provides significantly greater explanatory power than both GAAP and analysts' actual earnings. However, analysts' actual earnings do not provide significant explanatory power over GAAP earnings.

Lastly, similar to prior studies I use earnings before extraordinary items (EBEI) from Compustat as a proxy for GAAP earnings and re-estimate equation (2.4). Results from this test which are untabulated, indicate that pro forma earnings are still more informative than earnings before extraordinary items and that analysts' actuals are more informative than EBEI.

#### ***2.4.8. Comparing with other Pro Forma Studies***

Four pro forma studies are benchmarked to the findings of this study. Three of these: Bhattacharya et al. (2003), Lougee and Marquardt (2004) and Johnson and Schwartz (2005) use actual pro forma press releases, while Doyle et al., (2003) uses analysts' earnings as a proxy for pro forma. Bhattacharya et al. (2003) find that pro forma earnings are more informative and more permanent than GAAP operating earnings. Market participants also believe pro forma earnings to be more representative of core earnings. These results are generally consistent with the findings of this study (i.e., that pro forma earnings are informative beyond GAAP and analysts' actual earnings). However, as Bradshaw (2003) points out, the research design underlying their comparison of I/B/E/S, pro forma and GAAP operating earnings suffers from an error-in-variables problem that renders the interpretation of results somewhat difficult. The design adopted in this study alleviates this concern.

Lougee and Marquardt (2004) find that firms with low GAAP earnings quality, as measured by the earnings-return correlation and its related  $R^2$ , are more

likely to disclose pro forma earnings than other firms. They also find significantly greater relative and incremental information content of pro forma earnings over GAAP earnings when GAAP earnings quality is low and when strategic considerations are absent. Lastly, pro forma earnings also have significant predictive ability for future operating performance and returns. Their findings are also generally consistent with the findings of this study. However, as Berger (2005) notes, Lougee and Marquardt's evidence provides no clear support for either side of the debate. This is largely due to the low power of the future profitability and future returns tests. My study however uses a larger sample size and also uses two models (returns and price) in the assessment of informativeness and value relevance. While not reported, I also find that for the period of this study (which differs from their study), that when GAAP earnings are of higher quality, as evidenced by the earnings returns relation, pro forma firms are still more informative than GAAP and analysts' actual earnings. This finding also holds for firms with low quality GAAP earnings as evidenced by the earnings returns regression.

Johnson and Schwartz (2005) find that pro forma firms may be priced higher than non-pro forma firms, but that this overpricing is not related to the pro forma earnings numbers. They also find no evidence of a stock return premium for pro forma firms at the quarterly earnings announcement date. Johnson and Schwartz do not find pro forma to be incrementally informative to GAAP operating earnings, a finding contrary to the current study. However, a replication of Johnson and Schwartz's results by Bhattacharya et al. (2003) find that their results are sensitive to the time period and the sample used. Berger (2005) also notes that Johnson and Schwartz's findings are based on the rejection of the null hypothesis, and interpreting a failure to reject the null when sample size is small is fraught with problems. Moreover, the between-samples design adopted by Johnson and Schwartz is problematic as the pro forma firms differ from non-pro forma firms in areas such as risk, growth, earnings informativeness and sign of GAAP earnings surprise. In this study, using a within subjects design, the informativeness of pro forma earnings is examined controlling for firm characteristics. Also, the use of Collins et al.'s

(1994) model provides information on the informativeness of pro forma earnings, GAAP earnings and analysts' earnings.

#### ***2.4.9. Implications of Results***

Implications of this study have relevance to management, to regulatory bodies including the SEC, and lastly to academics. Contrary to wide spread belief in the business press, it appears that overall (in aggregate across firms), managers provide voluntary disclosures of pro formas for informative reasons and not to mislead investors. That pro formas are informative may be interpreted as managers disclosing information to inform consistent with their better understanding of the firm's operations. Even though analysts are independent, it does not appear that they have complete information about a firm's recurring earnings potential.

Prior to the enactment of the SOX Act, there were calls for a total prohibition of pro formas as the overwhelming belief was that they are reported to influence and possibly mislead investors. The results of this study are consistent with pro formas being provided for value relevant reasons. The SEC appears to have made the correct decision in not prohibiting the reporting of pro formas.

For academics, this study furthers research in voluntary disclosure and pro forma earnings. It uses an alternative econometric approach, consistent with Feltham-Ohson to examine value relevance. These results on future returns suggest that pro forma earnings provides a better representation of the clean surplus relationship than does GAAP earnings or analysts' actuals. It addresses some of the limitations of prior studies on the value relevance of pro formas and confirms some of the findings of earlier studies. The study also presents an avenue for further research – why have analysts actuals become more value relevant in the post SOX period, and why are they now more informative than pro forma earnings?



## **2.5. CONCLUSION**

This study uses the Collins et al. (1994) returns model in the examination of the value relevance of three earnings measures – GAAP, analysts’ actual and pro forma earnings. This model assesses the informativeness of the earnings measures as a function of the markets’ ability to anticipate future earnings. The empirical evidence is that future GAAP, future analysts’ actual and future pro forma earnings are all impounded in current stock price. Across a series of models, pro forma earnings are more value relevant than are analysts’ actuals which in turn are more value relevant than are GAAP earnings. These findings are robust to alternative model specifications (e.g., using price as the dependent variable). The findings also hold where the earnings measure is used to predict future cash flows, or for those firms that report a GAAP loss and a pro forma profit or where their GAAP earnings exceed their pro formas. This provides additional evidence that pro forma earnings are used for value relevance reasons and not for strategic reasons.

Note however that the findings in this paper are based on the assumption that the markets are efficient (a maintained assumption throughout the literature). If stocks are mispriced, then the results are open to alternative interpretations.

Interestingly, these results hold in the post-SOX period as future pro forma earnings are informative although not as value relevant as analysts’ actuals. Future studies can adopt a similar approach and perhaps using a longer time span to examine the value relevance of pro forma earnings in the post-SOX period.

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**Table 1- Sample Selection****Panel A: S&P 500 Firms Reporting Pro Forma for the Period 2000-2004**

<b>Year</b>	<b>Number</b>	<b>Percent</b>
2000	367	73%
2001	380	76%
2002	331	66%
2003	264	53%
2004	266	53%
<b>Total observations</b>	<b>1,608</b>	

**Panel B: Sample Pro Forma Firms by Industry**

<b>Industry</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Basic Materials	26 (7%)	26 (7%)	22 (7%)	14 (5%)	14 (5%)	102 (6%)
Services	51 (14%)	54 (14%)	49 (15%)	42 (16%)	38 (14%)	234 (15%)
Health Care	38 (10%)	40 (11%)	39 (12%)	30 (11%)	37 (14%)	184 (11%)
Technology	80 (22%)	83 (22%)	69 (21%)	47 (18%)	52 (20%)	331 (21%)
Consumer Goods	24 (7%)	25 (6%)	23 (7%)	19 (7%)	18 (7%)	109 (7%)
Industrial Goods	49 (13%)	49 (13%)	42 (12%)	34 (13%)	21 (8%)	195 (12%)
Utilities	24 (7%)	26 (7%)	29 (9%)	24 (9%)	28 (10%)	131 (8%)
Energy	19 (5%)	19 (5%)	16 (5%)	16 (6%)	19 (7%)	89 (6%)
Financial	56 (15%)	58 (15%)	42 (12%)	38 (15%)	39 (15%)	233 (14%)
<b>Total</b>	<b>367</b>	<b>380</b>	<b>331</b>	<b>264</b>	<b>266</b>	<b>1,608</b>

**Panel C: Calculation of Pro Forma Earnings**

	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>Per share Difference (Pro Forma – GAAP)</b>					
Average	\$0.26	\$0.80	\$1.29	\$0.32	\$0.45
25 <sup>th</sup> percentile	\$0.00	\$0.08	\$0.05	\$(0.04)	\$(0.06)
Median	\$0.03	\$0.34	\$0.34	\$0.13	\$0.09
75 <sup>th</sup> percentile	\$0.37	\$0.93	\$1.19	\$0.48	\$0.48

**Table 2- Sample Selection****Panel A: Sample Selection Process**

1.	Total number of firm year observations	1,608
2.	Less observations lacking 3 years of consecutive data	680
3.	Less observations with missing returns data from CRSP	38
4.	Less observations with missing analysts' earnings data	22
5.	Less observations with missing COMPUSTAT data	311
<b>6.</b>	<b>Total observations used in study</b>	<b>557</b>

**Panel B: Sample Pro Forma Firms by Industry**

<b>Industry</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>Total</b>
Basic Materials	15 (6%)	8 (5%)	7 (5%)	30 (5%)
Services	33 (14%)	26 (16%)	18 (12%)	77 (14%)
Health Care	30 (13%)	23 (14%)	24 (16%)	77 (14%)
Technology	50 (21%)	33 (20%)	33 (21%)	116 (21%)
Consumer Goods	19 (8%)	9 (6%)	5 (3%)	33 (6%)
Industrial Goods	31 (13%)	24 (15%)	13 (8%)	68 (12%)
Utilities	20 (8%)	14 (9%)	19 (12%)	53 (9%)
Energy	12 (5%)	6 (3%)	11 (7%)	29 (5%)
Financial	30 (12%)	19 (12%)	25 (16%)	74 (13%)
<b>Total</b>	<b>240</b>	<b>162</b>	<b>155</b>	<b>557</b>

**Panel C: Calculation of Pro Forma Earnings**

<b>Per share Difference (Pro Forma – GAAP)</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Average	\$0.29	\$0.92	\$1.21	\$0.40	\$0.32
25 <sup>th</sup> percentile	\$0.00	\$0.08	\$0.1	\$(0.04)	\$(0.07)
Median	\$0.05	\$0.33	\$0.38	\$0.17	\$0.07
75 <sup>th</sup> percentile	\$0.44	\$0.97	\$1.28	\$0.60	\$0.38

**TABLE 3**

<b>Panel A: Sample Summary Statistics for Main Variables</b>					
<b>Descriptive Statistics (557 firm-year observations for the period 2000-2004)</b>					
Variable	Mean	Median	Std. Dev.	Minimum	Maximum
$R_t$	0.08391	0.05150	0.45646	-0.93325	3.29663
$R_{t+1}$	0.08372	0.03776	0.47447	-0.85207	3.29663
$GP_{t-1}$	1.07339	1.29	3.72095	-46.30	39.0
$GP_t$	0.88948	1.18	3.26868	-51.40	7.35
$GP_{t+1}$	1.2004	1.43	3.37851	-41.07	14.30
$AE_{t-1}$	1.00495	1.22	3.13297	-51.40	8.37
$AE_t$	0.53178	0.85	2.40828	-20.60	7.01
$AE_{t+1}$	0.95714	1.10	2.56408	-25.43	14.18
$PF_{t-1}$	1.82646	1.61	1.63716	-8.46	9.310
$PF_t$	1.75127	1.59	1.75343	-8.58	7.20
$PF_{t+1}$	1.94110	1.75	2.01603	-18.10	11.57

  

<b>Panel B: Sample Summary Statistics for Other Dependent and Control Variables</b>					
<b>Descriptive Statistics (557 firm-year observations for the period 2000-2004)</b>					
<i>Price</i>	34.52	33.17	18.00	4.73	107.84
$CFO_{t+1}$	0.09736	0.08545	0.12909	-1.07369	0.91455
<i>growth</i>	1.61812	1.60602	0.32764	1.15121	3.61912
<i>loss</i>	0.18133	0	0.38564	0.	1
<i>current</i>	0.47936	0	0.5000	0	1
<i>Var</i>	7.14508	4.20800	8.57146	0.22900	81.43400
<i>size</i>	12.30528	10.37546	4.04409	6.97165	23.23134

The sample consists of 557 firm year observations that have reported pro forma earnings over the period 2000 – 2004.  $R_t$ , obtained from CRSP, represent the returns computed three months after the firms' press release date for years  $t$  and year  $t+1$  respectively.  $GP$  is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%), it is obtained from Compustat (data item # A169).  $AE$  is obtained from I/B/E/S database defined as analysts' actual earnings.  $PF$  is obtained from the earnings press releases downloaded from the firms' web sites.  $Price$  is obtained from CRSP and represents the firms' closing price three months after the press release date.  $CFO$  is Compustat data item # A308.  $Growth$  is the ratio of market value of equity (Compustat data items #25\*#199) to book value of equity (Compustat data item #216).  $Loss$  is proxied by a dummy variable which equals 1 if next year's GAAP earnings are negative and 0 otherwise.  $Current$  is proxied by a dummy variable coded one for negative contemporaneous return and zero otherwise.  $Var$  is calculated by dividing the absolute standard deviation of a company's percentage change in EPS over 20 quarters by the company's average four quarter percentage for 20 quarters.  $Size$  is the natural log of the market value of equity (Compustat data items #25\*#199).

**TABLE 4**  
**Panel B: Pairwise Pearson (Spearman) Correlations above (below) the Diagonal of the Main Variables**  
**Prob > |r| under H0: Rho=0, n=557**

	$R_t$	$R_{t+1}$	$GP_{t-1}$	$GP_t$	$GP_{t+1}$	$AE_{t-1}$	$AE_t$	$AE_{t+1}$	$PF_{t-1}$	$PF_t$	$PF_{t+1}$
$R_t$		-0.1588 (0.0001)	-0.0561 (0.1722)	0.1731 (<0.0001)	0.1808 (<0.0001)	-0.0028 (0.9464)	0.1239 (0.0025)	0.2385 (<0.0001)	0.0052 (0.8991)	0.0712 (0.0833)	0.2087 (<0.0001)
$R_{t+1}$	-0.1749 (<0.0001)		-0.1184 (0.0039)	0.02345 (0.5687)	0.1605 (<0.0001)	-0.1935 (<0.0001)	-0.0120 (0.7714)	0.0665 (0.1058)	-0.1313 (0.0014)	0.04206 (0.3066)	0.0664 (<0.0001)
$GP_{t-1}$	0.0054 (0.8959)	-0.1148 (0.0051)		0.2140 (<0.0001)	0.2123 (<0.0001)	0.7291 (<0.0001)	0.2672 (<0.0001)	0.2160 (<0.0001)	0.4578 (<0.0001)	0.3029 (<0.0001)	0.2821 (<0.0001)
$GP_t$	0.2192 (<0.0001)	0.0966 (0.0187)	0.4567 (<0.0001)		0.3467 (<0.0001)	0.2948 (<0.0001)	0.7224 (<0.0001)	0.4646 (<0.0001)	0.3516 (<0.0001)	0.5116 (<0.0001)	0.4273 (<0.0001)
$GP_{t+1}$	0.2300 (<0.0001)	0.2343 (<0.0001)	0.4254 (<0.0001)	0.6124 (<0.0001)		0.2215 (<0.0001)	0.5218 (<0.0001)	0.7658 (<0.0001)	0.3660 (<0.0001)	0.5737 (<0.0001)	0.7139 (<0.0001)
$AE_{t-1}$	0.0336 (0.4148)	-0.1644 (<0.0001)	0.8619 (<0.0001)	0.4921 (<0.0001)	0.4092 (<0.0001)		0.3421 (<0.0001)	0.2495 (<0.0001)	0.5101 (<0.0001)	0.3591 (<0.0001)	0.3337 (<0.0001)
$AE_t$	0.1461 (0.0004)	0.0507 (0.2173)	0.4404 (<0.0001)	0.7781 (<0.0001)	0.6034 (<0.0001)	0.4814 (<0.0001)		0.6958 (<0.0001)	0.3741 (<0.0001)	0.6476 (<0.0001)	0.5604 (<0.0001)
$AE_{t+1}$	0.2983 (<0.0001)	0.1567 (0.0001)	0.4194 (<0.0001)	0.6425 (<0.0001)	0.8167 (<0.0001)	0.4470 (<0.0001)	0.7474 (<0.0001)		0.3777 (<0.0001)	0.6301 (<0.0001)	0.7716 (<0.0001)
$PF_{t-1}$	0.0831 (0.0431)	-0.0741 (0.0715)	0.7813 (<0.0001)	0.5546 (<0.0001)	0.5113 (<0.0001)	0.7748 (<0.0001)	0.4985 (<0.0001)	0.4952 (<0.0001)		0.6402 (<0.0001)	0.6010 (<0.0001)
$PF_t$	0.1284 (0.0017)	0.0914 (0.0261)	0.5696 (<0.0001)	0.7636 (<0.0001)	0.6817 (<0.0001)	0.5910 (<0.0001)	0.7306 (<0.0001)	0.6734 (<0.0001)	0.7213 (<0.0001)		0.7801 (<0.0001)
$PF_{t+1}$	0.2338 (<0.0001)	0.1253 (0.0022)	0.5420 (<0.0001)	0.6631 (<0.0001)	0.7914 (<0.0001)	0.5308 (<0.0001)	0.6357 (<0.0001)	0.7735 (<0.0001)	0.6735 (<0.0001)	0.8358 (<0.0001)	

**TABLE 5**  
**Relative Informativeness Tests using Returns**  
 $(R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + U_t)$   
[Standardized estimate]  
(n=557)

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.07251[0] (3.59)***	0.06644[0] (3.24)***	0.07303[0] (2.56)**
$E_{i,t-1}$	-	-0.01782[-0.1453] (-3.45)***	-0.01455[-0.0999] (-2.29)**	-0.06261[-0.22457] (-4.18)***
$E_{i,t}$	+	0.01671[0.1197] (2.68)***	-0.01223[-0.0646] (-1.12)	-0.03826[-0.1470] (-2.20)**
$E_{i,t+1}$	+	<b>0.02847[0.2107]</b> <b>(4.67)***</b>	<b>0.05861[0.3292]</b> <b>(5.85)***</b>	<b>0.10866[0.4799]</b> <b>(7.42)***</b>
$R_{t+1}$	-	-0.22096[-0.2297] (-5.57)***	-0.20893[-0.2172] (-5.26)***	-0.22335[-0.2322] (-5.68)***
Adj. R <sup>2</sup>		0.1015	0.1038	0.1274
Akaike Information Criterion		-928.2886	-929.7247	-944.5909
Biddle et al X <sup>2</sup> test (p value)			(0.245)	(0.000)
			(0.000)	

\*\*\* Significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

$E_{i,t-1}$ ,  $E_{i,t}$  and  $E_{i,t+1}$  represent each of the earnings measures at times t-1, t and t+1.

