An Experimental Evaluation of the Effect of Voluntary Disclosure of Non-financial

Performance Indicators and Assurance on this Information on Stock Price Estimates

and Earnings Forecasts

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SUMMARY: This study examines whether the voluntary provision of non-financial performance indicators (as part of the Balanced Scorecard framework) and assurance on this information impacts on stock price estimates and earnings forecasts in an experimental setting. A controlled experiment was performed on sophisticated users of financial statements. They were provided with a case study containing excerpts from a fictitious company's annual report. In this case study the variables were manipulated in a 2 (positive and negative non-financial performance indicators) x 2 (assurance and no assurance) + 1 (base case) between-subjects design. Participants were then asked to assess whether the company's stock price estimates and earnings forecasts would increase, decrease or stay the same based on the information provided. It was found that the non-financial performance indicators had a very significant effect in the expected directions on both stock price estimates and earnings forecasts. Assurance had a significant effect on both stock price estimates and earnings forecasts but only when the non-financial information was positive, suggesting that the value of assurance is context specific.

INTRODUCTION

This study is an experimental evaluation of whether voluntary disclosures of non-financial performance indicators in a Balanced Scorecard framework impact on sophisticated users' stock price estimates and earnings forecasts. It also evaluates the associated impact of assurance on this information.

This study is important to business, regulators, analysts and professional practice because it provides evidence about the value of providing non-financial performance indicators to the market and the associated impact of assurance. This will be of interest to managers in companies considering enhanced disclosure policies, regulators considering mandating disclosure of this type of information and analysts deciding how to use this information. The value of providing assurance should be of interest to the accounting profession as well as managers considering purchasing these services.

The results show non-financial performance indicators in the form of a Balanced Scorecard have a very significant impact on both the stock price estimates and earnings forecasts of users. As well as providing evidence of the value of non-financial disclosure it shows specifically that the Balanced Scorecard framework may be appropriate for external disclosure. This proposition is inconsistent with the original view of the Kaplan and Norton who developed the Balanced Scorecard. They did not believe that it was appropriate for external disclosure (Kaplan and Norton 1993). The study also provides evidence that the value of assurance is context specific. Rather than adding value in all circumstances it was found that assurance only added value when the non-financial information disclosure was positive.

THEORY AND HYPOTHESES

Disclosure of Non-financial Information

Financial analysts, investors and valuers all use information in the financial statements of companies to make judgments about future company performance. Despite the obvious importance of this role, there are claims that the relevance of financial reporting is declining (Eccles et al 2001), although others suggest that the empirical evidence is mixed on this question (Kachelmeier and King 2002). However, irrespective of the empirical debate on the relative decline (or not) in the value of financial reporting there have been calls from a number of individuals and groups for greater disclosure of non-financial information by corporations (American Institute of Certified Public Accountants (AICPA) 1994; Eccles et al. 2001; Lev 2001). In response to calls for greater disclosure, the Financial Accounting Standards Board (FASB) (2001) produced a report called "Improving Business Reporting: Insights into Enhancing Voluntary Disclosures" to help companies improve their business reporting in relation to voluntary disclosures. This report did not state that non-financial performance measures must be disclosed but that companies should be encouraged to voluntarily report this type of information. Following from this report, a committee was set up to review the academic research with respect to this type of information. From the academic literature, they summarize that non-financial performance measures are relevant for predicting future financial performance and valuing corporate equity (American Accounting Association Financial Accounting Standards Committee (AAA FASC) 2002). However, they also note that the ability of investors to use this information is hampered by the non-comparability of measures or formats and there is little evidence concerning the reliability of these measures, suggesting that further research is warranted.

Studies have shown improved quality of corporate disclosure *per se* is associated with direct capital market benefits by increased stock prices (Botosan 1997) or though indirect capital market benefits, such as increased liquidity or analyst following (e.g. Botosan and Harris 2000; Healy et al. 1999; Lang and Lundholm 1996). Other studies have more specifically tried to evaluate the value relevance of non-financial performance indicators. Amir and Lev (1996) looked at the value relevance of non-financial information in the wireless communications industry. They found that non-financial indicators such as population size and market penetration are highly value relevant. In this industry, financial information in itself was largely irrelevant for security valuation, however, combined with non-financial information earnings did contribute to security prices. Ittner and Larcker (1998) investigated whether customer satisfaction is a good predictor of financial performance. They suggested that non-financial indicators of investments in "intangible" assets might be better predictors of future financial performance than historical accounting measures. Their study used customer and business unit data and found modest support for claims that customer satisfaction measures are leading indicators of customer purchase behavior, growth in the number of customers, and accounting information. Further research on whether customer satisfaction measures are leading indicators of financial performance was provided by Banker et al. (2000). They used time series data for 72 months from 18 hotels to provide evidence on the behavior of non-financial measures and their impact on firm performance. Their results indicate that non-financial measures of customer satisfaction are significantly associated with future financial performance and contain additional information not reflected in the past financial measures. These studies provide some evidence of an association between certain types of non-financial performance measures and firm performance. However, a cautionary note from the AAA FASC (2002)

is that studies relying on a regression methodology measure "association" rather than "causation". Therefore they do not actually tell us whether investors use the non-financial performance measures, it may be that they use other information that is correlated with the non-financial performance measures in their decision making processes.

Evidence on the importance of non-financial performance measures is also highlighted in a study by Ittner et al. (1997) that showed many firms use non-financial measures such as product quality, customer satisfaction and market share to evaluate and reward managerial performance. Of the 317 firms in their sample 36 percent employed non-financial measures in evaluating CEO performance, with a mean weighting placed on non-financial performance across all firms of 13 percent (Ittner et al. 1997). The rewarding of management based on these types of measures indicates that they are seen as value relevant information.

