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**THE REAL EFFECT OF NON-GAAP DISCLOSURES AND
FINANCIAL REPORTING CONSISTENCY: AN
EXAMINATION OF MANAGERS' INVESTMENT CHOICES**

LUKAS J. HELIKUM

NANYANG BUSINESS SCHOOL

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LUKAS J. HELIKUM

Nanyang Business School

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SUMMARY

Firms increasingly report earnings measures that do not comply with Generally Accepted Accounting Principles (GAAP) in their financial disclosures. While prior work has examined the informativeness of these measures for investors and potential opportunistic behavior by firms, the objective of this study is to examine how a firm's disclosure of non-GAAP earnings affects managers' real economic decisions. I report the results of two experiments in which the presence and consistency of non-GAAP disclosures are independently manipulated. The results show that non-GAAP disclosures can lead managers discount costs that are subsequently excluded from the non-GAAP measure which can lead to suboptimal investment decisions. I also find that this effect is present only when managers focus on financial reporting implications and when the non-GAAP earnings figure is consistently defined over time which is important as auditors and regulators actively enforce consistent reporting. Jointly, the findings suggest that managers make a conscious decision to maximize reported non-GAAP performance when the firm has a policy of disclosing adjusted earnings measures even at the expense of the economic performance of the firm. These insights contribute to the accounting literature on non-GAAP reporting and the real effects of financial reporting. They also have important practical implications for firms as well as investors and can inform the ongoing debates by regulators and standard setters.

I. INTRODUCTION

Virtually all firms include earnings measures that do not comply with Generally Accepted Accounting Principles (GAAP) in their financial disclosures, with about 95% of S&P 500 companies reporting some type of non-GAAP measure in their earnings releases in 2017 (Dirk E Black, Christensen, Ciesielski, and Whipple 2017a; Erickson 2017).¹ While prior research focuses mostly on the informativeness of these measures for investors and potential opportunistic behavior by firms, the objective of this study is to examine whether and how a firm's disclosure of non-GAAP earnings affects managers' real economic decisions, such as investments, acquisitions, and divestitures.²

In line with the real effects hypothesis (Kanodia 2007), I posit that non-GAAP reporting can lead to suboptimal resource allocation decisions because it focuses managers' attention on an incomplete performance measure. Prior research shows that non-GAAP earnings disclosures have capital market consequences and affect how investors perceive firm performance (Brown and Sivakumar 2003; Elliott 2006). However, non-GAAP earnings are typically calculated by excluding items from the closest GAAP-measure, for example, Net Income. The most common non-GAAP adjustments are related to restructurings, acquisitions, and litigation (CFA Institute 2016; Dirk E Black, Christensen, Ciesielski, and Whipple 2017b). I expect that executives will discount costs that

¹ Non-GAAP measures are sometimes also referred to as pro-forma earnings, alternative performance measures (APMs), management (operational) performance measures, or NGFMs (non-GAAP financial measures). For simplicity, I am using the term "non-GAAP" which is in line with the terminology used in the US-context.

² Following Kanodia (2007), "real effect" of accounting disclosure describes the impact of financial reporting on firms' resource-allocation decisions.

are subsequently excluded from non-GAAP performance measures when the firm has a policy of disclosing non-GAAP earnings alongside traditional GAAP earnings. This can lead to suboptimal economic decisions when excluded expenses are economically relevant.^{3,4} I also explore whether a manager's focus on financial reporting and the financial reporting consistency, in addition to the mere presence of non-GAAP earnings, affect managerial resource allocation decisions.⁵

This research is timely given the recent interest of regulators and standard setters in this issue (IASB 2017). While non-GAAP reporting has been widely adopted across industries, the practice remains controversial and is frequently debated (Dirk E Black et al. 2017a; International Organization of Securities Commissions 2016; Young 2014). A potential adverse effect of non-GAAP financial reporting is important to examine, given the great importance of managerial resource allocation decisions—even small distortions of these decisions are likely to have economically significant, adverse implications for firms as well as their stakeholders.

It has been argued that non-GAAP measures lack the enhancing characteristics of consistency and comparability (FASB 2010), relative to GAAP earnings, due to the lack of standardization of non-GAAP measures and the amount of managerial discretion involved (Dirk E Black et al. 2017b). In this

³ In the context of this thesis, an investment decision is understood to be economically optimal when it maximizes the (expected) cash inflows for the firm.

⁴ While non-GAAP earnings are designed to be an informative performance metric for investors, this does not mean that they are the most relevant performance measure for resource allocation decisions.

