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Non-GAAP Earnings Disclosures: Users' Perspective.

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Non-GAAP Earnings Disclosures: Users' Perspective

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Submitted in total fulfilment of the requirements of the degree of Doctor of Philosophy

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ABSTRACT

This dissertation examines how qualitative non-GAAP disclosures can affect investor decision making. It provides evidence that current accounting regulations surrounding such disclosures are useful to financial statement users and influence investor judgments. A largely recent, and archival, non-GAAP literature, which is maturing from its initial opportunistic versus informative roots, reveals a nuanced, but context-dependent, consensus slowly emerging. Increasing investor awareness of non-GAAP disclosures, coupled with tighter regulatory scrutiny of the practice, is resulting in users considering the management defined measures as more of a complement, rather than a replacement, to those prepared in accordance with accounting standards.

However, there is no suggestion the world of non-GAAP reporting is perfect. Evidence persists of firms using the management defined measures for opportunistic purposes. Whilst regulation is improving the non-GAAP disclosure environment; researchers still need to undertake constant fine-tuning and testing of the appropriate accounting standards and regulations. This dissertation contains experimental studies that examine two previously untested U.S. Security and Exchange Commission filing requirements. The two requirements are (1) how management internally uses non-GAAP earnings and (2) why management believes the disclosure of non-GAAP earnings is important. This dissertation utilises online participants to conduct two experiments concerning qualitative, non-GAAP earnings disclosures.

The first study, referred to as the Compensation study, examines the corporate disclosure of how management internally uses non-GAAP earnings. This study addresses the research question, *“how does the disclosure of managements’ internal use of non-GAAP earnings affect the decision making of financial statement users?”* Specifically, whether or not the use of non-GAAP earnings to determine executive compensation influences investor judgments, including investor evaluations of corporate financial performance and willingness to invest. The Compensation study finds investors prefer companies that use non-GAAP earnings in their performance contracting of executives. The finding persists in the prima facie more opportunistic setting of a reported GAAP loss and simultaneous non-GAAP profit. The additional analysis finds, contrary to prior research, contemporary investors cognitively rely on non-GAAP measures when making their investment-related decisions.

The second study, referred to as the Justification study, examines the corporate disclosure of how (and if) management justifies reporting their non-GAAP earnings. This study addresses the research question, *“how does the disclosure of managements’ justification of providing non-GAAP earnings affect the decision making of financial statement users?”* Specifically, whether a highly ambiguous or highly detailed non-GAAP earnings justification influences investor judgments. The

study also examines the scenario where management is silent on non-GAAP disclosure. The Justification study finds investors' judgments are not influenced by either the level of detail management provides or the presence of a non-GAAP earnings justification. However, preliminary evidence suggests investors' reactions to non-GAAP justifications are moderated by investors' level of financial reporting knowledge.

These findings are important for regulators seeking to maximise the reporting efficiency of corporate disclosure requirements and to standard-setting bodies, FASB and IASB, as they seek to craft accounting standards that produce reliable and relevant information for their intended audience. This dissertation provides input into what the IASB terms 'the disclosure problem'. The concerns are financial statements do not contain enough relevant information, contain too much irrelevant information, and ineffectively communicate the information they do provide. This dissertation contributes to the debate by highlighting management's internal use of non-GAAP measures as being relevant information and management's justification of non-GAAP measures as being, predominately, irrelevant for investor decision making.

The experimental studies also contribute to the extensive extant literature surrounding agency theory, attribution theory and ambiguity theory. It answers the call of behavioural accounting researchers to investigate judgment and decision-making theories in a financial accounting context.

KEYWORDS

Non-GAAP earnings, experiment, non-financial disclosure, executive compensation, street earnings, pro forma earnings, Regulations S-K, attribution theory, ambiguity theory

DECLARATION BY AUTHOR

This dissertation is submitted to Bond University in fulfilment of the requirements of the degree of Doctor of Philosophy. This dissertation represents my own original work towards this research degree and contains no material that has previously been submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

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ETHICS DECLARATION

The research associated with this dissertation received ethics approval from the Bond University Human Research Ethics Committee. Ethics application numbers MB02487, MB02503 and MB02505.

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No Copyright Declaration: no published manuscripts were included for publication within this dissertation.

TABLE OF CONTENTS

Title Page.....	i
Abstract	ii
Keywords.....	iv
Declaration by author	v
Declaration of author contributions.....	vi
Research outputs and publications during candidature	vii
Ethics declaration	viii
Copyright declaration	ix
Table of Contents	x
List of Figures.....	xi
List of Tables.....	xii
Chapter 1: Introduction.....	1
1.1 Background	1
1.2 Research questions	4
1.3 Experimental studies and findings	5
1.4 Contribution	8
Chapter 2: Literature Review	11
2.1 Definitions.....	11
2.2 Street earnings as a proxy for pro forma earnings.....	12
2.3 The nature and extent of pro forma disclosures	15
2.4 Why do firms make pro forma disclosures?.....	19
2.5 How do pro forma disclosures affect users' decisions?	34
2.6 Can regulation moderate pro forma disclosures?.....	38
2.7 Research questions	40
Chapter 3: Non-GAAP Earnings and Executive Compensation.....	42
3.1 Development of hypotheses	43
3.2 Method	48
3.3 Results	61
3.4 Discussion and conclusions.....	74
Chapter 4: Non-GAAP Earnings and Managements' Justification.....	78
4.1 Development of hypotheses	79
4.2 Method	86
4.3 Results	97
4.4 Discussion and conclusions.....	115
Chapter 5: Conclusion	120
References	125
Appendices	151

LIST OF FIGURES

Figure 1: GAAP vs non-GAAP published studies by non-GAAP source (n=99).....	16
Figure 2: Experimental design for the Compensation study	53
Figure 3: Compensation study investors' judgments and related hypotheses	56
Figure 4: Theoretical framework for the Compensation study.....	59
Figure 5: Observed mediation model for intention to inform.....	70
Figure 6: Hamilton and Winchel dual-process model	81
Figure 7: Justification study feelings of rightness variables and related hypotheses	94
Figure 8: Justification study valuation judgment variables and related hypotheses.....	95
Figure 9: Theoretical framework for the Justification study	96
Figure 10: Observed mediation model for hypothesis 4.....	106

LIST OF TABLES

Table 1: Participant screening for the Compensation study	51
Table 2: Experimental flow	55
Table 3: Summary of dependent variables	60
Table 4: Descriptive statistics of participants' Compensation study judgments.....	62
Table 5: Results of hypothesis 1.....	64
Table 6: Results of hypothesis 2.....	65
Table 7: Results of hypothesis 3.....	66
Table 8: Results of hypothesis 4.....	67
Table 9: Intention to inform mediation analysis.....	69
Table 10: Specific manipulation check analysis.....	72
Table 11: Compensation study summary of results.....	73
Table 12: Participant screening	87
Table 13: Treatment groups.....	89
Table 14: Readability controls by treatment.....	90
Table 15: Experimental flow	92
Table 16: Descriptive statistics of participants' Justification study judgments	99
Table 17: Results of hypothesis 1.....	100
Table 18: Level of disclosure descriptive statistics for variables.....	101
Table 19: Level of disclosure additional analysis results.....	102
Table 20: Results of hypothesis 2.....	103
Table 21: Results of hypothesis 3.....	104
Table 22: Results of hypothesis 4.....	105
Table 23: Financial reporting knowledge descriptive statistics - Mean (SD).....	107
Table 24: FoR descriptive statistics for financial reporting knowledge - Mean.....	107
Table 25: Financial reporting knowledge and treatment interactions for hypothesis 1	108
Table 26: Financial reporting knowledge for FoR variables by disclosure- Mean (SD).....	109
Table 27: Financial reporting knowledge and disclosure interactions for hypothesis 1.....	111
Table 28: Descriptive statistics for financial reporting knowledge and disclosure - Means (SD)	113
Table 29: Financial reporting knowledge and disclosure interactions for hypothesis 2.....	114
Table 30: Justification study summary of results	115
Table 31: ABDC A and A* by subject.....	151
Table 32: GAAP vs non-GAAP studies by journal.....	153
Table 33: Prior accounting research designs and scales.....	160
Table 34: Test of homogeneity of variances for Compensation study variables.....	163
Table 35: Test of homogeneity of variances for Justification study variables	164
Table 36: Tests of normality for Compensation study variables.....	165
Table 37: Tests of normality for Justification study variables	167
Table 38: Effect size comparisons.....	169
Table 39: Financial reporting knowledge quiz participant screening.....	184

CHAPTER 1: INTRODUCTION

Virgin Australia announced an “Underlying EBIT of \$210.6 million” in 2016 (Virgin Australia Holdings Limited, 2016). However, later in the very same announcement, the reader is informed of a “Statutory Loss After Tax of \$224.7 million”. “Underlying EBIT” is an example of a management defined earnings measure, which are referred to as non-GAAP disclosures. Virgin Australia is not unique in its disclosure choice. Sixty-four per cent of ASX200 companies (Malone et al., 2016), more than 80% of European firms (Guillamon-Saorin et al., 2017), and 88% of United States (U.S.) S&P500 companies (Coleman & Usvyatsky, 2015) report non-GAAP earnings. Not only is the disclosure of non-GAAP earnings commonplace, but it is also material. Securities and Exchange Commission (SEC) filings for 2015 indicate 82% of S&P500 companies report non-GAAP income greater than the GAAP equivalent (Coleman & Usvyatsky, 2015). These adjustments exceed \$100 billion, representing an increase to GAAP net income of more than 20% (Ciesielski & Henry, 2017).

Wesley Bricker, the chief accountant at the Securities and Exchange Commission, notes there is a “mischievous quality to non-GAAP reporting” (Cohn, 2018). As a result, the U.S. Securities and Exchange Commission (SEC) is expanding its whistleblower program to include monetary rewards for exposure of non-GAAP reporting violations (Stock & Zuckerman, 2018). The accounting literature finds managers’ motivations for disclosing non-GAAP measures are varied, nuanced, context-dependent and debated. However, the importance and impact they have on investors and markets are certainly not in dispute (Black et al., 2018; Young, 2014).

Prior research has primarily focused on the decision usefulness of the non-GAAP measures themselves but has largely overlooked the mandated qualitative disclosures that accompany and justify the reporting of non-GAAP measures (Chen et al., 2021a). This dissertation contributes to the conversation by focusing on the mandated qualitative disclosures that accompany reports of non-GAAP measures and explores whether these impact the decision making of investors. Investors’ judgments and decisions include evaluations of corporate financial performance and willingness to invest.

1.1 BACKGROUND

Non-GAAP measures are disclosed primarily in earnings announcements but can appear in annual reports, corporate websites, press releases and anywhere GAAP measures are also found. Their calculation most commonly involves adding back to GAAP earnings non-cash, one-off, non-

recurrent or other income and expenditure items management considers outside the ordinary course of business. These unaudited earnings measures are most often favourable as they usually exceed GAAP earnings. Non-GAAP disclosures in the U.S. rose to prominence in the mid-1990s (Bradshaw & Sloan, 2002). The practice quickly drew the attention of the financial press (Weil, 2001), industry bodies (Heitger & Ballou, 2003; James & Michello, 2003) and the U.S. regulator (Kabureck, 2017; SEC, 2001; White, 2016). Early impressions of the disclosures were resoundingly negative, with former Chief Accountant of the SEC, Lynn Turner, famously describing non-GAAP earnings as “everything but the bad stuff” (Dow Jones & Company Inc, 2001).

The initial focus of academic research was managements’ motivations for disclosing non-GAAP measures. The two competing, but not mutually exclusive, hypotheses of managers’ motivations are: (1) to provide market useful information or (2) to mislead the market. The two motivations are respectively labelled as *informative* and *opportunistic*. There has been a significant amount of research investigating these differing views of non-GAAP disclosures. Studies supporting the informative view cite higher quality earnings, a closer alignment to stock returns than GAAP earnings and voluntary non-GAAP disclosure when not doing so would have been more beneficial. However, proponents of the opportunistic view note non-GAAP earnings exclusions are often recurrent expenditures, non-GAAP earnings are used to beat analyst forecasts, and non-GAAP earnings are used to turn GAAP losses into non-GAAP profits.¹

The potentially opportunistic nature of non-GAAP earnings prompted the SEC, in 2001, to issue cautionary advice to the market (SEC, 2001). The U.S. Congress also intervened and enacted the Sarbanes-Oxley Act (SOX) in 2002, partially to address non-GAAP disclosures. The result was changes to the Code of Federal Regulations (CFR), including the creation of Regulation G², to govern public disclosures, and amendments to Regulation S-K³, to govern SEC filings. In announcing the changes, the SEC stated,

“The amendments to our rules are intended to ensure that investors and others are not misled by the use of non-GAAP financial measures” (SEC, 2002).

Evidence suggests past SEC regulations are broadly successful in curbing opportunistic corporate reporting behaviour. The SOX Act, and subsequent regulations, are credited with decreasing the emphasis of non-GAAP, relative to GAAP, disclosures (Bowen et al., 2005; Entwistle

¹ A detailed discussion surrounding all these assertions are referenced in the literature review chapter of this dissertation.

² Office of the Federal Register (2017a)

³ Office of the Federal Register (2017b)

et al., 2006b; Marques, 2006), improving the quality of non-GAAP to GAAP reconciliations (Baik et al., 2008; Zhang & Zheng, 2011), decreasing the likelihood of non-GAAP earnings being used to meet or beat analyst forecasts (Chen, 2010; Heflin & Hsu, 2008; Kolev et al., 2008) and increasing the quality of non-GAAP exclusions (Black et al., 2012; Black et al., 2017a; Bond et al., 2017; Chen, 2010; Heflin & Hsu, 2008; Kolev et al., 2008). In sum, evidence suggests recent non-GAAP disclosures are predominately informative (Black et al., 2021b; Hribar et al., 2021).

However, the non-GAAP disclosure debate is far from settled. For example, there is still evidence investors are being misled by opportunistic disclosures even after the regulatory intervention (Barth et al., 2012; Baumker et al., 2014; Black et al., 2017a; Choi & Young, 2015; Curtis et al., 2014). An SEC Compliance and Disclosure Interpretation (SEC, 2010) relaxed the disclosure criteria surrounding recurrent expenditure (recurrent expenditure are items firms reasonably expect to incur on a regular basis, such as depreciation, stock-based compensation expense and research and development costs). This change reduced the effectiveness of non-GAAP regulations initially introduced by SOX (Bond et al., 2017). More recent SEC updates (SEC, 2016, 2018) have further amended the interpretation of the SOX Act. These factors suggest the SEC is actively modifying the regulations but is still yet to strike a balance between informing and protecting investors.⁴

Other jurisdictions are also working to regulate non-GAAP disclosures. After a number of years of discussion, the Australian Securities and Investment Commission released *Regulatory Guide 230: Disclosing non-IFRS financial information* (ASIC, 2011). This document sets out guidance for Australian corporations when disclosing non-IFRS information⁵. The rules include equal prominence of measures, reconciliation to GAAP, terminology, consistency across time and a statement of whether the information is audited. Even though similar guidance regarding the use of non-GAAP measures has been issued by the standards boards or market regulators of other countries (for example, New Zealand, United Kingdom, France, South Africa, and Ireland), differences persist. For instance, South Africa has mandated the separate disclosure of a non-GAAP income statement measure, *headline earnings*, whilst Irish firms are recommended to disclose all non-GAAP measures in one location in the annual report (Irish Auditing & Accounting Supervision Authority, 2012).

Former Chair of the SEC, Mary Jo White, recently expressed concerns that corporations are using non-GAAP measures to “supplant, rather than supplement” GAAP measures (White, 2016). In December 2016, the IASB project, *Primary Financial Statements*, was commissioned, in part, to

⁴ SEC website explicitly states their goal is to “inform and protect” investors. <https://www.sec.gov/about/what-we-do>

⁵ Non-US jurisdictions follow International Financial Reporting Standards rather than US-GAAP. However, throughout this paper the term non-GAAP is used in the generic sense thus covering earnings measures that would otherwise be more correctly called non-IFRS.

address the issue of non-GAAP income statement measures (Kabureck, 2017). The SEC has also stated they intend to deal with non-GAAP disclosures through “*enforcement and further rulemaking if necessary to achieve optimal disclosures for investors*” (White, 2016). Overall, there is continuing debate on the practice, suggesting that it is still controversial. Prohibiting the practice of non-GAAP disclosures appears unrealistic, given its prevalence and potential to provide decision-useful information. Thus, regulators need to find a balance between the reporting of GAAP information, and supplementary non-GAAP disclosures, through the enactment of effective accounting standards permitting the practice while preserving the faithful representation of the information.

Given non-GAAP measures can be simultaneously informative and opportunistic (Choi & Young, 2015; Curtis et al., 2014; Lougee & Marquardt, 2004), a goal, and challenge, of standard setters and regulators, is to create accounting standards that allow managers to inform the market while at the same time mitigating the potential to mislead users of financial statements through non-GAAP disclosures (IASB, 2017a; SEC, 2002). This balancing act is a goal of the SEC regulations mandating certain non-GAAP disclosure conditions, such as those governing SEC filings.

1.2 RESEARCH QUESTIONS

SEC filing regulations set out four requirements for the inclusion of non-GAAP measures: (A) prominence of a non-GAAP measure, (B) reconciliation to appropriate GAAP measure, (C) justification for disclosing non-GAAP measure and (D) management’s use of non-GAAP measure (Office of the Federal Register, 2017b).⁶ Prior studies examine the first two requirements and find prominent and reconciling information does affect investor judgments (Allee et al., 2007; Christensen et al., 2014; Elliott, 2006; Hogan et al., 2017; Marques, 2010; Zhang & Zheng, 2011). To date, limited research has been conducted into the requirements (C) or (D). This dissertation is the first to address either of the remaining two SEC requirements in depth.

These two unresearched SEC requirements may contain important information useful to financial statement users, similar to the first two requirements. However, negative media attention has been shown to increase users’ hesitancy in using non-GAAP information (Koning et al., 2010) despite many situations where non-GAAP earnings have been shown to be more informative than GAAP earnings (Bhattacharya et al., 2003; Bradshaw et al., 2018; Choi et al., 2007). Therefore, managers wanting to disclose informatively may need to distance their non-GAAP announcements from the generally negative perception of non-GAAP use. Accompanying qualitative disclosures are one means to achieve this outcome. The rationale management provides for their non-GAAP

⁶ See Appendix E for the complete wording of the SEC Regulations S-K, section 10.

measures may give investors insight into managements' disclosure motivations. There is very limited research into the qualitative nature of non-GAAP disclosures, a fact this dissertation helps rectify. Available evidence indicates that non-financial, non-GAAP disclosures are useful in investor decision making. Guillamon-Saorin et al. (2017) find low-quality exclusions, such as recurrent expenditure items, in European firms' non-GAAP measures are positively associated with high levels of impression management⁷. Chen et al. (2021a) find a positive association between non-GAAP measure quality and disclosure transparency. These findings are consistent with management using qualitative non-GAAP disclosures to influence financial statement users' decision making.

This dissertation extends and builds on the limited research into qualitative disclosures issued by management in conjunction with the non-GAAP measures and how this impacts decision making. To address this issue, the dissertation contains two studies that examine the two qualitative requirements of SEC corporate filings: (1) managements' internal use and (2) managements' justification for disclosure of non-GAAP measures. The Compensation study uses agency and attribution theories to address the research question: *how does the disclosure of managements' internal use of non-GAAP earnings affect the decision making of financial statement users?* The Justification study employs ambiguity theory to address the research question: *how does the disclosure of managements' justification of providing non-GAAP earnings affect the decision making of financial statement users?*

1.3 EXPERIMENTAL STUDIES AND FINDINGS

Both studies utilise an experimental design to complement the predominately archival extant non-GAAP literature to capitalise on the advantages the experimental method offers. First, manipulating managements' justification and internal use disclosures of non-GAAP measures, while holding all else constant, allows the drawing of a causal link to investor judgments. In practice, many market, industry, and company-specific factors influence investor judgments and therefore can confound researchers' ability to draw causal conclusions. In particular, the multiple dimensions of qualitative disclosures make it difficult for archival researchers to draw meaningful causal links in this area (Han, 2013). Experimental researchers are uniquely positioned to provide insights into the potential impacts of textual disclosures as they possess the ability to manipulate a single dimension (e.g., scenario construction, readability, vividness, emotion, and various other elements). Second, debriefing questions directly following participant evaluations allow identification of the information participants considered salient and relevant in their decision making. A key advantage of

⁷ The authors define impression management as the tone, location and reinforcement of key words, repetition of statements and presence of quantitative comparisons.

experimental methods is the ability to investigate mediating variables allowing researchers to establish an explanatory mechanism for the observed results (Hayes, 2018).

The first study, which I refer to as the Compensation study, investigates how managements' internal use of non-GAAP earnings affects investor judgments. A common use of non-GAAP earnings is determining executive compensation (Curtis et al., 2021), and previous archival research finds managers manipulate non-GAAP earnings to increase their compensation (Grey et al., 2013; Guest et al., 2022; Isidro & Marques, 2013; Lont et al., 2020). However, agency theory suggests managers should be rewarded for their performance, and research shows non-GAAP measures are a better indicator of future firm performance compared to GAAP measures (Black et al., 2018; Marques, 2017; Young, 2014). In support of agency theory, researchers note non-GAAP measures linked to executive remuneration can improve disclosure quality (Black et al., 2022; Kyung et al., 2021). The focus of the Compensation study is to determine if, in an experimental setting, investors attribute the use of non-GAAP earnings in determining executive compensation to managements' desire to inform or mislead the market.

The use of non-GAAP measures to turn a GAAP loss into a non-GAAP profit is not uncommon and is typically considered indicative of opportunistic behaviour (Bhattacharya et al., 2004; Walker & Louvari, 2003). The Compensation study also explores this seemingly more opportunistic setting to test the strengths of the investors' attributions of management non-GAAP disclosures and the effect they may have on investors' judgments.

The Compensation study uses a 2x2 between-subjects experiment in which participants view an extract of the 10-K filing of a hypothetical pharmaceutical company and provide their judgments. The study manipulates the use of non-GAAP earnings to determine executive compensation and the level of GAAP net income (GAAP profit or GAAP loss). As stated, the purpose of this second manipulation is to determine if any effect found in the first manipulation holds in the seemingly more opportunistic setting (that is, a non-GAAP profit with a simultaneous GAAP loss).

Consistent with expectations, the Compensation study finds management's use of non-GAAP measures to determine executive compensation affects participants' judgments. Specifically, participants rate the financial performance higher, and are more willing to invest in a company that uses non-GAAP earnings as a basis for executive compensation. These findings persist when a GAAP loss contemporaneously accompanies a non-GAAP profit. Furthermore, mediation analysis results support the notion that investors attribute non-GAAP earnings disclosures to management's intention to inform investors, rather than to opportunistically mislead them, and that this perception of informativeness drives the evaluation of financial performance and ultimately the investment decision.

Additional analysis reveals further support for the informative nature of non-GAAP disclosures. Prior research finds unintentional cognitive effects influence investors' judgments (Elliott, 2006; Frederickson & Miller, 2004). That is, non-professional investors do not intentionally rely on non-GAAP information, but rather their judgments are influenced by the presence and prominence of non-GAAP measures. However, the Compensation study finds investors do intentionally rely on non-GAAP measures in their decision making. Some potential reasons for the inconsistency include significant public exposure (Henry et al., 2017; Lewitt, 2017), leading to investors being more wary of non-GAAP reporting and SEC regulations (e.g. Office of the Federal Register, 2017a) improving the quality of non-GAAP disclosures (Black et al., 2018).

The second experiment, which I refer to as the Justification study, investigates how managements' justification for disclosing non-GAAP earnings affects investor judgments. Previous research suggests management uses non-financial disclosures to influence investor decision making (Amir & Lev, 1996; Coram et al., 2009; Ittner & Larcker, 1998). Although limited to date, extant research suggests qualitative non-GAAP disclosures are another lever management can pull in an attempt to influence investor decisions (Chen et al., 2021a; Guillamon-Saorin et al., 2017). Ambiguity theory suggests individuals prefer precise information to vague information (Curley & Yates, 1985), and the level of ambiguity in disclosures can affect investor decisions (Du, 2009). The focus of the Justification study is to determine if, in an experimental setting, the level of ambiguity of a non-GAAP earnings justification will affect investors' judgments. Because financial reports are prepared for knowledgeable and diligent users (IASB, 2010), the Justification study also performs some preliminary analysis concerning investors' financial reporting knowledge and their judgments.

The Justification study uses a 3x1 between-subjects experiment in which participants view the press release of a hypothetical pharmaceutical company, three optional supplementary information items (analyst report, non-GAAP reconciliation and financial statement extracts) and provide their judgments. The study manipulates the level of ambiguity of managements' non-GAAP earnings justification found in the press release (no disclosure, low ambiguity, and high ambiguity). The study also uses a six-question test to separate participants based on their financial reporting knowledge. Details of how the test is developed can be found in the study and Appendix I.

Contrary to expectations, the Justification study finds no significant relationship between the level of ambiguity of managements' non-GAAP justifications and participants' judgments. Furthermore, additional analysis reveals the lack of relationship persists in the scenario where no justification is present. Investor judgments are found to be independent of whether or not management makes a non-GAAP justification disclosure. This finding suggests the provision of a non-GAAP justification alongside corporate results has no impact on users' judgments, which could be due to a

number of factors including because the signal is too subtle or not fully understood by users. The Justification study also provides analysis by creating dichotomous groups of participants' financial reporting knowledge, i.e., high or low knowledge. When using these two groups, the findings indicate high financial reporting knowledge participants rely on a non-GAAP justification disclosure, but the level of ambiguity of that disclosure is irrelevant. Results also show low financial reporting knowledge investors are significantly more likely to invest greater capital than are high financial knowledge investors when no disclosure is present.

Taken together, the findings partially support the SEC mandate for companies to provide qualitative information concerning non-GAAP disclosures in their SEC filings. Investors find the disclosure of non-GAAP earnings being used in determining executive compensation decision-useful, but, in general, do not rely on managements' justification of non-GAAP disclosures when making investment decisions.

1.4 CONTRIBUTION

This dissertation makes several important contributions. First, it extends the limited existing research to provide direct evidence for two of the four SEC filing requirements. The first two SEC requirements, (A) prominence and (B) reconciliation, have proven to be decision useful to investors. This dissertation examines the second two requirements, (C) management's justification and (D) internal use and provides preliminary evidence of their decision usefulness. Second, it provides insight for accounting standard setters looking to craft standards that include addressing the markets' voluntary disclosure of non-GAAP earnings. Third, it contributes to the existing body of non-GAAP research by providing causal evidence using experiments. The extant literature is dominated by archival studies that are only able to provide correlational evidence. This dissertation provides causal evidence on the usefulness of non-GAAP disclosures and explores the various nuances of how non-GAAP investor judgments are made.

SEC regulations set out four requirements for the inclusion of non-GAAP measures in SEC filings: (A) prominence of a non-GAAP measure, (B) reconciliation to appropriate GAAP measure, (C) justification for disclosing non-GAAP measure and (D) management's use of non-GAAP measure (Office of the Federal Register, 2017b).⁸ Requirements (A) and (B) have been extensively studied, but only Chen et al. (2021a) have begun to address requirements (C) and (D). However, due

⁸ See Appendix E for the complete wording of the SEC Regulations S-K, section 10.

to the nature of their study, no direct inferences regarding these two requirements can be drawn.⁹ In contrast, this dissertation directly investigates the requirements around the justification for and internal use of non-GAAP measures and finds mixed results. The Justification study finds limited evidence to support the inclusion of item (C) in SEC filings. Investors' assessment of firm performance and their willingness to invest are unaffected by the wording of a management justification for disclosing non-GAAP earnings. However, while investors with higher financial reporting knowledge do find the justification disclosure useful, the contents of the disclosure appear unimportant. The Compensation study provides support for the inclusion of item (D) in SEC filings in the context of firms using non-GAAP earnings to calculate executive compensation. Investors rely on this information and consider it to be decision useful.

While on the surface, non-GAAP reporting can appear opportunistic, proponents believe it enhances the decision-usefulness of financial information by providing users with a more relevant measure of the real earnings performance of a company. However, concerns exist that these, largely unregulated, disclosures “might obscure or undermine other information in the financial statements” (IASB, 2017a, p. 44). Concerns noted include users finding it difficult to identify relevant, audited financial statement information and that too much additional information, even if appropriately highlighted, fragments the financial statements. User-perspective evidence is timely due to the International Accounting Standards Board (IASB) recently seeking comments on its ‘Disclosure Initiative – Principles of Disclosure’ project (IASB, 2017a). This dissertation aims to pursue this line of enquiry and produce evidence of the impact non-GAAP disclosures might have on the decision-making of financial statement users.

In addition, the U.S. standard setter, the Financial Accounting Standards Board (FASB), are also closely watching the evolution of non-GAAP reporting (Kabureck, 2017). Non-GAAP reporting, as the name suggests, is outside of the established accounting standards. To remain relevant in a reporting environment where voluntary disclosures of accounting information are prevalent, the FASB and IASB are developing standards that add value to financial reports without overburdening corporate reporting requirements (FASB, 2015; IASB, 2017b). Furthermore, the IASB has recently released an exposure draft on the general presentation and disclosures in financial statements; this exposure draft specifically highlights the importance of non-GAAP measures, referred to as management performance measures (MPM) by the IASB (2019). This dissertation provides

⁹ The researchers examine 12 qualitative characteristics relating to non-GAAP disclosures and give them a rating. Items (C) and (D) are just two of these 12 characteristics. The small sample size (N=2,266) and the binary nature of each category (the final disclosure score ranges from zero to 12 with a median = 5) means the researcher-developed instrument is a broad approximation of disclosure quality.

preliminary evidence to support the regulation of the disclosure of managements' use of non-GAAP measures as investors find the disclosures informative.

The remainder of this dissertation is organised as follows. Chapter 2 contains a comprehensive review of the extant non-GAAP literature and leads into this dissertation's research questions. Chapters 3 and 4 contain the Compensation and Justification studies, respectively. Each study addresses a research question. Each study also contains their relevant hypothesis development, experimental methodology, analysis, and discussion. A summary of the dissertation's conclusions and contributions are contained in Chapter 5.

CHAPTER 2: LITERATURE REVIEW

This chapter presents a review and synthesis of the relevant non-GAAP literature. After a discussion of the non-GAAP terms used in the literature, this chapter then establishes the prevalence and significance of non-GAAP disclosures. Next, the research on the motivations for employing non-GAAP disclosures is reviewed, considering both the informative and opportunistic perspectives. Then, a discussion of a growing subset of the non-GAAP literature, performance contracting, is presented. This chapter also reviews the literature around how non-GAAP disclosures influence users' decision-making. Details of the review criteria and process are contained in Appendix A. Finally, this chapter discusses the research on how other factors moderate managements' non-GAAP disclosures.

2.1 DEFINITIONS

Although many studies examine firms' 'core' or recurring earnings, it is a seminal paper by Bradshaw and Sloan (2002) that starts the "non-GAAP" literature. The early literature interchangeably uses 'street' and 'pro forma' earnings¹⁰ to describe non-GAAP earnings. Gu and Chen (2004) provide helpful, and now widely accepted definitions:

1. 'Pro forma earnings' being the term used to describe the modified actual earnings figures reported by management.
2. 'Street earnings' being the term used to describe the modified actual earnings figures reported by analysts (such as First Call or I/B/E/S).¹¹

Others suggest the above terms can be more accurately described as "incomplete-GAAP" earnings (Bradshaw & Soliman, 2007; Christensen, 2007). Non-U.S. centric and recent U.S. research studying this phenomenon use the term 'non-GAAP' or 'non-IFRS' in place of pro forma earnings (Black et al., 2017a; Choi et al., 2007; Curtis et al., 2014; Isidro & Marques, 2013; Koning et al., 2010). The Gu and Chen (2004) terminology, recognising pro forma and street earnings are individual concepts with different origins (management vs analyst defined), is employed to review the literature. Highlighting these two distinctly different concepts allows a more thorough discussion of their nuances in the systematic literature review and the ability to demonstrate the historical progression

¹⁰ Historically, the term 'pro forma' represents financial information showing the continuing impacts of significant business acquisitions or disposals (Office of the Federal Register, 2017b). Although this historic definition is consistent with the Office of the Federal Register (2017b) it is inconsistent with Sarbanes-Oxley Act (2002).

¹¹ First Call and I/B/E/S are databases that collate analyst estimates. Christensen (2012, p. 566) provides a detailed discussion on the calculation of street earnings. In summary, street earnings are calculated from reported (GAAP) earnings adjusted for items that have not been forecast by a majority of analysts.

of non-GAAP research. Where appropriate, both pro forma and street earnings are collectively referred to as ‘non-GAAP’ earnings.¹² However, when describing the research this dissertation is pursuing, the term ‘non-GAAP’ will describe managements’ disclosed measures. This approach is consistent with the recent literature (Black et al., 2018).

2.2 STREET EARNINGS AS A PROXY FOR PRO FORMA EARNINGS

While most studies use actual pro forma earnings figures issued by management, more than a quarter, and some of the most cited (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Doyle et al., 2003), use street earnings as a proxy for pro forma earnings. Bhattacharya et al. (2003) were the first to examine actual pro forma earnings releases issued by management. Street earnings, from sources such as I/B/E/S, are a machine-readable dataset widely available to a vast number of researchers. In contrast, pro forma disclosures, until recently, need to be hand collected. Readily available and containing ample observations, street earnings data allow for powerful statistical analysis.

Bhattacharya et al. (2003) collect both street and pro forma earnings and find a statistically significant mean difference of approximately 4 cents per share. In their sample, they find the pro forma earnings figure are greater than GAAP (street) in 70% (26%) of instances. They also find pro forma earnings are equal to GAAP (street) in 0%¹³ (65%) of cases. Choi et al. (2007) find support in that U.K. management adjustments were the same as Thompson Datastream (I/B/E/S) analyst adjustments in 55% (69%) of cases. Bhattacharya et al. (2007) find when firms voluntarily report a pro forma number, it agrees with I/B/E/S analysts’ adjustments just 58% of the time. However, it is the Bhattacharya et al. (2003) 65% finding that has been the justification for many subsequent studies to use street earnings as a proxy for pro forma earnings (Bond et al., 2017; Doyle et al., 2003; Gu & Chen, 2004). Literary commentators are in agreement that a difference exists between street and pro forma earnings (Bhattacharya et al., 2003; Bradshaw, 2003; Christensen, 2007; Easton, 2003). However, there is disagreement surrounding whether the difference is significant enough to invalidate the use of street earnings as a proxy for pro forma earnings.

Doyle et al. (2003) believe both management and analysts are similarly focused, hence the importance of beating analysts’ targets. They randomly audit a subset of press releases in their sample and find the street earnings figure matched the pro forma figure in 96% of instances. They did not

¹² Non-U.S. jurisdictions follow International Financial Reporting Standards rather than US-GAAP. However, term “non-GAAP” is used in the generic sense thus covering earnings measures that would otherwise be more correctly called non-IFRS.

¹³ No observations of GAAP equalling pro forma is not surprising given their inclusion criteria required at least one adjustment to earnings.

offer a reason for such a high correlation compared to Bhattacharya et al. (2003). Bradshaw (2003) argues for the use of street earnings by noting the differences in pro forma and I/B/E/S earnings are driven largely by the tail of the distributions, with the medians being equal. Heflin and Hsu (2008) find I/B/E/S actual earnings matched the pro forma figure in 90% of their sample. Doyle et al. (2013) randomly audit their sample and find that the incidence of pro forma earnings equalling I/B/E/S analyst actuals (street earnings) was 94.4%. Recently, Bentley et al. (2018) show managers' non-GAAP reporting (pro forma earnings) agree with I/B/E/S's street earnings 79% of the time.

In contrast, Easton (2003) is highly critical of Doyle et al. (2003) use of street earnings as pro forma proxy. Easton (2003) highlights several issues, including statistically significant differences in the data as well as different calculation criteria of managers and analysts. Abarbanell and Lehavy (2007) and Cohen et al. (2007) demonstrate using street earnings as a pro forma proxy will bias value relevance tests in favour of the analyst produced figures. These two studies also show that prior to 1992, I/B/E/S forecasted and actual earnings data were prepared using different definitions. Due to the differences, researchers no longer use the pre-1992 datasets.

Barth et al. (2012) examine the 2005 street and pro forma treatment of a single expense - stock option expense. They find that analysts (street) and management (pro forma) differ in 256 of 1,845 observations (14%). However, management is significantly more aggressive as 251 (of 256) of the incidences were management excluding stock option expense while analysts included it. Meanwhile, Bansal et al. (2013) justify their choice of I/B/E/S actuals based on convenience and the fact that prior research finds pro forma exclusions to be larger and more aggressive than street exclusions (Bhattacharya et al., 2007), hence creating a potential bias against their findings. Finally, Seetharaman et al. (2014) use I/B/E/S EPS data for their study concerning the level of accounting expertise of audit committee members. As part of their sensitivity analysis, they do a keyword search for actual pro forma announcements and find the results are "generally consistent" (p. 30).

U.K. data compare Thompson Datastream analyst EPS to the actual pro forma numbers and find that these differ in 45% of cases (Choi et al., 2007). Furthermore, management includes items that are excluded by analysts two times more often than management excludes items included by analysts and 71% of the additional inclusions are losses (thus, management gives a worse picture of firm performance than analysts).

Black et al. (2012) used actual pro forma announcements citing that a large number of firms do not report pro forma figures but that analysts provide street earnings for most firms. Bhattacharya et al. (2003) support this claim finding only 11% of companies followed by I/B/E/S report pro forma figures. Both studies conclude that seeking to make inferences about managers' motivations requires the use of managements' disclosures. The close relationship between pro forma and street earnings

is widely accepted in the literature, with suggestions the relationship is a causal one (Christensen et al., 2011; Cotter et al., 2006; Lambert, 2004). However, the question remains: are street earnings a good proxy for pro forma numbers?

Evidence suggests street earnings are a good enough proxy for pro forma figures. Most likely, this has contributed to street earnings' continued use but also relative decline. Over the first half of the 20-year review period (2002-2011), street earnings were employed as a proxy in 39% of the published studies. By the second half of the review period (2012-2021), that figure has dropped to 24%. The more recent reliance on actual pro forma announcements is helped by an improvement in search protocols and tools, such as the textual analysis used by Henry et al. (2020). Black et al. (2022) use Amazon Mechanical Turk to crowdsource the collection process. The researchers provide a quick training survey that helps train the workers in their specific requirements as well as assess worker diligence and effectiveness. The resulting sample is from 11,061 firm years covering 2009-2015.

Hand collecting pro forma announcements is labour and time-intensive. Studies relying on keyword searches and hand collected pro forma disclosures are relatively evenly split. Hand collected disclosure studies have smaller sample sizes, with the largest containing 4,234 observations (Marques, 2006, 2010). In contrast, the largest keyword sample is 36,672 observations (Brown et al., 2012b).¹⁴ Bhattacharya et al. (2003) obtain their pro forma sample via a keyword search. From a subsample of their timeframe, they find their search criteria only picks up about half of the total pro forma announcements made by companies. Subsequent studies expand their search dictionaries (Black et al., 2017a; Brown et al., 2012a). Brown et al. (2012b) find their keyword search false-negative rate of 9% is dramatically lower than Bhattacharya et al. (2003).

Prominent non-GAAP researchers have recently made their manager-disclosed non-GAAP earnings sample publicly available (Bentley et al., 2018). Their sample was just under 35,000 observations at the time of writing and created using a combination of hand collection, keyword searches and text analysis. The authors use their dataset to compare street and pro forma earnings disclosures and find 79% consistency. Recent publications (for example, Hribar et al. (2021) and Abdel-Meguid et al. (2021)) employ I/B/E/S street earnings for their main analysis, to take advantage of the vast volume of observations, and then perform robustness checks on the publicly available pro forma database of Bentley et al. (2018).

Ultimately, the choice of street earnings or pro forma earnings may come down to the specific phenomenon under investigation. Street earnings, being analyst prepared, may better represent what the market feels is the 'real' earnings of a firm. Therefore, it is no surprise they are more value relevant

¹⁴ By way of comparison, Jennings et al. (2020) analyse a street earnings sample consisting of 261,722 firm quarter observations.

and predictive compared to GAAP earnings. However, if managers' manipulation of the market and associated motivations are being investigated, then managements' pro forma earnings is the more relevant variable. Over the literature review time period, street earnings have become more reflective of managements' disclosures while at the same time mining for pro forma disclosures has become more accessible. As a result, both non-GAAP measures are commonplace in the non-GAAP literature. Due to the focus of this dissertation being the impact managements' disclosures can have on the users of financial statements, the two experimental studies in this dissertation involve the manipulation of pro forma disclosures.

2.3 THE NATURE AND EXTENT OF PRO FORMA DISCLOSURES

Managers contend earnings information prepared using GAAP does not allow them to communicate the firm's 'real' profitability to financial statement users (Graham et al., 2005). The implication is that the current reporting standards are deficient in that GAAP earnings are not sufficient for decision-makers. Regulators and standard setters cast doubt on managements' contentions by highlighting pro forma disclosure inconsistencies, for example, that common income statement items excluded from pro forma measures are often recurrent expenditures usually associated with core profitability.

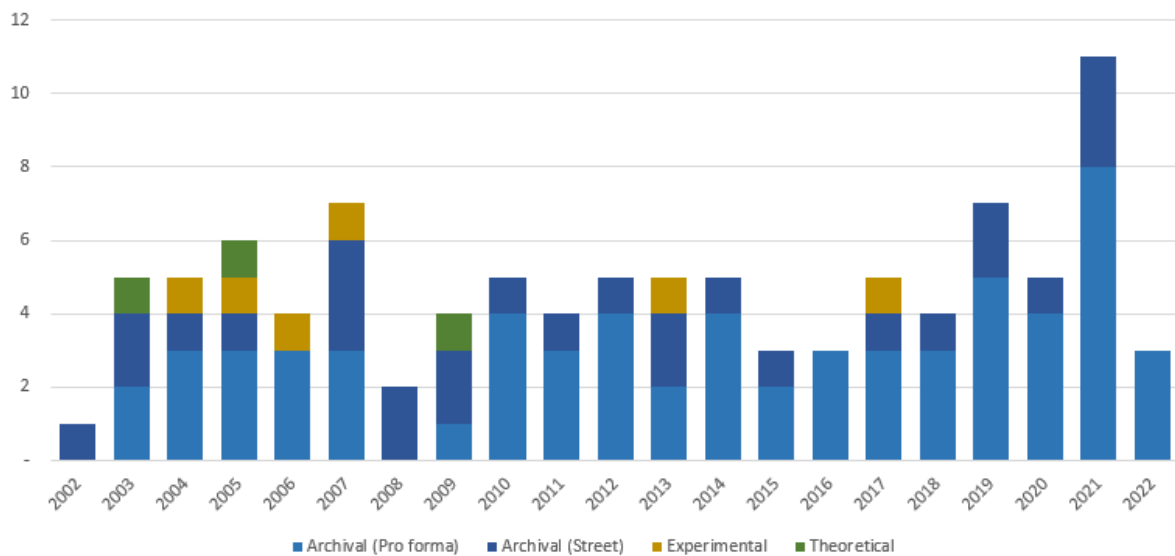
The practice of pro forma reporting began in the mid-1990s and dramatically increased over time (Bradshaw & Sloan, 2002). Using the largest published sample of pro forma disclosures (n=9,663), Black et al. (2012) find the number of disclosures made by U.S. firms rose ninefold from 1998 to 2006. There was a dip in pro forma disclosures in 2002-2003 that the authors attributed to the introduction of Regulation G, the SEC legislation resulting from the SOX Act that governs non-GAAP disclosures. Entwistle et al. (2010) noted the percentage of pro forma issuing S&P500 firms fell from 76% in 2001 to 53% in 2004. Several studies have noted the Regulation G-inspired slump was temporary, and pro forma reporting in the U.S. surpassed pre Regulation G levels (Black et al., 2017a; Bond et al., 2017). Seventy-one per cent of S&P500 companies (excluding real estate investment trusts) issued pro forma earnings disclosures in 2014 (Black et al., 2021b).

Pro forma reporting is not just a U.S. phenomenon and thus not solely a function of unique aspects of the FASB's reporting regulations. In a sample of the United Kingdom's (U.K.) largest 500 companies, Choi et al. (2007) find firms disclosing pro forma EPS in their financial statements in 1993, 1996, and 2001 were 39%, 53% and 71%, respectively. Examining a sample of the top 500 U.K. firms, Grey et al. (2013) note 77% reported a pro forma earnings figure in their 2002-2003 financial statements. Koning et al. (2010) note that Dutch firms' use of pro forma figures in press releases rose from 55% in 2000 to 83% in 2005. Further European evidence is provided by several

studies finding the incidence of pro forma disclosures averaging greater than 80% between 2003 and 2009 (Guillamon-Saorin et al., 2017; Isidro & Marques, 2013). Australian evidence from Malone et al. (2016) shows 64% of ASX200 listed firms, between 2008-10, issued pro forma earnings figures in annual reports, earnings announcements and/or investor presentations. The use of pro forma disclosures is widespread, and, as will be discussed below, they are materially different to their GAAP counterparts.

Based on a systematic review of the literature, it is apparent that the existing body of work is largely based on archival data. Appendix A details the systematic literature review process. Of the 99 published non-GAAP studies, 90 are archival, six experimental and three theoretical. The archival studies are split, with 63 primarily examining actual pro forma disclosures and 27 that use street earnings as a proxy. Among the 15 working papers, all but one utilises an archival approach. Figure 1 shows the published GAAP vs non-GAAP papers by non-GAAP type of research.

Figure 1: GAAP vs non-GAAP published studies by non-GAAP source (n=99)



A number of papers that use pro forma disclosures provide descriptive data of their sample compared to street earnings. Appendix B provides a comparative table. Due to different sample sets, inclusion criteria, scaling denominators and treatment of outliers, these studies' findings cannot be directly compared without considering their nuances. However, they do provide valuable insight into the differences, and similarities, between pro forma, street and GAAP earnings when compared

within the sample. Overall, the sample sizes are small, ranging from 371 to 8,127¹⁵, but the findings are consistent across all published papers. Pro forma earnings are higher than street earnings, with both being larger than GAAP earnings and the differences are statistically significant. For example, Ciesielski and Henry (2017) find S&P500 adjustments to GAAP in 2014 totalled US\$132 billion and represented 22% of GAAP net income.

The differences between the various earnings measures have created significant debate in the literature about the appropriateness of street earnings as a proxy for pro forma earnings. Appendix C overviews the literary discussion and, in summary, suggests street earnings are a reasonable, but not perfect, proxy for pro forma earnings, especially in the early non-GAAP literature where large pro forma samples were difficult to obtain. The focus of this dissertation is financial statement users' decision making, and as such, the emphasis will be given to pro forma earnings, the adjustments management make to GAAP earnings, rather than street earnings, the adjustments analysts make to GAAP earnings.¹⁶ A heavy bias towards excluding expense items from pro forma earnings is expected due to the conservative nature of accounting rules with respect to the recognition of revenue and expenses. However, critics of pro forma disclosure cite the recurrent nature, and inconsistent application, of exclusions as concerns (Dow Jones & Company Inc, 2001; James & Michello, 2003).

Historic accounting standards previously allowed the separate presentation of infrequent income statement items as 'extraordinary items'. Entities reporting under IFRS must now disclose items separately if the item is material (IASB, 2014)¹⁷. U.S. GAAP mandates separate disclosure of income statement items that are unusual in nature, infrequent or both (FASB, 2015)¹⁸. Even though the wording of these standards still provides some room for interpretation for financial statement preparers, pro forma reporting is more flexible as there are no rules governing its preparation and, unlike GAAP, pro forma measures are not directly subject to audit.¹⁹ The Sarbanes-Oxley Act has placed some guidelines on U.S. pro forma disclosures but not their presentation, other than to not be "misleading" (Office of the Federal Register, 2017a).

¹⁵ In contrast, Jennings et al. (2020) analyse an I/B/E/S street earnings sample consisting of 261,722 firm quarter observations.

¹⁶ In many cases the adjustments are the same. Doyle et al. (2003), Heflin and Hsu (2008) and Doyle et al. (2013) find street earnings were equal to pro forma earnings in 96%, 90% and 94% of cases respectively.

¹⁷ "Omissions or misstatements of items are material if they could, individually or collectively, influence the economic decisions that users make on the basis of the financial statements. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances. The size or nature of the item, or a combination of both, could be the determining factor" (IASB, 2014, paragraph 97).

¹⁸ "The nature and financial effects of each event or transaction that is unusual in nature or occurs infrequently, or both shall be presented as a separate component of income from continuing operations or, alternatively, disclosed in notes to the financial statements" (FASB, 2015, subsection 225-20-50-3).

¹⁹ Pro forma disclosures are usually found on earnings announcements, corporate websites, conference calls, SEC filings and the unaudited sections of annual reports (Entwistle et al., 2006b; Seetharaman et al., 2014).

Bhattacharya et al. (2003) examined 1,149 management issued earnings announcements between 1998 and 2000. They find the income statement items most commonly excluded to create pro forma earnings were depreciation, amortisation, stock compensation expenses, research and development costs and merger and acquisition expenses. The authors saw an increase in the average incidences of adjustments per earnings announcement, from 1.5 in 1998 to 2.0 in 2000. The total adjustments per announcement changed, as did the nature of the adjustments. Depreciation and amortisation expense adjustments were 4% in 1998 and grew to 26% in 2000. Similarly, stock-based compensation expense was 3% in 1998 and grew to 22% in 2000. Other early studies find a similar list of common exclusions (Entwistle et al., 2005; Johnson & Schwartz, 2005).

Choi et al. (2007) find, in their 1993 to 2001 sample, that European firms rarely adjust for recurrent items. However, in a later sample from 2003 to 2007, Isidro and Marques (2015) noted that 54% of large European companies excluded recurrent expenditure items (such as depreciation, stock-based compensation expense and research and development costs). Other studies have shown that the composition of adjustments changed at the firm level as well. Koning et al. (2010) noted over 40% of Dutch companies in their sample defined their pro forma number differently when compared to the previous quarter. Bhattacharya et al. (2004) also find a large proportion of firms calculated their pro forma disclosures differently between periods. Ciesielski and Henry (2017) looked at the adjustments made by S&P500 companies in 2009 and 2014. They find the overall number of adjustments, composition and absolute value increased significantly, but the relative value of adjustments remained constant at approximately 22% of GAAP net income. By way of contrast, a recent study by Black et al. (2021b), using data from 2009-2014, finds firms that change the calculation of their pro forma earnings from one year to the next overwhelmingly improve the informativeness of their disclosures.

The nature and magnitude of GAAP exclusions are not the only concerns of regulators and standard setters. The prominent presentation of pro forma measures, relative to GAAP profit, in corporate releases also draws attention. Regulations G and S-K bar the practice of emphasising a pro forma measure relative to the GAAP measure in U.S. disclosures and SEC filings. The practice is also banned in Australia (ASIC, 2011). Prior to these regulations, managers in both countries gave prominence to the pro forma measures (Bowen et al., 2005; Cameron et al., 2012; Marques, 2010; Sek & Taylor, 2011). Dutch firms also emphasise pro forma measures. In 2000, 30% of companies had pro forma measures mentioned before GAAP. By 2005 it had increased to 55% (Koning et al., 2010).

Overall, there is little consistency across or within firms when it comes to the nature of adjustments managers make to create their own earnings measures. Furthermore, the practice of pro

forma disclosures is widespread and gaining popularity. Evidence suggests pro forma disclosures are incomparable across companies and industries, but also in successive periods of the same firm. Next is a discussion of managements' motivations for making pro forma disclosures.

2.4 WHY DO FIRMS MAKE PRO FORMA DISCLOSURES?

There are two competing, although not mutually exclusive, hypotheses of managers' motivations to issue pro forma disclosures. The first motivation is to reduce information asymmetry and better inform market participants of the firm's true economic performance. The second motivation is that managers use pro forma disclosures to opportunistically mislead investors by deliberately obscuring their firm's true economic performance. It is this second, nefarious motivation that has drawn financial media (Dow Jones & Company Inc, 2001; Heitger & Ballou, 2003; Henry et al., 2017; Weil, 2001) and regulators' attention (Kabureck, 2017; White, 2016).

Inferring the pro forma reporting motivations of managers is the focus of the majority of the non-GAAP literature²⁰. Both the informative and opportunistic motivations are premised on financial statement users relying on pro forma disclosures to make investment decisions; otherwise, the disclosures would be pointless. Surveys and interviews of public company CFOs by Dichev et al. (2013) find support for both motivations. The authors note that CFOs believe the most important use of reported earnings measures is to help investor valuations, and the most important motivation for companies to misrepresent their earnings performance is to influence stock prices. Archival evidence suggests users do rely on pro forma information for investment decision making (Bhattacharya et al., 2007; Bradshaw & Sloan, 2002; Christensen et al., 2014). Investors respond more to non-GAAP earnings as they are more value relevant than GAAP figures (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Entwistle et al., 2010). These archival findings are supported by experimental research, which shows both less sophisticated and professional investors utilise pro forma earnings measures in investment decisions (Andersson & Hellman, 2007; Dilla et al., 2013; Elliott, 2006; Frederickson & Miller, 2004). Prior to examining the evidence for the competing hypotheses, a brief summary of the research methods used to infer managers' motivations follows.

2.4.1 Decision usefulness

This section discusses how prior research attempts to determine if non-GAAP measures are more or less useful than GAAP measures. Managers' use of pro forma earnings disclosures can be

²⁰ It is not possible to infer managements' intentions from their reporting behaviour. Therefore, the term 'opportunistic' may not be a strictly accurate fit in all circumstances. Instead, it refers to the potential of the disclosures to be misleading.

justified if they are of a higher quality than the GAAP equivalent. ‘Earnings quality’ is context-dependent, multifaceted and complex (Dechow et al., 2010). The non-GAAP literature has predominately utilised the three approaches suggested by Aboody and Lev (1998) in determining the quality of earnings.

1. *Valuation*²¹ – the relationship between earnings and share prices.
2. *Information content* – the relationship between earnings announcements and abnormal stock returns.
3. *Predictive ability* – the ability of earnings to predict future earnings, analyst forecast revisions or stock returns.

All three approaches ultimately result in the use of regressions to compare the significance and magnitude of non-GAAP and GAAP earnings figures. Robust debate surrounds the use of variables, proxies, data sources, methodologies and inferences drawn (Abarbanell & Lehavy, 2007; Berger, 2005; Black et al., 2012; Bond et al., 2017; Christensen et al., 2014; Kolev et al., 2008). Despite the different designs and methodologies throughout the literature, the consensus is that pro forma and street earnings measures are of a higher quality than GAAP earnings (Black et al., 2018; Marques, 2017; Young, 2014).

Other studies focus on what is excluded from non-GAAP measures rather than what is included. In these instances, earnings quality is defined by the properties of excluded items. Equally, high-quality exclusions are defined as those that are more transitory or less persistent (Bond et al., 2017; Doyle et al., 2003; Gu & Chen, 2004; Kolev et al., 2008). The focus on earnings quality measures to determine managerial motives dominated the early literature.