These studies provide evidence of the value of enhanced quality of disclosure and the value of increased disclosure of some types of non-financial performance indicators. However, external disclosure is varied, unstructured and uncommon. The AAA FASC (2002) raised the issue of whether companies should use an integrated framework for disclosure of non-financial and financial measures but questioned the ability of stock market participants to use this type of information appropriately. This was based on the results of the studies that questioned how well even managers within firms could understand the linkage of this type of information and profitability (Banker et al. 2000; Ittner and Larcker 1998). However they concluded by stating that "...the FASB should investigate and encourage the development of models and frameworks that enhance the relevance of financial performance measures via the inclusion of non-financial performance measures." (AAA FASC 2002, 361) This paper provides further evidence of the value of

disclosure of non-financial information to investors in an experimental setting. Specifically, it will look at the impact of disclosure of non-financial performance indicators within a *structured* framework by using the Balanced Scorecard in an experimental setting. This has not been examined in the literature to date.

This study proposes that the Balanced Scorecard is a useful structured framework to disclose a firm's non-financial performance. The Balanced Scorecard is a performance measurement approach that is based on integrating leading indicator non-financial measures with financial ones (Kaplan and Norton 1992). It also emphasizes the importance of linking non-financial performance to strategy (Kaplan and Norton 1993). Kaplan and Norton (2001) suggest that the Balanced Scorecard is a way to assist in creating and deploying intangible assists such as customer relationships, innovative products and services, high quality and responsive operating processes, and skills and knowledge of the workforce. However, they do not think it is appropriate to try and put the value of these intangible assets on the balance sheet. They suggest that "The scorecard does not attempt to 'value' an organization's intangible assets, but it does measure the assets in units other than currency." (Kaplan and Norton 2001, 89)

The obvious question is that if it is "value relevant" as an internal management tool, why would it not be useful information to investors and analysts of the company? Eccles et al. (2001, 5) suggest that information on a broader range of performance measures has as much relevance to analysts and investors as to managers. In particular because they believe many of these measures such as delivery performance, service quality and customer satisfaction are leading indicators of future earnings (Eccles et al. 2001, 17). However, Kaplan and Norton (1993) do not think that the Balanced Scorecard approach is easily adapted to the needs of the investment community. They believe the scorecard primarily

makes sense for business units with a well-defined strategy and the problem is that most companies have several business units. Another consideration is that even for companies where it might be appropriate competitive sensitivity constrains disclosure of the information. They go on to say that even if it was more suited to external reporting, the financial community shows very little interest in making the change from financial to strategic reporting (Kaplan and Norton 1993).

Another possible concern relates to the perceived lack of objectivity associated with Balanced Scorecard disclosures, which would make it difficult for external disclosure. A case study of a company using the Balanced Scorecard in bonus plans, found it replaced by purely financial measures because of the subjectivity of some of the Balanced Scorecard measures (Ittner et al. 2003). This subjectivity may have implications for the level of reliance on these types of measures. Direct experiments that have compared how managers weight financial versus non-financial measures in evaluating and forecasting performance have found mixed results (Luft and Shields 2001; Schiff and Hoffman 1996). This study will provide experimental evidence on the value and perceived reliability of disclosing Balanced Scorecard non-financial measures in a financial reporting setting.

In summary, there have been calls for greater disclosure of non-financial information and there has been *some* evidence to suggest benefits have arisen from this type of disclosure. However, due to the lack of disclosure of this type of information in the marketplace, this study evaluates the benefit of additional disclosure of non-financial information in an experimental setting through its impact on stock price estimates and earnings forecasts.

If the non-financial performance indicators contained in the Balanced Scorecard are value relevant, the information hypothesis suggests that it will therefore improve investor

decision-making and reduce uncertainty. The information hypothesis (Fama and Laffer 1971; Wallace 1980) suggests the following three benefits in providing information to the financial markets:

(1) improved decision making due to decreased firm to market information asymmetry,

(2) reduced investor risk due to decreased uncertainty, and

(3) enhanced trading profits due to lower transaction costs.

If non-financial measures are value relevant because they are leading indicators of financial performance, improved decision-making and decreased uncertainty will be reflected in a higher relative stock price estimates and earnings forecasts when positive non-financial indicators are disclosed and a lower relative stock price estimates and earnings forecasts when negative non-financial indicators are disclosed.

From the above discussion, the following hypotheses are proposed:

H$_{1a}$: Disclosure of positive non-financial performance indicators will increase users' stock price estimates.

H$_{1b}$: Disclosure of negative non-financial performance indicators will decrease users' stock price estimates.

H$_{2a}$: Disclosure of positive non-financial performance indicators will increase users' earnings forecasts.

H$_{2b}$: Disclosure of negative non-financial performance indicators will decrease users' earnings forecasts.

Assurance Services and Non-financial Information

Since the release of the Elliott Report (AICPA 1997), there has been much discussion and debate about the role of assurance services in the future of the auditing profession. One of the potential areas of growth in assurance services is seen to be in the assurance of entity performance measures (AICPA 1997). Many of these entity performance measures would be of a non-financial nature and are consistent with the model proposed by the Jenkins Committee (AICPA 1994). Percy (1999) suggests that while the financial statements once fulfilled all of the information needs of stockholders and stakeholders, there is now a push towards better management and analysis of operational reviews and reports. He believes there will be demand in these reports for the use of non-financial performance measures to assess the quality of a company and its ability to develop into the future. Elliott (1998, 2) sees a very clear linkage between the historical financial statement audit and assurance of new information. He states: "The audit provides assurance that an information set presented to investors and creditors is reliable. But the marketplace need for high-quality information is far greater than just the need for reliable historical-cost-based financial statements."