⁵ In practice, managers are responsible for resource allocation decisions and the design of the firm's financial reporting policy, including the use of non-GAAP earnings measures, if any. In the current study, the financial reporting policy is imposed on the manager to test the causal effect of non-GAAP disclosures on managers' investment decisions.

context, non-GAAP consistency describes the extent to which firms consistently define and calculate their non-GAAP earnings across time periods. Archival evidence suggests that a non-trivial amount of exclusions is inconsistently made by firms across time. Specifically, Black et al. (2017) report that 21% of exclusions are not consistent from one year to the next during their sample period. Regulators and auditors alike advocate and, in fact, enforce consistency in an attempt to limit misleading presentation and opportunistic changes to firms' non-GAAP performance measures (IASB 2017; Deloitte 2016; Deloitte 2017; McKeon and Usvyatsky 2017; Securities and Exchange Commission (SEC) 2017).

I conduct two controlled experiments in which the firm's reporting policy is manipulated between participants to test my hypotheses. In the task, experienced participants are asked to make an investment decision by choosing between two projects. The comparative advantage of experiments allows me to keep all factors other than the manipulated variables constant to document the causal effect of non-GAAP disclosures on manager's real decisions. Endogeneity concerns, notably reverse causality, limit the ability of archival research to make causal inferences in the current setting due to the mutual interrelatedness of financial reporting and managers' resource allocation decisions. In addition, archival studies suffer from limited data availability. Data on the decisions of individual managers, firms' project portfolios, and process measures captured in my experiment allow me to investigate the underlying decision-making process. This information is generally not available from publicly available databases. Overall, a controlled experiment offers important advantages that enable me to collect

data to answer the research question that could not be obtained using archival methods.

Experiment 1 features a between-participants design in which participants are randomly assigned to one of two different financial reporting regimes (GAAP-only vs. GAAP-plus-non-GAAP) while acting as the general manager of a hypothetical, publicly-listed company in the IT hardware industry. In the GAAP-plus-non-GAAP condition, the company has a policy of disclosing a non-GAAP performance measure, which, in line with current reporting practice, is utilized for financial reporting and management evaluation purposes. Specifically, the performance measure, labeled Adjusted Income, is derived from Net Income by excluding restructuring costs. This type of adjustment is one of the most common in practice (Dirk E Black et al. 2017b). In the GAAP-only condition, however, the hypothetical company exclusively uses GAAP-based Net Income for financial reporting and management evaluation purposes.

Experiment 2 expands on the first experiment by using a 2 by 3 between-participants design in which I measure participants' concern for financial reporting to create two subsamples while also randomly assigning participants to one of three different financial reporting regimes to investigate the influence of financial reporting consistency. Financial reporting consistency of the non-GAAP measure is manipulated by varying whether the firm consistently uses one measure or whether the firm changed the non-GAAP earnings measure in recent years. I do not manipulate Consistency in the GAAP-only condition because GAAP is largely consistent by default, which implies a nested design.

The main hypothesis predicts that non-GAAP disclosures can induce management to make suboptimal investment decisions when a manager

discounts otherwise relevant costs due to the presence of a non-GAAP measure. However, I expect that a firm's non-GAAP reporting policy will have little, if any, influence on the manager's decision making when she is more concerned about economic substance, rather than financial reporting. Finally, I expect that financial reporting that is consistent, rather than inconsistent, in its usage of a non-GAAP measure will foster investment decisions that are relatively more in line with that measure. This is because the performance measure will be perceived as more important when it is consistently defined.

The results of my two experiments generally support these predictions. In Experiment 1, participants are significantly more likely to forego the optimal project when the firm discloses non-GAAP earnings in addition to traditional GAAP-based Net Income. This result is consistent with the idea that managers are sacrificing economic value in favor of preferred non-GAAP reporting features. Consistent with this interpretation, a mediation analysis shows that the importance of the Adjusted Income measure and preference for the projects' financial reporting features mediate the effect of non-GAAP disclosures on project choice. I also find that the results replicate in a within-participants test which suggests that the change in behavior is intentional.

Experiment 2 replicates the main effect of non-GAAP reporting and further shows that this effect holds only when the participants focus on financial reporting and when the firm has a consistent approach towards non-GAAP disclosures. The higher propensity for suboptimal investment decisions disappears when the firm uses non-GAAP earnings inconsistently over time suggesting that non-GAAP financial reporting consistency can be costly from a real effects perspective. In line with the proposed theory, non-GAAP reporting

has no effect on investment decision making when the participants focus less on financial reporting. Consistent with the findings in the first experiment, results of a within-participants test confirm that non-GAAP disclosures can induce suboptimal investment decisions. This holds regardless of whether managers focus more or less on financial reporting. I continue to find, using an SEM-based mediation model, that managers place greater importance on the non-GAAP performance measure when non-GAAP reporting is consistent, which leads the executives to prefer the suboptimal projects' financial reporting features.