More recent attempts to infer managers’ pro forma disclosure motivations expand beyond the disclosed earnings figures. Bond et al. (2017) caution researchers against fixating on future earnings at the expense of considerations such as accrual quality, individual income statement components and cash flows. Christensen et al. (2014) investigated the trading patterns of short-sellers, as a proxy for sophisticated investors, as a means to understand pro forma motivations. Earnings surprise is another common proxy (Choi & Young, 2015; Isidro & Marques, 2015). Other studies use expanded measures of earnings quality, including conservatism and earnings smoothness (Heflin et al., 2015; Ribeiro et al., 2019) and timeliness (Brown et al., 2012a; Ribeiro et al., 2019). Regardless of the

²¹ *Valuation* is sometimes referred to as ‘value relevance’ (Cornell & Landsman, 2003). However, other studies use ‘value relevance’ to refer to all three measures collectively (Black et al., 2018; Brown & Sivakumar, 2003; Young, 2014). This dissertation uses the terms *value relevance* and *informativeness* to refer to all earnings quality measures collectively.

measure chosen, previous studies overwhelmingly conclude one of two motivations to explain pro forma disclosures – informative or opportunistic.

2.4.2 Informative motivations

The informative motivation theory for pro forma disclosures is borne out of both signalling and information asymmetry theories. Information asymmetry exists when one person or group possesses superior information to another person or group (Huang & Skantz, 2016). Signalling theory helps explain the behaviours of parties who have access to different information (Mavlanova et al., 2012). Proponents argue pro forma reporting is the signal management uses to inform investors of information management possesses, and it represents the true underlying performance of the firm. In support of this claim, proponents offer several lines of evidence. Most significantly, non-GAAP earnings disclosures have been shown to be of a higher quality than GAAP earnings (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Choi & Young, 2015). Managers have also voluntarily used pro forma disclosures even when not doing so would have been more beneficial (Curtis et al., 2014; Entwistle et al., 2006a). Standardisation of earnings measures is unlikely to enhance the informativeness of pro forma disclosures, as evidenced by recent attempts. South Africa's *headline earnings* (Venter et al., 2013; Venter et al., 2014) and Standard and Poor's *core earnings* (Wieland et al., 2013) have both been unsuccessful as each industry, firm, and period can present anomalies. Given the information asymmetry between managers and the market, managers are in the best position to distinguish between industry, firm, and period-specific persistent and transitory components of earnings. Therefore, it is difficult to impose a standardised earnings measure. Not that the difficulty has stopped standard-setters from trying, the long-running 'Disclosure Initiative – Principles of Disclosure' project (IASB, 2017a) has been dedicated to this topic.

Andersson and Hellman (2007) suggest that pro forma reporting is a product of increasingly complex accounting regulations and that managers are seeking to create their own, simpler version of financial reporting more aligned with a firm's recurrent earnings. The lack of rules surrounding the preparation and presentation of pro forma earnings measures can enable more informative disclosures by management by excluding non-recurring, non-cash, transient expenditure from earnings. More recent studies have shown persistent earnings are more informative (higher earnings quality) than transitory earnings (Fairfield et al., 1996; Nichols & Wahlen, 2004). Indeed, much of the non-GAAP research shows that street (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003;

Collins et al., 2009)²² and pro forma (Bhattacharya et al., 2003; Bhattacharya et al., 2007; Choi & Young, 2015; Entwistle et al., 2010; Marques, 2006) earnings are more informative and value relevant than GAAP earnings. These findings are not surprising as non-GAAP measures, by definition, remove transitory earnings components.

Underlying this discussion, there have been many methodological criticisms of how earnings quality is measured in studies, which has implications for the robustness of the findings. Some early studies are biased in favour of the non-GAAP earnings figure as analyst forecasts, and thus the estimated earnings surprises are based on non-GAAP forecasts (Berger, 2005; Bradshaw, 2003; Cohen et al., 2007; Easton, 2003). Abarbanell and Lehavy (2007) argued data in the tail of the distribution (extreme differences between GAAP and non-GAAP earnings by a limited number of firms) can explain the entire phenomenon. Ultimately their findings contribute to the robustness of future analysis, and their suggestion of throwing the “baby out with the bath water” was the topic of multiple journal editorials (Bradshaw & Soliman, 2007; Christensen, 2007). Further criticism came from using analyst forecasts to calculate earnings surprises. Analysts’ forecasts are more closely aligned with pro forma earnings definitions (they both exclude non-recurrent items) and thus expected to produce a closer relationship to each other than are analyst forecasts and GAAP earnings (Cohen et al., 2007). In response to the methodological criticisms biasing the results against GAAP earnings being more decision-useful than non-GAAP earnings, researchers have rerun some of the analysis and still find non-GAAP measures are more informative (Bradshaw et al., 2018).

As a way of avoiding the above methodologically concerns, some studies examine the non-earnings properties of firms. Huang and Skantz (2016) use the adverse-selection component of the bid-ask spread as a proxy for information asymmetry and conclude pro forma earnings are more informative than GAAP. Lougee and Marquardt (2004) look at the predictive ability of GAAP and pro forma earnings on one quarter ahead of future cash flow from operations (OCF) and conclude mixed motives that are context-dependent. In contrast, Doyle et al. (2003) applied an operating cash flows approach for a longer investment horizon (three years ahead) and concluded opportunistic motives explain the relationships in their street earnings sample. Malone et al. (2016) suggest informative motives by showing pro forma adjustments aid ASX200 companies to communicate their ‘underlying’ earnings to analysts using fair value disclosures. However, relying on analysts’ adjustments as a means to determine managements’ motives is criticised by the discussant (Cheng,

²² Francis et al. (2002) investigate potential reasons for the Landsman and Maydew (2002) finding of an increase in information content of earnings announcements over the past three decades. Francis et al. (2002) conclude this increase is due to more detailed disclosures, particularly those associated with the income statement. Collins et al. (2009) revisit this finding and determine that, in their sample, the intensified market reaction to street, not GAAP, earnings is responsible for the increase in information content of earnings announcements.

2016) despite survey and interview data with analysts stating the primary reason for making adjustments to GAAP figures are to remove non-recurrent items (Brown et al., 2015).

Using a hand-collected U.K. sample of 1,301 announcements, Choi et al. (2007) find managements' pro forma disclosures are more informative than analysts' street earnings. This is contrary to Marques (2006), who finds investors view analysts' exclusions as being a more appropriate elimination of transitory items than managements'. Supporting the findings of Choi et al. (2007), Entwistle et al. (2010) find pro forma, street, and GAAP earnings are all value relevant, but that pro forma disclosures are the most closely related to stock prices. All three studies agree that non-GAAP earnings are of a higher quality than GAAP earnings.

More support for the informative motivation hypothesis is evidence that managers with low-quality GAAP earnings are more likely to provide pro forma earnings figures (Lougee & Marquardt, 2004), and the pro forma figure is given greater managerial emphasis than the GAAP equivalent (Bowen et al., 2005). The Bhattacharya et al. (2003) sample contained 30% of firms with pro forma earnings less than GAAP earnings, where the pro forma figure was usually reported first. Later studies also find a significant number of firms prominently reporting pro forma figures that are lower than GAAP (Bhattacharya et al., 2004; Entwistle et al., 2006a). Curtis et al. (2014) find almost half the firms in their study disclosed one-time transitory gains. Excluding the transitory gains lowered pro forma earnings relative to GAAP earnings, and thus they concluded informative motives for this portion of their sample. Charitou et al. (2018) investigate one of the most prominent locations a non-GAAP measure can be displayed, the face of the Income Statement. The authors conclude such a potentially costly disclosure location is more consistent with managements' intent to inform the market than it is to mislead the market.

The superior quality of non-GAAP earnings prompted attempts by regulators and market participants to create 'one size fits all' income statement measures. In 2002 Standard and Poor's (S&P) released an earnings measure of their own design – *core earnings* (Standard and Poor's, 2002). *Core earnings* is defined as GAAP profit with specific items added back. Wieland et al. (2013) find *core earnings* to be higher quality than GAAP earnings. However, they also find street earnings are more informative than *core earnings*²³. This finding suggests that managers and analysts have relevant information and expertise and should be afforded flexibility when calculating non-GAAP earnings.

In contrast to the U.S. experience of *core earnings*, research from South Africa shows mandating the separation of recurrent and non-recurrent expenditure improves earnings quality

²³ Logically it follows that if a standardised earnings metric was substantially better than current GAAP, standard setters would adopt it in replacement to GAAP earnings or as a step in calculating GAAP earnings.

(Venter et al., 2013; Venter et al., 2014). South Africa mandates the separation of recurring and non-recurring income statement items, and results in the reported measure (sans non-recurrent items) called *headline earnings* (South African Institute of Chartered Accountants, 2015). South African regulators provide a list of exclusions from *headline earnings*, effectively eliminating managers' discretion available in both pro forma disclosures and classification shifting. Venter et al. (2013) and Venter et al. (2014) both conclude a rules-based approach to pro forma disclosures would provide investors with better decision-making information. They argue the superior nature of the mandatory *headline earnings*, relative to GAAP earnings, stems from its rigid definition, uniformity across firms, and reporting periods, as well as being subject to audit.

More recently, Howard et al. (2019) conduct the first, and currently only, investigation into South African *headline earnings* relative to pro forma disclosures. These authors find only 36% of South African firms are reporting pro forma disclosures, significantly lower than in other jurisdictions. Their key finding is pro forma disclosures meet or exceed analyst forecasts more often than GAAP or *headline earnings*. As a result, the authors call into question the usefulness of *headline earnings*. However, the small sample size (570 firm years) and the lack of analysis investigating the decision usefulness (valuation, information content and/or predictive ability) of *headline earnings* versus pro forma disclosures makes any inferences preliminary. Nevertheless, mandating the separation of recurrent and non-recurrent expenditure is something both the FASB and IASB are examining (IASB, 2017a; Linsmeier, 2016).

Managements' pro forma earnings are not the only non-GAAP measures shown to be superior to GAAP earnings. Batta and Muslu (2017) find that different kinds of analysts make different adjustments. From their sample, they conclude debt rating agencies are more conservative in their adjustments than equity analysts, while credit rating agencies make adjustments that better predict bankruptcies. Industry-specific metrics have also been shown to provide decision-useful information. For example, *funds from operations* for real estate investment trusts (Baik et al., 2008), *distributable cash* for income trusts (Cormier et al., 2011) and *revenue-passenger-miles* for airlines (Francis et al., 2003). The pragmatic conclusion of different metrics dependent on the usage case will be revisited later in this dissertation.

It is not just the accounting literature that is taking an interest in the non-GAAP performance of firms. Finance discipline research devises a successful trading strategy by excluding non-recurrent expenditure (Rouen et al., 2021). Similarly, another finance-focused study reports successfully trading on the GAAP and street earnings differential (Coté & Qi, 2005). These findings mirror the well-established body of accounting research showing a closer alignment between non-GAAP earnings and future firm performance. Thus, providing further evidence for the informative

hypothesis by demonstrating that GAAP earnings are not necessarily the most decision-useful earnings measure.

2.4.3 Opportunistic motivations

The second hypothesis for why managers disclose pro forma measures is they are trying to opportunistically mislead the market. Miller (2009, p. 4) defines opportunistic behaviour “as the propensity to seek advantages, through disclosure choices, that accrue specifically to either the firm, management, or a subset of investors”. Stakeholder theory suggests managers should make decisions with respect to all stakeholders, including current and future shareholders. Lipe (1986) shows that higher valuation multiples are typically afforded to core earnings than to non-core earnings. Thus, creating an incentive for managers to opportunistically disclose pro forma earnings if they can convince the market their pro forma disclosures are a better representation of core earnings than is GAAP earnings. Although inflating the share price, via opportunistic disclosures that would benefit current shareholders, it would punish future shareholders when the shares adjust downward to reflect the true value.

Although we cannot know managers’ true intentions for pro forma disclosures, regulators and standard setters (Kabureck, 2017; SEC, 2010; White, 2016) have expressed concern managers are using the practice opportunistically, that is, to mislead investors and circumvent accounting policies. Evidence for opportunistically disclosing pro forma earnings figures includes managers using the unaudited pro forma earnings disclosures to aggressively exclude recurrent expenditure (Barth et al., 2012; Bhattacharya et al., 2003; Black et al., 2017a; Doyle et al., 2003). These aggressive exclusions are often given more prominence in corporate earnings announcements (Isidro & Marques, 2015), allow firms to meet earnings estimates (Black & Christensen, 2009), are applied differently from period to period (Baumker et al., 2014; Bhattacharya et al., 2004; Curtis et al., 2014), and are released to the market in an accelerated fashion (Brown et al., 2012a). There is also evidence for pro forma practice being considered a new earnings management technique (Black et al., 2017b; McVay, 2006), as will be discussed in more detail below.

Bhattacharya et al. (2003) find the pro forma earnings figure was greater than GAAP (street) in 70% (26%) of instances. The Entwistle et al. (2005) study of U.S. and Canadian firms find pro forma earnings exceed GAAP in 86% of U.S. cases and 75% in Canada. This is consistent with Lougee and Marquardt (2004), who also find pro forma earnings exceed GAAP in 86% of cases. Appendix B provides a table that displays studies whose samples include readily comparable non-GAAP earnings measures. In all cases, non-GAAP earnings are higher than GAAP earnings. This finding, on its own, is not proof the non-GAAP phenomenon is misleading. That is because the

conservative nature of accounting necessarily means most transient income statement items, and thus typical pro forma exclusions, will be expenses, not revenues. However, disclosure patterns demonstrate firms are selective as to the presentation of pro forma exclusions.

Walker and Louvari (2003) find firms are significantly more likely to report a pro forma earnings figure when it increases reported profits than when it would make a loss larger. The larger the difference between GAAP and pro forma, the more likely they are to make pro forma disclosure. Pro forma disclosing firms tend to be young firms, have higher debt levels and be less profitable (Bhattacharya et al., 2004). Bhattacharya et al. (2004) also find pro forma reporting is correlated with subsequent share price decreases, suggesting management is attempting to disguise poor performance, but the market, as a whole, is not fooled. However, more recent evidence from Seetharaman et al. (2014) finds firms with accounting experts on the audit committee are less likely to use pro forma reporting, and when they do, the exclusions are of a higher quality.

Non-GAAP earnings being greater than GAAP earnings is no surprise given the conservative nature of accounting and the more stringent criteria for recognising revenue versus expenditure. Truly transitory (non-recurrent) items should not have an association with future earnings, as they genuinely are one-off expenditure items. However, Bhattacharya et al. (2003) find most common exclusions are 'routine' expenses that should be reported in GAAP operating income. Christensen (2007) finds supporting evidence of firms excluding recurrent expenditure (examples include depreciation, amortisation, stock option expenses and research and development costs) from pro forma earnings. These excluding firms were more likely to have missed analyst forecasts and are more likely to emphasise the pro forma disclosure. At the other extreme, those firms beating analyst forecasts were more likely to exclude gains on the sale of assets. A fresh re-examination of the data used to classify meet-or-beat firms has been made possible by the recent capture of I/B/E/S analysts' GAAP earnings forecasts. After analysing the data, Bradshaw et al. (2018) suggest the previously reported magnitude of firms using exclusions to meet-or-beat analyst forecasts is overstated by more than one third. Therefore, the new evidence suggests that while some firms do behave opportunistically, the effect is not as large as the published literature originally concluded.

The inclusion of stock option expense in GAAP earnings is mandated in the U.S. (Statement of Financial Accounting Standards 123R). Barth et al. (2012) compare the instances of management (analysts) excluding this expense to create pro forma (street) earnings. They find that when managers exclude stock option expense from earnings, the resulting pro forma number is less predictive of future earnings – consistent with opportunism. In contrast, when analysts exclude the expense, the resulting street earnings number increases its predictive ability. They conclude managers exclude stock option expense for opportunistic reasons but that analysts exclude it for predictive value. These

findings provide a direct comparison between street and pro forma earnings and add merit to the notion that street earnings are not a good proxy for inferring management's non-GAAP motivations. The findings also demonstrate that judgments made at a market level, in this case, the treatment of stock option expenses, should be exercised with caution as they can lead to incorrect inferences at the firm level.

Research also finds a negative relationship between non-GAAP exclusions and future GAAP operating income, suggesting the exclusions are not entirely transitory (Kolev et al., 2008; Landsman et al., 2007). Doyle et al. (2003) find items excluded from street earnings relate to lower future cash flows. Even post-Regulation G, many firms still exclude recurrent expenditure items aggressively (Black et al., 2017a). Brown et al. (2012a) employ a within-firm comparison to find managers deliberately accelerate the release of earnings announcements in quarters that contain a pro forma disclosure when compared with quarters that do not. Further investigation reveals the accelerated announcements have lower quality exclusions and contain less transparent reconciliations to GAAP earnings. They conclude the acceleration of pro forma announcements and less transparent reconciliations are used opportunistically by managers to mask the low-quality exclusions. However, firm characteristics that mitigate these opportunistic behaviours and improve the quality of exclusions include having independent boards (Frankel et al., 2011), increased levels of institutional ownership (Jennings & Marques, 2011), increased media attention (Koning et al., 2010), increased investor scrutiny following debt covenant violations (Christensen et al., 2019), and stricter regulation (Black et al., 2017a). This collection of papers highlights the nuanced nature of the non-GAAP literature. Over time, researchers have built on previous findings to discover patterns within patterns, sometimes superficially contradictory, until the evidence can be fully teased apart and triangulated. All areas of legitimate research behave in this manner, particularly in their early stages. The non-GAAP literature being less than 20 years old contributes to the apparent turbulent nature of the literature review.

Discretely classifying a firm as a pro forma discloser or not is also problematic. Heflin and Hsu (2008) find that over a period of 20 quarters, almost no firm follows a consistent disclosure pattern, switching between GAAP and pro forma disclosures depending on the conditions at each quarter. Bhattacharya et al. (2004) find excluded earnings components varied across companies and across different quarters of the same company. Schrand and Walther (2000) find that managers strategically choose which prior period benchmark to report against current earnings. In an experimental setting, Krische (2005) find this selective disclosure of prior period benchmarks affects the judgment of less sophisticated investors.

Several studies note managers give prominence to the earnings figure that is strategically the most beneficial (Bowen et al., 2005; Johnson & Schwartz, 2005). Isidro and Marques (2015) find pro

forma earnings exceed GAAP earnings in 72% of their European sample. And that managers give equal or higher prominence to the pro forma earnings in 93% of these cases but only provide a tabular reconciliation in 47% of them. The authors also find that non-GAAP earnings disclosures are more likely when GAAP earnings miss analyst benchmarks. A similar disclosure pattern can be seen in the U.S., with Bhattacharya et al. (2003) finding that 80% (39%) of pro forma (GAAP) earnings announcements exceed analyst expectations and, therefore, the pro forma measure is what management usually emphasises. Marques (2010) agrees managers give more prominence to pro forma earnings when they exceed forecasts, but GAAP earnings fall short of the forecasts. In addition to making pro forma disclosures more prominent, they have also been observed as a way managers can avoid reporting a GAAP loss (Walker & Louvari, 2003), later in the literature described as ‘loss converters’ (Leung & Veenman, 2018, p. 4). Indeed several studies cite the conversion of GAAP loss into a non-GAAP profit as an indicator of opportunistic and aggressive disclosure choices (Black et al., 2012; Black & Christensen, 2009; Christensen et al., 2014). Loss conversion is the topic of a recent study by Leung and Veenman (2018), although, in their sample, they find pro forma disclosures in GAAP loss firms to be informative and more predictive of future firm performance.

Both Baumker et al. (2014) and Curtis et al. (2014) use the decision to disclose one-time gains to assess managers’ motivations. While Baumker et al. (2014) find evidence of opportunism from firms being significantly less likely to report one-time gains post Regulation G. That is, firms not providing a non-GAAP earnings figure if the net effect would be to have non-GAAP earnings less than GAAP. Prima facie, these firms appear to be steering away from non-GAAP disclosures but are, in fact, only doing so as it benefits them. Also investigating one-time gains, Curtis et al. (2014) find evidence for both opportunistic and informative motives. Specifically, they find roughly half of their matched sample disclose transitory gains (informative) while the other half do not (opportunistic). Their pragmatic findings mirror the later literature and contrast with the early years of non-GAAP research that was generally picking sides in the debate. The authors create their own classifications to categorise their subsample of 202 firms:

1. Informative - firm discloses both transitory gains and losses (38%).
2. Uninformative - firm makes no disclosures of either transitory gains or losses (25%).
3. Conservative - firm discloses transitory gains but not losses (10%).
4. Opportunistic - firm discloses transitory losses but not gains (27%)²⁴.

²⁴ One case example is where the SEC prosecuted Trump Hotels & Casino Resorts Inc. for a 1999 press release that excluded a one-time loss but did not exclude a one-time gain. Had the gain and loss been treated consistently, the firm would have failed to meet analyst estimates.

Dechow et al. (1995, p. 194) define “earnings management as managements’ purposeful intervention in the external financial reporting process with the intent of obtaining some private gain”. Traditionally, the two main strands of the earnings management literature centre on the adjustment of real economic activity and accruals management. Two more recent additions that are closely related to the non-GAAP literature are classification shifting (McVay, 2006) and managing or influencing analyst forecasts (Christensen et al., 2011; Griffin & Lont, 2021; Matsumoto, 2002). Classification shifting is the deliberate misclassification of operating expenses as non-operating on the income statement with the aim of displaying larger operating earnings (McVay, 2006). Importantly, and similar to pro forma disclosures, bottom-line earnings are not affected, nor are past or future accounting periods. Although part of the disclosure literature, classification shifting is not usually considered a core component of the non-GAAP literature as the financials are prepared in adherence to accounting standards, form part of the audited accounts and are not separately presented by management as an alternative performance measure.

Doyle et al. (2013) find managers use earnings exclusions as a substitute for adjusting real economic activity and accrual management. Using street earnings as a proxy for pro forma earnings, they find the use of exclusions is more likely when the cost of GAAP earnings management is high, and the balance sheet already contains a high level of income increasing accruals. Their study also finds firms reporting exclusions are more likely to beat analyst forecasts than those that do not. Black et al. (2017b) confirm these street earnings findings using pro forma data. Specifically, they find managers are less likely to use pro forma reporting when they can meet earnings expectations through strong operating performance or via traditional earnings management techniques such as adjustment to real economic activity, and accruals management. However, when managers miss earnings expectations, they are significantly more likely to employ pro forma reporting after attempting the other previously described earnings management techniques. Both Doyle et al. (2013) and Black et al. (2017b) find evidence of pro forma reporting substituting for other earnings management strategies.

Managers’ desire to meet analyst earnings forecasts is well documented (Matsumoto, 2002; Payne & Robb, 2000). The importance is such that some managers admit to sacrificing long-term value to meet earnings benchmarks (Graham et al., 2005). The non-GAAP literature is saturated with analyses concluding managers’ opportunistic use of pro forma disclosures to meet or beat analyst forecasts (Bhattacharya et al., 2003; Bhattacharya et al., 2004; Black & Christensen, 2009; Chen, 2010; Doyle et al., 2013; Isidro & Marques, 2015; Lont et al., 2020; Lougee & Marquardt, 2004) as well as influence analyst calculations (Athanasakou et al., 2009; Christensen et al., 2011; Cotter et al., 2006; Graham et al., 2005; Lambert, 2004). Recent evidence suggests using pro forma disclosures

to meet forecasts has been overstated in the early literature, but the issue still exists (Bradshaw et al., 2018).

Lougee and Marquardt (2004) find firms with negative earnings surprises are more likely to report pro forma earnings. Bhattacharya et al. (2003) conclude opportunistic motives partly on the finding that 80% of pro forma figures exceeded analyst expectations, while only 39% of GAAP results did so. Using exclusions to beat forecasts by increasing the reported pro forma earnings figure relative to GAAP is widely researched (Black & Christensen, 2009; Brown et al., 2012b; Doyle et al., 2013). Those firms that just miss earnings targets employ the most aggressive exclusions²⁵ (Choi & Young, 2015).

Black and Christensen (2009) find that firms that irregularly report pro forma figures use recurring expenses to meet earnings benchmarks more often than regular pro forma disclosing firms. Isidro and Marques (2015) use a European sample and also find the exclusion of recurrent items more prevalent when it allows managers to beat analyst consensus and avoid reporting a loss. Thielemann and Dinh (2019) perform an exploratory study into ‘implicit non-GAAP reporting’. That is, the practice of providing non-GAAP earnings information without an explicit reconciliation. They find U.S. firms that start reporting implicit non-GAAP earnings information in the post-SOX environment are associated with beating analyst forecasts.

Frankel et al. (2011) find evidence of managers using pro forma disclosures to meet earnings targets prior to selling their own shares. Bansal et al. (2013) argue managers with stock options benefit from stock price volatility, and that pro forma disclosures create such volatility. The authors find evidence of opportunism by managers seeking to maximise their compensation through pro forma disclosures. One of the study’s limitations is the use of street earnings to infer management motivations. However, Shiah-Hou and Teng (2016) examine managers’ earnings press releases and also find evidence of post-Regulation G opportunistic reporting. Specifically, CEOs and CFOs who sell shares in a two-week post-earnings announcement window are more likely to report low-quality non-GAAP exclusions.

Opportunistic reporting of non-GAAP metrics has also been associated with CEO narcissism, Abdel-Meguid et al. (2021) suggest the discretion available in non-GAAP disclosures appeals to more self-centred CEOs. Laurion and Sloan (2022) find almost a third of earnings guidance issued by managers exclude significant recurring expenses in their forward-looking non-GAAP earnings

²⁵ Aggressive exclusions are lower quality because they are less transitory, more persistent, and therefore of a more recurrent nature.

forecasts that are not excluded by analysts, and use ‘unreasonable effort’²⁶ as the justification for doing so.

In summary, the opportunistic characteristic of non-GAAP disclosures is a worrying aspect for regulators and standards setters. Managements’ ability to mislead financial statement users through pro forma disclosures can undermine the relevance of financial statements. Up to this point, the main purpose of managements’ opportunistic behaviour is to mislead investors and influence the share price. However, a recent addition to the non-GAAP literature is another avenue management can personally benefit from pro forma disclosures, using them in performance contracting.

2.4.4 Performance contracting

A growing body of research in the accounting literature centres around the relationship between non-GAAP measures and performance contracting. Curtis et al. (2021) report that 84% of S&P1500 firms use adjusted earnings to determine managers’ bonus compensation. The adjusted earnings figures used by compensation committees are substantially the same pro forma measures managers disclose in earnings releases (Black et al., 2021a; Curtis et al., 2021). If pro forma measures form part of executive compensation and are associated with an increase in shareholder wealth, then an optimal contract exists as agency theory suggests managers should be rewarded in line with their principals’, that is, the shareholders’, outcome (Lambert, 2001). That is, the pro forma disclosures are management signalling to users the true economic performance of the firm, and they should be rewarded in line with their efforts. Alternatively, if pro forma measures are not positively related to an increase in shareholder wealth, then their role in performance contracting can be considered an opportunistic way for managers to increase their personal wealth. The findings of non-GAAP literature regarding performance contracting mirrors the main body of non-GAAP literature; that is, they are mixed and contextual.²⁷

A paper by Guest et al. (2022) examines the link between abnormally high CEO remuneration and pro forma earnings announcements finding a limited, but economically significant, number of

²⁶ The SEC requires managers to reconcile non-GAAP measures to the most directly comparable GAAP measure. However, there is an exemption for forward-looking non-GAAP measures if it would require ‘unreasonable efforts’ to do so (SEC, 2018).

²⁷ The subset of non-GAAP literature relating to performance contracting is exclusively based on pro forma measures. Street earnings (analyst prepared numbers) are an insufficient proxy for management intentions in these circumstances even though there is evidence management influences street earnings figures (Athanasakou et al., 2009; Christensen et al., 2011). Analysis of performance contracting and street earnings, regardless of researchers’ opinions as to the suitability of them as a proxy for pro forma earnings, is unnecessary given the ease of collection of pro forma measures (see ‘Street earnings as a proxy for pro forma earnings’ for a discussion on the collection methods of non-GAAP measures). Therefore, the term ‘non-GAAP’ refers to pro forma in the performance contracting section of the literature review. As discussed previously in Definitions, the terms ‘street’ and ‘pro forma’ are seldom used in the more recent non-GAAP studies.

CEOs behave opportunistically. They find the lower the quality of non-GAAP exclusions, and larger the difference between GAAP and non-GAAP earnings, the greater the likelihood and magnitude of abnormal CEO pay. Black et al. (2022) provide supportive findings but note that boards have a moderating effect on the quality of non-GAAP earnings reported by management. That is, the non-GAAP measure used for performance contracting is of a significantly higher quality when boards report the same non-GAAP measure as management in their proxy statements. This result is supported by Kyung et al. (2021), who find, consistent with the efficient contracting theory, corporate boards mitigate agency issues by using non-GAAP performance measures in determining executive compensation.

European firms with directors' compensation linked to market performance are more likely to issue non-GAAP earnings disclosures, give them greater prominence compared to the GAAP figure, less likely to provide reconciling information, and the disclosure contained lower quality exclusions (Grey et al., 2013; Isidro & Marques, 2013). Lont et al. (2020) find managers have opportunistic intentions to disclose non-GAAP measures to increase their cash-based compensation. Their New Zealand evidence finds a positive relationship between the frequency of non-GAAP earnings disclosures and CEO cash compensation. Furthermore, these non-GAAP disclosures coincide with missed earnings benchmarks, lower quality non-GAAP reconciliations, and recurring exclusions. The same effects are not found in stock-based compensation situations. The authors note the more forgiving local regulatory environment allows other environmental factors to determine non-GAAP behaviours. The New Zealand business environment is less litigious, has a light-handed approach to regulation, and there is little chance of standard-setting penalising misleading non-GAAP disclosures. As a result, it is not surprising to see a difference between New Zealand and the highly regulated markets of the U.S. and Europe. This New Zealand evidence provides further support for non-GAAP measures to be the subject of effective regulation.

The study by Lont et al. (2020) examines cash versus stock compensation which, in general, can proxy for short and long term performance targets. Black et al. (2021a) also look at CEO compensation but from an explicitly temporal perspective. Their findings support Lont et al. (2020) in that managers' non-GAAP earnings disclosures are of higher quality in firms employing long-term incentive plans. Their results suggest long-term incentive plans for CEOs can result in less aggressive, and more informative, non-GAAP disclosures. Although this specific non-GAAP evidence is new, their findings are consistent with agency and optimal contracting theories. Their findings also reflect the maturity of the practices mentioned above.

In summary, non-GAAP measures linked to executive remuneration triggers a disclosure under item 10 (e) (D) of Regulation S-K of the Code of Federal Regulations, which concerns the

internal use of non-GAAP measures. Agency theory suggests corporate leadership, including managers and directors, and shareholder rewards should be aligned. Therefore, the use of non-GAAP measures in performance contracting can potentially put corporate leadership in a difficult position. If managers and directors' remuneration is linked to non-GAAP measures, and the non-GAAP measures are low quality, they risk significant backlash from shareholders as their behaviour will be viewed as opportunistic. For example, Grey et al. (2013) find firms disclosing non-GAAP EPS is positively related to compensation packages linked to EPS growth. Isidro and Marques (2013) find firms are more likely to disclose and promote non-GAAP earnings when compensation is linked to market performance. Both Black et al. (2022) and Guest et al. (2022) find evidence of CEOs using low-quality non-GAAP disclosures to increase personal wealth. However, these opportunistic behaviours can be mitigated by the board involvement (Black et al., 2022; Kyung et al., 2021) and by employing longer-term incentive plans (Black et al., 2021a; Lont et al., 2020)). Alternatively, consistent with agency theory, if non-GAAP measures are a better indicator of firm performance, then corporate leadership should be remunerated in line with them. However, firms will need to manage the negative connotations associated with non-GAAP measures, and any additional scrutiny, if they are being used in performance contracting.

The preceding paragraphs outline the non-GAAP literature relating to performance contracting. A wider view of performance contracting can be found in Section 3.1 of this dissertation, where the hypotheses to test investor reactions to managements' disclosure that non-GAAP earnings are used to determine executive compensation are developed.

2.4.5 Informative and opportunism coexisting

The preceding discussion predominately sets out the underlying dichotomous premise of management disclosing non-GAAP measures to either opportunistically mislead the market or reduce information asymmetry by better informing the market. A more pragmatic view is some managers use pro forma disclosures for informative purposes while others use them opportunistically. Many studies find evidence for opportunistic and informative motives in the same sample.

Choi and Young (2015) find firms that meet earnings forecasts have high-quality exclusions, but those firms that miss earnings targets have low-quality exclusions. Yet both categories of firms are found to use pro forma disclosures, one opportunistically and the other informatively. Barth et al. (2012) show the exclusion of stock option expense can be informative in one firm's pro forma measure but appear opportunistically in another. In their pre-Regulation G sample, Jennings and Marques (2011) find pro forma disclosures are used opportunistically by managers, but only for firms with weaker corporate governance. More recently, Henry et al. (2020) use textual analysis of

conference calls to find that firms most likely to emphasise the non-GAAP earnings result, relative to GAAP earnings, are those where non-GAAP performance is superior to GAAP performance and when the non-GAAP result achieves a benchmark that the GAAP result misses. This opportunistic reporting contrasts with Henry et al. (2020) contemporaneous finding of firms emphasising their non-GAAP earnings when they have less value-relevant GAAP earnings; clear support for the informative motivation hypothesis.

This evidence clearly shows managers go to great lengths to notify financial statement users of *their* numbers. But are these users incorporating that information in their decision making? Archival studies overwhelmingly dominate the extant literature. These firm and market-level observations provide a significant amount of information about the practice of non-GAAP disclosures, but they lack the ability to make causal insights into financial statement users' decisions. The next section of this dissertation examines *how* non-GAAP disclosures affect investors' judgment and decision making.

2.5 HOW DO PRO FORMA DISCLOSURES AFFECT USERS' DECISIONS?

Despite the large body of research examining non-GAAP disclosures, the vast majority of insights are market-level observations. The IASB Conceptual Framework for Financial Reporting states the objective of general purpose financial reporting is "to provide financial information about the reporting entity that is useful to existing and potential investors" (IASB, 2015). To date, there has been very little research from the perspective of what makes pro forma information useful and how users use pro forma disclosures to make decisions. The experimental method is the best placed research tool to examine the decision-making process of financial statement users. This section of the literature review details the decision-making non-GAAP literature, that is, studies using the experimental method.

"If non-GAAP earnings merely adjust for transitory items that are transparently observable to financial statement users then the costs and benefits of such disclosures are unclear" Choi et al. (2007, p. 596).

The opportunism motivation suggests the benefits to managers of using pro forma disclosures to mislead investors will be increased share prices, at significantly less cost than other earnings management techniques. An explanation for this apparent contradiction to the efficient market hypothesis is provided by Hirshleifer and Teoh (2003). The authors postulate investors' limited attention and processing power can allow managers to manipulate share prices with public

disclosures. Non-GAAP decision-making literature broadly supports the Hirshleifer and Teoh (2003) theory. The presence and prominence of pro forma disclosures (Allee et al., 2007; Elliott, 2006; Frederickson & Miller, 2004) and emphasis of prior period benchmarks (Krische, 2005) can affect the investment decisions of investors. The presence of a GAAP reconciliation (Dilla et al., 2014; Elliott, 2006) and the format of the reconciliation (Hogan et al., 2017) have also been shown to affect users' decision making. Collectively, experimental findings support regulating the presence and format of pro forma disclosures. However, with so few studies in the area, and containing conflicting findings, the exact nature of the most effective regulation is yet to be resolved.

Less sophisticated investors rely significantly more on pro forma disclosures when making investment decisions than do professional investors (Frederickson & Miller, 2004; Johnson et al., 2014; Reimsbach, 2014)²⁸. Elliott (2006) finds both professional and less sophisticated investors are not affected by the mere presence of pro forma information, however, less sophisticated investors' decisions are influenced if the pro forma disclosure is given greater prominence. The Elliott (2006) prominence finding has precedent in an archival setting. Bowen et al. (2005) find the greater the emphasis placed on a metric, whether pro forma or GAAP, the stronger the market reaction to the earnings surprise for that metric. Allee et al. (2007) use trade-size-based proxies in an archival setting to support the findings of both Frederickson and Miller (2004) and Elliott (2006). Bhattacharya et al. (2007) similarly use trade-size-based proxies to find less sophisticated investors' trading is significantly positively associated with the direction and magnitude of the pro forma earnings surprise, and no association between professional investors' trading behaviour and pro forma earnings information.

Not all decision-making research agrees that professional investors' decisions are not affected by pro forma earnings disclosures. Elliott (2006) find the presence of a reconciliation resulted in analysts giving a higher rating to earnings performance. She concluded analysts regard reconciled pro forma earnings as more reliable and less misleading. Andersson and Hellman (2007) conducted a monitored experiment with Swedish analysts and found those provided with pro forma information projected significantly higher year-ahead earnings. The authors suggest the differences to previous experimental findings can be explained through design choices. The Andersson and Hellman (2007) study contained a large GAAP loss and large pro forma profit. They also chose future earnings per

²⁸ Both Frederickson and Miller (2004) and Elliott (2006) cite unintended cognitive effects, rather than perceived informativeness, as the cause of less sophisticated investor reliance on pro forma disclosures. Regardless of the mechanism, these authors demonstrate the existence, and presentation, of pro forma earnings disclosures can result in mispricing by less sophisticated investors.

share as the dependent variable and conducted trials in a monitored environment. The overall limited amount of experimental research utilising professional analysts makes it difficult to draw inferences.

However, the presence of a quantitative simultaneous reconciliation between pro forma and GAAP earnings eliminates the influence of prominence on less sophisticated investors' judgment in an experimental setting (Elliott, 2006). Elliott (2006) employed a single type of reconciliation, side by side. Using a self-described 'noisy' reconciliation proxy²⁹ in their archival study, Allee et al. (2007) do not find evidence that the existence of a reconciliation affects investors' trading behaviour, in aggregate. Given their sample is post-Regulation G, this is consistent with the findings of Elliott (2006). In answering the Allee et al. (2007) call for a more granular investigation of their reconciliation proxy, Marques (2010) finds both reconciliations and pro forma income statements contain useful information, and that information content is higher for side by side reconciliations than for other reconciliations. Aubert and Grudnitski (2014) similarly find that high-quality reconciliations³⁰ reduce market mispricing. Hogan et al. (2017) use an experimental setting to investigate how graduate accounting students', as a proxy for less sophisticated investors, investment choices are affected when shown two types of reconciliations. Similar to the archival findings of Brown et al. (2012a), Hogan et al. (2017) find that less sophisticated investor participants are prepared to invest more when a less transparent reconciliation is displayed. This body of research supports the inclusion of reconciliations accompanying non-GAAP disclosures and adds an extra layer that the type of reconciliation can affect its decision usefulness.

Dilla et al. (2013) extend earlier experimental studies by examining the effect graphical disclosures have on investor decisions. They find graphical displays of GAAP and pro forma information do affect the decision-making judgments of both professional and less sophisticated investors, even in the presence of a pro forma to GAAP reconciliation. This finding contrasts with Elliott (2006), who finds a pro forma to GAAP reconciliation mitigates the pro forma disclosure impact on less sophisticated investors. Consistent with Andersson and Hellman (2007), but inconsistent with Frederickson and Miller (2004), Dilla et al. (2013) also find exposure to pro forma information can affect the judgment of professional investors. The authors suggest further research is required to determine if the inconsistencies with previous studies are due to the presence of graphical information or differences in experimental designs, specifically reconciliation format.

²⁹ Regulation G specifies the pro forma earnings release disclosure needs to be reconciled to GAAP but does not specify a reconciliation format. The reconciliation proxy employed by Allee et al. (2007) does not differentiate between different reconciliation types.

³⁰ The authors define reconciliation quality as "the degree to which a pro forma disclosure fully articulates the difference between pro forma and GAAP earnings" (p. 159).

Some of the inconsistencies in results may be explained by various experimental substitutions for less sophisticated investors. Less sophisticated, or non-professional investors, are heterogeneous, and therefore it is difficult to find suitable proxies. M.B.A. students often represent less sophisticated investors as they are a convenience sample.³¹ Evidence on the appropriateness of using M.B.A. students as a proxy for less sophisticated investors in a pro forma setting is mixed. Elliott et al. (2007) find M.B.A. students can generally be used as a proxy, depending on task complexity and the number of courses completed. Dilla et al. (2014) find little difference between M.B.A. students and less sophisticated investors recruited from the general public with regard to the level of investing experience. However, within this combined group of less sophisticated investors, there are significant differences in participants' financial knowledge. Dilla et al. (2014) divide their less sophisticated investor sample into two groups: less knowledgeable and more knowledgeable, based on a financial reporting knowledge quiz. They find less knowledgeable investors' decisions are affected by the presence of a pro forma to GAAP reconciliation. However, more knowledgeable investors' decisions are akin to professional investors in that their evaluations of firm earnings are not significantly affected by the presence of a reconciliation.

Dilla et al. (2014) is the only study to classify the participants based on their financial reporting knowledge rather than group membership. Their study employed a 2x1 design, GAAP only information and GAAP plus pro forma reconciliation. The results are in stark contrast to Elliott (2006), who also had a GAAP and a GAAP plus pro forma reconciliation manipulation. Elliott (2006) find there was no difference in the M.B.A. students' perception of earnings performance between these two groups. Frederickson and Miller (2004) and Johnson et al. (2014) employed a GAAP and pro forma scenario that did not contain a reconciliation, while Andersson and Hellman (2007) only investigated the decisions of analysts. Hogan et al. (2017) did utilise two different reconciliation types, full reconciliation, and reconciliation summary, but lacked a GAAP-only control group or separation of participants based on financial knowledge.

For completeness, the only other decision making study in the non-GAAP literature is a working paper that looks at pro forma disclosures from a managerial perspective (Guggenmos et al., 2021). Consequently, the effect of pro forma disclosure prominence, or types of pro forma reconciliations, on the decisions of financial statement users remains largely unresolved. A key difficulty is finding a clear consensus on exactly who best proxies for financial statement users, a

31 Both Elliott (2006) and Dilla et al. (2013) use M.B.A. students as a proxy for "nonprofessional investors". Hogan et al. (2017) use accounting graduates as a proxy for "reasonably informed nonprofessional investors". Krische (2005) uses M.B.A. and late undergraduate degree students as a proxy for "reasonably informed individual investors". This paper has adopted the terminology from Frederickson and Miller (2004) who classified M.B.A. students as "less sophisticated investors".

limitation of all non-GAAP experimental/decision-making studies to date. However, finding suitable proxies for financial statement users is an important consideration when determining the required regulation to govern non-GAAP disclosures.

2.6 CAN REGULATION MODERATE PRO FORMA DISCLOSURES?

Jennings and Marques (2011, p. 367) suggest “corporate governance can be viewed as a substitute for regulation”. Firm characteristics, such as board composition (Frankel et al., 2011; Jennings & Marques, 2011), accounting expertise of audit committee members (Seetharaman et al., 2014), number of directorships the audit committee chair holds (Lee, 2021), and level of institutional ownership (Jennings & Marques, 2011) are effective in improving the quality of pro forma disclosures. External factors, such as analyst coverage (Christensen et al., 2021), media attention (Koning et al., 2010), and the level of competition within an industry (Isidro & Marques, 2021), have a similar inhibiting effect. Given some managers disclose non-GAAP earnings measures opportunistically and others informatively, market participants cannot rely on individual firms or managers to act altruistically. Hence the introduction of market-wide regulation, such as the SOX Act in the U.S.

Overall, the literature agrees that the SOX regulations have been effective in improving the quality of pro forma disclosures. However, despite the moderating effects of internal governance and external monitoring, some managers continue to opportunistically disclose non-GAAP earnings measures. As per the preceding section, both professional and less sophisticated investors can be misled by these disclosures. The ability of managers to successfully mislead investors via pro forma disclosures is precisely the concern of regulators (ASIC, 2011; SEC, 2001). The usefulness of pro forma disclosures coupled with their deceptive potential is the reason standard setters strive to determine the regulatory balance between managers informing, but not misleading, financial statement users. The constant amendments to reporting regulations in the U.S. suggest that balance is yet to be found.

Many studies use the natural experimental setting provided by the introduction of Regulations G and S-K in 2003 to investigate the impact of regulation on pro forma disclosures. The regulations brought about a decrease in emphasis of pro forma disclosures relative to GAAP (Bowen et al., 2005; Entwistle et al., 2006b; Marques, 2006), an increase in the quality of reconciliations to GAAP (Baik et al., 2008; Zhang & Zheng, 2011), a decrease in the likelihood of managers using pro forma disclosures to meet or beat earnings targets (Chen, 2010; Heflin & Hsu, 2008; Jennings & Marques, 2011), and an increase in the quality of pro forma exclusions (Black et al., 2012; Black et al., 2017a; Bond et al., 2017; Chen, 2010; Heflin & Hsu, 2008; Kolev et al., 2008). There was a temporary

decline in the use of pro forma disclosures (Entwistle et al., 2006a; Marques, 2006), but that trend has reversed, and pro forma disclosures are above pre-Regulation G levels (Black et al., 2021b; Black et al., 2017a; Bond et al., 2017; Ciesielski & Henry, 2017).

Baumker et al. (2014) examine an unintended consequence of SOX regulations – doing nothing. That is, firms who experience a one-time transitory gain, for example, legal settlements and insurance recoveries, but neglect to report a pro forma disclosure. The authors find the pre (post) Regulation G instance of managers reporting pro forma EPS explicitly excluding the one-time gain was 62% (34%). In 2010 the SEC issued updated guidance for pro forma disclosures (SEC, 2010). Question 102.03 relaxes previous guidance surrounding the exclusion of recurrent items from pro forma disclosures. Bond et al. (2017) find that although regulation improved the quality and reduced the magnitude of pro forma disclosures, the 2010 SEC relaxation partially reversed the previous regulatory effects. Kolev et al. (2008) note the quality of special items decreased following Regulation G, suggesting managers may have adapted to the additional non-GAAP scrutiny by reporting recurrent expenditure as special items.

A recent examination of SEC comment letters sent to firms to address their use of non-GAAP measures in mandatory filings, for example, 10-Ks, 10-Qs, and earnings releases, finds support for regulatory effectiveness. Jo and Yang (2020) find firms with poorer GAAP results are more likely to receive a SEC non-GAAP comment letter. However, these firms are more likely to cease non-GAAP reporting in future filings. Those firms who receive a non-GAAP comment letter and continue to report non-GAAP measures reduce the non-GAAP prominence and provide more robust justifications for doing so. Chen et al. (2021a) also examine comment letters and similarly find firms improve their non-GAAP disclosures post receipt of a SEC comment letter. Both findings suggest regulation, and its enforcement, is having the desired effect of improving the disclosure quality of non-GAAP measures.

Despite the successes of SEC regulation in the U.S., there is still evidence of managers acting opportunistically in the post-SOX period (Barth et al., 2012; Baumker et al., 2014; Black et al., 2017a; Black et al., 2017b; Choi & Young, 2015; Curtis et al., 2014; Isidro & Marques, 2013; Laurion & Sloan, 2022; Shiah-Hou & Teng, 2016). Taken together, the increase in exclusion quality and decreased probability of using pro forma measures to meet analyst forecasts support the SEC's use of regulation to improve the quality and informativeness of earnings disclosures, making them more useful for the users of financial statements. The question remaining is not if regulation can improve financial information, but what regulation provides users with the most useful financial information?

2.7 RESEARCH QUESTIONS

As previously discussed, Item 10 (e) of Regulation S-K of the Code of Federal Regulations mandates four requirements when non-GAAP information is included with SEC filings. These requirements are:

- (A) Non-GAAP disclosures must not be given greater prominence than the comparable GAAP measure.
- (B) The filing must contain a quantitative non-GAAP to GAAP reconciliation.
- (C) Management must disclose the reason(s) they believe the non-GAAP information is useful to investors.
- (D) Management must also disclose the extent to which they use the non-GAAP measure internally.

Extant non-GAAP literature contains a thorough examination of the impact requirements (A) and (B) have on the decisions of financial statement users. Bowen et al. (2005) find the greater the emphasis placed on an earnings measure, the stronger the market reaction. The prominence of non-GAAP disclosures can affect the investment decisions of investors, especially those considered less sophisticated (Allee et al., 2007; Elliott, 2006; Frederickson & Miller, 2004). However, the presence (Dilla et al., 2014; Elliott, 2006) and format (Hogan et al., 2017) of a quantitative, simultaneous non-GAAP reconciliation can eliminate the influence of prominence on investors' judgments, while high-quality reconciliations can reduce market mispricing (Aubert & Grudnitski, 2014). Whilst there are still questions to be answered regarding prominence and reconciliation of non-GAAP earnings, undoubtedly the first two requirements of Regulation S-K Item 10 (e) have improved disclosure quality and, in turn, decision usefulness.

The second two requirements of Regulation S-K Item 10 (e) are yet to be investigated in depth. Only one published study discusses these requirements (Chen et al., 2021a) and it does so with a cursory nature. This research addresses the literature gap and consists of two studies that draw inspiration from requirements (C) and (D) by examining how management's justification for the disclosure of non-GAAP earnings and how management's internal use of non-GAAP earnings affect the judgments of financial statement users. This research seeks to determine answers to the following two research questions:

- RQ1:** How does the disclosure of managements' internal use of non-GAAP earnings affect the decision making of financial statement users?

RQ2: How does the disclosure of managements' justification of providing non-GAAP earnings affect the decision making of financial statement users?

The first research question is the subject of the Compensation study and is presented in the next chapter. While the second research question is addressed in the Justification study and presented in Chapter 4. To aid the flow of this dissertation, the literature relevant to the development of each research question is contained in the appropriate chapter.

CHAPTER 3: NON-GAAP EARNINGS AND EXECUTIVE COMPENSATION

Recall, SEC filing regulations set out four requirements for the inclusion of non-GAAP measures: (A) prominence of a non-GAAP measure, (B) reconciliation to appropriate GAAP measure, (C) justification for disclosing non-GAAP measure and (D) management's use of non-GAAP measure (Office of the Federal Register, 2017b). The SEC explicitly states one of their main goals is to “inform and protect investors” and they achieve their goals through the enforcement of federal securities laws (SEC, 2022). This dissertation's first research question addresses requirement (D) by asking, “*how does the disclosure of managements' internal use of non-GAAP earnings affect the decision making of financial statement users?*” To answer the research question, this study, known as the Compensation study, adopts an experimental approach.

There are many potential management internal uses of non-GAAP earnings. Microsoft uses non-GAAP measures “for comparability of reporting”³², while Facebook says they “enable comparison of financial results between periods where certain items may vary independent of business performance”³³. AT&T report their non-GAAP measures are “used by management as a method of comparing performance with that of many of our competitors”³⁴. A common theme across S&P500 companies is reported by Proctor & Gamble in that their non-GAAP “measures are also used to evaluate senior management and are a factor in determining their at-risk compensation”³⁵.

The Council of Institutional Investors (CII) have expressed concern non-GAAP earnings are being used to engineer excessive executive payouts (Cohn, 2019). To be clear, the CII are not suggesting outlawing the practice, as they readily admit there are “valid reasons” to use non-GAAP earnings. Instead, they are calling for transparency. Given the substantive and growing subset of non-GAAP literature surrounding performance contracting of managers, outlined in the literature review chapter of this dissertation, and the increasing public acceptance and scrutiny of the practice (Cohn, 2019), this study explores investor reactions to management using non-GAAP earnings to determine executive compensation.

³² Microsoft Corporation (NASDAQ: MSFT) Form 10-Q March 31, 2018
https://www.sec.gov/Archives/edgar/data/789019/000156459018009307/msft-10q_20180331.htm

³³ Facebook Incorporated (NASDAQ: FB) Form 10-Q March 31, 2018
<https://www.sec.gov/Archives/edgar/data/1326801/000132680118000032/fb-03312018x10q.htm>

³⁴ AT&T Incorporated (NYSE: T) Form 10-Q September 30, 2017
https://www.sec.gov/Archives/edgar/data/732717/000073271717000101/q3_10q.htm

³⁵ The Proctor & Gamble Company (NYSE: PG) Form 10-Q March 31, 2018
<https://www.sec.gov/ix?doc=/Archives/edgar/data/80424/000008042418000034/fy1718q3jfm10-qreport.htm>

3.1 DEVELOPMENT OF HYPOTHESES

In support of using non-GAAP earnings to determine executive compensation, studies show non-GAAP earnings are more closely related to future earnings and stock returns (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Choi et al., 2007; Collins et al., 2009; Marques, 2006). GAAP earnings contain items outside of managements' control known as 'noise' (Guay et al., 1996). The informative hypothesis suggests non-GAAP earnings can create a better measure of managers' actions by removing the 'noise'. Curtis et al. (2021) find that, consistent with agency theory, corporate boards are more likely to use non-GAAP earnings in determining CEO compensation when GAAP earnings are less informative (i.e., 'noisy' or less responsive to management effort). If non-GAAP earnings are more closely linked to future financial performance, it is reasonable that management is rewarded for their creation of shareholder wealth.

An extensive, largely archival, literature links executive compensation to corporate financial performance as a mechanism to reduce agency costs by aligning management and shareholder interests (Bebchuk & Fried, 2003; Jensen & Meckling, 1976). Using non-GAAP measures to determine executive compensation (hereafter called "non-GAAP compensation") can undermine the agency contract because a conflict of interest can arise if management can use non-GAAP disclosures to increase their private wealth. Whilst executive remuneration is agreed upon and monitored by the remuneration committee as part of the firm's corporate governance, the process is by no means perfect. A seminal paper by Bebchuk and Fried (2003) demonstrates how managers can exert influence over their own compensation packages, and Guest et al. (2022) find evidence of CEO rent extraction through the use of non-GAAP earnings.

The non-GAAP literature documents agency issues and opportunistic management behaviour concerning executive compensation (Bansal et al., 2013; Frankel et al., 2011; Grey et al., 2013; Isidro & Marques, 2013). Guest et al. (2022) find firms with the highest-paid CEOs have the largest, positive differences between non-GAAP and GAAP earnings. They conclude that non-GAAP earnings reported to the market (investors) lead boards to more generously compensate executives through bonuses linked to share prices, thereby giving management the incentive to inflate reported non-GAAP earnings opportunistically. That is, management uses non-GAAP earnings to influence the board, not the shareholders.

The findings of Guest et al. (2022) are premised on management dictating the definition of non-GAAP earnings to the board. Black et al. (2022) test this premise and find the board and management jointly determine non-GAAP earnings. They also find the boards' use of non-GAAP measures in determining executive compensation is a signal to investors of a higher quality non-GAAP disclosure and attribute this to investors' finding the disclosures more credible. In addition,

earlier research supports the notion that linking compensation to non-GAAP earnings improves disclosure quality (Bansal et al., 2013). However, while this archival research provides some evidence on the use of non-GAAP earnings for compensation, and the capital market impact, they do not address investors' perception of such disclosures. The Compensation study provides a contribution, with strong evidence on the perception of such disclosures, and whether these perceptions influence the decisions of investors.