The expectation that assurance will affect investors' judgments comes from the information hypothesis, which asserts that independently audited information reduces information asymmetry and decreases uncertainty (Wallace 1987). This suggests that investors increase reliance on voluntary disclosure of information when assurance is provided on that information. There is significant evidence that shows the demand for audits in regulated and unregulated environments to support this theory (Abdel-khalik 1993; Chow 1982; Watts and Zimmerman 1983). Further support for the information hypothesis is provided by studies that have shown that the market places a stock price

premium on independently audited information (Dopuch et al. 1986; Willenborg 1999). Although these studies have all looked at audits of financial statements, there are good arguments to suggest that this will also apply to assurance of information as provision of assurance services is generally considered a natural extension of the traditional financial audit role (Elliott 1998).

A few studies have examined the value of these new assurance services to users of information. Fargher and Gramling (1996) used an experimental setting to look at the assurance on the Performance Presentation Standards of the Association for Investment Management and Research. They found that assurance did not affect users' perceptions of information credibility or their investment decisions. Hunton et al. (2000) assessed the impact of electronic commerce assurance on earnings forecasts and stock price estimates of financial analysts. They found that auditor provided electronic commerce assurance has a positive impact on earnings forecasts and stock price estimates. The present study will add to this literature by examining the value of assurance on non-financial information in an experimental setting.

If non-financial information is value relevant the information hypothesis asserts that auditing of this information will reduce information asymmetry and decrease uncertainty, thereby affecting investors' decisions in their stock price estimates and earnings forecasts. Based on the above discussion, the following hypotheses are proposed:

H_{3a}: Provision of assurance increases users' stock price estimates.

H_{3b}: Provision of assurance increases users' earnings forecasts.

Attribution Theory and Assurance

The voluntary disclosure of non-financial information also raises questions about how this disclosure will be perceived by users. Attribution theory is concerned with the process by which individuals assign causes to events (Kent and Martinko 1995). Further Kent and Martinko (1995) state that attribution theorists are concerned with the perceived causes of events and the consequences of those perceptions. Heider (1958), who is considered to be the founder of attribution theory said that individuals function as "naïve psychologists," developing causal explanations for significant events. In drawing from the attribution and persuasion literature to motivate their study on investors' reactions to analyst reports, Hirst et al. (1995) drew on Eagly and Chaiken (1975) who stated that attributions depend on: (1) the recipient's 'investor' ex ante expectation of the communicator's 'manager' message, and (2) whether the communicator's conclusion confirms or disconfirm the expectation. Further, Eagly et al. (1978) found that interpretation of voluntary disclosure is not only a function of the content of the disclosure, but also of the recipient's perception as to why the disclosure was made. Applying this to voluntary disclosure by corporations, the question is whether investors will perceive certain disclosures as self-serving. Koonce and Mercer (2002), in relating attribution theory to a financial context, suggest that investors will discount self-serving statements if they are recognized as such. Applying this theoretical framework to voluntary disclosures of non-financial information, it is expected that investors would discount positive disclosures as self-serving but would not adjust negative disclosures in the same way because in most cases they would not be construed as self-serving.[1]

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[1] Some evidence supporting this assertion comes from a question in the research instrument that asked participants their perceptions of the reliability of the financial information on an 11 point Likert scale with '0'

When the voluntary provision of non-financial information is positive, it is expected that users will perceive the information as self-serving. Given this perception, attribution theory suggests that users would be more uncertain about the validity of the information and discount it. In these circumstances and given the expected benefits from provision of assurance to reduce uncertainty as per the information hypothesis, it is expected that assurance would have a positive effect on users' stock price estimates and earnings forecasts. However, it is unlikely that voluntary disclosure of negative information would be perceived as self-serving in most circumstances, therefore it is not expected that assurance would make any difference to users' stock price estimates and earnings forecasts. The following hypotheses are therefore proposed:

H4a: When there is disclosure of positive non-financial performance indicators, provision of assurance increases users' stock price estimate.

H4b: When there is disclosure of negative non-financial performance indicators, provision of assurance does not affect users' stock price estimate.

H5a: When there is disclosure of positive non-financial performance indicators, provision of assurance increases users' earnings forecast.

H5b: When there is disclosure of negative non-financial performance indicators, provision of assurance does not affect users' earnings forecast.

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not reliable and '10' very reliable. A t-test found the assessed reliability of the financial information was significantly higher when the non-financial disclosure was negative (mean 5.98) compared to when it was positive (mean 5.40) (t=-1.97, p=0.025).

Reliability of Non-Financial Performance Indicators

In an efficient market investors will incorporate non-financial measures in their equity values only if they are relevant and reliable. Support for the above hypotheses will therefore give *some* indication that the measures are reliable. In their review of the research, the AAA FASC (2002) stated that there was little direct evidence concerning the reliability of non-financial performance measures. Hirst et al. (1999) found that investors adjust their reliance on information based on the incentives of information sources. The AAA FASC (2002, 359) raised the question: "…whether attestation services or other forms of reliability enhancement could affect the quality of non-financial performance measure reporting remains largely unexplored."