Jointly, the results suggest that managers make a conscious decision to maximize reported non-GAAP performance when the firm has a policy of disclosing adjusted earnings that are not in compliance with GAAP, particularly when this form of performance measure is consistently employed over time and when managers are concerned about the financial reporting implications of their actions. These results provide support for the real effects hypothesis in the context of alternative performance measures. Firm executives try to maximize reported non-GAAP performance because they anticipate that it will have a positive effect on investor perceptions even when it reduces the true economic performance of the firm.

My findings extend the academic literature in several ways. Firstly, this study contributes to the literature on non-GAAP reporting by documenting a “real cost” of non-GAAP disclosures. While a lot of research in accounting has focused on informativeness and potential opportunism (Doyle, Jennings, and Soliman 2013; Marques 2006; Brown and Sivakumar 2003), less emphasis has been placed on the behavioral consequences for financial statement preparers and related economic consequences for firms. I also provide evidence on the role that non-

GAAP reporting consistency plays from a manager's perspective by showing that the behavioral consequences of non-GAAP disclosures are muted when the non-GAAP measure is inconsistently defined over time.

Secondly, this study adds to the literature on the real effects of financial reporting (Jackson 2008; Seybert 2010; Chen, Tan, and Wang 2013). I examine the effect of non-GAAP reporting, a controversial but nevertheless widely adopted reporting practice, that has received considerable attention from regulators, practitioners, and academics. I contribute to this stream of literature by showing that the reporting of non-GAAP performance measures, whose use is at the discretion of management, has behavioral consequences and can lead to suboptimal investment decisions. My research addresses a call by Kanodia and Saprà (2016) who argue that using theory to test for changes in specific corporate decisions in response to changes in specific accounting mandates can yield particularly relevant insights. Closely related, Leuz and Wysocki (2016) encourage accounting researchers to do more research on firm behavior rather than focus entirely on investors and the capital markets. I answer these calls by designing a series of experiments that examine the decision-making process of management in response to changes in firms' non-GAAP disclosure policies.

Finally, I also contribute to the literature on classification shifting and expense misclassification. Prior studies such as McVay (2006) discuss the classification of items within the income statement as an earnings management tool, whereby managers are able to favorably affect how the market perceives the firm's core earnings by misclassifying core expenses as special items. In contrast to the misclassification of existing expenses, I examine how the presence of alternative performance measures, here, non-GAAP earnings, alters managers'

resource allocation decisions. Rather than misclassifying existing expenses, executives may choose to invest in projects that exhibit favorable reporting characteristics, at the expense of economic value creation.

My findings also have implications for practice. The results of this study provide valuable information pertaining to a current regulatory debate about the disclosure of management performance measures (IASB 2017) by examining the consequences of non-GAAP reporting for the efficiency of resource allocation. I examine a cost—suboptimal resource allocation—that has received little attention to date but that is likely significant given the scale and importance of managerial resource allocation decisions. I also provide evidence that enforcing high levels of financial reporting consistency can have adverse consequences in the context of non-GAAP disclosures. This result is informative given the current advocacy for the consistent use of non-GAAP measures by regulators, standard setters, and auditors.

In addition, firms may find the insights from this study useful to improve their resource allocation processes. Directors may be able to provide more effective oversight to mitigate the adverse consequences of non-GAAP disclosures once they are aware of the potential implications and pitfalls, especially since Black, Black, Christensen, and Gee (2018) find that non-GAAP measures are often used for compensation contracting when a firm discloses non-GAAP earnings. Finally, the real cost of non-GAAP disclosures should be of interest to investors when making investment decisions and when responding to standard setters' outreach initiatives on non-GAAP reporting which may ultimately lead to changes in regulatory oversight and firm behavior (CFA Institute 2016; IASB 2017).

The rest of the study proceeds as follows. The next section reviews the relevant literature and develops the hypotheses. Section III and IV discuss the design and results of Experiment 1 and Experiment 2, respectively. Finally, Section V concludes the paper.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The Real Effect of Financial Reporting

Measurement and disclosure rules, which form the basis of accounting systems, have a significant effect on the real, economic decisions of firms. This notion is often referred to as the real effects hypothesis (Kanodia and Saprà 2016; Kanodia 2007). Which and how economic transactions are measured by the accounting system, how the accounting system aggregates transactions over time, and what information (and in what form) is disclosed to outsiders are all relevant considerations for executives when they make decisions about resource allocation (such as investments or acquisitions), risk management, and financing. Put briefly, “[t]he accounting regime is an integral and important component of the economic environment that determines how firms allocate resources (Kanodia and Saprà 2016, 624).”