Building on this non-GAAP agency-based research, this study employs attribution theory (Heider, 1958) to examine the impact on investors' judgment and decision-making behaviour of using non-GAAP compensation. Non-GAAP compensation is hypothesized to affect two distinct constructs of investor judgment, (1) evaluation of *financial performance* and (2) *quantitative investment judgments*.

Attribution theory suggests that how investors perceive managements' disclosures will impact the persuasiveness and interpretation of those disclosures (Barton & Mercer, 2005; Chen et al., 2016). Investors can assign one of two attributions to managements' disclosure of non-GAAP earnings when accompanied by lower GAAP earnings. Management is perceived as either attempting to mislead investors or to inform investors. These attributions are consistent with opportunistic and informative hypotheses of managements' non-GAAP disclosure motivations. Additional non-GAAP compensation disclosure may strengthen the opportunistic attribution, as it reveals management is remunerated based on the higher earnings figure. On the other hand, the additional non-GAAP compensation disclosure may strengthen the informative attribution, because the potential for the disclosure to be interpreted opportunistically may ultimately be costly to management. Therefore, management will only make a potentially costly disclosure if they believe non-GAAP earnings are more informative than their GAAP counterpart. Thus, the use of the non-GAAP earnings in determining executive compensation by the board signals that the measure is credible, increasing the informativeness weight placed by users.

Drawing upon attribution theory, the Compensation study hypothesises investors' judgments will be influenced by their perception of managements' motivation to disclose non-GAAP based compensation. Consistent with the more recent research of non-GAAP earnings that indicates it is of higher quality when compared to GAAP earnings (Black & Christensen, 2018; Chen et al., 2021b), and prior research showing a positive relationship between non-GAAP earnings quality and executive compensation (Bansal et al., 2013; Black et al., 2022), the first hypothesis predicts investors will attribute the use of non-GAAP compensation to an informative motivation.

H1: Investors' evaluations of corporate financial performance will be higher (lower) when non-GAAP earnings are (not) used to determine executive compensation.

Previous non-GAAP research documents that non-GAAP disclosures affect investors' quantitative financial judgments. In experimental settings, non-GAAP disclosures affect investors' forecasted earnings per share estimates (Andersson & Hellman, 2007; Elliott, 2006), forecasted stock price valuations (Frederickson & Miller, 2004; Reimsbach, 2014), and the amount investors are willing to invest (Dilla et al., 2013; Hogan et al., 2017). The effects are observed among both less sophisticated (Dilla et al., 2014; Elliott, 2006; Frederickson & Miller, 2004; Hogan et al., 2017; Reimsbach, 2014) and professional investors (Andersson & Hellman, 2007; Dilla et al., 2013). These prior studies manipulate the presentation of non-GAAP disclosure financial elements, that is, presence, prominence and/or reconciliation format, rather than the accompanying non-financial information, such as that found in the Management Discussion and Analysis (MD&A) portion of corporate filings. This study seeks to help fill this gap in the literature.

Research finds other forms of non-financial information are decision-useful for investors (Amir & Lev, 1996; Ittner & Larcker, 1998). Coram et al. (2009) find the disclosure of non-financial information, such as customer satisfaction ratings, affects sophisticated users' stock price estimates. These researchers report positive non-financial information leads users to assign a higher stock price valuation than does negative information. The first hypothesis predicts investors will positively view non-GAAP compensation, therefore increasing investors' evaluation of corporate financial performance. It is expected these positive evaluations, attributed to managements' informative motivations, will similarly influence investors' quantitative financial judgments. Therefore, the second hypothesis is:

H2: Investors' quantitative financial judgments will be higher (lower) when non-GAAP earnings are (not) used to determine executive compensation.

However, financial and non-financial information may not be weighted equally in decision making. Coram et al. (2011) demonstrate the relative importance of financial information may be impacted by non-financial information. In an experimental setting, they find the attention analysts pay to non-financial disclosures is affected by the accompanying financial information. To assess the strength of investors' potential attributions in H1 and H2, a scenario where managements' actions are traditionally seen as opportunistic is introduced by disclosing financial information that polarises with the non-financial, non-GAAP disclosure.

Concerns about non-GAAP earnings misleading investors are well documented. The classic case of opportunistic use of non-GAAP earnings is their use to *'recast a loss as if it were a profit'* (SEC, 2001). Companies that exclude income reducing items to recast a GAAP loss as a non-GAAP profit are called 'loss converters' (Leung & Veenman, 2018, p. 4). These authors conclude, from the loss converter subset of their data, that managements' exclusion of expenses is informative for investors and aids investor decision making with regards to assessing loss converters' future earnings performance.

These findings contrast with prior research, which suggests loss converters' non-GAAP disclosures are viewed sceptically by the market. Black et al. (2012) find, in a post-SOX sample, that investors aggressively discount loss conversion companies, relative to other companies. Black and Christensen (2009, p. 323) find loss converters are '... more likely than not to exclude income statement items that could be associated with opportunistic motives' (p. 323) to meet strategic targets. Bhattacharya et al. (2003) find that while analysts discount loss converters' non-GAAP earnings surprises, investors are less wary. Prior to Leung and Veenman (2018), the non-GAAP literature clearly presents loss conversion as indicative of opportunistic reporting behaviour.

However, Leung and Veenman (2018) do not consider non-GAAP compensation. Isidro and Marques (2013) find, in an international sample, that companies with directors' compensation linked to non-GAAP earnings are more likely to behave opportunistically to increase performance-based compensation, suggesting that not only managers use non-GAAP measures opportunistically but also directors. Specifically, non-GAAP compensation companies adjust for recurring expenditure more frequently, give greater prominence to non-GAAP measures, and are less likely to provide a GAAP to non-GAAP reconciliation. Curtis et al. (2021) find firms using non-GAAP earnings to determine executive compensation are more likely to meet minimum performance targets and pay higher performance-related bonuses. Their conclusion is CEOs opportunistically use the discretion available in reporting non-GAAP earnings to increase their personal wealth. The findings from this prior non-GAAP and executive compensation research leads to an expectation the informative attributions in H1 and H2 will change users' perceptions of the signal management is sending for loss converters. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead to investors attributing managements' disclosure of non-GAAP compensation to opportunistic motivations and impact investor evaluations and judgements. Therefore, the third and fourth hypotheses are:

H3: Investors' evaluations of loss converters' financial performance will be lower (higher) when non-GAAP earnings are (not) used to determine executive compensation.

H4: Investors' quantitative financial judgments of loss converters will be lower (higher) when non-GAAP earnings are (not) used to determine executive compensation.

The final two hypotheses explore the relationship between non-GAAP compensation and investors' judgments more fully. The first two hypotheses predict investors will positively view non-GAAP compensation because they attribute the disclosure to managements' intent to inform investors. In other words, the relationship between non-GAAP compensation and investor judgments is indirect (i.e., mediated by managements' informative intention). Stated formally:

H5: Investors' perceptions of managements' intent to inform will mediate the relationship between investors' evaluations of corporate financial performance and managements' use of non-GAAP compensation.

H6: Investors' perceptions of managements' intent to inform will mediate the relationship between investors' quantitative financial judgments and managements' use of non-GAAP compensation.

This study addresses the research question, “*how does the disclosure of managements' internal use of non-GAAP earnings affect the decision making of financial statement users?*” Specifically, how does the use of non-GAAP earnings to determine executive compensation affect investors' decision making? Hypotheses 1 and 2 examine the effect of non-GAAP compensation on investors' evaluations of corporate performance and quantitative investment decisions, respectively, while hypotheses 3 and 4 explore investors' judgments in a potentially more opportunistic setting by adding a loss conversion dimension to the analysis. The final two hypotheses, 5 and 6, seek to discover the cognitive process by which investors make their judgments.

3.2 METHOD

This study employs the experimental method to answer the hypotheses and related research question. Experiments enjoy some benefits in comparison to archival studies in that they allow the drawing of causal inferences, provide the ability to control the research environment by only making the changes the researchers wish to examine and can investigate mediating variables to help understand participants' decision-making mechanisms. An advantage of archival research is the significantly larger samples sizes researchers can access through publicly available financial data and trading information. However, qualitative research is particularly problematic for archival research due to the abundance notes and textual information accompanying corporate financial disclosures. The experimental method dominates in answering qualitative research questions as all financial and non-financial information can be held constant, excepting the researchers' specific manipulations. This manufactured approach, if not executed properly, can involve the risk of deviating from real-world practice and therefore potentially limiting the generalisability of the findings. Another drawback to the experimental approach is obtaining participants qualified to help answer the research questions and obtaining quality responses from these participants.

In this study, the participants are U.S. based and recruited using an online panel provider. After being shown the stimulus materials, financial information relating to a fictional health care company, participants' subsequent judgments are recorded. Participants are randomly assigned to one of four treatment groups that contain two experimental manipulations. The following section details the design choices and variables utilised to test the study's hypotheses.

3.2.1 Participants

Participants are 122 individuals recruited from an online panel provider – Cint³⁶. The Cint registration process requires potential panellists (participants) to complete demographic and profiling information. These profiling attributes allow researchers to specifically target participants applicable to their research topic. This research targeted active equity investors and finance professionals, that is, those with a job title concerned with audit, corporate finance, financial analysis/research/reporting, fund accounting or investment management, but not professional investors, that is, those who are professional equity traders or equity analysts. Investment experience and job attributes are collected as part of the demographic questions to verify the accuracy of Cint profiling. Approximately 75% (92/122) actively participate in stock trading (average of 8.1 years trading experience), while 48%

³⁶ <https://www.cint.com/>

(59/122) work in the finance sector (average tenure of 9.7 years).³⁷ All participants are based in the U.S. and aged between 21 and 80 (average 43) years old, with the gender mix being 62%/38% male/female.

Traditionally, obtaining experimental participants is difficult and costly (Brandon et al., 2014). As a result, many researchers utilise convenience samples, such as M.B.A. students and personal contacts. In certain circumstances M.B.A. students are shown to be reasonable proxies for reasonably informed investors (Elliott et al., 2007). However, Elliott et al. (2007) also note M.B.A. students are dissimilar to non-professional investors when making investment decisions. Their lack of investment experience, and the manner they acquire and integrate information can reduce the external generalisability of results from investment-related decision-making experiments. The use of appropriately qualified participants is essential for external validity.

Online panel providers, such as Cint, have made access to externally valid research participants more accessible (Gabriele et al., 2010). Prior experimental literature uses either professional investors (such as analysts) or non-professional investors (usually M.B.A. students as discussed above). This research specifically targets the users of financial reports (investors) as defined by the Conceptual Framework. The Conceptual Framework for Financial Reporting produced by the Financial Accounting Standards Board (FASB, 2018, p. 21) states, “*Financial reports are prepared for users who have a reasonable knowledge of business and economic activities and who review and analyze the information diligently*”. Specifically targeting the intended audience of financial statements increases the generalisability of the findings.

3.2.1.1 Participant screening

Data quality concerns emanate from the use of online participants satisficing. Satisficing is the exertion of the minimal effort required to reach an acceptable solution (Oppenheimer et al., 2009). In an experimental setting, satisficing involves unmotivated participants completing the task in a manner that minimises cognitive effort. A common result of satisficing is unwanted response behaviours, also known as careless or insufficient effort responding (IER) (Huang et al., 2012; Meade & Craig, 2012). IER can lead to poor quality data. Poor data quality resulting from inattentive participants is usually assumed to take the form of random measurement error (Oppenheimer et al., 2009). However, Huang et al. (2015) demonstrate how IER can be the cause of significant findings. In either instance, IER results in data contamination that can bias findings and conclusions. Desimone et al. (2015) outline three broad categories of data screening methods used to reduce IER, direct

³⁷ The results are inferentially the same if stock trading and work experience are included as covariates. However, because neither experience nor trading is significant, it is excluded from the analysis presented in the “Results” section.

screening methods, archival screening methods and statistical screening methods. A detailed discussion surrounding how this dissertation implements these screening methods can be found in Appendix D. Previous research suggests online participants can perform as diligently as traditional participants (Brandon et al., 2014; Farrell et al., 2017; Krische, 2019). Krische (2019) find online respondents with investment experience are more likely and willing, to engage diligently in investment-related judgment activities. However, as Table 1 illustrates, this research finds significant evidence of satisficing.

Table 1 details participant screening for the Compensation study. Instructional manipulation checks (IMCs) are a commonly used direct screening method. IMCs provide the researcher's desired answer in the question to participants to determine which among them are reading the questions carefully. More details about IMCs can be found in Appendix D. This study employs an IMC at the beginning of the response materials, and support for this approach is witnessed by the high number of participants who failed the initial IMC (48%). An explanation for the inconsistency between prior literature and this study is that the screening out of poor-quality participants and responses is usually handled by the online panel provider. Cint offers inexpensive access to participants in exchange for the researcher managing the project. As a result, Table 1 contains participant responses that would not normally be made available to researchers.

In addition, the manipulation failure rate is high compared to some published research, specifically those who use mTurk³⁸. The Cint platform does not provide the mTurk feature that allows researchers to restrict participants if their past performances show them to perform non-diligently. While the results in this study are inferentially the same when the investors who failed the manipulation checks in our experiments are included, the significance of the statistical tests decreases due to the introduction of noise to the data. Brandon et al. (2014) show some panel participants are not suitable for lengthier or more complex instruments. The average length of time taken was 27 minutes ($n=122$) for those who passed the attention checks, while those who failed averaged only 10 minutes ($n=193$). The relative complexity of the experimental materials helps explain a large number of incompletes (138 of 453 = 30%), and the manipulation check fail rate (193 of 315 = 61%). However, the usable response rate of 122 (39%) is not substantially different from previous studies (Andon et al., 2018; Hauser & Schwarz, 2016).

³⁸ <https://www.mturk.com/>

Table 1: Participant screening for the Compensation study

	Responses	
Invited to participate	878	
Failed 1 st IMC	(425)	
Started experiment	453	
Did not complete	(138)	
Finished experiment	315	100%
Failed Manipulation/attention check ³⁹	(193)	61%
Useable responses	122	39%
Treatment 1	38	31%
Treatment 2	30	25%
Treatment 3	28	23%
Treatment 4	26	21%
Useable responses	122	100%

3.2.2 Design and manipulations

Participants evaluate the most recent financial information of Health Solutions Ltd, a hypothetical company based on a real S&P500 pharmaceutical company. As per the previous section, Appendix C outlines many of the experiment's design choices. For example, screening techniques, the use of instructional manipulation and attention checks to ensure data quality, as well as the use of 11-point Likert scales, consistent with prior literature. The model for the experimental materials is a company in the Health Care sector. The Health Care sector has been used in prior non-GAAP research (Dilla et al., 2013, 2014; Frederickson & Miller, 2004). Also, in line with previous non-GAAP research, the materials are based on actual corporate filings (Andersson & Hellman, 2007; Reimsbach, 2014). The use of real, historical data enhances realism and is important for the generalisability of findings.

The pharmaceutical company's actual 2017 annual 10-K SEC filing are used as the starting point. As of 31 December 2017, there were 58 companies in the S&P Health Care Sector. Forty-nine of these companies lodged a Form 10-K included in the quarter 1 2018 SEC Financial Statement Data

³⁹ Appendix F - Justification study out of sample manipulation check and instrument provides a discussion on the terminology and progressively different approach the Justification study employs relative to The Compensation study.

Sets public archive⁴⁰. Although non-GAAP reporting is prevalent among these filings, only 11 Health Care companies reported a non-GAAP net income equivalent⁴¹. Given forecast EPS and an investment decision are dependent variables, a financially stable company with consistent earnings is selected. To anonymise the chosen corporate identity, the consolidated statement of income, balance sheet and GAAP to non-GAAP net income reconciliation are all scaled. In addition, certain items on the reconciliation are changed to contain more general wording. To create a GAAP loss for treatments 3 and 4, sales was reduced with corresponding changes to retained earnings, cost of sales, tax expense, accounts receivable and cash.

The final stimulus materials mimicked historical 10-K filings available on the SEC web portal⁴². The same font (Times New Roman) and colour scheme (light blue and white stripes) is utilised. Previous studies have presented only two years of financial information to participants (Dilla et al., 2014; Elliott, 2006; Frederickson & Miller, 2004; Hogan et al., 2017). However, similar to real filings and Andersson and Hellman (2007), three years of financial information is provided to the participants to enhance the realism of the materials. Appendix H contains the complete experimental instrument.

This study employs a 2x2 between-subjects experimental design to test the hypotheses. Manipulations are the managements' use of non-GAAP earnings (used/not used in determining executive compensation) and GAAP earnings (profit/loss). These two manipulations are the study's independent variables, titled *UseComp* and *GAAPProfit*, respectively. Figure 2 illustrates the treatment groups and manipulations.

⁴⁰ <https://www.sec.gov/dera/data/financial-statement-data-sets.html>

⁴¹ Other non-GAAP measures reported include free cash flow, constant currency revenue, adjusted operating expenses, consolidated adjusted EBITDA, core operating margin, organic revenue, return on incremental invested capital and net debt.

⁴² <https://www.sec.gov/edgar/searchedgar/companysearch.html>

Figure 2: Experimental design for the Compensation study

		Non-GAAP used to determine executive compensation?	
		<i>UseComp</i>	
<i>GAAPProfit</i>		Yes	No
GAAP Profit		Treatment 1 n = 38	Treatment 2 n = 30
GAAP Loss		Treatment 3 n = 28	Treatment 4 n = 26

The online platform used to administer the experiment is Qualtrics, a popular choice among academic researchers. Qualtrics is primarily for the creation, distribution, and administration of surveys. However, the platform contains various features that allow it to be sufficiently adapted for online experiments. One of these features is the ability to create multiple sets of survey questions, known as ‘blocks’, and control participant access to these *blocks*. This controlled access is the mechanism for distributing the various treatment groups among the survey respondents and ensuring participants only see the materials relevant to their randomly assigned stimulus materials.

Participants are randomly assigned to one of four treatment groups with no concerning significant difference in demographics noted across groups. A series of one-way ANOVAs compare participants’ age ($p=.211$), stock investment experience ($p=.396$), active stock trading participation ($p=.990$), the number of years of work experience ($p=.100$), average stock investment time horizon ($p=.123$) and investment risk profile ($p=.733$). There is a significant difference for participants’ education ($p=.032$). Post hoc tests reveal the difference is between treatment groups 1 (mean=3.9) and 2 (mean=4.7). The education question is a Likert scale ranging from 1 (less than high school degree) to 6 (doctoral degree). On the scale, 4 = bachelor’s degree and 5 = master’s degree. Although the difference in means is statistically significant, the practical significance is highly doubtful, given education does not appear as a significant covariant in any additional analysis.

Participants are provided with a brief description of the hypothetical company and an extract from its hypothetical 10-K filing for the year ended 31 December 2017. The extract contains a written summary of the year-end results on a GAAP and non-GAAP basis, including EPS calculations, and a statement of how the company’s management uses non-GAAP earnings. Three schedules then follow: GAAP to non-GAAP earnings reconciliation; Consolidated GAAP Statement of Income; and Consolidated Balance Sheet.

In line with archival findings, in the treatment, the non-GAAP earnings exceed GAAP earnings in each scenario (Bhattacharya et al., 2003; Brown et al., 2012b; Choi & Young, 2015; Malone et al., 2016). Also, similar to archival findings (Lougee & Marquardt, 2004) and previous non-GAAP experiments (Andersson & Hellman, 2007; Elliott, 2006; Hogan et al., 2017), the *GAAPProfit* manipulation contains a non-GAAP profit and a GAAP loss. Unlike Elliott (2006) and Frederickson and Miller (2004), but similar to Andersson and Hellman (2007), this research utilises a material difference between non-GAAP and GAAP earnings. This design approach is supported by Ciesielski and Henry (2017), who find S&P500 non-GAAP earnings were more than 20% greater than GAAP earnings. Similarly, Lougee and Marquardt (2004) find non-GAAP earnings were, on average, triple that of GAAP.

Cohen (1992, p. 158) is used to estimate the required experimental sample size. Cohen suggests researchers targeting a medium to large effect size, using an alpha level of 0.05, should aim for 18-45 participants per treatment group. Four treatment groups, with an average of 30 per group, lead to a total sample size of approximately 120. The treatment group and manipulation check accuracy of completed responses were the only variables checked during the data collection stage. Data collection was halted once the desired number of responses were achieved.

The experimental instrument was pretested among academic colleagues and various participants at the 2018 Australian and New Zealand Accounting and Finance conference held in Auckland. Using the same profiling attributes as the final participants, an initial online pretest was conducted with 51 respondents. A second online pretest, incorporating feedback from the first pretest, utilised 35 respondents. The data from these initial pretests was discarded and not used in final analysis. The second pretest utilised essentially the final instrument, meaning the entirety of the experimental materials were thoroughly exposed to testing. Participants who participated in the pretests were excluded from participating in the final experiment.

3.2.3 Task and procedure

Immediately following consent, an instructional manipulation check (IMC) question is presented to participants. Participants are given the correct answer to the question in the body of the question. As reported in Table 1, almost half of the respondents ($425/878 = 48\%$) failed the IMC and exited from the experiment at this point. Next, the manipulated stimulus materials, described above, are presented followed by a manipulation reinforcement.⁴³ Participants are required to correctly answer the manipulation reinforcement questions before being able to continue. The manipulation

⁴³ See Appendix C for discussion on manipulation reinforcements, also known as comprehension checks.

reinforcement questions are designed to minimise the potential creation of a demand effect⁴⁴ and have precedent in prior research (Harding & Trotman, 2017; Payne et al., 2010; Peecher, 1996). Table 2 provides an overview of the experimental task.

Table 2: Experimental flow

Item
Overview and consent
Instructional manipulation check
Experimental materials (four treatments)
Manipulation reinforcement
Investor judgments question set
Decision making question set
Attention checks ⁴⁵
Demographic Information

The first set of questions concerned participants' judgments based on the stimulus materials, including rating the realism and sufficiency of those materials, concluding with an open response question where any comments deemed relevant could be provided. These *investor judgment* questions formed the dependent variable measures used to test the hypotheses. Participants can view the stimulus materials and *investor judgment* questions concurrently. The dependant variable question set in this study was adapted from Elliott (2006), in particular, the question wording and empirical proxies (see Figure 3). However, pretesting allowed for some questions to be removed, and others slightly modified to streamline the experiment for this study's research aims.

Respondents are then presented with a second question set aimed at helping understand participants' decision-making process. Specifically, participants are asked which, and how, elements of the experimental materials influenced their responses in the first question set. These questions are included to test the findings of previous non-GAAP experimental studies, which attributed unintentional cognitive effects, rather than the perceived usefulness of non-GAAP earnings, as the mechanism influencing non-professional investors' investment decisions (Elliott, 2006; Frederickson

⁴⁴ See Appendix C for discussion on demand effects.

⁴⁵ The Compensation study's attention check questions concern the experimental manipulations and, as such, would traditionally be called 'manipulation checks'. See Appendices D, E and K for further discussion.

& Miller, 2004). Participants could not change their answers from the first question set while answering these questions.

The attention check section contains three questions - one for each manipulation and a specific question to examine if the *UseComp* manipulation worked as intended. The Additional analysis section details how this specific manipulation check is used to provide further insight into the question of unintended consequences (Highhouse, 2009).

3.2.4 Investors' judgments

This research seeks to determine if (and how) the dependant variables, *investors' judgments*, are affected by certain disclosures made in financial statements. Because *investors' judgments* are not directly observable, they are measured via the two constructs discussed in the hypothesis development section, *financial performance* and *quantitative investment judgments*. Figure 3 provides an overview of the constructs of *investors' judgments* as well as the hypotheses and dependent variables utilised in empirical testing.

Figure 3: Compensation study investors' judgments and related hypotheses

Concept	Investors' judgments			
Constructs	Financial performance		Quantitative investment judgments	
Hypotheses	H1, H3 & H5 (via <i>Inform</i>)		H2, H4 & H6 (via <i>Inform</i>)	
Empirical proxies	Earnings performance	Earnings potential	Investment amount	EPS estimate
Dependent variables	<i>EarnPerf</i>	<i>EarnPot</i>	<i>InvestAmt</i>	<i>EPS</i>

3.2.4.1 Financial performance

The *financial performance* construct of *investors' judgments* is measured using a combination of two empirical proxies as dependent variables: *earnings performance* (*EarnPerf*) and *earnings potential* (*EarnPot*). Participants are asked, "How do you rate Health Solutions' *earnings performance* for the year ended December 31, 2017?" and "How do you rate Health Solutions' *earnings potential* for the year ended December 31, 2017?" An 11-point scale (0 = very weak to 10

= very strong) is used to capture participant responses.⁴⁶ Both of these variables have precedent in previous non-GAAP experimental research (Dilla et al., 2013; Elliott, 2006; Reimsbach, 2014).

When *EarnPot* and *EarnPerf* are combined using a principal component analysis (PCA), the result is a single component that explains 86% of the variance. PCA is a statistical method of reducing a large set of variables to a smaller set while retaining the majority of the original information. The close relationship likely means they are measuring the same underlying construct. Thus, the analysis in this study reports the results of the hypotheses using the new combined dependent variable, *FinPerf*. The extraction of the two variables' commonality provides an advantage of dimension reduction techniques to reduce the noise associated with imperfect proxy measurements. Dimension reduction techniques are common in the experimental accounting literature. Prior studies assess the relatedness of variables using Cronbach's alpha (Dilla et al., 2014; Elliott et al., 2015; Elliott, 2006; Reimsbach, 2014; Rennekamp, 2012) or a correlation coefficient (Tan et al., 2014), and use a simple average to create a combined dependent variable. Recent studies increasingly embrace more sophisticated techniques such as principal component analysis.⁴⁷

3.2.4.2 *Quantitative investment judgments*

The *quantitative investment judgments* construct of *investors' judgments* is measured using two empirical proxies as dependent variables: *investment amount* (*InvestAmt*) and *earnings per share estimate* (*EPS*). These variables have precedent in prior non-GAAP experimental literature, and provide a realistic simulation of real-world investor decisions. These variables contrast with the *financial performance* variables in the preceding section in that they mimic actual investor decisions, not just an indirect proxy rating. The use of both these dependent variables in prior non-GAAP experiments motivates a comparative question: Are they inferentially the same? This dissertation maintains these proxies' independence and does not combine them. A single component (extracted using PCA) explains 74% of the variance, indicating the concepts are similar but not identical.

For the first simulated decision, participants are told to assume they already own a diversified stock portfolio and have an additional \$10,000 to invest. The rationale for assuming a diversified portfolio is to help alleviate any bias a participant might feel towards, or against, the health sector. That is, participants are being primed to assume an investment in the health sector will have no impact on any stock portfolio diversification strategy they may employ. An 11-point scale (0 = nothing at all to \$10,000 = the entire amount) with increments of \$1,000 records participants' response to the question, "How much of the \$10,000 would you invest in Health Solutions?" The resulting dependent

⁴⁶ See Appendix C for the rationale of using 11-point scales.

⁴⁷ Ironically, PCA (Pearson, 1901) predates Cronbach's alpha (Cronbach, 1951).

variable is titled *InvestAmt*. Previous non-GAAP experimental research employs the same technique to capture investors' decisions quantitatively. Non-GAAP experimental participants have typically been given a hypothetical \$5,000 to invest (Dilla et al., 2013, 2014; Elliott, 2006; Hogan et al., 2017). However, financial accounting research is now taking inflation into account, and doubling the amount to \$10,000 is becoming increasingly more common (Elliott et al., 2015; Elliott et al., 2017; Elliott et al., 2007; Elliott et al., 2014).

The second empirical proxy and dependent variable for the *quantitative investment judgments* construct is *EPS estimate (EPS)*. This variable is also in line with prior experimental research (Andersson & Hellman, 2007; Han & Tan, 2010). Participants are asked to estimate Health Solutions' EPS at the end of the next fiscal year. Both *GAAPProfit* treatments provide 11 options: GAAP profit: \$0 to \$3.00 in \$0.30 increments and GAAP loss: -\$2.00 to \$2.00 in \$0.40 increments with the midpoint \$0. The use of two different scales minimises the chance of creating a demand effect (Libby & Thorne, 2017), that is, participants identifying the research hypotheses and modifying their behaviour. To enable a valid comparison between the different scales, \$1.50 is subtracted from responses from the participants exposed to a GAAP profit. Hence, both scales centre on zero dollars.

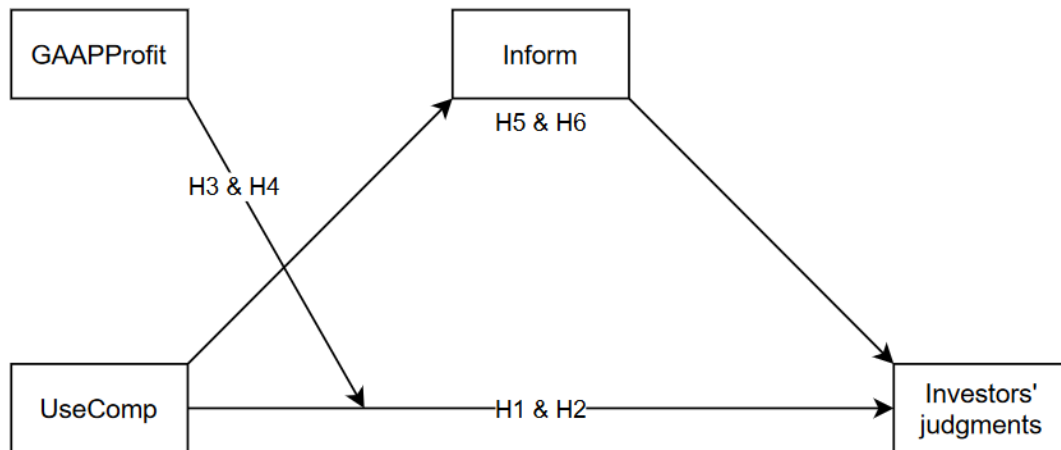
The use of the quantitative dependent variables *InvestAmt* and *EPS* closely simulates actual investment decisions. While the predicted stock price has been used in previous non-GAAP research (Frederickson & Miller, 2004; Reimsbach, 2014), criticisms of this approach include the introduction of confounding factors, such as participant-selected valuation models and the general condition of the stock market (Andersson & Hellman, 2007). Furthermore, other financial accounting studies employ vague scales to "capture participants' general impressions about firm value" (Asay et al., 2017, p. 8). Hence, the use of authentic dependent variables increases this study's generalisability. Leaving the participants' decisions as they naturally occur provides further support for not combining the two *quantitative investment judgment* variables using a PCA. Table 3 provides a link between the experimental questions and the dependent variables.

3.2.4.3 *Intention to inform*

Hypotheses 5 and 6 test whether the perception of managements' intention to inform investors is a mediator with respect to non-GAAP compensation and investors' judgments, that is, their *financial performance* and *quantitative investment judgments*. Participants are asked, 'Why do you believe Health Solutions' management discloses non-GAAP earnings measures: To inform investors?'. Responses are collected using a 7-point scale with 'Strongly disagree' (-3) and 'Strongly agree' (3) at opposite ends of the scale, with the mid-point being 'Neither agree nor disagree' (0). The resulting mediating variable is titled *Inform*. Reimsbach (2014) uses a similar mediation approach

to tease out participants' decision-making process. Figure 4 shows the theoretical framework for the Compensation study.

Figure 4: Theoretical framework for the Compensation study



3.2.4.4 Decision-making analysis

Previous non-GAAP experimental research finds that non-GAAP measures can influence both professional and non-professional investors' decision making (Andersson & Hellman, 2007; Dilla et al., 2013; Elliott, 2006; Frederickson & Miller, 2004; Hogan et al., 2017). Prior research concludes unintentional cognitive effects, rather than perceived information content, are responsible for non-professional investors' judgments (Elliott, 2006; Frederickson & Miller, 2004). That is, non-professional investors do not intentionally rely on non-GAAP information, but rather their judgments are influenced by the presence and prominence of non-GAAP measures.

This study tests if prior unintentional cognitive effects findings are applicable in the present regulatory environment and with participants who do not fit into the dichotomous professional (e.g., analysts) or non-professional (e.g., M.B.A. students) investor groups. In addition to the dependent variables discussed above, additional analysis is conducted by examining participant responses to supplementary questions. Participants are asked the following questions as part of the *decision-making question set*: 'In determining your \$10,000 investment decision earlier, which of the following did you find the most useful?' The response scales, dependent variables and analysis methods are discussed as additional analyses in the Results section below.

Table 3: Summary of dependent variables

Experimental Questions	Dependent variable
How do you rate Health Solutions' earnings performance for the year ended December 31, 2017?	Earnings performance (<i>EarnPerf</i>)
How do you rate Health Solutions' earnings potential over the next two years?	Earnings potential (<i>EarnPot</i>)
Assume:	
(1) you already own a diversified stock portfolio.	Investment amount
(2) you have another \$10,000 to invest in a stock.	(<i>InvestAmt</i>)
How much of the \$10,000 you would invest in Health Solutions?	
Using the options below, estimate Health Solutions' earnings per share (EPS) at the end of the next fiscal year (i.e., December 31, 2018).	EPS estimate (<i>EPS</i>)
Why do you believe Health Solutions' management discloses non-GAAP earnings measures?	Intent to inform (<i>Inform</i>)

3.3 RESULTS

The participants rate both the realism ($M=6.97$, $SD=2.15$) and sufficiency ($M=7.12$, $SD=2.21$) of the materials highly.⁴⁸ A multivariate analysis of variance (MANOVA) revealed no significant difference between the treatment groups. These results confirm the suitability of the materials for the task and enhance the potential to generalise the findings. Assumption testing includes tests for homogeneity of variance and normality, as well as tests specific to certain analyses, such as MANOVAs. Where applicable, additional tests results are detailed in footnotes explaining the implications of failing an assumption test, the suggested remedy, the reason the failed test can be safely ignored and/or the results of a more appropriate alternative test given the failed assumption. Appendix D details all the assumption testing for both the Compensation and Justification studies' variables.

As discussed previously in the Participant screening section, the experimental materials produced an attention check fail rate of 61% (193 of 315). Initial screening targeted suitable participants who were active equity investors and finance professionals. However, being suitable and being motivated to perform diligently are not synonymous. Even though participants were compelled to complete a manipulation reinforcement before indicating their judgments, many still failed the attention checks. The average length of time taken was 27 minutes ($n=122$) for those who passed the attention checks, while those who failed averaged only 10 minutes ($n=193$). A closer inspection of the participant response rate shows many participants who failed the attention checks were speeding and/or straightlining.⁴⁹ These attention checks worked to improve the quality of participants and therefore increase the external validity of the experimental findings.

3.3.1 Descriptive statistics

Table 4 presents the mean and standard deviations for each of the empirical proxies used to test the hypotheses. The descriptive statistics are reported by treatment group.

⁴⁸ Based on an 11-point scale (0 = not at all realistic/sufficient to 10 = very realistic/sufficient).

⁴⁹ Straightlining describes undesirable participant response behaviour of giving the same answer to multiple Likert scale questions. For example, a participant always providing the far-right response option.

Table 4: Descriptive statistics of participants' Compensation study judgments

Panel A: Financial performance judgments – Mean (SD)					
GAAP earnings	Non-GAAP compensation	n	<i>EarnPerf</i>	<i>EarnPot</i>	<i>FinPerf</i>⁵⁰
Profit	Yes	38	7.8 (1.9)	7.9 (1.5)	0.5 (0.9)
	No	30	7.1 (1.4)	7.1 (1.5)	0.1 (0.8)
Loss	Yes	28	6.4 (2.1)	6.6 (1.9)	-0.2 (1.1)
	No	26	5.7 (2.0)	6.0 (1.9)	-0.6 (1.0)
Combined		122	6.8 (2.0)	7.0 (1.8)	0.0 (1.0)

Panel B: <i>FinPerf</i>– Mean (SD)			
	<i>UseComp</i>		
<i>GAAPProfit</i>	Yes	No	Combined
GAAP Profit	0.5 (0.9)	0.1 (0.8)	0.3 (0.8)
GAAP Loss	-0.2 (1.1)	-0.6 (1.0)	-0.4 (1.0)
Combined	0.2 (1.0)	-0.2 (0.9)	0.0 (1.0)

Panel C: <i>InvestAmt</i> – Mean (SD)			
	<i>UseComp</i>		
<i>GAAPProfit</i>	Yes	No	Combined
GAAP Profit	\$ 6,553 (\$ 2,975)	\$ 4,600 (\$ 2,884)	\$ 5,691 (\$ 3,073)
GAAP Loss	\$ 4,643 (\$ 2,857)	\$ 3,231 (\$ 2,997)	\$ 3,963 (\$ 2,984)
Combined	\$ 5,742 (\$ 3,055)	\$ 3,964 (\$ 2,991)	\$ 4,926 (\$ 3,142)

⁵⁰ The two dependent variables, *earnings performance* and *earnings potential* are combined into a single component using principal component analysis (total variance explained = 86%). The new component is named *Financial Performance (FinPerf)*.

Panel D: EPS – Mean (SD)⁵¹

<i>GAAPProfit</i>	<i>UseComp</i>		Combined
	Yes	No	
GAAP Profit	0.6 (0.6)	0.2 (0.7)	0.4 (0.7)
GAAP Loss	0.4 (0.7)	-0.2 (0.9)	0.1 (0.9)
Combined	0.5 (0.7)	0.0 (0.8)	0.3 (0.8)

Panel E: Inform - Mean (SD)

<i>GAAPProfit</i>	<i>UseComp</i>		Combined
	Yes	No	
GAAP Profit	1.7 (1.3)	1.3 (1.2)	1.5 (1.3)
GAAP Loss	1.9 (0.8)	1.1 (1.4)	1.5 (1.2)
Combined	1.8 (1.1)	1.2 (1.3)	1.5 (1.2)

3.3.2 Test of hypothesis 1

Hypothesis 1 posits that non-GAAP compensation will influence investors' evaluations of corporate financial performance. Participants' evaluations of corporate financial performance are captured using a single component created from *earnings performance* and *earnings potential*. The two empirical proxies, *earnings performance*, and *earnings potential*, are combined into a single component using principal component analysis (total variance explained = 86%). The resulting new component is named *FinPerf*. A one-way between-groups analysis of variance (ANOVA) is conducted to test H1. The independent variable is *UseComp*, the compensation use, or not, of non-GAAP earnings, with the dependent variable being *FinPerf*. Preliminary assumption testing is conducted with no significant violations noted (Appendix D contains all the assumption testing results for both studies). Table 5 summarises the ANOVA results. There is a statistically significant main effect for *UseComp* ($F=(1,120)=5.62, p=0.017; \eta^2=0.05$).

⁵¹ Represent the zero centred descriptive statistics.

Table 5: Results of hypothesis 1

Source of Variation	SS	df	MS	F	p-value	η^{252}
One-way ANOVA model test of H1 - <i>FinPerf</i>						
<i>UseComp</i>	5.62	1	5.62	5.85	.017	.05
Error	115.38	120	0.84			

Within the levels of *UseComp*, an examination of the component (*FinPerf*), used to test the directional H1, reveals the means for the treatment groups (1 and 3), where executive compensation is determined using non-GAAP earnings ($M=0.2$, $SD=1.0$) is significantly higher than the means for the groups (2 and 4) without a link to executive compensation ($M=-0.2$, $SD=0.9$). The descriptive statistics are shown in Panel B of Table 4. That is, participants attribute a significantly higher evaluation of corporate financial performance when management uses non-GAAP earnings measures in determining executive compensation. H1 predicts the use of non-GAAP earnings to determine executive remuneration will increase investors' evaluations of corporate financial performance. Therefore, H1 is supported.

3.3.3 Test of hypothesis 2

Hypothesis 2 posits that non-GAAP compensation will influence investors' quantitative financial judgments. Participants' quantitative financial judgments are captured using the dependent variables *InvestAmt* and *EPS*. As mentioned in the Method section of this study, these two variables are analysed separately even though they are correlated ($r=.488$; $p<.001$) and a single component explains 74% of the variance⁵³. Both variables are used in prior studies, and their separation allows comparisons to be drawn. A one-way between-groups ANOVA is conducted to test H2. The independent variable is *UseComp*. Preliminary assumption testing is conducted with no significant violations noted (see Appendix D for assumption testing results). Panels A and B of Table 6 summarise the ANOVA results.

⁵² Eta squared (η^2) is a measure of effect size calculated as the ratio of the sum of squares for an effect to the total sum of squares - see Appendix D for a more complete discussion of effect sizes.

⁵³ Results are inferentially the same if *InvestAmt* and *EPS* are combined into a single component, using PCA.

Table 6: Results of hypothesis 2

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: One-way ANOVA model test of H2 – InvestAmt						
<i>UseComp</i>	95786282	1	95786282	10.46	.002	.08
Error	1098549784	120	9154581			
Panel B: One-way ANOVA model test of H2 – EPS						
<i>UseComp</i>	6.31	1	6.31	11.20	.001	.09
Error	67.56	120	0.56			

With regard to *InvestAmt*, there is a statistically significant main effect for *UseComp* ($F=(1,120)=10.46$, $p=.002$; $\eta^2=0.08$). Within the levels of *UseComp*, an examination of *InvestAmt*, employed to test the directional hypothesis H2, reveals the means for the treatment groups (1 and 3) where executive compensation employs non-GAAP earnings ($M=5,742$, $SD=3,055$) is significantly higher than the means for the groups (2 and 4) without a link to executive compensation ($M=3,964$, $SD=2,991$), as reported in Panel C of Table 4. That is, participants are prepared to invest significantly more when management uses non-GAAP earnings measures in determining executive compensation.

With regard to *EPS*, there is a statistically significant main effect for *UseComp* ($F=(1,120)=11.20$, $p=.001$; $\eta^2=.09$). Within the levels of *UseComp*, an examination of *EPS*, employed to test the directional hypothesis H2, reveals the means for the treatment groups (1 and 3) where executive compensation is based on non-GAAP earnings ($M=0.5$, $SD=0.7$) is significantly higher than the means for the groups (2 and 4) without a link to executive compensation ($M=0.0$, $SD=0.8$), as reported in Panel D of Table 4. That is, participants' EPS estimates are significantly more favourable when management uses non-GAAP earnings measures in determining executive compensation. In summary, H2 predicts the use of non-GAAP earnings to determine executive remuneration will increase investors' quantitative financial judgment. Therefore, H2 is supported.

3.3.4 Test of hypothesis 3

Hypothesis 3 posits that investors' evaluations of loss converters' corporate financial performance will be the reverse of the relationship found in H1. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead participants to attribute opportunistic motivations to managements' use of non-GAAP compensation. H3 is tested using the two-way ANOVA interaction effect between

the independent variables *GAAPProfit* and *UseComp* with participants' evaluations of financial performance captured using the dependent variable component *FinPerf*. Table 7 summarises the ANOVA results. The interaction is not statistically significant ($F=(1,118)=0.01, p=.943; \eta^2=.00$). The lack of interaction shows participants' relative evaluations of financial performance are unchanged when analysing loss converters. A means comparison of the component *FinPerf* (Panel B of Table 4) shows the lack of interaction as the means for the non-GAAP compensation treatment groups (1 and 3) are both higher than the corresponding treatment groups (2 and 4) where non-GAAP earnings are not used to determine compensation. Participants provided a higher evaluation of financial performance regardless of the analysed company being a loss converter. Therefore, H3 is not supported.

Table 7: Results of hypothesis 3

Source of Variation	SS	df	MS	F	p-value	η^2
Two-way ANOVA model test of H3 - <i>FinPerf</i>						
<i>UseComp</i>	4.79	1	4.79	5.68	.019	.04
<i>GAAPProfit</i>	15.71	1	15.71	18.63	.000	.13
<i>UseComp</i> * <i>GAAPProfit</i>	0.00	1	0.00	0.01	.943	.00
Error	99.54	118	0.84			

Although there is no interaction effect, there is, unsurprisingly, a statistically significant main effect for *GAAPProfit* ($F=(1,118)=18.63, p<.001; \eta^2=.13$). A means comparison of the component *FinPerf* shows the means for the GAAP profit treatment groups (1 and 2) ($M=0.3, SD=0.8$) are significantly higher than the means for the GAAP loss treatment groups (3 and 4) ($M=-0.4, SD=1.0$) (Panel B of Table 4). That is, investors attribute a higher evaluation of corporate financial performance in the presence of a GAAP profit when compared to a GAAP loss. A GAAP profit or loss has a larger effect ($\eta^2=.13$) on investors' evaluations of financial performance than does the use of compensation ($\eta^2=.04$); however, both are important factors in investors' decision-making.

3.3.5 Test of hypothesis 4

Hypothesis 4 posits that investors' quantitative financial judgments of loss converters will be the reverse of the relationship found in H2. That is, a GAAP loss, in the presence of a non-GAAP profit, will lead participants to attribute opportunistic motivations to managements' use of non-GAAP

compensation H4 is tested by examining the two-way ANOVA interaction effect between the independent variables *GAAPProfit* and *UseComp* with participants' quantitative financial judgments captured using the dependent variables *InvestAmt* and *EPS*.

There is no statistically significant interaction for either *InvestAmt* ($F=(1,118)=0.25, p=.615; \eta^2=.00$) or *EPS* ($F=(1,118)=0.40, p=.527; \eta^2=.00$). Panels A and B of Table 8 summarise the ANOVA results. The lack of interactions shows participants' relative quantitative financial judgments are unchanged when analysing loss converters. Means comparison of the variable *InvestAmt* (Panel C of Table 4) and *EPS* (Panel D of Table 4) shows the lack of interaction as the means for the non-GAAP compensation treatment groups (1 and 3) are both higher than the corresponding treatment groups (2 and 4) where non-GAAP earnings are not used to determine compensation. Participants provided higher quantitative financial judgments regardless of the analysed company being a loss converter. Therefore, H4 is not supported.

Table 8: Results of hypothesis 4

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: Two-way ANOVA model test of H4 – <i>InvestAmt</i>						
<i>UseComp</i>	84598107	1	84598107	9.85	.002	.07
<i>GAAPProfit</i>	80342831	1	80342831	9.35	.003	.07
<i>UseComp</i> * <i>GAAPProfit</i>	2183355	1	2183355	0.25	.615	.00
Error	1013638692	118	8590158			
Panel B: Two-way ANOVA model test of H4 – <i>EPS</i>						
<i>UseComp</i>	6.18	1	6.18	11.21	.001	.08
<i>GAAPProfit</i>	2.40	1	2.40	4.35	.039	.03
<i>UseComp</i> * <i>GAAPProfit</i>	0.22	1	0.22	0.40	.527	.00
Error	65.04	118	0.55			

Again, and unsurprisingly, a statistically significant main effect is found for *GAAPProfit* for both *InvestAmt* ($F=(1,118)=9.35, p=.003; \eta^2=.07$) and *EPS* ($F=(1,118)=4.35, p=.039; \eta^2=.03$). Means comparison of *InvestAmt* and *EPS*, across the levels of *GAAPProfit*, show the means for the GAAP profit treatment groups (1 and 2) are significantly higher than the means for the GAAP loss treatment groups (3 and 4) (Panels C and D of Table 4). That is, investors are prepared to invest more, and assign a higher EPS estimate, in the presence of a GAAP profit when compared to a GAAP loss.

However, a surprising finding is the same explanatory power, the effect size, for both *GAAPProfit* and *UseComp* ($\eta^2=.07$) for *InvestAmt* and greater explanatory power for *UseComp* ($\eta^2=.08$) compared to *GAAPProfit* ($\eta^2=.03$) for *EPS*. This finding suggests, in this sample, financial statement users consider non-GAAP compensation is a more important signal than GAAP profitability in determining their attributions and making their quantitative financial judgments.

3.3.6 Test of hypotheses 5 and 6

Hypotheses 5 and 6 predict investors' perception of management's intention for non-GAAP compensation to be informative will mediate the relationship between investors' evaluation of corporate financial performance, H5, and investors' quantitative financial judgments, H6. Mediation analysis is used to test hypotheses 5 and 6, as a mediating variable helps better understand the mechanism through which the independent variable influences the dependent variable (Hayes, 2018, p. 7). In this study, the results for testing H1 and H2 establish a significant relationship between non-GAAP compensation (independent variable *UseComp*) and both participants' evaluations of *financial performance* (H1: dependent variable *FinPerf*) and their *quantitative investment judgments* (H2: dependent variables *InvestAmt* and *EPS*). For H5 and H6, the mediating variable is investors' perceptions of managements' intent to provide informative disclosures (*Inform*).⁵⁴ This study follows the Hayes (2018) statistical approach to mediation testing. Specifically, H5 and H6 are tested using the SPSS PROCESS macro to obtain 95 per cent bias-corrected confidence intervals bootstrapped with 5,000 resamples. For mediation to exist, non-GAAP compensation (*UseComp*) must first affect investor perceptions of managements' intent to inform (*Inform*). Second, *Inform* must significantly affect *FinPerf* (H5), *InvestAmt* or *EPS* (H6). Third, for perfect mediation to exist, the indirect effect of *UseComp* on *FinPerf*, *InvestAmt* or *EPS* must not be significant. Figure 4 shows the theoretical framework of H5 and H6.

The results in Table 9, and presented in Figure 5, provide support for H5 and limited support for H6. The significant positive path coefficient for *UseComp* on *Inform* ($a=0.57$) indicates participants attribute the use of non-GAAP earnings to determine executive compensation to managements' intention to provide informative information to investors. The significant positive path coefficient for *Inform* on *FinPerf* ($b_1=0.34$) and *InvestAmt* ($b_2=857$) indicates participants' informative attribution of managements' intentions positively affects their evaluation of the

⁵⁴ Data on whether investors perceive the disclosure to be misleading are also collected, with the resulting variable named *Mislead*. However, analysis of the results (untabulated) provide no evidence to suggest that investors find such disclosures misleading, or that this attribution has any effect on decision-making. *Inform* and *Mislead* are analysed separately. A PCA on the two variables results in a single component that only explains 56% of the variance. These results provide comfort that participants had significantly different opinions surrounding management's intentions.

company's financial performance (H5: *FinPerf*) and their decision to invest in the company (H6: *InvestAmt*). However, the non-significant path coefficient for EPS ($b_3=0.07$) suggests no relationship between participants' informative attribution of managements' intentions and the *EPS* estimate. Finally, the indirect effect of *UseComp* on *FinPerf* (LLCI= 0.04 and ULCI= 0.40) and *InvestAmt* (LLCI=102 and ULCI=1,005) provide evidence of significant mediation with 95 per cent bias-corrected confidence intervals that do not include zero.

Table 9: Intention to inform mediation analysis

Panel A: Path estimates and coefficients for mediation model test of H5 and H6							
<i>Path</i>	<i>Path</i>	<i>Coefficient</i>	<i>t</i>	<i>p-value</i>	LLCI ^a	ULCI ^a	<i>R</i> ²
<i>UseComp</i> → <i>Inform</i>	<i>a</i>	0.57	2.63	.010	0.14	1.00	.06
<i>Inform</i> → <i>FinPerf</i>	<i>b</i> ₁	0.34	4.99	.000	0.21	0.48	.21
<i>Inform</i> → <i>InvestAmt</i>	<i>b</i> ₂	857	3.93	.000	426	1,288	.19
<i>Inform</i> → <i>EPS</i>	<i>b</i> ₃	0.07	1.17	.243	-0.05	0.18	.10
<i>UseComp</i> → <i>FinPerf</i>	<i>c'</i> ₁	0.24	1.41	.162	-0.10	0.57	.21
<i>UseComp</i> → <i>InvestAmt</i>	<i>c'</i> ₂	1,286	2.41	.018	229	2,344	.19
<i>UseComp</i> → <i>EPS</i>	<i>c'</i> ₃	0.42	2.99	.003	0.14	0.70	.10

Panel B: Indirect effects and confidence intervals				
<i>Indirect effect</i>	<i>Effect</i>	LLCI ^a	ULCI ^a	
<i>UseComp</i> → <i>FinPerf</i>	0.20*	0.04	0.40	
<i>UseComp</i> → <i>InvestAmt</i>	492*	102	1,005	
<i>UseComp</i> → <i>EPS</i>	0.04	-0.03	0.13	

^a Represents 95 per cent bias-corrected confidence intervals obtained from a bootstrapping method with 5,000 bootstrapped resamples.

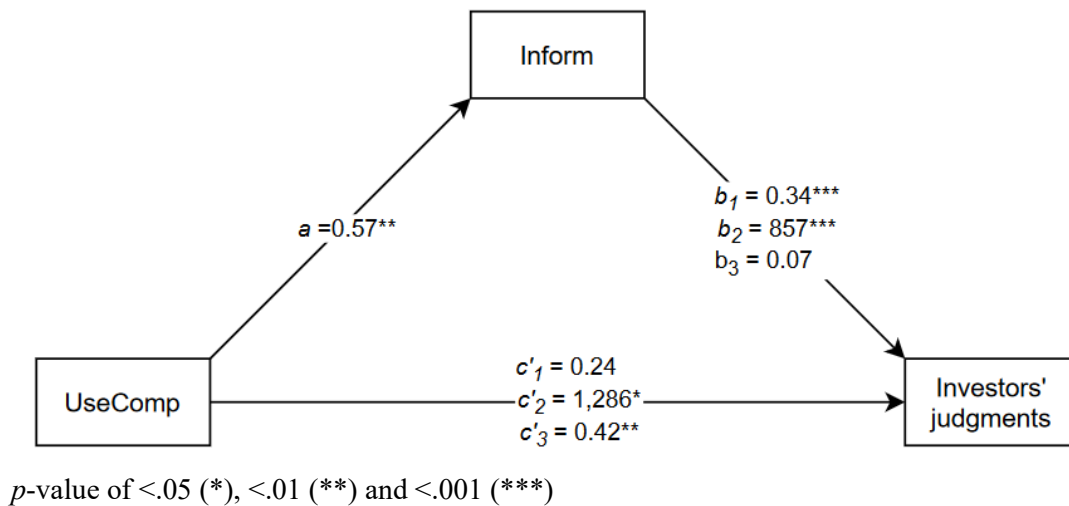
* Denotes *p*-value of 0.05 or less.

^ Levene's test shows the mean variances for *Inform* are not equal ($F(3,118)=3.19, p=0.026$). This violation is not considered serious as the sample groups are roughly equal (largest is < 1.5 times the smallest). Tabachnick and Fidell (2013) suggest a stricter alpha level of 0.025 for minor violations. Applying this stricter alpha level results in inferentially the same result presented above.

The non-significant path coefficient for *UseComp* on *FinPerf* ($c'_1=0.24$) indicates perfect mediation. That is, participants' informative attribution of managements' intentions fully explains the relationship between non-GAAP compensation and their evaluation of financial performance. The significant path coefficient for *UseComp* on *InvestAmt* ($c'_2=1,286$) indicates a lack of perfect

mediation. That is, participants' informative attribution of managements' intentions does not fully explain the relationship between non-GAAP compensation and the amount they are likely to invest. There is at least another contributing factor that helps explain the relationship. The significant path coefficient for *UseComp* on *EPS* ($c'_3=0.42$) re-establishes the relationship found in H2 and suggests participants' informative attribution of managements' intentions plays no part in their earnings estimates.