$R_t$  and  $R_{t+1}$ , obtained from CRSP, represent the returns computed three months after the firms' press release date for years  $t$  and year  $t+1$  respectively. Returns computed one month after the press release date yields identical results.

$PF$  is obtained from the earnings press releases downloaded from the firms' web sites.

$GAAP$  is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%), it is obtained from Compustat (data item # A169).

$AE$  is obtained from I/B/E/S database defined as analysts' actual earnings.

**TABLE 6**  
**Relative Informativeness Tests using Returns and Controlling for Firm Characteristics**

$$R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + b_4 growth_t + b_5 loss_t + b_6 current_t + b_7 var_t + b_8 size_t + U_t$$

[Standardized Estimate]

(n=557)

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.55601[0] (8.58)***	0.55757[0] (8.69)***	0.57184[0] (8.87)***
$E_{i,t-1}$	-	-0.01116[-0.0909] (-2.54)**	-0.01001[-0.0687] (-1.87)*	-0.02491[-0.0893] (-1.93)*
$E_{i,t}$	+	0.00736[0.0527] (1.40)	-0.01314[-0.0693] (-1.44)	-0.04971[-0.1920] (-3.41)***
$E_{i,t+1}$	+	<b>0.00627[0.0464]</b> <b>(1.08)</b>	<b>0.02508[0.1409]</b> <b>(2.81)***</b>	<b>0.06592[0.2911]</b> <b>(5.20)***</b>
$R_{t+1}$	-	-0.24571[-0.2554] (-6.18)***	-0.24819[-0.2580] (-6.24)***	-0.24796[-0.2578] (-6.33)***
<i>growth</i>	+	-0.02574[-0.0184] (-0.51)	-0.03722[-0.0266] (-0.74)	-0.04875[-0.0349] (-0.96)
<i>loss</i>	-	-0.11605[-0.0981] (-2.27)**	-0.10749[-0.0908] (-2.21)**	-0.09908[-0.0837] (-2.17)**
<i>current</i>	-	-0.45185[-0.4950] (-13.86)***	-0.45056[-0.4936] (-13.80)***	-0.44288[-0.4852] (-13.78)***
<i>var</i>	-	-0.00156[-0.0292] (-0.87)	-0.00158[-0.0296] (-0.89)	-0.00134[-0.0252] (-0.77)
<i>size</i>	+	-0.01570[-0.1391] (-3.42)***	-0.01594[-0.1412] (-3.49)***	-0.01630[-0.1444] (-3.60)***
Adj. R <sup>2</sup>		0.3820	0.3846	0.4033
AIC		-1134.7574	-1136.8480	-1153.8336
BBW X <sup>2</sup> test (p value)			(0.1063)	(0.000)
			(0.000)	

\*\*\* Significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

$E_{i,t-1}$ ,  $E_{i,t}$  and  $E_{i,t+1}$  represent each of the earnings measures at times t-1, t and t+1.

$R_t$  and  $R_{t+1}$ , obtained from CRSP, represent the returns computed three months after the firms' press release date for years  $t$  and year  $t+1$  respectively. Returns computed one month after the press release date yields identical results.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

GAAP is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Table 6 continued

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Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

*growth* represents the ratio of market value of equity (Compustat data items #25\*#199) to book value of equity (Compustat data item #216).

*loss* is a dummy variable that is coded 1 if next year's earnings are negative and 0 otherwise.

*current* represents a dummy variable coded 1 for negative contemporaneous returns and 0 otherwise.

*Var* is a measure of earnings predictability. This is a relative measure of earnings dispersion calculated by dividing the absolute standard deviation of a company's percentage change in EPS over 20 quarters by the company's average four quarter percentage for 20 quarters.

*size* represents the natural log of market value (Compustat data items #25\*#199)



**TABLE 7**  
**Relative Value Relevance Tests using Price**  
 $(P_t = \alpha + b_0 E_t + U_t)$   
n=1486

Variables	Predicted sign	GAAP Earnings	Analysts' Actual Earnings	Pro Forma Earnings
Intercept	?	32.25704 (50.48)***	31.61396 (48.84)***	25.46867 (32.51)***
$E_{i,t}$	+	<b>1.98258</b> <b>(11.57)***</b>	<b>3.20727</b> <b>(12.28)***</b>	<b>4.75487</b> <b>(16.64)***</b>
Adj. R <sup>2</sup>		0.1518	0.1679	0.2711
AIC		4175.0559	4160.8195	4062.4064
			(0.000)	
BBW X <sup>2</sup> test (p-value)				(0.000)
			(0.000)	

\*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test, the sample size is 1486 firm year observations because the criterion that each firm have pro forma earnings for three consecutive years is dropped. However, there are still missing price observations from the CRSP database.

$E_t$  represents each of the earnings measures at time t.

The dependent variable represents price, three months after the firm's fiscal year end. This is obtained from the CRSP database. Price data obtained from Compustat yields identical results.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

GAAP is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

**TABLE 8**  
**Relative Value Relevance Tests using Price and Controlling for Lagged Earnings**  
 $(P_t = \alpha + b_0 E_{t-1} + b_1 E_t + U_t)$   
n=1486

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	31.28451 (48.58)***	30.60047 (49.41)***	23.35816 (27.83)***
$E_{i,t-1}$	-	1.11301 (6.10)***	1.87176 (6.63)***	2.74984 (6.11)***
$E_{i,t}$	+	<b>1.67466</b> <b>(9.58)***</b>	<b>2.52261</b> <b>(9.67)***</b>	<b>3.16833</b> <b>(8.31)***</b>
Adj. R <sup>2</sup>		0.1913	0.2602	.3052
AIC		4140.6542	4074.4475	4027.8697
			(0.0479)	
BBW X <sup>2</sup> test (p-value)			(0.1014)	
			(0.000)	

\*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test, the sample size is 1486 firm year observations because the criterion that each firm have pro forma earnings for three consecutive years is dropped. However, there are still missing price observations from the CRSP database.

$E_i$  represents each of the earnings measures at times t-1 and t.

The dependent variable represents price, three months after the firm's fiscal year end. This is obtained from the CRSP database. Price data obtained from Compustat yields identical results.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

GAAP is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

**TABLE 9**  
**Results of Cash flow Prediction Tests using Earnings Measures**

$$CFO_{t+1} = \alpha + b_0 E_{t-1} + b_1 E_t + U_t$$

n=1486

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.08796 (15.48)***	0.08617 (15.74)***	0.04755 (6.06)***
$E_{i,t-1}$	-	0.00263 (1.78)*	0.00262 (1.49)	0.00165 (0.41)
$E_{i,t}$	+	<b>0.00739</b> <b>(4.39)***</b>	<b>0.01610</b> <b>(7.05)***</b>	<b>0.02672</b> <b>(7.16)***</b>
Adj. R <sup>2</sup>		0.0439	0.1037	0.1387
AIC		-2302.6596	-2338.6606	-2360.8096
			(0.000)	
BBW X <sup>2</sup> test (p-value)				(0.000)
			(0.000)	

\*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test, the sample size is 1486 firm year observations because the criterion that each firm have pro forma earnings for three consecutive years is dropped. However, there are still missing price observations from the CRSP database.

*CFO* is Compustat data item # A308.

$E_i$  represents each of the earnings measures at times t-1 and t.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

*GAAP* is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

**TABLE 10**

**Panel A**

**Informativeness Tests using Returns and Controlling for the Impact of SOX**

$$R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + b_4 Post + b_5 (Post * E_{t-1}) +$$

$$b_6 (Post * E_t) + b_7 (Post * E_{t+1}) + b_8 (Post * R_{t+1}) + U_t$$

n=557

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	-0.09068 (-4.77)***	-0.8406 (-4.55)***	-0.14274 (-5.08)***
$E_{t-1}$	-	0.00333 (0.66)	0.00100 (0.19)	-0.00842 (-0.63)
$E_t$	+	0.01105 (2.11)**	0.01286 (1.35)	-0.03400 (-2.38)**
$E_{t+1}$	+	<b>0.03218</b> <b>(4.48)***</b>	<b>0.02995</b> <b>(3.04)***</b>	<b>0.08836</b> <b>(7.07)***</b>
$R_{t+1}$	-	-0.25598 (-7.65)***	-0.24049 (-7.30)***	-0.24728 (-7.46)***
Post	?	0.63355 (15.63)***	0.55836 (14.84)***	0.73640 (14.78)***
(Post* $E_{t-1}$ )	-	-0.02090 (-2.32)**	-0.04759 (-3.21)***	-0.06041 (-1.83)*
(Post* $E_t$ )	+	-0.07694 (-4.64)***	-0.13003 (-5.765)***	-0.06706 (-2.09)**
<b>(Post* <math>E_{t+1}</math>)</b>	+	<b>-0.01128</b> <b>(-1.15)</b>	<b>0.05418</b> <b>(3.04)***</b>	<b>-0.0097514</b> <b>(-0.17)</b>
(Post* $R_{t+1}$ )	?	0.00414 (4.13)***	0.00349 (3.56)***	0.00359 (3.52)***
Adj. $R^2$		0.4307	0.4576	0.4478

**TABLE 10 Continued**  
**Panel B**  
**Relative Informativeness Tests using Returns in the Pre-SOX Period**

$$R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + U_t$$

N=447

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	-0.08725 (-5.51)***	-0.08324 (-5.27)***	-0.14227 (-6.20)***
E <sub>t-1</sub>	-	-0.00235 (-0.55)	-0.00025 (-0.05)	-0.01049 (-0.92)
E <sub>t</sub>	+	0.01475 (3.61)***	0.01223 (1.51)	-0.02328 (-1.93)*
<b>E<sub>t+1</sub></b>	+	<b>0.02257</b> <b>(4.21)***</b>	<b>0.03165</b> <b>(3.75)***</b>	<b>0.08121</b> <b>(6.18)***</b>
R <sub>t+1</sub>	-	-0.24591 (-9.03)***	-0.23595 (-8.62)***	-0.24313 (-8.93)***
Adj. R <sup>2</sup>		0.2177	0.2119	0.2238
AIC		-1088.72	-1085.39	-1092.22
		(0.305)		
BBW X <sup>2</sup> test (p-value)				(0.081)
				(0.092)

**Panel C**  
**Relative Informativeness Tests using Returns in the Post-SOX Period**

N=110

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.54375 (11.80)***	0.47430 (11.56)***	0.59382 (11.22)***
E <sub>t-1</sub>	-	-0.02019 (-2.05)*	-0.04659 (-2.70)**	-0.06858 (-1.77)*
E <sub>t</sub>	+	0.08054 (3.68)***	0.11717 (4.28)**	-0.09603 (-2.16)**
<b>E<sub>t+1</sub></b>	+	<b>0.03406</b> <b>(3.00)**</b>	<b>0.08413</b> <b>(4.54)***</b>	<b>0.08271</b> <b>(3.72)***</b>
R <sub>t+1</sub>	-	0.12612 (1.02)	0.10901 (0.94)	0.1152 (0.92)
Adj. R <sup>2</sup>		0.0997	0.1920	0.1308
AIC		-246.81	-263.58	-252.26
		(0.000)		
BBW X <sup>2</sup> test (p-value)				(0.000)
				(0.000)

\*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

Table 10 Continued

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Note: Panel A represents a specification that uses a dummy variable *Post* representing the adoption of SOX (years before the adoption of SOX i.e. 2000-2002 are coded as 0 and the post adoption years, 2003-2004 are coded as 1). Panels B and C on the other hand represent separate regressions with the data split into pre- and post SOX periods i.e. 2000, 2001, and 2002 represent the pre- SOX period and 2002, 2003 and 2004 represent the post- SOX period.

$R_t$  and  $R_{t+1}$ , obtained from CRSP, represent the returns computed three months after the firms' press release date for years  $t$  and year  $t+1$  respectively. Returns computed one month after the press release date yields identical results.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

*GAAP* is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

$E_{t-1}$ ,  $E_t$  and  $E_{t+1}$  represent each of the earnings measures at times  $t-1$ ,  $t$  and  $t+1$ .

**TABLE 11**  
**Relative Informativeness Tests using Returns and Controlling for GAAP Loss Firms**

$$(R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + U_t)$$

(n=115)

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.08856[0] (1.27)	0.06750[0] (0.93)	0.05180[0] (0.75)
E <sub>t-1</sub>	-	-0.01283[-0.10108] (-1.07)	-0.01120[-0.09758] (-1.03)	-0.07896[-0.23953] (-2.28)**
E <sub>t</sub>	+	0.01671[0.13727] (2.68)***	0.00367[0.01950] (0.16)	-0.06519[-0.20761] (-1.61)
E <sub>t+1</sub>	+	<b>0.01729[0.16101]</b> <b>(1.47)</b>	<b>0.03808[0.21448]</b> <b>(1.79)*</b>	<b>0.10857[0.42361]</b> <b>(3.05)***</b>
R <sub>t+1</sub>	-	-0.23857[-0.24934] (-2.63)***	-0.23909[-0.24990] (-2.65)***	-0.23136[0.24181] (-2.63)***
Adj. R <sup>2</sup>		0.0569	0.0580	0.0925
AIC		-92.9402	-95.0489	-97.3582
BBW X <sup>2</sup> test (p-value)			(0.432)  (0.000)	  (0.000)

\*\*\* Significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test, the sample size is 115 firm year observations which is the number of firms with GAAP losses and pro forma profits in the same year.

E<sub>t-1</sub>, E<sub>t</sub> and E<sub>t+1</sub> represent each of the earnings measures at times t-1, t and t+1.

R<sub>t</sub> and R<sub>t+1</sub>, obtained from CRSP, represent the returns computed three months after the firms' press release date for years *t* and year *t+1* respectively. Returns computed one month after the press release date yields identical results.

*PF* is obtained from the earnings press releases downloaded from the firms' web sites.

*GAAP* is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

*AE* is obtained from I/B/E/S database defined as analysts' actual earnings.

**TABLE 12**  
**Relative Informativeness Tests using Returns and Controlling for Firms**  
**where GAAP Earnings Exceeds Pro Forma Earnings**

$$(R_t = \alpha + b_0 E_{t-1} + b_1 E_t + b_2 E_{t+1} + b_3 R_{t+1} + U_t)$$

(n=97)

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	0.15701[0] (2.38)**	0.23774[0] (0.93)	0.23062[0] (3.93)***
$E_{i,t-1}$	-	-0.02948[-0.28943] (-2.86)***	-0.05661[-0.28693] (-2.34)**	-0.13213[-0.59200] (-3.67)**
$E_{i,t}$	+	0.02643[0.13438] (1.11)	0.00179[0.01023] (0.07)	-0.05155[0.26348] (-1.41)
$E_{i,t+1}$	+	<b>0.01808[0.23556]</b> <b>(1.87)*</b>	<b>0.03975[0.34624]</b> <b>(2.25)**</b>	<b>0.07105[0.48158]</b> <b>(2.91)***</b>
$R_{t+1}$	-	-0.25053[-0.22175] (-2.19)**	-0.23911[-0.21164] (-2.05)**	-0.36364[-0.32187] (-3.05)***
Adj. R <sup>2</sup>		0.1074	0.0715	0.1621
AIC		-167.8538	-166.0228	-173.9850
BBW X <sup>2</sup> test (p-value)			(0.000)	(0.000)

\*\*\* Significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test, the sample size is 97 firm year observations which is the number of firms where GAAP exceeds pro formas in the same year.

$E_{t-1}$ ,  $E_t$  and  $E_{t+1}$  represent each of the earnings measures at times t-1, t and t+1.

$R_t$  and  $R_{t+1}$ , obtained from CRSP, represent the returns computed three months after the firms' press release date for years  $t$  and year  $t+1$  respectively. Returns computed one month after the press release date yields identical results.

$PF$  is obtained from the earnings press releases downloaded from the firms' web sites.

$GAAP$  is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

$AE$  is obtained from I/B/E/S database defined as analysts' actual earnings.



**TABLE 13**  
**Relative Value Relevance Tests using Price and Controlling for Book Value**  
 $(P_t = \alpha + b_0 BV_t + b_1 E_t + U_t)$

n=1486

Variables	Predicted sign	GAAP Earnings	Analyst's Actual Earnings	Pro Forma Earnings
Intercept	?	22.2738 (24.25)***	22.0743 (24.19)***	20.1829 (22.33)***
BV	+	0.79304 (13.94)***	0.77808 (13.65)***	0.6209 (10.11)***
$E_{i,t}$	+	<b>1.2010</b> <b>(7.42)***</b>	<b>1.9532</b> <b>(7.82)***</b>	<b>3.0697</b> <b>(9.76)***</b>
Adj. R <sup>2</sup>		0.3292	0.3343	0.3616
AIC		3985.6244	3979.9461	3948.8969
			(0.061)	
BBW X <sup>2</sup> test (p-value)				(0.000)
				(0.000)

\*\*\* significant at the 1% level; \*\* significant at the 5% level; \* significant at the 10% level

**Note:** In this test the sample size is 1486 firm year observations because the criterion that each firm have pro forma earnings for three consecutive years is dropped. However, there are still missing price observations from the CRSP database.

$E_t$  represents each of the earnings measures at time t.

The dependent variable represents price, three months after the firm's fiscal year end. This is obtained from the CRSP database. Price data obtained from Compustat yields identical results.

Pro forma earnings is obtained from the earnings press releases downloaded from the firms' web sites.

GAAP is obtained from the earnings press releases and in instances where this is not disclosed (less than 5%) it is obtained from Compustat (data item # A169).

Analysts' actual earnings is obtained from I/B/E/S database defined as analysts' actual earnings.

BV is shareholders equity obtained from Compustat (data item #216).