In this study, I specifically focus on the real effect of accounting disclosures, rather than other aspects of the accounting system. Executives are very interested in how their decisions and the related disclosures are perceived by investors and the capital market because firm decisions and capital market reactions are interrelated. While the decisions of managers affect investor behavior and firm value, e.g., in the form of stock price reactions, there is also an effect going in the opposite direction. The (anticipated) behavior of investors has a significant

effect on corporate decisions (Kanodia and Sapra 2016), and the market reaction is directly affected by what and how information is disclosed to the market. This applies to all information that is provided to the market, whether mandated by disclosure regulations or voluntarily chosen by the firm (see Leuz and Wysocki, 2016 for a review on the economics of financial reporting and disclosure regulation). Graham, Harvey, and Rajgopal (2005) report that 78% of CFOs who participated in their survey admit to sacrificing long-term value to achieve smooth earnings. This is because a majority of managers believe that investors primarily focus on accounting performance, such as earnings, rather than cash flows when assessing firm performance.

Several empirical studies report findings in line with the idea that managers alter business decisions to achieve favorable reporting outcomes (Jackson 2008; Seybert 2010; Bentley 2017). Using an experimental methodology, Chen, Tan, and Wang (2013) examine how fair value accounting affects managers' hedging decisions. The results imply that fair value accounting can have adverse, unintended consequences for managers' hedging decisions as participants are less likely to hedge price risk when information on the fair value impact is provided than when only economic information is presented. In another study, Wang and Tan (2013) find that frequent earnings guidance, a form of voluntary disclosure, leads executives to sacrifice total earnings for quarterly earnings predictability. In contrast, managers who provide only infrequent guidance are less likely to forgo economic value for earnings predictability.

Overall, the evidence supports the real effects hypothesis. Executives actively alter their real decisions in response to financial reporting and disclosure-related

factors. As argued below, the continuing prominence of non-GAAP reporting is expected to have adverse consequences on managers' real decisions.

Non-GAAP Reporting

Non-GAAP reporting describes a company's use and disclosure of performance measures that are not calculated or defined in accordance with the prevailing accounting standards. In Regulation G, the SEC defines a non-GAAP measure as a numerical measure of a firm's past or future financial performance that excludes items that would be included in the most comparable GAAP measure, e.g., certain cost items, or by including items that would otherwise be excluded, e.g., deferred revenue (Securities and Exchange Commission (SEC) 2002). Non-GAAP earnings disclosures afford managers a great deal of discretion because these measures are not constrained by a common set of reporting regulations.

Firm executives, financial analysts, and investors started using alternative performance measures, such as non-GAAP measures, in the mid-1990s. Although their use temporarily declined in the mid-2000s largely due to regulatory intervention, this recovered soon after and has been steadily increasing since. In their review of the academic and practitioners literature on non-GAAP reporting, Black, Christensen, Ciesielski, and Whipple (2017b) report that the use of alternative performance measures is currently at, or near, an all-time high. About 71 percent of firms in the S&P 500 disclose non-GAAP earnings in 2014 and an analysis by Audit Analytics finds that 95% (88%) of S&P 500 companies incorporate non-GAAP measures in their earnings releases in 2017 (2015) (Coleman and Usvyatsky 2015; Dirk E Black et al. 2017a; Erickson 2017).

However, critics, especially regulators, continue to express concern that these disclosures may be misleading to investors. After passing Regulation G back in 2002, the SEC has recently renewed its focus on firms' non-GAAP disclosures by issuing Compliance and Disclosure Interpretations on the topic in 2010 (updated in 2011) and most recently in May 2016. In contrast, proponents argue that non-GAAP disclosures provide valuable information to the capital markets and managers appear to value the practice to provide their own view on their company's performance.

This begs the question of whether investors pay attention to non-GAAP disclosures. Examining the issue from a theoretical perspective, the model in Hirshleifer and Teoh (2003) shows that non-GAAP disclosures can lead to an upward bias in investor perceptions but that non-GAAP earnings can also aid stock price efficiency by making stock prices more accurately reflect fundamental value. Several studies subsequently compare investor reactions to traditional earnings with the investor reactions to non-GAAP earnings disclosures. Overall, the evidence suggests that investors value and react to non-GAAP disclosures (Brown and Sivakumar 2003; Bradshaw and Sloan 2002; Johnson and Schwartz 2005; Marques 2006; Bhattacharya, Black, Christensen, and Mergenthaler 2007). There is also some experimental evidence that firms' non-GAAP disclosures influence investors via an unconscious cognitive effect that alters the perceived performance of the firm (Elliott 2006; Frederickson and Miller 2004). In addition to investors, a variety of other stakeholders, including financial analysts, directors, creditors, and auditors, utilize non-GAAP measures for purposes such as contracting and forecasting.

Black, Christensen, Ciesielski, and Whipple (2017a) analyze the non-GAAP reporting policies of S&P 500 firms from 2010 to 2014 and document that non-recurring items are the most common form of non-GAAP adjustment. Specifically, firms most commonly adjust for items related to restructurings, tax resolutions, acquisitions, and impairments. However, companies also regularly adjust for recurring items, most commonly related to investments, amortization, stock-based compensation, and pensions. This finding is consistent with earlier evidence from Doyle, Lundholm, and Soliman (2003) who note that firms with non-GAAP measures exclude recurring items of two cents per share, on average. While adjustments for non-recurring items are generally regarded as more justified because they provide more relevant information about the firm's sustainable performance, there is more skepticism with respect to the exclusion of recurring items.