Figure 5: Observed mediation model for intention to inform



Taken together, the results indicate the use of non-GAAP earnings to determine executive compensation increases investor evaluations of financial performance, and the amount investors are likely to invest, through an informative attribution of management's disclosure intention.

3.3.7 Decision-making analyses

Previous non-GAAP experimental research attributed unintentional cognitive effects as the mechanism influencing investor judgments (Elliott, 2006; Frederickson & Miller, 2004). This current research seeks to determine if, in the post-SOX reporting environment, participants intentionally rely on non-GAAP disclosures in their judgments. A specific manipulation check assesses the salience of the *UseComp* manipulation. Participants are asked, 'How did Health Solutions' use of non-GAAP financial measures in calculating executive performance-based compensation affect your previous responses?' Participants rated the influence non-GAAP compensation had on their previous responses to 'current earnings performance', 'future earnings potential', 'decision to invest \$10,000' and 'earnings per share estimate' on an 11-point scale (0 = not at all affected to 10 = very much affected). Using principal component analysis, the four responses are combined into a single component for

analysis (*Decisions*).⁵⁵ Panel A of Table 9 presents the descriptive statistics for the specific manipulation check as well as the resulting component. The results of a two-way ANOVA, presented in Panel B of Table 10, are consistent with the informative view of non-GAAP measures.

A two-way ANOVA investigates if participants intentionally relied on how Health Solutions used non-GAAP earnings when making their decisions. One dependent variable is analysed: *Decisions*. The independent variables are *GAAPProfit* and *UseComp*. Using an adjusted alpha level of 0.025 due to a Levene's test violation⁵⁶, the interaction effect between *GAAPProfit* and *UseComp* is not statistically significant ($F=(1,118)=0.02, p=.884; \eta^2=.00$). However, a statistically significant main effect is found for *UseComp* ($F=(1,118)=13.58, p<.001; \eta^2=.10$) but not for *GAAPProfit* ($F=(1,118)=0.02, p=.890; \eta^2=.00$).

⁵⁵ The four dependent variables, *current earnings performance*, *future earnings potential*, *decision to invest \$10,000* and *earnings per share estimate*, are combined into a single component using principal component analysis (total variance explained = 82%). The new component is named *Decisions*.

⁵⁶ Levene's test showed the mean variances for *Decision* were not equal ($F(3,118)=3.70, p=.014$). This violation is not considered serious as the sample groups are roughly equal (largest is < 1.5 times the smallest). Tabachnick and Fidell (2013) suggest a stricter alpha level of .025 for minor violations. As an additional check, the non-parametric Mann-Whitney U test was conducted on *Decisions* across the categories of *GAAPProfit* and *UseComp*. The results confirm the ANOVA findings that the only significant difference relates to *Decisions* across the categories of *UseComp*.

Table 10: Specific manipulation check analysis

Panel A: Descriptive statistics for responses to specific manipulation check questions – Mean (SD)						
GAAP earnings / Non-GAAP compensation	n	Current earnings performance	Future earnings potential	Earnings per share estimate	Decision to invest \$10k	Decisions ⁵⁷ (component)
Profit / Yes	38	7.5 (2.2)	7.1 (2.1)	7.9 (1.7)	7.3 (2.4)	0.3 (0.7)
Profit / No	30	5.8 (3.3)	6.0 (3.2)	5.5 (3.2)	5.8 (3.4)	-0.4 (1.2)
Loss / Yes	28	7.5 (2.2)	7.5 (2.2)	7.5 (2.3)	7.2 (2.3)	0.3 (0.8)
Loss / No	26	5.6 (3.1)	2.6 (3.0)	6.3 (2.9)	6.1 (3.4)	-0.3 (1.1)
Combined	122	6.7 (2.8)	6.6 (2.7)	6.9 (2.7)	6.7 (2.9)	0.0 (1.0)

Panel B: Two-way ANOVA model test of *Decisions**

Source of Variation	SS	df	MS	F	p-value	η^2
<i>UseComp</i>	12.46	1	12.46	13.58	.000	.10
<i>GAAPProfit</i>	0.02	1	0.02	0.02	.890	.00
<i>UseComp</i> * <i>GAAPProfit</i>	0.02	1	0.02	0.02	.884	.00
Error	108.27	118	0.92			

*The four dependent variables, *current earnings performance*, *future earnings potential*, *decision to invest \$10,000* and *earnings per share estimate*, are combined into a single component using principal component analysis (total variance explained = 82%). The new component is named *Decisions*.

An inspection of the mean scores for the component *Decisions* reveals the treatment groups (1 and 3) where executive compensation is determined using non-GAAP earnings ($M=0.3$, $SD=0.8$) is significantly higher than the groups (2 and 4) without a link to executive compensation ($M=-0.4$, $SD=1.1$). That is, investors intentionally rely more on non-GAAP earnings when they are used to determine executive compensation as opposed to when they are not. This finding further supports the informative nature hypothesis of non-GAAP measures. These results corroborate the main findings, and the medium to large effect size ($\eta^2=0.10$) shows there is a meaningful and strong relationship between non-GAAP earnings and investor decisions.

Together, this evidence suggests investors are aware of and cognitively use non-GAAP measures in their decision making. The contrast to prior experimental studies (Elliott, 2006; Frederickson & Miller, 2004) is potentially explained by the passage of time since conducting the

⁵⁷ If participants' response to '*earnings per share estimate*' is excluded, due to the lack of significance found in H6, the resulting component, from the remaining three variables, explains 83% of the variance. The subsequent ANOVA with the three variable component provides an almost identical statistical result.

research. The last decade has seen an increase in non-GAAP exposure and scrutiny (Cohn, 2018; Henry et al., 2017; SEC, 2010) and thus may go some way in explaining investors' awareness and increased reliance on non-GAAP measures in their decision making. Another explanation could be a difference in participants. Prior research indicates unintentional cognitive effects influenced M.B.A. students', typically used as proxies for non-professionals, judgments (Elliott, 2006; Frederickson & Miller, 2004). The participants in this study are neither professional investors nor M.B.A. students, but rather non-professional investors and finance professionals with stock trading and/or investment-related experience. If the difference in participants is the reason for the conflicting findings, then the results of this study support the Elliott et al. (2007) findings of M.B.A. students' lack of suitability for investment-related decision-making experiments. A hypothesis testing summary can be found in Table 11.

Table 11: Compensation study summary of results

Hypothesis	Analysis	Result
H1	One-way ANOVA	Accept
H2	One-way ANOVA	Accept
H3	Two-way ANOVA	Reject
H4	Two-way ANOVA	Reject
H5	Mediation analysis	Accept
H6	Mediation analysis	Accept*

* Results are mixed but, on the whole, support the hypothesis.

3.4 DISCUSSION AND CONCLUSIONS

The research question the Compensation study examines is, “*How does the disclosure of managements’ internal use of non-GAAP earnings affect the decision making of financial statement users?*” Specifically, whether or not the use of non-GAAP earnings to determine executive compensation influences investor judgments. Using an experiment, this study finds that when non-GAAP earnings are used in determining executive compensation, participants assign a more favourable evaluation of financial performance and are prepared to invest significantly more capital. Unsurprisingly, the study also finds participants more favourably evaluate financial performance and are prepared to invest more capital when a company discloses a GAAP profit.

As presented in the literature review chapter of this dissertation, from the very early beginnings of the non-GAAP literature, the debate has centred around the opportunistic and informative views of non-GAAP disclosures. However, more recent evidence suggests regulation and awareness of the practice has meant the disclosures are predominately informative for financial statement users (Black & Christensen, 2018; Chen et al., 2021b). The findings of this study are consistent with these recently published archival papers concluding a predominately informative nature to non-GAAP measures.

This study also contributes to the qualitative disclosure literature. This study is the first to examine non-financial non-GAAP disclosures in detail and finds, similar to other non-financial disclosure studies (Amir & Lev, 1996; Ittner & Larcker, 1998), that the non-financial information can be value relevant. An examination of effect sizes shows the non-financial non-GAAP disclosure is at least as important to investors as the financial disclosure in influencing investors’ qualitative financial judgments (Table 8: Results of hypothesis 4) but not as important in determining investors’ evaluations of corporate financial performance (Table 7: Results of hypothesis 3). The latter finding is consistent with those of Coram et al. (2009).

Consistent with attribution theory, the mediation analysis finds evidence that investors attribute non-GAAP compensation to managements’ desire to inform the market, and this, in turn, is what influences their evaluation of financial performance and investment decisions. Investors do not, in the described setting, view non-GAAP compensation as a way for managements to opportunistically increase their remuneration. The lack of observed interaction between the manipulations in the results demonstrates investors do not change their attributions in a purposely opportunistic setting. The *GAAPProfit* manipulation provides a robust test of attribution theory. That is, even when management reports a GAAP loss, but is remunerated using a disclosed non-GAAP profit, investors attribute non-GAAP compensation to managements’ desire to inform. Although not in an empirical setting, the examination of loss converters begins to address the call of Aubert and

Grudnitski (2014) to extend the research of non-GAAP earnings to situations where the regulatory concern is heightened.

As investors perceive the non-GAAP measures to be used for informative purposes, it suggests that boards, in their monitoring function, are seen to be effectively curtailing opportunistic behaviour. As a consequence, it suggests that the boards, in their process of reducing agency costs, perceives non-GAAP measures to be more effective in managing and evaluating business performance than traditional GAAP measures. This supports the current SEC position of permitting non-GAAP reporting with adequate disclosures.

Taken together, the results suggest companies using non-GAAP compensation are viewed more favourably by investors. Investors find non-GAAP compensation informative, rather than opportunistic. In addition, these findings persist in a purposely opportunistic loss conversion scenario. Mediation analyses provide further support for the informative disclosure hypothesis for managements' motivations by demonstrating participants intentionally relied on non-GAAP earnings when making their decisions, and that their perception of informativeness, in turn, influenced their evaluation of financial performance and investment decisions.

Prior experimental literature uses either participants' estimated earnings per share or the amount they are willing to invest to capture investors' quantitative judgments. The study shows both measures result in inferentially the same conclusions. The implication is that future researchers can choose the dependent measure most appropriate to their experimental design, confident the choice is not a compromise.

The Compensation study also finds that investors intentionally rely on non-GAAP measures in their decision making, providing further support for the informative nature of non-GAAP disclosures. This finding contrasts with prior research that attributes unintentional cognitive effects as the mechanism influencing investors' judgments (Elliott, 2006; Frederickson & Miller, 2004). Two factors help explain the inconsistency with prior research. Firstly, significant public exposure (Henry et al., 2017) means investors are more aware of non-GAAP reporting now compared to when previous studies on these issues were performed. Secondly, SEC regulations (SEC, 2017a) have improved the quality of non-GAAP disclosures (Bond et al., 2017), and this has potentially impacted the perceived legitimacy of the non-GAAP earnings.

3.4.1 Limitations and future direction

This study is subject to several limitations. First, the experimental materials provide participants with only a subset of the information usually available to them in the real world. The vast quantities of information available for investors to make decisions are impossible to replicate in an

experimental setting. As such, many investors may not have access to the resources and time they usually do when making investment-related decisions. Second, the complexity and length of the stimulus materials limit the suitability of some participants. The experimental overview sent to participants details the expectations and estimated completion time, participants who signed up may not have appreciated the difficulty of the task, hence the high manipulation check failure rate. Future work should better isolate hypothesis testing by, for example, breaking the research questions into smaller, distinct experiments. Future research could also seek to include only those participants who are suitably qualified to read and comprehend the financial information presented to them. Although this experiment uses online profiling in an attempt to recruit such participants, they may not be appropriately skilled or knowledgeable. An objective knowledge test to assess participants' financial reporting knowledge could be a useful technique to identify suitable participants.

Third, the only use of non-GAAP earnings this experiment examines is in its role in determining executive compensation. Different uses of non-GAAP earnings may elicit different investor judgments. Future work should examine other management uses of non-GAAP measures on investor judgments. Fourth, the negative disclosure of non-GAAP compensation is explicitly stated in treatment groups 2 and 4. An advantage of the experimental method are the researcher freedoms to construct scenarios specifically tailored to the research questions and hypotheses. In this instance, the non-GAAP compensation manipulation was constructed to be as strong as possible, hence the negative disclosure. Although there are presently no real-world corporate filings, that I am aware of, which negatively disclose non-GAAP compensation, it is not unrealistic to expect corporate filings could do so, if management deems such a negative disclosure useful. As a result, the negative disclosure, being unlike those in real-world filings, has high internal validity but potentially limited external generalisability. Future research could explore the differences, if any, between a negative and non-disclosure of non-GAAP compensation. The second study in this dissertation introduces a non-disclosure treatment group to help address this limitation.

Fifth, as the scenarios are comprised of situations where non-GAAP earnings are higher than GAAP earnings, no conclusions can be drawn on what would be observed in the reverse situation. Finally, this experiment employs online participants. Although online participants can be profiled and screened, there is no guarantee they possess the requisite skills to undertake a task as demanding as the one presented in this paper. Similarly, previous work in this area predominately relies on either online participants or convenience samples using M.B.A. and undergraduate students. A solution to finding appropriately qualified participants is to use an objective knowledge test to better screen participants and ensure they possess task-suitable skills and knowledge.

Although not the primary focus, this study contributes to the broader decision-making literature. Prior research suggests a subset of investors rely on non-GAAP disclosures in their decision making but do so unknowingly due to unintentional cognitive effects (Elliott, 2006; Frederickson & Miller, 2004). This paper finds investors knowingly use non-GAAP measures when making investment evaluations and decisions. Public scrutiny and regulation have led to an increase in acceptance and understanding of non-GAAP measures as well as an improvement in disclosure quality (Bond et al., 2017). As a result, investors are seen to be incorporating non-GAAP measures into their decision-making processes.

Despite a different regulatory jurisdiction, this study also contributes to the recent work by the IASB in addressing the growing use of non-GAAP measures internationally (Kabureck, 2017). The recent IASB Exposure Draft General Presentation and Disclosures highlight the importance of management performance measures (MPMs) (IASB, 2019). The exposure draft recommends that entities provide footnote disclosure on why management's "non-GAAP" MPMs provide useful information about an entity's financial performance, including how it is computed and how it relates to the GAAP reported numbers. The results of this study are in line with the proposed recommendations. Non-GAAP measures can provide informative information that investors find decision-useful, and while there may be potential for opportunistic behaviour, this can be curtailed by appropriate mandated disclosures. Furthermore, these results suggest that investors also find disclosures on the internal use of non-GAAP measures to be useful, something that is currently not being considered by the IASB. Consequently, the findings of this research can help inform future standards as to what investors consider useful MPM and non-GAAP disclosures.

CHAPTER 4: NON-GAAP EARNINGS AND MANagements' JUSTIFICATION

Recall, SEC filing regulations set out four requirements for the inclusion of non-GAAP measures: (A) prominence of a non-GAAP measure, (B) reconciliation to appropriate GAAP measure, (C) justification for disclosing non-GAAP measure and (D) management's use of non-GAAP measure (Office of the Federal Register, 2017b). The SEC explicitly states one of their main goals is to "inform and protect investors" and they achieve their goals through the enforcement of federal securities laws (SEC, 2022). This dissertation's second research question addresses requirement (C) by asking, "*how does the disclosure of managements' justification of providing non-GAAP earnings affect the decision making of financial statement users?*" To answer the research question, this study, known as the Justification study, adopts an experimental approach.

There are many examples of managements' justifications for disclosing non-GAAP earnings. Intel suggests "making these adjustments facilitates a better evaluation of our current operating performance"⁵⁸. Microsoft justifies their reporting of non-GAAP measures as they believe they "aid investors by providing additional insight into our operational performance and help clarify trends"⁵⁹. AT&T advises their non-GAAP measures are "relevant and useful information to investors as it is used by management"⁶⁰. However, the only management use they offer is a comparison to competitors, a somewhat dubious claim given the unregulated and varying nature of non-GAAP earnings among businesses.

Even these few examples highlight the variability of detail contained in corporate justifications of non-GAAP measures. A Facebook filing provides a unique justification in that it attempts to specifically suggest how their non-GAAP measures are useful to investors. Facebook reports their non-GAAP measures "provide(s) investors with useful supplemental information about the financial performance of our business, enables comparison of financial results between periods where certain items may vary independent of business performance"⁶¹. This study seeks to examine if the level of detail provided in managements' justification of non-GAAP earnings affects investor

⁵⁸ Intel Corporation (NASDAQ: INTC) Form 10-K December 30, 2017
<https://www.sec.gov/Archives/edgar/data/50863/000005086318000007/a12302017q4-10kdocument.htm>

⁵⁹ Microsoft Corporation (NASDAQ: MSFT) Form 10-Q March 31, 2018
https://www.sec.gov/Archives/edgar/data/789019/000156459018009307/msft-10q_20180331.htm

⁶⁰ AT&T Incorporated (NYSE: T) Form 10-Q September 30, 2017
https://www.sec.gov/Archives/edgar/data/732717/000073271717000101/q3_10q.htm

⁶¹ Facebook Incorporated (NASDAQ: FB) Form 10-Q March 31, 2018
<https://www.sec.gov/Archives/edgar/data/1326801/000132680118000032/fb-03312018x10q.htm>

judgments. Specifically, how do varying degrees of detail in managements' non-GAAP justifications affect influence investor decision-making?

4.1 DEVELOPMENT OF HYPOTHESES

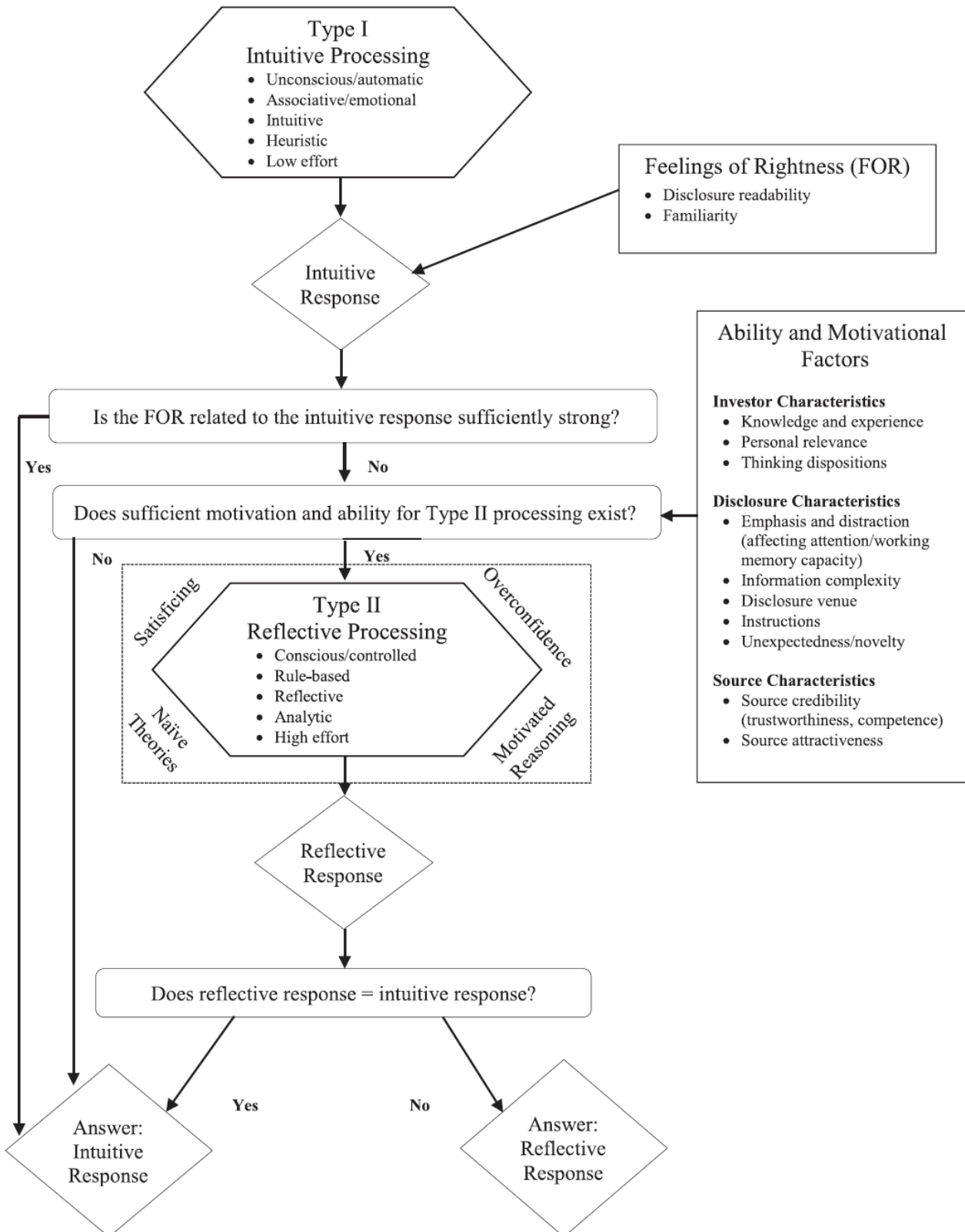
Evans (2011, p. 86) describes the psychological decision making dual-process theory as having two different processing types: Type I (“fast and intuitive”) and Type II (“slow and deliberate”). Hamilton and Winchel (2019) adapt the dual-process model from Evans (2011) and view it through a financial accounting decision-making lens. Figure 6 diagrammatically displays the authors' adaptation of the dual-process model to an accounting context. Hamilton and Winchel (2019) offer “*feelings of rightness* (FoR)” (p. 138) as a boundary condition that triggers an individual's cognitive step from Type I to Type II processing. That is, if an individual's intuitive response to a stimulus ‘feels right’, they proceed. For example, they answer, act, rely on, based on this initial reaction. However, if their initial Type I response does not induce ‘*feelings of rightness*’, individuals are more likely to engage in reflective Type II processing to resolve the mental impasse. The stronger (weaker) the FoR, the less (more) likely an individual is to engage in Type II processing.

As Hamilton and Winchel (2019) note, there is, to date, no financial accounting decision-making research explicitly examining the concept of *FoR*. However, other judgment and decision making (JDM) theories do explore a similar concept. For example, fluency theory underpins research findings that disclosure (Asay et al., 2017; Rennekamp, 2012) and familiarity (Chen & Tan, 2013) can affect investors' judgments and decisions. Specifically, Asay et al. (2017) employ processing fluency to find a less (more) readable press release makes investors more (less) likely to seek outside information due to the disclosure eliciting a decreased (increased) FoR. Chen and Tan (2013) employ perceptual fluency to find an increased (decreased) familiarity with an analyst's name leads to a higher (lower) *feelings of rightness*, as measured by perceptions of analyst credibility. At its core, fluency theory concerns an individual's interaction with the environment (Alter et al., 2007). A smooth interaction with the environment allows an individual to cognitively relax (Type I processing) while a problematic environmental interaction directs an individual's attention towards problem resolution (Type II processing). The Hamilton and Winchel (2019), model displayed in Figure 6, identifies disclosure characteristics as potential *FoR* trigger. Given the varying detail of corporate non-GAAP justifications, this research seeks to examine if another JDM theory, ambiguity theory,

can similarly produce environmental interactions that affect investors' *FoR* and subsequent judgments and decisions.⁶²

⁶² An argument could be made that fluency theory (specifically processing fluency) incorporates an individual's interaction with the ambiguity of a financial disclosure. Whilst ambiguity is not explicitly an environmental interaction, this research seeks to examine if it can elicit similar smooth or problematic experiences.

Figure 6: Hamilton and Winchel dual-process model



Hamilton, E. L., & Winchel, J. (2019). Investors' processing of financial communications: A persuasion perspective. *Behavioral Research in Accounting*, 31(1), 133-156. doi: 10.2308/bria-52211
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Du (2009, p. 201) states ambiguity can “have a significant impact on investors’ decisions and choices”. Ambiguity can be defined as “missing information that is relevant and could be known” (Camerer & Weber, 1992, p. 330). Ambiguity theory suggests individuals prefer precise information to vague information (Curley & Yates, 1985). Popularised by Ellsberg (1961), ambiguity theory research has been largely quantitative in nature, with the accounting literature focusing on investor reactions to managements’ EPS guidance (Han, 2013). Du and Budescu (2005) find ambiguity does affect investment decisions in various contexts and domains. However, the authors readily admit, “the ability of ambiguity attitudes to predict investment behaviour is limited” (p. 1791), a point supported by Fox and Tversky (1995). These authors find decision-makers are ambiguity averse when presented with simultaneous options but not when presented with options in isolation. Du (2009) experimentally shows investors prefer ambiguity for positive news but for negative news, they are ambiguity averse. The author predicts and finds that investors will seek to rely on the upper portion of range earnings estimates if they perceive the potential gains. But investors prefer point earnings estimates, indicating ambiguity aversion, when faced with potential losses. Finally, Du et al. (2011) establish a curvilinear relationship between accuracy and ambiguity in managements’ earnings forecasts, supporting previous findings that investors’ ambiguity aversion is context-dependent.

Non-financial disclosures also affect information users’ decisions (Amir & Lev, 1996; Coram et al., 2011; Ittner & Larcker, 1998). Within the non-GAAP literature, financial disclosure formats influence both professional (Andersson & Hellman, 2007) and non-professional decision making (Elliott, 2006; Frederickson & Miller, 2004; Hogan et al., 2017). Chen et al. (2021a) are among the first to directly examine the information content contained in the qualitative characteristics of non-GAAP disclosures. However, Brosnan et al. (2022) are the first to show non-financial non-GAAP disclosures can affect investor decision making.

Prior literature shows that ambiguous disclosures, defined as missing information that is relevant and knowable (Camerer & Weber, 1992), and non-financial disclosures and non-GAAP disclosures can individually affect investors’ judgments and decisions. Asay et al. (2017, p. 1) find a less readable disclosure results in investors feeling “less comfortable”, that is, they experience decreased *feelings of rightness*. This study posits a higher level of ambiguity contained in a non-financial, non-GAAP disclosure will reduce investors’ *feelings of rightness*. Hence, the first hypothesis states:

H1: A higher (lower) level of non-financial, non-GAAP disclosure ambiguity will result in lower (higher) feelings of rightness.

Extensive non-GAAP literature outlines both the informative and opportunistic motivations of non-GAAP disclosures (Black et al., 2018; Young, 2014) but is almost exclusively quantitative in nature. Very little of the research explores the qualitative, non-financial, non-GAAP disclosures. However, preliminary research evidence of non-financial, non-GAAP earnings disclosures shows them to be decision-useful, with investors relying on the disclosures in their decision making (Brosnan et al., 2022). Applying attribution theory, these authors find investors who attribute non-GAAP disclosures to management's motivation to inform, rather than to behave opportunistically, assign a higher earnings per share and are prepared to invest more capital in investment decisions. H1 posits a low level of ambiguity contained in a non-financial, non-GAAP disclosure will result in higher *feelings of rightness*. H2 combines attribution and ambiguity theories and predicts investors will attribute the low ambiguity, non-financial, non-GAAP disclosure (and resulting in higher *feelings of rightness*) to management's desire to inform investors. Therefore, the second hypothesis can be stated as follows:

H2: Investors' valuation judgments will be higher after viewing a less ambiguous non-financial, non-GAAP disclosure compared with a highly ambiguous non-GAAP disclosure.

The disentanglement of the informative and opportunistic motivations of non-GAAP disclosures, necessitates the establishment of a frame of reference. That is, if investors do perceive a difference between low and high ambiguity disclosures, as suggested by the first two hypotheses, is it due to investors considering a low ambiguity non-GAAP justification to be informative, or a high ambiguity non-GAAP justification opportunistic? A null disclosure condition provides a reference point from which to compare the low and high ambiguity non-financial, non-GAAP justifications.

The Sarbanes-Oxley Act (2002) regulates non-GAAP disclosures, and since its introduction, evidence suggests the more recent non-GAAP reporting is predominately motivated by managements' desire to inform the market (Black & Christensen, 2018). Therefore, the third hypothesis is:

H3: Investors' valuation judgments in a null disclosure scenario will be similar to the high ambiguity, and lower than the low ambiguity, non-financial, non-GAAP disclosure scenario.

The second and third hypotheses predict investors will assign a higher valuation to a less ambiguous non-GAAP justification. The next hypothesis predicts investors will attribute the lack of ambiguity in a non-GAAP justification to managements' intent to inform. In other words, the relationship between disclosure ambiguity and investor valuation judgments is indirect; that is, it is mediated by managements' informative versus opportunistic intention. Stated formally:

H4: Investors' perceptions of managements' intent to inform will mediate the relationship between the level of ambiguity in managements' non-GAAP disclosure and investors' valuation judgments.

Specific non-GAAP research finds wealth transfers from less to more sophisticated investors. Curtis et al. (2014) support the Hirshleifer and Teoh (2003) limited attention model. In their sample, they find investors do not fully price transitory gains into a firm's share price even though 90% of disclosures contained the requisite information for users to reconcile appropriately. Bhattacharya et al. (2007) find evidence that less sophisticated investors can influence share prices and are not price-protected around the times of non-GAAP earnings announcements. Research using trade-size-based proxies finds less sophisticated investors trade on non-GAAP disclosures, but professional investors do not (Allee et al., 2007; Bhattacharya et al., 2007). These results have been confirmed experimentally (Elliott, 2006; Frederickson & Miller, 2004). Allee et al. (2007, p. 206) suggest, "*our results indicate that the target audience of these managerial manipulations is the less-sophisticated individual class of investors.*" However, the Conceptual Framework (IASB, 2010, p. 21) states, "*Financial reports are prepared for users who have a reasonable knowledge of business and economic activities and who review and analyse the information diligently.*" Taken together, less sophisticated investors appear the most at risk of being misled by opportunistic non-GAAP disclosures and transfer their wealth to professional investors (Bloomfield et al., 1999).

An inability of non-professional investors to extract information from corporate disclosures has been voiced by the SEC (2012). Given the level of investor sophistication can affect investment judgments, the final hypothesis draws on prior non-GAAP experimental research and suggests investors with higher levels of financial reporting knowledge will be more wary of ambiguous non-GAAP justifications.

H5: Investors with a higher (lower) level of financial reporting knowledge will experience lower (higher) feelings of rightness when presented with a high (low) ambiguity non-GAAP disclosure.

This study addresses the research question, “*how does the disclosure of managements’ justification of providing non-GAAP earnings affect the decision making of financial statement users?*” Specifically, how does the level of ambiguity of management’s non-GAAP earnings disclosure affect investors’ decision making? Hypothesis 1 examines the relationship between disclosure ambiguity and investors’ *feelings of rightness*. While hypotheses 2 and 3 predict that non-GAAP disclosure ambiguity will affect investors’ valuation judgments. Hypothesis 4 seeks to discover the cognitive process by which investors make their judgments, and the final hypothesis, 5, introduces investors’ level of financial reporting knowledge as a potential explanatory factor.

4.2 METHOD

This study employs the experimental method to answer the hypotheses and related research question. Experiments enjoy some benefits compared to archival studies in that they allow the drawing of causal inferences, provide the ability to control the research environment by only making the changes the researchers wish to examine and can investigate mediating variables to help understand participants' decision-making mechanisms. An advantage of archival research is the significantly larger samples sizes researchers can access through publicly available financial data and trading information. However, qualitative research is particularly problematic for archival research due to the abundance notes and textual information accompanying corporate financial disclosures. The experimental method dominates in answering qualitative research questions as all financial and non-financial information can be held constant, excepting the researchers' specific manipulations. This manufactured approach, if not executed properly, can involve the risk of deviating from real-world practice and therefore potentially limiting the generalisability of the findings. Another drawback to the experimental approach is obtaining participants qualified to help answer the research questions and obtaining quality responses from these participants.

In this study, the participants are U.S. based and recruited using an online panel provider. After being shown the stimulus materials, financial information relating to a fictional health care company, participants' subsequent judgments are recorded. Participants are randomly assigned to one of three treatment groups, containing varying levels of disclosure ambiguity. The following section details the design choices and variables utilised to test the study's hypotheses.

4.2.1 Participants

Participants are 150 individuals recruited from an online panel provider, Cint⁶³. Similar to the Compensation study, this research uses the profiling attributes of the panellists to specifically target those participants who self-nominate as active equity traders who use an online trading platform. That is, the target participants are those that make their own investment decisions. All participants are based in the U.S.A. and aged between 24 and 84 (average 54) years old, with the gender mix being 63%/37% male/female. Participants are asked to self-assess their "*experience investing in individual stocks*" and "*knowledge of analysing financial statements*" on an 11-point scale (0 - no experience/knowledge and 10 - a great deal of experience/knowledge). The average experience is 6.4 and 5.4 for knowledge suggesting the target audience has been reached. However, neither investment

⁶³ <https://www.cint.com/>

experience nor knowledge of analysing financial statements are found to be significant when used as covariates in the main hypothesis testing and, as such, are not reported in the results section. The participant section of the Compensation study provides more details on the use of online panel providers.

4.2.1.1 Participant screening

The experiment invitation was sent to 229 participants. Thirty-four failed one of the two instructional manipulation checks (IMCs) and were not exposed to the experimental materials. A further 48 did not complete the experiment, leaving 147 useable responses spread evenly across three treatment groups. The participant screening section of the Compensation study provides a detailed discussion on screening methods and the use of instructional manipulation checks. Table 12 details the participant screening results. The roughly equal treatment groups (n=48, 49 and 50) make general linear model tests, such as ANOVA and MANOVAs, less sensitive to departures from normality and provide enough statistical power to draw inferences.

Table 12: Participant screening

	Participants
Invited to participate	229
Failed 1 st IMC	(33)
Failed 2 nd IMC ⁶⁴	(1)
Started experiment	195
Did not complete	(45)
Finished experiment	150
Did not complete comprehension questions ⁶⁵	(3)
Useable responses	147

4.2.2 Design and manipulations

Participants evaluate a press release of Health Solutions Ltd, a hypothetical company based on an S&P500 listed pharmaceutical entity. As per the Compensation study design and manipulations section, Appendix C outlines many of the experiment's design choices. For example, screening

⁶⁵ Results are inferentially the same if these participants' results are included in the analysis.

techniques, the use of instructional manipulation and attention checks to ensure data quality, as well as the use of 11-point Likert scales, are consistent with prior literature. A company in the Health Care sector was selected as the model for the stimulus materials. The Health Care sector has been used in prior non-GAAP research (Dilla et al., 2013, 2014; Frederickson & Miller, 2004). Also, in line with previous non-GAAP research, the materials are based on actual corporate filings (Andersson & Hellman, 2007; Reimsbach, 2014). The use of real, historical data enhances realism and is important for the generalisability of findings.

A real-world U.S. health care company provides the basis for the stimulus materials in this experiment. The stimulus earnings announcement follows the same format as the real-world company's actual announcement, although abbreviated to fit on one page. The reduced materials available to experimental participants, relative to those at the disposal of real investors, is a noted limitation of the experiment. The experimental instrument comprises a press release and three optional supplementary items. The press release, details of which can be found in Appendix I, consists of (1) financial performance summary table with two years of comparative data, (2) CEO commentary paragraph, (3) non-GAAP net income explanatory paragraph (for low and high ambiguity treatments only) and (4) a concluding financial outlook paragraph. Items (1), (2) and (4) are identical among all three treatments. The optional supplemental materials provided to participants in the Justification study are an analyst report, GAAP to non-GAAP reconciliation and financial statements (Consolidated Statement of Income and Balance Sheet). Copies of the supplemental materials can be viewed in Appendix J. The GAAP to non-GAAP reconciliation and financial statements closely follow the presentation of the Compensation study materials, while the analyst report borrows its format from the experimental materials in Asay et al. (2017).

A 3x1 between-subjects experimental design is employed to test the hypotheses. The level of ambiguity of the non-GAAP earnings justification is the sole manipulation. Hypothesis testing is conducted using two independent variables, the level of ambiguity of management's non-GAAP justification and participant financial reporting knowledge. Participants are randomly assigned to one of three treatment groups with no significant difference in demographics noted across groups. A series of one-way ANOVAs compare participants' age ($p=.776$), education ($p=.679$), financial statement analysis knowledge ($p=.332$), stock investment experience ($p=.375$), average stock investment time horizon ($p=.936$) and investment risk profile ($p=.577$). None of these items appears as a significant covariant in any additional analysis.

4.2.2.1 Non-GAAP disclosure ambiguity

Management’s justification for disclosing non-GAAP earnings, contained in item (3) above, is the first independent variable. The three management justifications are a null disclosure, low ambiguity, and highly ambiguous non-GAAP earnings disclosure.⁶⁶ Table 13 shows the manipulations by treatment group. A popular online dictionary defines ambiguity as “the fact of something having more than one possible meaning and therefore possibly causing confusion.”⁶⁷ The addition of more detail is attempting to remove the possibility of additional meanings being extracted by the experimental participants. That is, the more details provided the less likely additional interpretations will be encountered. As stated in the hypothesis development section, the literature defines ambiguity as “missing information that is relevant and could be known” (Camerer & Weber, 1992, p. 330). Additional details flesh out the missing information in the low ambiguity treatment and provide them to the investors to decide if they are relevant.

Table 13: Treatment groups

Non-GAAP Justification		
Low ambiguity	High ambiguity	Null disclosure
Treatment 1	Treatment 2	Treatment 3
Treatment 1 manipulation:		
Management believes the non-GAAP financial measures provide investors with relevant and useful information. They enable a clearer comparison of financial results from one period to another. Non-GAAP measures remove one-off items that are not related to business performance. These measures also allow for greater transparency of the key metrics used by management in operating our business and measuring our performance. We believe making these adjustments allows investors to more easily evaluate our current operating performance and compare past operating results.		
Treatment 2 manipulation:		
Management believes the non-GAAP financial measures are relevant and useful to investors. These measures are used by management as a method of evaluating operating performance. We believe they assist investors in their decision making.		

The non-financial (textual) nature of the manipulations in the Justification study legitimately raises the possibility of introducing bias associated with a difference in language, changing the

⁶⁶ Appendix K contains the original justifications and management commentary from SEC filings.

⁶⁷ <https://dictionary.cambridge.org/dictionary/english/ambiguity>

meaning between the disclosures. Two steps were taken to mitigate this risk. The first mitigating step was the use of an out of sample manipulation check where participants, who were not associated with the main experiment, are asked if the high and low ambiguity disclosures convey the same fundamental meaning. Appendix F provides the rationale and analysis of the Justification study out of sample manipulation and the experimental instrument. The second mitigating step is to keep the readability constant across the various treatment groups.

The experimental manipulations are sourced from actual 10-K non-GAAP disclosures; however, they have been modified to hold readability constant. The readability of corporate disclosures has been shown to influence investor decision making (Asay et al., 2017; Tan et al., 2014). Two common measures of readability used in prior accounting literature are the (Gunning) Fog Index⁶⁸ and Flesch Reading Ease Score⁶⁹ (Asay et al., 2017; Reuven et al., 2011). The manipulations have been designed to hold these readability measures consistent across treatment groups as much as is practically possible. Word count is also held relatively constant across the non-GAAP justification treatment groups. Table 14 provides a breakdown of the readability controls for each treatment.

Table 14: Readability controls by treatment

Treatment	Fog Index	Flesch Reading Ease Score	Word Count
1	19.90	24.1	277
2	19.83	29.0	231
3	na	na	194

Note: A lower (higher) Fog Index (Flesch Reading Ease Score) indicates a more readable passage of text.

Unlike readability, no standardised measures of ambiguity exist. As mentioned above, the ambiguity literature focuses on non-linguistic concepts of ambiguity. For example, Rizzo et al. (1970) examine the ambiguity in large organisations created by role conflict. The economic literature has many attempts to empirically measure ambiguity, such as Izhakian (2020) incorporating ambiguity into the Arrow-Pratt asset pricing model and constructing an ambiguity premium. Much research is devoted to the construct of ambiguity tolerance (McLain, 1993; Norton, 1975). The ambiguity tolerance construct centres on individuals’ characteristics rather than the ambiguity present in stimulus materials. However, the construct of ambiguity tolerance developed by Norton (1975) touches on the ambiguity concept researched here, as his definition includes the “actual or potential

⁶⁸ <http://gunning-fog-index.com/index.html>

⁶⁹ <https://goodcalculators.com/flesch-kincaid-calculator/>

sources of psychological discomfort” (p. 608). This study uses the *feelings of rightness* variables, expanded on below, to capture the psychological discomfort experienced by users of financial statement. Given no objective measure of ambiguity exists in relation to disclosures, this paper employs an out of sample manipulation check to ensure the experimental treatments contain the desired level of ambiguity. Appendix F details the rationale and analysis of the out of sample manipulation check and contains the complete out of sample experimental instrument.

4.2.2.2 *Financial reporting knowledge*

The second independent variable is the participants’ level of financial reporting knowledge. The participants recruited for this research are active equity investors who make their own investment decisions. However, the IASB states, “*Financial reports are prepared for users who have a reasonable knowledge of business and economic activities*” (IASB, 2010, p. 21). Merely being an active equity investor does not necessarily equate to having “*a reasonable knowledge of business and economic activities*”. An inability of non-professional investors to extract information from corporate disclosures has been voiced by the SEC (2012). Therefore, as an additional variable used to test hypothesis 5, participants completed a six-question financial reporting knowledge test to help identify those participants who may satisfy the IASB definition above. Appendix G details the development of the financial reporting knowledge quiz, including a discussion on the test’s limitations. Appendix G also contains the entire experimental instrument used to select the final six questions.

Participants are divided into two groups based on their financial reporting knowledge score from the six-question test: low (0-3) and high (4-6). The new independent, dichotomous variable representing the two groups of financial reporting knowledge is called *FinKnow*. Consistent with prior literature, the mean score (mean = 3.0; median = 3) is chosen as the separation point (Dilla et al., 2014; Tan et al., 2014). In support of this separation point, a binomial test indicates the number of correct responses significantly higher than chance is four, $p=.033$ (one-tailed). The financial reporting knowledge test is not a validated instrument. No validated instrument exists in the literature (see Appendix G), and the creation of one is beyond the scope of this research. Although the lack of validation may be considered a limitation, given that none presently exists, it can also be viewed as a pilot for future research.

4.2.3 **Task and procedure**

Table 15 details the task the participants perform. Similar to the Compensation study and its focus on non-GAAP compensation, an instructional manipulation check follows participant consent. Next is a six-question, multiple-choice financial reporting knowledge test plus a second instructional

manipulation check disguised as a seventh question. The results of the financial reporting knowledge test are used in testing hypothesis 5. Following the knowledge test, participants are presented with the stimulus materials of one of the three treatments. Before proceeding, participants are reminded they cannot return to this information. Unlike the Compensation study, there are no manipulation reinforcement questions. Next, participants are given a choice to view any of the supplemental materials. The supplemental materials consist of an analyst report, non-GAAP to GAAP reconciliation and an Income Statement and Balance Sheet (see Appendix J for details). Participants can view any of the supplemental materials as often as they need and for as long as they want. They could only proceed once they selected the option, “I am ready to make my investment evaluation”. It is explained to participants that they do not need to view any supplemental materials if they are ready to make their investment decision directly after viewing the stimulus presented to them. Participants are also paid a flat fee for participation with no performance or completion time-related incentives on offer. This specific design choice tries to ensure participants do not feel compelled to view the supplemental materials to improve their performance or forecast accuracy.

Table 15: Experimental flow

Item
Overview and consent
Instructional manipulation check
Financial reporting knowledge quiz
Experimental materials (three treatments)
Supplemental materials
Investor judgments question set
Decision making question set
Attention checks
Demographic Information

The investor judgment question set presented to participants contained three questions that sought their *valuation judgments*. The decision-making question set contained six questions aimed at helping understand participants’ decision-making process. These questions also included assessments of the materials’ realism and sufficiency for making investment evaluations. Specifically, participants were asked if the manipulated element of the experimental materials influenced their responses in the

investor judgments question set. Participants could not change their answers from the investor judgments question set while answering these questions.

The attention check section contains five questions, with none of the attention check questions concerning the experimental manipulations. Two of the five questions are based on the treatment stimuli, and there is a question for each of the three supplemental materials. All participants are asked the first two questions but were only asked the remaining three questions if they viewed the corresponding supplemental material. Finally, the experiment finishes with standard demographic questions.

4.2.4 Investors' judgments

This research seeks to determine if, and how, *investors' judgments* are affected by certain financial statement disclosures. Specifically, management's qualitative justification for their non-GAAP disclosure. Because *investors' judgments* are not directly observable, they are measured via the two constructs, *feelings of rightness* and *valuation judgments*. Figure 7 provides an overview of the constructs of *feelings of rightness*, while Figure 8 provides an overview of the constructs of *valuation judgments*. These tables also include the respective hypotheses and dependent variables utilised in empirical testing.

4.2.4.1 Feelings of rightness

The *feelings of rightness* construct of *investors' judgments* is measured using a combination of three empirical proxies as dependent variables: number of participants who view supplemental materials (*PartViews*), total supplemental material views (*TotalViews*) and time spent viewing supplemental materials (*TimeViewed*). The number of participants who view at least one of the supplemental materials is captured by *PartViews*, while *TotalViews* captures the total number of supplemental materials that participants view. *TimeViewed* records the total time spent viewing all supplemental materials and is measured in seconds. Asay et al. (2017) use these three unobtrusive⁷⁰ variables in their research.

⁷⁰ Unobtrusive measures are responses that require no direct participant action. As such, they collect information without the participants' knowledge. Kathryn Kadous and Yuepin (Daniel) Zhou (Libby & Thorne, 2017) discuss in detail the benefits of unobtrusive measures and argue they are a better provision of inferential value.

Figure 7: Justification study feelings of rightness variables and related hypotheses

Concept	Investors' judgments		
Constructs	Feelings of rightness		
Hypotheses	H1 & H5 (via <i>FinKnow</i>)		
Empirical proxies	No. of participants who view supplemental materials	Total supplemental material views	Time spent viewing supplemental materials
Dependent variables	<i>PartViews</i>	<i>TotalViews</i>	<i>TimeViewed</i>

Hypothesis 1 predicts an inverse relationship between the three *feelings of rightness* dependent variables and disclosure ambiguity. A high (low) ambiguity non-GAAP disclosure leads to low (high) *feelings of rightness* triggering (not triggering) the participant to engage in Type II processing. *PartViews*, *TotalViews* and *TimeViewed* measure participants' *feelings of rightness* with the expectation that the lower (higher) a participant's *feelings of rightness*, the more (less) likely they are to view supplemental materials, more (less) likely they are to view multiple supplemental materials, and they are likely to spend more (less) time in total viewing the supplemental materials. As an example of the hypothesised relationship, if an investor considers a high ambiguity, non-GAAP disclosure as being indicative of opportunistic behaviour by management, it will lead to lower *feelings of rightness* and trigger Type II processing. Figure 9 illustrates the hypothesised relationship between the level of ambiguity in the non-GAAP justification disclosure and participants' *feelings of rightness*. The *feelings of rightness* variables are not used as independent variables, or mediators, due to their confounding nature. That is, participants who choose to view the materials have accessed further information to aid their decision-making and therefore introduce confounds for making their *valuation judgments*.

4.2.4.2 Valuation judgments

Hypotheses 2 and 3 make predictions about participants' *valuation judgments*. Specifically, that the level of ambiguity contained in a non-GAAP justification will be inversely proportional to investors' valuation judgments, H2. And investors will react to a lack of non-GAAP justification in a similar manner as viewing a highly ambiguous non-GAAP justification, H3. Both H2 and H3 are

tested using the three *valuation judgments* dependent variables.⁷¹ The *valuation judgments* construct of *investors' judgments* is a combination of the *financial performance* and *quantitative investment judgments* constructs from the Compensation study and are measured using a combination of three empirical proxies as dependent variables: earnings performance (*EarnPerf*), earnings potential (*EarnPot*) and investment amount (*InvestAmt*). The same questions employed in the Compensation study are asked of participants to capture *EarnPerf* and *EarnPot* on an 11-point scale (0 = very weak to 10 = very strong). Again, principal component analysis (PCA) combines these two proxies into a single component, *FinPerf*.

Figure 8: Justification study valuation judgment variables and related hypotheses

Concept	Investors' judgments		
Constructs	Valuation judgments		
Hypotheses	H2, H3 & H4 (via <i>Inform</i>)		
Empirical proxies	Earnings performance	Earnings potential	Investment amount
Dependent variables	<i>EarnPerf</i>	<i>EarnPot</i>	<i>InvestAmt</i>

Similar to the Compensation study, participants are instructed to assume they already own a diversified stock portfolio and have an additional \$10,000 to invest. An 11-point scale (0 = nothing at all to \$10,000 = the entire amount) with increments of \$1,000 recorded participants' responses to the question, "How much of the \$10,000 would you invest in Health Solutions?". The resulting dependent variable is titled *InvestAmt*. The Compensation study details the rationale and literary support for the three *valuation judgments* dependent variables, 11-point scale and the associated dimension reduction. It is noted that the Justification study does not employ the *EPS* variable used in the *quantitative investment judgments* construct from the Compensation study. The first study sought, and finds, a close relationship between *InvestAmt* and *EPS* in investors' *valuation judgments*, confirming prior literature that these variables are interchangeable. Furthermore, as a response to the

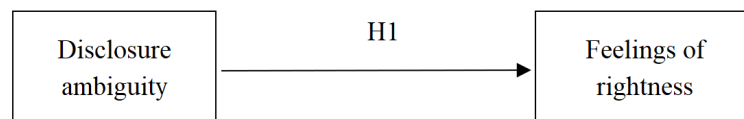
⁷¹ As discussed in the methods section of the Compensation study, prior behavioural accounting research utilises the dependent variables in the two constructs *financial performance* and *quantitative investment judgments*. Dilla et al. (2013) and Hogan et al. (2017) hypothesise the dependent variables separately while Elliott (2006) and Frederickson and Miller (2004) hypothesise them jointly. The Compensation study adopts the former approach and, because it finds a strong relationship between the variables associated with these two constructs, the Justification study adopts the latter approach by grouping them together as *valuation judgments*.

complex and demanding first study, the Justification study simplifies the experimental design by removing the redundant activity of judging EPS.

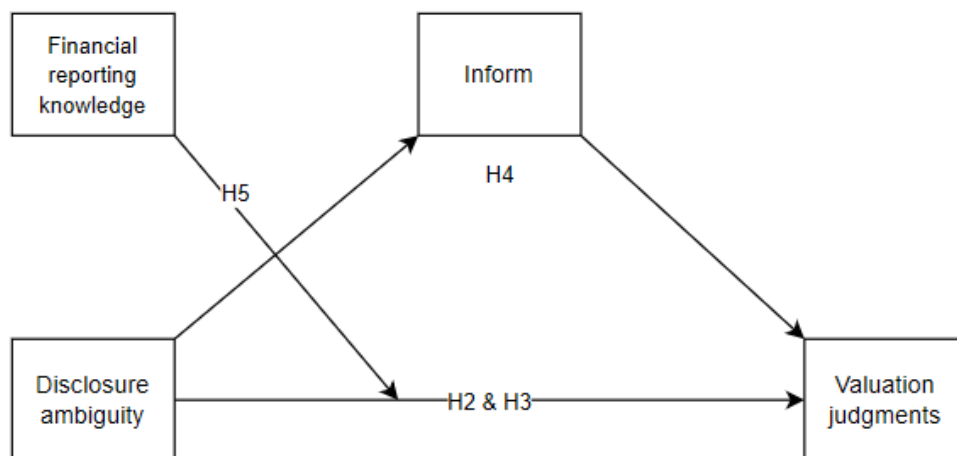
Hypothesis 2 predicts an inverse relationship between the three *valuation judgments* dependent variables and disclosure ambiguity. A high (low) ambiguity non-GAAP disclosure leads to low (high) *valuation judgments* triggering (not triggering) the participant to engage in Type II processing. *EarnPerf*, *EarnPot* and *InvestAmt* capture participants' *valuation judgments*. As an example of the hypothesised relationship, if an investor considers a high ambiguity, non-GAAP disclosure as being indicative of opportunistic behaviour by management, it will lead to lower *feelings of rightness* and trigger Type II processing. Figure 9 illustrates the hypothesised relationship between the level of ambiguity in the non-GAAP justification disclosure and participants' *valuation judgments*.

Figure 9: Theoretical framework for the Justification study

Panel A: Theorised model for H1



Panel B: Theorised model for H2, H3, H4 and H5



4.3 RESULTS

The participants rated both the realism ($M=7.20$, $SD=1.90$) and sufficiency ($M=6.82$, $SD=2.13$) of the materials highly.⁷² A multivariate analysis of variance (MANOVA) revealed no significant difference between the treatment groups. These results confirm the suitability of the materials for the task and enhance the potential to generalise the findings. Assumption testing includes tests for homogeneity of variance and normality, as well as tests specific to certain analyses, such as MANOVAs. Where applicable, additional tests results are detailed in footnotes explaining the implications of failing an assumption test, the suggested remedy, the reason the failed test can be safely ignored and/or the results of a more appropriate alternative test given the failed assumption. Appendix D details all the assumption testing for both the Compensation and Justification studies' variables.

4.3.1 Manipulation and comprehension checks

As discussed previously, an out of sample manipulation check ensures the low ambiguity scenario is indeed less ambiguous than the high ambiguity scenario while still providing the same underlying information. All participants are required to answer two comprehension check questions derived from the initial press release. Similar to Asay et al. (2017), participants' attentiveness is assessed by comparing their responses to chance. The first comprehension check question concerns the level of GAAP profitability, and the second the name of the CEO. These questions were identical across all treatment groups, and participants were able to select one of three options. Ninety-two participants answered the GAAP profitability question correctly (63%), while 61 participants correctly answered the CEO question (41%). A binomial test indicates both these results are significantly greater than chance ($p<.001$ and $p=.023$, respectively; both one-tailed).⁷³

Forty-four participants accessed a total of 75 sources of additional materials. Some 31 participants accessed the analyst report, 19 participants accessed the non-GAAP reconciliation, while 25 participants accessed the Income Statement and Balance Sheet. To determine if participants read the additional materials carefully, or gave it only a cursory glance, a comprehension check for each item was asked, but participants were only asked questions relating to the additional materials they accessed. Each comprehension check question has three possible responses, with the average number of correct responses being 73% (55/75). A binomial test indicates this result is significantly greater than chance $p<.001$ (one-tailed).

⁷² Based on an 11-point scale (0 = not at all realistic/sufficient to 10 = very realistic/sufficient).

⁷³ The results are inferentially the same if those participants who fail the comprehension check questions are included or excluded from the analysis.

Specifically, of the participants who accessed the additional materials, 87% of participants correctly answered the analyst report comprehension check question, 58% of participants correctly answered the non-GAAP reconciliation comprehension check question, and 68% of participants correctly answered the Income Statement and Balance Sheet comprehension check question. A binomial test indicates these results are all greater than chance ($p < .001$, $p = .023$, $p < .001$, respectively; all one-tailed).

4.3.2 Descriptive statistics

Table 16 contains the descriptive statistics for the variables forming the theoretical constructs, *feelings of rightness* and *valuation judgments*, as well as the mediating variable, *Inform*.