**Appendix A**  
**Review of Value Relevance of Pro Forma Literature**

**Panel A: Research using Proxies for Pro Forma Earnings**

No.	Study Authors	Date of Data Used	Source of Data Used	Pro Forma Proxy	Analysts' Actual Proxy/operating income	GAAP Earnings (If used)	Findings
1.	Bradshaw and Sloan (2002)	1986 – 1997	I/B/E/S and Compustat	I/B/E/S actual earnings	-	EBEI – Earnings before extraordinary items from COMPUSTAT	Street forecast errors are more highly associated with stock returns than with GAAP forecast errors
2.	Brown and Sivakumar (2003)	1989 – 1997 [1149 firm year observations]	I/B/E/S and Compustat	Operating income by I/B/E/S	<b>OPINC</b> – Operating income [COMPUSTAT #Q177]	<b>EBED</b> – Earnings from Continuing operations [COMPUSTAT #Q19]	Pro forma earnings are more value-relevant than a measure of operating earnings derived from firm's financial statements
3.	Doyle et al. (2003)	1988-1999 [143,462 firm-quarter observations]	Compustat, CRSP, I/B/E/S	I/B/E/S actual earnings	Basic or diluted EPS per share before special items, extraordinary items and discounted operations [COMPUSTAT #177 matched to I/B/E/S definition]	Basic or diluted income per share before special items and discounted operations (matched to I/B/E/S definition)	Expenses excluded in the determination of I/B/E/S earnings are far from unimportant. Higher levels of exclusions lead to predictably lower future cash flows. Also, investors do not fully appreciate the lower cash flow implications at the time of the earnings announcement.

**Panel B: Experimental Research and Research using Actual Pro Forma Earnings**

No.	Study Authors	Date of Data Used	Source of Data Used	Pro Forma Proxy	Analysts' Actual Proxy	GAAP Earnings (If used)	Findings
1.	Bhattacharya et al. (2003)	1998 – 2000 [1,149 press releases; 596 firms]	Earnings press release, Compustat, CRSP, and Compustat	Actual pro forma earnings	I/B/E/S actual earnings	GAAP Operating Income	Pro forma earnings are more informative and more permanent than GAAP operating earnings. Market participants also believe pro forma earnings to be more representative of core earnings.
2.	Lougee and Marquardt (2004)	1997-1999 [249 firms]	Earnings press release	Actual pro forma earnings	-	GAAP Operating Earnings	Firms with low GAAP earnings quality, as measured by the earnings-return correlation and its related R <sup>2</sup> are more likely to disclose pro forma earnings than other firms. Also, there is significantly greater relative and incremental information content of pro forma earnings over GAAP earnings when GAAP earnings quality is low and when strategic considerations are absent. Pro forma earnings also have significant predictive ability for future operating performance and returns.
3.	Bowen, et al. (2005)	2001-2002 [783 earnings press releases; 196 firms]	Earnings press release	Actual pro forma earnings	-	GAAP earnings or other recognized above line GAAP earnings number	Firms with less value-relevant earnings place greater emphasis on pro forma earnings. Firms reporting pro forma profits but GAAP losses place more (less) emphasis on pro forma (GAAP) earnings to portray a more favourable story.
4.	Frederickson and Miller (2004)	Experiment consisting of MBA students and analysts	-	-	-	-	Nonprofessional investors who see an earnings announcement that contains both pro forma and GAAP disclosures assess a higher stock price than do nonprofessionals who see an earnings announcement that contains only GAAP disclosures, whereas analysts' stock price judgments are not affected.

<b>No.</b>	<b>Study Authors</b>	<b>Date of Data Used</b>	<b>Source of Data Used</b>	<b>Pro Forma Proxy</b>	<b>Analysts' Actual Proxy</b>	<b>GAAP Earnings (If used)</b>	<b>Findings</b>
5.	Johnson and Schwartz (2005)	June – August 2000 [433 firms]	Earnings Press Releases, Compustat	Actual pro forma earnings	Zacks actual EPS	GAAP earnings from press releases  GAAP operating income from Compustat	Pro forma firms may be priced higher than non-pro forma firms but this overpricing is not related to the pro forma earnings numbers. Also no evidence of a stock return premium for pro forma firms at the quarterly earnings announcement date.
6.	Entwistle et al. (2005)	2001 [S&P 500 firms; 380 firms]	Earnings press releases, Compustat, CRSP, and I/B/E/S	Actual pro forma earnings	I/B/E/S actual earnings	GAAP net income from press release	There are distinct differences between Canadian and U.S. managers. Our evidence suggests that in both countries pro forma earnings is used by some corporations to affect users' perceptions of firm performance.
7.	Entwistle et al. (2006)	2001 – 2003 [S&P 500 firms; 1608 firms]	Earnings press releases, Compustat, CRSP, and I/B/E/S	Actual pro forma earnings	-	GAAP net income from press release	There is a 23% decline in the disclosure of pro forma by managers of S&P 500 firms over the three year period. Also, the magnitude of the difference between pro forma and GAAP earnings declined in the same period.
8.	Elliott (2006)	Experiment consisting of MBA students and analysts					Non-professional investors' judgments are influenced by the emphasis placed on pro forma profit relative to GAAP. The extent of influence is reduced if the pro forma and GAAP earnings statements are presented in a side-by-side reconciliation as opposed to a sequential presentation. However, professional investors' judgments are influenced by pro forma when earnings are presented in a side-by-side reconciliation.

No.	Study Authors	Date of Data Used	Source of Data Used	Pro Forma Proxy	Analysts' Actual Proxy	GAAP Earnings (If used)	Findings
9.	Allee et al. (2006)	1998-2003 [1,896 firms]	Earnings press release, Compustat, CRSP and I/B/E/S	Actual pro forma from press release	I/B/E/S actual earnings	Actual GAAP earnings from press release	Our results suggest that less-sophisticated investors rely significantly more on quarterly earnings press releases that include a pro forma number than on those that do not, while more-sophisticated investors exhibit the opposite behavior. This result is consistent with Frederickson and Miller's experimental evidence. Also consistent with Elliott's results, we find that less-sophisticated investors rely more on the pro forma figure when it is placed before the GAAP earnings number in the press release, while more-sophisticated investors' trading behavior is unaffected by the relative placement of the two earnings metrics.
10.	Bhattacharya et al. (2006)	1998 – 2003 [5,736 earnings press releases]	Earnings press release, Compustat, CRSP, and I/B/E/S	Actual pro forma earnings	I/B/E/S actual earnings	GAAP operating income	No association between sophisticated investors' trading and manager-reported pro forma information. Overall, the analyses suggest that the segment of the market that relies on pro forma earnings information is populated predominantly by less-sophisticated individual investors.

## **CHAPTER 3: PAPER 2**

### **THE CREDIBILITY OF PRO FORMA DISCLOSURES**

#### ***3.1. INTRODUCTION***

The previous chapter demonstrates that pro forma earnings are value relevant – in fact, that pro forma earnings provide stronger association to value than does GAAP or analyst’s actual earnings. This suggests that, in aggregate, where managers have significant discretion to disclose, that these disclosures will add value relevant information. However, this finding is across all firms that issue pro formas. One may expect that some firms are more likely to provide value relevant information and others to manage expectations (e.g., to mislead). Can the market differentiate between these motives?

If the market can identify good pro forma from bad – that is, if it can identify which firms are likely to provide value relevant information and which provide poor information – then this should lead to differential market reactions. That is, those firms which provide credible pro formas will have a larger market reaction to the release of this information.

What are the attributes or characteristics of firms which will provide more credible pro forma information? These firms are likely to have stronger governance, higher quality auditors, and have higher overall information quality. In this chapter, I test these relationships. That is, I determine whether pro forma earnings announcements for firms with better governance, auditors, and overall information quality provide greater value relevance. The study is conducted on S&P 500 firms that reported pro formas earnings between 2000 and 2004 – covering the period both before and after the implementation of the SOX Act.

### ***3.1.1. Why Pro Forma Earnings?***

This study tests whether a firm's corporate governance, auditor quality, and overall information quality will add credibility to a voluntary disclosure – that where these credibility attributes are high, voluntary disclosure will be more credible leading to a larger market reaction. This may best be tested where there is little oversight and firms have significant discretion to disclose. Pro forma earnings disclosure provides the ideal setting. First, as pro forma earnings are not audited there is no independent third party validation. Second, managers have absolute discretion to provide a pro forma measure in the firm's press release, and almost unfettered discretion (even following SOX) in determining how the earnings measure is calculated. This is in contrast to GAAP earnings which has far less discretion in its determination. Third, pro forma earnings may be reported to provide value relevant information (the typical claim by management), or to manage investor expectations (e.g., to mislead). That is, there are competing motives with evidence that some firms do so to inform and others appear to do so to mislead.

As there are few restrictions on the use and calculation of pro forma, there are potential competing motives for their disclosure. The perceived credibility of the measure is therefore of great importance. If the pro forma is viewed as credible, one would expect investors to include it in their determination of value. Conversely, if it is perceived as lacking credibility or even misleading, investors will discount the information (and may even view it negatively).

Next, the three credibility attributes – independent variables in this study – are briefly examined.

### ***3.1.2. Credibility Attributes***

A brief discussion of the credibility attributes used in the study is provided below. Note that it is these attributes that an investor can observe and which may lend credibility to the pro forma disclosure. These attributes are board characteristics, auditor quality, and overall information quality.

### ***3.1.2.1. Boards Characteristics (Corporate Governance)***

Boards of directors tend to approve management disclosures in earnings press releases prior to their being made available to the public. To avoid loss of reputation, a firm with an effective board may be less likely to approve a misleading or non-value relevant disclosure. That is, it is posited that firms with highly effective boards can provide a more credible signal that the voluntary disclosure reflects value relevant information.

Anecdotal evidence and prior research (for example, Ajinkya et al., 2005; Dey, 2005; Karamanou and Vafeas, 2005; Kanagaretnam et al., 2007) suggests that high quality corporate governance is an important factor in perceived credibility of financial information.<sup>40</sup> The recent concerns about earnings management and high profile accounting scandals have led most in the investing community to call for more stringent corporate governance. This is based on the assumption that good corporate governance is necessary for credible financial disclosure. Consistent with this, a primary objective of the Sarbanes-Oxley Act of 2002 (hereafter SOX) is to strengthen the credibility of corporate disclosures. Prior to SOX, various reports asserted that certain dimensions of corporate governance increase the credibility of financial statements. These reports include: the recommendations of the Committee of Sponsoring Organizations of the Treadway Commission (1992); the Public Oversight Board of the SEC practice division of the AICPA (1988, 1995); the Cadbury Committee Report on Financial Aspects of Corporate Governance (1992); and the Blue Ribbon Committee (1999).

Using principal component analysis on 23 dimensions of board variables (representing governance dimensions) four factors emerge in this study. These factors reflect (are interpreted as): the degree of board independence; the number of board meetings; the board structure; and the board separation of powers.

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<sup>40</sup> According to Bushman and Smith (2001) the role of governance research is to provide evidence on the extent to which information provided by the financial accounting systems mitigate agency problems, thereby facilitating the efficient flow of resources to promising investment opportunities. This efficiency is based in part on the fact that investors make resource allocation decisions based on the available information.



### ***3.1.2.2. Auditor Type***

Auditors provide investors with independent assurance that the firm's financial statements conform to GAAP. While it is easy to see why investors may regard GAAP earnings as credible – reasons which include regulation governing how GAAP earnings are prepared and penalties for deviation – the same direct relationship does not exist for pro forma earnings. Pro forma earnings are therefore unlikely to be regarded with the same level of credibility as GAAP earnings because they are not audited. However, one may expect that the quality of the firm's auditor is consistent with the overall quality of information provided by the firm.

Prior research provides evidence that external auditors, especially high quality auditors, serve as monitoring agents and help to reduce fraud and earnings management. Also, because of their greater expertise and resources, high quality auditors are able to enhance the informativeness of discretionary accruals by separating the information content from noise (Francis et al., 1999).

While pro forma earnings are not audited, firms may not be willing to place at risk the overall perception of information quality through providing non-informative pro forma. That is, if a firm uses a Big-5 audit firm – which provides a costly signal of information and firm quality – they may not wish to undermine this by providing pro forma to manage perceptions or to mislead. One may therefore expect that, while pro forma is not audited, firms with better auditors will also have more value relevant pro forma.

Conversely, one could argue that higher quality audits of GAAP earnings could lead to lower quality pro forma – a substitution effect. With a stronger auditor there may be less opportunity for a firm with high quality auditors to manage expectations within their audited information (GAAP earnings), and therefore they may decide to manage expectations through voluntary disclosure including pro forma release.

Between these two arguments – maintaining the overall information quality or a substitution effect – the first affect would appear to be the more important. That is, firms with stronger auditors will provide more value relevant pro forma.

This study therefore examines whether auditor type (measured as a Big-5 audit firm) is one of the credibility attributes which can increase the perceived credibility of pro forma earnings.

### ***3.1.2.3. Information Quality***

While not directly observable, investors will form judgments as to the overall information quality provided by a firm. Some firms will be perceived as having high information quality, and some low. In this study, I use two broad measures of overall information quality. One following Frances, Lafond, Olsson and Schipper (2005) and the other following Ecker, Francis, Kim, Olsson and Schipper (2006). The first measure provides information on whether a firm's information system is likely to provide poor or high quality information signals while the second is a returns based measure of earnings quality which is based on the investors' perceptions of earnings quality. While investors are unlikely to directly apply either of these measures, they are reasonable proxies for sophisticated investors' beliefs as to overall information quality.

### ***3.1.3. Hypotheses***

Firms may choose to release pro forma earnings in their earnings releases. The quality of this information is not directly observable. However, investors can observe firm attributes which may add credibility to the pro forma announcement. Specifically, the quality of the firms' governance and auditors, and overall historical information quality, are observable to investors. I hypothesize that the observed quality of these attributes will lend credibility to the pro forma earnings release, increasing its value relevance. The primary credibility hypotheses, developed more fully in Section 3.2 are therefore:

- *Pro forma earnings from firms with strong (poor) board characteristics have high (low) value relevance;*
- *Pro forma earnings from firms with high (low) quality auditors have high (low) value relevance.*
- *Pro forma earnings from firms with high (low) overall information quality have high (low) value relevance.*

The hypotheses are predicated on the following investor behaviour. First, investors must perceive that there are differences in pro forma information quality across firms (above we noted that these differences may be large for pro formas). Second, investors will assess the credibility of the pro forma release based on observable firm attributes including the quality of governance, auditors, and overall information. The stronger are the credibility attributes the greater the credibility given to the pro forma measure. Third, investors will react more strongly where the pro forma is perceived as credible – that is, the information will be perceived as more value relevant. To illustrate, firms with “better governance” or a big five auditor will have a more credible pro forma leading to greater value relevance of the information.

#### ***3.1.4. Dependent Variable (measure of Value Relevance)***

The dependent variable in this study is cumulative abnormal returns (CAR). As in many other academic accounting and finance studies, CARs are the measure of value relevance. The credibility of pro forma is therefore determined through regressing the interaction of pro forma and the credibility attributes on CARs measured three months after the firm’s press release date.

#### ***3.1.5. Motivation of the Study***

This study is motivated by increased concerns about the credibility of financial accounting information – has accounting lost its relevance? There is no issue more fundamental to accounting research and practice. Prior studies on the credibility of financial information have focused on GAAP based measures. Further, prior studies have tended to focus on only a single dimension of credibility. In contrast, this study examines the credibility of voluntary disclosure (in the form of pro forma earnings), where credibility is operationalized by observable attributes of the board, the auditor, and overall information quality. This study therefore adds to the literature on the credibility of management voluntary disclosure. The study also investigates whether these credibility attributes mitigate management incentives to report potentially misleading disclosures and whether they increase the perceived credibility of pro

formas. That is, do investors differentiate between pro forma created to inform, and pro forma intended to manage perceptions or mislead?

### ***3.1.6. Findings of the Chapter and Implications***

Overall, this study supports each of the three primary hypotheses. That is, strong board characteristics, auditor quality, and overall information quality enhance the credibility of pro forma thus providing greater value relevance. Specifically, two of the governance variables – board structure (*B-str*) and board separation of powers (*B-sep*) – are statistically significant across models and tests indicating that these board attributes enhance the credibility of pro formas. This study also finds that high auditor quality increases the perceived credibility of management voluntary disclosures. Lastly, the study finds that overall information quality is statistically significant at increasing the perceived credibility of pro formas.

### ***3.1.7. Organization of the Chapter***

The remainder of this chapter is structured as follows. The following section provides an overview of the literature on pro forma earnings and each of the credibility attributes and goes on to formulate the hypotheses. Section three provides a description of the variables of interest, the empirical constructs and the research design. In section four, the results of the study are presented while section five concludes.

## ***3.2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT***

### ***3.2.1. Pro Forma Earnings***

This study focuses on pro forma earnings reported in earnings press releases. Pro formas are defined as earnings prepared in a manner that varies from Generally Accepted Accounting Principles (GAAP). Unlike earnings determined under GAAP, pro forma earnings are reported under the sole discretion of management and have no specific requirements for their calculation. Two competing motives for issuing pro formas have been offered: to inform, or to manage expectations (which could be potentially misleading).

Managers argue that they use pro forma reporting to provide value relevant information beyond that provided by GAAP. Consistent with this assertion, the preceding chapter of this thesis, Bhattacharya, Christensen, Black and Mergenthaler (2004), Bradshaw and Sloan (2002) and Brown and Sivakumar (2003), all find that pro forma earnings are value relevant.

However, the predominant belief among investors, and the public at large, is that managers' purpose for reporting pro forma earnings is for strategic reasons – that is, to bias investors' perceptions of the firm upwards (Strong and Meyer, 1987; Elliott and Shaw, 1988, Schrand and Walther, 2000; Byrnes and Henry, 2001; Byrne and Elgin 2002). This belief is set against an environment in which regulators have become alert to the more traditional earnings management techniques like “cookie jar” reserves, and premature revenue recognition (Levitt 1998; Loomis 1999). Regulators and other critics of pro forma reporting take issue with the “non-standard” and “ad-hoc” nature of pro forma reporting citing it as an avenue for managers to opportunistically mislead investors, especially as these pro formas are not audited.