On average, from 2012 to 2014, a firm excludes three items to calculate non-GAAP earnings, composed of two non-recurring items and one recurring item (Dirk E Black et al. 2017a). In addition, the average magnitude of adjustments is economically significant with firms recording total adjustments of more than \$1.00 per diluted share in 2014. Since the average company excludes costs rather than gains, this implies that diluted non-GAAP Earnings-per-Share (EPS) exceed GAAP EPS by about one dollar. These findings are consistent with an analysis of 2015 quarterly earnings data by Audit Analytics (Coleman and Usvyatsky 2015) which finds that non-GAAP adjustments increase income 82% of the time and that the average impact of non-GAAP income adjustments is an increase of \$176 million.

While a number of studies to date have investigated the consequences of non-GAAP reporting for the functioning of capital markets, and especially investor reactions, much fewer studies have examined the behavioral impact of non-GAAP disclosures on firms and firm executives. One notable exception is a recent study by Black, Christensen, Joo, and Schmardebeck (2016) which explores the relationship between earnings management and non-GAAP reporting. The authors find evidence of a substitution effect between aggressive non-GAAP reporting and earnings management, suggesting that managers choose to exclude recurring items in calculating their non-GAAP number when other earnings management attempts are insufficient to meet the market's expectations. Black, Black, Christensen, and Gee (2018) document that there is a significant association between firm's disclosure of non-GAAP earnings and the use of non-GAAP earnings in compensation contracting. In addition, a recent working paper by Guggenmos, Rennekamp, and Rupar (2017) shows that the disclosure of non-GAAP earnings can increase managers' willingness to book an impairment that causes the firm to miss the analyst consensus estimate for GAAP-based net income.

In contrast, the present study examines whether and how non-GAAP measures affect managerial resource allocation decisions, especially with respect to investments. Thereby, I focus on an important type of operational decision rather than a financial reporting or disclosure choice. This question is motivated by the importance of non-GAAP measures in practice and the well-documented findings related to the real effects hypothesis (Kanodia 2007).

The Disclosure of non-GAAP Earnings and Investment Decisions

The real effects hypothesis states that financial reporting affects managers economic decisions because managers care about how the market perceives their decisions (Kanodia and Sapra 2016; Kanodia 2007). This implies that, even absent any other agency problems (Jensen 2003), managers will aim to optimize reported performance and the market's perceptions of firm performance rather than simply maximizing the true economic performance of the firm. When a firm decides to issue non-GAAP earnings disclosures, a manager is incentivized to make corporate decisions that maximize reported performance on that specific non-GAAP earnings measure. Put simply, non-GAAP disclosures affect investor reactions and the anticipated reaction of investors will affect the manager's corporate decisions. In this study, I focus primarily on an investment context, i.e., how the manager chooses an investment from a set of available projects, but the theory should also apply to other resource allocation decisions.

Existing studies show that the magnitude of non-GAAP exclusions is economically significant and that a wide variety of non-recurring and recurring items are being excluded (Dirk E Black et al. 2017a). Since investors pay attention to non-GAAP earnings and managers are concerned with their reaction, there is a strong incentive for executives to alter their investment behavior to optimize reported, rather than true, performance. As a result, non-GAAP adjustments that exclude certain types of costs (but not others) create an asymmetry which makes costs that are excluded from non-GAAP earnings less costly for a manager than costs that are included in non-GAAP and GAAP

earnings.⁶ This is problematic if at least some of the costs that firms exclude from non-GAAP earnings are economically relevant for managers' resource allocation decisions. This seems likely given the large economic magnitude of non-GAAP adjustments documented by researchers and practitioners (Coleman and Usvyatsky 2015; Dirk E Black et al. 2017a).

A conceptually related argument is put forth in the classification shifting and misclassification literature (McVay 2006; Fan, Barua, Cready, and Thomas 2010). Rather than shifting items from core expenses to special items, non-GAAP disclosures incentivize managers to shift expenses from those that are included in non-GAAP earnings to expense categories that are excluded from non-GAAP earnings. In addition, rather than misclassifying existing costs, managers may adjust their resource allocation decisions to achieve favorable reporting features. While it does not directly mislead investors, the latter can be costlier from an economic perspective when the firm's resources are allocated suboptimally, which implies that economic value creation is reduced.