Table 16: Descriptive statistics of participants' Justification study judgments

Panel A: Descriptive statistics for feelings of rightness variables					
Treatment	n	PartViews #	TotalViews ^	TimeViewed Mean (SD) ~	
Null disclosure	50	20 (40%)	31	88.8 (92.4)	
Low ambiguity	49	12 (24%)	24	77.4 (54.1)*	
High ambiguity	48	12 (25%)	20	69.4 (55.4)	
Combined	147	44 (30%)	75	80.4 (73.3)*	

Panel B: Descriptive statistics for valuation judgments variables – Mean (SD)					
Treatment	n	EarnPerf	EarnPot	FinPerf⁷⁴	InvestAmt
Null disclosure	50	5.9 (2.0)	6.5 (2.0)	0.0 (0.9)	\$ 3,260 (\$ 2,686)
Low ambiguity	49	6.1 (2.1)	6.8 (2.0)	0.1 (0.9)	\$ 3,286 (\$ 2,791)
High ambiguity	48	5.5 (2.5)	6.0 (2.3)	-0.2 (1.1)	\$ 3,208 (\$ 2,821)
Combined	147	5.8 (2.2)	6.5 (2.1)	0.0 (1.0)	\$ 3,252 (\$ 2,747)

Panel C: Descriptive statistics of Inform - Mean (SD)		
Treatment	n	Inform
Null disclosure	50	1.3 (1.4)
Low ambiguity	49	1.2 (1.3)
High ambiguity	48	1.3 (1.2)
Combined	147	1.2 (1.3)

Number of participants who viewed at least one additional material

^ Total number of additional materials viewed

~ Time spent viewing additional materials in seconds – Mean (SD)

* One outlier removed – 4,238 seconds (1 hour and 11 minutes). Value replaced with mean of 77.4.

⁷⁴ A single component, *FinPerf.*, is created by combining the two Likert scale, dependent variables, *earnings performance*, and *earnings potential*, using principal component analysis (total variance explained = 92%).

4.3.3 Test of hypothesis 1

H1 makes predictions about participants' *feelings of rightness*. Specifically, the effect a high ambiguity non-GAAP disclosure has on participants' propensity to utilise additional information when provided the opportunity. A series of independent samples *t*-tests are conducted to compare the three *feelings of rightness* variables (*PartViews*, *TotalViews* and *TimeViewed*) between the low ambiguity and high ambiguity treatment groups. Preliminary assumption testing was conducted with no serious violations noted. However, both *PartViews* and *TotalViews* failed the test of normality.⁷⁵ ⁷⁶ None of the three *t*-tests yielded a significant relationship: *PartViews* ($t(95)=0.06$; $p=.477$, one-tailed; $d=-0.01$), *TotalViews* ($t(95)=0.41$; $p=.658$, one-tailed; $d=0.08$) and *TimeViewed* ($t(22)=0.36$; $p=.638$, one-tailed; $d=0.15$). Table 17 summarises the test results.

Table 17: Results of hypothesis 1

Variable	df	t statistic	p-value ⁷⁷	Cohen d
<i>PartViews</i>	95	0.06	.477	0.01
<i>TotalViews</i>	95	0.41	.658	0.08
<i>TimeViewed</i>	22	0.36	.638	0.15

The results of hypothesis 1 suggest the level of ambiguity in managements' non-GAAP justifications do not impact investors' *feelings of rightness*. Clearly, participants find no difference between the low and high ambiguity disclosure. However, managements' disclosure of their non-GAAP justification in their corporate filings are mandated by requirement (C) in Item 10 (e) of Regulation S-K of the Code of Federal Regulations. Even though management cannot choose to be silent on their justification disclosure, the question of whether any disclosure, regardless of ambiguity level, is different to no disclosure is explored in the next section.

4.3.4 Additional analysis for H1 – level of disclosure

The SEC filing requirements mandate that companies provide a disclosure concerning their justification of non-GAAP measures. Companies do not have an option to not provide a justification

⁷⁵ Tabachnick and Fidell (2013) suggest the non-parametric Mann-Whitney U Test as a replacement to the independent samples *t*-tests when the data depart from normality.

⁷⁶ A Shapiro-Wilk test shows a significant departure from normality for *PartViews* ($W(95)=0.54$; $p<.001$) and *TotalViews* ($W(95)=0.57$; $p<.001$). A Mann-Whitney U Test for *PartViews* ($U=1170$; $p=.479$, one-tailed) and *TotalViews* ($U=1184$; $p=.532$, one-tailed) provides the same non-significant finding as the independent samples *t*-test.

⁷⁷ All tests were one-tailed given the directional hypothesis.

disclosure. The situation of no disclosure is not legally allowed. Due to the insignificant findings of H1, the additional analysis will examine if a non-GAAP justification disclosure, regardless of level of ambiguity, has an impact on investor judgments. The results of H1 show there is no difference between a high or low ambiguity non-GAAP justification disclosure on participants' *feelings of rightness*. This additional analysis relates to H1 and tests participants' *feelings of rightness* in the dichotomous situation of any disclosure, whether high or low ambiguity, versus no disclosure. For this analysis, the high and low ambiguity treatments are combined and compared to the null disclosure group. Table 18 displays the descriptive statistics for this additional analysis.

Table 18: Level of disclosure descriptive statistics for variables

Treatment	n	PartViews #	TotalViews ^	TimeViewed Mean (SD) ~
Null disclosure	50	20 (40%)	31	88.8 (92.4)
Any disclosure	97	24 (25%)	44	73.4 (53.7)*
Total	147	44 (30%)	75	80.4 (73.3)*

Number of participants who viewed at least one additional material

^ Total number of additional materials viewed

~ Time spent viewing additional materials – Mean (SD)

* One outlier removed – 4,238 seconds (1 hour and 11 minutes). Value replaced with mean of 77.4.

Three non-directional, independent samples *t*-tests are conducted to compare the means of the two groups across the three *feelings of rightness* dependent variables: *PartViews*, *TotalViews* and *TimeViewed*. Preliminary assumption testing was conducted with *PartViews* failing Levene's Test and all three variables failing the Shapiro-Wilk Test.⁷⁸ None of the three *t*-tests yielded a significant relationship: *PartViews* ($t(88)=1.85$; $p=.068$; $d=0.33$), *TotalViews* ($t(145)=1.08$; $p=.282$; $d=0.34$) and *TimeViewed* ($t(42)=0.69$; $p=.500$; $d=0.34$). Table 19 summarises the test results. These tests further suggest the presence of a non-GAAP justification does not affect investor decision making. It is therefore unsurprising that the level of ambiguity of such disclosure makes no difference to investors' judgments (H1). These results add further support to the notion managements' non-GAAP justifications are not an important consideration in investors' judgments and decision making.

The experiment also contained a question specifically to examine if the level of disclosure ambiguity affected participants' investment decision. Participants were asked "In determining your

⁷⁸ A Shapiro-Wilk test shows a significant departure from normality for *PartViews* ($W(147)=0.57$; $p<.001$), *TotalViews* ($W(147)=0.62$; $p<.001$) and *TimeViewed* ($W(44)=0.83$; $p<.001$). A Mann-Whitney U Test for *PartViews* ($U=2795$; $p=.057$, two-tailed), *TotalViews* ($U=2744$; $p=.107$, two-tailed) and *TimeViewed* ($U=238$; $p=.972$, two-tailed) provide the same non-significant findings as the independent samples *t*-test.

\$10,000 investment decision earlier, how did management's explanation for disclosing non-GAAP earnings measures affect your decision?" Participants rated their responses on an 11-point scale (0 = not at all affected to 10 = very much affected) with the resulting variable called *Determine10k*. A non-directional, independent samples *t*-test was conducted to compare the means of *Determine10k* across both the low and high ambiguity treatment groups. Preliminary assumption testing reveals the variable *Determine10k* fails the Shapiro-Wilk test for normality ($W(97)=0.95$; $p=.001$).⁷⁹ The results show no significant difference between the two treatment groups ($t(95)=0.89$; $p=.375$; $d=0.18$). This finding provides yet further support for the main results that investors do not consider managements' non-GAAP justification disclosures an important part of their judgment and decision-making.

Table 19: Level of disclosure additional analysis results

<i>FoR</i> Variable	<i>df</i>	<i>t</i> statistic	<i>p</i> -value ⁸⁰	Cohen <i>d</i>
<i>PartViews</i>	88.42 ⁸¹	1.85	.068 ⁸²	0.33
<i>TotalViews</i>	145	1.08	.282	0.34
<i>TimeViewed</i>	42	0.69	.500	0.34
<i>Determine10k</i>	95	0.89	.375	0.18

4.3.5 Test of hypothesis 2

H2 makes predictions about participants' *valuation judgments*. Specifically, participants who view a low ambiguity non-GAAP justification disclosure will assign a higher valuation judgment than those participants who view a high ambiguity disclosure. Although H2 uses the rejected *feelings of rightness* premise from H1, it is still feasible to investigate H2, as participants' *valuation judgments* may be influenced by factors other than *FoR*. Alternatively, if the H2 findings mirror those from H1, further support is added to the H1 finding that level of ambiguity contained in non-GAAP justification disclosures is not an important consideration in investor decision-making.

⁷⁹ A Mann-Whitney *U* test confirms the results of the independent samples *t*-test ($U=1298$; $p=.378$, two-tailed).

⁸⁰ All *t*-tests are two-tailed given the non-directional investigation.

⁸¹ The Welch's unequal variances *t*-test uses the Welch-Satterthwaite equation to calculate the degrees of freedom.

⁸² During preliminary assumption testing, Levene's Test finds the variances for *PartViews* were not equal, $F(1,145)=10.88$; $p=.001$. Subsequently, the *PartViews* results are reported using Welch's unequal variances *t*-test.

Earnings performance, earnings potential and investment amount are used to capture participants' *valuation judgments*.⁸³ A series of independent samples *t*-tests are conducted to compare the two *valuation judgment* variables (*FinPerf* and *InvestAmt*) between the low ambiguity and high ambiguity treatment groups. Preliminary assumption testing was conducted with no serious violations noted, however, *InvestAmt* failed the test of normality.⁸⁴ Neither of the *t*-tests yielded a significant relationship: *FinPerf* ($t(95)=1.51$; $p=.068$, one-tailed; $d=0.31$) and *InvestAmt* ($t(95)=0.14$; $p=.446$, one-tailed; $d=0.03$). Table 20 summarises the test results. Even though the observed means (Panel B of Table 16) are in the hypothesised direction, they are not significantly different. These findings further support those of H1, suggesting the level of ambiguity of non-GAAP justification disclosures is not an important consideration in investor decision making.

Table 20: Results of hypothesis 2

Variable	<i>df</i>	<i>t</i> statistic	<i>p</i> -value ⁸⁵	Cohen <i>d</i>
<i>FinPerf</i> (PCA)	95	1.51	.068	0.31
<i>InvestAmt</i>	95	0.14	.446	0.03

4.3.6 Test of hypothesis 3

H3 makes predictions about participants' *valuation judgments*. Specifically, participants in the null disclosure group will provide similar responses to those in the high ambiguity group and lower than those in the low ambiguity group. H2 finds no significant difference between the high and low ambiguity groups, a revelation that renders H3 mute. An inspection of the treatment group means (Panel B of Table 16) reveals that, for all variables (*earnings performance, earnings potential, the component FinPerf and investment amount*), the null disclosure group means are between those of the high and low ambiguity and possess a similar standard deviation. These initial observations indicate, even before conducting statistical tests, H3 can be rejected.

To confirm these initial observations, a series of one-way ANOVAs are conducted using all three treatment groups as the independent variable with the component *FinPerf* and *InvestAmt* as the dependent variables. Preliminary assumption testing finds *InvestAmt* fails the Shapiro-Wilk normality

⁸³ The three variables, earnings performance, earnings potential, and investment amount, reduced to a single component using principal component analysis produces a new component that explains 81% of the variance of the original variables. Testing H2 using this new single component yields a similar, non-significant result ($t(95)=1.16$; $p=.125$, one-tailed).

⁸⁴ A Shapiro-Wilk test shows a significant departure from normality for *InvestAmt* ($W(95)=0.91$; $p<.001$). A Mann-Whitney U Test for *InvestAmt* ($U=1188$; $p=.467$, one-tailed) provides the same non-significant finding as the independent samples *t*-test.

⁸⁵ All tests were one-tailed given the directional hypothesis.

test ($W(147)=0.92; p<.001$).⁸⁶ Table 21 summarises the ANOVA results of H3. The results show no statistically significant main effect for either *FinPerf* ($F=(2,144)=1.23, p=.295; \eta^2=0.02$) or *InvestAmt* ($F=(2,144)=0.01, p=.990; \eta^2=0.00$). The results of H3 suggest investors disregard managements' non-GAAP justifications when making their *valuation judgments*. That is, investors' judgments appear unaffected by not only the level of non-GAAP justification disclosure ambiguity, but also the mere presence of a non-GAAP justification.

Table 21: Results of hypothesis 3

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: One-way ANOVA model test of H3 - <i>FinPerf</i>						
<i>Treatment</i>	4.50	2	2.25	1.23	.295	.02
Error	263	144	1.83			
Panel B: One-way ANOVA model test of H3 - <i>InvestAmt</i>						
<i>Treatment</i>	150408	2	75204	0.01	.990	.00
Error	1101536666	144	7649560			

4.3.7 Test of hypothesis 4

Hypothesis 4 is tested using mediation analysis. A mediating variable helps to better understand the mechanism through which the independent variable influences the dependent variable (Hayes, 2018). Hypothesis 2 finds no significant relationship between *Disclosure Ambiguity* and either of the valuation judgment dependent variables, *FinPerf* and *InvestAmt*. The lack of the hypothesised relationships in H2 makes H4 redundant. That is, a mediating variable cannot explain a non-existent relationship. However, to complete the study, H4 is tested, and results set out below (Table 22 and Figure 10).

Hypothesis 4 is tested using the SPSS PROCESS macro (model 4) to obtain 95 per cent bias-corrected confidence intervals bootstrapped with 5,000 resamples. For mediation to exist, *Disclosure Ambiguity* must first affect investor perception of managements' intent to inform (*Inform*) (path *a*, Figure 10). Second, *Inform* must significantly affect investors' *valuation judgments* (*FinPerf* and *InvestAmt*) (path *b*, Figure 10). Third, for perfect mediation to exist, the indirect effect of *Disclosure Ambiguity* on *FinPerf* or *InvestAmt* must not be significant (path *c'*, Figure 10).

⁸⁶ The reported ANOVA results are considered robust to *InvestAmt*'s departure from normality due to the sample size being greater than 20 (Mardia, 1971; Seo et al., 1995).

Table 22: Results of hypothesis 4

Panel A: Path estimates and coefficients for mediation model test of H4

<i>Path</i>	<i>Path</i>	<i>Coefficient</i>	<i>t</i>	<i>p-value</i>	LLCI ^a	ULCI ^a	<i>R</i> ²
<i>Disclosure Ambiguity</i> → <i>Inform</i>	<i>a</i>	0.09	0.33	.741	-0.43	0.61	.00
<i>Inform</i> → <i>FinPerf</i>	<i>b</i> ₁	0.35	4.67	.000	0.20	0.49	.46
<i>Inform</i> → <i>InvestAmt</i>	<i>b</i> ₂	952	4.72	.000	551	1,354	.44
<i>Disclosure Ambiguity</i> → <i>FinPerf</i>	<i>c</i> ' ₁	-0.34	-1.82	.072	-0.72	0.03	.46
<i>Disclosure Ambiguity</i> → <i>InvestAmt</i>	<i>c</i> ' ₂	-160	-0.31	.757	-1,183	863	.44

Panel B: Indirect effects and confidence intervals

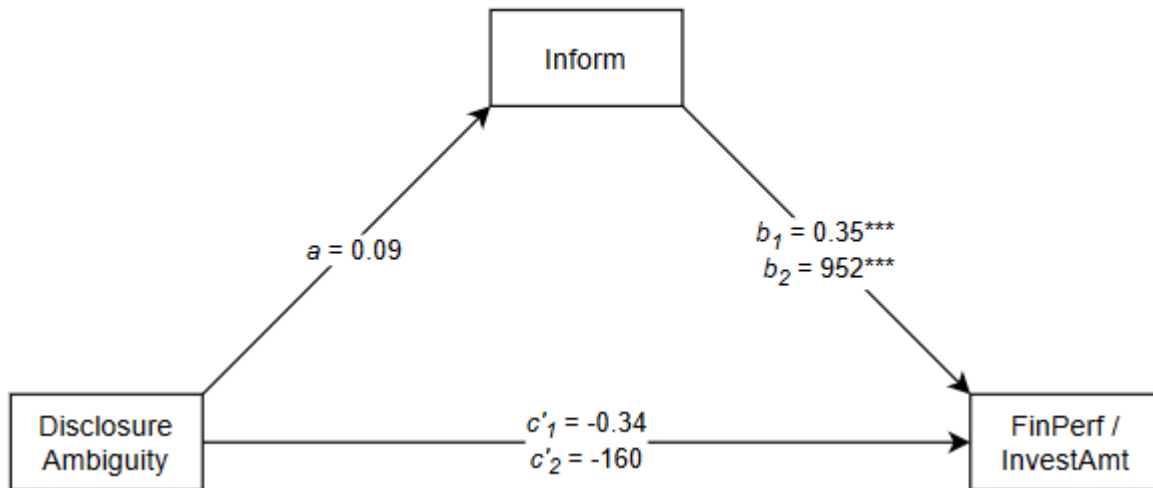
<i>Indirect effect</i>	<i>Effect</i>	LLCI ^a	ULCI ^a
<i>Disclosure Ambiguity</i> → <i>FinPerf</i>	0.30	-0.16	0.20
<i>Disclosure Ambiguity</i> → <i>InvestAmt</i>	82	-412	605

^a Represents 95 per cent bias-corrected confidence intervals obtained from a bootstrapping method with 5,000 bootstrapped resamples.

As mentioned above, the lack of a significant relationship between *Disclosure Ambiguity* and either *FinPerf* or *InvestAmt* limits the inferences that can be made from these results. The non-significant path coefficient for *Disclosure Ambiguity* on *Inform* ($a=0.09$) indicates the level of non-GAAP ambiguity does not influence participants' perception of management's intention to inform investors. The insignificant path coefficients for *Disclosure Ambiguity* on *FinPerf* ($c'_1=-0.34$) and *InvestAmt* ($c'_2=-160$) are unsurprising, given no relationship exists when *Inform* is absent. Similarly unsurprising are the non-significant confidence intervals for the indirect effect of *Disclosure Ambiguity* on *FinPerf* (LLCI=-0.16 and ULCI=0.20) and *InvestAmt* (LLCI=-412 and ULCI=605), showing no mediation present.

The significant relationships in the model are the positive path coefficients for *Inform* on *FinPerf* ($b_1=0.35$) and *InvestAmt* ($b_2=952$), mirroring the corresponding results found in the Compensation study. Taken together, the results indicate investors' perceptions of management's intent to inform the market is significantly related to their *valuation judgments*, but their perceptions are not influenced by the level of ambiguity of non-financial, non-GAAP disclosures.

Figure 10: Observed mediation model for hypothesis 4



4.3.8 Test of hypothesis 5

The final hypothesis predicts investors with higher levels of financial reporting knowledge will be more wary of ambiguous non-GAAP justifications disclosed by management. H5 is tested by interacting the independent, dichotomous variable, financial reporting knowledge (*FinKnow*) with the level of disclosure ambiguity (*Treatment*). As part of the demographic question set, participants were asked two self-assessment questions. First, “How much experience investing in individual stocks do you have?” on an 11-point scale (0 = no experience to 10 = great deal of experience). Second, “How much knowledge of analyzing financial statements do you have?” (0 = no knowledge to 10 = great deal of knowledge). The results for the two groups, as well as their age, are presented in Table 23. A series of *t*-tests suggests only age is significantly different among the two groups, ($t(142)=3.29$; $p=.001$, two-tailed; $d=0.56$)⁸⁷, with the high financial reporting knowledge group older than the low group with a mean of 59.2 versus 50.9 for the low financial reporting knowledge group. Participants in the high financial reporting knowledge group have a higher self-assessment of their investment experience (mean of 6.7 vs 6.2) and knowledge of financial statement analysis (mean of 5.8 vs 5.2) than those in the low financial reporting knowledge group, but the differences are not statistically significant, ($t(145)=1.48$; $p=.140$, two-tailed; $d=0.25$) and ($t(145)=1.58$; $p=.117$, two-tailed; $d=0.27$) respectively.^{88 89}

⁸⁷ The reduction in degrees of freedom are a result of age not being available for three participants.

⁸⁸ All three variables fail the Shapiro-Wilk normality test. However, Mann-Whitney *U* tests confirm the findings of the *t*-tests for age ($U=1597$; $p<.001$), investment experience ($U=2206$; $p=.169$) and financial statement analysis ($U=2150$; $p=.110$), all two tailed.

⁸⁹ As an aside, it is interesting to speculate about these findings through the well-known psychological effect attributed to Kruger and Dunning (1999). That is, participants with higher financial reporting knowledge self-report their

Table 23: Financial reporting knowledge descriptive statistics - Mean (SD)

Financial Reporting Knowledge (score)	<i>n</i>	Age	Investment experience	Analysing knowledge
Low (0-3)	91	50.9 (14.4)	6.2 (2.2)	5.2 (2.5)
High (4-6)	56	59.2 (15.6)	6.7 (1.9)	5.8 (2.3)
Total	147	54.1 (15.4)	6.4 (2.1)	5.4 (2.5)

Hypothesis 5 concerns investors' *feelings of rightness*. Specifically, investors with higher levels of financial reporting knowledge will exhibit lower *feelings of rightness* when exposed to a high ambiguity non-GAAP disclosure. Three dependent variables are used to measure the *feelings of rightness* construct, the number of participants who view the additional information (*PartViews*), the total number of materials these participants view (*TotalViews*), and the time spent reviewing the additional materials (*TimeViewed*). The descriptive statistics, shown in Table 24, reveal for all but one variable, the mean value for the *feelings of rightness* variable is higher for those in the high financial reporting knowledge groups.

Table 24: FoR descriptive statistics for financial reporting knowledge - Mean

Financial Reporting Knowledge	<i>n</i>		<i>PartViews</i>		<i>TotalViews</i>		<i>TimeViewed</i>	
	Low	High	Low	High	Low	High	Low (n=12)	High (n=12)
Treatment								
Low Ambiguity	30	19	0.23	0.26	0.50	0.47	75.01	80.81
High Ambiguity	28	20	0.18	0.35	0.32	0.55	60.25	75.99
Total	58	39	0.21	0.31	0.41	0.51	68.19	78.66

A series of two-way ANOVAs are conducted with these three dependent variables and the two independent variables, *Treat* (low and high ambiguity treatment groups) and *FinKnow* (low and high financial reporting knowledge). Preliminary assumption testing reveals no serious violations.⁹⁰

competencies above lower scoring peers and do so conservatively. While the low financial reporting knowledge participants self-report their competencies below higher-scoring peers and do so aggressively. Therefore, there is a very high likelihood the self-reported differences in investment experience and financial statement analysis knowledge are significantly different.

⁹⁰ All three variables pass Levene's test and both *PartViews* and *TotalViews* fail the Shapiro-Wilk normality test. However, the sample sizes make the ANOVA robust to departures from normality.

Table 25 summarises the ANOVA results. Those with high financial reporting knowledge are more likely to view the additional materials (*PartViews*), view more of the additional materials (*TotalViews*) and spend longer viewing them (*TimeViewed*). However, none of the differences is statistically significant. These results supplement those from hypothesis 1 and suggest that investors with differing levels of financial reporting knowledge perceive no difference, with respect to *feelings of rightness*, between the levels of ambiguity of management’s non-GAAP justification disclosures.

Table 25: Financial reporting knowledge and treatment interactions for hypothesis 1

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: Two-way ANOVA model test of H5 - <i>PartViews</i> by <i>FinKnow</i> and <i>Treatment</i>						
<i>Treatment</i>	0.00	1	0.00	0.00	.954	.00
<i>FinKnow</i>	0.24	1	0.24	1.24	.268	.01
<i>Treatment * FinKnow</i>	0.12	1	0.12	0.61	.435	.01
Error	17.71	93	0.19			
Panel B: Two-way ANOVA model test of H5 - <i>TotalViews</i> by <i>FinKnow</i> and <i>Treatment</i>						
<i>Treatment</i>	0.13	1	0.13	0.17	.686	.00
<i>FinKnow</i>	0.24	1	0.24	0.30	.583	.00
<i>Treatment * FinKnow</i>	0.38	1	0.38	0.48	.490	.01
Error	73.29	93	0.79			
Panel C: Two-way ANOVA model test of H5 - <i>TimeViewed</i> by <i>FinKnow</i> and <i>Treatment</i>						
<i>Treatment</i>	383.62	1	383.62	0.12	.735	.01
<i>FinKnow</i>	676.12	1	676.12	0.21	.654	.01
<i>Treatment * FinKnow</i>	144.01	1	144.01	0.04	.836	.00
Error	65132.18	20	3256.61			

4.3.9 Additional analysis for H5 – level of disclosure

The additional analysis relating to H1 introduces a new dichotomous variable, *Disclosure*. This variable separates the participants into two groups, those exposed to any non-GAAP justification (low and high ambiguity treatment groups combined, $n=97$) and those who viewed no justification (null disclosure treatment group, $n=50$). The results for hypothesis 5 find no significant difference between these two groups’ *feelings of rightness*. The following analysis revisits the *Disclosure*

variable and interacts it with *FinKnow*. The descriptive statistics can be found in Table 26, while Table 27 summarises the results of the analysis.

Table 26: Financial reporting knowledge for FoR variables by disclosure- Mean (SD)

Panel A: Descriptive statistics for <i>PartViews</i> by <i>FinKnow</i> and <i>Disclosure</i>					
Financial reporting Knowledge					
Disclosure	Low	High	Low	High	Total
Null disclosure	33	17	0.24 (0.44)	0.71 (0.47)	0.40 (0.50)
Any disclosure	58	39	0.21 (0.41)	0.31 (0.47)	0.25 (0.40)
Total	91	56	0.22 (0.42)	0.43 (0.50)	0.30 (0.46)

Panel B: Descriptive statistics for <i>TotalViews</i> by <i>FinKnow</i> and <i>Disclosure</i>					
Financial reporting Knowledge					
Disclosure	Low	High	Low	High	Total
Null disclosure	33	17	0.30 (0.64)	1.24 (1.03)	0.62 (0.90)
Any disclosure	58	39	0.41 (0.88)	0.51 (0.89)	0.45 (0.88)
Total	91	56	0.37 (0.80)	0.73 (0.98)	0.51 (0.89)

Panel C: Descriptive statistics for <i>TimeViewed</i> by <i>FinKnow</i> and <i>Disclosure</i>					
Financial reporting Knowledge					
Disclosure	Low	High	Low	High	Total
Null disclosure	8	12	67.0 (112.6)	103.3 (78.2)	88.8 (92.4)
Any disclosure	12	12	68.9 (50.7)	78.0 (58.5)	73.4 (53.7)
Total	20	24	68.1 (78.5)	90.6 (68.8)	80.4 (73.3)

A series of two-way ANOVAs are conducted with the three *feelings of rightness* dependent variables (*PartViews*, *TotalViews* and *TimeViewed*) and two independent variables, *Disclosure* and *FinKnow*. Preliminary assumption testing reveals no serious violations.⁹¹ Similar to hypothesis 5, each variable's mean is higher for those in the high financial reporting knowledge group. That is, those with high financial reporting knowledge are more likely to view the additional materials

⁹¹ All three variables pass Levene's test and fail the Shapiro-Wilk normality test. However, as reported previously, the samples sizes make the ANOVA robust to departures from normality.

(*PartViews*), view more of the additional materials (*TotalViews*) and spend longer viewing them (*TimeViewed*). However, unlike hypothesis 5, there is a statistically significant interaction and main effect for *PartViews* and *TotalViews*.

For *PartViews* (Panel A of Table 27), there was a statistically significant interaction between *Disclosure* and *FinKnow* ($F=(1143)=5.20, p=.024; \eta^2=.03$). There is also a statistically significant main effect for both *Disclosure* ($F=(1143)=4.01, p=.047; \eta^2=.03$) and *FinKnow* ($F=(1143)=8.61, p=.004; \eta^2=.00$). A pairwise comparison, using the Tukey HSD test, explains these results by showing the mean for the null disclosure/high financial reporting knowledge group (0.71) is significantly different to all other group means: null disclosure/low financial reporting knowledge (0.24, $p=.003$), any disclosure/high financial reporting knowledge (0.31, $p=.011$), and any disclosure/low financial reporting knowledge (0.21, $p<.001$). These results suggest high financial reporting knowledge investors are more likely to seek out additional information than are low financial knowledge participants, especially when confronted with a non-GAAP disclosure that is not justified by management.

Table 27: Financial reporting knowledge and disclosure interactions for hypothesis 1

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: Two-way ANOVA model test of H1 - PartViews by FinKnow and Disclosure						
<i>Disclosure</i>	0.77	1	0.77	4.01	.047	.03
<i>FinKnow</i>	1.65	1	1.65	8.61	.004	.05
<i>Disclosure * FinKnow</i>	1.00	1	1.00	5.20	.024	.03
Error	27.42	143	0.19			
Panel B: Two-way ANOVA model test of H1 - TotalViews by FinKnow and Disclosure						
<i>Disclosure</i>	0.91	1	0.91	1.26	.264	.01
<i>FinKnow</i>	4.72	1	4.72	6.50	.012	.04
<i>Disclosure * FinKnow</i>	5.26	1	5.26	7.24	.008	.05
Error	103.84	143	0.73			
Panel C: Two-way ANOVA model test of H1 - TimeViewed by FinKnow and Disclosure						
<i>Disclosure</i>	2565	1	2565	0.46	.500	.01
<i>FinKnow</i>	4842	1	4842	0.87	.356	.02
<i>Disclosure * FinKnow</i>	1957	1	1957	0.35	.556	.01
Error	221856	40	5546			

A similar result is observed for the dependent variable *TotalViews*, Panel B of Table 27. There was a statistically significant interaction between *Disclosure* and *FinKnow* ($F=(1,143)=7.24, p=.008; \eta^2=.05$). There is also a statistically significant main effect for *FinKnow* ($F=(1,143)=6.50, p=.012; \eta^2=.04$) but not for *Disclosure* ($F=(1,143)=1.26, p=.264; \eta^2=.01$). A pairwise comparison, using the Tukey HSD test, explains these results by showing the mean for the null disclosure/high financial reporting knowledge group (1.24) is significantly different to all other group means: null disclosure/low financial reporting knowledge (0.30, $p=.002$), any disclosure/high financial reporting knowledge (0.51, $p=.021$) and any disclosure/low financial reporting knowledge (0.41, $p=.003$). These results support the previous finding that high financial reporting knowledge investors are more likely to view and seek additional information than low financial knowledge participants, particularly when confronted with a non-GAAP disclosure that is not justified by management.

The results for the third and final *feelings of rightness* variable, *TimeViewed*, are shown in Panel C of Table 27. No statistically significant relationships are observed. The low sample size for

TimeViewed ($n=44$) limits the power of the statistical tests. However, the means display the same pattern as the previous two variables, high financial reporting knowledge investors in the null disclosure group spend the most time examining the additional materials. Taken together, these results suggest high financial reporting knowledge investors are more likely to view additional materials, and view more of them for longer, when no non-GAAP justification is provided by management. That is, high financial knowledge investors experience lower *feelings of rightness* when provided with non-GAAP earnings unaccompanied by a management justification. However, when a justification is provided, the level of ambiguity is irrelevant. Prima face, the SEC requirement of firms providing a non-GAAP justification appears useful to investors. However, given the level of detail contained in that justification is irrelevant, exactly how useful to investors is questionable. Investors prefer management provides some justification, but are indifferent to what that justification entails.

The next series of tests flow from the previous *Disclosure* findings and extend hypothesis 2 by seeking to determine if the differing *feelings of rightness* between participants affect their *valuation judgments*. The main hypothesis testing in this study finds no difference between treatment groups, but subsequent financial reporting knowledge testing by *Disclosure* finds the presence or absence of a management non-GAAP justification does affect participants' *feelings of rightness*. Table 28 displays the descriptive statistics for participants' *valuation judgments* by *Disclosure* and *FinKnow*.

Table 28: Descriptive statistics for financial reporting knowledge and disclosure - Means (SD)

Panel A: Descriptive statistics for <i>FinPerf</i> by <i>FinKnow</i> and <i>Disclosure</i>					
Financial reporting	<i>n</i>		<i>FinPerf</i> ⁹²		
	Low	High	Low	High	Total
Knowledge					
Disclosure					
Null disclosure	33	17	0.5 (0.9)	-0.9 (1.4)	0.0 (1.4)
Any disclosure	58	39	0.2 (1.4)	-0.3 (1.3)	0.0 (1.3)
Total	91	56	0.3 (1.3)	-0.5 (1.3)	0.0 (1.4)

Panel B: Descriptive statistics for <i>InvestAmt</i> by <i>FinKnow</i> and <i>Disclosure</i>					
Financial reporting	<i>n</i>		<i>InvestAmt</i>		
	Low	High	Low (<i>n</i> =20)	High (<i>n</i> =24)	Total (<i>n</i> =44)
Disclosure					\$
Null disclosure	33	17	\$ 4,121 (\$ 2,547)	\$ 1,588 (\$ 2,152)	\$ 3,260 (\$ 2,686)
Any disclosure	58	39	\$ 3,724 (\$ 2,931)	\$ 2,538 (\$ 2,437)	\$ 3,247 (\$ 2,791)
Total	91	56	\$ 3,868 (\$ 2,790)	\$ 2,250 (\$ 2,376)	\$ 3,252 (\$ 2,747)

The previous tests reveal high financial reporting knowledge participants in the null disclosure treatment exhibit lower *feelings of rightness* when compared to all other treatments (Table 27). Hypothesis 2 posits lower *feelings of rightness* will lead to a lower *valuation judgment* with respect to the level of ambiguity contained in a non-financial, non-GAAP disclosure. Hypothesis 5 posits the level of financial reporting knowledge will influence investors' *feelings of rightness*. The following analysis combines these two hypotheses to examine if the level of financial reporting knowledge leads to lower *valuation judgments* with respect to the presence or absence of a non-financial, non-GAAP justification.

Two-way ANOVAs are conducted to examine the relationship, if any, between participants' *feelings of rightness* and *valuation judgments*. The dependent variables used to measure the *valuation judgments* construct are the financial performance component (*FinPerf*) developed previously and

⁹² *FinPerf* is the result of the dimension reduction technique PCA.

the amount participants are willing to invest (*InvestAmt*). Two independent variables are *Disclosure* and *FinKnow*. Preliminary assumption testing reveals both *FinPerf* and *InvestAmt* pass Levene's test, but *InvestAmt* fails the Shapiro-Wilk normality test.⁹³ Table 29 summarises the test statistics.

Table 29: Financial reporting knowledge and disclosure interactions for hypothesis 2

Source of Variation	SS	df	MS	F	p-value	η^2
Panel A: Two-way ANOVA model test of H2 - <i>FinPerf</i> by <i>FinKnow</i> and <i>Disclosure</i>						
<i>Disclosure</i>	0.10	1	0.10	0.06	0.809	0.00
<i>FinKnow</i>	23.47	1	23.47	14.05	0.000	0.09
<i>Disclosure</i> * <i>FinKnow</i>	5.53	1	5.53	3.31	0.071	0.02
Error	239	143	1.67			
Panel B: Two-way ANOVA model test of H2 - <i>InvestAmt</i> by <i>FinKnow</i> and <i>Disclosure</i>						
<i>Disclosure</i>	5219	1	5219	0.00	0.978	0.00
<i>FinKnow</i>	91019821	1	91019821	13.06	0.000	0.08
<i>Disclosure</i> * <i>FinKnow</i>	13750721	1	13750721	1.97	0.162	0.01
Error	996911313	143	6971407			

With regard to *FinPerf* (Panel A of Table 29), the interaction is not statistically significant ($F=(1,143)=3.31$, $p=.071$; $\eta^2=.02$). However, there is a statistically significant main effect for *FinKnow* ($F=(1,143)=14.05$, $p<.001$; $\eta^2=.09$). A means comparison of *FinPerf* (Table 28) shows participants in the low financial reporting knowledge group (mean = 0.3) rate the financial performance of the experimental company significantly higher than those with a higher financial reporting knowledge score (mean = -0.5). The lack of interaction between the independent variables means the higher financial performance rating persists regardless of the presence of a non-GAAP justification. The lack of a significant main effect for *Disclosure* ($F=(1,143)=0.06$, $p=.809$; $\eta^2=0.00$) confirms this observation.

InvestAmt (Panel B of Table 29) follows a similar pattern to *FinPerf*. There is no statistically significant interaction ($F=(1,143)=1.97$, $p=.162$; $\eta^2=.01$) or main effect for *Disclosure* ($F=(1,143)=0.00$, $p=.978$; $\eta^2=.00$). But there is a significant main effect for *FinKnow* ($F=(1,143)=13.06$, $p<.001$; $\eta^2=.08$). A means comparison of *InvestAmt* (Table 28) shows participants

⁹³ However, the samples sizes make the ANOVA robust to departures from normality.

in the low financial reporting knowledge group (mean = \$3,868) are prepared to invest significantly more into the experimental company than those with a higher financial reporting knowledge score (mean = \$2,250). The lack of interaction between the independent variables suggests the higher investment amount persists regardless of the presence, or absence, of a non-GAAP justification. Both dependent variables produce a medium effect size (*FinPerf* $\eta^2=.09$ and *InvestAmt* $\eta^2=.08$), suggesting *FinKnow* is a factor of interest with respect to investors' perceptions of financial performance and willingness to invest. A hypothesis testing summary of results can be found in Table 30.

Table 30: Justification study summary of results

Hypothesis	Analysis	Result
H1	<i>t</i> -test	Reject
H2	<i>t</i> -test	Reject
H3	One-way ANOVA	Reject
H4	Mediation analysis	Reject
H5	Two-way ANOVA	Reject

4.4 DISCUSSION AND CONCLUSIONS

The research question the Justification study examines is, “*how does the disclosure of managements' justification of providing non-GAAP earnings affect the decision making of financial statement users?*” Specifically, whether a highly ambiguous or highly detailed non-GAAP earnings justification influences investor judgments. Using an experiment, this study finds that the level of ambiguity of managements' justification of disclosing non-GAAP earnings does not affect investor decision making. However, when participants are separated according to their financial reporting knowledge, highly knowledgeable investors are affected by the absence of a non-GAAP justification. But when a justification is present, the level of ambiguity is irrelevant to their decision making.

This study is the first to respond to the calls by Hamilton and Winchel (2019) to research *feelings of rightness* in a financial accounting setting. The results indicate the disclosure characteristic, the ambiguity of a non-GAAP justification, does not sufficiently motivate financial statement users to trigger Type II processing. These results contrast with the findings of Asay et al. (2017), who similarly use a fluency theory concept, disclosure readability, but find readability can trigger Type II processing and therefore affect investors' judgments. Prior research has found ambiguity can impact investor judgments (Du & Budescu, 2005; Du et al., 2011; Han, 2013). However, all these findings concern the ambiguity of financial information, whereas this study

examines ambiguity in a non-financial setting. The additional analysis does find the presence or absence of a non-GAAP justification can affect investor *feelings of rightness* and investors' judgments, but only for those investors with higher levels of financial reporting knowledge.

Taken together, the dichotomous situation, that is, either the presence or absence of a non-financial, non-GAAP justification, affects the *feelings of rightness* and *valuation judgments* for high financial reporting knowledgeable investors. However, when such a justification is present, the level of ambiguity is irrelevant. In the absence of a qualitative non-GAAP justification, high financial reporting knowledge investors are more likely to view additional materials, view more of them, rate the disclosing entity's financial performance lower and are prepared to invest less than investors with a lower level of financial reporting knowledge. In contrast, the *feelings of rightness* and *valuation judgments* for low financial reporting knowledge investors are unaffected by the level of ambiguity contained in a non-financial, non-GAAP justification or even if a justification is present. The findings suggest high financial reporting knowledge investors engage in Type II processing when they view an unjustified non-GAAP disclosure, but not when any non-GAAP justification is present. Managements' mere acknowledgement of their non-GAAP disclosure appears to placate high financial reporting knowledge investors.

Hypothesis 5 finds high and low financial reporting knowledge investors exhibit a similar level of *feelings of rightness* in the presence of a qualitative non-GAAP justification, regardless of the level of ambiguity. That is, if a qualitative non-GAAP justification is present, both high and low financial reporting knowledgeable investors are similarly likely to view additional materials, view a similar number of those materials and spend a similar amount of time viewing them.

Interestingly, the mean values for both *valuation judgments* and two of the three *feelings of rightness* variables for the *disclosure* manipulation move in different directions depending on the level of financial reporting knowledge. The mean values of the dependent variables suggest low financial reporting knowledge participants experience a lower *feelings of rightness* when any non-GAAP justification is present, compared to no justification. These participants view fewer additional materials (*TotalViews* 0.30 vs 0.41, Panel B Table 26), spend less time viewing them (*TimeViewed* 67.0 vs 68.9, Panel C Table 26), rate the financial performance of the entity higher (*FinPerf* 0.5 vs 0.2, Table 28) and are prepared to invest more capital (*InvestAmt* \$4,121 vs \$3,724, Table 28) when no justification is present. One possible explanation is those investors with less reporting knowledge or experience lack the required expertise to interpret the non-GAAP justification disclosure and are therefore affected by its mere presence. This finding supports those of Dilla et al. (2014), who find the presence of a non-GAAP reconciliation affects the decisions of less sophisticated investors with lower levels of financial reporting knowledge. Both this study and the Dilla et al. (2014) findings

contrast with Elliott (2006), who finds the mere presence of non-GAAP information does not affect less sophisticated investors' decisions. However, Elliott (2006) does not examine the financial reporting knowledge of her participants but rather uses M.B.A. students as a proxy. Only Dilla et al. (2014) and this study have explicitly tested the financial reporting knowledge of non-GAAP experimental participants. More research should be conducted using an objective test of financial reporting knowledge to tease out further nuances.

In contrast, high financial reporting knowledge participants experience a higher *feelings of rightness* when any non-GAAP justification is present, compared to no justification. These participants are more likely to view additional materials (*PartViews* 0.71 vs 0.31, Panel A Table 26), view more additional materials (*TotalViews* 1.24 vs 0.51, Panel B Table 26), spend more time viewing them (*TimeViewed* 103.3 vs 78.0, Panel C Table 26), rate the financial performance of the entity lower (*FinPerf* -0.9 vs -0.3, Table 28) and are prepared to invest less capital (*InvestAmt* \$1,588 vs \$2,538, Table 28) when no justification is present.

The difference in behaviour between low and high financial knowledge investors has important implications for future research. The Conceptual Framework states financial statements are prepared for users with “*a reasonable knowledge of business and economic activities*” (IASB, 2010, p. 21). Financial accounting standards must be written with these users in mind. Because academic research contributes to the creation and modification of accounting standards, it is important that academic research utilises participants who reflect the ultimate users. Much prior experimental research has utilised convenience samples for their research, such as M.B.A. or undergraduate students. The findings from the Justification study suggest this convenience sample approach to behavioural accounting research may not be targeting the participants defined in the Conceptual Framework as the audience for financial statements.

An important caveat to the preceding two paragraphs is that most of these *disclosure* relationships are not significant (the exception being *PartViews*, $p=.047$); therefore, little weight can be put on the observation other than to note them as future research opportunities.

4.4.1 Limitations and future direction

This study is subject to several limitations. First, the experimental materials provide participants with only a subset of the information usually available to them in the real world. The reduction in the amount of information usually available to investors may impact external validity, a point made clearer in this study as the analysis shows investors with higher levels of financial reporting knowledge have a propensity to seek more information. Second, the justification of non-GAAP earnings this study examines is unique, although based on actual corporate disclosures.

Different justifications of non-GAAP earnings may elicit different investor judgments. Future work should examine other justifications of non-GAAP measures on investor judgments. Third, as the scenarios are comprised only of situations where non-GAAP earnings are higher than GAAP earnings, it is therefore not possible to comment on what would be observed in the reverse situation. Future studies could explore the situation to help further understand investor decision-making.

Fourth, this experiment employs online participants. Although online participants can be profiled and screened, there is no guarantee they possess the requisite skills to undertake a task as demanding as the one presented in this paper. Similarly, previous work in this area predominately relies on either online participants or convenience samples (M.B.A. and undergraduate students). The financial reporting knowledge test goes some way to mitigate this concern. However, a limitation of the financial reporting knowledge test is the lack of objective external validation. Even though it follows the previous literature by using the mean as a separation point (and in this case, the mean coincided with random guessing), there are no results from professional investors, analysts, and accountants to accurately calibrate the scale. A future body of research would be to perform this calibration analysis.

Nevertheless, the financial reporting knowledge result has implications for future behavioural accounting research. For example, not assuming M.B.A. students are a sufficient proxy for investment-related decision-making studies (Elliott et al., 2007) and researchers considering introducing a screening test to assess the suitability of online participants (Krische, 2019). Accounting standards are written for an audience with assumed levels of knowledge and understanding of financial statements. If academic research is to help inform the creation of accounting standards, then the research being relied upon should use appropriate participants to generalise its findings. A validated financial reporting knowledge instrument would be an important step in the right direction.

Finally, a further limitation of this research is that management justification disclosures, similar to management usage disclosures in the Compensation study, typically appear in SEC filings (subject of Regulations S-K of the SOX Act), not earnings announcements (subject of Regulation G of the SOX Act). However, this research uses the earnings announcement setting for management's justification setting to gauge the potential usefulness for investors. While the Compensation study finds the disclosure of management's compensation use of non-GAAP measures in earnings announcements benefits investors' decision making, the Justification study finds no similar benefit to including management's justification of non-GAAP measures in earnings announcements.

Future studies should examine the relationship between *FoR* and *valuation judgments*. The experimental design in this research limits the ability to examine the *FoR*, and *valuation judgments* relationship as those participants who view additional materials may rely on them in forming their

valuation judgments. Therefore, future experimental design mechanisms should allow the capture of *FoR* without confounding the participants' *valuation judgments*.

Observations of the descriptive statistics and results for the additional analysis concerning financial reporting knowledge show some potentially significant, yet unexplored, relationships. However, the lack of formal hypotheses predicting these relationships means these observations are considered preliminary, and only useful as a way to develop future hypotheses. The placement of any significant weight on these observations and any ex-post analysis of this data is not considered responsible science (Faff, 2021). The development of a validated financial reporting knowledge instrument, and subsequent analysis, is an area of future research, and the observations from the additional analysis section of the Justification study suggest they could yield meaningful results.

Finally, the lack of significant relationships in this study, unfortunately, means the Hamilton and Winchel dual-processing model, on which this study bases its hypotheses, is not adequately tested. However, researchers should not be discouraged from continuing to pursue the suggestions outlined by Hamilton and Winchel (2019) to further explore the decision making processes of financial statement users.

CHAPTER 5: CONCLUSION

As stated in the introduction, one of the aims of this dissertation is to provide input into ‘Disclosure Initiative – Principles of Disclosure’ project (IASB, 2017a). Specifically, the IASB highlights three main concerns and collectively calls them ‘the disclosure problem’. The concerns are financial statements do not contain enough relevant information, contain too much irrelevant information, and ineffectively communicate the information they do provide. This dissertation contributes to the debate by highlighting management’s internal use of non-GAAP measures as being relevant information and management’s justification of non-GAAP measures as being predominately irrelevant for investor decision making. Other academics have engaged in constructive dialogue with the IASB, during the Disclosure Initiatives project, to argue for an evidence-informed standard setting (Abad et al., 2020; Birt et al., 2016).

Chapter 2 details a systematic review of the literature. The seminal paper by Bradshaw and Sloan (2002) is widely regarded as the start of the non-GAAP literature. From the early days of trying to identify which firms were using non-GAAP measures to mislead investors, a consensus has emerged that the measures are largely informative to investors. The change in nature is due to the measures improving in quality, through regulation and enforcement, as well as a greater acceptance of them by financial statement users, through additional media attention and scrutiny. The literature review chapter noted the lack of experimental research into the phenomenon, with the majority of what we understand of non-GAAP measures coming from archival studies. The lack of user perspective risks the creation of accounting standards as a reaction to corporate disclosures, rather than from a basis of what is relevant and useful for financial statement users. This dissertation seeks to redress the methodological imbalance and provide insight into how investors make their decisions concerning non-GAAP disclosures. The two experiments in this dissertation examine the SEC requirements to include qualitative information accompanying corporate filings and seek to examine their relevance to investor decision-making.

Chapter 3 presents the Compensation study that examines the research question, “*how does the disclosure of managements’ internal use of non-GAAP earnings affect the decision making of financial statement users?*” Specifically, whether or not the use of non-GAAP earnings to determine executive compensation influences investor judgments. The Compensation experimental study finds that when non-GAAP earnings are used in determining executive compensation, participants assign a more favourable evaluation of financial performance and are prepared to invest significantly more

capital. Unsurprisingly, the study also finds participants more favourably evaluate financial performance and are prepared to invest more capital when a company discloses a GAAP profit.

Chapter 4 contains the Justification experimental study that examines the research question, “*how does the disclosure of managements’ justification of providing non-GAAP earnings affect the decision making of financial statement users?*” Specifically, whether a highly ambiguous or highly detailed non-GAAP earnings justification influences investor judgments. Using an experiment, this study finds that the level of ambiguity of managements’ justification of disclosing non-GAAP earnings does not affect investor decision making. However, when participants are separated according to their financial reporting knowledge, highly knowledgeable investors are affected by the absence of a non-GAAP justification. But when a justification is present, the level of ambiguity is irrelevant to their decision making.

Despite calls from academics to research qualitative management non-GAAP disclosures (Miller, 2009; Young, 2014), only two papers have been published on the topic. In the first paper, Guillamon-Saorin et al. (2017) find evidence of management attempting to distort users’ perceptions of low-quality non-GAAP disclosures using impression management in earnings releases. The authors also find the market reaction is to discount such disclosures. The authors test cumulative abnormal returns across a three-day window, which allows enough time for less sophisticated investors to be misled and the market to stabilise.

In the second paper, Chen et al. (2021a) examine the qualitative characteristics of non-GAAP (pro forma) disclosures and score them relative to their adherence to regulations. They find non-financial (qualitative) non-GAAP disclosures contain value-relevant information. Although unsurprising, their findings suggest more transparent disclosures are of higher quality. These authors are among the first to directly examine the information content contained in the qualitative characteristics of non-GAAP disclosures and are the first to specifically address management’s non-GAAP justification and internal use, respectively items (C) and (D) of Item 10 (e) of Regulation S-K of the Code of Federal Regulations. Unfortunately, their research is not granular enough to draw inferences about items (C) and (D). Both studies in this dissertation are the first to examine these items of Regulation S-K at a sufficiently detailed level in which to draw meaningful conclusions.

This dissertation builds on the two previous studies in the qualitative non-GAAP disclosure literature by adopting an experimental approach and examining specific qualitative disclosures. The Compensation study examines managements’ use of qualitative non-GAAP disclosures in determining executive compensation, while the Justification study manipulates the ambiguity level of managements’ qualitative non-GAAP justification. The findings, as previously discussed, suggest

managements' disclosure of their internal use of non-GAAP measures can affect investor decision making, but their justification thereof is, mostly, disregarded by investors.

5.1.1 Contribution

As a result of regulation and public awareness, non-GAAP reporting has matured and become more accepted among financial statement users (Cohn, 2019; Curtis et al., 2021). Non-GAAP reporting is no longer the “wild west”. As a result, more recent papers demonstrate researchers have become more sophisticated in drawing out the nuances of managements' disclosure motivations (Abdel-Meguid et al., 2021; Chen et al., 2021b). This dissertation extends that sophistication as it employs experiments to explore how financial statement users interpret the signals from management when they justify their use of non-GAAP earnings and use them to determine executive compensation.

This dissertation contributes to the debate on non-GAAP disclosures in several areas. It contributes to the existing body of research by providing causal evidence on the issue using experiments. The literature to date is dominated by archival studies that are only able to provide correlational evidence. This dissertation provides causal evidence on the usefulness of non-GAAP disclosures, and in contrast to some previous non-GAAP experimental studies, explores investors' decision-making processes surrounding non-GAAP disclosures.

This dissertation also contributes to practice and specifically financial reporting. As managers are attempting to provide more informative measures when reporting non-GAAP measures, it is very relevant for them to understand how this reporting should be effectively communicated to financial statement users in order for users to incorporate these reported measures in their decision-making. Presently, the internal use and justification for non-GAAP disclosures need only be reported in SEC filings, in accordance with Regulation S-K Item 10 (e). However, the internal use of using non-GAAP earnings to reward executives is useful in investor decision making and should be disclosed in other corporate communications.

This dissertation contributes to the regulatory debate by providing evidence on how non-GAAP disclosures should be communicated for these disclosures to be useful to investors. Current regulation provides minimal guidance concerning specific qualitative, non-GAAP disclosures, and there is little standardization across companies, making it difficult for investors to compare non-GAAP measures of multiple companies. Through the use of experiments, this dissertation establishes the usefulness (or lack thereof) of certain non-financial, non-GAAP disclosure from the perspective of investors.

As presented in the literature review chapter of this dissertation, from the very early beginnings of the non-GAAP literature, the debate has centred around the opportunistic and informative views of non-GAAP disclosures. However, more recent evidence suggests regulation and awareness of the practice has meant the disclosures are predominately informative for financial statement users (Black & Christensen, 2018; Chen et al., 2021b). The findings of this study contribute to the non-GAAP literature by providing causal evidence consistent with the recent published archival papers concluding a predominately informative nature to non-GAAP measures.

This dissertation also contributes to the qualitative disclosure literature. It is the first to examine non-financial non-GAAP disclosures in detail and finds, similar to other non-financial disclosure studies (Amir & Lev, 1996; Ittner & Larcker, 1998), that the non-financial information can be value relevant. An examination of effect sizes in the compensation study shows the non-financial non-GAAP disclosure is at least as important to investors as the financial disclosure in influencing investors' qualitative financial judgments but not as important in determining investors' evaluations of corporate financial performance. The latter finding is consistent with those of Coram et al. (2009).

The Compensation study also contributes to the judgment and decision-making literature. It finds that investors intentionally rely on non-GAAP measures in their decision making, providing further support for the informative nature of non-GAAP disclosures. This finding contrasts with prior research that attributes unintentional cognitive effects as the mechanism influencing investors' judgments (Elliott, 2006; Frederickson & Miller, 2004). Two factors help explain the inconsistency with prior research. Firstly, significant public exposure (Henry et al., 2017) means investors are more aware of non-GAAP reporting now compared to when previous studies on these issues were performed. Secondly, SEC regulations (SEC, 2017a) have improved the quality of non-GAAP disclosures (Bond et al., 2017), and this has potentially impacted the perceived legitimacy of the non-GAAP earnings.