Research has shown that in the context of financial statements, audited information is considered more credible than unaudited information (Johnson et al. 1983; Libby 1979; Pany and Smith 1982). This study provides some evidence on whether this also applies in provision of assurance on non-financial performance indicators. The information hypothesis as discussed in developing H_{3a} and H_{3b} suggests that attestation services increase the reliability of information, thereby leading to the following hypothesis:

H_6: Provision of assurance increases users' perceptions of non-financial information reliability.

EXPERIMENTAL METHOD

The participants were provided with a case study containing excerpts from a fictitious company's annual report, including: company information; non-financial performance indicators; financial statements; and audit and assurance (if applicable)

reports. They were asked to assess whether the company's stock price and earnings would increase, decrease or stay the same based on the information provided. The experiment was a between-subjects 2 (positive and negative non-financial performance indicators) x 2 (assurance and no-assurance) + 1 (control group) design. As a consequence, there were five discrete versions of the experiment. To control for order effects the order of the financial and non-financial information was reversed to create a total of nine versions of the experiment.[2] The participants were 209 accountants undertaking a course as part of their professional training to become Chartered Accountants.[3] Libby et al. (2002) suggest that the goals of the experiment should drive the choice of the subjects and to avoid using more sophisticated subjects than is necessary to achieve those goals. In this case assessing the stock price and earnings forecasts is quite a complex task so participants with expertise in financial statement and security valuation concepts were chosen. This group of accountants could appropriately be described as 'sophisticated' financial statement users. In their self evaluation of financial statement knowledge they rated themselves with a mean of 6.4 (median of 7) (scale 0 (naïve) – 10 (sophisticated)).[4] The group also had a reasonable level of stock ownership with almost half owning stock and of those there was an average stockholding of five. 80 percent of the participants had between one and four years accounting experience including 43 percent having between two and three years. 40 percent of participants worked in audit and assurance and 32 percent in tax.

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[2] The ANOVAs were run with the different orderings included as a covariance. The order was not found to be significant in assessments of stock price ($F=0.12$, $p=0.732$) or earnings forecast ($F=0.00$, $p=0.997$).
[3] The total original sample size was 232. Participants who completely missed the manipulations of the independent variables were removed (22 removed who missed the assurance manipulation) as well as outliers in responses given to the dependent variable measures (one removed). Tests that were run on the original sample data found consistent results to the results reported in this paper.
[4] The ANOVAs were run with the response to this question as a covariance. It was not found to be significant in assessments of stock price ($F=1.46$, $p=0.229$) or earnings forecast ($F=0.47$, $p=0.492$).

The financial statement information incorporated into the case study was originally developed from a real listed company on the Australian Stock Exchange and the Balanced Scorecard information was based on the case developed by Lipe and Salterio (2000), which was based on a case study originally developed by Kaplan and Norton (1996). The original version of the case study was pilot tested on eight professional financial analysts by the protocol analysis methodology. This pilot test resulted in a number of changes to the case to ensure realism and cue salience in the experiment.

The experiment held constant all information except for the information directly related to the two independent variables. The main information held constant were the company information and the financial statements. The company information was not manipulated and just provided some general information about the company and the industry in which it operated, as well as the average and range of price earnings ratio for the industry. All of this information was designed to be "average" and not to raise any concerns for the participant evaluating the annual report. The three basic financial statements comprising the Statement of Financial Performance, Statement of Financial Position and Statement of Cash Flows were provided with two years of comparative information and were also not manipulated. The financial information was accompanied by an unqualified audit report that was not manipulated in the experiment. A control group of participants was asked to make a stock price estimate and earnings forecast for the company based on the provision of the base information alone. This provided a benchmark against which to measure the impact provision of non-financial information.

The first independent variable was the provision of non-financial information. This is a voluntary disclosure because there are no legal or professional reasons to provide it. The voluntary information was in the form of a Balanced Scorecard outlining performance

measures related to the strategy employed by the company. It was provided with both positive and negative information content. This was to try and isolate the effect of providing value relevant information from an effect of just providing more information *per se*. A variation in users' judgments from providing positive compared to negative Balanced Scorecard information would provide evidence of the value of that *type* of disclosure. The development of the two different types of Balanced Scorecards was by a pilot test on 61 3rd year commerce students. Five versions of each of the measures used in Lipe and Salterio (2000) were developed with the figures manipulated to ascertain 'salience' as to whether they were positive or negative as follows: original value; -50%; -25%; +25%; +50%. In a between-subjects design the students were then asked to rate these measures on an 11 point Likert scale (0 (very poor) – 10 (very good)). The positive version of the Balanced Scorecard for the experiment was then compiled from manipulations that rated close to seven and the negative version by measures close to three.[5] Normally a Balanced Scorecard includes a financial measure. This was not provided because in this experiment the financial statements were included, thereby negating any value in incorporating financial measures into the Balanced Scorecard.

The second independent variable was the provision or absence of an assurance report on the non-financial information. The assurance report provided related to a high level of assurance based on the guidance in the ISA (International Standard on Auditing) 100, Assurance Engagements.

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[5] This adjustment was made because of the lack of 'salience' of the positive versus negative Balanced Scorecard manipulations as observed from the protocol analysis pilot test.