In sum, the disclosure of non-GAAP earnings can reduce the perceived costliness of expenses which are excluded from the non-GAAP performance measure so that a manager becomes more likely to overspend on items that are not included in the non-GAAP measure. This can lead to suboptimal investment decisions assuming that at least some of the excluded cost items are economically relevant. Specifically, this study looks at the exclusion of restructuring costs which are among the most common form of non-GAAP adjustment (Dirk E

⁶ The model of Hirshleifer and Teoh (2003) provides a theoretical rationale why managers have an incentive to maximize a non-GAAP performance by showing that such actions can effectively boost the firm's stock price, under the assumption of limited investor attention.

Black et al. 2017b; Dirk E Black et al. 2017a). While restructurings are commonly considered non-recurring, Black, Christensen, Ciesielski, and Whipple (2017) find that firms who exclude this type of cost generally do so on a recurring basis.

While I focus on an investment setting in this study, the same argument applies for managers' resource allocation decisions more broadly. For example, a firm is expected to compensate employees relatively more with stock-based compensation rather than other forms of performance-based pay when a non-GAAP earnings measure excludes stock-based compensation expense but includes other compensation related costs.

In the context of the investment setting of the present study, the prior discussion leads to the following formal hypothesis, expressed in the alternative form:

H1: When a firm adopts non-GAAP financial reporting policies, managers have a propensity to make suboptimal investment decisions, by discounting costs excluded by the firm's financial reporting policy, relative to a situation when the firm only adopts GAAP financial reporting policies.

This prediction, however, has some tension. Suboptimal resource allocation has real economic costs in that it leads to lower GAAP earnings. Since firms are required to prominently disclose GAAP earnings even if they choose to supplement them with non-GAAP disclosures, it is not obvious that the manager is willing to accept lower GAAP earnings to achieve higher non-GAAP earnings.

Attribute Substitution

Attribute substitution is an alternative way to think of the relationship between non-GAAP measures and managers' real decisions. It describes a phenomenon in which individuals rely on an easily accessible "heuristic attribute" when making a judgment about a less accessible, complex "target attribute" (Kahneman and Frederick 2002). In the present context, the easily accessible attribute is the measure of firm performance, GAAP or non-GAAP earnings, while the complex target attribute is economic value creation.

Attribute substitution is also the basis for surrogation, which was introduced to the accounting literature by Choi, Hecht, and Tayler (2012, 2013). Surrogation describes a phenomenon whereby managers ignore the fact that performance measures are merely meant to represent an abstract underlying construct, here, firm performance or economic value creation, rather than being the construct of interest themselves. Subsequently, the managers make decisions to maximize the (imperfect) measure without considering the implications of these decisions on firm performance (Choi et al. 2012).

For attribute substitution to occur, three conditions must be met (Kahneman and Frederick 2002). First, the target attribute must be relatively inaccessible. Second, the heuristic attribute must be highly accessible. And three, the substitution of the target attribute with the heuristic attribute must not be consciously rejected. These requirements are likely fulfilled when managers make decisions to maximize firm value. Economic value is difficult to measure and uncertain which makes it a rather inaccessible construct. In contrast, reported earnings, in whatever form, are highly accessible to managers and frequently used when making resource allocation decisions. Thus, reported earnings should

fulfill conditions two and three. Therefore, the theory of attribute substitution leads to a directionally similar prediction as the real effects hypothesis in the context of non-GAAP earnings disclosures.

To the extent that non-GAAP earnings become an accessible heuristic attribute for the manager when the firm discloses non-GAAP earnings, managers are expected to make investment decisions that maximize non-GAAP earnings which will mechanically lead them to place less emphasis on costs that are not included in non-GAAP performance. Managers likely consider non-GAAP earnings a relevant performance measure because investors have been shown to react to this kind of information, when the firm discloses it (Brown and Sivakumar 2003; Bradshaw and Sloan 2002). In contrast, managers will be more likely to anchor on GAAP earnings when the firm does not disclose non-GAAP figures. In sum, attribute substitution leads to a formal hypothesis in line with H1 under the assumption that some of the excluded cost items are economically relevant for the investment decision.

However, there is some tension to this prediction because I keep the presence of GAAP disclosures constant, in line with the current regulatory regime. As all firms report GAAP numbers but only a subset also reports non-GAAP disclosures, managers may also naturally focus on GAAP earnings, even when the firm also discloses alternative performance measures.

Managers' Concern for Financial Reporting

The prior discussion about the effect of non-GAAP disclosures implicitly assumes that the manager who is allocating firm resources cares about the financial reporting effects of his decision. However, existing studies document that the extent to which a manager is concerned with financial reporting relative

to her concern for economic value creation varies widely among managers. For example, Graham, Harvey, and Rajgopal (2005) report that, while managers are generally willing to sacrifice economic value to meet earnings benchmarks, between 17 percent and 39 percent of managers invest in a profitable project even if this means that the firm will miss an important earnings benchmark (see Table 7 in the paper). Moreover, existing studies provide ample evidence that managers' individual characteristics have significant effects on firm outcomes (Malmendier and Tate 2005; Bertrand and Schoar 2003; Jia, Van Lent, and Zeng 2014).