5.1.2 Limitations and future direction

The studies in this dissertation are subject to several limitations. First, the experimental materials provide participants with only a subset of the information usually available to them in the real world. The vast quantities of information available for investors to make decisions are impossible to replicate in an experimental setting. As such, many investors may not have access to the resources and time they usually do when making investment-related decisions. Second, the internal use and justification of non-GAAP earnings in these studies examine specific circumstances, although they are based on actual corporate disclosures. Different internal uses and justifications may elicit different investor judgments. Future work should examine other internal uses and justifications of non-GAAP

measures on investor judgments. Third, as the scenarios are comprised only of situations where non-GAAP earnings are higher than GAAP earnings, it is therefore not possible to comment on what would be observed in the reverse situation. Although the reverse scenario is less common, future studies could explore the situation to help further understand investor decision-making.

Fourth, these experiments employ online participants. Although online participants can be profiled and screened, there is no guarantee they possess the requisite skills to undertake the tasks like the ones presented in these studies. Similarly, previous work in this area predominately relies on either online participants or convenience samples (M.B.A. and undergraduate students). The Justification study's financial reporting knowledge test goes some way to mitigate this concern and demonstrates financial reporting knowledge can affect investor decisions. However, a limitation of the financial reporting knowledge test is the lack of objective external validation. Even though its development follows the previous literature, there are no results from professional investors, analysts, and accountants to accurately calibrate the scale. Accounting standards are written for an audience with assumed levels of knowledge and understanding of financial statements. If academic research is to help inform the creation of accounting standards, then the research being relied upon should use appropriate participants to generalise its findings. A validated financial reporting knowledge instrument would be an important step in the right direction. A future body of research would be to perform this calibration analysis.

5.1.3 Future outlook

Undoubtedly the perception of non-GAAP disclosures has shifted over the past two decades, from Lynn Turner, describing them as “everything but the bad stuff” (Dow Jones & Company Inc, 2001), to Wesley Bricker suggesting they have a “mischievous quality” (Cohn, 2018). Both the FASB and IASB are actively seeking to incorporate new measures into the preparation of financial statements, and companies continue to report them in their communications to the market. However, the real test of their usefulness will be determined by investors.

REFERENCES

- Abad, C., Barone, E., Gullkvist, B. M., Hellman, N., Marques, A., Marton, J., Mason, S., Silva, R. L. M., Morais, A., Gutierrez, S. M., Quagli, A., & Vysotskaya, A. (2020). On the 'Disclosure Initiative - Principles of Disclosure': The EAA Financial Reporting Standards Committee's view. *Accounting in Europe*, 17(1), 1-32. doi: 10.1080/17449480.2019.1664753
- Abarbanell, J. S., & Lehavy, R. (2007). Letting the "tail wag the dog": The debate over GAAP versus street earnings revisited. *Contemporary Accounting Research*, 24(3), 675-723. doi: 10.1506/car.24.3.1
- Abdel-Meguid, A., Jennings, J. N., Olsen, K. J., & Soliman, M. T. (2021). The impact of the CEO's personal narcissism on non-GAAP earnings. *The Accounting Review*, 96(3), 1-25. doi: 10.2308/TAR-2017-0612
- Aboody, D., & Lev, B. (1998). The value relevance of intangibles: The case of software capitalization. *Journal of Accounting Research*, 36, 161-191. doi: 10.2307/2491312
- Allee, K. D., Bhattacharya, N., Black, E. L., & Christensen, T. E. (2007). Pro forma disclosure and investor sophistication: External validation of experimental evidence using archival data. *Accounting, Organizations & Society*, 32(3), 201-222. doi: 10.1016/j.aos.2006.09.012
- Alter, A. L., Oppenheimer, D. M., Epley, N., & Eyre, R. N. (2007). Overcoming intuition: Metacognitive difficulty activates analytic reasoning. *Journal of Experimental Psychology: General*, 136(4), 569-576. doi: 10.1037/0096-3445.136.4.569
- American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association.
- Amir, E., & Lev, B. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of Accounting and Economics*, 22(1), 3-30. doi: 10.1016/S0165-4101(96)00430-2
- Andersson, P., & Hellman, N. (2007). Does pro forma reporting bias analyst forecasts? *European Accounting Review*, 16(2), 277-298. doi: 10.1080/09638180701390966

- Andon, P., Free, C., Jidin, R., Monroe, G., & Turner, M. (2018). The impact of financial incentives and perceptions of seriousness on whistleblowing intention. *Journal of Business Ethics*, 151(1), 165-178. doi: 10.1007/s10551-016-3215-6
- Aronow, P. M., Baron, J., & Pinson, L. (2019). A note on dropping experimental subjects who fail a manipulation check. *Political Analysis*, 27(4), 1-18. doi: 10.1017/pan.2019.5
- Asay, H. S., Elliott, W. B., & Rennekamp, K. (2017). Disclosure readability and the sensitivity of investors' valuation judgments to outside information. *The Accounting Review*, 92(4), 1-25. doi: 10.2308/accr-51570
- Asay, H. S., Libby, R., & Rennekamp, K. M. (2018). Do features that associate managers with a message magnify investors' reactions to narrative disclosures? *Accounting, Organizations & Society*, 68-69, 1-14. doi: 10.1016/j.aos.2018.02.003
- ASIC (2011), Regulatory guide 230: Disclosing non-IFRS financial information, ASIC, Australia.
- Athanasakou, V. E., Strong, N. C., & Walker, M. (2009). Earnings management or forecast guidance to meet analyst expectations? *Accounting and Business Research*, 39(1), 3-35. doi: 10.1080/00014788.2009.9663347
- Aubert, F., & Grudnitski, G. (2014). The role of reconciliation quality in limiting mispricing of non-GAAP earnings announcements by EURO STOXX firms. *Advances in Accounting*, 30(1), 154-167. doi: 10.1016/j.adiac.2014.03.008
- Audsabumrungrat, J., Pornupatham, S., & Tan, H.-T. (2016). Joint impact of materiality guidance and justification requirement on auditors' planning materiality. *Behavioral Research in Accounting*, 28(2), 17-27. doi: 10.2308/bria-51339
- Baik, B., Billings, B. K., & Morton, R. M. (2008). Reliability and transparency of non-GAAP disclosures by real estate investment trusts (REITs). *The Accounting Review*, 83(2), 271-301. doi: 10.2308/accr.2008.83.2.271
- Bansal, N., Seetharaman, A., & Wang, X. F. (2013). Managerial risk-taking incentives and non-GAAP earnings disclosures. *Journal of Contemporary Accounting and Economics*, 9(1), 100-121. doi: 10.1016/j.jcae.2013.03.002

- Barth, M. E., Gow, I. D., & Taylor, D. J. (2012). Why do pro forma and street earnings not reflect changes in GAAP? Evidence from SFAS 123R. *Review of Accounting Studies*, 17(3), 526-562. doi: 10.1007/s11142-012-9192-9
- Barton, J., & Mercer, M. (2005). To blame or not to blame: Analysts' reactions to external explanations for poor financial performance. *Journal of Accounting and Economics*, 39(3), 509-533. doi: 10.1016/j.jacceco.2005.04.006
- Batta, G., & Muslu, V. (2017). Credit rating agency and equity analysts' adjustments to GAAP earnings. *Contemporary Accounting Research*, 34(2), 783-817. doi: 10.1111/1911-3846.12293
- Baumker, M., Biggs, P., McVay, S. E., & Pierce, J. (2014). The disclosure of non-GAAP earnings following regulation G: An analysis of transitory gains. *Accounting Horizons*, 28(1), 77-92. doi: 10.2308/acch-50645
- Bebchuk, L. A., & Fried, J. M. (2003). Executive compensation as an agency problem. *Journal of Economic Perspectives*, 17(3), 71-92. doi: 10.1257/089533003769204362
- Bentley, J. W., Christensen, T. E., Gee, K. H., & Whipple, B. C. (2018). Disentangling managers' and analysts' non-GAAP reporting. *Journal of Accounting Research*, 56(4), 1039-1081. doi: 10.1111/1475-679X.12206
- Berger, P. G. (2005). Discussion of "Are investors misled by 'pro forma' earnings?". *Contemporary Accounting Research*, 22(4), 965-976. doi: 10.1111/j.1911-3846.2005.tb00308.x
- Berinsky, A. J., Margolis, M. F., & Sances, M. W. (2014). Separating the shirkers from the workers? Making sure respondents pay attention on self-administered surveys. *American Journal of Political Science*, 58(3), 739-753. doi: 10.1111/ajps.12081
- Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R. (2003). Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings. *Journal of Accounting and Economics*, 36(1-3), 285-319. doi: 10.1016/j.jacceco.2003.06.001
- Bhattacharya, N., Black, E. L., Christensen, T. E., & Mergenthaler, R. D. (2004). Empirical evidence on recent trends in pro forma reporting. *Accounting Horizons*, 18(1), 27-43. doi: 10.2308/acch.2004.18.1.27

- Bhattacharya, N., Black, E. L., Christensen, T. E., & Mergenthaler, R. D. (2007). Who trades on pro forma earnings information? *The Accounting Review*, 82(3), 581-619. doi: 10.2308/accr.2007.82.3.581
- Birt, J., Hellman, N., Jorissen, A., Mason, S., & Paananen, M. (2016). What Is the way forward for IASB's Research Programme under the evidence-supported approach? Some analyses and comments based on the 2015 Agenda Consultation. *Accounting in Europe*, 13(2), 269-283. doi: 10.1080/17449480.2016.1208834
- Black, D. E., Black, E. L., Christensen, T. E., & Gee, K. H. (2021a). CEO pay components and aggressive non-GAAP earnings disclosure. *Journal of Accounting, Auditing & Finance*, 68(2), 1353-1377. doi: 10.1177/0148558X21989907
- Black, D. E., Black, E. L., Christensen, T. E., & Gee, K. H. (2022). Comparing non-GAAP EPS in earnings announcements and proxy statements. *Management Science*, forthcoming. doi: 10.1287/mnsc.2020.3928
- Black, D. E., Black, E. L., Christensen, T. E., & Heninger, W. G. (2012). Has the regulation of pro forma reporting in the US changed investors' perceptions of pro forma earnings disclosures? *Journal of Business Finance and Accounting*, 39(7-8), 876-904. doi: 10.1111/j.1468-5957.2012.02297.x
- Black, D. E., & Christensen, T. E. (2009). US managers' use of 'pro forma' adjustments to meet strategic earnings targets. *Journal of Business Finance and Accounting*, 36(3-4), 297-326. doi: 10.1111/j.1468-5957.2009.02128.x
- Black, D. E., & Christensen, T. E. (2018). Policy implications of research on non-GAAP reporting. *Research in Accounting Regulation*, 30(1), 1-7. doi: 10.1016/j.racreg.2018.03.001
- Black, D. E., Christensen, T. E., Ciesielski, J. T., & Whipple, B. C. (2018). Non-GAAP reporting: Evidence from academia and current practice. *Journal of Business Finance and Accounting*, 45(3-4), 259-294. doi: 10.1111/jbfa.12298
- Black, D. E., Christensen, T. E., Ciesielski, J. T., & Whipple, B. C. (2021b). Non-GAAP earnings: A consistency and comparability crisis? *Contemporary Accounting Research*, 38(3), 1712-1747. doi: 10.1111/1911-3846.12671

- Black, E. L., Christensen, T. E., Kiosse, P. V., & Steffen, T. D. (2017a). Has the regulation of non-GAAP disclosures influenced managers' use of aggressive earnings exclusions? *Journal of Accounting, Auditing and Finance*, 32(2), 209-240. doi: 10.1177/0148558X15599131
- Black, E. L., Christensen, T. E., Taylor Joo, T., & Schmardebeck, R. (2017b). The relation between earnings management and non-GAAP reporting. *Contemporary Accounting Research*, 34(2), 750-782. doi: 10.1111/1911-3846.12284
- Bloomfield, R., Libby, R., & Nelson, M. W. (1999). Confidence and the welfare of less-informed investors. *Accounting, Organizations & Society*, 24(8), 623-647. doi: 10.1016/S0361-3682(99)00025-2
- Bond, D., Czernkowski, R., Lee, Y.-S., & Loyeung, A. (2017). Market reaction to non-GAAP earnings around SEC regulation. *Journal of Contemporary Accounting and Economics*, 13(3), 193-208. doi: 10.1016/j.jcae.2017.09.001
- Bowen, R. M., Davis, A. K., & Matsumoto, D. A. (2005). Emphasis on pro forma versus GAAP earnings in quarterly press releases: Determinants, SEC intervention, and market reactions. *The Accounting Review*, 80(4), 1011-1038. doi: 10.2308/accr.2005.80.4.1011
- Bradshaw, M. T. (2003). A discussion of 'Assessing the relative informativeness and permanence of pro forma earnings and GAAP operating earnings'. *Journal of Accounting and Economics*, 36(1-3), 321-335. doi: 10.1016/j.jacceco.2003.09.002
- Bradshaw, M. T., Christensen, T. E., Gee, K. H., & Whipple, B. C. (2018). Analysts' GAAP earnings forecasts and their implications for accounting research. *Journal of Accounting and Economics*, 66(1), 46-66. doi: 10.1016/j.jacceco.2018.01.003
- Bradshaw, M. T., & Sloan, R. G. (2002). GAAP versus the street: An empirical assessment of two alternative definitions of earnings. *Journal of Accounting Research*, 40(1), 41-66. doi: 10.1111/1475-679x.00038
- Bradshaw, M. T., & Soliman, M. (2007). Discussion of "letting the 'tail wag the dog': The debate over GAAP versus street earnings revisited". *Contemporary Accounting Research*, 24(3), 725-739+658+666. doi: 10.1506/car.24.3.2

- Brandon, D. M., Long, J. H., Loraas, T. M., Mueller-Phillips, J., & Vansant, B. (2014). Online instrument delivery and participant recruitment services: Emerging opportunities for behavioral accounting research. *Behavioral Research in Accounting*, 26(1), 1-23. doi: 10.2308/bria-50651
- Brosnan, M., Duncan, K., Hasso, T., & Hollindale, J. (2022). *Non-GAAP earnings and executive compensation: An experiment*. Working Paper. Retrieved from <https://research.bond.edu.au/en/publications/non-gaap-earnings-and-executive-compensation-an-experiment-2>
- Brown, L. D., Call, A. C., Clement, M. B., & Sharp, N. Y. (2015). Inside the “black box” of sell-side financial analysts. *Journal of Accounting Research*, 53(1), 1-47. doi: 10.1111/1475-679X.12067
- Brown, L. D., & Sivakumar, K. (2003). Comparing the value relevance of two operating income measures. *Review of Accounting Studies*, 8(4), 561-572. doi: 10.1023/a:1027328418571
- Brown, N. C., Christensen, T. E., & Elliott, W. B. (2012a). The timing of quarterly 'pro forma' earnings announcements. *Journal of Business Finance and Accounting*, 39(3-4), 315-359. doi: 10.1111/j.1468-5957.2012.02281.x
- Brown, N. C., Christensen, T. E., Elliott, W. B., & Mergenthaler, R. D. (2012b). Investor sentiment and pro forma earnings disclosures. *Journal of Accounting Research*, 50(1), 1-40. doi: 10.1111/j.1475-679X.2011.00427.x
- Camerer, C., & Weber, M. (1992). Recent developments in modeling preferences: Uncertainty and ambiguity. *Journal of Risk and Uncertainty*, 5(4), 325-370. doi: 10.1007/BF00122575
- Cameron, R., Percy, M., & Stevenson-Clarke, P. (2012). Do large Australian companies emphasise non-GAAP financial measures: Over statutory net profit (GAAP) in annual reports? *JASSA: The Finsia Journal of Applied Finance*, 3(1), 19-25. doi: 10.3316/ielapa.423684742673962
- Charitou, A., Floropoulos, N., Karamanou, I., & Loizides, G. (2018). Non-GAAP earnings disclosures on the face of the Income Statement by UK Firms: The effect on market liquidity. *The International Journal of Accounting*, 53(3), 183-202. doi: 10.1016/j.intacc.2018.07.003

- Chen, C. Y. (2010). Do analysts and investors fully understand the persistence of the items excluded from street earnings? *Review of Accounting Studies*, 15(1), 32-69. doi: 10.1007/s11142-008-9079-y
- Chen, H. C., Lee, Y. J., Lo, S. Y., & Yu, Y. (2021a). Qualitative characteristics of non-GAAP disclosures and non-GAAP earnings quality. *Journal of Accounting and Economics*, 72(1). doi: 10.1016/j.jacceco.2021.101402
- Chen, J. V., Gee, K. H., & Neilson, J. J. (2021b). Disclosure prominence and the quality of non-GAAP earnings. *Journal of Accounting Research*, 59(1), 163-213. doi: 10.1111/1475-679X.12344
- Chen, W., Han, J., & Tan, H.-T. (2016). Investor reactions to management earnings guidance attributions: The effects of news valence, attribution locus, and outcome controllability. *Accounting, Organizations and Society*, 55, 83-95. doi: 10.1016/j.aos.2016.10.002
- Chen, W., & Tan, H.-T. (2013). Judgment effects of familiarity with an analyst's name. *Accounting, Organizations and Society*, 38(3), 214-227. doi: 10.1016/j.aos.2013.02.001
- Chen, W. E. I., Tan, H.-T., & Wang, E. Y. (2013). Fair value accounting and managers' hedging decisions. *Journal of Accounting Research*, 51(1), 67-103. doi: 10.1111/j.1475-679X.2012.00468.x
- Cheng, C. S. A. (2016). Discussion of 'IFRS non-GAAP earnings disclosures and fair value measurement'. *Accounting and Finance*, 56(1), 99-112. doi: 10.1111/acfi.12200
- Cheng, M. M., Tan, H.-T., Trotman, K. T., & Tse, A. (2017). The impact of the timing of a prior year's auditor concessions on financial officers' judgments. *Auditing: A Journal of Practice & Theory*, 36(1), 43-62. doi: 10.2308/ajpt-51517
- Choi, Y.-S., & Young, S. (2015). Transitory earnings components and the two faces of non-generally accepted accounting principles earnings. *Accounting and Finance*, 55(1), 75-103. doi: 10.1111/acfi.12040
- Choi, Y. S., Lin, S., Walker, M., & Young, S. (2007). Disagreement over the persistence of earnings components: evidence on the properties of management-specific adjustments to GAAP earnings. *Review of Accounting Studies*, 12(4), 595-622. doi: 10.1007/s11142-007-9048-x

- Christensen, T. E. (2007). Discussion of "letting the 'tail wag the dog': The debate over GAAP versus street earnings revisited". *Contemporary Accounting Research*, 24(3), 741-762. doi: 10.1506/car.24.3.3
- Christensen, T. E. (2012). Discussion of "Why do pro forma and street earnings not reflect changes in GAAP? Evidence from SFAS 123R". *Review of Accounting Studies*, 17(3), 563-571. doi: 10.1007/s11142-012-9197-4
- Christensen, T. E., Drake, M. S., & Thornock, J. R. (2014). Optimistic reporting and pessimistic investing: Do pro forma earnings disclosures attract short sellers? *Contemporary Accounting Research*, 31(1), 67-102. doi: 10.1111/1911-3846.12009
- Christensen, T. E., Gomez, E., Ma, M., & Pan, J. (2021). Analysts' role in shaping non-GAAP reporting: evidence from a natural experiment. *Review of Accounting Studies*, 26(1), 172-217. doi: 10.1007/s11142-020-09564-7
- Christensen, T. E., Merkley, K. J., Tucker, J. W., & Venkataraman, S. (2011). Do managers use earnings guidance to influence street earnings exclusions? *Review of Accounting Studies*, 16(3), 501-527. doi: 10.1007/s11142-011-9158-3
- Christensen, T. E., Pei, H., Pierce, S. R., & Tan, L. (2019). Non-GAAP reporting following debt covenant violations. *Review of Accounting Studies*, 24(2), 629-664. doi: 10.1007/s11142-019-09492-1
- Ciesielski, J. T., & Henry, E. (2017). Accounting's tower of babel: Key considerations in assessing non-GAAP earnings. *Financial Analysts Journal*, 73(2), 34-50. doi: 10.2469/faj.v73.n2.5
- Clow, K. E., & James, K. E. (2013). *Essentials of marketing research : putting research into practice*. Thousand Oaks, Calif. London: SAGE.
- Cohen, D. A., Hann, R. N., & Ogneva, M. (2007). Another look at GAAP versus the Street: an empirical assessment of measurement error bias. *Review of Accounting Studies*, 12(2-3), 271-303. doi: 10.1007/s11142-007-9029-0
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Cohen, J. (1992). A power primer. *Psychological bulletin*, 112(1), 155.

- Cohn, M. (2018). SEC chief accountant warns against mischief in non-GAAP reporting, Media. *Accounting Today*. May 3, 2018.
- Cohn, M. (2019). Investor group wants companies to explain non-GAAP metrics used to set executive comp, Media. *Accounting Today*. May 1, 2019.
- Coleman, D., & Usvyatsky, O. (2015). Trends in non-GAAP disclosures. Sutton, MA Retrieved from: <http://www.auditanalytics.com/blog/trends-in-non-gaap-disclosures/>
- Collins, D. W., Li, O. Z., & Xie, H. (2009). What drives the increased informativeness of earnings announcements over time? *Review of Accounting Studies*, 14(1), 1-30. doi: 10.1007/s11142-007-9055-y
- Coram, P. J., Mock, T. J., & Monroe, G. S. (2011). Financial analysts' evaluation of enhanced disclosure of non-financial performance indicators. *The British Accounting Review*, 43(2), 87-101. doi: 10.1016/j.bar.2011.02.001
- Coram, P. J., Monroe, G. S., & Woodliff, D. R. (2009). The value of assurance on voluntary nonfinancial disclosure: An experimental evaluation. *Auditing: A Journal of Practice & Theory*, 28(1), 137-151. doi: 10.2308/aud.2009.28.1.137
- Cormier, D., Lapointe-Antunes, P., & Magnan, M. (2011). Revisiting the relevance and reliability of non-GAAP reporting: The case of the income trusts. *Contemporary Accounting Research*, 28(5), 1585-1609. doi: 10.1111/j.1911-3846.2011.01079.x
- Cornell, B., & Landsman, W. R. (2003). Accounting valuation: Is earnings quality an issue? *Financial Analysts Journal*, 59(6), 20-28. doi: 10.2469/faj.v59.n6.2571
- Coté, D. E., & Qi, R. (2005). Honest EPS: A measure of GAAP earnings relative to pro forma earnings. *International Journal of Managerial Finance*, 1(1), 25-35. doi: 10.1108/17439130510584865
- Cotter, J., Tuna, I., & Wysocki, P. D. (2006). Expectations management and beatable targets: How do analysts react to explicit earnings guidance? *Contemporary Accounting Research*, 23(3), 593-624. doi: 10.1506/FJ4D-04UN-68T7-R8CA
- Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334. doi: 10.1007/BF02310555

- Curley, S. P., & Yates, J. F. (1985). The center and range of the probability interval as factors affecting ambiguity preferences. *Organizational Behavior and Human Decision Processes*, 36(2), 273-287. doi: 10.1016/0749-5978(85)90016-0
- Curtis, A., Li, V., & Patrick, P. H. (2021). The use of adjusted earnings in performance evaluation. *Review of Accounting Studies*, 26(4), 1290-1322. doi: 10.1007/s11142-021-09580-1
- Curtis, A. B., McVay, S. E., & Whipple, B. C. (2014). The disclosure of non-GAAP earnings information in the presence of transitory gains. *The Accounting Review*, 89(3), 933-958. doi: 10.2308/accr-50683
- Dechow, P., Ge, W. L., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50(2-3), 344-401. doi: 10.1016/j.jacceco.2010.09.001
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting review*, 70(2), 193-225. doi: 10.1016/S2212-5671(14)00542-5
- Desimone, J. A., Harms, P. D., & Desimone, A. J. (2015). Best practice recommendations for data screening. *Journal of Organizational Behavior*, 36(2), 171-181. doi: 10.1002/job.1962
- Dichev, I. D., Graham, J. R., Harvey, C. R., & Rajgopal, S. (2013). Earnings quality: Evidence from the field. *Journal of Accounting and Economics*, 56(2-3), 1-33. doi: 10.1016/j.jacceco.2013.05.004
- Dilla, W. N., Janvrin, D. J., & Jeffrey, C. (2013). The impact of graphical displays of pro forma earnings information on professional and nonprofessional investors' earnings judgments. *Behavioral Research in Accounting*, 25(1), 37-60. doi: 10.2308/bria-50289
- Dilla, W. N., Janvrin, D. J., & Jeffrey, C. (2014). Pro forma accounting disclosures: The effect of reconciliations and financial reporting knowledge on nonprofessional investors' judgments. *Advances in Accounting*, 30(1), 43-54. doi: 10.1016/j.adiac.2013.12.002
- Dolnicar, S. (2013). Asking good survey questions. *Journal of Travel Research*, 52(5), 551-574. doi: 10.1177/0047287513479842
- Dow Jones & Company Inc. (2001). SEC probes 4 firms for possible abuses of pro-forma results, Media. *Wall Street Journal*. June 19, 2001.

- Doyle, J. T., Jennings, J. N., & Soliman, M. T. (2013). Do managers define non-GAAP earnings to meet or beat analyst forecasts? *Journal of Accounting and Economics*, 56(1), 40-56. doi: 10.1016/j.jacceco.2013.03.002
- Doyle, J. T., Lundholm, R. J., & Soliman, M. T. (2003). The predictive value of expenses excluded from pro forma earnings. *Review of Accounting Studies*, 8(2-3), 145-174. doi: 10.1023/a:1024472210359
- Du, N. (2009). Do investors react differently to range and point management earnings forecasts? *Journal of Behavioral Finance*, 10(4), 195-203. doi: 10.1080/15427560903369276
- Du, N., & Budescu, D. V. (2005). The effects of imprecise probabilities and outcomes in evaluating investment options. *Management Science*, 51(12), 1791-1803. doi: 10.1287/mnsc.1050.0428
- Du, N., Budescu, D. V., Shelly, M. K., & Omer, T. C. (2011). The appeal of vague financial forecasts. *Organizational Behavior and Human Decision Processes*, 114(2), 179-189. doi: 10.1016/j.obhdp.2010.10.005
- Easton, P. (2003). Discussion of "The predictive value of expenses excluded from pro forma earnings". *Review of Accounting Studies*, 8(2-3), 175-183. doi: 10.1023/a:1024457227197
- Elliott, W., Rennekamp, K., & White, B. (2015). Does concrete language in disclosures increase willingness to invest? *Review of Accounting Studies*, 20(2), 839-865. doi: 10.1007/s11142-014-9315-6
- Elliott, W. B. (2006). Are investors influenced by pro forma emphasis and reconciliations in earnings announcements? *The Accounting Review*, 81(1), 113-133. doi: 10.2308/accr.2006.81.1.113
- Elliott, W. B., Grant, S. M., & Rennekamp, K. M. (2017). How disclosure features of corporate social responsibility reports interact with investor numeracy to influence investor judgments. *Contemporary Accounting Research*, 34(3), 1596-1621. doi: 10.1111/1911-3846.12302
- Elliott, W. B., Hodge, F. D., Kennedy, J. J., & Pronk, M. (2007). Are M.B.A. students a good proxy for nonprofessional investors? *The Accounting Review*, 82(1), 139-168. doi: 10.2308/accr.2007.82.1.139

- Elliott, W. B., Jackson, K. E., Peecher, M. E., & White, B. J. (2014). The unintended effect of corporate social responsibility performance on investors' estimates of fundamental value. *The Accounting Review*, 89(1), 275-302. doi: 10.2308/accr-50577
- Ellsberg, D. (1961). Risk, ambiguity, and the savage axioms. *The Quarterly Journal of Economics*, 75(4), 643-669. doi: 10.2307/1884324
- Entwistle, G., Feltham, G., & Mbagwu, C. (2005). The voluntary disclosure of pro forma earnings: A U.S.-Canada comparison. *Journal of International Accounting Research*, 4(2), 1-23. doi: 10.2308/jiar.2005.4.2.1
- Entwistle, G., Feltham, G., & Mbagwu, C. (2006a). Financial reporting regulation and the reporting of pro forma earnings. *Accounting Horizons*, 20(1), 39-55. doi: 10.2308/acch.2006.20.1.39
- Entwistle, G., Feltham, G., & Mbagwu, C. (2006b). Misleading disclosure of pro forma earnings: An empirical examination. *Journal of Business Ethics*, 69(4), 355-372. doi: 10.1007/s10551-006-9095-4
- Entwistle, G., Feltham, G., & Mbagwu, C. (2010). The value relevance of alternative earnings measures: A comparison of pro forma, GAAP, and I/B/E/S earnings. *Journal of Accounting, Auditing and Finance*, 25(2), 261-288. doi: 10.1177/0148558X1002500205
- Evans, J. S. B. T. (2011). Dual-process theories of reasoning: Contemporary issues and developmental applications. *Developmental Review*, 31(2-3), 86-102. doi: 10.1016/j.dr.2011.07.007
- Faff, R. (2021). *Responsible science matters*. Working Paper. WP. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3880341
- Fairfield, P. M., Sweeney, R. J., & Yohn, T. L. (1996). Accounting classification and the predictive content of earnings. *The Accounting Review*, 71(3), 337-355.
- Farrell, A., Grenier, J., & Leiby, J. (2017). Scoundrels or stars? Theory and evidence on the quality of workers in online labor markets. *The Accounting Review*, 92(1), 93-114. doi: 10.2308/accr-51447

- FASB (2015), Income Statement - extraordinary and unusual items (subtopic 225-20): Simplifying Income Statement presentation by eliminating the concept of extraordinary items, ASU2015-01, Connecticut, FASB.
- FASB (2018), Conceptual Framework for Financial Reporting, Statement of Financial Accounting Concepts No. 8, Connecticut, Financial Accounting Standards Board.
- FINRA. (2019). National financial capability study. *Financial Industry Regulation Authority (FINRA) Investor Education Foundation (FINRA Foundation)*. Retrieved November 2019, Retrieved from <https://www.usfinancialcapability.org/quizzes.php>
- Fox, C. R., & Tversky, A. (1995). Ambiguity aversion and comparative ignorance. *The Quarterly Journal of Economics*, 110(3), 585-603. doi: 10.2307/2946693
- Francis, J., Schipper, K., & Vincent, L. (2002). Expanded disclosures and the increased usefulness of earnings announcements. *The Accounting Review*, 77(3), 515-546.
- Francis, J., Schipper, K., & Vincent, L. (2003). The relative and incremental explanatory power of earnings and alternative (to earnings) performance measures for returns. *Contemporary Accounting Research*, 20(1), 121-164. doi: 10.1506/XVQV-NQ4A-08EX-FC8A
- Frankel, R., McVay, S., & Soliman, M. (2011). Non-GAAP earnings and board independence. *Review of Accounting Studies*, 16(4), 719-744. doi: 10.1007/s11142-011-9166-3
- Frederickson, J. R., & Miller, J. S. (2004). The effects of pro forma earnings disclosures on analysts' and nonprofessional investors' equity valuation judgments. *The Accounting Review*, 79(3), 667-686. doi: 10.2308/accr.2004.79.3.667
- Gabriele, P., Jesse, C., & Panagiotis, G. I. (2010). Running experiments on Amazon Mechanical Turk. *Judgment and Decision Making*, 5(5), 411-419. doi: 10.1016/j.jcps.2015.01.006
- Giacomino, D. E., Akers, M. D., & Wall, J. (2009). Testing the financial literacy and expertise of audit committee members. *The CPA Journal*, August 2009.
- Goodman, S. N., Fanelli, D., & Ioannidis, J. P. (2016). What does research reproducibility mean? *Science translational medicine*, 8(341). doi: 10.1126/scitranslmed.aaf5027

- Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40(1), 3-73. doi: 10.1016/j.jacceco.2005.01.002
- Grey, C., Stathopoulos, K., & Walker, M. (2013). The impact of executive pay on the disclosure of alternative earnings per share figures. *International Review of Financial Analysis*, 29, 227-236. doi: 10.1016/j.irfa.2012.09.005
- Griffin, P. A., & Lont, D. H. (2021). Evidence of an increasing trend in earnings surprises over the past two decades: The role of positive manager-initiated non-GAAP adjustments. *Journal of Business Finance and Accounting*. doi: 10.1111/jbfa.12527
- Gu, Z., & Chen, T. (2004). Analysts' treatment of nonrecurring items in street earnings. *Journal of Accounting and Economics*, 38(1-3), 129-170. doi: 10.1016/j.jacceco.2004.09.002
- Guay, W. R., Kothari, S. P., & Watts, R. L. (1996). A market-based evaluation of discretionary accrual models. *Journal of Accounting Research*, 34, 83-105. doi: 10.2307/2491427
- Guest, N. M., Kothari, S. P., & Pozen, R. (2022). Why do large positive non-GAAP earnings adjustments predict abnormally high CEO pay? *The Accounting Review (forthcoming)*. doi: 10.2308/TAR-2019-0003
- Guggenmos, R. D., Rennekamp, K. M., Rupar, K., & Wang, S. (2021). The relationship between non-GAAP earnings and aggressive estimates in reported GAAP numbers. *Working Paper*. doi: SSRN 3045484
- Guillamon-Saorin, E., Isidro, H., & Marques, A. (2017). Impression management and non-GAAP disclosure in earnings announcements. *Journal of Business Finance and Accounting*, 44(3-4), 448-479. doi: 10.1111/jbfa.12238
- Hamilton, E. L., & Winchel, J. (2019). Investors' processing of financial communications: A persuasion perspective. *Behavioral Research in Accounting*, 31(1), 133-156. doi: 10.2308/bria-52211
- Han, J. (2013). A literature synthesis of experimental studies on management earnings guidance. *Journal of Accounting Literature*, 31(1), 49-70. doi: 10.1016/j.acclit.2013.06.003

- Han, J., & Hun-Tong, T. (2007). Investors' reactions to management guidance forms: The influence of multiple benchmarks. *The Accounting Review*, 82(2), 521-543. doi: 10.2308/accr.2007.82.2.521
- Han, J. U. N., & Tan, H.-T. (2010). Investors' reactions to management earnings guidance: The joint effect of investment position, news valence, and guidance form. *Journal of Accounting Research*, 48(1), 123-146. doi: 10.1111/j.1475-679X.2009.00350.x
- Harding, N., & Trotman, K. T. (2017). The effect of partner communications of fraud likelihood and skeptical orientation on auditors' professional skepticism. *Auditing: A Journal of Practice & Theory*, 36(2), 111-131. doi: 10.2308/ajpt-51576
- Hauser, D., & Schwarz, N. (2016). Attentive Turkers: MTurk participants perform better on online attention checks than do subject pool participants. *Behavior Research Methods*, 48(1), 400-407. doi: 10.3758/s13428-015-0578-z
- Hauser, D. J., Ellsworth, P. C., & Gonzalez, R. (2018). Are manipulation checks necessary? *Frontiers in Psychology*, 9, 1-10. doi: 10.3389/fpsyg.2018.00998
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis : a regression-based approach* (Second edition. ed.). New York: Guilford Publications.
- Heflin, F., & Hsu, C. (2008). The impact of the SEC's regulation of non-GAAP disclosures. *Journal of Accounting and Economics*, 46(2-3), 349-365. doi: 10.1016/j.jacceco.2008.07.002
- Heflin, F., Hsu, C., & Jin, Q. (2015). Accounting conservatism and street earnings. *Review of Accounting Studies*, 20(2), 674-709. doi: 10.1007/s11142-014-9311-x
- Heider, F. (1958). *The psychology of interpersonal relations*: John Wiley & Sons Inc.
- Heitger, D. L., & Ballou, B. (2003). Pro forma earnings: Adding value or distorting perception? *The CPA Journal*, March 2003.
- Henry, E., Hu, N., & Jiang, X. (2020). Relative emphasis on non-GAAP earnings in conference calls: Determinants and market reaction. *European Accounting Review*, 29(1), 169-197. doi: 10.1080/09638180.2019.1664312

- Henry, T. F., Rosenthal, D. A., & Weitz, R. R. (2017). Recent trends in reporting non-GAAP income: An example from social media companies. *The CPA Journal*, July 2017.
- Highhouse, S. (2009). Designing experiments that generalize. *Organizational Research Methods*, 12(3), 554-566. doi: 10.1177/1094428107300396
- Hirshleifer, D., & Teoh, S. H. (2003). Limited attention, information disclosure, and financial reporting. *Journal of Accounting and Economics*, 36(1-3), 337-386. doi: 10.1016/j.jacceco.2003.10.002
- Hogan, B. R., Krishnamoorthy, G., & Maroney, J. J. (2017). Pro forma earnings presentation effects and investment decisions. *Behavioral Research in Accounting*, 29(2), 11-24. doi: 10.2308/bria-51775
- Howard, M., Maroun, W., & Garnett, R. (2019). Misuse of non-mandatory earnings reporting by companies Evidence from an emerging economy. *Meditari Accountancy Research*, 27(1), 125-146. doi: 10.1108/MEDAR-12-2017-0247
- Hribar, P., Mergenthaler, R., Roeschley, A., Young, S., & Zhao, C. X. (2021). Do managers issue more voluntary disclosure when GAAP limits their reporting discretion in financial statements? *Journal of Accounting Research*, 60(1), 299-351. doi: 10.1111/1475-679X.12401
- Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., & Deshon, R. P. (2012). Detecting and deterring insufficient effort responding to surveys. *Journal of Business and Psychology*, 27(1), 99-114. doi: 10.1007/s10869-011-9231-8
- Huang, J. L., Liu, M., & Bowling, N. A. (2015). Insufficient effort responding: Examining an insidious confound in survey data. *Journal of Applied Psychology*, 100(3), 828-845. doi: 10.1037/a0038510
- Huang, Q., & Skantz, T. R. (2016). The informativeness of pro forma and street earnings: an examination of information asymmetry around earnings announcements. *Review of Accounting Studies*, 21(1), 198-250. doi: 10.1007/s11142-015-9345-8
- IASB (2010), Conceptual Framework, London, IFRS Foundation.
- IASB (2014), IAS 1 - Presentation of Financial Statements, London, IFRS Foundation.

- IASB (2015), Conceptual Framework for Financial Reporting, Exposure Draft 2105/3, London, IFRS Foundation.
- IASB (2017a), Disclosure Initiative - Principles of Disclosure, Discussion Paper, London, IFRS Foundation.
- IASB. (2017b). Primary Financial Statements. *IASB Update November 2017*. Retrieved from <http://www.ifrs.org/projects/work-plan/primary-financial-statements/>
- IASB (2019), Exposure Draft ED/2019/7 General Presentation and Disclosures, London, IFRS Foundation.
- Irish Auditing & Accounting Supervision Authority. (2012). Alternative performance measures - a survey of their use together with key recommendations. Naas, County Kildare Retrieved from: <https://www.iaasa.ie>
- Isidro, H., & Marques, A. (2013). The effects of compensation and board quality on non-GAAP disclosures in Europe. *The International Journal of Accounting*, 48(3), 289-317. doi: 10.1016/j.intacc.2013.07.004
- Isidro, H., & Marques, A. (2015). The role of institutional and Economic factors in the strategic use of non-GAAP disclosures to beat earnings benchmarks. *European Accounting Review*, 24(1), 95-128. doi: 10.1080/09638180.2014.894928
- Isidro, H., & Marques, A. (2021). Industry competition and non-GAAP disclosures. *Accounting and Business Research*, 51(2), 156-184. doi: 10.1080/00014788.2020.1798209
- Ittner, C. D., & Larcker, D. F. (1998). Are nonfinancial measures leading indicators of financial performance? An analysis of customer satisfaction. *Journal of Accounting Research*, 36, 1-35. doi: 10.2307/2491304
- Izhakian, Y. (2020). A theoretical foundation of ambiguity measurement. *Journal of economic theory*, 187, 105001. doi: 10.1016/j.jet.2020.105001
- Jamal, K., Marshall, E., & Tan, H.-T. (2016). Does disclosure of conflict of interest increase or decrease bias? *Auditing: A Journal of Practice & Theory*, 35(1), 89-99. doi: 10.2308/ajpt-51018

- James, K. L., & Michello, F. A. (2003). The dangers of pro forma reporting. *The CPA Journal*, February 2003.
- Jennings, J., Seo, H., & Soliman, M. T. (2020). The market's reaction to changes in relative performance rankings. *Review of Accounting Studies*, 25(2), 672-725. doi: 10.1007/s11142-020-09532-1
- Jennings, R., & Marques, A. (2011). The joint effects of corporate governance and regulation on the disclosure of manager-adjusted non-GAAP earnings in the US. *Journal of Business Finance and Accounting*, 38(3-4), 364-394. doi: 10.1111/j.1468-5957.2011.02238.x
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. doi: 10.1016/0304-405X(76)90026-X
- Jo, K. M., & Yang, S. (2020). SEC comment letters on firms' use of non-GAAP measures: The determinants and firms' responses. *Accounting Horizons*, 34(2), 167-184. doi: 10.2308/horizons-16-134
- Johnson, A., Percy, M., Stevenson-Clarke, P., & Cameron, R. (2014). The impact of the disclosure of non-GAAP earnings in Australian annual reports on non-sophisticated users. *Australian Accounting Review*, 24(3), 207-217. doi: 10.1111/auar.12034
- Johnson, J. A. (2005). Ascertaining the validity of individual protocols from web-based personality inventories. *Journal of Research in Personality*, 39(1), 103-129. doi: 10.1016/j.jrp.2004.09.009
- Johnson, W. B., & Schwartz, W. C. (2005). Are investors misled by "pro forma" earnings? *Contemporary Accounting Research*, 22(4), 915-963. doi: 10.1506/cket-2era-nnrp-atxf
- Kabureck, G. R. (2017). Accounting for non-GAAP earnings measures, Media. *IFRS Foundation*. March 2, 2017 Retrieved from <http://www.ifrs.org/news-and-events/2017/03/accounting-for-non-gaap-earnings-measures/>
- Kelly, K., & Tan, H.-T. (2017). Mandatory management disclosure and mandatory independent audit of internal controls: Evidence of configural information processing by investors. *Accounting, Organizations & Society*, 56, 1-20. doi: 10.1016/j.aos.2016.12.002

- Kim, S., & Harding, N. (2017). The effect of a superior's perceived expertise on the predecisional distortion of evidence by auditors. *Auditing: A Journal of Practice & Theory*, 36(1), 109-127. doi: 10.2308/ajpt-51508
- Kolev, K., Marquardt, C. A., & McVay, S. E. (2008). SEC scrutiny and the evolution of non-GAAP reporting. *The Accounting Review*, 83(1), 157-184. doi: 10.2308/accr.2008.83.1.157
- Koning, M., Mertens, G., & Roosenboom, P. (2010). The impact of media attention on the use of alternative earnings measures. *Abacus*, 46(3), 258-288. doi: 10.1111/j.1467-6281.2010.00319.x
- Krische, S. D. (2005). Investors' evaluations of strategic prior-period benchmark disclosures in earnings announcements. *The Accounting Review*, 80(1), 243-268. doi: 10.2308/accr.2005.80.1.243
- Krische, S. D. (2019). Investment experience, financial literacy, and investment-related judgments. *Contemporary Accounting Research*, 36(3), 1634-1668. doi: 10.1111/1911-3846.12469
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal Of Personality And Social Psychology*, 77(6), 1121-1134. doi: 10.1037/0022-3514.77.6.1121
- Kyung, H., Lee, H., & Marquardt, C. (2019). The effect of voluntary clawback adoption on non-GAAP reporting. *Journal of Accounting and Economics*, 67(1), 175-201. doi: 10.1016/j.jacceco.2018.09.002
- Kyung, H., Ng, J., & Yang, Y. G. (2021). Does the use of non-GAAP earnings in compensation contracts lead to excessive CEO compensation? Efficient contracting versus managerial power. *Journal of Business Finance and Accounting*, 48(5-6), 841-868. doi: 10.1111/jbfa.12506
- Lambert, R. A. (2001). Contracting theory and accounting. *Journal of Accounting and Economics*, 32(1), 3-87. doi: 10.1016/S0165-4101(01)00037-4
- Lambert, R. A. (2004). Discussion of analysts' treatment of non-recurring items in street earnings and loss function assumptions in rational expectations tests on financial analysts' earnings

- forecasts. *Journal of Accounting and Economics*, 38(1-3), 205-222. doi: 10.1016/j.jacceco.2004.11.001
- Landsman, W. R., & Maydew, E. L. (2002). Has the information content of quarterly earnings announcements declined in the past three decades? *Journal of Accounting Research*, 40(3), 797-808. doi: 10.1111/1475-679X.00071
- Landsman, W. R., Miller, B. L., & Yeh, S. (2007). Implications of components of income excluded from pro forma earnings for future profitability and equity valuation. *Journal of Business Finance and Accounting*, 34(3-4), 650-675. doi: 10.1111/j.1468-5957.2007.02033.x
- Laurion, H., & Sloan, R. (2022). When does forecasting GAAP earnings entail unreasonable effort? *Journal of Accounting and Economics*, 73(1), 101437. doi: 10.1016/j.jacceco.2021.101437
- Lee, C. H. (2021). Non-generally accepted accounting principles disclosures and audit committee chairs' external directorships. *Journal of Business Finance and Accounting*, 49(1-2), 111-139. doi: 10.1111/jbfa.12566
- Leung, E., & Veenman, D. (2018). Non-GAAP earnings disclosure in loss firms. *Journal of Accounting Research*, 56(4), 1083-1137. doi: 10.1111/1475-679X.12216
- Levine, T. R., & Hullett, C. R. (2002). Eta Squared, Partial Eta Squared, and misreporting of effect size in communication research. *Human Communication Research*, 28(4), 612-625. doi: 10.1111/j.1468-2958.2002.tb00828.x
- Lewitt, M. (2017). Danger ahead: The market is fueled by fake earnings. *Forbes*, May 2017.
- Libby, T., & Thorne, L. (2017). *The Routledge Companion to Behavioural Accounting Research*. London: Routledge.
- Linsmeier, T. J. (2016). Revised model for presentation in statement(s) of financial performance: Potential implications for measurement in the conceptual framework. *Accounting Horizons*, 30(4), 485-498. doi: 10.2308/acch-51543
- Lipe, R. C. (1986). The information contained in the components of earnings. *Journal of Accounting Research*, 24, 37-64. doi: 10.2307/2490728

- Lont, D. H., Ranasinghe, D., & Roberts, H. (2020). Non-GAAP disclosures and CEO pay levels. *The International Journal of Accounting*, 55(04). doi: 10.1142/S109440602050016X
- Lougee, B. A., & Marquardt, C. A. (2004). Earnings informativeness and strategic disclosure: An empirical examination of "pro forma" earnings. *The Accounting Review*, 79(3), 769-795. doi: 10.2308/accr.2004.79.3.769
- Malone, L., Tarca, A., & Wee, M. (2016). IFRS non-GAAP earnings disclosures and fair value measurement. *Accounting and Finance*, 56(1), 59-97. doi: 10.1111/acfi.12204
- Mardia, K. V. (1971). The effect of nonnormality on some multivariate tests and robustness to nonnormality in the linear model. *Biometrika*, 58(1), 105-121. doi: 10.2307/2334321
- Marques, A. (2006). SEC interventions and the frequency and usefulness of non-GAAP financial measures. *Review of Accounting Studies*, 11(4), 549-574. doi: 10.1007/s11142-006-9016-x
- Marques, A. (2010). Disclosure strategies among S&P 500 firms: Evidence on the disclosure of non-GAAP financial measures and financial statements in earnings press releases. *The British Accounting Review*, 42(2), 119-131. doi: 10.1016/j.bar.2010.02.004
- Marques, A. (2017). Non-GAAP earnings: International overview and suggestions for future research. *Meditari Accountancy Research*, 25(3), 318-335. doi: 10.1108/MEDAR-04-2017-0140
- Matsumoto, D. A. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review*, 77(3), 483-514. doi: 10.2308/accr.2002.77.3.483
- Mavlanova, T., Benbunan-Fich, R., & Koufaris, M. (2012). Signaling theory and information asymmetry in online commerce. *Information & management*, 49(5), 240-247. doi: 10.1016/j.im.2012.05.004
- McLain, D. L. (1993). The Mstat-I: A new measure of an individual's tolerance for ambiguity. *Educational and Psychological Measurement*, 53(1), 183-189. doi: 10.1177/0013164493053001020
- McVay, S. E. (2006). Earnings management using classification shifting: An examination of core earnings and special items. *The Accounting Review*, 81(3), 501-531. doi: 10.2308/accr.2006.81.3.501

- Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological methods, 17*(3), 437. doi: 10.1037/a0028085
- Miliken, G. A., & Johnson, D. E. (1984). *Analysis of messy data. Volume 1: designed experiments*. New York: Van Nostrand Reinhold.
- Miller, J. S. (2009). Opportunistic disclosures of earnings forecasts and non-GAAP earnings measures. *Journal of Business Ethics, 89*(1), 3-10. doi: 10.1007/s10551-008-9903-0
- Nichols, D. C., & Wahlen, J. (2004). How do earnings numbers relate to stock returns? A review of classic accounting research with updated evidence. *Accounting Horizons, 18*(4), 263-286. doi: 10.2308/acch.2004.18.4.263
- Norton, R. W. (1975). Measurement of ambiguity tolerance. *Journal of personality assessment, 39*(6), 607-619. doi: 10.1207/s15327752jpa3906_11
- Code of Federal Regulations, 17 C.F.R. § 244 - Regulation G (2017a).
- Code of Federal Regulations, 17 C.F.R. § 210.11 Pro forma financial information (2017b).
- Oppenheimer, D. M., Meyvis, T., & Davidenko, N. (2009). Instructional manipulation checks: Detecting satisficing to increase statistical power. *Journal of Experimental Social Psychology, 45*(4), 867-872. doi: 10.1016/j.jesp.2009.03.009
- Paas, L. J., Dolnicar, S., & Karlsson, L. (2018). Instructional manipulation checks: A longitudinal analysis with implications for MTurk. *International Journal of Research in Marketing, 35*(2), 258-269. doi: 10.1016/j.ijresmar.2018.01.003
- Payne, E., Ramsay, R., & Bamber, E. (2010). The effect of alternative types of review on auditors' procedures and performance. *Auditing: A Journal of Practice & Theory, 29*, 207-220. doi: 10.2308/aud.2010.29.1.207
- Payne, J. L., & Robb, S. W. G. (2000). Earnings management: The effect of ex ante earnings expectations. *Journal of Accounting, Auditing and Finance, 15*(4), 371-392. doi: 10.1177/0148558X0001500401

- Pearson, K. (1901). LIII. On lines and planes of closest fit to systems of points in space. *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, 2(11), 559-572. doi: 10.1080/14786440109462720
- Peecher, M. E. (1996). The influence of auditors' justification processes on their decisions: A cognitive model and experimental evidence. *Journal of Accounting Research*, 34(1), 125-140. doi: 10.2307/2491335
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research : A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903. doi: 10.1037/0021-9010.88.5.879
- Reimsbach, D. (2014). Pro forma earnings disclosure: The effects of non-GAAP earnings and earnings-before on investors' information processing. *Journal of Business Economics*, 84(4), 479-515. doi: 10.1007/s11573-013-0688-y
- Rennekamp, K. (2012). Processing fluency and investors' reactions to disclosure readability. *Journal of Accounting Research*, 50(5), 1319-1354. doi: 10.1111/j.1475-679X.2012.00460.x
- Reuven, L., Feng, L., & Kenneth, M. (2011). The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, 86(3), 1087-1115. doi: 10.2308/accr.00000043
- Ribeiro, A., Shan, Y., & Taylor, S. (2019). Non-GAAP earnings and the earnings quality trade-off. *Abacus*, 55(1), 6-41. doi: 10.1111/abac.12150
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role conflict and ambiguity in complex organizations. *Administrative science quarterly*, 15(2), 150-163. doi: 10.2307/2391486
- Rouen, E., So, E. C., & Wang, C. C. Y. (2021). Core earnings: New data and evidence. *Journal of Financial Economics*, 142(3), 1068-1091. doi: 10.1016/j.jfineco.2021.04.025
- Sarbanes-Oxley Act (2002), Title IV - Enhanced Financial Disclosures, Section 403(b).
- Schrand, C. M., & Walther, B. R. (2000). Strategic benchmarks in earnings announcements: The selective disclosure of prior-period earnings components. *The Accounting Review*, 75(2), 151-177. doi: 10.2308/accr.2000.75.2.151

- SEC (2001), Cautionary advice regarding the use of "pro forma" financial information in earnings releases, Washington, DC, US Government Publishing Office. December 4, 2001.
- SEC (2002), Conditions for use of non-GAAP financial measures, Final Rule: RIN 3235-A169, Washington, US Government Publishing Office.
- SEC (2010), Compliance and Disclosure Interpretations, Washington, DC, US Government Publishing Office. January 11, 2010.
- SEC (2012), Study regarding financial literacy among investors, Washington, DC, US Government Publishing Office. August 2012.
- SEC (2016), Compliance and Disclosure Interpretations, Washington, DC, US Government Publishing Office. May 17, 2016.
- SEC (2018), Compliance and Disclosure Interpretations, Washington, DC, US Government Publishing Office. April 4, 2018.
- SEC. (2022). U.S. Securities and Exchange Commission. Retrieved August 16, 2022, Retrieved from <https://www.sec.gov/>
- Seetharaman, A., Wang, X. F., & Zhang, S. B. (2014). An empirical analysis of the effects of accounting expertise in audit committees on non-GAAP earnings exclusions. *Accounting Horizons*, 28(1), 17-37. doi: 10.2308/acch-50584
- Sek, J., & Taylor, S. (2011). Profit or prophet? A case study of the reporting of non-GAAP earnings by Australian banks. *Australian Accounting Review*, 21(4), 327-339. doi: 10.1111/j.1835-2561.2011.00153.x
- Seo, T., Kanda, T., & Fujikoshi, Y. (1995). The effects of nonnormality of tests for dimensionality in canonical correlation and MANOVA models. *Journal of Multivariate Analysis*, 52(2), 325-337. doi: 10.1006/jmva.1995.1017
- Shiah-Hou, S. R., & Teng, Y. Y. (2016). The informativeness of non-GAAP earnings after Regulation G? *Finance Research Letters*, 18, 184-192. doi: 10.1016/j.frl.2016.04.015
- South African Institute of Chartered Accountants (2015), Circular 2/2015: Headline Earnings, Johannesburg, SAICA.