After the participants had read the case materials they were given the stock price on the day preceding the release of the annual report.[6] They were then asked whether the stock price would increase, decrease or stay the same and the percentage of that change (if applicable). This was done rather than asking them to estimate a stock price without a benchmark because of the suggestion by Libby et al. (2002) that it is better to measure directional effects rather than point predictions. The next question was whether they thought the following year's earnings would increase, decrease or stay the same from the earnings reported in the annual report and the percentage of that change (if applicable). They were next required to turn the page to answer some further questions that included manipulation checks. Finally, the last section of the experiment asked them a number of biographical questions. The experiments were conducted in a controlled setting during courses undertaken in Sydney and Melbourne and participants were given 25 minutes to complete the case. Participants were given a $20 voucher as compensation for their time in performing the experiment.

RESULTS

Hypothesis Tests

The first hypotheses tested assess the effects of the independent variables on participants' assessment of the company's stock price. The primary analysis is through an ANOVA with *post hoc* analyses as shown below in Table 1.

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[6] This was calculated in the same way as was observed from the valuations performed by financial analysts in the protocol analysis. The assessment of the expected average net profit after tax was multiplied by the estimate of the company's price earnings ratio (based on the industry average price earnings ratio) to calculate the stock price estimate.

Insert Table 1 here

H$_{1a}$ and H$_{1b}$ relate to the perceived value of the non-financial performance indicators compared to the control group. The ANOVA shows a main effect for non-financial information indicating that non-financial performance indicators affect stock price estimates. To confirm the hypotheses *post hoc* tests were required because they propose that they there is a difference from the control group. H$_{1a}$ proposes that disclosure of positive non-financial performance indicators will increase users' stock price estimates. As can be seen in Table 1, Panel C, the stock price when positive non-financial information is provided is $0.14 higher than the control group and that different is significant from the *post hoc* test performed (p=0.009), confirming H$_{1a}$. H$_{1b}$ proposes that disclosure of negative non-financial performance indicators will decrease users' stock price estimates. As can be seen from Table 1, Panel C, when negative non-financial information is provided the stock price is $0.12 lower than the control group and that difference is significant in the *post hoc* test performed (p=0.039), confirming H$_{1b}$.[7]

The next hypothesis tested relate to the value of assurance. H$_{3a}$ proposes that the provision of assurance increases users' stock price estimates. This was not found to be significant as a main effect. However, to test the hypothesis, a t-test was performed to compare directly the difference between the provision and non-provision of assurance (excluding the base case) and the difference was not significant (t=0.59, p=0.280, one-tailed), therefore H$_{3a}$ is rejected.

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[7] For the ANOVAs reporting in Tables 1 and 2, the assumption of homogeneity of variance was violated. Hays (1988, 373) suggested that this is not a major concern where the ratio of the smallest to the largest group size is 1.5 or less, which was satisfied in this case.

H_{4a} and H_{4b} both propose that the value of assurance will be context specific i.e. the signal of the non-financial performance indicators will vary the value that users' place on the assurance provided through their stock price estimates.

H_{4a} states that when there is a disclosure of positive non-financial information, provision of assurance will increase users' stock price estimates. To test this hypothesis, a simple effects test was performed. As can be seen in Table 1, Panel A, when the non-financial information is positive and assurance is provided the share valuation was $6.12, whereas when assurance was not provided the share valuation was $5.99. In performing a simple effects t-test this difference was found to be significant ($t=2.13$, $p=0.019$, one-tailed). However, the assumption of homogeneity of variance was violated in performing Levene's Test for equality of variances ($F=11.17$, $p=0.001$). However, Pagano (2004, 339) says that the evidence suggests that the t-test is a robust test to violations of the assumptions of normality and homogeneity of variance. The violation of homogeneity of variance in this case is quite significant so a Mann-Whitney test was also performed to corroborate the results. The Mann-Whitney was found to be not quite significant ($Z=-1.57$, $p=0.058$, one-tailed). Given the fact that the t-test was very significant and the corroborating evidence of the Mann-Whitney test was almost significant, H_{4a} is accepted.

H_{4b} states that when there is disclosure of negative non-financial performance indicators, provision of assurance does not affect users' stock price estimates. It should be noted that the validity of H_{4b} is conditional on finding a significant effect for H_{4a}, which states that assurance will have a positive effect on users' stock price estimates when positive non-financial performance indicators are disclosed. If no significant differences are found for H_{4a} the conclusion is that assurance does not make a difference and finding the same result for H_{4b} would not add to that finding or be consistent with the theory

underpinning the development of H$_{4a}$ and H$_{4b}$. In this case H$_{4a}$ was found to be significant. From performing a t-test the difference in the mean share price of $5.77 when assurance was provided and $5.82 when assurance was not provided was found to be not significant (t=-.83, p=0.205, one tailed). Therefore H$_{4b}$ was accepted.

The second group of hypotheses tested assesses the effects of the independent variables on participants' earnings forecasts. The primary analysis is through an ANOVA with *post hoc* analyses as shown below in Table 2.

Insert Table 2 here

H$_{2a}$ and H$_{2b}$ relate to the perceived value of the non-financial performance indicators compared to the control group. Therefore although the ANOVA shows a main effect for non-financial information to confirm the hypotheses *post hoc* tests were required because the hypotheses propose that they there is a difference from the control group. H$_{2a}$ proposes that disclosure of positive non-financial performance indicators will increase users' earnings forecasts. As can be seen in Table 2, Panel C, the earnings forecast when positive non-financial information is provided is $0.08 higher than the control group and that different is significant from the *post hoc* test performed (p=0.023), confirming H$_{2a}$. H$_{2b}$ proposes that disclosure of negative non-financial performance indicators will decrease users' earnings forecasts. As can be seen from Table 2, Panel C, when negative non-financial information is provided the earnings forecast is $0.13 lower than the control group and that difference is significant in the post hoc test performed (p<0.001), confirming H$_{2b}$.