Recall that managers are expected to care about the financial reporting outcomes of their investment decisions because of the (anticipated) reaction of investors (Kanodia and Saprà 2016). The extent to which managers are concerned about financial reporting consequences can vary based on factors such as capital market pressure (Stein 1989), firm policies (Wang and Tan 2013), and an individual manager's personal traits and experiences (Malmendier, Tate, and Yan 2011).

Based on the proposed theory, I expect that a firm's financial reporting policy will have little (if any) influence on a manager's investment decision when the manager is primarily concerned about economic substance, rather than financial reporting implications. As such, I expect that managerial focus on financial reporting will moderate the effect of non-GAAP disclosures on managers' resource allocation decisions. When a manager is exclusively concerned with economic substance, there is no reason for her to alter an investment decision in response to changes to the firm's financial reporting policy since the underlying economics of the investment are unaffected. In contrast, non-GAAP disclosures

are expected to have an effect on the manager's resource allocation when she focuses on the financial reporting implications. In the context of this study, I formally posit the following hypothesis:

H2: Managers' propensity to make suboptimal investment decisions, by discounting costs excluded by the firm's non-GAAP financial reporting policy, is greater when they are more concerned about the financial reporting implications of their investment decision.

Non-GAAP Financial Reporting Consistency

Financial reporting consistency has received a lot of attention in the context of non-GAAP earnings disclosures. In the case at hand, consistency describes the extent to which firms calculate their non-GAAP earnings in a persistent manner across time periods. Thus, high consistency implies that non-GAAP earnings are defined and calculated the same way every period; in contrast, low consistency, or inconsistency, describes firms who regularly change what they include and exclude in their non-GAAP earnings.

It has been argued that non-GAAP measures lack the enhancing characteristics of consistency and comparability (FASB 2010), relative to GAAP earnings, due to the lack of standardization and extensive managerial discretion. Regulators and auditors alike advocate consistency in an attempt to limit misleading presentation and opportunistic changes to firms' non-GAAP performance measures (IASB 2017; Deloitte 2016; Deloitte 2017). Black, Christensen, Ciesielski, and Whipple (2017a) find about 21% of exclusions to be inconsistent from one year to the next during their sample period. Similarly, Curtis, McVay, and Whipple (2014) report that some managers are rather inconsistent in their exclusion decisions, to the point where these executives

adjust for income-decreasing items in quarters where they exist, but do not to adjust for the same items in other quarters when they are income increasing. While this shows that opportunistic reporting is an issue with non-GAAP measures, recent archival evidence suggests that inconsistent non-GAAP disclosures are on average more informative than consistent reporting choices (Dirk E Black et al. 2017b) which supports the idea that managers make changes to non-GAAP disclosures over time to accurately reflect changes in the underlying economics of the business, rather than for opportunistic reasons.

Nevertheless, regulators actively promote consistency in non-GAAP reporting by issuing related guidance (International Organization of Securities Commissions 2016; Securities and Exchange Commission (SEC) 2017) and by questioning firms who engage in inconsistent reporting (McKeon and Usvyatsky 2017).

I posit that non-GAAP consistency is likely to be costly from a real effects perspective when the decision maker cares about the financial reporting implications. I expect that management perceives a consistently defined non-GAAP measure as more important, relative to a non-GAAP measure that is inconsistently defined, which should increase management's willingness to make investment decisions on the basis of non-GAAP earnings. In contrast, the manager may expect that inconsistent reporting leads investors to become suspicious that the firm's reporting may be opportunistic. If so, investors are less likely to rely on non-GAAP earnings when assessing firm performance and managers have less incentive to rely on non-GAAP metrics to guide their resource allocation decisions. This argument suggests that the manager will be less likely to discount relevant costs that are excluded from non-GAAP earnings

when non-GAAP earnings are inconsistently reported. Overall, I expect that a manager's resource allocation decisions will be affected relatively more by a consistent non-GAAP measure and relatively less, if at all, by an inconsistent measure—but only if the manager cares about the financial reporting implications.

A consistent performance measure also facilitates the process of attribute substitution (Choi et al. 2012; Kahneman and Frederick 2002) since a consistently used non-GAAP measure is more salient and likely perceived as a higher quality proxy for the underlying strategic construct than an inconsistently defined measure. This means that high non-GAAP consistency favors the attribute substitution process described by Kahneman and Frederick (2002) which increases managers' propensity to discount relevant costs and make suboptimal investment decisions, in line with H1. In contrast, inconsistency can act as a signal to the manager that the performance measure is not a viable substitute for the construct of economic value creation.