While some managers may report pro forma to inform, others may be doing so to mislead. Empirical evidence that pro forma is value relevant (such as in the preceding chapter) reflects an average effect. It does not imply that some firms (and perhaps a large proportion of firms) are not reporting pro forma to manage expectations rather than to inform. If firms are using different motives, the degree of value relevance will vary across pro formas.

The first hypothesis in this study examines whether – consistent with the findings in the first study in this thesis, Bhattacharya, Christensen, Black and Mergenthaler (2004), Bradshaw and Sloan (2002) and Brown and Sivikumar (2003) – pro formas are value relevant. Unlike the previous chapter that uses a returns model, this study examines the value relevance of pro forma earnings using CARs. Stated formally, this study examines the following:

H1. *Pro forma earnings are value relevant.*

### **3.2.2. Credibility Attributes**

How does an investor assess the credibility or informativeness of a particular disclosure – in this study, pro forma earnings? There is an extensive literature on the credibility of disclosures. Mercer (2004) provides a synthesis of the literature and classifies these attributes into four categories: situational incentives; management's credibility; degree of external and internal assurance; and the characteristics of the disclosure itself.

Consistent with this literature, in this study I examine the credibility of pro forma earnings announcements provided by the following credibility attributes: the strength of the board; the quality of the auditor; and the overall information quality (all aspects of corporate governance).<sup>41</sup> In the following section, these credibility attributes are further examined.

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<sup>41</sup> Note that broadly defined, corporate governance refers to the interaction of several participants including board members, internal control activities, external auditors, and managers. The optimal governance structure of a firm may involve several aspects of governance variables acting as complements of or substitutes for each other (Bushman, Chen, Engel and Smith, 2004; Perry, 2000; Agrawal and Knoeber, 1996). As a result, studies that have examined corporate governance have either examined components such as audit committee characteristics (independence, financial expertise and diligence); auditor quality, internal control system; CEO independence etc. or formed an index of these corporate governance variables and examined the relationship of the index to certain firm characteristics or disclosure. With the exception of Larcker, Richardson and Tuna (2005), studies that examine corporate governance (e.g., Gompers et al., 2003) form one dimensional governance indices which includes several governance variables but does not take into account the interactions between the variables.

### **3.2.2.1. Board Characteristics**

*An active and effective board of directors, responsible financial management, skeptical and independent auditors and attentive regulatory authorities all have responsibilities to safeguard those who invest in public corporations. Effective corporate governance of the financial reporting process is an important tool for enabling companies and their auditors to fulfill those responsibilities.*

– Arthur Levitt, Chairman

Securities and Exchange Commission

This section provides a discussion of the first credibility attribute, board characteristics. Board characteristics are a primary attribute that investors can evaluate in assessing the credibility of disclosures. In fact, ensuring that financial disclosures are credible is one of the primary roles of the board. According to the Blue Ribbon Committee, the board's primary role is to help ensure "high quality financial reporting" (PricewaterhouseCoopers 1999). In addition, this report indicates that the audit committee of the board has significant roles to play in the financial reporting process as well as being the ultimate monitor of the fairness and validity of the financial statements. Herdman (2002) reports that the audit committee of the board may help reduce opportunistic earnings management by being proactive with respect to discussing and understanding the company's critical accounting policies and by probing issues that management and the auditors give considerable attention to.

A sizeable body of prior research indicates that the market recognizes differences in the quality of monitoring controls provided by the board. This body of research indicates that boards that do a more effective job of monitoring management enhance the quality and the frequency of information released by management. Ajinkya et al. (2005) and Karamanou and Vafeas (2005) examine the impact of board structure on both the quality and quantity of corporate information disclosures. They find that companies with more effective boards issue more frequent earnings forecasts and that these

forecasts are more accurate. Similarly, Kanagaretnam et al. (2007) examine the relationship between the quality of corporate governance and information asymmetry around quarterly earnings announcements. They find that firms with higher levels of corporate governance have lower information asymmetry around quarterly earnings announcements.

In other related research, Carcello and Neal (2000) find an inverse relation between the proportion of inside or affiliated directors on the board audit committee and the likelihood of that firm receiving a 'new' going-concern report. Similarly Abbott et al. (2004) study the relationship between board audit committee independence and the likelihood of a firm restating its financial statements and committing financial statement fraud. They find a negative association between the occurrence of financial reporting restatements and (1) board audit committee independence and (2) board audit committees that meet on average four times a year. They also report that firms with independent board audit committees are less likely to commit financial reporting fraud. Beasley (1996), Dechow, Sloan and Sweeney (1995), and Klein (2002) find that less earnings management is found in firms whose boards and audit committees are independent, meet more frequently and have greater financial expertise, thus suggesting that audit committee characteristics of independence, financial expertise and diligence are associated with high information quality. Vafeas (2000) examines whether the informativeness of earnings – proxied by the earnings-return relationship – varies with board size and the proportion of outside directors on the board. He finds that the earnings of firms with the smallest boards are perceived as being more informative by market participants. However, his findings show no evidence that the proportion of outside directors on the board is related to earnings informativeness. Libby et al. (2003) also examine the role of the board of directors. They contend that the presence of outside board members acts as a signal to the market regarding the credibility of management disclosures. They find that the market values the monitoring role played by outside directors in reducing information risk associated with the firm.

Following from this research, investors should interpret the presence of good board characteristics as a signal that pro forma is credible thus leading to greater value relevance. This leads to the following hypothesis:



H2. *Pro forma earnings from firms with strong (poor) board characteristics have higher (lower) value relevance.*

### **3.2.2.2. Auditor Type**

Under the provisions of SFAS 78, *Consideration of Internal Control in a Financial Statement Audit*, auditors must obtain an understanding of how the control environment affects the overall risk of material error in the financial statements (AICPA, 1995). According to this statement, control environment factors are explicitly expanded to include typical corporate governance characteristics such as composition and function of the board and its committees, especially the audit committee. In the recent past, this concern has been raised to such a level that external auditors are now required to consider these institutional features in the conduct of their annual examinations. As a result, the external auditor, while not directly responsible for the credibility of pro formas, helps to increase financial reporting quality and consequently the quality and credibility of voluntary management disclosures which includes pro formas. It is believed that a higher quality external auditor will discharge these duties better because of their size and the amount of resources available to them.

Research on the monitoring activities of external parties such as the external auditor provides evidence of their importance in improving perceived credibility of financial disclosures. Titman and Truman (1986) provide evidence that external auditors serve as monitoring agents that act as a signal to the market that management's private information is credible and value relevant. Similarly, Teoh and Wong (1993) find that the earnings response coefficient of firms audited by a Big-8 audit firm is higher than that of firms audited by a non-Big-8 firm. They interpret this finding as evidence that investors perceive financial disclosures of firms with higher quality auditors as being more credible than those of lower quality auditors.<sup>42</sup> This study therefore hypothesizes the following:

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<sup>42</sup> Please note that while these studies present interesting findings, none has examined whether a high quality external auditor improves the perceived credibility of pro formas.

H3. *Pro forma earnings from firms with higher (lower) quality auditors have higher (lower) value relevance.*

### **3.2.2.3. Information Quality**

Overall information quality is important in assessing the perceived credibility of pro formas. While not directly observable, investors will form judgments as to the overall information quality provided by a firm. Some firms will be perceived as having high information quality, and some low. One may expect that a firm with overall high quality information would also produce more credible (i.e., value relevant) pro forma.

Two measures of overall information quality are used in this study. While investors are unlikely to directly apply either of these measures, they are reasonable proxies for sophisticated investors' beliefs as to overall information quality. The following is therefore hypothesized:

H4. *Pro forma earnings from firms with higher (lower) overall information quality have higher (lower) value relevance.*

### ***3.3. RESEARCH DESIGN AND VARIABLES OF INTEREST***

In this section, a detailed description of the research design is presented as well as the sample selection and empirical proxies employed. It begins by describing the sample selection for pro formas. The three classes of credibility attributes are then discussed, followed by the control variables. Next, the dependent variable (cumulative abnormal returns) is discussed. Summary statistics and correlation data are then presented followed by a discussion of the empirical models.

#### ***3.3.1. Sample Selection***

One of the significant differences between this study and prior pro forma studies is the way pro formas are determined. Unlike most prior studies that perform a search of the newswire for the term pro forma or other nomenclature used to refer to pro forma earnings, or that use a pro forma proxy such as analysts' actuals, this study identifies pro forma earnings through a full reading of the earnings press release. In order for a firm to be classified as a pro forma firm, it must report somewhere in its earnings press release a pro forma earnings per share (EPS) number clearly different from the GAAP number.

The releases for all firms in the S&P 500 for the period beginning March 2000 and ending February 2004 (covering five successive year ends) are read and coded. An important aspect of this five year period is that it encompasses the period during which regulation (specifically the Sarbanes Oxley Act and Regulation G) was introduced into the financial markets.

As shown in Table 1, of the initial set of firms listed in the S&P 500 index over the five year period (2,500 firm year observations) a total of 1,608 firm year observations are identified as having reported a pro forma earnings measure in their annual earnings press release. Table 1 shows a breakdown of the pro forma firms by industry and by year (with similar percentages across years). Consistent with Entwistle et al. (2006), Heflin and Hsu (2004), and Yi (2006) there is a decline in the number of firms reporting pro formas from 2000 to 2004.

[Insert Table 1 here]

To arrive at a sample for subsequent analyses, 38 firm year observations for firms missing CRSP data and 140 observations for firms missing Compustat data were eliminated. In addition, 364 observations for firms in the financial and utilities industries were eliminated because the unique nature of regulation governing the industries makes estimation of accruals intractable. This leaves a total of 1,066 firm year observations for subsequent analyses. Panel B in Table 2 provides a breakdown of the distribution of the difference between pro forma and GAAP earnings for the sample of firms.<sup>43</sup> Note that, consistent with prior research, the mean difference between pro forma earnings and GAAP earnings is positive. That is, on average pro forma is income increasing.

[Insert Table 2 here]

### ***3.3.2. Variable Measurement and Data Reliability***

To determine whether firms disclosed a pro forma earnings measure, the earnings press release is fully analyzed. These press releases are primarily obtained from firm's web sites. Where they are not available from the web, the firms are contacted by e-mail for a copy of their press release. In order to determine if the press release has a pro forma measure or not, a detailed and time intensive coding process is adopted. Although the process involves some judgment, it is a reliable means for identifying which firms reported pro forma earnings in the press release. To be considered a pro forma earnings disclosure, an alternative measure of earnings (to GAAP earnings for the year) has to be provided in the press release, either in the headline or in the body of the press release. A second criterion is that this measure has to be provided on a per share basis.

For reliability, a significant number of test cases in each of the five years are independently coded by individuals well trained in the coding protocol.<sup>44</sup> Results from this independent coding are compared with the initial coding and only in a few cases are

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<sup>43</sup> The reduced sample appears similar to the full sample. Tests of differences in the mean of the two distributions (Panel C of Table 1 and Panel B of Table 2) fail to reject equality of the mean. Thus there is a high degree of comfort that the sample appropriately represents the population of S&P 500 firms.

<sup>44</sup> Inter-rater reliability and test-retest reliability are both high (98%) for a sample of 100 press releases for 2002, 2003 and 2004.

differences observed. In those cases (less than 2%) a consensus is obtained as to whether pro forma earnings exist and the amount.

In the following section, a detailed discussion of the empirical constructs for the credibility attributes (the independent variables) is presented followed by a discussion of the empirical construct for the dependent variable – cumulative abnormal returns.

### ***3.3.3. Operationalizing Board Characteristics***

Data on board variables is obtained from the Institutional Shareholder Services (ISS) database of corporate governance. This database covers a wide variety of companies and provides information including that relating to board of directors.<sup>45</sup>

Board characteristics refers to the interaction of several variables which include board committees, number of board and board committee meetings, separation of CEO and chairman, structure of the board, board tenure and board voting system. As it is not econometrically feasible to include individually each board variable from the board database, principal components analysis (PCA) of the available variables is used to obtain a reduced set of board characteristics which is then used in the study.<sup>46</sup>

PCA is an effective data reduction tool that creates a reduced set of variables by summarizing the common information in the observed data. It reduces redundancy in the data by creating a set of variables or principal components that account for most of the variance in the data. These reduced variables or components are then used as a measure of the underlying board characteristics construct. In this study, various board characteristics such as number of board meetings, board committees, separation of CEO and chairman, structure of the board, board tenure and board voting system to name a few, are considered. See Appendix 1 for a detailed description of the 23 board governance dimensions considered, their meaning and the coding scheme adopted. Table 3 provides descriptive statistics of the governance variables prior to the PCA while Table 4 provides bivariate correlations of the board variables.

[Insert Table 3 here]

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<sup>45</sup> The corporate governance variables are extracted from this database.

<sup>46</sup> Larcker et al. (2007) is another paper that utilizes this technique.

[Insert Table 4 here]

As seen in Table 4, some of the variables are highly correlated and may effectively serve as substitutes for each other. For example, the presence of a corporate governance committee and the presence of a nominating committee are highly correlated (.507).

In PCA, one of the most commonly used criteria for deciding on the number of components is the eigenvalue-one criterion, also known as the Kaiser criterion (Kaiser, 1960). In this approach, you retain and interpret all components that have an eigenvalue greater than 1.00. The rationale is straightforward. Any component that displays an eigenvalue greater than 1.00 is accounting for a greater amount of variance than is contributed by one variable and vice versa. Stevens (1986) reviews studies that investigate the accuracy of the eigenvalue-one criterion and recommends its use when less than 30 variables are being analyzed and communalities are greater than 0.70, or when the analysis is based on more than 250 observations. In addition to the eigenvalue-one criterion, Rummel (1970) suggests that each retained component should have at least three variables loading onto it when the procedure is complete. Thus, these two criteria are simultaneously applied in choosing components to be retained for the corporate governance variables. See Appendix 2 for a more detailed discussion of the PCA procedure.

The results of the PCA are presented in Table 5. The board variables load onto four main factors which are defined descriptively as the independence of the board (***B-ind***), the number of meetings of the board and board committees (***B-meet***), the structure of the board (***B-str***), and the separation of powers between the chairman of the board and the CEO (***B-sep***). These four constructed variables are used in the subsequent analysis. ***B-ind*** includes affiliated directors, number of independent directors, and relatives on the board. Each measure that loaded into ***B-meet*** relates to the number of either board meetings or committee meetings. The measures that load onto ***B-str*** include: classified board, cumulative voting, board size, ownership, board tenure, and independent directors on the nominating committee. The last factor, ***B-sep***, includes such measures as board committees, separate chair, presence of a lead director and employee representative.

[Insert Table 5 here]

The method used to compute each of the governance factors is such that higher scores for *B-ind*, *B-str*, and *B-ind* correspond to a higher quality on the governance dimension. It is unclear whether higher scores on *B-meet*, indicating a higher number of meetings, would indicate a higher or lower level of governance. Meeting more often may be a good thing (indicating greater attention) or a bad thing (indicating a firm in crisis). Therefore, we do not sign this one constructed variable.

#### ***3.3.4. Operationalizing Auditor Type***

Examining the impact of the quality of the external auditor is important given that the auditor is an external monitor that expresses an opinion on the fairness of mandated disclosure. If the auditor's opinion conveys that financial information is presented fairly, then investors may perceive non-GAAP disclosures to be credible because the same information environment that produces the mandated earnings information is also responsible for providing the voluntary disclosure. Also, while pro forma earnings are not audited, firms may not be willing to place at risk the overall perception of information quality (signaled by the use of a Big-5 audit firm) by providing non-informative pro forma.

Auditor quality is a dichotomous variable that is coded as one if the external auditor is a Big-5 firm and zero otherwise. This data is obtained from Compustat. As an additional test, given the demise of Arthur Andersen, the sensitivity of the results to Arthur Andersen is examined. This is done relative to the Big-5. That is, among the firms that have a Big-5 auditor, if the firm's external auditor is Arthur Andersen, this is coded one. Otherwise, it is coded zero.<sup>47</sup>

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<sup>47</sup> When this is coded relative to all other firms, the results remain unchanged.

### 3.3.5. Operationalizing Overall Information Quality (OIQ)

This study uses two measures of overall information quality, both described below. The first, referred to as EQ is an earnings quality metric that is accounting based and the second referred to as e-loading (Ecker et al. 2006) is a returns based representation of earnings quality.

#### 3.3.5.1. Earnings Quality

The first proxy for overall information quality follows Francis, Lafond, Olsson and Schipper (2005). This measure, known as  $EQ$ , provides information on whether a firm's information system is likely to provide poor or high quality information signals. Essentially, their model attempts to determine the variability of total accruals after economic factors have been accounted for. To do this they measure the standard deviation of the residuals from an accrual equation. Specifically, Francis et al. (2005) perform the following two part test. First, they calculate McNichols' (2002) modification of Dechow and Dichev's (2002) model. This modified model relates current accruals to lagged, current and future cash flows from operations as well as change in revenues and property, plant and equipment. This model is specified as follows:

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \phi_{0,j} + \phi_{1,j} \frac{CFO_{j,t-1}}{Assets_{j,t}} + \phi_{2,j} \frac{CFO_{j,t}}{Assets_{j,t}} + \phi_{3,j} \frac{CFO_{j,t+1}}{Assets_{j,t}} + \phi_{4,j} \frac{\Delta Rev_{j,t}}{Assets_{j,t}} + \phi_{5,j} \frac{PPE_{j,t}}{Assets_{j,t}} + \varepsilon_{j,t} \quad (1)$$

where:

$TCA_{j,t}$  = firm  $j$ 's total current accruals in year

$t = (\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t})$ ;

$Assets_{j,t}$  = firm  $j$ 's average total assets in year  $t$  and  $t-1$ ;

$CFO_{j,t}$  = cash flow from operations in year  $t$ . This is calculated as net income before extraordinary items (NIBE, Compustat data item #18) less total accruals (TA), where  $TA = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t} - DEPN_{j,t}$ , where



$\Delta CA_{j,t}$  = firm  $j$ 's change in current assets (Compustat data item #4)  
 between year  $t-1$  and year  $t$ ;  
 $\Delta CL_{j,t}$  = firm  $j$ 's change in current liabilities (Compustat data item #5)  
 between year  $t-1$  and year  $t$ ;  
 $\Delta Cash_{j,t}$  = firm  $j$ 's change in cash (Compustat data item #1) between year  
 $t-1$  and year  $t$ ; and  
 $\Delta STDEBT_{j,t}$  = firm  $j$ 's change in debt in current liabilities (Compustat  
 data item #34) between year  $t-1$  and year  $t$ ;  
 $DEPN_{j,t}$  = firm  $j$ 's depreciation and amortization expense (Compustat  
 data item #14) in year  $t$ ; and  
 $\Delta Rev_{j,t}$  = firm  $j$ 's change in revenues (Compustat data item #12) between year  $t-1$  and  
 year  $t$ ;  
 $PPE_{j,t}$  = firm  $j$ 's gross value of property, plant and equipment (Compustat data item #7)  
 in year  $t$ ; and  
 $\varepsilon_{j,t}$  = Residual.