- Standard and Poor's (2002), Standard & Poor's core earnings technical bulletin, New York, Standard & Poor's.
- Stock, M., & Zuckerman, J. (2018). Deceptive non-GAAP financials will lead to future SEC whistleblower awards, Media. *Accounting Today*. May 18, 2018
- Sullivan, G. M., & Feinn, R. (2012). Using effect size—or why the p value is not enough. *Journal of Graduate Medical Education*, 4(3), 279-282. doi: 10.4300/JGME-D-12-00156.1
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (6th international ed.). Boston: Pearson.
- Tan, H.-T., & Tan, S.-K. (2009). Investors' reactions to management disclosure corrections: Does presentation format matter? *Contemporary Accounting Research*, 26(2), 605-626. doi: 10.1506/car.26.2.11
- Tan, H.-T., Ying Wang, E., & Zhou, B. O. (2014). When the use of positive language backfires: The joint effect of tone, readability, and investor sophistication on earnings judgments. *Journal of Accounting Research*, 52(1), 273-302. doi: 10.1111/1475-679X.12039
- Thielemann, F., & Dinh, T. (2019). Non-GAAP earnings disclosures around regulation G – The case of “implicit non-GAAP reporting”. *Advances in Accounting*, 46, 100432. doi: 10.1016/j.adiac.2019.100432
- Trotman, K. T. (2019). *Financial Accounting : An Integrated Approach* (7th ed. ed.). Melbourne: Cengage.
- Turner, C. W. (2001). Accountability demands and the auditor's evidence search strategy: The influence of reviewer preferences and the nature of the response (belief vs. action). *Journal of Accounting Research*, 39(3), 683-706. doi: 10.1111/1475-679X.00034
- Venter, E. R., Cahan, S. F., & Emanuel, D. (2013). Mandatory earnings disaggregation and the persistence and pricing of earnings components. *The International Journal of Accounting*, 48(1), 26-53. doi: 10.1016/j.intacc.2013.01.005
- Venter, E. R., Emanuel, D., & Cahan, S. F. (2014). The value relevance of mandatory non-GAAP earnings. *Abacus*, 50(1), 1-24. doi: 10.1111/abac.12020

- Virgin Australia Holdings Limited. (2016). Virgin Australia Holdings Limited (ASX: VAH) reports financial results for full year ended 30 June 2016. Retrieved from <https://www.virginaustralia.com/au/en/about-us/media/2016/va-financial-results-2016/>
- Walker, M., & Louvari, E. (2003). The determinants of voluntary disclosure of adjusted earnings per share measures by UK quoted companies. *Accounting and Business Research*, 33(4), 295-309. doi: 10.1080/00014788.2003.9729655
- Weil, J. (2001). Ignore the items behind the curtain: EPS means different things to different earnings, Media. *Wall Street Journal*. October 16, 2001
- White, M. J. (2016) *Board diversity, non-GAAP and sustainability*. Keynote Address, International Corporate Governance Network Annual Conference, San Francisco, California, June 27, 2016, Available at: <https://www.sec.gov/news/speech/chair-white-icgn-speech.html>.
- Wieland, M. M., Dawkins, M. C., & Dugan, M. T. (2013). The differential value relevance of S&P's core earnings versus GAAP earnings: The role of stock option expense. *Journal of Business Finance and Accounting*, 40(1-2), 55-81. doi: 10.1111/jbfa.12013
- Wilks, T. (2002). Predecisional distortion of evidence as a consequence of real-time audit review. *The Accounting Review*, 77(1), 51-71. doi: 10.2308/accr.2002.77.1.51
- Ying Wang, E., & Tan, H.-T. (2013). The effects of guidance frequency and guidance goal on managerial decisions. *Journal of Accounting Research*, 51(3), 673-700. doi: 10.1111/j.1475-679X.2012.00470.x
- Young, S. (2014). The drivers, consequences and policy implications of non-GAAP earnings reporting. *Accounting and Business Research*, 44(4), 444-465. doi: 10.1080/00014788.2014.900952
- Zhang, H., & Zheng, L. (2011). The valuation impact of reconciling pro forma earnings to GAAP earnings. *Journal of Accounting and Economics*, 51(1-2), 186-202. doi: 10.1016/j.jacceco.2010.07.001

APPENDICES

Appendix A - Literature review criteria

This appendix details the systematic approach to reviewing the literature. Four online databases were searched (Web of Science, Scopus, Ebsco and Proquest (including dissertations)) using the terms “non-gaap earnings”, “gaap earnings”, “pro forma earnings”, “street earnings”, “core earnings” and “underlying earnings”⁹⁴. The resulting search returned 931 items. Duplicates, obvious false positives, and non-academic articles are removed, resulting in 341 articles of potential interest. Two accounting researchers reviewed the remaining articles’ titles and abstracts. Where the researchers agree on either exclusion or inclusion, the articles are treated accordingly. When a discrepancy arises, the researchers read the full article to form a consensus. The remaining articles are classified according to the Australian Business Deans’ Council journal list⁹⁵. Given the volume, only articles published in A or A* journals were initially considered. However, any articles that these papers cited were also reviewed. All articles that adopted an experimental approach were included no matter the ranking of the journal.

A review of the A and A* articles resulted in 75 being deemed not relevant, but a further nine were identified through references that were not captured by the initial search terms. Table 31 summarises the resulting 161 A and A* articles of interest.

Table 31: ABDC A and A by subject*

Subject	Count
GAAP vs non-GAAP	99
Discussion papers	20
Earnings management	17
GAAP vs other measures	10
Foreign GAAP comparisons	15
Total	161

⁹⁴ Earnings before interest and tax (EBIT) and earnings before interest, tax, depreciation, and amortisation (EBITDA) represent common steps in the income statement and are not considered pro forma disclosures. Previous research adopts a similar approach (Bhattacharya et al., 2003; Kyung et al., 2019). IAS 1 Presentation of Financial Statements allows these measures to be reported, adding further reason to exclude them as not being considered non-GAAP disclosures. However, “modified” or “adjusted EBITDA” meets the non-GAAP disclosure criteria.

⁹⁵ Version downloaded 16 November 2021.

A search of the Social Science Research Network database (www.ssrn.com)⁹⁶ results in a further 60 working papers. Unrelated papers (again based on title and abstract), those papers subsequently published (therefore eligible for this dissertation's main search criteria) and papers whose body of text was not viewable were removed. The final result was 15 current, related working papers. However, the literature review focuses predominately on the published, rather than working, papers.

⁹⁶ The search was performed November 2021 using the same criteria as the published literature search for the past three years.

The final number of papers considered for this review is 114. An overview of the outlets they have been published in is shown in Table 32. In addition to the 114 identified articles, other work is discussed where deemed appropriate.

Table 32: GAAP vs non-GAAP studies by journal

Journal	ABDC	Count
Review of Accounting Studies	A*	14
Journal of Accounting and Economics	A*	11
Journal of Business Finance and Accounting	A*	10
The Accounting Review	A*	9
Journal of Accounting Research	A*	7
Contemporary Accounting Research	A*	6
Accounting Horizons	A	5
European Accounting Review	A*	3
Journal of Contemporary Accounting and Economics	A	3
Journal of Accounting, Auditing and Finance	A	3
The International Journal of Accounting	A	3
Behavioral Research in Accounting	A	2
Accounting and Finance	A	2
Advances in Accounting	A	2
Journal of Corporate Finance	A*	2
Accounting and Business Research	A	2
Abacus	A	2
Journal of Business Ethics	A	2
Journal of Applied Corporate Finance	A	1
Accounting, Organizations and Society	A*	1
Finance Research Letters	A	1
Journal of International Accounting Research	A	1
Accounting in Europe	A	1
British Accounting Review	A*	1
SSRN Working Papers		15
Total		114

Appendix B - Published differences between Pro forma vs street vs GAAP earnings

Study	Data Sample	N Observations	Country	Metric	Pro Forma Earnings		Street Earnings		GAAP Earnings	
					Mean	Median	Mean	Median	Mean	Median
Bhattacharya et al. (2003)	1998-2000	1,149	US	EPS	0.085	0.080	0.047	0.060	(0.147)	0.010
Johnson and Schwartz (2005)	2000	433	US	EPS	0.092	0.070	0.026	0.060	(0.262)	(0.080)
Entwistle et al. (2010)	2000-2004	1,486	US	EPS	1.762	1.580	0.521	0.850	0.880	1.180
Koning et al. (2010)	2000-2005	381	Netherlands	€ m	474.1	106.0	nd	nd	256.0	44.0
Jennings and Marques (2011)	2001-2003	3,681	US	EPS	0.350	nd	nd	nd	0.260	nd
Frankel et al. (2011)	1998-2005	4,246	US	EPS	0.350	0.28	nd	nd	0.150	0.190
Brown et al. (2012a)	1988-2006	8,127	US	EPS	0.355	0.260	0.296	0.230	0.230	0.200
Brown et al. (2012b)	1998-2005	7,157	US	EPS	0.307	0.25	0.276	0.22	0.224	0.180
Isidro and Marques (2013)	2003-2005	805	Europe	EPS €	3.94	1.35	nd	nd	2.93	1.00
Curtis et al. (2014)	2004-2009	1,920	US	EPS	binary variable		0.421	0.320	0.355	0.270
Choi and Young (2015)	1993-2001	2,238	UK	EPS	0.074	0.071	0.064	0.069	0.044	0.087
Malone et al. (2016)	2008-2010	371	Australia	AUD \$m	653.2	151.2	588.6	130.5	420.8	78.9
Black et al. (2017a)	1998-2006	5,339	US	EPS	0.355	0.280	0.349	0.270	0.234	0.200

nd = not disclosed.

Due to different sample sets, inclusion criteria, scaling denominators and treatment of outliers, these studies' finding are not directly comparable.

Appendix C - Experimental design choices

This appendix is a wide-ranging discussion of many of the methodological design choices in the Compensation and Justification studies' experiments. Correct experimental design is essential for generalising the findings. Flaws in the experimental method can render the results meaningless. This appendix details the rationale for many design choices and provides support for those choices. This appendix provides a discussion of the alternative choices available, and the ultimate choice chosen, where the literature has conflicting views.

Participant screening techniques

Satisficing is the exertion of the minimal effort required to reach an acceptable solution (Oppenheimer et al., 2009). In an experimental setting, satisficing involves unmotivated participants completing the task in a manner that minimises cognitive effort. A common result of satisficing is unwanted response behaviours, also known as careless or insufficient effort responding (IER) (Huang et al., 2012; Meade & Craig, 2012). IER can lead to poor quality data. Poor data quality resulting from inattentive participants is usually assumed to take the form of random measurement error (Oppenheimer et al., 2009). However, Huang et al. (2015) demonstrate how IER can be the cause of significant findings. In either instance, IER results in data contamination that can bias findings and conclusions.

Desimone et al. (2015) outline three broad categories of data screening methods used to reduce IER.

1. Direct screening methods
2. Archival screening methods
3. Statistical screening methods

None of the methods are comprehensive in their own right but instead should be used in unison to identify IER (Meade & Craig, 2012; Oppenheimer et al., 2009; Paas et al., 2018). This dissertation adopts the following experimental design choices to improve response quality and mitigate IER.

Direct screening methods are those that involve adding items into the materials to detect IER. Examples include self-reported effort, instructional manipulation checks and bogus questions. Instructional manipulation checks (IMCs) assess experimental participants' behaviour by telling them specifically which response (if any) to choose. Instructional manipulation checks are also known as 'screeners', 'trap questions' or 'attention checks'. Bogus, or trick, questions are designed to elicit the same response from all participants (for example, "On which planet were you born?"). Incorrect

answers to instructional manipulation checks and bogus questions indicate careless or dishonest responding. Instructional manipulation checks are particularly relevant for online panel services where the psychological distance between researcher and participants is large (Paas et al., 2018). This distance, combined with the potential distractions of an uncontrolled experimental setting and relative anonymity of participants, may exaggerate IER (Meade & Craig, 2012). The use of multiple IMCs and/or bogus questions is recommended as participant interest in the materials can wane (Desimone et al., 2015; Meade & Craig, 2012). Instructional manipulation checks and bogus questions fulfil the same purpose, however, Meade and Craig (2012) recommend instructional manipulation checks in preference to bogus items as they find bogus items may be endorsed by attentive responders if they find the question humorous. Subsequently, instructional manipulation checks, not bogus questions, were used in the studies presented in this dissertation.

An instructional manipulation check is deployed at the beginning of each main experiment, the out of sample manipulation check and the financial reporting knowledge quiz development instrument, immediately following participant consent in each case. The Compensation study also employs a second instructional manipulation check (a series of three questions) directly following the presentation of the stimulus materials and served the dual purpose as a manipulation reinforcement. A more detailed discussion surrounding the practice of manipulation reinforcements can be found in the next section of this appendix. Several other instructional manipulation checks are also deployed as part of the Justification study and during the development of the out of sample manipulation check and financial reporting knowledge quiz.

The use of an instructional manipulation checks risks participant backlash and may imply a “norm of non-diligence” (Oppenheimer et al., 2009, p. 871). However, the authors find the responses from participants who initially failed the instructional manipulation check, and were required to successfully complete it before continuing, were “indistinguishable” (p. 870) from those who passed at the first attempt. Similarly, warning participants in advance that their responses are being monitored has shown to decrease the incidence of IER (Huang et al., 2012; Paas et al., 2018). However, some online panel providers and researchers suggest removing participants who exhibit inattentive behaviours (Clow & James, 2013; Paas et al., 2018). This research adopted both approaches. Participants who failed the first instructional manipulation check were immediately exited from the experiment. Participants who failed the second instructional manipulation check were not allowed to continue until it was completed correctly. The pass rate for the first two instructional manipulation checks was 52% and 100%, respectively.

Archival screening methods focus on participants’ responses to researcher determined patterns (Desimone et al., 2015). Examples include inconsistent responses to similar or dissimilar

items, monitoring response times and patterns. These studies utilise various constructs and dependent variables to observe investors' decision making. Perfect response consistency across the dependent variables is not expected due to differences in the questions. However, given they are ultimately measuring the same underlying phenomena, users' perceptions, similar patterns amongst them should be identifiable.

“Response time” is the time taken to digest the experimental stimulus, read questions and provide answers. If one or more of these activities is skipped, response time will be reduced (also known as ‘speeding’ with culprits known as ‘speeders’). A variation in speed among participants is expected; however, the response quality of exceedingly quick responses are potentially dubious. The key limitation with using response time to determine IER is establishing an appropriate cut-off value (Meade & Craig, 2012). Although obvious low-end outliers can be treated as suspicious responses, unless there is a clear break in the response time distribution, it can be difficult to identify speeders. Therefore, response time is used in conjunction with response patterns and response inconsistency to more reliably predict IER (Oppenheimer et al., 2009).

Response patterns can be an indicator of IER. For example, long strings of identical responses (‘straight lining’) and zigzagging. Invariant response patterns are more obvious in materials with both positive and negative scored items with larger available response options (Desimone et al., 2015). To aid IER detection, this research predominately uses 11-point scales for most responses and has a mix of multiple positively and negatively scored items. Previous researchers recommend screens based on 6 to 14 consecutive invariant responses (Desimone et al., 2015; Huang et al., 2012). Intuitively, straightlining and speeding are often interrelated. The average response time for participants who passed (failed) the traditional manipulation checks was 27 (10) minutes. An inspection of the data reveals those who failed the traditional manipulation checks were often speeding and/or straightlining. All participants who passed the traditional manipulation checks were analysed, while those who failed the traditional manipulation checks were excluded from the analysis (see Table 1 for participant breakdown).

Statistical screening methods focus on participants' responses to statistically determined patterns found in post hoc analysis (Desimone et al., 2015). Statistical tools identify similar response items and score the inter-item correlations to create a screening index. Individual participant attentiveness is judged against the screening index using predetermined cut-off values (Huang et al., 2012; Johnson, 2005; Meade & Craig, 2012). Another common technique is the Mahalanbis D statistic to identify outliers. A benefit of statistical, versus archival, screening is the elimination of researcher bias in response pattern recognition. This dissertation uses statistical techniques, such as

principal component and factor analysis to examine the consistency of participant responses across related variables. The results are reported in the appropriate section of the paper.

Direct screening methods provide a more objective view of IER compared to the subjective nature of archival and statistical screening methods. However, a benefit to archival and statistical screening methods is they do not require modification to the experimental questions and, therefore, do not alert the participants that their responses are being scrutinized. Participant awareness of response scrutiny is not necessarily detrimental to data quality (Huang et al., 2012; Paas et al., 2018) provided the researcher does not create a demand effect by revealing the research hypotheses (Harding & Trotman, 2017).

Instructional manipulation checks and reinforcements

The second instructional manipulation check in the Compensation study, a series of three questions, doubled as a manipulation reinforcement. The aim of these questions was to confirm the respondents read and understood the stimulus materials. The three questions contained a total of seven selectable response options. Four of the seven response options were common across all experimental groups. The inclusion of common and manipulated items in the manipulation reinforcement was to reduce the possibility of revealing the other treatments (creating a demand effect). Demand effects (or demand characteristics) are subtle cues in the experimental materials that alert participants to the research hypotheses and cause them to alter their response behaviours, consciously or subconsciously, to align with the researcher's expectations.

Using manipulation reinforcements as a way to increase the salience of key information has precedent. After presenting the stimuli, both Peecher (1996) and Turner (2001) asked participants to summarise the manipulated materials. By asking participants to speculate on how the presented scenario could arise, Wilks (2002) increased awareness of the manipulations. Previous researchers have not allowed participants to continue with the experiment until all the manipulation reinforcement questions were answered correctly (Cheng et al., 2017; Harding & Trotman, 2017; Kim & Harding, 2017; Payne et al., 2010). Recent financial accounting experiments utilise a manipulation reinforcement (Elliott et al., 2017), also called a comprehension check (Asay et al., 2017).

This research, similar to Peecher (1996) and Turner (2001), asks participants questions of a summary nature that directly relate to the stimulus materials. The questions are presented on the same page as the stimulus materials, with participants freely available to view both concurrently. Participants are not permitted to proceed until the manipulation reinforcement questions are answered correctly. Oppenheimer et al. (2009) find experimental participants who are required to amend their responses, after failing manipulation reinforcement questions, become “indistinguishable” (p. 870)

from those who correctly answered the questions at the first attempt. In this way, the questions increased the manipulation's salience and doubled as a direct screening technique used to remedy 'speeders' and other satisficing participants. A manipulation reinforcement is within the realms of realism. In an actual investment scenario, reasonably knowledgeable and diligent investors seeking to make an investment decision would be motivated to read and understand the summary disclosures presented and accompanying schedules that form the stimulus materials in this experiment.

Attention checks

Attention check questions are a way to confirm the salience of the stimulus materials among participants (Hauser et al., 2018). In the Compensation study, attention check questions are asked after the participants have answered the investor judgment and decision making questions. To eliminate the possibility of creating a demand effect, as the attention check questions concerned the experimental manipulations, participants could not change their previous responses once the attention check questions were displayed. As discussed in the [Additional analysis](#) section, a specific manipulation check question was asked (Highhouse, 2009). This approach seeks to understand if the manipulation worked as intended, as opposed to assuming a causal relationship between the manipulation and participant response.

Other experimental design choices

Digital distribution of the materials enables some favourable experimental design choices. These choices include forcing participants to respond, obtaining unambiguous responses, limiting inappropriate response platforms (such as mobile phones) and aiding management of common method biases. A particular benefit of distributing the experimental materials digitally is the "force response" function available in the experimental software (Qualtrics online survey software). This function forces participants to respond to the questions before being able to proceed. The result is no missing data. In addition to obtaining complete responses, the responses are unambiguous as the only available options are those predetermined by the researcher. Participants are not able to select an invalid option. For open questions, typed comments are always legible; however, spelling, grammar and sentence construction issues may remain.

Another feature of online distribution is the choice of platforms that can display the materials. Given the complexity of the experimental materials, the experiments were only made available to desktop computer, not mobile phone or tablet, users. The software achieves this by not allowing access to the Qualtrics survey software online portal if the participant's web browser user-agent is not identified as belonging to a desktop computer. The rationale for desktops only is further enhancing

the realism of the experimental conditions. In a real-world setting, the type of information acquisition and analysis required by the experimental participants would normally be undertaken on a desktop computer present in an office or home office.

Common method bias (also known as common method variance) is measurement error attributable to, or created by, the research instrument. Podsakoff et al. (2003) provide a comprehensive review of the literature along with recommended remedies. Some Podsakoff et al. (2003) recommendations adopted in the creation of this research's experimental materials include:

- No fixed starting points on scale items to eliminate the anchoring bias (the tendency for respondents to select an option close to the starting point),
- Large scales (11-point, see additional information below) to mitigate scale length bias (the tendency for respondents to hold in short-term memory their selection more easily on smaller scales and repeat them),
- Online distribution allows participants to opt-in at a time physically and mentally convenient for them, thus eliminating the mood state bias (the tendency for respondents to allow current mood to affect responses). Traditional lab experiments mean all participants must perform tasks at the same time, regardless of their mood or general state of wellbeing.

Particularly long surveys can induce fatigue effects among participants (Meade & Craig, 2012). The experiment in this study was adapted from Elliott (2006). Pretesting allowed for some questions to be removed, and others modified in order to achieve an average length of 27 minutes per useable response. Table 33 displays 24 recent experimental accounting studies, with only five publishing completion times. Time to complete ranges from 8 minutes (Asay et al., 2017) to 19 minutes (Andersson & Hellman, 2007), with 12 to 15 minutes common (Audsabumrungrat et al., 2016; Kim & Harding, 2017; Rennekamp, 2012). The additional time to complete this study further confirms its relative complexity and thus the requirement to select appropriate participants while guarding against IER.

Table 33 presents the design and number of items used in Likert scale response items. Although an inexhaustive list, overwhelmingly, the most common attributes are 11-point scales (14 of 24) and 2x2 between-subject experimental designs (11 of 24). Podsakoff et al. (2003) present both the for and against cases for scale lengths, and often the choice is discipline-specific (Dolnicar, 2013). The adoption of 11-point scales in this research is consistent with prior accounting research.

Table 33: Prior accounting research designs and scales

Study	Design	Likert scale(s) response items
Andersson and Hellman (2007)	2x1	6 & 11-point
Asay et al. (2017)	2x2	7 & 11-point
Audsabumrungrat et al. (2016)	2x2	7-point
Chen et al. (2013)	2x2+1 & 3x1	15-point
Cheng et al. (2017)	3x1	7 & 10-point
Dilla et al. (2013)	2x2	11-point
Dilla et al. (2014)	2x2	11-point
Elliott (2006)	2x4	11-point
Elliott et al. (2014)	2x2+1	7-point
Elliott et al. (2015)	2x2	101-point
Elliott et al. (2017)	2x2x2	11 point
Frederickson and Miller (2004)	2x1	11-point
Han and Hun-Tong (2007)	3x2	11-point
Han and Tan (2010)	2x2x2+2	11-point
Harding and Trotman (2017)	2x2+1	9-point
Hogan et al. (2017)	2x1	7-point
Jamal et al. (2016)	2x2+1	9 & 11-point
Kelly and Tan (2017)	(2x2)x2	15-point
Kim and Harding (2017)	3x2x2	15-point
Reimsbach (2014)	2x2	11-point
Rennekamp (2012)	2x2	7 & 101-point
Tan and Tan (2009)	2x3	11 point
Tan et al. (2014)	2x2x2	11 & 13-point
Ying Wang and Tan (2013)	2x3	11-point

Appendix D - Statistical tests

Use of parametric tests

Although some of the experimental results data are non-parametric in nature (such as Likert scale responses), parametric tests have been used to analyse and draw conclusions. This approach is in line with standard social science practice and the accounting literature. Researchers, as a result of their training and the widespread use in empirical studies, are more familiar with parametric tests. Fortunately, in practice, the choice of parametric versus non-parametric test does not materially influence the statistical outcome. The reason is that the parametric tests are robust enough to analyse non-parametric data and, in most circumstances, provide the same inferential results. Therefore, the more powerful and well-known parametric tests dominate the experimental literature.

One of the main objections to using parametric tests on non-parametric experimental data is the lack of consistent interval spacing in Likert scales. However, the experiments in this study use 11-point scales (0 to 10) to help alleviate the issue by providing easier cognitive spacing. Where appropriate, this dissertation reports the more technically correct non-parametric test to support the reported parametric statistics.

Assumption testing

In addition to parametric data, the validity of ANOVA results requires three primary assumptions to be met – independent observations, homogeneity of variances and normality (Tabachnick & Fidell, 2013).

As each observation is from a distinct participant, and the participants did not interact, the independence criteria is satisfied. The assumption of homogeneity is consistent levels of variance across each of the treatment groups. Levene's test statistic is utilised to test the homogeneity of variance. Levene's Test examines the homogeneity of the sample variances. This test requires two assumptions, independent observations, and parametric data. As discussed previously, Likert scale data is non-parametric. All dependent variable observations in the Compensation study, except *Inform* and *Decisions*, pass Levene's Test of homogeneity of variances (Table 34). While all dependent variable observations in the Justification study, except *PartViews*, pass Levene's Test of homogeneity of variances (Table 35). Stricter alpha levels have been applied in the statistical analysis where appropriate to accommodate these violations. The results have been included for completeness as Levene's Test can be safely ignored when the treatment groups are of roughly equal sizes (Tabachnick & Fidell, 2013).

Table 34: Test of homogeneity of variances for Compensation study variables

Dependent Variable	Measure	Levene Statistic	df1	df2	p-value
<i>Real</i>	Based on Mean	2.459	3	118	.066
	Based on Median	1.616	3	118	.189
<i>Sufficient</i>	Based on Mean	1.615	3	118	.189
	Based on Median	1.360	3	118	.258
<i>EarnPerf</i>	Based on Mean	1.651	3	118	.181
	Based on Median	0.989	3	118	.400
<i>EarnPot</i>	Based on Mean	0.772	3	118	.512
	Based on Median	0.354	3	118	.786
<i>FinPerf</i> (component)	Based on Mean	1.396	3	118	.247
	Based on Median	1.179	3	118	.321
<i>InvestAmt</i>	Based on Mean	0.085	3	118	.968
	Based on Median	0.035	3	118	.991
<i>EPS</i>	Based on Mean	2.308	3	118	.080
	Based on Median	2.317	3	118	.079
<i>Inform</i>	Based on Mean	3.191	3	118	.026
	Based on Median	2.095	3	118	.105
<i>Current earnings</i> <i>performance</i>	Based on Mean	2.950	3	118	.036
	Based on Median	1.562	3	118	.202
<i>Future earnings</i> <i>potential</i>	Based on Mean	3.277	3	118	.024
	Based on Median	1.905	3	118	.133
<i>Earnings per share</i> <i>estimate</i>	Based on Mean	4.484	3	118	.005
	Based on Median	3.245	3	118	.024
<i>Decision to invest</i> <i>\$10k</i>	Based on Mean	4.216	3	118	.007
	Based on Median	3.271	3	118	.024
<i>Decisions</i> (component)	Based on Mean	3.696	3	118	.014
	Based on Median	2.782	3	118	.044

Table 35: Test of homogeneity of variances for Justification study variables

Dependent Variable	Measure	Levene Statistic	df1	df2	p-value
<i>Real</i>	Based on Mean	0.102	2	144	.903
	Based on Median	0.138	2	144	.872
<i>Sufficient</i>	Based on Mean	0.000	2	144	1.000
	Based on Median	0.021	2	144	.979
<i>PartViews</i>	Based on Mean	5.414	2	144	.005
	Based on Median	1.841	2	144	.162
<i>TotalViews</i>	Based on Mean	0.787	2	144	.457
	Based on Median	0.661	2	144	.518
<i>TimeViewed</i>	Based on Mean	1.542	2	41	.226
	Based on Median	0.609	2	41	.549
<i>EarnPerf</i>	Based on Mean	2.563	2	144	.081
	Based on Median	2.405	2	144	.094
<i>EarnPot</i>	Based on Mean	0.446	2	144	.641
	Based on Median	0.629	2	144	.535
<i>FinPerf</i> (component)	Based on Mean	1.713	2	144	.184
	Based on Median	1.605	2	144	.204
<i>InvestAmt</i>	Based on Mean	0.293	2	144	.747
	Based on Median	0.355	2	144	.702
<i>Inform</i>	Based on Mean	0.086	2	144	.918
	Based on Median	0.023	2	144	.978
<i>AccLitScore</i> ⁹⁷	Based on Mean	0.044	2	144	.957
	Based on Median	0.042	2	144	.959

Virtually all dependent variables violate the normality assumption across treatment groups (Table 36 and Table 37). Given the experimental aims of eliciting different responses from different scenarios, the lack of normality is expected. That is, participants' observations clumping together, at different points of a Likert scale is entirely the goal of well-designed behavioural research. Fortunately, the sample sizes (smallest n is 26) suggest the parametric tests, ANOVA and MANOVA, will be robust to the departure from normality. Univariate F is robust to violations of normality

⁹⁷ Variable used to create *FinKnow*.

provided there are minimum 20 degrees of freedom for error (Mardia, 1971). Seo et al. (1995) find Multivariate F robust to non-normality with an overall $N=40$ ($n=10$ per group). These findings, coupled with the results from Levene's Test, provide confidence in the resulting analysis despite the departures from normality.

Table 36: Tests of normality for Compensation study variables

Dependent Variable	Treatment	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<i>Real</i>	1	.150	38	.030	.942	38	.047
	2	.134	30	.179	.929	30	.047
	3	.193	28	.009	.892	28	.008
	4	.187	26	.020	.931	26	.081
<i>Sufficient</i>	1	.162	38	.014	.924	38	.013
	2	.132	30	.193	.939	30	.088
	3	.194	28	.008	.860	28	.002
	4	.155	26	.107	.917	26	.039
<i>EarnPerf</i>	1	.176	38	.005	.906	38	.004
	2	.194	30	.005	.950	30	.164
	3	.219	28	.001	.898	28	.010
	4	.186	26	.022	.952	26	.263
<i>EarnPot</i>	1	.149	38	.033	.919	38	.009
	2	.299	30	.000	.848	30	.001
	3	.144	28	.142	.936	28	.086
	4	.239	26	.001	.910	26	.026
<i>FinPerf</i> (component)	1	.146	38	.040	.935	38	.028
	2	.148	30	.093	.942	30	.105
	3	.135	28	.200	.962	28	.396
	4	.163	26	.072	.948	26	.210

Dependent Variable	Treatment	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<i>InvestAmt</i>	1	.165	38	.011	.899	38	.002
	2	.116	30	.200	.955	30	.237
	3	.121	28	.200	.961	28	.369
	4	.167	26	.060	.884	26	.007
<i>EPS</i>	1	.124	38	.148	.945	38	.060
	2	.156	30	.062	.947	30	.142
	3	.230	28	.001	.916	28	.027
	4	.161	26	.080	.925	26	.058
<i>Inform</i>	1	.328	38	.000	.815	38	.000
	2	.304	30	.000	.847	30	.001
	3	.269	28	.000	.855	28	.001
	4	.162	26	.076	.928	26	.068
<i>Current earnings performance</i>	1	.145	38	.042	.880	38	.001
	2	.253	30	.000	.816	30	.000
	3	.226	28	.001	.854	28	.001
	4	.191	26	.016	.886	26	.008
<i>Future earnings potential</i>	1	.199	38	.001	.896	38	.002
	2	.239	30	.000	.843	30	.000
	3	.231	28	.001	.852	28	.001
	4	.155	26	.111	.905	26	.020
<i>Earnings per share estimate</i>	1	.202	38	.000	.902	38	.003
	2	.133	30	.186	.927	30	.040
	3	.264	28	.000	.807	28	.000
	4	.250	26	.000	.847	26	.001
<i>Decision to invest \$10k</i>	1	.189	38	.001	.866	38	.000
	2	.151	30	.079	.895	30	.006
	3	.178	28	.024	.878	28	.004
	4	.210	26	.004	.869	26	.003
<i>Decisions (component)</i>	1	.146	38	.039	.925	38	.014
	2	.138	30	.151	.913	30	.018
	3	.187	28	.013	.831	28	.000
	4	.176	26	.037	.889	26	.009

Table 37: Tests of normality for Justification study variables

Dependent Variable	Treatment	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<i>Real</i>	1	.210	49	.000	.921	49	.003
	2	.154	48	.006	.944	48	.023
	3	.207	50	.000	.872	50	.000
<i>Sufficient</i>	1	.146	49	.010	.953	49	.049
	2	.217	48	.000	.900	48	.001
	3	.167	50	.001	.921	50	.003
<i>PartViews</i>	1	.469	49	.000	.535	49	.000
	2	.466	48	.000	.539	48	.000
	3	.391	50	.000	.622	50	.000
<i>TotalViews</i>	1	.446	49	.000	.548	49	.000
	2	.456	48	.000	.560	48	.000
	3	.354	50	.000	.707	50	.000
<i>TimeViewed</i>	1	.151	12	.200	.924	12	.316
	2	.212	12	.141	.870	12	.065
	3	.279	20	.001	.790	20	.001
<i>EarnPerf</i>	1	.115	49	.114	.971	49	.273
	2	.154	48	.006	.961	48	.107
	3	.167	50	.001	.953	50	.044
<i>EarnPot</i>	1	.162	49	.002	.936	49	.010
	2	.115	48	.132	.965	48	.166
	3	.170	50	.001	.943	50	.017
<i>FinPerf</i> (component)	1	.098	49	.200	.977	49	.462
	2	.110	48	.194	.977	48	.451
	3	.097	50	.200	.959	50	.077

Dependent Variable	Treatment	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
<i>InvestAmt</i>	1	.153	49	.006	.906	49	.001
	2	.145	48	.013	.908	48	.001
	3	.181	50	.000	.905	50	.001
<i>Inform</i>	1	.186	49	.000	.877	49	.000
	2	.169	48	.001	.921	48	.003
	3	.231	50	.000	.867	50	.000
<i>AccLitScore</i>	1	.148	49	.009	.943	49	.020
	2	.158	48	.004	.938	48	.014
	3	.141	50	.015	.947	50	.027

Although not used specifically in hypothesis testing, multivariate analysis of variance (MANOVA) is employed on occasion throughout this dissertation. MANOVAs have an additional assumption test where the dependent variables should be highly negatively correlated or moderately correlated, in either direction (approximately $|0.6|$) (Tabachnick & Fidell, 2013). Homogeneity of variance is tested using the *Box's M* Test. The *Box's M* Test determines the similarity of the covariance matrices for multivariate data. Tabachnick and Fidell (2013) state the *Box's M* Test is extremely sensitive to departures from normality and can be safely ignored when sample sizes are roughly equal. The authors suggest using an $\alpha=.001$. The *Box's M* statistic is reported as part of the MANOVA assumption testing where appropriate.

Unbalanced designs in ANOVAs occur when treatment groups contain different numbers of observations, or participant responses. Unbalanced designs can reduce the statistical power of tests and make the test statistic more susceptible to small departures for homogeneity (Tabachnick & Fidell, 2013). However, single factor ANOVAs, such as the ones this dissertation utilises, are usually unaffected by unbalanced designs (Milhken & Johnson, 1984, p. 127).

Effect size

Effect size can be defined as “the degree to which the phenomenon is present in the population” (Cohen, 1988, p. 9). More simplistically, effect size shows the magnitude of the variance in the dependent variable that is attributable to the independent variable. In contrast, statistical significance assesses the likelihood the differences found are due to chance (Sullivan & Feinn, 2012). Tabachnick and Fidell (2013, p. 54) describe statistical significance as the “*reliability of the*

association” between independent and dependent variables and contrast it with effect size measuring “how much association” is present between the independent and dependent variables. Effect size is also known as *strength of association* and *treatment magnitude*. Table 38 shows a comparison of numerous effect size measures.

Eta squared (η^2) and multivariate eta squared (multivariate η^2) are effect size measures appropriate for analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA), respectively. Eta squared (η^2) is the ratio of the sum of squares for an effect (SS_{effect}) to the total sum of squares (SS_{total}) (Levine & Hullett, 2002). While multivariate eta squared (multivariate η^2) is calculated using Wilks’ Lambda.⁹⁸

Table 38: Effect size comparisons

Effect size	Usage	Small	Medium	Large
Cohen d^{99}	t -tests	0.20	0.50	0.80
Eta squared (η^2) ¹⁰⁰	ANOVA	.01	.06	.14
Cohen f^{101}	ANOVA	0.10	0.25	0.40
Multivariate eta squared (multivariate η^2)	MANOVA	.01	.06	.14
Cramer phi (ϕ_c) (for $\geq 3df$)	Chi-square (χ^2)	0.06	0.17	0.29
r (Pearson)	correlation	.10	.30	.50
r -squared (r^2)	regression	.01	.09	.25

Effect size helps readers understand the magnitude of differences found, whereas statistical significance examines whether the findings are likely to be due to chance. Eta squared (η^2) is a popular effect size measure because, in balanced designs, it is additive. That is, the sum of all $\eta^2=100\%$. This allows researchers to determine the proportion of the dependent variable that can be explained by the independent variables tested.

All effect size measures have drawbacks. Even though η^2 is popular, it has two commonly accepted flaws. First, because it is additive, individual independent variable effect sizes are influenced by the other independent variables’ effect sizes due to all effect sizes being used to calculate the

⁹⁸ Multivariate eta squared = $1 - \Lambda^{\frac{1}{s}}$ (where Λ = Wilks’ Lambda and s = the number of levels of the factor minus 1 or the number of dependent variables, whichever is smaller)

⁹⁹ Cohen $d = (M_2 - M_1) / SD_{pooled}$ where $SD_{pooled} = \sqrt{((SD_1^2 + SD_2^2) / 2)}$

¹⁰⁰ $\eta^2 = SS_{effect} / SS_{total}$

¹⁰¹ Cohen f and eta squared are mathematically related: $f = \sqrt{\frac{\eta^2}{1-\eta^2}}$ or $\eta^2 = \frac{f^2}{1+f^2}$

denominator (SS_{total}). Second, η^2 is a sample statistic and makes no attempt to estimate the effect size for the population. To overcome these drawbacks, researchers can use alternative measures, such as *partial* η^2 and ω^2 (omega squared).¹⁰² ¹⁰³ However, these alternate measures are subject to their own limitations.

Use of two-tailed, uncorrected p-values

Unless stated in the main text analysis, all p -values are two-tailed, even for some directional hypotheses. The stricter two-tailed p -values are somewhat offset by the lack of correction for multiple tests. Although not strictly correct, the use of uncorrected p -values across multiple hypotheses is common in social science research (Goodman et al., 2016). This approach assumes each hypothesis test is independent and the results, at an $\alpha=.05$, have 95% of not being attributable to chance. Logically, it follows that if you test 20 different hypotheses at $\alpha=.05$, statistically speaking, one will be found significant incorrectly. However, corrected α are used when multiple dependent variables are tested in the same statistical models. In these instances, the hypotheses are being tested together, so the α level is corrected using the Bonferroni or Tukey HSD method.

Layout of ANOVA and MANOVA tables

The layout of the ANOVA and MANOVA tables displayed in this paper are consistent with the format presented in recent publications in the top three accounting journals, The Accounting Review (Asay et al., 2017; Elliott et al., 2014; Han & Hun-Tong, 2007), Journal of Accounting Research (Peecher, 1996; Rennekamp, 2012; Tan et al., 2014) and Accounting, Organizations & Society (Asay et al., 2018; Kelly & Tan, 2017). The exception being the addition of effect size columns to the tables in this paper. Although the layout is consistent with published accounting research, it contains a significant amount of redundant information. For example:

- $MS=SS / df$
- $F=MS_{effect} / MS_{error}$
- p -value = table lookup value (similar to z or t) based on F and df
- $\eta^2=SS_{effect} / SS_{total}$

Articles published in leading statistical journals, such as the Journal of the American Statistical Association and the Journal of the Royal Statistical Society: Series B (Statistical Methodology), do not tabulate ANOVA or MANOVA findings. Instead, these journals report the

¹⁰² Partial $\eta^2=SS_{effect} / (SS_{effect} + SS_{error})$

¹⁰³ $\omega^2=\frac{SS_{effect} - (df_{effect})(MS_{error})}{SS_{total} + MS_{error}}$

statistics in-text only. The American Psychological Association (2010) suggests providing enough information “*in the text*” (p. 116) for readers to reconstruct the statistics. This dissertation adheres to both conventional and best practices.

Realism and sufficiency of the Study materials

In the Compensation study, the participants rated both the realism ($M=7.0$, $SD=2.2$) and sufficiency ($M=7.1$, $SD=2.2$) of the materials highly. A multivariate analysis of variance (MANOVA) was performed to investigate the differences, if any, between treatment groups. Preliminary assumption testing finds no serious violations.¹⁰⁴ There were no statistically significant differences between treatment groups in the omnibus test ($F(6, 234)=1.51$, $p=.175$; Wilks' $\Lambda=0.93$; multivariate $\eta^2=.07$).

Although MANOVAs are a generally accepted statistical technique for the above type of analysis, the non-parametric nature of Likert scales means a chi-square test for independence is strictly the correct statistical test. When performed, chi-square results for realism ($\chi^2=(27,122)=28.43$, $p=.389$) and sufficiency ($\chi^2=(27,122)=36.28$, $p=.109$) show no significant differences among treatment groups, thereby supporting the MANOVA findings.

In the Justification study, the participants rated both the realism ($M=7.2$, $SD=2.8$) and sufficiency ($M=6.8$, $SD=2.1$) of the materials highly. A multivariate analysis of variance (MANOVA) was performed to investigate the differences, if any, between treatment groups. Preliminary assumption testing finds no serious violations.¹⁰⁵ There were no statistically significant differences between treatment groups in the omnibus test ($F(4, 286)=1.42$, $p=.227$; Wilks' $\Lambda=0.96$; multivariate $\eta^2=.04$).

As above, the non-parametric nature of Likert scales means a chi-square test for independence is strictly the correct statistical test. When performed, chi-square results for realism ($\chi^2=(18,147)=18.64$, $p=.414$) and sufficiency ($\chi^2=(18,147)=13.25$, $p=.777$) show no significant differences among treatment groups, thereby supporting the MANOVA findings.

¹⁰⁴ Box's $M=20.06$, $p=.022 > \alpha (.001)$ and Pearson's $r=0.738$ (Spearman= 0.674)

¹⁰⁵ Box's $M=0.70$, $p=.995 > \alpha (.001)$ and Pearson's $r=0.647$ (Spearman= 0.619)

Appendix E - Section 10 Regulation S-K

(e) Use of non-GAAP financial measures in Commission filings.

(1) Whenever one or more non-GAAP financial measures are included in a filing with the Commission:

(i) The registrant must include the following in the filing:

(A) A presentation, with equal or greater prominence, of the most directly comparable financial measure or measures calculated and presented in accordance with Generally Accepted Accounting Principles (GAAP);

(B) A reconciliation (by schedule or other clearly understandable method), which shall be quantitative for historical non-GAAP measures presented, and quantitative, to the extent available without unreasonable efforts, for forward-looking information, of the differences between the non-GAAP financial measure disclosed or released with the most directly comparable financial measure or measures calculated and presented in accordance with GAAP identified in paragraph (e)(1)(i)(A) of this section;

(C) A statement disclosing the reasons why the registrant's management believes that presentation of the non-GAAP financial measure provides useful information to investors regarding the registrant's financial condition and results of operations; and

(D) To the extent material, a statement disclosing the additional purposes, if any, for which the registrant's management uses the non-GAAP financial measure that are not disclosed pursuant to paragraph (e)(1)(i)(C) of this section;

Note, footnote 44 of SEC (2002) relates to requirement (C) and states management's justification of the non-GAAP disclosure needs to 'substantive'.

Appendix F - Justification study out of sample manipulation check and instrument

Rationale for out of sample manipulation check

Jacob Rose discusses the uses, and differences, of comprehension and manipulation checks in his chapter of *The Routledge Companion to Behavioral Accounting Research* (Libby & Thorne, 2017). Comprehension, or attention, checks are designed to determine if the participants are attentive and engaged with the experimental materials.¹⁰⁶ Whereas manipulation checks determine if the theoretical constructs operationalise in the eyes of the participants. Rose points out, many researchers fail to properly distinguish between manipulation and comprehension checks, and consequently, they are often misused in research. Much of the misuse stems from inferences being drawn regarding participants' attention, and the experimental manipulation effectiveness, from a single check (Hauser et al., 2018). It is not just historical behavioural accounting literature that is guilty of performing manipulation and attention checks simultaneously, the dual attention/manipulation check underpins much of the published behavioural literature.

The first study in this dissertation follows the aforementioned simultaneous approach, and accordingly, the attention check questions concern the manipulation. Therefore, in the Compensation study, the terms 'attention check', 'manipulation check' and 'comprehension check' are interchangeable. Hauser et al. (2018) point out participants failing the simultaneous approach means researchers are unable to determine if the failure was a lack of participant attention, weak or ineffective manipulation or participants not remembering what they were thinking during the stimulus phase of the experiment. Historical behavioural studies in all disciplines generally conclude manipulation check failures mean participants were not attentive enough and therefore not manipulated. The alternative explanations that participants are attentive, but the manipulation is too weak, ineffective, or unimportant are not conclusions authors wish to entertain. In addition, if most participants do pass the manipulation checks, then that is good evidence they are prominent enough.

However, as is discussed below, the dual check approach only really allows inferences regarding participants' attention, not the strength or successfulness of the intended manipulation. As a result, this simultaneous approach, although accepted practice, is not ideal. The second study in this dissertation, the Justification study, takes a different approach and separates the attention and manipulation checks by performing an out of sample manipulation check. The following discussion details the implications of various research attention/manipulation check strategies and concludes

¹⁰⁶ Confusingly, the poorly named instructional manipulation check performs the role of a comprehension, or attention, check and not that of a manipulation check.

with the rationale and results of the out of sample manipulation check employed by this dissertation's Justification study.

Aronow et al. (2019) find excluding results based on failing the manipulation check can bias the final analysis. In support, Jacob Rose (Libby & Thorne, 2017) notes that participants need not pass a manipulation check in order for them to rely on the experimental materials. Indeed, an essential element of behavioural research is to elicit responses from participants who do not realise the exact nature of manipulation subjected to them (a *demand effect* is created when participants recognise the experimental manipulation and adjust their responses accordingly). However, participants must view the experimental manipulations to assure researchers of their causal inferences. Attention checks perform this function.

Even though Berinsky et al. (2014) demonstrate the responses from inattentive participants are random noise, they suggest including these responses in the statistical analysis. Aronow et al. (2019) also identify inattentive participants' responses as noise and, as such, suggest removing them and, where possible, minimising inattentive participants' exposure to the experimental materials. Given the conflicting advice, researchers need to decide how to deal with inattentive participants failing the attention checks with respect to their specific circumstances.

Oppenheimer et al. (2009) urge caution with eliminating inattentive participants, as a result, may be a reduction in external validity. However, the latest draft of The Conceptual Framework explains "*users are responsible for actually studying reported financial information with reasonable diligence rather than only being willing to do so*" (IASB, 2010, p. 64). It follows that the elimination of inattentive participants from the studies in this dissertation may actually increase the external validity, as qualified and attentive users are the target audience of financial disclosures.

The premise of the preceding discussion is participants' manipulation check failures are due to inattention. Participants can also fail if the manipulations are not "*sufficiently clear*" (Aronow et al., 2019, p. 579). To ensure the manipulations are sufficiently strong, the Justification study employs an out of sample manipulation check. Out of sample manipulation checks are a preferred approach of Hauser et al. (2018) and have precedence in behavioural accounting research (Asay et al., 2017).

An out of sample manipulation check provides an opportunity to test the effectiveness of the different experimental treatments with participants not involved in the main study. In the Justification study, an out of sample manipulation check confirms the effective operationalisation of the intended manipulations. The two manipulations (high and low ambiguity non-GAAP justifications) are shown to 56 participants, out of sample, who select the non-GAAP justification they believe is the least ambiguous. The options were presented side by side, randomly switching positions as to not invoke an order effect. Participants are also asked the true/false question, "At their core, the two statements

above present the same fundamental message”. Participants are recruited through the online panel provider, Cint. The out of sample participants are recruited using the same profiling criteria of the main experiment, but individuals are specifically excluded from participating in both experiments. Participants are 61% male and 39% female, with an average age of 50 years.

A binomial test indicated the proportion of respondents agreeing the low ambiguity manipulation was the least ambiguous (43 of 56 or 77%) was significantly higher than chance, $p < .001$ (one-tailed). Similarly, a binomial test indicated the proportion of respondents agreeing both statements presented the same fundamental message (51 of 56 or 91%) was significantly higher than chance, $p < .001$ (one-tailed). The results provide confidence the manipulations are of sufficient strength to infer results and contain the same underlying information.

Experimental results not in accordance with the hypotheses can be explained by the participants; A) not being attentive to the manipulations; B) the manipulations not being prominent enough; or C) the manipulations are not sufficiently important in investor decision making. Both A and B are addressed through comprehension/attention check questions. Item C can only be inferred from the final results with the Justification study concluding the manipulations, management’s disclosure of non-GAAP earnings justification, is not important in investor decision making.

Out of sample manipulation check experimental instrument

Overview and consent

Thank you for agreeing to participate in this research.

Participation in this study is completely voluntary and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. The information we obtain from you will be dealt with in a manner that ensures you remain anonymous.

This research concerns financial statement disclosures.

First, you will be shown two (2) groups of financial disclosures from fictional S&P500 companies. Each disclosure group contains two (2) individual disclosures.

Second, you will be asked your opinion regarding the companies' disclosures.

Finally, there are some questions about you and your investment experience. It is estimated the entire exercise will take approximately 5-10 minutes to complete.

Should you have any complaints concerning the manner in which this research is being conducted please contact:

Bond University Human Research Ethics Committee
Office of Research Services
Bond University, Gold Coast, 4229, Australia
Tel: +61 7 5595 4194
Fax: +61 7 5595 1120
Email: ethics@bond.edu.au

Instructional manipulation check

This survey concerns the opinions of participants in the fields of business and finance. The survey might ask participants *which of the following factors are most important in terms of influencing the future performance of an organization*. We are also interested in determining whether people read the questions carefully. To confirm that you have read this instruction, assume that you believe "Intellectual property" and "Historical performance" are the most important factors that influence the future performance of an organization. That's right, only select these two options.

- Global political events
- Technological advantages
- National economic policy
- Corporate governance policies
- Political connections
- Historical performance
- Management
- Competitive advantage
- Intellectual property
- All of the above

Experimental materials (management commentary 1)

Below are statements taken from the earnings announcements of two (2) different companies. These statements are quotes from management concerning their use of non-GAAP measures. Please read them carefully and answer the questions that follow.

Select the management commentary you think provides the least ambiguity (that is, the most detail)?

- “Management believes the non-GAAP financial measures provide investors with relevant and useful information. They enable a clearer comparison of financial results from one period to another. Non-GAAP measures remove one-off items that are not related to business performance. These measures also allow for greater transparency of the key metrics used by management in operating our business and measuring our performance. We believe making these adjustments allows investors to more easily evaluate our current operating performance and compare past operating results.”
- “Management believes the non-GAAP financial measures are relevant and useful to investors. These measures are used by management as a method of evaluating operating performance. We believe they assist investors in their decision making.”

At their core, the two statements above present the same fundamental message.

- False
- True

Experimental materials (management commentary 2)

Below are statements from the earnings announcements of two (2) different companies. These statements are quotes from management concerning their recent financial performance. Please read them carefully and answer the questions that follow.

Select the management commentary you think provides the least ambiguity (that is, the most detail)?

“The full-year 2018 results meet management EPS guidance of \$1.52 – \$1.57. Clinical trials of a new drug used in treating junction carcinoma were endorsed by the FDA in addition to three new approvals granted in Europe for existing vaccine related immunobiologic pharmaceutical products,” said Troy G. Corser, chairman and chief executive officer. “Health Solutions’ key strategic pillars – vaccines, hospital and specialty care products and oncology – are expected to drive sustainable growth over the medium to long-term. We enter 2019 with numerous regulator approved products that are market ready both domestically and overseas.”

“The full-year 2018 results are in line with prior guidance issued by management. Our company has made substantial progress on many scientific and commercial fronts,” said Troy G. Corser, chairman and chief executive officer. “The full-year results further bolster our confidence in Health Solutions’ innovation-based approach. Our key pillars are expected to help drive future sustainable growth. We enter the new year, 2019, with good momentum and have many opportunities available. Our unique products and pipeline position us to perform well in the near future.”

At their core, the two statements above present the same fundamental message.

- False
- True

Demographic information

Prior to participating in this study, indicate your familiarity with *non-GAAP* financial measures.

	True
I had not heard of the term 'non-GAAP earnings'.	<input type="checkbox"/>
I had heard of the term non-GAAP earnings.	<input type="checkbox"/>
I understood that non-GAAP earnings was an earnings measure sometimes reported by firms in addition to GAAP earnings.	<input type="checkbox"/>
I knew which items firms typically excluded from non-GAAP earnings.	<input type="checkbox"/>
I had analyzed the financial performance of a firm that reported non-GAAP earnings.	<input type="checkbox"/>
I had invested in a firm that reports non-GAAP earnings.	<input type="checkbox"/>

What is the highest level of education you have attained?

- Less than high school diploma
- High school graduate
- Some university/college but no degree
- Bachelor's degree
- Master's degree
- Doctoral degree

Do you have any professional qualifications? Select if applicable.

	Yes
Certified Public Accountant (CPA)	<input type="checkbox"/>
Chartered Financial Analyst (CFA)	<input type="checkbox"/>
Certified Management Accountant (CMA)	<input type="checkbox"/>
Other accounting qualifications (eg CIMA, CA, IPA, NIA, etc)	<input type="checkbox"/>

How much experience investing in individual stocks do you have?

- No experience 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of experience 10

How much knowledge of analyzing financial statements do you have?

- No knowledge 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of knowledge 10

When purchasing stocks, what typical time period do you invest for?

- A few days
- A few months
- The next year
- The next few years
- The next 5 to 10 years
- Longer than 10 years
- Not applicable

Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments?

- Take substantial financial risk expecting to earn substantial returns
- Take above average financial risks expecting to earn
- Take average financial risks expecting to earn average returns
- Not willing to take any financial risks

Appendix G - Financial reporting knowledge test

Development of financial reporting knowledge questions

The practice of screening experimental participants using an objective knowledge test is not novel. Professors Katherine Schipper and Roman Weil famously administered a 25 question accounting knowledge test to audit committee members, M.B.A. and undergraduate students across a number of years (Giacomino et al., 2009). Elliott et al. (2007) modified the Schipper and Weil test, by reducing the number of questions to 15 and adding new questions. Elliott et al.'s quiz was modified further by Dilla et al. (2014) for their study, now 14 questions with the addition of non-GAAP material. Guggenmos et al. (2021) screen online participants using a simple set of questions concerning depreciation and journal entries. Krische (2019) uses the six-question financial literacy quiz published on the Financial Industry Regulatory Authority Investor Education Foundation website (FINRA, 2019) in her replication of three accounting studies.

However, none of the above quizzes are suitable for this research. For example, Guggenmos et al. (2021) accounting knowledge check questions concern depreciation calculations and asset disposal journal entries. Arguably desirable, this knowledge is not necessarily essential for firm level investment related judgments. At 25 questions, the Schipper and Weil test is too long. Even the 14 question test of Dilla et al. (2014) is substantial. For this study, a six-question financial reporting knowledge test would serve the dual purpose of screening ineligible participants (those not meeting the IASB definition above) while providing a potentially useful covariate in data analysis.

The test for this research draws upon existing financial knowledge tests (Dilla et al., 2014; Elliott et al., 2007; Giacomino et al., 2009) but modifies them to provide a concise financial reporting knowledge test that can discriminate between varying levels of financial reporting knowledge. Prior research on non-GAAP disclosures that utilises an experimental approach has, to date, not explicitly measured financial reporting knowledge but instead inferred it based on arbitrary group membership (for example, M.B.A. enrolment). This approach introduces noise to the data as some less sophisticated investors have high financial reporting knowledge whereas some investors whom prior research classified as sophisticated investors may in fact not have a lot of financial reporting knowledge. The use of a financial reporting knowledge test goes some way to address this shortcoming. However, creating and validating a task specific accounting or financial reporting knowledge instrument is a dissertation in its own right and thus beyond the scope of this research. Instead, a simplified, preliminary instrument is developed to test the potential usefulness a more comprehensive instrument may have in behavioural accounting research.