The next hypothesis tested relate to the value of assurance. H$_{3b}$ proposes that the provision of assurance increases users' earnings forecasts. Assurance was found to be

significant as a main effect in the ANOVA performed in Table 2 (F=6.99, p=0.009). A *post hoc* test was also performed to compare directly the difference between the provision and non-provision of assurance (excluding the base case) and the difference was not significant (p=0.083) therefore H_{3b} is rejected.

H_{5a} and H_{5b} both propose that the value of assurance will be context specific i.e. the signal of the non-financial performance indicators will vary the value that users' place on the assurance through their earnings forecasts.

H_{5a} states that when there is a disclosure of positive non-financial information, provision of assurance will increase users' earnings forecasts. To test this hypothesis, a simple effects test was performed. As can be seen in Table 2, Panel A, when the non-financial information is positive and assurance is provided the earnings assessment was $4.34, whereas when assurance was not provided the share valuation was $4.25. In performing a simple effects t-test this difference was found to be significant (t=2.61, p=0.006, one-tailed). However, the assumption of homogeneity of variance was violated in performing Levene's Test for equality of variances (F=6.39, p=0.01). The violation of homogeneity of variance in this case is quite significant so a Mann-Whitney test was also performed to corroborate the results. The Mann-Whitney test confirmed the findings from the T-test (Z=-2.68, p=0.004, one-tailed). H_{5a} is therefore confirmed.

H_{5b} states that when there is disclosure of negative non-financial performance indicators, provision of assurance does not affect users' earnings forecasts. It should be noted that the validity of H_{5b} (as with H_{4b} for the reasons previously discussed) is conditional on finding a significant effect for H_{5a}. As discussed above, H_{5a} was found to be significant. As can be seen in Table 2, Panel A, when the non-financial information is negative and assurance is provided the earnings forecast was $4.11, whereas when

assurance was not provided the earnings forecast was $4.05. In performing a simple effects t-test this difference was found to not be significant ($t=1.09$, $p=0.140$, one-tailed). Therefore H_{5b} was accepted.

The final hypothesis, H_6, proposes that provision of assurance increases user's perceptions of non-financial information reliability. Participants were asked: 'Assess the reliability of the non-financial performance indicators disclosed in the annual report'. Their response was measured on an 11 point Likert scale with '0' not reliable and '10' very reliable. An ANOVA was conducted to test the hypothesis that the group provided with assurance assessed the non-financial information as more reliable than the group who were not provided with assurance. The results of the ANOVA are shown in the Table 3 below.

Insert Table 3 here

The difference is between assurance being provided (mean=6.36) and not provided (mean=5.01) is very significant ($F=22.81$, $p<0.001$), thereby confirming H_6.

Sensitivity Analyses

There were a couple of factors that could possibly bias the results that are explored in this section. Firstly, whether the results were driven by the auditors in the group. Secondly, whether responses might be different dependent on whether the participants were stockholders.

Of the CA candidates who performed the experiment, 40 percent were auditors. To ensure that results were not being driven by this group an ANOVA was run to with a separate independent variable indicating whether the participant was an auditor or not. The

descriptive statistics and ANOVA showing the differences between the two groups' stock price estimates are shown below in Table 4.

Insert Table 4 here

From the ANOVA results shown in Table 4, Panel B, it can be seen that there are no significant differences in responses between the auditors compared to non-auditors. The closest result to being significant is the interaction between auditors and assurance. From review of Table 4, Panel A, it can be seen that this interaction is due to auditors undervaluing the audit function rather than overvaluing it as may have been expected. When both positive and negative non-financial information is provided, non-auditors place a higher value on the share price when assurance is provided and a lower value when assurance is not provided than auditors.[8]

The descriptive statistics and ANOVA showing the differences between the two groups' earnings forecasts are shown below in Table 5.

Insert Table 5 here

From the above ANOVA it can be concluded that there are no significant differences between the auditors and non-auditors in how they responded to the experimental manipulations.

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[8] In fact, when the non-auditors are examined alone H_{3a} would have been supported ($t=1.87$, $p=0.032$, one-tailed) and stronger support would have been found for H_{4a} ($t=2.33$, $p=0.012$, one-tailed) as well as H_{4b} as the stock price estimates were exactly the same under both levels of assurance when negative non-financial performance indicators were provided.

The other possible concern was whether the holding of stock made a difference to stock price estimates and earnings forecasts. The ANOVAs were re-run with participants' response to whether they owned stock included as a covariance. This was found to make a significant difference in participants' estimation of the company's stock price estimate (F=5.86, p=0.016), however it was not found to be significant in participants' earnings forecasts (F=0.80, p=0.374). As a result of this an ANOVA was performed for the stock price estimation that included whether the participants owned stock or not as an independent variable in the analysis. Table 6 shows the differences in stock price estimates and the ANOVA performed.

Insert Table 6 here

As can be seen from the above, the stockholding variable was found to be significant in the ANOVA (F=5.46, p=0.020). In looking at the mean differences, it can be seen that this significant difference is due to stockholders consistently adopting more conservative stock price estimations than non-stockholders. There were no interactions between whether the participants owned stock and the non-financial or assurance variables. This provides some assurance that the validity of the results is not affected by the differences due to whether the participants owned stock or not.