Equation (1) is estimated for each firm using data from 1996 – 2004. Similar to Francis et al. (2005) each firm is used as its own benchmark rather than estimating equation (1) by industry and using an industry-benchmark.<sup>48</sup> Also Equation (1) includes both lead and lag terms which effectively requires that each firm have information from 1995 – 2005.

Second, firm and year specific residuals,  $\varepsilon_{j,t}$  form the basis for the information quality metric,  $EQ$ . That is, the information quality for each firm for each year is calculated from the residuals from equation (1).  $EQ_{j,t} = \sigma(\hat{\varepsilon}_{j,t})$  is equal to the rolling

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<sup>48</sup> The objective is to reduce noise in the measure of accruals quality. Francis et al. (2005) document that as a result of the requirement of time-series of observations about each firm, there is a potential bias in favour of large firms in their data set. This is a bias which this study will face as well as my sample is composed of large surviving firms. This bias should be taken into consideration in interpreting the results of this study. More pertinent to this study is the absence of a long enough time series of observations. As a sensitivity test, equation (1) is also estimated by industry using an industry-benchmark and the results are similar.

five year standard deviation of firm  $j$ 's estimated residuals from year  $t-4$  to year  $t$ . To illustrate, for year 2000,  $EQ$  is equal to the standard deviation of the residuals from year 1996-2000. To ensure that market participants have access to the same data that is used to calculate information quality, I ensure that the period  $t$ 's correspond in both the information quality tests and the perceived credibility tests. Unlike Francis et al. (2005), the earnings quality metric is reverse coded in this study such that large (small) values of  $EQ_{j,t}$  correspond to good (poor) information quality.

### 3.3.5.2. E-Loading

A second measure of overall information quality (e-loading) is also used in this study. This measure is a representation of earnings quality following Ecker et al. (2006). Ecker et al. create an accounting-based measure of accruals quality  $AQ_{j,T}$  using a restricted sample of firms and convert  $AQ$  to a time specific returns representation ( $AQfactor_t$ ). In order to obtain the e-loading, the following firm-year specific regression is run using the time-specific returns representation ( $AQfactor_t$ ):

$$R_{j,t} - R_{F,t} = \alpha_{j,T}^{1f} + \beta_{j,T}^{1f} (R_{M,t} - R_{F,t}) + e_{j,T}^{1f} AQfactor_t + \varepsilon_{j,t}^{1f} \quad (2)$$

where

- $t$  = index for the number of trading days in year  $T$ ;
- $R_{j,t}$  = firm  $j$ 's return on day  $t$ ;
- $R_{F,t}$  = the risk free rate on day  $t$ ;
- $R_{M,t}$  = the market return on day  $t$ ;
- $e$  = e-loading; the coefficient on  $AQfactor$  which is the measure of information quality;
- $AQfactor_t$  = the difference between the daily returns of the highest and poorest accounting accruals quality firms; and
- $\varepsilon_t$  = the error term.

The firm year representation of earnings quality (e-loading) is the coefficient on the *AQfactor*.<sup>49</sup> According to Ecker et al. an advantage of this measure is that it is not constrained to be slow to change unlike the accounting data representation which has a mechanical dependence year over year.

### 3.3.6. Additional Independent (control) Variables

Following prior studies, we include control variables to ensure less biased econometric results. These variables control for those firm characteristics that are related to earnings informativeness. These variables are as follows:

Growth (*Growth* in the tables), controls for the anticipated higher future earnings in growth forms. The proxy for growth is the book-to-market ratio, as operationalized by Ettredge et al. (2005).<sup>50</sup>

Loss (*Loss* in the tables) controls for the differential valuation of loss firms as well as the persistence of earnings. The proxy for this is a dummy variable equal to one if next year's earnings are negative and zero otherwise as operationalized by Hayn (1995). This variable also controls for the differential valuation of loss firms.<sup>51</sup>

Current (*Current* in the tables) controls for the timeliness of earnings. Bad news is timelier than good news and is more likely to be reflected in returns faster than good news. Timeliness of earnings is proxied by a dummy variable as operationalized by Basu (1997) and is coded one for negative contemporaneous return,  $R_t$ , and zero otherwise. Returns are obtained from the CRSP annual database.

Earnings uncertainty (*Var* in the tables) controls for the dispersion in earnings. More variable earnings are less predictable. Earnings uncertainty is calculated by dividing the absolute standard deviation of a company's percentage change in EPS over

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<sup>49</sup> I thank Ecker et al. for making their *AQfactor* data available for use. The earnings quality measure reported above is the one factor model. Ecker et al. also suggest a three factor model following the regression:

$$R_{j,t} - R_{f,t} = \alpha_{j,T}^{3f} + \beta_{j,T}^{3f} (R_{M,t} - R_{F,t}) + s_{j,T}^{3f} SMB + h_{j,t}^{3f} HML + e_{j,T}^{3f} AQfactor_t + \varepsilon_{j,t}^{3f}$$

This is also used in this study as a sensitivity test.

<sup>50</sup> Book value is Compustat data item (#216) while market value is Compustat data items (#25\*#199).

<sup>51</sup> Earnings are obtained from Compustat data item #216.

20 quarters by the company's average four quarter percentage for 20 quarters. This is obtained from the Compustat annual data file.

Size (*Size* in the tables) controls for the size of the organization. Larger organizations have a richer information environment, therefore may have more informative earnings. Size is measured as the log of the firm's total assets.<sup>52</sup>

### 3.3.7. *Dependent Variable*

The dependent variable is measured as cumulative abnormal return (CAR). The association between CAR and the interaction terms (i.e. of the credibility attributes and pro forma) gives an indication of the credibility of the pro forma earnings measure. CAR is estimated using a market model as in Hackenbrack and Hogan (2002). Using earnings informativeness as a measure of perceived credibility is not new to the literature. Teoh and Wong (1993) use the informativeness of earnings as a measure of earnings credibility.

A three month window is used as it provides adequate time for the market to impound information contained in earnings releases.<sup>53</sup> The market model is defined as follows:

$$CAR_{j,t} = \sum_{t \in A_j} R_{j,t} - R_{m,t} \quad (3)$$

where:

$CAR_{j,t}$  = cumulative abnormal return for firm  $j$  at time  $t$ ;

$t \in A_j$  = represents the announcement window which is three months after the firm's announcement date. As a sensitivity test, a three day announcement window around the earnings announcement date is also used;

$R_{j,t}$  = the return to firm  $j$ , at time  $t$  which is three months after the announcement date;

and,

$R_{m,t}$  = the value weighted return to the market for the same time period.

In the following section, the summary statistics and correlations are presented.

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<sup>52</sup> Obtained from the Compustat annual data file (data item A6).

<sup>53</sup> A three day window is also used and the results are unchanged.

### **3.3.8. Summary Statistics and Correlations**

Table 6 presents descriptive statistics of the primary variables of interest used in the study and the control variables. While there is a bias towards larger firms, mean (median) of log assets 3.943 (3.915) representing about \$8 billion, there is variation among the size of the companies (standard deviation = 0.5510) representing about \$3.5 billion. The mean (median) of the pro forma earnings measure, \$1.88 (\$1.59) is greater than the GAAP equivalent \$1.17 (\$1.18). This is consistent with prior studies that have found that pro forma measures are positively biased and greater than GAAP earnings measures. This income increasing characteristic may lead market participants to perceive pro forma earnings as lacking credibility.

[Insert Table 6 here]

Table 7 presents the Spearman correlations between the independent variables used in the various regressions. The signs on the correlations are largely as one would expect.<sup>54</sup> The two overall information quality measures, EQ and e-loading are correlated at the .473 level. Auditor quality is also positively correlated with the size of the firm and with the overall information quality measures.

[Insert Table 7 here]

### **3.3.9. Models**

In this section, the empirical models used to test the hypotheses are presented – that is, the value relevance of the credibility attributes on pro forma earnings is examined.

As noted above, value relevance is assessed using cumulative abnormal returns – that is, we examine the market’s reaction in the period immediately following release of the pro forma earnings announcement. To test the credibility hypotheses (H2 through

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<sup>54</sup> Note that while GAAP earnings is not used in the study, it is provided as a reference point for the correlations.

H4), the focus is the interaction between pro forma and the three categories of credibility attributes. For each category of the credibility attribute we run similar tests.

### 3.3.9.1. Test of H1: the Pro Forma Main Effect

The simplest test of H1 (the main effect for pro forma) is as follows:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \varepsilon_{j,t} \quad (4)$$

where:

$CAR_{j,t}$  = cumulative abnormal return for firm  $j$  at time  $t$ ; and

$PF_{j,t}$  = pro forma earnings for firm  $j$  at time  $t$ .

However, as discussed above, we control for omitted variables which are related to the informativeness of earnings. These variables include:

- Market-to-book ratio is used to control for growth (*Growth*);
- Earnings persistence (*Loss*) is coded 1 if next year's earnings are negative and 0 otherwise;
- Contemporaneous return (*Current*) is coded 1 for negative returns  $R_t$  and 0 otherwise;
- Firm level earnings variability (*Var*) is calculated by dividing the absolute standard deviation of a company's percentage change in EPS over 20 quarters by the company's average four quarter percentage for 20 quarters. This is obtained from the Compustat annual data file; and
- Firm size (*Size*) is measured as the natural log of market capitalization each year.

Including these control variables provides the following specification:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 Growth_{j,t} + \lambda_3 Loss_{j,t} + \lambda_4 Current_{j,t} + \lambda_5 Var_{j,t} + \lambda_6 Size_{j,t} + \varepsilon_{j,t} \quad (5)$$

### 3.3.9.2. Test of H2: the Effect of Governance

The following test on the value relevance of credible pro forma is estimated:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \sum_{k=1}^4 \lambda_{k+1} (PF_{j,t} * Gov_{k,j,t}) + \varepsilon_{j,t} \quad (6)$$

where:

$CAR_{j,t}$  = cumulative abnormal return for firm  $j$  at time  $t$ ;

$PF_{j,t}$  = pro forma earnings for firm  $j$  at time  $t$ ; and

$(GOV)_{k,j,t}$  = represents each of the four components of corporate governance from the PCA for firm  $j$  at time  $t$ .

Including the control variables provides the following specification:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \sum_{k=1}^4 \lambda_{k+1} (PF_{j,t} * Gov_{k,j,t}) + \lambda_6 Growth_{j,t} + \lambda_7 Loss_{j,t} + \lambda_8 Current_{j,t} + \lambda_9 Var_{j,t} + \lambda_{10} Size_{j,t} + \varepsilon_{j,t} \quad (7)$$

### 3.3.9.3. Test of H3: the Effect of Auditor Quality

The equivalent equations to examine the impact of auditor quality are as follows:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF_{j,t} * auditorq_{j,t}) + \varepsilon_{j,t} \quad (8)$$

Including the control variables provides the following specification:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF_{j,t} * auditorq_{j,t}) + \lambda_3 Growth_{j,t} + \lambda_4 Loss_{j,t} + \lambda_5 Current_{j,t} + \lambda_6 Var_{j,t} + \lambda_7 Size_{j,t} + \varepsilon_{j,t} \quad (9)$$

In these models, the term *auditorq* refers to auditor quality. Recall that this is coded as 1 if the firm is audited by a big-5 audit firm and zero otherwise. As an additional test, this study examines the sensitivity of the findings on auditor quality to Arthur Andersen.

#### 3.3.9.4. Test of H4: Effect of Overall Information Quality (OIQ)

The equivalent equations to examine the impact of overall information quality are as follows:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF_{j,t} * OIQ_{j,t}) + \varepsilon_{j,t} \quad (10)$$

where *OIQ* refers to information quality which is measured in two ways as discussed above – the first an accounting based measure referred to in this study as *EQ* and the second a returns based measure referred to by the authors as *e-loading* 1 factor.

Including the control variables provides the following specification:

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF_{j,t} * OIQ_{j,t}) + \lambda_3 Growth_{j,t} + \lambda_4 Loss_{j,t} + \lambda_5 Current_{j,t} + \lambda_6 Var_{j,t} + \lambda_7 Size_{j,t} + \varepsilon_{j,t} \quad (11)$$

The above tests are run separately for expositional purposes. A single regression including board characteristics, auditor type and overall information quality provides consistent results.



### **3.4. RESULTS OF EMPIRICAL TESTS**

This section presents the results of the empirical tests outlined in the previous research design section. While the results of the tests reported use CARs computed over a three month window, tests using CARs computed three days around the press release announcement window (untabulated) yield similar results.

#### **3.4.1. Results from the Test of H1: The Pro Forma Main Effect**

The results for the test of the main variable, pro forma, are provided in Table 8. Consistent with the prior chapter in this thesis, and Bhattacharya, Christensen, Black and Mergenthaler (2004), Bradshaw and Sloan (2002), and Brown and Sivakumar (2003), in aggregate pro forma releases are value relevant. It is statistically significant at the 1% level for the restricted model (equation 4) and at the 5% level for the equation which incorporates the control variables (equation 5). Of the control variables, *Loss* and *Current* are in the hypothesized direction and are statistically significant at the 1% level. The coefficient on *Growth* is not significantly different from zero, while the coefficient on *Size* is significantly negative [-.0715 (t-stat = -3.52)]. This inverse relationship between *Size* and *CAR* could be due to a more complex information environment for large firms and its corresponding higher risk (Lu, 2007). Also, note that the adjusted R<sup>2</sup> for the constrained regression is only about 1%. This is not surprising as earnings measures alone tend to have very low explanatory power in explaining abnormal returns. Including the control variables, the explanatory power of the model increases to 20.53%

[Insert Table 8 here]

#### **3.4.2. Results from the Test of H2: The Effect of Governance**

The results for the test of the second hypothesis [H2] are reported in Table 9. This hypothesis suggests that there is a positive association between the perceived credibility of pro forma earnings and board characteristics. That is, that the perceived credibility of pro forma increases with the strengthening of board characteristics.

The variables of interest are the interaction between pro forma earnings and the board variables. Overall, there is strong support that governance provides credibility to

pro forma earnings – that is, that the interaction terms are statistically significant in the hypothesized direction. The interaction terms related to meetings ( $PF*B-meet$ ), structure ( $PF*B-str$ ) and separation ( $PF*B-sep$ ) are statistically significant in each of the regressions. Note that none of the regressions for the interaction term related to independence ( $PF*B-ind$ ) is statistically significant although they are in the hypothesized direction. Note also that while the regressions for the interaction term related to meetings ( $PF*B-meet$ ) are statistically significant, they are negative. This is consistent with the second explanation provided in the theory section – that a larger number of meetings may indicate distress in the firm leading to reduced credibility in pro forma earnings.

Of interest, in adding the effects of governance, the explanatory power of the constrained equation increased from an  $R^2$  of .0095 (Table 8) to .0271 (Table 9). That is, adding the governance credibility measures roughly tripled the explanatory power of pro forma in explaining cumulative abnormal returns.

[Insert Table 9 here]

### ***3.4.3. Results from the Test of H3: The Effect of Auditor Quality***

Table 10 presents the results of the test of the hypothesis that auditor quality increases the perceived credibility of pro forma earnings. Recall that in this test, the proxy for auditor quality is the size of the audit firm (Big 5 versus others). The variable of interest is the interaction between pro forma and auditor quality. As predicted, the interaction is positive and statistically significant at conventional levels across all models.

[Insert Table 10 here]

Following the events at Enron and the subsequent demise of Arthur Andersen, the study further examines whether investors perceive the pro forma earnings of firms that were audited by Arthur Andersen as being credible. The results (not tabulated)

suggest that investors perceived pro formas of firms that were audited by Arthur Andersen to be less credible than the pro formas of other Big-5 firms.

#### ***3.4.4. Results from the Test of H4: The Effect of Information Quality***

Tables 11 and 12 present the results of the test of the hypothesis that overall information quality increases the perceived credibility of pro forma earnings. The two measures of overall information quality are used. The first measure, *EQ*, is an accounting based measure of earnings quality and the second measure, *e-loading*, is a returns based measure of earnings quality. As in previous tests, the variable of interest is the interaction between the overall information quality variable and pro forma. As predicted in H4, the higher the quality of information that the firm reports, the more credible is its pro forma. Table 11 documents the results using the *EQ* measure. Table 12 reports the results of the regression using *e-loading*. All the variables of interest in all the four models are statistically significant and in the hypothesized direction. That is, the results are consistent across two very different measures of overall information quality.

[Insert Table 11 here]

[Insert Table 12 here]

### **3.5. CONCLUSION**

#### **3.5.1. Summary of Findings and Conclusion**

This study questions whether investors can differentiate between good and bad pro forma leading to differential market reactions. The premise is that if investors can differentiate between credible pro formas and pro formas that lack credibility, then good or credible pro formas will lead to a larger market reaction. However because managers' motivations in reporting pro formas cannot be observed, credibility attributes such as the characteristics of the board, the quality of the external auditor and the overall information quality of the firms' financial statements are used as a basis for the credibility of firms' pro forma earnings. Thus, this study examines the relationship between board characteristics, auditor quality, overall information quality and the credibility of pro formas. The chapter hypothesizes that the credibility of pro formas is related to the strength of board characteristics, the quality of the external auditor and the overall quality of information.