Krische (2019) finds investment experience and financial literacy can help identify participants who are more willing to diligently study financial reporting information to form investment-related judgments. The author suggests assessing both financial literacy and investment experience. As a result, both the Financial and Investor Literacy quiz questions (FINRA, 2019) are added to the Schipper and Weil questions along with the Elliott et al. (2007) financial reporting quiz questions and questions from an undergraduate accounting textbook (Trotman, 2019) to ensure a variety of financial reporting topics are represented. The complete list of questions totals 107. After removing duplicates, I workshop the list in the accounting department of a university business school with academics and practitioners agreeing a final list of 25 questions.

Two hundred and twenty-one participants are recruited from Cint, using the same profiling criteria as the main experiment in the Justification study, resulting in 146 useable responses (66%). Participants are 61% male and 39% female with an average age of 56 years.¹⁰⁷ The mean score on the test was 13.2 (out of 25) with a standard deviation of 4.2. A binomial test indicated the chance of respondents guessing more than 13 questions correctly (14 of 25 or 56%) was significantly less than chance, $p=.001$ (one-tailed). Table 39 details the participant screening results for the financial reporting knowledge test.

Table 39: Financial reporting knowledge quiz participant screening

	Responses	%
Invited to participate	221	
Failed 1 st instructional manipulation check	(36)	
Started Quiz	185	100%
Failed 2 nd instructional manipulation check	(20)	11%
Failed 3 rd instructional manipulation check	(19)	10%
Total used in principal component analysis	146	79%

The financial reporting knowledge quiz employs three instructional manipulation checks. The first is same instructional manipulation check that commences the Compensation study and the Justification study. It instructs participants to choose several options before proceeding and those participants who fail this check are immediately ejected from the quiz and are not exposed to the

¹⁰⁷ Participants who participated in the development of the financial reporting knowledge test are specifically excluded from participating in the main experiment.

questions. The second was an embedded multiple-choice question that gave the desired response in the question. While the third was a relatively easy and unambiguous multiple-choice question shown to participants twice, once towards the start and again towards the finish of the quiz. Participants were determined to have failed this third instructional manipulation check if their answers differed on the question between showings.

Principal component analysis identifies the most discriminating questions. That is, the highest loading top five questions on the first principal component were selected as they explain the most variation in the data. The sixth question chosen is the tenth highest loading question, however, the inclusion is justified as it concerns non-GAAP financial measures. A statistical approach to question selection removes researcher bias but also creates a limitation as the main aim is to identify the most discriminating questions, not to ensure all aspects of financial reporting are represented. A future improvement would be to ensure all facets of financial reporting are present in the final instrument. Although this approach may not provide maximum discrimination, it may improve the ability to generalise participant test scores. The final six questions are contained in the Justification study experimental materials.

Justification study financial reporting knowledge questions instrument

Overview and Consent

Thank you for agreeing to participate in this exercise.

Participation in this study is completely voluntary and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. The information we obtain from you will be dealt with in a manner that ensures you remain anonymous.

This research concerns accounting/financial literacy.

First, you will be shown a series of questions, 27 in total. Please read the questions carefully and select your response from the available options.

Finally, there are some questions about you and your investment experience. It is estimated the entire exercise will take approximately 10-15 minutes to complete.

Should you have any complaints concerning the manner in which this research is being conducted please contact:

Bond University Human Research Ethics Committee

Office of Research Services

Bond University, Gold Coast, 4229, Australia

Tel: +61 7 5595 4194

Fax: +61 7 5595 1120

Email: ethics@bond.edu.au

First instructional manipulation check

This survey concerns the opinions of participants in the fields of business and finance. The survey might ask participants *which of the following factors are most important in terms of influencing the future performance of an organization*. We are also interested in determining whether people read the questions carefully. To confirm that you have read this instruction, assume that you believe "Management" and "Political connections" are the most important factors that influence the future performance of an organization. That's right, only select these two options.

- Global political events
- Technological advantages
- National economic policy
- Corporate governance policies
- Political connections
- Historical performance
- Management
- Competitive advantage
- Intellectual property
- All of the above

List of Questions (first block)

Which of the following is NOT an asset?

- Equipment
- Accounts receivable
- Accounts payable
- Inventory

The following are the quarterly net income amounts reported by a company. In which quarter did they make the highest profit?

- Quarter 1 = \$10,439m
- Quarter 2 = (\$20,876m)
- Quarter 3 = \$8,911m
- Quarter 4 = (\$3,992m)

Buying a single company's stock usually provides a safer return than a stock mutual fund.

- True
- False
- Don't know

If you buy a company's bond...

- You own part of the company
- You have lent money to the company
- You are liable for the company's debts
- You can vote on shareholder resolutions

If interest rates rise, what will typically happen to bond prices? Rise, fall, stay the same, or is there no relationship?

- Rise
- Fall
- Stay the same
- No relationship
- Don't know

Which of the following is NOT an example of a liability?

- Provisions for employee entitlements
- Share capital
- Accounts payable
- Loans

Which of the following statements about shareholders' equity is NOT true?

- Shareholders' equity is the excess of assets over liabilities.
- Shareholders' equity consists of two main elements: share capital and retained profits.
- Shareholders' equity is a residual claim of the shareholders on the assets of the organisation.
- Shareholders' equity is the amount shareholders will receive in dividends in the future.

Which of the following is NOT a revenue of a company?

- Cash sales
- Dividends received on shares
- Rent from premises
- Issue of shares

Which of the following is recorded as an asset?

- Accrued revenue
- Accrued expenses
- Unearned revenue
- Provision for employee entitlements

List of Questions (second block)

(second instructional manipulation check)

Financial reports consist of multiple statements. To confirm you are reading the questions, select 'Income Statement'.

- Balance sheet
- Income Statement
- Cash Flow Statement
- Changes in Equity Statement

Which of the following statements is true?

- $\text{Assets} + \text{Shareholders' Equity} = \text{Liabilities}$
- $\text{Assets} - \text{Liabilities} = \text{Shareholders' Equity}$
- $\text{Assets} + \text{Liabilities} = \text{Shareholders' Equity}$
- None of these options are true

If a company files for bankruptcy, which of the following securities is most at risk of becoming virtually worthless?

- The company's preferred stock
- The company's common stock
- The company's bonds

You invest \$500 to buy \$1,000 worth of stock on margin. The value of the stock drops by 50%. You sell it. Approximately how much of your original \$500 investment are you left with in the end?

- \$500
- \$250
- \$0

Deferred revenue:

- Represents the portion of Accounts Receivable that may be difficult to collect from customers
- Represents an estimate of the cash the firm may have to refund to customers if the customers return goods as defective
- Represents cash that has been received but for which the firm has not yet delivered goods/services
- More than one of the above

Which is the best definition of "selling short"?

- Selling shares of a stock shortly after buying it
- Selling shares of a stock before it has reached its peak
- Selling shares of a stock at a loss
- Selling borrowed shares of a stock

To which balance sheet grouping does the item 'accounts receivable' normally belong?

- Current asset
- Noncurrent asset
- Current liability
- Noncurrent liability

Non-GAAP financial measures:

- Do not appear in corporate filings or annual reports
- Can vary depending on the company reporting them
- Are audited in the same manner as GAAP financial measures
- Are defined by accounting standards

Which of the following is NOT a liability?

- Provision for long service leave
- Interest payable
- Share capital
- Creditors

List of Questions (third block)

(third instructional manipulation check – repeated question)

Which of the following is NOT an asset?

- Equipment
- Accounts receivable
- Accounts payable
- Inventory

Gross profit is the difference between:

- sales revenue and operating expenses.
- sales revenue and cost of goods sold.
- operating profit before tax and income tax expense.
- sales and sales returns.

Which of the following best explains the distinction between nominal returns and real returns?

- Nominal returns are pre-tax returns; real returns are after-tax returns
- Nominal returns are what an investment is expected to earn; real returns are what an investment actually earns
- Nominal returns are not adjusted for inflation; real returns are adjusted for inflation
- Nominal returns are not adjusted for fees and expenses; real returns are adjusted for fees and expenses

Suppose you owe \$1,000 on a loan and the interest rate you are charged is 20% per year compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?

- Less than 2 years
- 2 to 4 years
- 5 to 9 years
- 10 or more years
- Don't know

If you buy a company's stock...

- You own part of the company
- You have lent money to the company
- You are liable for the company's debts
- The company will return you original investment to you with interest
- Don't know / Not sure

What is the purpose of an income statement?

- To summarize all changes in assets and liabilities for an accounting period
- To summarize all financing and investing activities for an accounting period
- To summarize the results of operations for an accounting period
- To summarize the financial position at the end of an accounting period

A balance sheet:

- lists the assets and liabilities at present replacement cost.
- shows how the resources of an entity change during a period of time.
- shows all facts affecting the financial position of the entity.
- lists the assets, liabilities, and shareholders' equity at a specific point in time.

The purpose of depreciation is to:

- allocate cost in order to measure profit.
- track value changes in the assets.
- measure the current value of assets in the balance sheet.
- record the fair value of the asset.

Which of the following is a liability?

- Revenue received in advance
- Accrued revenue
- Accumulated depreciation
- None of the above

Demographic information

What is the highest level of education you have attained?

- Less than high school diploma
- High school graduate
- Some university/college but no degree
- Bachelor's degree
- Master's degree
- Doctoral degree

Do you have any professional qualifications? Select if applicable.

	Yes
Certified Public Accountant (CPA)	<input type="checkbox"/>
Chartered Financial Analyst (CFA)	<input type="checkbox"/>
Certified Management Accountant (CMA)	<input type="checkbox"/>
Other accounting qualifications (eg CIMA, CA, IPA, NIA, etc)	<input type="checkbox"/>

How much experience investing in individual stocks do you have?

- No experience 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of experience 10

How much knowledge of analyzing financial statements do you have?

- No knowledge 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of knowledge 10

When purchasing stocks, what typical time period do you invest for?

- A few days
- A few months
- The next year
- The next few years
- The next 5 to 10 years
- Longer than 10 years
- Not applicable

Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments?

- Take substantial financial risk expecting to earn substantial returns
- Take above average financial risks expecting to earn above average returns
- Take average financial risks expecting to earn average returns
- Not willing to take any financial risks

Appendix H - Compensation study experimental instrument

Overview and consent

Thank you for agreeing to participate in this exercise.

Participation in this study is completely voluntary and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. The information we obtain from you will be dealt with in a manner that ensures you remain anonymous.

This research concerns financial statement disclosures.

First, you will be shown the following three (3) financial statements, relating to 2015, 2016 and 2017, of an S&P500 Health Care company:

1. A reconciliation between GAAP and non-GAAP financial measures
2. Consolidated Statement of Income
3. Consolidated Balance Sheet

Second, you will be asked your opinion regarding the company's investment potential.

Third, you will be asked to complete a financial reporting questionnaire. There are fourteen (14) questions that should take you approximately 5-10 minutes.

Finally, there are some questions about you and your investment experience. It is estimated the entire exercise will take approximately 15-20 minutes to complete.

Should you have any complaints concerning the manner in which this research is being conducted please contact:

Bond University Human Research Ethics Committee
Office of Research Services
Bond University, Gold Coast, 4229, Australia
Tel: +61 7 5595 4194
Fax: +61 7 5595 1120
Email: ethics@bond.edu.au

Instructional manipulation check

This survey concerns the opinions of participants in the fields of business and finance. The survey might ask participants *which of the following factors are most important in terms of influencing the future performance of an organization*. We are also interested in determining whether people read the questions carefully. To confirm that you have read this instruction, assume that you believe "Management" and "Political connections" are the most important influence on the future performance of an organization. That's right, only select these two options.

- Global political events
- Technological advantages
- National economic policy
- Corporate governance policies
- Political connections
- Historical performance
- Management
- Competitive advantage
- Intellectual property
- All of the above

Experimental materials (four treatments)

Treatment 1: Non-GAAP used for compensation and firm reports GAAP profit (Additional treatments are located at the end of this instrument)

Health Solutions Inc. is a global health care company that delivers innovative health solutions through its prescription medicines, vaccines, biologic therapies, and animal health products. Evaluate the following information as if it is Quarter 1, 2018. That is, these are the most recent financials issued by the Company.

Below is an extract from the Company's 10-K filing.

Full Year 2017 Results

Health Solutions reported worldwide sales were \$24.1b for the full year ended 31 December 2017. This result represents an increase of 1% over the prior corresponding period.

On a **GAAP** basis, the gross margin was 68.2 percent for the full year of 2017 compared to 65.1 percent for the full year of 2016. The **non-GAAP** gross margin was 76.4 percent for the full year of 2017 compared to 75.7 percent for the full year of 2016.

Full-year 2017 **GAAP** EPS was \$0.52 while full-year **non-GAAP** EPS was \$2.39.

Non-GAAP income and **non-GAAP** EPS are alternative views of the Company's performance that Health Solutions provides because we believe this information enhances investors' understanding of the Company's results as it permits investors to understand how management assesses performance.

The **non-GAAP** measures described below are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are also used to evaluate senior management and are a factor in determining executive performance-based compensation.

Health Solutions

A reconciliation between GAAP financial measures and non-GAAP financial measures is as follows

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Income before taxes as reported under GAAP	3,913	2,795	3,241
Increase (decrease) for excluded items:			
Acquisition and divestiture-related costs	2,256	4,387	3,239
Restructuring costs	556	641	666
Other items:			
Aggregate charge related to the formation of a joint venture	1,410	-	-
Charge related to the settlement of patent litigation	-	375	-
Foreign currency devaluation	-	-	526
Net charge related to the settlement of shareholder class action litigation	-	-	408
Gain on sale of certain clinical development programs	-	-	(150)
Gain on divestiture of certain products	-	-	(88)
Other	(10)	(40)	(20)
Non-GAAP income before taxes	8,125	8,159	7,820
Taxes on income as reported under GAAP	2,462	431	565
Estimated tax benefit on excluded items	471	1,393	882
Provisional net tax charge related to the enactment of the TCJA	(1,575)	-	-
Net tax benefits from the settlements of certain federal income tax issues	140	-	246
Tax benefit related to the settlement of a state income tax issue	53	-	-
Non-GAAP taxes on income	1,551	1,823	1,693
Non-GAAP net income	6,574	6,335	6,127
Less: Net income attributable to noncontrolling interests	14	13	10
Non-GAAP net income	6,560	6,323	6,117
Shares used to calculate EPS (millions)	2,750	2,790	2,840
Non-GAAP EPS	2.39	2.27	2.15

Health Solutions

Consolidated Statement of Income

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Sales	24,073	23,884	23,699
Costs, Expenses and Other			
Materials and production	7,665	8,335	8,960
Marketing and administrative	5,898	5,857	6,188
Research and development	6,125	6,074	4,022
Restructuring costs	466	391	371
Other (income) expense, net	7	432	916
	20,161	21,089	20,458
Income Before Taxes	3,913	2,795	3,241
Taxes on Income	2,462	431	565
Net Income	1,451	2,365	2,675
Less: Net Income Attributable to Noncontrolling Interests	14	13	10
Net Income	1,436	2,352	2,665
Shares used to calculate EPS (millions)	2,750	2,790	2,840
GAAP EPS	0.52	0.84	0.94

Health Solutions
Consolidated Balance Sheet
Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Assets			
Current Assets			
Cash and cash equivalents	3,655	3,909	5,114
Accounts receivable	4,124	4,211	3,890
Inventories	3,058	2,920	2,820
Other current assets	4,023	7,329	6,026
Total current assets	14,860	18,368	17,851
Investments	7,275	6,850	7,823
Property, Plant and Equipment, Net	7,463	7,216	7,504
Goodwill	10,970	10,897	10,634
Other Intangibles, Net	8,510	10,383	13,561
Other Assets	3,645	3,512	3,633
Total Assets	52,723	57,226	61,006
Liabilities and Equity			
Current Liabilities			
Trade accounts payable	1,861	1,684	1,520
Accrued and other current liabilities	8,090	6,505	8,279
Income taxes and dividends payable	1,217	2,133	1,721
Total current liabilities	11,168	10,322	11,521
Long-Term Debt	12,812	14,564	14,297
Other Noncurrent Liabilities	8,002	8,155	8,328
Stockholders' Equity			
Common stock and other paid-in capital	25,014	25,036	25,206
Retained earnings	21,864	23,344	24,720
Less treasury stock, at cost:	(26,276)	(24,328)	(23,120)
Total stockholders' equity	20,602	24,053	26,806
Noncontrolling Interests	140	132	55
Total equity	20,741	24,185	26,860
Total Liabilities and Equity	52,723	57,226	61,006

Full-year 2017 **GAAP** EPS was \$0.52 while full-year **non-GAAP** EPS was \$2.39.

The **non-GAAP** measures described above are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are also used to evaluate senior management and are a factor in determining executive performance-based compensation.

Manipulation reinforcement

How does Health Solutions' management use *non-GAAP* financial measures? Select all that apply.

- making operating decisions
 - allocating financial resources
 - determining dividend amounts
 - evaluating senior management
 - determining executive performance-based compensation
-

Select the options that best describes Health Solutions' earnings for 2017?

	Profit	Loss
<i>GAAP</i> earnings	<input type="radio"/>	<input type="radio"/>
<i>Non-GAAP</i> earnings	<input type="radio"/>	<input type="radio"/>

You may use the "Previous" and "Next" arrows at the bottom of this page to switch views between the financial statements and these questions.

Investor judgment question set

How do you rate Health Solutions' **earnings performance** for the year ended December 31, 2017?

- Very Weak 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Strong 10

How do you rate Health Solutions' **earnings potential** over the next two years?

- Very Weak 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Strong 10

Assume:

- (1) you already own a diversified stock portfolio.
- (2) you have another \$10,000 to invest in a stock.

How much of the \$10,000 you would invest in Health Solutions?

- Nothing at all 0
- 1,000
- 2,000
- 3,000
- 4,000
- 5,000
- 6,000
- 7,000
- 8,000
- 9,000
- The Entire Amount 10,000

One of the next two questions is shown depending on treatment (GAAP profit or GAAP loss)

Using the options below, estimate Health Solutions' earnings per share (EPS) at the end of the next fiscal year (i.e., December 31, 2018).

- 0
- \$0.30
- \$0.60
- \$0.90
- \$1.20
- \$1.50
- \$1.80
- \$2.10
- \$2.40
- \$2.70
- \$3.00

Using the options below, estimate Health Solutions' earnings (loss) per share (EPS) at the end of the next fiscal year (i.e., December 31, 2018).

- (\$2.00)
- (\$1.60)
- (\$1.20)
- (\$0.80)
- (\$0.40)
- 0
- \$0.40
- \$0.80
- \$1.20
- \$1.60
- \$2.00

How realistic were the materials provided to you?

- Not at all Realistic 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Realistic 10

How sufficient were the materials for the purposes of forecasting?

- Not at all Sufficient 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Sufficient 10

Please provide any comments you deem relevant (about your predictions or the materials).

Decision making question set

In determining your \$10,000 investment decision earlier, which of the following did you find the most useful?

- GAAP measures
- Non-GAAP measures
- Both measures equally
- Neither measure

How useful do you believe the following are in determining Health Solutions' **current** earnings performance?

	Not at all Useful	1	2	3	4	5	6	7	8	9	Very Useful
	0										10
GAAP earnings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-GAAP earnings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How useful do you believe the following are in determining Health Solutions' **future** years' earnings potential?

	Not at all Useful	1	2	3	4	5	6	7	8	9	Very Useful
	0										10
GAAP earnings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-GAAP earnings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Why do you believe Health Solutions' management discloses non-GAAP earnings measures?

	Strongly disagree			Neither agree nor disagree			Strongly agree
	-3	-2	-1	0	1	2	3
To inform investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To mislead investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Attention checks

Did Health Solutions use **non-GAAP** earnings to evaluate senior management or as a factor in determining executive performance-based compensation.?

- Yes
- No

What were Health Solutions' reported **GAAP** earnings?

- Profit
- Loss

How did Health Solutions' use of **non-GAAP** financial measures in calculating executive performance-based compensation affect your previous responses?

	Not at all affected	1	2	3	4	5	6	7	8	9	Very much affected
	0										10
Current earnings performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Future earnings potential	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decision to invest \$10,000	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Earnings per share estimate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demographic information

Prior to participating in this study, indicate your familiarity with *non-GAAP* financial measures.

	True
I had heard of the term non-GAAP earnings.	<input type="checkbox"/>
I understood that non-GAAP earnings was an earnings measure sometimes reported by firms in addition to GAAP earnings.	<input type="checkbox"/>
I knew which items firms typically excluded from non-GAAP earnings.	<input type="checkbox"/>
I had analyzed the financial performance of a firm that reported non-GAAP earnings.	<input type="checkbox"/>
I had invested in a firm that reports non-GAAP earnings.	<input type="checkbox"/>

What is the highest level of education you have attained?

- Less than high school degree
- High school graduate
- Some university/college but no degree
- Bachelor's degree
- Master's degree
- Doctoral degree

Do you have any professional qualifications? Select if applicable.

	Yes
Certified Public Accountant (CPA)	<input type="checkbox"/>
Chartered Financial Analyst (CFA)	<input type="checkbox"/>
Certified Management Accountant (CMA)	<input type="checkbox"/>
Other accounting qualifications (eg CIMA, IPA, NIA, etc)	<input type="checkbox"/>

If you work in the finance sector, which best describes your position?

- Audit
- Corporate Finance
- Financial Analysis / Research / Reporting
- Fund Accounting
- Investment Management
- I do not work in Finance

Approximately how many years experience do you have working in the finance sector?

Do you actively participate in stock trading?

- Yes
- No

Approximately how many years stock trading experience do you have?

When purchasing stocks, what typical time period do you invest for?

- A few days
- A few months
- The next year
- The next few years
- The next 5 to 10 years
- Longer than 10 years
- Not applicable

Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments?

- Take substantial financial risk expecting to earn substantial returns
- Take above average financial risks expecting to earn above average returns
- Take average financial risks expecting to earn average returns
- Not willing to take any financial risks

Treatment 2: Non-GAAP not used for compensation and firm reports GAAP profit

Health Solutions Inc. is a global health care company that delivers innovative health solutions through its prescription medicines, vaccines, biologic therapies, and animal health products. Evaluate the following information as if it is Quarter 1, 2018. That is, these are the most recent financials issued by the Company.

Below is an extract from the Company's 10-K filing.

Full Year 2017 Results

Health Solutions reported worldwide sales were \$24.1b for the full year ended 31 December 2017. This result represents an increase of 1% over the prior corresponding period.

On a **GAAP** basis, the gross margin was 68.2 percent for the full year of 2017 compared to 65.1 percent for the full year of 2016. The **non-GAAP** gross margin was 76.4 percent for the full year of 2017 compared to 75.7 percent for the full year of 2016.

Full-year 2017 **GAAP** EPS was \$0.52 while full-year **non-GAAP** EPS was \$2.39.

Non-GAAP income and **non-GAAP** EPS are alternative views of the Company's performance that Health Solutions provides because we believe this information enhances investors' understanding of the Company's results as it permits investors to understand how management assesses performance.

The **non-GAAP** measures described below are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are **not** used to evaluate senior management and are **not** a factor in determining executive performance-based compensation.

Health Solutions

A reconciliation between GAAP financial measures and non-GAAP financial measures is as follows

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Income before taxes as reported under GAAP	3,913	2,795	3,241
Increase (decrease) for excluded items:			
Acquisition and divestiture-related costs	2,256	4,387	3,239
Restructuring costs	556	641	666
Other items:			
Aggregate charge related to the formation of a joint venture	1,410	-	-
Charge related to the settlement of patent litigation	-	375	-
Foreign currency devaluation	-	-	526
Net charge related to the settlement of shareholder class action litigation	-	-	408
Gain on sale of certain clinical development programs	-	-	(150)
Gain on divestiture of certain products	-	-	(88)
Other	(10)	(40)	(20)
Non-GAAP income before taxes	8,125	8,159	7,820
Taxes on income as reported under GAAP	2,462	431	565
Estimated tax benefit on excluded items	471	1,393	882
Provisional net tax charge related to the enactment of the TCJA	(1,575)	-	-
Net tax benefits from the settlements of certain federal income tax issues	140	-	246
Tax benefit related to the settlement of a state income tax issue	53	-	-
Non-GAAP taxes on income	1,551	1,823	1,693
Non-GAAP net income	6,574	6,335	6,127
Less: Net income attributable to noncontrolling interests	14	13	10
Non-GAAP net income	6,560	6,323	6,117
Shares used to calculate EPS (millions)	2,750	2,790	2,840
Non-GAAP EPS	2.39	2.27	2.15

Health Solutions**Consolidated Statement of Income**

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Sales	24,073	23,884	23,699
Costs, Expenses and Other			
Materials and production	7,665	8,335	8,960
Marketing and administrative	5,898	5,857	6,188
Research and development	6,125	6,074	4,022
Restructuring costs	466	391	371
Other (income) expense, net	7	432	916
	20,161	21,089	20,458
Income Before Taxes	3,913	2,795	3,241
Taxes on Income	2,462	431	565
Net Income	1,451	2,365	2,675
Less: Net Income Attributable to Noncontrolling Interests	14	13	10
Net Income	1,436	2,352	2,665
Shares used to calculate EPS (millions)	2,750	2,790	2,840
GAAP EPS	0.52	0.84	0.94

Health Solutions
Consolidated Balance Sheet
Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Assets			
Current Assets			
Cash and cash equivalents	3,655	3,909	5,114
Accounts receivable	4,124	4,211	3,890
Inventories	3,058	2,920	2,820
Other current assets	4,023	7,329	6,026
Total current assets	14,860	18,368	17,851
Investments	7,275	6,850	7,823
Property, Plant and Equipment, Net	7,463	7,216	7,504
Goodwill	10,970	10,897	10,634
Other Intangibles, Net	8,510	10,383	13,561
Other Assets	3,645	3,512	3,633
Total Assets	52,723	57,226	61,006
Liabilities and Equity			
Current Liabilities			
Trade accounts payable	1,861	1,684	1,520
Accrued and other current liabilities	8,090	6,505	8,279
Income taxes and dividends payable	1,217	2,133	1,721
Total current liabilities	11,168	10,322	11,521
Long-Term Debt	12,812	14,564	14,297
Other Noncurrent Liabilities	8,002	8,155	8,328
Stockholders' Equity			
Common stock and other paid-in capital	25,014	25,036	25,206
Retained earnings	21,864	23,344	24,720
Less treasury stock, at cost	(26,276)	(24,328)	(23,120)
Total stockholders' equity	20,602	24,053	26,806
Noncontrolling Interests	140	132	55
Total equity	20,741	24,185	26,860
Total Liabilities and Equity	52,723	57,226	61,006

Full-year 2017 **GAAP** EPS was \$0.52 while full-year **non-GAAP** EPS was \$2.39.

The **non-GAAP** measures described above are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are **not** used to evaluate senior management and are **not** a factor in determining executive performance-based compensation.

Treatment 3: Non-GAAP used for compensation and firm reports GAAP loss

Health Solutions Inc. is a global health care company that delivers innovative health solutions through its prescription medicines, vaccines, biologic therapies, and animal health products. Evaluate the following information as if it is Quarter 1, 2018. That is, these are the most recent financials issued by the Company.

Below is an extract from the Company's 10-K filing.

Full Year 2017 Results

Health Solutions reported worldwide sales were \$19.1b for the full year ended 31 December 2017. This result represents an increase of 1% over the prior corresponding period.

On a **GAAP** basis, the gross margin was 53.0 percent for the full year of 2017 compared to 55.9 percent for the full year of 2016. The **non-GAAP** gross margin was 70.2 percent for the full year of 2017 compared to 69.3 percent for the full year of 2016.

Full-year 2017 **GAAP** earnings (loss) per share was (\$1.20) while full-year **non-GAAP** EPS was \$0.57.

Non-GAAP income and **non-GAAP** EPS are alternative views of the Company's performance that Health Solutions provides because we believe this information enhances investors' understanding of the Company's results as it permits investors to understand how management assesses performance.

The **non-GAAP** measures described below are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are also used to evaluate senior management and are a factor in determining executive performance-based compensation.

Health Solutions

A reconciliation between GAAP financial measures and non-GAAP financial measures is as follows

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Loss before taxes as reported under GAAP	(2,387)	(2,205)	(1,759)
Increase (decrease) for excluded items:			
Acquisition and divestiture-related costs	3,556	4,387	3,239
Restructuring costs	556	641	666
Other items:			
Aggregate charge related to the formation of a joint venture	1,410	-	-
Charge related to the settlement of patent litigation	-	375	-
Foreign currency devaluation	-	-	526
Net charge related to the settlement of shareholder class action litigation	-	-	408
Gain on sale of certain clinical development programs	-	-	(150)
Gain on divestiture of certain products	-	-	(88)
Other	(10)	(40)	(20)
Non-GAAP income before taxes	3,125	3,159	2,820
Taxes on income as reported under GAAP	887	431	565
Estimated tax benefit on excluded items	471	1,393	882
Net tax benefits from the settlements of certain federal income tax issues	140	-	246
Tax benefit related to the settlement of a state income tax issue	53	-	-
Non-GAAP taxes on income	1,551	1,823	1,693
Non-GAAP net income	1,574	1,335	1,127
Less: Net income attributable to noncontrolling interests	14	13	10
Non-GAAP net income	1,560	1,323	1,117
Shares used to calculate EPS (millions)	2,750	2,790	2,840
Non-GAAP EPS	0.57	0.47	0.39

Health Solutions

Consolidated Statement of Income

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Sales	19,073	18,884	18,699
Costs, Expenses and Other			
Materials and production	8,965	8,335	8,960
Marketing and administrative	5,898	5,857	6,188
Research and development	6,125	6,074	4,022
Restructuring costs	466	391	371
Other (income) expense, net	7	432	916
	21,461	21,089	20,458
Income Before Taxes	(2,387)	(2,205)	(1,759)
Taxes on Income	887	431	565
Net Income	(3,274)	(2,635)	(2,325)
Less: Net Income Attributable to Noncontrolling Interests	14	13	10
Net Loss	(3,289)	(2,648)	(2,335)
Shares used to calculate EPS (millions)	2,750	2,790	2,840
GAAP loss per share	(1.20)	(0.95)	(0.82)

Health Solutions
Consolidated Balance Sheet
Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Assets			
Current Assets			
Cash and cash equivalents	1,155	1,409	2,614
Accounts receivable	1,624	1,711	1,390
Inventories	3,058	2,920	2,820
Other current assets	4,023	7,329	6,026
Total current assets	9,860	13,368	12,851
Investments	7,275	6,850	7,823
Property, Plant and Equipment, Net	7,463	7,216	7,504
Goodwill	10,970	10,897	10,634
Other Intangibles, Net	8,510	10,383	13,561
Other Assets	3,645	3,512	3,633
Total Assets	47,723	52,226	56,006
Liabilities and Equity			
Current Liabilities			
Trade accounts payable	1,861	1,684	1,520
Accrued and other current liabilities	8,090	6,505	8,279
Income taxes and dividends payable	1,217	2,133	1,721
Total current liabilities	11,168	10,322	11,521
Long-Term Debt	12,812	14,564	14,297
Other Noncurrent Liabilities	8,002	8,155	8,328
Stockholders' Equity			
Common stock and other paid-in capital	25,014	25,036	25,206
Retained earnings	16,864	18,344	19,720
Less treasury stock, at cost:	(26,276)	(24,328)	(23,120)
Total stockholders' equity	15,602	19,053	21,806
Noncontrolling Interests	140	132	55
Total equity	15,741	19,185	21,860
Total Liabilities and Equity	47,723	52,226	56,006

Full-year 2017 **GAAP** earnings (loss) per share was (\$1.20) while full-year **non-GAAP** EPS was \$0.57.

The **non-GAAP** measures described above are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are also used to evaluate senior management and are a factor in determining executive performance-based compensation.

Treatment 4: Non-GAAP not used for compensation and firm reports GAAP loss

Health Solutions Inc. is a global health care company that delivers innovative health solutions through its prescription medicines, vaccines, biologic therapies, and animal health products. Evaluate the following information as if it is Quarter 1, 2018. That is, these are the most recent financials issued by the Company.

Below is an extract from the Company's 10-K filing.

Full Year 2017 Results

Health Solutions reported worldwide sales were \$19.1b for the full year ended 31 December 2017. This result represents an increase of 1% over the prior corresponding period.

On a **GAAP** basis, the gross margin was 53.0 percent for the full year of 2017 compared to 55.9 percent for the full year of 2016. The **non-GAAP** gross margin was 70.2 percent for the full year of 2017 compared to 69.3 percent for the full year of 2016.

Full-year 2017 **GAAP** earnings (loss) per share was (\$1.20) while full-year **non-GAAP** EPS was \$0.57.

Non-GAAP income and **non-GAAP** EPS are alternative views of the Company's performance that Health Solutions provides because we believe this information enhances investors' understanding of the Company's results as it permits investors to understand how management assesses performance.

The **non-GAAP** measures described below are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are **not** used to evaluate senior management and are **not** a factor in determining executive performance-based compensation.

Health Solutions**A reconciliation between GAAP financial measures and non-GAAP financial measures is as follows***Years Ended December 31*

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Loss before taxes as reported under GAAP	(2,387)	(2,205)	(1,759)
Increase (decrease) for excluded items:			
Acquisition and divestiture-related costs	3,556	4,387	3,239
Restructuring costs	556	641	666
Other items:			
Aggregate charge related to the formation of a joint venture	1,410	-	-
Charge related to the settlement of patent litigation	-	375	-
Foreign currency devaluation	-	-	526
Net charge related to the settlement of shareholder class action litigation	-	-	408
Gain on sale of certain clinical development programs	-	-	(150)
Gain on divestiture of certain products	-	-	(88)
Other	(10)	(40)	(20)
Non-GAAP income before taxes	3,125	3,159	2,820
Taxes on income as reported under GAAP	887	431	565
Estimated tax benefit on excluded items	471	1,393	882
Net tax benefits from the settlements of certain federal income tax issues	140	-	246
Tax benefit related to the settlement of a state income tax issue	53	-	-
Non-GAAP taxes on income	1,551	1,823	1,693
Non-GAAP net income	1,574	1,335	1,127
Less: Net income attributable to noncontrolling interests	14	13	10
Non-GAAP net income	1,560	1,323	1,117
Shares used to calculate EPS (millions)	2,750	2,790	2,840
Non-GAAP EPS	0.57	0.47	0.39

Health Solutions**Consolidated Statement of Income***Years Ended December 31*

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Sales	19,073	18,884	18,699
Costs, Expenses and Other			
Materials and production	8,965	8,335	8,960
Marketing and administrative	5,898	5,857	6,188
Research and development	6,125	6,074	4,022
Restructuring costs	466	391	371
Other (income) expense, net	7	432	916
	21,461	21,089	20,458
Income Before Taxes	(2,387)	(2,205)	(1,759)
Taxes on Income	887	431	565
Net Income	(3,274)	(2,635)	(2,325)
Less: Net Income Attributable to Noncontrolling Interests	14	13	10
Net Loss	(3,289)	(2,648)	(2,335)
Shares used to calculate EPS (millions)	2,750	2,790	2,840
GAAP loss per share	(1.20)	(0.95)	(0.82)

Health Solutions
Consolidated Balance Sheet
Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2017	2016	2015
Assets			
Current Assets			
Cash and cash equivalents	1,155	1,409	2,614
Accounts receivable	1,624	1,711	1,390
Inventories	3,058	2,920	2,820
Other current assets	4,023	7,329	6,026
Total current assets	9,860	13,368	12,851
Investments	7,275	6,850	7,823
Property, Plant and Equipment, Net	7,463	7,216	7,504
Goodwill	10,970	10,897	10,634
Other Intangibles, Net	8,510	10,383	13,561
Other Assets	3,645	3,512	3,633
Total Assets	47,723	52,226	56,006
Liabilities and Equity			
Current Liabilities			
Trade accounts payable	1,861	1,684	1,520
Accrued and other current liabilities	8,090	6,505	8,279
Income taxes and dividends payable	1,217	2,133	1,721
Total current liabilities	11,168	10,322	11,521
Long-Term Debt	12,812	14,564	14,297
Other Noncurrent Liabilities	8,002	8,155	8,328
Stockholders' Equity			
Common stock and other paid-in capital	25,014	25,036	25,206
Retained earnings	16,864	18,344	19,720
Less treasury stock, at cost:	(26,276)	(24,328)	(23,120)
Total stockholders' equity	15,602	19,053	21,806
Noncontrolling Interests	140	132	55
Total equity	15,741	19,185	21,860
Total Liabilities and Equity	47,723	52,226	56,006

Full-year 2017 **GAAP** earnings (loss) per share was (\$1.20) while full-year **non-GAAP** EPS was \$0.57.

The **non-GAAP** measures described above are used by management in making operating decisions, allocating financial resources and for business strategy purposes. The **non-GAAP** measures are **not** used to evaluate senior management and are **not** a factor in determining executive performance-based compensation.

Appendix I - Justification study experimental treatments

Treatment 1 – low ambiguity

Health Solutions, Inc. Reports Full Year Results

KENILWORTH, N.J. — Feb, 1 2019 — (BUSINESS WIRE) — Health Solutions (NYSE:HSN), today announced financial results for the full year 2018.

Financial Summary

\$ in millions, except EPS amounts	FY 2018	FY 2017	Change
Sales	\$ 35,788	\$ 35,448	1%
GAAP net income/(loss)	(3,688)	(3,114)	-18%
GAAP EPS	(1.32)	(1.10)	-21%
Non-GAAP net income *	3,592	3,215	10%
Non-GAAP EPS *	1.29	1.13	14%

“The full-year 2018 was a strong one with the financial results coming in line with guidance issued by management. Health Solutions has made substantial progress on many scientific and commercial fronts,” said Troy G. Corser, chairman and chief executive officer. “The full-year results further bolster our confidence in Health Solutions’ innovation-based strategy. Our key pillars are expected to help drive sustainable growth over the medium to long-term. We enter 2019 with good momentum, anticipating the many opportunities afforded by our broad and differentiated portfolio and pipeline.”

* Management believes the non-GAAP financial measures provide investors with relevant and useful information. They enable a clearer comparison of financial results from one period to another. Non-GAAP measures remove one-off items that are not related to business performance. These measures also allow for greater transparency of the key metrics used by management in operating our business and measuring our performance. We believe making these adjustments allows investors to more easily evaluate our current operating performance and compare past operating results.

Financial Outlook

Health Solutions anticipates full-year 2019 sales to be between \$34.9 billion and \$36.5 billion and full-year 2019 GAAP EPS to be between (\$1.39) and (\$1.44). Health Solutions expects its full-year 2019 non-GAAP EPS to be between \$1.33 and \$1.38.

Treatment 2 – high ambiguity

Health Solutions, Inc. Reports Full Year Results

KENILWORTH, N.J. — Feb, 1 2019 — (BUSINESS WIRE) — Health Solutions (NYSE:HSN), today announced financial results for the full year 2018.

Financial Summary

\$ in millions, except EPS amounts	FY 2018	FY 2017	Change
Sales	\$ 35,788	\$ 35,448	1%
GAAP net income/(loss)	(3,688)	(3,114)	-18%
GAAP EPS	(1.32)	(1.10)	-21%
Non-GAAP net income *	3,592	3,215	10%
Non-GAAP EPS *	1.29	1.13	14%

“The full-year 2018 was a strong one with the financial results coming in line with guidance issued by management. Health Solutions has made substantial progress on many scientific and commercial fronts,” said Troy G. Corser, chairman and chief executive officer. “The full-year results further bolster our confidence in Health Solutions’ innovation-based strategy. Our key pillars are expected to help drive sustainable growth over the medium to long-term. We enter 2019 with good momentum, anticipating the many opportunities afforded by our broad and differentiated portfolio and pipeline.”

* Management believes the non-GAAP financial measures are relevant and useful to investors. These measures are used by management as a method of evaluating operating performance. We believe they assist investors in their decision making.

Financial Outlook

Health Solutions anticipates full-year 2019 sales to be between \$34.9 billion and \$36.5 billion and full-year 2019 GAAP EPS to be between (\$1.39) and (\$1.44). Health Solutions expects its full-year 2019 non-GAAP EPS to be between \$1.33 and \$1.38.

Treatment 3 – null disclosure

Health Solutions, Inc. Reports Full Year Results

KENILWORTH, N.J. — Feb, 1 2019 — (BUSINESS WIRE) — Health Solutions (NYSE:HSN), today announced financial results for the full year 2018.

Financial Summary

\$ in millions, except EPS amounts	FY 2018	FY 2017	Change
Sales	\$ 35,788	\$ 35,448	1%
GAAP net income/(loss)	(3,688)	(3,114)	-18%
GAAP EPS	(1.32)	(1.10)	-21%
Non-GAAP net income	3,592	3,215	10%
Non-GAAP EPS	1.29	1.13	14%

“The full-year 2018 was a strong one with the financial results coming in line with guidance issued by management. Health Solutions has made substantial progress on many scientific and commercial fronts,” said Troy G. Corser, chairman and chief executive officer. “The full-year results further bolster our confidence in Health Solutions’ innovation-based strategy. Our key pillars are expected to help drive sustainable growth over the medium to long-term. We enter 2019 with good momentum, anticipating the many opportunities afforded by our broad and differentiated portfolio and pipeline.”

Financial Outlook

Health Solutions anticipates full-year 2019 sales to be between \$34.9 billion and \$36.5 billion and full-year 2019 GAAP EPS to be between (\$1.39) and (\$1.44). Health Solutions expects its full-year 2019 non-GAAP EPS to be between \$1.33 and \$1.38.

Appendix J - Justification study supplemental materials

Analyst report

Health Solutions, Inc. Feb 4, 2019 Prepared by MarketWatch

Company Overview:

Health Solutions, Inc. engages in the provision of health services through its prescription medicines, vaccines, biologic therapies, and consumer care products. It operates through the following segments: Pharmaceutical, Healthcare Services, and Alliances. The Alliances segment includes results from the Company's relationship with joint venture partners. The company was founded in 1891 and is headquartered in Kenilworth, NJ.

At a Glance

Industry	Pharmaceuticals
Fiscal Year-end	12/2019
Revenue	\$35.79 B
Employees	42,000
NYSE	HSN

Key Financials:

P/E	23.02
Dividend Yield	2.61%
Current Ratio	1.36
Gross Margin	57.3
Mkt Cap (USD)	60,530 M
Share Price (2/3/19)	52.50

Snapshot:

Average Recommendation	HOLD
Number of Ratings	17
Average Target Price	52.75
Median Target Price	53.10

Analyst Recommendations:

	Current	1 Month Ago	3 Months Ago
BUY	1	1	0
OVERWEIGHT	2	3	3
HOLD	11	10	11
UNDERWEIGHT	3	1	2
SELL	0	2	1
MEAN	HOLD	HOLD	HOLD

GAAP to non-GAAP reconciliation

Health Solutions

A reconciliation between GAAP financial measures and non-GAAP financial measures is as follows

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2018	2017
Income before taxes as reported under GAAP	(2,875)	(2,059)
Increase (decrease) for excluded items:		
Acquisition and divestiture-related costs	8,043	5,938
Restructuring costs	1,176	1,221
Other items:		
Charge related to the settlement of patent litigation	688	-
Foreign currency devaluation	-	964
Net charge related to the settlement of shareholder class action litigation	-	748
Gain on sale of certain clinical development programs	-	(275)
Gain on divestiture of certain products	-	(162)
Other	(74)	(37)
Non-GAAP income before taxes	6,958	6,337
Taxes on income as reported under GAAP	790	1,036
Estimated tax benefit on excluded items	2,553	1,617
Net tax benefits from the settlements of certain federal income tax issues	-	451
Non-GAAP taxes on income	3,343	3,104
Non-GAAP net income	3,615	3,233
Less: Net income attributable to noncontrolling interests	23	19
Non-GAAP net income (Loss)	3,592	3,215
Shares used to calculate EPS (millions)	2,790	2,840
Non-GAAP EPS	1.29	1.13

Statement of Income and Balance Sheet

Health Solutions

Consolidated Statement of Income

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2018	2017
Sales	35,788	35,448
Costs, Expenses and Other		
Materials and production	15,280	16,427
Marketing and administrative	10,738	11,344
Research and development	11,136	7,374
Restructuring costs	716	681
Other (income) expense, net	792	1,680
	38,663	37,507
Income Before Taxes	(2,875)	(2,059)
Taxes on Income	790	1,036
Net Income	(3,665)	(3,095)
Less: Net Income Attributable to Noncontrolling Interests	23	19
Net Income (Loss)	(3,688)	(3,114)
Shares used to calculate EPS (millions)	2,790	2,840
GAAP EPS	(1.32)	(1.10)

Health Solutions

Consolidated Balance Sheet

Years Ended December 31

<i>(\$ in millions except per share amounts)</i>	2018	2017
Assets		
Total current assets	25,675	24,726
Total noncurrent assets	71,239	79,119
Total Assets	96,915	103,845
Liabilities and Equity		
Total current liabilities	18,924	21,121
Long-term debt	26,701	26,212
Other noncurrent liabilities	14,950	15,268
Stockholders' equity	36,339	41,244
Total Liabilities and Equity	96,915	103,845

Appendix K - Original SEC justifications and management commentary (unedited)

Low ambiguity:

“We believe these non-GAAP financial measures provide investors with useful supplemental information about the financial performance of our business, enable comparison of financial results between periods where certain items may vary independent of business performance, and allow for greater transparency with respect to key metrics used by management in operating our business and measuring our performance. We believe making these adjustments facilitates a better evaluation of our current operating performance and comparisons to past operating results.”¹⁰⁸

High ambiguity:

“We believe the following measure is relevant and useful information to investors as it is used by management as a method of comparing performance with that of many of our competitors.”¹⁰⁹

Management commentary:

“Last year was a strong one for Merck marked by substantial progress on scientific and commercial fronts,” said Kenneth C. Frazier, chairman and chief executive officer, Merck. “The fourth-quarter and full-year results further bolster our confidence in Merck’s innovation-based strategy in which our key pillars - oncology, vaccines, animal health, and select hospital and specialty care products - are expected to drive sustainable growth over the long-term. We enter 2019 with good momentum, anticipating the many opportunities afforded by our broad and differentiated portfolio and pipeline.”

¹¹⁰

¹⁰⁸ Intel Corporation (NASDAQ: INTC) Form 10-K December 30, 2017.

<https://www.sec.gov/Archives/edgar/data/50863/000005086318000007/a12302017q4-10kdocument.htm>

¹⁰⁹ AT&T Inc (NYSE: T) Form 10-Q September 30, 2017.

https://www.sec.gov/Archives/edgar/data/732717/000073271717000101/q3_10q.htm

¹¹⁰ Merck (NYSE: MRK) news release February 1, 2019. <https://www.merck.com/news/merck-announces-fourth-quarter-and-full-year-2018-financial-results/>

Appendix L - Justification study experimental instrument

Overview and consent

Thank you for agreeing to participate in this research.

Participation in this study is completely voluntary and you may withdraw at any time without risking any negative consequences. If you choose to withdraw your participation in this study, the information you have provided will be immediately destroyed. If you complete the study, the information we obtain from you will be dealt with in a manner that ensures you remain anonymous.

This task will take about 15 minutes to complete and must be done in a single sitting. If you do not have 15 minutes, please do not start the study.

This research concerns financial statement disclosures. Your task today is to:

1. Answer seven (7) questions regarding financial reporting.
2. Evaluate a press release of the full-year earnings for an S&P500 Health Care company.

At the end of the task there are some questions about you and your investment experience.

Should you have any complaints concerning the manner in which this research is being conducted please contact:

Bond University Human Research Ethics Committee
Office of Research Services
Bond University, Gold Coast, 4229, Australia
Tel: +61 7 5595 4194
Fax: +61 7 5595 1120
Email: ethics@bond.edu.au

Instructional manipulation check

This survey concerns the opinions of participants in the fields of business and finance. The survey might ask participants *which of the following factors are most important in terms of influencing the future performance of an organization*. We are also interested in determining whether people read the questions carefully. To confirm that you have read this instruction, assume that you believe "Competitive advantage" and "National economic policy" are the most important factors that influence the future performance of an organization, and select these options below. That's right, only select these two options.

- Global political events
- Technological advantages
- National economic policy
- Corporate governance policies
- Political connections
- Historical performance
- Management
- Competitive advantage
- Intellectual property
- All of the above

Financial reporting knowledge quiz

The next page contains seven (7) financial reporting questions. To help us interpret the results, we would like to understand your level of knowledge before you begin the task.

Financial reports consist of multiple statements. To confirm you are reading the questions, select 'Income Statement'.

- Balance sheet
- Income Statement
- Cash Flow Statement
- Changes in Equity Statement

If you buy a company's bond...

- You own part of the company
- You have lent money to the company
- You are liable for the company's debts
- You can vote on shareholder resolutions

Which is the best definition of "selling short"?

- Selling shares of a stock shortly after buying it
- Selling shares of a stock before it has reached its peak
- Selling shares of a stock at a loss
- Selling borrowed shares of a stock

Non-GAAP financial measures:

- Do not appear in corporate filings or annual reports
- Can vary depending on the company reporting them
- Are audited in the same manner as GAAP financial measures
- Are defined by accounting standards

Which of the following is NOT a liability?

- Provision for long service leave
- Interest payable
- Share capital
- Creditors

If interest rates rise, what will typically happen to bond prices? Rise, fall, stay the same, or is there no relationship?

- Rise
- Fall
- Stay the same
- No relationship
- Don't know

What is the purpose of an income statement?

- To summarize all changes in assets and liabilities for an accounting period
- To summarize all financing and investing activities for an accounting period
- To summarize the results of operations for an accounting period
- To summarize the financial position at the end of an accounting period

Experimental materials (three treatments)

Today your task is to evaluate **Health Solutions Incorporated** based on some information provided to you.

A press release that was provided by Health Solutions Inc. is presented on the next page.

Please take the time to thoroughly review the press release in order to answer the questions that will follow. You will not be able to view the press release once you leave the next page. The success of this research depends on you paying careful attention to the task.

Participants are then shown one of three treatments.

1. Treatment 1 – low ambiguity
2. Treatment 2 – high ambiguity
3. Treatment 3 – null disclosure

Details can be seen in Appendix I - Justification study experimental treatments.

Supplemental materials

Investors have the option to access many sources of information before making an investment decision.

Listed below are some sources of information that you can access before you make your investment evaluation about Health Solutions.

You can review any of the sources that you would like. Alternatively, if you feel ready to make your investment evaluation, please select the option at the bottom labeled "I am ready to make my investment evaluation".

- MarketWatch Analyst Report
- GAAP to non-GAAP reconciliation
- Statement of Income and Balance Sheet
- I am ready to make my investment evaluation

Participants can view the above items as much as they want for as long as they want. Details of these items can be found in Appendix J - Justification study supplemental materials.

Investor judgments question set

How do you rate Health Solutions' **earnings performance** for the year ended December 31, 2018?

- Very Weak 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Strong 10

How do you rate Health Solutions' **earnings potential** over the next two years?

- Very Weak 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Strong 10

Assume:

(1) you already own a diversified stock portfolio. (2) you have another \$10,000 to invest in a stock. How much of the \$10,000 you would invest in Health Solutions?

- Nothing at all 0
- 1,000
- 2,000
- 3,000
- 4,000
- 5,000
- 6,000
- 7,000
- 8,000
- 9,000
- The Entire Amount 10,000

Decision making question set

(Question not displayed to participants exposed to treatment 3)

In determining your \$10,000 investment decision earlier, how did management's explanation for disclosing non-GAAP earnings measures affect your decision?

- Not at all affected 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very much affected 10

Why do you believe Health Solutions' management discloses non-GAAP earnings measures?

	Strongly disagree			Neither agree nor disagree			Strongly agree
	-3	-2	-1	0	1	2	3
To inform investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To mislead investors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How realistic were the materials provided to you?

- Not at all Realistic 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Realistic 10

How sufficient were the materials for the purposes of making an investment evaluation?

- Not at all Sufficient 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Very Sufficient 10

Please provide any comments you deem relevant (about your predictions or the materials).

Attention checks

Which option best describes Health Solutions' full-year 2018 **Non-GAAP Net Income**?

- Loss
- Breakeven
- Profit

Troy G. Corser holds which position at Health Solutions Inc.?

- Chief Executive Officer
- Chief Financial Officer
- Chief Operating Officer

Which of the following sources of additional information did you access in evaluating Health Solutions? (select all that apply)

- MarketWatch Analyst Report
- GAAP to non-GAAP reconciliation
- Statement of Income and Balance Sheet
- I did not access any of these sources of additional information**

(Following questions only displayed to participants who accessed supplemental materials)

In the MarketWatch report, what was the average analyst recommendation?

- BUY
- SELL
- HOLD

Which item was **not** part of the 2018 GAAP to non-GAAP reconciliation?

- Restructuring costs
- Acquisition and divestiture
- Foreign currency translation

In the Balance Sheet, **total assets** for Health Solutions in 2018 were:

- \$70.5 b
- \$96.9 b
- \$130.1 b

Demographic information

Prior to participating in this study, indicate your familiarity with *non-GAAP* financial measures.

	True
I had not heard of the term 'non-GAAP earnings'.	<input type="checkbox"/>
I had heard of the term 'non-GAAP earnings'.	<input type="checkbox"/>
I understood that non-GAAP earnings was an earnings measure sometimes reported by firms in addition to GAAP earnings.	<input type="checkbox"/>
I knew which items firms typically excluded from non-GAAP earnings.	<input type="checkbox"/>
I had analyzed the financial performance of a firm that reported non-GAAP earnings.	<input type="checkbox"/>
I had invested in a firm that reports non-GAAP earnings.	<input type="checkbox"/>

What is the highest level of education you have attained?

- Less than high school diploma
- High school graduate
- Some university/college but no degree
- Bachelor's degree
- Master's degree
- Doctoral degree

Do you have any professional qualifications? Select if applicable.

	Yes
Certified Public Accountant (CPA)	<input type="checkbox"/>
Chartered Financial Analyst (CFA)	<input type="checkbox"/>
Certified Management Accountant (CMA)	<input type="checkbox"/>
Other accounting qualifications (eg CIMA, CA, IPA, NIA, etc)	<input type="checkbox"/>

How much experience investing in individual stocks do you have?

- No experience 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of experience 10

How much knowledge of analyzing financial statements do you have?

- No knowledge 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- Great deal of knowledge 10

When purchasing stocks, what typical time period do you invest for?

- A few days
- A few months
- The next year
- The next few years
- The next 5 to 10 years
- Longer than 10 years
- Not applicable

Which of the following statements comes closest to the amount of financial risk that you are willing to take when you save or make investments?

- Take substantial financial risk expecting to earn substantial returns
- Take above average financial risks expecting to earn above average returns
- Take average financial risks expecting to earn average returns
- Not willing to take any financial risks