Manipulation and Other Checks

The results of the manipulation checks indicate that the participants saw the two variables as intended. For the non-financial information variable, participants were asked to assess on an 11 point Likert scale the level of the non-financial performance indicators with

0 "very poor" and 10 "very good". The group in the positive condition rated the information better than the negative condition with a mean of 6.77 compared to 5.08 ($t = 5.77$, $p < 0.001$). For the provision of assurance, participants were asked on an 11 point Likert scale the level of assurance provided by the external auditors on the non-financial indicators with 0 "no assurance" and 10 "high assurance". The group in the assurance condition rated the assurance level significantly higher with a mean of 6.84 than the group in the non-assurance condition with a mean of 3.90 ($t = 6.45$, $p < 0.001$). These results suggest that the manipulations were seen by the participants as intended. However, a greater difference was expected between the groups in the assurance versus the no-assurance condition because of the dichotomous nature of this variable. It seems that there were some participants who hardly noticed the assurance report at all, which may be due to the fact that it is very rarely produced in practice.[9] There were also some participants who appear to have attributed some assurance from the audit report on the financial statements to the non-financial indicators where there was no assurance provided.[10]

ANOVAs were also run to check whether order manipulations in the case made a difference. This was not found to be a significant factor in participants stock price estimation ($F=0.21$, $p=0.645$) or earnings forecast ($F=0.01$, $p=0.912$).

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[9] Twenty two participants were removed from the analysis where they rated the level of assurance as '0' when an assurance report was provided or '10' where an assurance report was not provided. The overall results as presented in Tables 1 and 2 did not significantly change after these participants were removed.
[10] Some comfort about this possible concern can be gained from the fact that this would work against finding support for Hypotheses 3 and 4.

CONCLUSION

Contribution

  This study provides experimental evidence of the impact of voluntary disclosure of structured non-financial information on stock price estimates and earnings forecasts and the effect of assurance on that information.

  Three key findings emerge from the results. Firstly, non-financial performance indicators in the form of a Balanced Scorecard have a very significant impact on both the stock price estimates and earnings forecasts of sophisticated users. This should be of interest to regulators, users and the accounting profession. If this type of information is value relevant, as these findings suggest, companies will benefit from its disclosure. Of course there are costs associated with the disclosure of proprietary information, and managers need to weigh up whether the benefits outweigh these costs. These findings also indicate that the Balanced Scorecard framework may be appropriate for external disclosure, which is inconsistent with the view of Kaplan and Norton (1993). By experimentally examining the impact of the Balanced Scorecard on external financial statement users the study also provides evidence for the value of one type of structured disclosure of non-financial information, as called for by the AAA FASC (2002).

  Secondly, this study shows that the value of assurance is context specific. Assurance made a significant difference to stock price estimates and earnings forecasts when the non-financial information disclosure was positive, but did not make any difference when the non-financial information disclosure was negative. It was expected that users would be more uncertain about the validity of the positive information disclosures because of concerns about the motivations of managers in making the disclosure and therefore (according to attribution theory) it is expected that they would discount it. This

creates a situation where there would be expected to be a benefit from provision of assurance to reduce this uncertainty. This has implications for managers by showing that if voluntary disclosures of non-financial information are positive then there is value in engaging an auditor to attest the information but if the disclosures are negative it would seem that assurance does not add value for the company. The information hypothesis asserts that independently audited information reduces information asymmetry and decreases uncertainty in a broad sense. This study shows that the value of assurance on disclosure is not independent of the signal provided by the disclosure.

Finally, the AAA FASC (2002) called for research to evaluate whether attestation services could impact on the reliability of non-financial performance measures. In this study, it was found that assurance significantly increased users' perceptions of the reliability of the non-financial performance measures.

Future research should examine the value of alternative models of non-financial information disclosure in experimental settings. The impact of these types of disclosures on the judgments of other user groups should also be evaluated. It would also be interesting to further explore the finding that the value of assurance is not independent of the type of disclosure.

Limitations

The study had some limitations beyond those inherent in experimental studies. The market is made up of participants with a variety of financial literacy levels in relation to firm valuations. Accountants were seen as a good 'mid-way' group between financial analysts who have a very high level of this type of expertise and shareholders who often have a more basic understanding of valuation concepts. However, it is accepted that using

one group such as this is a limitation. Another possible limitation is that only one type of non-financial disclosure was provided - the Balanced Scorecard. This is partially a limitation associated with the experimental approach. The Balanced Scorecard is also a measurement tool designed only for segments; one Balanced Scorecard would therefore not be appropriate for a company with diverse interests. Finally, the experiment related to only one period and users' decisions may have been different if they were measured over a multi-period setting.

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TABLE 1

Stock Price Estimations

Panel A: Descriptive Statistics

	Assurance		
Non-financial	**Provided**	**Not Provided**	**Condition Means**
Positive	6.12 (0.35) n = 38	5.99 (0.21) n = 44	6.05 (0.29) n = 82
Negative	5.77 (0.28) n = 42	5.82 (0.27) n = 38	5.79 (0.27) n = 80
Condition Means	5.94 (0.36) n = 80	5.91 (0.25) n = 82	
Base Case			5.91 (0.18) n = 47

Panel B: Analysis of Variance

Source of Variation	SS	df	MS	F-Ratio	F-Test p-level
Main Effects					
Non-financial	2.81	1	2.81	41.27	<0.001
Assurance	0.08	1	0.08	1.14	0.287
Interaction					
Non-financial × Assurance	0.36	1	0.36	5.33	0.022
Error	13.91	204	0.07		

Panel C: Post Hoc Test – Tukey HSD

Non-financial	Base case versus positive	Base case versus negative	Positive versus negative
Mean Difference	(0.14)	0.12	0.26
Std. Error	0.05	0.05	0.04
Significance	0.009	0.039	<0.001