The study first finds that the 23 board governance dimensions analyzed distil into four major board characteristics. These are board structure, board separation of powers, board independence and board meetings. Second, the study finds that three of these board characteristics, board structure, board separation and board meetings, are strongly related to the credibility of pro forma earnings (i.e., these board characteristics are more likely to influence the perceived credibility of pro formas). Specifically, the study finds that board structure and separation of powers are most strongly and positively related to the credibility of pro forma earnings (i.e. the greater the structure of the board and the more board powers are separated, the more credible investors perceive pro formas to be). Note also that while the number of board meetings is statistically significant, it has a negative coefficient. This could suggest that having more meetings may not be a good thing as it could be related to more difficult issues that have to be addressed leading to less perceived credibility – that is, it is a bad signal.

The study also finds that external auditor quality is associated with the perceived credibility of pro formas. In all the models examined, the interaction between auditor quality and pro formas is statistically significant and positive. This finding suggests that while pro forma earnings are not audited, firms are not willing to place at risk the overall

perception of information quality through providing non-informative pro forma. That is, if a firm uses a Big-5 audit firm – which provides a costly signal of information and firm quality – the firms are less likely to undermine this signal by providing pro formas that are intended to manage perceptions or to mislead. When Arthur Andersen is controlled for, relative to other Big-4 firms the results are that pro formas of firms that are audited by Arthur Andersen are less credible than those of other Big-5 audit firms.

Lastly, the two measures of overall information quality provide evidence that overall information quality is associated with the perceived credibility of pro formas. That is, while not directly observable, investors are able to form judgments as to the overall information quality provided by a firm and apply this judgment to pro forma earnings.

In conclusion, the results of these tests provide support for the claim that investors perceive credibility attributes such as board characteristics, auditor quality and overall information quality, to be useful in inferring the credibility of pro formas. These findings are robust to alternative specifications, for example, using a different window to determine the cumulative abnormal returns.

In summary, managers have significant discretion to disclose pro forma earnings. This discretion can be used in one of two ways: to inform (to provide value relevant information), and to manage expectations (e.g., to mislead). This study examines whether the credibility attributes are associated with an increase in the perceived credibility and value relevance of pro forma earnings. That is, based on credibility attributes, is the market able to attribute credibility to certain pro formas while discounting others? These results are consistent with the following. First, investors do perceive that there are differences in pro forma information quality across firms. Second, investors assess the credibility of the pro forma release based on observable firm attributes including the quality of governance, auditors, and overall information. The stronger are the credibility attributes, the greater the credibility given to the pro forma measure. Finally, investors will react more strongly where the pro forma is perceived as credible – that is, the information will be perceived as more value relevant.

This study contributes to the empirical evidence on the association between board characteristics, auditor quality and overall information quality in terms of the

credibility of voluntary disclosures. To shareholders and managers, the results suggest that a stronger governance environment, for example, having a high quality board and having high quality auditors, enhances the credibility of corporate disclosures and most notably, in this study, the disclosure of pro forma earnings.

From a regulatory standpoint, it is important to note that this study covers a period of heightened interest regarding corporate governance, including the introduction of SOX. Hence regulators will be interested in the finding that a better governance environment does improve investors' confidence in the credibility of financial disclosures.

### ***3.5.2. Limitations and Future Research***

This study has two primary limitations. The first relates to the sample of firms used. While I use a major set of visible firms, being the S&P 500 firms, the results may differ if a different set of firms is used. Second, this study uses an important set of attributes to proxy for credibility. However, there are other variables that may also impact the credibility of firms' disclosures. Future research can address these limitations, for example, other studies can use the Russell 1000 or other expanded set of firms. To address the second limitation, future studies can examine other variables such as the impact of situational factors like management compensation on the credibility of firms' disclosures.

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**Table 1- Sample Selection****Panel A: S&P 500 Firms Reporting Pro Forma for the Period 2000-2004**

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<b>Year</b>	<b>Number</b>	<b>Percent</b>
2000	367	73%
2001	380	76%
2002	331	66%
2003	264	53%
2004	266	53%
<b>Total observations</b>	<b>1,608</b>	

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**Panel B: Sample Pro Forma Firms by Industry**

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<b>Industry</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Total</b>
Basic Materials	26 (7%)	26 (7%)	22 (7%)	14 (5%)	14 (5%)	102 (6%)
Services	51 (14%)	54 (14%)	49 (15%)	42 (16%)	38 (14%)	234 (15%)
Health Care	38 (10%)	40 (11%)	39 (12%)	30 (11%)	37 (14%)	184 (11%)
Technology	80 (22%)	83 (22%)	69 (21%)	47 (18%)	52 (20%)	331 (21%)
Consumer Goods	24 (7%)	25 (6%)	23 (7%)	19 (7%)	18 (7%)	109 (7%)
Industrial Goods	49 (13%)	49 (13%)	42 (12%)	34 (13%)	21 (8%)	195 (12%)
Utilities	24 (7%)	26 (7%)	29 (9%)	24 (9%)	28 (10%)	131 (8%)
Energy	19 (5%)	19 (5%)	16 (5%)	16 (6%)	19 (7%)	89 (6%)
Financial	56 (15%)	58 (15%)	42 (12%)	38 (15%)	39 (15%)	233 (14%)
<b>Total</b>	<b>367</b>	<b>380</b>	<b>331</b>	<b>264</b>	<b>266</b>	<b>1,608</b>

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**Panel C: Pro Forma EPS Less GAAP EPS**

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	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
<b>Per share Difference (Pro Forma – GAAP)</b>					
Average	\$0.26	\$0.80	\$1.29	\$0.32	\$0.45
25 <sup>th</sup> percentile	\$0.00	\$0.08	\$0.05	\$(0.04)	\$(0.06)
Median	\$0.03	\$0.34	\$0.34	\$0.13	\$0.09
75 <sup>th</sup> percentile	\$0.37	\$0.93	\$1.19	\$0.48	\$0.48

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**Table 2- Sample Selection****Panel A: Sample Selection Process**

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1.	Total number of firm year observations	1,608
2.	Less observations with missing returns data from CRSP	38
3.	Less observations with missing COMPUSTAT data	140
4.	Less banks, other financial institutions and utilities	364
<b>5.</b>	<b>Total observations used in study</b>	<b>1066</b>

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**Panel B: Pro Forma EPS Less GAAP EPS**

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<b>Per share Difference (Pro Forma – GAAP)</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Average	\$0.25	\$0.76	\$1.29	\$0.31	\$0.40
25 <sup>th</sup> percentile	(\$0.02)	\$0.09	\$0.05	(\$0.04)	(\$0.07)
Median	\$0.10	\$0.32	\$0.34	\$0.12	\$0.08
75 <sup>th</sup> percentile	\$0.38	\$0.87	\$1.09	\$0.46	\$0.45

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<b>Table 3</b>				
<b>Descriptive Statistics of Coded Governance Variables from ISS Database</b>				
	<b>Governance Variable</b>	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>
1.	Board Size	0.1728	0.0	0.3782
2.	Classified Board	0.5958	1.0	0.4908
3.	Cumulative Voting	0.1028	0.0	0.3038
4.	Relatives on Board	0.8959	1.0	0.3054
5.	Representatives on the Board	0.0021	0.0	0.0455
6.	Affiliated Directors	1.3877	1.0	1.4944
7.	Independent Directors	0.8594	1.0	0.3516
8.	Separate Chair	0.2222	0.0	0.4158
9.	Lead Director	0.1882	0.0	0.3910
10.	Nominating Committee	0.9034	1.0	0.2955
11.	Corporate Governance Committee	0.7189	1.0	0.4496
12.	Executive Committee	0.4420	0.0	0.4967
13.	Compensation Committee	0.9959	1.0	0.0643
14.	Independent directors on the nominating committee	0.5307	1.0	0.4992
15.	Independent directors on the compensation committee	0.7973	1.0	0.4021
16.	Independent directors on the audit committee	0.7177	1.0	0.4502
17.	Board Meetings	7.8735	7.0	3.4127
18.	Nominating Committee Meetings	2.8736	3.0	2.2888
19.	Compensation Committee Meetings	4.9594	5.0	2.3455
20.	Audit Committee Meetings	6.1041	5.0	3.0628
21.	Ownership	0.9096	1.0	0.2868
22.	Employed Directors	1.8545	2.0	1.1095
23.	Board Tenure	0.0422	0.0	0.2013

This table presents the descriptive statistics of the individual board dimensions used in the PCA procedure to obtain the board variables. See Appendix 1 for a description of each of the variables. Note that although the variables for affiliated directors (item 6) and employed directors (item 22) have been presented in the table as positive numbers, they are reverse coded in the PCA (are coded as negative numbers) for ease of interpretation. That is, more affiliated directors and employed directors are generally perceived as weakening the governance structure.

**Table 4**  
**Correlations of Coded Governance Variables from ISS Database**

	Board Size	Class. Board	Cum. Voting	Reatives on Board	Reps on board	Aff. Directors	Ind. Directors	Separate Chair	Lead Director	Nomination Committee	Corp. Gov. Committee
Board size											
Class. Board	-.043*										
Cum. Voting	.014	-.061**									
Rel. on board	.066**	.054**	.080**								
Reps on board	-.024	.019	-.015	.016							
Aff. Directors	.193**	.035	.094**	.265**	-.013						
Ind. Directors	-.607**	.093**	.050*	.127**	-.003	.252**					
Separate chair	.008	.003	-.056**	.125**	.019	-.048*	-.105**				
Lead director	-.022	.003	-.020	.060**	-.022	.061*	.080**	-.038			
Nom. Comm	-.172**	.040	-.023	.128**	.015	.065**	.331**	-.035	.147**		
Corp. Gov. comm	-.120**	.007	-.010	.119**	.028	.122**	.274**	-.038	.285**	.507**	
Exec. Comm	-.188**	.056**	-.004	-.041*	.051*	-.040	.206**	-.102**	-.177**	.076**	-.079**
Comp. Comm..	-.031	-.001	.001	.084**	.003	.035	.111**	.003	.015	.197**	.103**
Ind. Dir. Nom. Comm..	-.120**	.037	.027	.206**	.020	.392**	.452**	-.050*	.200**	.781**	.527**
Ind. Dir. Comp. Comm..	-.027	.032	.017	.171**	-.003	.498**	.322**	0.000	.042*	.164**	.188**
Ind. Dir. Aud. Comm.	-.061**	.003	.059**	.127**	-.014	.510**	.346**	-.035	.092**	.211**	.193**
Board mtgs.	-.020	.018	.023	.117**	.018	.025	.085**	.001	-.011	.059**	.072**
Nunber Com. Mtgs.	-.160**	.053**	.005	.121**	.050*	.059**	.306**	-.052*	.208**	.411**	.371**
Comp. com. Mtgs.	-.073**	-.001	-.008	.102**	.040	.033	.167**	-.027	.082**	.196**	.171**
Aud. Com. Mtgs.	.005	-.043*	.009	.062**	-.016	.047*	.052*	.040*	.319**	.128**	.264**
Ownership	-.118**	.007	.060**	.155**	-.023	.072**	.213**	-.083**	.027	.126**	.146**
Emp. Directors	.256**	.070**	.075**	.252**	-.006	.120**	.114**	-.200**	.059**	.157**	.183**
Board Tenure	-.070*	.110**	.098**	.283**	-.022	.735**	.662**	-.172**	.107**	.269**	.282**

\* Correlation significant at the 0.05 level (2-tailed); \*\* Correlation significant at the 0.01 level (2-tailed).



**Table 4 Cont'd**  
**Correlations of Coded Governance Variables from ISS Database**

	Exec. Comm	Comp. Comm.	Ind. Dir. Nom. Com	Ind. Dir. Comp. Com	Ind. Dir. Aud. Comm.	Board mtgs.	Nom. Com. Mtgs.	Comp. com. Mtgs.	Aud. Com. Mtgs.	Ownership	Emp. Directors	Board Tenure
Board size												
Class. Board												
Cum. Voting												
Rel. on board												
Reps on board												
Aff. Directors												
Ind. Directors												
Separate chair												
Lead director												
Nom. Comm												
Corp. Gov. Comm												
Exec. Comm												
Comp. Comm..	.018											
Ind. Dir. Nom. Comm..	.024	.154**										
Ind. Dir. Comp. Comm..	.047*	.373**	.364**									
Ind. Dir. Aud. Comm.	.011	.081**	.390**	.348**								
Board mtgs.	-.021	-.019	.078**	.026	.057**							
Nom. Com. Mtgs.	-.011	.081**	.415**	.114**	.139**	.186**						
Comp. com. Mtgs.	-.010	.136**	.207**	.124**	.082**	.338**	.374**					
Aud. Com. Mtgs.	-.189**	.017	.184**	.039	.103**	.259**	.274**	.322**				
Ownership	.002	.032	.173**	.075**	.072**	.138**	.197**	.143**	.024			
Emp. Directors	-.100**	.078**	.226**	.085**	.118**	.072**	.179**	.082**	.103**	.063**		
Board Tenure	.039	.095**	.575**	.426**	.477**	.109**	.313**	.156**	.083*	.182**	.546*	

**Table 5**  
**Results of Principal Components Analysis: Factors and Factor Loadings**

<b>PRINCIPAL FACTOR</b>	<b>SIGNIFICANT COMPONENTS</b>	<b>FACTOR LOADINGS</b>
<i>B-ind</i> (Fac 5-1)	Affiliated directors	.885
Board Independence	Independent directors	.796
	Ind. directors – comp. comm..	.636
	Independent directors- audit comm..	.728
	Relatives on board	.492
	Employed directors	.676
<i>B-meet</i> (Fac 3-1)	Number of board meetings	.763
Board Meetings	Number of comp. comm. meetings	.737
	Number of audit comm. meetings	.547
	Number of nominating comm. meetings	.413
<i>B-str</i> (Fac 6-1)	Classified board	.795
Board Structure	Cumulative voting	-.613
	Ind. directors nominating committee.	.763
	Board size	-.850
	Ownership	.492
	Board tenure	.668
<i>B-sep</i> (Fac2-1)	Corp. gov. committee	.738
Board Separation	Nominating committee	.834
	Executive committee	.525
	Compensation committee	.869
	Separate chair	-.639
	Lead director	-.584
	Employee representative	.656

This table reports the factor loading on each of the individual board variables for each factor. Factors are computed using PCA where all factors with eigen values greater than 1 as well as those that have a minimum of three variables loading on to them are retained. For each factor, individual variables with absolute values greater than 0.4 are retained and interpreted. Definitions of the governance variables are provided in appendix 1.

**TABLE 6**

**Panel A: Sample Summary Statistics for Main Variables  
Descriptive Statistics (1,066 firm-year observations for the period 2000-2004)**

Variable	Mean	Median	Std. Dev.	Minimum	Maximum
<i>CAR</i>	.080	.065	.450	-.890	4.770
<i>EQ</i>	.033	.026	.026	0.003	.170
<i>e-loading(1)</i>	.013	.151	.489	-1.325	2.569
<i>PF</i>	1.880	1.590	1.580	-9.130	11.570
<i>B-ind</i>	.117	.324	.939	-4.460	2.210
<i>B-meet</i>	-.043	.074	.996	-5.070	2.440
<i>B-str</i>	.049	.0508	1.048	-2.217	14.520
<i>B-sep</i>	.032	.255	.952	-3.205	5.188
<i>Auditorq</i>	.746	0.000	.498	0.000	1.000

**Panel B: Sample Summary Statistics for Other Dependent and Control Variables  
Descriptive Statistics (1,066 firm-year observations for the period 2000-2004)**

<i>Size</i>	3.943	3.915	.551	2.557	5.902
<i>Current</i>	.419	.000	.493	.000	1.000
<i>Loss</i>	.173	.000	.378	.000	1.000
<i>var</i>	17.38	3.985	1.222	.144	29.850
<i>growth</i>	1.618	1.606	.328	1.151	3.619

The sample consists of 1,066 firm year observations that have reported pro forma earnings over the period 2000 – 2004. *CAR*, obtained from CRSP, is computed three months around the firms' press release date for year *t*. *EQ* and *e-loadings* are the residuals and coefficients from the modified Jones model and the asset-pricing regressions respectively; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites. *B-ind*, *B-meet*, *B-str*, *B-sep*, are the board variables from the PCA. *Auditorq* is coded 1 if the firms is audited by a Big-5 firm and zero, otherwise. For the control variables; *Size* is the log of total assets (compustat data item A6); *Current* is coded one for negative contemporaneous returns and zero otherwise; *Loss* is coded one if next years earnings are negative and zero otherwise ; *Var*, is a measure of earnings predictability obtained from Compustat; and *Growth* is the ratio of the firm's market value of equity (data item #25\* data item #199) to its book value of equity (data item #216).

**Table 7**  
**Panel B: Pairwise Spearman Correlations**  
**Prob > |r| under H0: Rho=0, N=1,066**

	<i>GP</i>	<i>PF</i>	<i>EQ</i>	<i>e-loading (1-factor)</i>	<i>B-ind</i>	<i>B-meet</i>	<i>B-str</i>	<i>B-sep</i>	<i>Auditor</i>	<i>logassets</i>	<i>var</i>	<i>growth</i>	<i>Current</i>	<i>Loss</i>
<i>GP</i>														
<i>PF</i>	.768 (.000)													
<i>EQ</i>	.223 (.000)	.299 (.000)												
<i>e-loading (1-factor)</i>	.396 (.000)	.509 (.000)	.473 (.000)											
<i>B-ind</i>	.099 (.001)	.172 (.000)	.074 (.016)	.202 (.000)										
<i>B-meet</i>	.175 (.000)	.285 (.000)	.312 (.000)	.417 (.000)	.058 (.059)									
<i>B-str</i>	.004 (.907)	.063 (.040)	.159 (.000)	.266 (.000)	.217 (.000)	.297 (.000)								
<i>B-sep</i>	.198 (.000)	.148 (.000)	-.033 (.278)	-.020 (.505)	-.104 (.001)	-.093 (.002)	-.394 (.000)							
<i>Auditor</i>	.006 (.844)	.017 (.577)	.056 (.067)	.251 (.078)	.015 (.629)	-.021 (.494)	.031 (.305)	.007 (.832)						
<i>logassets</i>	.196 (.000)	.314 (.000)	.273 (.000)	.305 (.000)	.094 (.002)	.499 (.000)	.014 (.655)	.093 (.002)	.016 (.609)					
<i>var</i>	-.157 (.000)	-.056 (.067)	-.002 (.948)	-.033 (.277)	.118 (.000)	.105 (.001)	.117 (.000)	-.007 (.824)	-.051 (.099)	.040 (.190)				
<i>growth</i>	-.047 (.127)	.036 (.237)	.125 (.000)	.410 (.181)	.103 (.001)	.071 (.020)	.080 (.009)	-.029 (.340)	-.169 (.000)	.218 (.000)	.222 (.000)			
<i>Current</i>	-.252 (.000)	-.207 (.000)	-.131 (.000)	-.231 (.451)	-.006 (.856)	.060 (.049)	-.183 (.000)	-.226 (.000)	-.240 (.437)	-.014 (.656)	.082 (.007)	.123 (.00)		
<i>Loss</i>	-.310 (.000)	-.320 (.000)	-.217 (.000)	-.343 (.210)	.044 (.149)	.122 (.000)	-.476 (.121)	-.170 (.000)	-.004 (.887)	-.033 (.285)	.060 (.051)	.256 (.000)	.252 (.000)	

**Table 8****Results for the Association between Pro forma and CARs**

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 Growth_{j,t} + \lambda_3 Loss_{j,t} + \lambda_4 Current_{j,t} + \lambda_5 Var_{j,t} + \lambda_6 Size_{j,t} + \varepsilon_{j,t}$$

Variable	Predicted Sign	(1) Coef. (T-stat) Eq (4)	(2) Coef. (T-stat) Eq (5)
<i>Intercept</i>	?	.1125 (6.20)***	.5930 (7.66)***
<i>PF</i>	+	.0247 (3.35)***	.0586 (2.77)**
<i>Growth</i>	+		-.0464 (-1.35)
<i>Loss</i>	-		-.1330 (-4.26)***
<i>Current</i>	-		-.2939 (-13.21)***
<i>Var</i>	-		-.0192 (-.58)
<i>Size</i>	+		-.0715 (-3.52)***
<i>Number of observations</i>		1066	1066
<i>Adjusted R<sup>2</sup></i>		.0095	.2053

\*Coefficient significant at the 0.10 level; \*\* Coefficient significant at the 0.05 level; \*\*\* Coefficient significant at the 0.01 level.

*CAR* is the cumulative abnormal returns three months around the earnings announcement date; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites; *Growth* is the ratio of the firm's market value of equity (data item #25\* data item #199) to its book value of equity (data item #216); *Loss* is coded one if next years earnings are negative and zero otherwise; *Current* is coded one for negative contemporaneous returns and zero otherwise; *Var*, is a measure of earnings predictability obtained from Compustat; and *Size* is the log of total assets (compustat data item A6).

**Table 9**  
**Results for the Association between Pro forma Credibility and Governance**

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \sum_{k=1}^4 \lambda_{k+1} (PF_{j,t} * Gov_{k,j,t}) + \lambda_6 Growth_{j,t} + \lambda_7 Loss_{j,t} + \lambda_8 Current_{j,t} + \lambda_9 Var_{j,t} + \lambda_{10} Size_{j,t} + \varepsilon_{j,t}$$

Variable	Predicted Sign	(1) Coef. (T-stat) Eq (6)	(2) Coef. (T-stat) Eq (7)	(3) Coef. (T-stat) Eq (6) with main effects	(4) Coef. (T-stat) Eq (7) with main effects
<i>Intercept</i>	?	.1042 (5.72)***	.5540 (6.73)***	.1123 (5.86)***	.05681 (6.48)***
<i>PF</i>	+	.0345 (4.34)***	.0253 (1.92)**	.0295 (2.32)***	.0283 (2.07)***
<i>PF*B-ind</i>	+	.001 (.17)	.0026 (.50)	.0208 (1.63)	.0197 (1.65)
<i>PF*B-meet</i>	+ or -	-.0153 (-2.96)***	-.0464 (-2.31)**	-.0237 (-3.02)**	-.0210 (-2.93)**
<i>PF*B-str</i>	+	.0118 (2.11)**	.0161 (3.22)***	.0449 (3.39)***	.0367 (2.23)**
<i>PF*B-sep</i>	+	.0188 (2.89)***	.0233 (3.98)***	.0366 (2.01)**	.0347 (2.31)**
<i>Growth</i>	+		-.0444 (-2.30)**		-.0498 (-2.47)***
<i>Loss</i>	-		-.1313 (-4.25)***		-.1484 (-4.72)***
<i>Current</i>	-		-.3124 (-14.00)***		-.3276 (-14.62)***
<i>Var</i>	-		-.0318 (-.64)		-.0441 (-1.35)
<i>Size</i>	+		-.0630 (-2.93)***		-.0614 (-2.69)***
<i>B-ind</i>				.0030 (.16)	.0071 (.42)
<i>B-meet</i>				-.0307 (-1.80)*	-.0320 (-1.83)*
<i>B-str</i>				.0493 (3.69)***	.0423 (3.48)***
<i>B-sep</i>				.0677 (4.44)***	.0597 (3.74)***
<i>Number of observations</i>		1066	1066	1066	1066
<i>Adjusted R<sup>2</sup></i>		.0271	.2278	.0252	.2384

\*Coefficient significant at the 0.10 level; \*\* Coefficient significant at the 0.05 level; \*\*\*Coefficient significant at the 0.01 level.

Table 9 Continued

*CAR* is the cumulative abnormal returns three months around the earnings announcement date; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites; *B-ind* (representing board independence), *B-meet* (representing board meetings), *B-str* (representing board structure) and *B-sep* (representing board separation) constitute the governance variables from the PCA; *PF\*B-ind*, *PF\*B-meet*, *PF\*B-str* and *PF\*B-sep* represent the interaction between the governance variables from the PCA and pro forma earnings; *Growth* is the ratio of the firm's market value of equity (data item #25\* data item #199) to its book value of equity (data item #216); *Loss* is coded one if next years earnings are negative and zero otherwise; *Current* is coded one for negative contemporaneous returns and zero otherwise; *Var*, is a measure of earnings predictability obtained from Compustat; and *Size* is the log of total assets (compustat data item A6)

<b>Table 10</b>					
<b>Results of Regressions for the Association between Pro forma Credibility and Auditor Quality</b>					
$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF * auditorq)_{j,t} + \lambda_3 Growth_{j,t} + \lambda_4 Loss_{j,t} + \lambda_5 Current_{j,t} + \lambda_6 Var_{j,t} + \lambda_7 Size_{j,t} + \lambda_8 Auditorq_{j,t} + \varepsilon_{j,t}$					
Variable	Predicted Sign	(1) Coef. (T-stat) Eq (8)	(2) Coef. (T-stat) Eq (9)	(3) Coef. (T-stat) Eq (8) with main effect	(4) Coef. (T-stat) Eq (9) with main effect
<i>Intercept</i>	+	.1128 (6.20)***	.5945 (7.67)***	.1098 (4.01)***	.5994 (7.47)***
<i>PF</i>	+	.0233 (2.45)**	.0161 (2.08)**	.0265 (2.30)**	.0120 (2.11)**
<i>PF*auditorq</i>	+	.0123 (2.24)**	.0105 (1.96)**	.0206 (2.24)**	.0197 (1.98)**
<i>Growth</i>	+		-.0486 (-2.41)***		-.0480 (-2.39)***
<i>Loss</i>	-		-.1334 (-4.27)***		-.1338 (-4.27)***
<i>Current</i>	-		-.2935 (-13.18)***		-.2935 (-13.17)***
<i>Var</i>	-		-.0191 (-.58)		-.0196 (-.59)
<i>Size</i>	+		-.0715 (-3.52)***		-.0717 (-3.52)***
<i>Auditorq</i>	+			.0053 (.15)	.0079 (.24)
<i>Number of observations</i>		1066	1066	1066	1066
<i>Adjusted R<sup>2</sup></i>		.0087	.2048	.007	.2041

\* Coefficient significant at the 0.10 level; \*\* Coefficient significant at the 0.05 level; \*\*\*Coefficient significant at the 0.01 level.

*CAR* is the cumulative abnormal returns three months around the earnings announcement date; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites; *auditorq* is auditor quality coded one if the firm's external auditor is a Big-5 audit firm and zero, otherwise; *PF\*auditorq* is the interaction between pro forma earnings and auditor quality; *Growth* is the ratio of the firm's market value of equity (data item #25\* data item #199) to its book value of equity (data item #216); *Loss* is coded one if next years earnings are negative and zero otherwise; *Current* is coded one for negative contemporaneous returns and zero otherwise; *Var*, is a measure of earnings predictability obtained from Compustat; and *Size* is the log of total assets (compustat data item A6).



**Table 11**  
**Results of Regressions for the Association between Pro forma Credibility and Information Quality - EQ**

$$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF * IQ)_{j,t} + \lambda_3 Growth_{j,t} + \lambda_4 Loss_{j,t} + \lambda_5 Current_{j,t} + \lambda_6 Var_{j,t} + \lambda_7 Size_{j,t} + \lambda_8 IQ_{j,t} + \varepsilon_{j,t}$$

Variable	Predicted Sign	(1) Coef. (T-stat) Eq (10)	(2) Coef. (T-stat) Eq (11)	(3) Coef. (T-stat) Eq (10) with main effect	(4) Coef. (T-stat) Eq (11) with main effect
<i>Intercept</i>	+	<b>.1157</b> (6.35)***	<b>.6374</b> (8.06)***	<b>.1438</b> (7.51)***	<b>.6671</b> (8.45)***
<i>PF</i>	+	<b>.0162</b> (1.83)*	<b>.0189</b> (1.90)*	<b>.0490</b> (2.76)**	<b>.0191</b> (2.01)**
<i>PF*IQ</i>	+	<b>.0342</b> (1.76)*	<b>.0466</b> (2.80)***	<b>.0480</b> (2.03)**	<b>.0437</b> (2.73)**
<i>Growth</i>	+		<b>-.0457</b> (-2.34)***		<b>-.0473</b> (-2.93)***
<i>Loss</i>	-		<b>-.1440</b> (-4.60)***		<b>-.1254</b> (-3.93)***
<i>Current</i>	-		<b>-.2930</b> (-13.22)***		<b>-.2854</b> (-12.82)***
<i>Var</i>	-		<b>-.0130</b> (-.39)		<b>-.0452</b> (-1.30)
<i>Size</i>	+		<b>-.0781</b> (-3.84)***		<b>-.0887</b> (-4.30)***
<i>IQ</i>	+			<b>.1270</b> (4.43)***	<b>.0799</b> (3.76)***
<i>Number of observations</i>		<b>1066</b>	<b>1066</b>	<b>1066</b>	<b>1066</b>
<i>Adjusted R<sup>2</sup></i>		<b>.0115</b>	<b>.2123</b>	<b>.0286</b>	<b>.2172</b>

\*Coefficient significant at the 0.10 level; \*\* Coefficient significant at the 0.05 level; \*\*\*Coefficient significant at the 0.01 level.

*CAR* is the cumulative abnormal returns three months around the earnings announcement date; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites; *IQ* represents the overall information quality computed as the standard deviation of firm specific residuals from a modified Dechow and Dichev (2002) model; *PF\*IQ* is the interaction between pro forma earnings and earnings quality; *Growth* is the ratio of the firm's market value of equity (data item #25\* data item #199) to its book value of equity (data item #216); *Loss* is coded one if next years earnings are negative and zero otherwise; *Current* is coded one for negative contemporaneous returns and zero otherwise; *Var*, is a measure of earnings predictability obtained from Compustat; and *Size* is the log of total assets (compustat data item A6).

<b>Table 12</b>					
<b>Results of Regressions for the Association between Pro forma Credibility and Information Quality – e-loading</b>					
$CAR_{j,t} = \lambda_0 + \lambda_1 PF_{j,t} + \lambda_2 (PF * IQ)_{j,t} + \lambda_3 Growth_{j,t} + \lambda_4 Loss_{j,t} + \lambda_5 Current_{j,t} + \lambda_6 Var_{j,t} + \lambda_7 Size_{j,t} + \lambda_8 IQ_{j,t} + \varepsilon_{j,t}$					
Variable	Predicted Sign	(1) Coef. (T-stat) Eq (10)	(2) Coef. (T-stat) Eq (11)	(3) Coef. (T-stat) Eq (10) with main effect	(4) Coef. (T-stat) Eq (11) with main effect
<i>Intercept</i>	+	.1122 (6.19)***	.5901 (7.62)***	.1405 (7.74)***	.5992 (7.74)***
<i>PF</i>	+	.0191 (2.44)**	.0179 (1.82)*	.0101 (1.85)*	.0175 (1.83)*
<i>PF*IQ</i>	+	.0434 (2.15)**	.0294 (2.02)**	.0156 (2.26)**	.0119 (1.89)*
<i>Growth</i>	+		-.0443 (-2.29)***		-.0386 (-2.12)***
<i>Loss</i>	-		-.1371 (-4.38)***		-.1267 (-3.99)***
<i>Current</i>	-		-.2912 (-13.05)***		-.2865 (-12.79)***
<i>Var</i>	-		-.0183 (-.56)		-.0387 (-1.12)
<i>Size</i>	+		-.0710 (-3.50)***		-.0737 (-3.63)***
<i>IQ</i>	+			.1500 (4.34)***	.0678 (2.96)***
<i>Number of observations</i>		1066	1066	1066	1066
<i>Adjusted R<sup>2</sup></i>		.0129	.2065	.0293	.2088

\*Coefficient significant at the 0.10 level; \*\* Coefficient significant at the 0.05 level; \*\*\*Coefficient significant at the 0.01 level.

*CAR* is the cumulative abnormal returns three months around the earnings announcement date; *PF* is the pro forma eps disclosed in the earnings press releases downloaded from the firms' web sites; *IQ* represents the information quality metric which is computed as the e-loading - 1 factor; *PF\*IQ* is the interaction between pro forma earnings and the e-loading; *Growth* is the ratio of the firm's book value of equity (data item #216) to its market value (data item #25\* data item #199).; *Loss* is coded one if next years earnings are negative and zero otherwise; *Current* is coded one for negative contemporaneous returns and zero otherwise; *Var*, is a measure of earnings predictability obtained from Compustat; and *Size* is the log of total assets (compustat data item A6).

## APPENDIX

### *Appendix 1: Governance Variables and Coding Scheme*

	<b>Governance Variable</b>	<b>Description</b>	<b>Coding Scheme</b>
<b>1.</b>	<b>Board size</b>	<b>The number of directors on the board</b>	<b>This is coded +1 if the directors are between 5 and 8 and 0, otherwise. An alternative coding scheme is used – the negative of the number of directors – and the results are the same.</b>
	<p>This variable refers to the size of the board. Smaller boards are considered more effective in achieving results because of the fewer number of disagreements in arriving at a consensus. Boards with between five and eight members are considered the optimal size because they are more likely to be more efficient and organized in carrying out board functions than larger boards are.</p>		
<b>2.</b>	<b>Classified Board</b>	<b>Is the Board Classified?</b>	<b>This is coded +1 if the board is classified and 0, if not.</b>
	<p>This is a structure of the board that requires directors to serve for different lengths of time depending on their classification. Under a classified board system, directors serve different terms from one to eight years with longer terms awarded to more senior board positions. Different classes of directors are up for replacement each year. This system ensures continuity and is sometimes used as a defense against a takeover. A classified board reduces enshrinement since different director positions are up for replacement each year.</p>		
<b>3.</b>	<b>Cumulative Voting</b>	<b>Does the Company allow cumulative voting?</b>	<b>This is coded +1 if the Company does and 0, if the Company does not.</b>
	<p>Cumulative voting is a type of voting process that helps strengthen the ability of minority shareholders to elect a director. Under the cumulative voting method, a shareholder is allowed to cash all their votes for a single nominee up for consideration for a board position when there are multiple positions available. This method is different from regular voting where shareholders are not allowed to give more than one vote per share to any single nominee. Cumulative voting is</p>		

	considered an effective method of gaining minority representation on the board and of ensuring that the board is somewhat independent of management.		
4.	<b>Relatives on Board</b>	<b>Are any directors related?</b>	<b>This is coded +1 if there are no related directors and 0, if there are.</b>
	This refers to whether any directors on the board are related. Related directors on the board are more likely to form a voting block on issues of interest to the board and these could reduce the independence of the board.		
5.	<b>Representatives on the Board</b>	<b>Are there employee representatives on the Board?</b>	<b>This is coded +1 if there are employee representatives on the Board and 0, if not.</b>
	This refers to whether there is a board position reserved for employee representatives. While not very common in the US this is considered good corporate governance, especially in Europe.		
6.	<b>Affiliated Directors</b>	<b>The number of directors on the board that are affiliated with the Company</b>	<b>This is coded as the negative of the number of affiliated directors.</b>
	This refers to directors who have dealings with the company. Affiliated directors have family and/or business relationships with the company and may also be associated with other organizations that have dealings with the company. Such relations with the company are more likely to materially affect the independent judgment of such directors. As such affiliated directors are considered less independent than fully independent directors.		
7.	<b>Independent Directors</b>	<b>Percentage of independent directors on the board</b>	<b>This is coded as 1 if the percentage of independent directors is greater than 50% and 0, if less than.</b>
	Independent directors are directors who are considered to be autonomous from management and free from any business or other relationship that could materially interfere with the exercise of their independent judgment.		
8.	<b>Separate Chair</b>	<b>Is there a separate chairman of the board?</b>	<b>This is coded +1 if the Chairman of the Board is not the CEO and 0, otherwise.</b>
	This refers to whether the Chairman of the board is also the CEO of the company. The CEO's role as the chairman of the board implies that the CEO runs both the company and the board. Thus there is little		

	separation of power between the board and management. Also, if the other board members do not take decisions that oppose the chair, then the chair has ultimate power in decisions that involve the company.		
<b>9.</b>	<b>Lead Director</b>	<b>Is there a lead independent director?</b>	<b>This is coded +1 if there is a lead independent director and 0, otherwise.</b>
	The lead director is an independent director that works closely with, and in an advisory capacity to, the Chair of the board. The primary focus of the lead director is to ensure that the board is organized properly, functions effectively and operates independently of management.		
<b>10.</b>	<b>Nominating Committee</b>	<b>Is there a nominating committee</b>	<b>This is coded +1 if there is a nominating committee and 0, otherwise</b>
	In most firms, the nominating committee is primarily responsible for nominating people to the board of directors. Anecdotal evidence suggests that the quality of appointments to the board is better in firms that have a nominating committee.		
<b>11.</b>	<b>Corporate Governance Committee</b>	<b>Is there a corporate governance committee?</b>	<b>This is coded +1 if there is and 0, otherwise.</b>
	The corporate governance committee is primarily responsible for developing and formulating the corporation's approach to governance issues. While the corporate governance committee is not a feature of all boards, where the committee is absent these functions are usually not performed. Thus boards that have corporate governance committees are regarded as more effective.		