TABLE 2

Earnings Forecasts

Panel A: Descriptive Statistics

Non-financial	Assurance		Condition Means
	Provided	Not Provided	
Positive	4.34 (0.17) n = 38	4.25 (0.12) n = 44	4.29 (0.15) n = 82
Negative	4.11 (0.22) n = 42	4.05 (0.21) n = 38	4.08 (0.22) n = 80
Condition Means	4.22 (0.23) n = 80	4.16 (0.19) n = 82	
Base Case			4.21 (0.09) n = 47

Panel B: Analysis of Variance

Source of Variation	SS	df	MS	F-Ratio	F-Test p-level
Main Effects					
Non-financial	1.89	1	1.89	67.39	<0.001
Assurance	0.20	1	0.20	6.99	0.009
Interaction					
Non-financial × Assurance	0.01	1	0.01	0.41	0.524
Error	5.74	204	0.03		

Panel C: Post Hoc Test – Tukey HSD

Non-financial	Base case versus positive	Base case versus negative	Positive versus negative
Mean Difference	(0.08)	0.13	0.21
Std. Error	0.03	0.03	0.03
Significance	0.023	<0.001	<0.001
Assurance	Base case versus assurance	Base case versus no-assurance	Positive versus no-assurance
Mean Difference	(0.01)	0.05	0.06
Std. Error	0.03	0.03	0.03
Significance	0.982	0.222	0.083

TABLE 3

Investors' Perceptions of Non-financial Information Reliability

Panel A: Mean Reliability Assessments (0 – 10 Likert Scale)

	Positive Non-financials	Negative Non-financials	Row Means
Assurance	6.05 (1.64)	6.64 (1.99)	6.36 (1.84)
No Assurance	4.81 (1.83)	5.24 (1.48)	5.01 (1.68)
Column Means	5.40 (1.84)	5.98 (1.89)	5.68 (1.89)

Panel B: Analysis of Variance

Source	d.f.	F-statistic	Probability
Non-financials	1	3.35	0.069
Assurance	1	22.81	<0.001
Non-financials x Assurance	1	0.09	0.763

TABLE 4

Comparison Between Auditors and Non-Auditors – Stock Prices

Panel A – Descriptive Statistics

	Control	Positive Non-financial/ Assurance	Positive Non-financial/ No Assurance	Negative Non-financial/ Assurance	Negative Non-financial/ No Assurance
Auditors	5.93 (0.25) n=18	6.04 (0.28) n=12	6.01 (0.24) n=18	5.75 (0.32) n=22	5.87 (0.27) n=13
Non-auditors	5.89 (0.13) n=29	6.16 (0.38) n=26	5.97 (0.19) n=26	5.79 (0.24) n=20	5.79 (0.27) n=25
Dif. in mean	0.04	(0.12)	0.04	(0.04)	0.08
Overall	5.91 (0.18) n=47	6.12 (0.35) n=38	5.99 (0.21) n=44	5.77 (0.28) n=42	5.82 (0.27) n=38

Panel B: Analysis of Variance

Source	d.f.	F-statistic	Probability
Auditors	1	0.01	0.909
Auditors x Non-financial	1	0.61	0.436
Auditors x Assurance	1	2.84	0.093

TABLE 5

Comparison Between Auditors and Non-Auditors – Earnings Forecasts

Panel A – Descriptive Statistics

	Control	Positive Non-financial/ Assurance	Positive Non-financial/ No Assurance	Negative Non-financial/ Assurance	Negative Non-financial/ No Assurance
Auditors	4.21 (0.12) n=18	4.33 (0.20) n=12	4.27 (0.15) n=18	4.11 (0.22) n=22	4.01 (0.20) n=13
Non-auditors	4.21 (0.06) n=29	4.35 (0.16) n=26	4.25 (0.10) n=26	4.10 (0.24) n=20	4.08 (0.21) n=25
Dif. in mean	0.00	(0.02)	0.02	0.01	(0.07)
Overall	4.21 (0.09) n=47	4.34 (0.17) n=38	4.25 (0.12) n=44	4.11 (0.22) n=42	4.05 (0.21) n=38

Panel B: Analysis of Variance

Source	d.f.	F-statistic	Probability
Auditors	1	0.24	0.627
Auditors x Non-financial	1	0.26	0.611
Auditors x Assurance	1	0.16	0.691

TABLE 6

Comparison Between Stockholders and Non-Stockholders – Stock Prices

Panel A – Descriptive Statistics

	Control	Positive Non-financial/ Assurance	Positive Non-financial/ No Assurance	Negative Non-financial/ Assurance	Negative Non-financial/ No Assurance
Stockholders	5.88 (0.17) n=27	6.10 (0.36) n=21	5.96 (0.23) n=24	5.72 (0.24) n=14	5.71 (0.20) n=17
Non-Stockholders	5.94 (0.20) n=20	6.16 (0.35) n=17	6.02 (0.19) n=20	5.79 (0.30) n=28	5.90 (0.29) n=21
Dif. in mean	(0.06)	(0.06)	(0.06)	(0.07)	(0.19)
Overall	5.91 (0.18) n=47	6.12 (0.35) n=38	5.99 (0.21) n=44	5.77 (0.28) n=42	5.82 (0.27) n=38

Panel B: Analysis of Variance

Source	d.f.	F-statistic	Probability
Stockholding	1	5.46	0.020
Stockholding x Non-financial	1	0.74	0.390
Stockholding x Assurance	1	0.49	0.487