12.	<b>Executive Committee</b>	<b>Is there an executive committee?</b>	<b>This is coded +1 if there is an executive committee and 0, otherwise.</b>
	The executive committee is a standing committee of the board. Its purpose is to assist the board in discharging its responsibilities with respect to the management of the affairs of the company at times when it is impracticable for the full board to act. The presence of the executive committee improves the overall governance structure of the board because board powers are delegated to a committee and not to a single individual in the person of the chair.		
13.	<b>Compensation Committee</b>	<b>Is there a compensation committee?</b>	<b>This is coded +1 if there is a compensation committee and 0, otherwise.</b>
	The compensation committee usually comprises of non-management directors and the responsibility of the committee is to recommend to the board the compensation of full time directors and other senior personnel of the company. The existence of a compensation committee improves the governance structure of the company because no single individual is responsible for the compensation of senior members of the company.		
14.	<b>Independent directors on the nominating committee</b>	<b>The ratio of independent directors on the nominating committee.</b>	<b>This is coded as +1 if the nominating committee is composed of fully independent directors and 0, otherwise.</b>
	The more independent the members of the nominating committee are, the higher the quality of individuals nominated for election to the board.		
15.	<b>Independent directors on the compensation committee</b>	<b>The ratio of independent directors on the compensation committee.</b>	<b>This is coded as +1 if the compensation committee is composed of fully independent directors and 0, otherwise.</b>
	The more independent the members of the compensation committee are, the more independent are decisions regarding the compensation of the CEO and senior members of management.		
16.	<b>Independent directors on the audit committee</b>	<b>The ratio of independent directors on the audit committee.</b>	<b>This is coded as +1 if the audit committee is composed of</b>

	The more independent the members of the audit committee are, the more independent are decisions regarding the financial statements.		
17.	<b>Board Meetings</b>	<b>Number of board meetings held in prior year</b>	<b>This is coded as the number of board meetings held in the prior year.</b>
	The number of meetings held during the year by the board may provide an indication of both the effectiveness of the board and the seriousness of the issues that are brought forward for deliberation. This is true of the committees of the board as well. The audit committee for example, is responsible for overseeing the financial reporting process and so the more meetings they have could be an indication of the seriousness of the issues that the committees have to deal with.		
18.	<b>Nominating Committee Meetings</b>	<b>Number of nominating committee meetings held in prior year.</b>	<b>This is coded as the number of nominating committee meetings held in prior year.</b>
	The number of meetings held during the year by the nominating committee may provide an indication of both the effectiveness of the committee or it could be an indication that there are major issues that need to be resolved.		
19.	<b>Compensation Committee Meetings</b>	<b>Number of compensation committee meetings held in prior year.</b>	<b>This is coded as the number of compensation committee meetings held in prior year.</b>
	The number of meetings held during the year by the compensation committee may provide an indication of both the effectiveness of the board and the seriousness of the issues that are brought forward for deliberation.		

20.	<b>Audit Committee Meetings</b>	<b>Number of audit committee meetings held in prior year.</b>	<b>This is coded as the number of audit committee meetings held in prior year.</b>
	The number of meetings held during the year by the audit committee may provide an indication of both the effectiveness of the board and the seriousness of the issues that are brought forward for deliberation. The audit committee is responsible for overseeing the financial reporting process and so the more meetings they have could be an indication of the seriousness of the issues that the committee has to deal with.		
21.	<b>Ownership</b>	<b>Percent of shares owned by the directors and officers of the company.</b>	<b>This is coded as +1 if the directors and officers own less than 25% of the Company and 0, otherwise. An alternative coding scheme – if directors own less than 1% as suggested by the SEC, this is coded as 1 and 0, otherwise – is also used and the results are similar.</b>
	This refers to the percentage of outstanding common shares owned by directors and officers. If the directors own more than 25% of the shares, this suggests that they have a certain amount of control over the company and could influence the decisions of the company.		
22.	<b>Employed Directors</b>	<b>Number of employed directors</b>	<b>This is coded as the negative of the number of directors who are employed in the company.</b>
	Employed directors are employees of the company. They are not independent directors. There is the argument that even though they are not independent, they have the expertise and knowledge of the company that is required to smoothly run the operations of the company.		



23.	<b>Board Tenure</b>	<b>Maximum tenure of directors</b>	<b>This is coded as +1 if the directors have a maximum tenure that they can serve and 0, otherwise.</b>
<p>There is the argument that longer serving directors have more expertise, commitment and experience in running the affairs of the Company. However, when directors serve too long, they could also become too friendly with the management which may impair their independence. It is likely that when specified tenure exists for directors, management friendliness is likely to be reduced.</p>			

## ***Appendix 2: Principal Components Analysis***

This section outlines some of the concepts of the Principal Components Analysis (PCA) procedure. PCA is a data reduction procedure that is useful when there are a large number of variables most of which are proxies of each other because they are essentially measuring the same underlying construct. To eliminate redundancy, PCA reduces the variables into a smaller number of scores (factor scores) or artificial variables which are used in any further analysis. Thus the goal of PCA is to compute the most meaningful basis to re-express a noisy data set. The ultimate objective is that this new basis will filter out the noise and reveal hidden structure while maintaining most of the original variability in the data. The first principal component accounts for as much of the variability in the data as possible, and each successive component accounts for as much of the remaining variability as possible.

The general form for the formula to compute scores on the first component in a PCA is as follows:

$$c_1 = b_{11}(x_1) + b_{12}(x_2) + \dots + b_{1p}(x_p)$$

where:

$c_1$  = the firm's score on principal component 1 (the first component extracted);

$b_{1p}$  = the regression coefficient (or weight) for observed variable  $p$ , as used in creating principal component 1; and

$x_p$  = the firm's score on observed variable  $p$ .

The regression weights ( $b$ ) from the preceding equation are determined using a special type of equation called an eigenequation. The weights produced by these eigenequations are optimal weights given that for a set of data, no other set of weights could produce a set of components that account for more of the variance in the observed variables. In creating these weights, the principle of least squares has to be satisfied. This is similar but not identical to that used in multiple regressions.

The means of computing the factor scores provides the rationale for why PCA is referred to as a linear combination optimally weighted observed variables. When a variable is given a great deal of weight in constructing a component, that variable is said to “load” on that component. For example, the variable “number of affiliated directors” is given a lot of weight in computing the first component which I refer to as *B-ind*. Thus “number of affiliated directors” is said to load onto *B-ind*. It is highly desirable that at least three variables load onto any retained component.

In establishing the number of components extracted in a PCA for rotation and interpretation, one has to rely on a number of criteria that are helpful. In general, only the first few components will account for meaningful amounts of variance while the latter components will tend to account for only trivial variance. The four criteria that are mainly used to determine how many meaningful components should be retained include the following: (1) the eigen-value-one criterion; (2) the scree test; (3) the proportion of variance accounted for; and (4) the interpretability criterion. I provide some more detail on each of these criteria below. However, in this study, I adopt the eigen-value-one criterion and the scree test.

#### *The Eigen-value-one Criterion*

In PCA, the most commonly used criteria for solving the problem of the number of components retained is the eigen-value-one criterion, also known as the Kaiser criterion (Kaiser, 1960). Under this approach, any component with an eigen value greater than one (1) is retained and interpreted. Recall that the eigen value represents the amount of variance that is accounted for by a given component. The rationale for this is quite simple – each observed variable contributes one unit of variance to the total variance in the data set. Therefore, any component that displays an eigen value greater than one is accounting for more variance than is contributed by a single variable. On the other hand, a component that has an eigen value of less than one, is accounting for less variance than is contributed by one variable. Since PCA is a data reduction technique, it only makes sense to retain components that account for the variance that is contributed by more than one variable and to treat those components that account for less variance than is contributed by one variable as trivial. The eigen-value-one criterion has a number of positive features that have contributed to its popularity. Perhaps the most important is its simplicity. There is no subjectivity in applying this criterion. In addition, this method has been shown to retain the correct number of components, particularly when a small to moderate number of variables are being analyzed and the communalities are high. Stevens (1986) based on a review of the accuracy of studies that have used this criterion, recommends its use when less than 30 variables are being analyzed and communalities are greater than 0.70, or when the analysis is based on over 250 observations and the mean communality is greater than or equal to 0.60. When these conditions don't hold, it can lead to retaining the wrong number of components. Note however, that an arbitrary application of this approach can also lead to retaining the wrong number of components for example if a component with eigen value of 0.999 is dropped while one with an eigen value of 1.0001 is retained. This can lead to serious errors of interpretation.

### *The Scree Test*

The scree test (Cattell, 1966) plots the eigen values associated with each component and looks for a “break” or “scree”. Scree is a term from geology which refers to the rubble at the bottom of a cliff. The idea in the scree test is that if a factor is important, it will have a large variance associated with it. By plotting the eigen values by factor number, one is able to assess the relative importance of each of the factors. The number of components retained corresponds to the number of factors above the “elbow” in the plot. The components above the elbow account for the bulk of the variance and are the important components that are retained. With the scree test, one can see where the important factors stop and the unimportant ones start.

The scree test can be expected to provide reasonably accurate results, provided the sample is large (over 200) and most of the variable communalities are large (Stevens, 1986). However, this criterion has its own weaknesses as well, most notably the difficulty in identifying the scree in typical research conditions.

### *Proportion of Variance*

A third criterion used in determining the number of components to retain is the proportion of variance in the data set criterion. This involves retaining any component that accounts for a specified percentage (proportion) of the variance in the data set. This proportion is specified a priori. For example, one may decide to retain any component that accounts for at least 5% of the total variance. This proportion is computed as follows:

$$\text{Proportion of variance} = \text{eigen value of the component of interest} / \text{total eigen values of the correlation matrix}$$

In PCA, the total eigen values of the correlation matrix is equal to the total number of variables being analyzed (in this study, 22) because each variable contributes one unit of variable to the analysis.

An alternative way of applying this criterion is to retain enough components such that the cumulative percent of variance explained is equal to some specified minimum. When this alternative approach is used, enough components are usually retained so as to explain at least 70% of the variance.

The proportion of variance criterion has a number of positive features. For example, in most cases, one would not want to retain a group of components that, combined, account for

only a very limited amount of the variance in the data set (say less than 50%). Nonetheless, the critical values (10% for individual components and 70% for the combined components) are arbitrary. The subjectivity in this approach is a major criticism (Kim and Mueller, 1978).

#### *The Interpretability Criterion*

The fourth and last criterion for deciding on the number of components to retain is the interpretability criterion. This is simply the ability to interpret the substantive meaning of the retained components and verifying that this interpretation makes sense in terms of what is known about the constructs under investigation.

In the following section, I discuss the results of the PCA and how these are interpreted.

#### *Rotation to a Final Solution: Factor Patterns and Factor Loadings*

In PCA, when more than one component has been retained, the output usually includes a table showing the paths from the factors to the observed variables. This table of paths, also called an unrotated solution, is difficult to interpret. Obviously, one would like to understand, label or name the components that are retained. In such a case, it would normally be easy to understand the factors if the observed variables only correlate highly with a single factor. If variables are correlated with multiple factors, then identifying what the factors are becomes an almost insurmountable challenge. To make the results easier to interpret, one needs to perform an operation called a rotation. A rotation is a linear transformation that is performed on factor loadings so that the factors are easily interpretable.

When the initial components are extracted, the PCA procedure creates an unrotated factor pattern matrix. The rows of this matrix represent the variables being analyzed while the columns represent the retained components. The entries in the matrix are the factor loadings. A factor loading is a general term for a coefficient that appears in a factor pattern matrix or a factor structure matrix. A rotated solution can be interpreted by determining what is measured by each of the retained components. This involves identifying the variables that demonstrate high loadings for a given component and determining what these variables have in common. Usually a brief name is assigned to each retained component that describes its content. The first decision to be made at this stage is to decide how large a factor loading must be to be considered “large.” Usually a loading is considered “large” if its absolute value exceeds 0.40 (Stevens, 1986).

## **CHAPTER 4**

### ***CONCLUSION***

#### ***4.1. SUMMARY OF FINDINGS AND CONTRIBUTIONS***

Prior literature has not provided conclusive evidence on the value relevance of pro forma earnings relative to GAAP and analysts' actuals. The debate surrounding the value relevance of earnings measures – both GAAP and non-GAAP continues in the academic press. The first study in this dissertation introduces the Collins et al. (1994) returns model to the examination of the value relevance of three earnings measures – GAAP, analysts' actual, and pro forma earnings. This model assesses the informativeness of the earnings measures as a function of the markets' ability to anticipate future earnings. The empirical evidence is consistent with future GAAP earnings, future analysts' actual, and future pro forma earnings being impounded in current stock price. However, after controlling for firm characteristics, pro forma earnings is more informative than is analysts' actual earnings which in turn is more informative than is GAAP earnings. These findings are robust to alternative model specifications. In price regressions (price as the dependent variable), pro forma earnings significantly outperforms both GAAP earnings and actual earnings. The findings also hold where the earnings measure is used to predict future cash flows, or for those firms that report a GAAP loss and a pro forma profit or where their GAAP earnings exceed their pro formas. These results are consistent with pro forma earnings being used across firms for value relevance reasons and not for strategic reasons or to mislead. Note however that these findings are based on the traditional assumption that the markets are efficient. If stocks are mispriced, then the results are open to alternative interpretations.

While the findings of the first study are in aggregate (they represent average behaviour across firms), the second study examines the value relevance of pro forma

earnings based on the perceived credibility of the measure. That is, the study asks whether investors are able to differentiate between pro formas that are credible and those that lack credibility. In assessing whether a pro forma is credible, investors can observe credibility attributes – board characteristics, external auditor quality, and overall information quality – even though managers’ motives in disclosing pro formas cannot be observed. The study finds that the value relevance of pro forma is different for firms with strong credibility attributes than for those with weak credibility attributes. An interpretation is that pro forma earnings have a larger market reaction where they are perceived to be credible. The results from the study are consistent with some firms using these disclosures to inform (to provide value relevant information), and others to manage expectations (e.g., to mislead). That is, based on credibility attributes, the market appears to differentiate between these motives. These results are consistent with the following. First, investors do perceive that there are differences in pro forma information quality across firms. Second, investors assess the credibility of the pro forma release based on observable firm attributes including the quality of governance, auditors, and overall information. The stronger are the credibility attributes, the greater the credibility given to the pro forma measure. Finally, investors will react more strongly where the pro forma is perceived as credible – that is, the information will be perceived as more value relevant.

This dissertation contributes to the empirical evidence on the value relevance of pro forma earnings measures. The first study, contributes to the evidence on the relative value relevance of GAAP earnings, analysts’ actuals, and pro forma earnings. It also provides empirical evidence on which future earnings measure is closest to investors’ expectations of future earnings. This is especially relevant in valuation and resource allocation decisions.

This dissertation also contributes to the empirical evidence on the usefulness of board characteristics, auditor quality, and overall information quality in improving the perceived credibility of voluntary disclosures. To shareholders and managers, the results suggest that improving the governance environment by having a high quality board and high quality auditors enhances the perceived credibility of corporate disclosures. This evidence is particularly interesting from a regulatory point of view since a primary aim

of SOX is to improve investor confidence including their confidence in firms' financial reporting.

#### ***4.2. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH***

The first study in this dissertation assumes that markets are efficient and that stock prices are reflective of value. However if stocks are mispriced and the markets are inefficient, then the results are open to alternative interpretation. This study uses data on only the S&P 500 firms. Thus the findings of this study are generalizable to only this group of firms. Future research can examine firms that are not included in the S&P 500. Also, this study uses data that is collected from the period 2000 – 2004 during which significant business failures occurred. Therefore the findings of the study may be period specific.<sup>55</sup> Future research can examine the value relevance of pro forma earnings over a longer time frame.

The second study in this dissertation examines observable credibility attributes which form part of the overall corporate governance structure of a firm. Similar to the first study, it is limited by its use of only S&P 500 firms. Thus the results are only generalizable to this group of firms. Also, as only three governance dimensions are considered in this chapter – board variables, the quality of the external auditor and the overall information quality, this study states the importance of further research on the relationship between an expanded set of governance and monitoring dimensions and the impact on reporting credibility. Such other governance dimensions could include banks and other fund providers. This will help increase our understanding of the association between other aspects of governance and the credibility of voluntary disclosures.

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<sup>55</sup> Note though that if anything, the bias would be against finding that pro formas are value relevant as they are unaudited management voluntary disclosure.



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## PUBLICATIONS

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*American Accounting Association, Mid-Year Meeting of the International Section, Jan/Feb., 2004 – Discussion of “The Role of the Quality of Accounting Systems, Corporate Governance and Financial Analysts in China” by Ron Barniv and Yan Bao.*

*American Accounting Association, Mid-Year meeting of the International Section, February, 2005 – Discussion of “The Effect of Multinationality on Management Earnings Forecasts”, by Bruce W. Runyan and L. Murphy Smith.*

### Invited Presentations

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