In the context of an investment setting, I formally posit the following hypothesis based on the above discussion:

H3: Managers' propensity to make suboptimal investment decisions, by discounting costs excluded by the firm's non-GAAP financial reporting policy, is greater when they are more concerned about the financial reporting implications of their investment decision and the non-GAAP reporting is consistent over time.

This prediction also has some tension, however. Consistently excluding a (presumably) non-recurring expense item every year, such as restructuring costs,

may cast some doubt on the management's assertion that the excluded item is truly non-recurring. Investors may be more reluctant to believe that a non-recurring item should be ignored when the expense is adjusted for in several subsequent financial years. As a result, the non-GAAP earnings measure may be perceived as less informative than GAAP earnings when the non-GAAP reporting is consistent rather than inconsistent over time.⁷ This would imply a prediction in the opposite direction.

ADD FIGURE 1 ABOUT HERE

III. EXPERIMENT 1

Method

Research Design and Independent Variables

In this study, I experimentally examine how a firm's use of non-GAAP measures affects executive decision-making on an investment task. An experimental approach is well suited for the present study for at least three reasons. First, endogeneity and reverse causality concerns limit the ability of archival research to make causal inferences which are especially relevant since the real effects hypothesis is based on the mutual interrelatedness of financial reporting and management's real decisions. Second, data on the decisions of individual managers and their firm's project portfolio is not available; at best, one can observe firm outcomes, such as investment efficiency ex-post but it is

⁷ This is in line with the empirical findings of Dirk E Black et al. (2017b) with respect to the informativeness of inconsistent non-GAAP measures.

difficult to infer suboptimal decision making from such a result without having information on the manager's available options and a clean set of control firms. Finally, and directly related to the first and second points, an experiment allows me to directly observe suboptimal resource allocation, without the need to estimate a model to derive expected investment efficiency, and to collect detailed process measures to examine the decision process of the individual manager in greater detail.

Experiment 1 features a between-participants design in which participants are randomly assigned to one of two financial reporting regimes (GAAP-only vs. GAAP-plus-non-GAAP) while acting as the general manager of a hypothetical, publicly-listed company in the IT hardware industry. In the GAAP-plus-non-GAAP condition, the company has a policy of utilizing a non-GAAP performance measure for financial reporting and management evaluation purposes. Specifically, the performance measure, labeled Adjusted Income, is derived from Net Income by excluding restructuring costs. I choose this measure because empirical data show that non-recurring items, including restructuring charges, are the most common form of non-GAAP adjustment (Dirk E Black et al. 2017b; Dirk E Black et al. 2017a). Therefore, the chosen performance measure reflects current financial reporting practices while still being simple and straightforward enough to allow for a clean manipulation. The design of the non-GAAP disclosure follows current reporting practices by also including information on how the firm uses the non-GAAP measure.⁸ In the GAAP-only

⁸ This includes the statement that the non-GAAP measure is “presented solely to permit investors to more fully understand how management assesses performance.” This type of caveat, or disclaimer, is commonly used in practice as a result of regulatory interventions and disclosure guidelines issued by the SEC.

condition, the hypothetical company exclusively uses GAAP-based Net Income for financial reporting and management evaluation purposes. Both the manipulation and the investment decision task are featured in Appendix A.

An overview of the experimental procedure is included in Appendix B. Participants who accept the task on Amazon Mechanical Turk (Mturk) receive a link that directs them to the screening questionnaire. Qualified participants then move forward to the main study. All materials are completed electronically and hosted on Qualtrics. After indicating their willingness to take part in the study, the participants receive instructions, background information, and a summary information about the financial performance of a hypothetical company. Next, the participants review the financial reporting policy of the company which features the manipulation of the independent variable. Afterwards, the participants receive information about two available projects and make an investment decision.

Several features of the design are worth highlighting. First, both information content and presentation format of the project overview are held constant across conditions. All participants receive information on the Net Income and Adjusted Income effects of the two projects. While participants have sufficient information to calculate the Adjusted Income measure for themselves because I provide an exact breakdown of the revenue and cost structure of the projects, this design choice rules out presentation effects and information salience as alternative explanations for my findings. Second, I inform participants that the ratio of cash and non-cash items (accruals) does not differ between the different cost types, so

that projected Net Income can proxy for expected cash-flows.⁹ Third, project order is randomized across conditions; i.e. some participants see the good project first and the bad project last while the order is reversed for others, as to mitigate any concern of primacy or recency effects on project choice. Finally, I present both projects with a finite lifetime of three years while providing detailed sales and cost estimates for each year. This prevents participants' assumptions about the future behavior of different cost items from affecting their perceptions of the two projects.

After reviewing the project information and making their investment decision, the participants answer several process and manipulation check questions and provide demographic information. Finally, the experiment features a within-participants test in which both financial reporting regimes are displayed next to each other on the same page and the participants repeat the investment decision.

Setting and Dependent Measures

In the experimental case, the general manager of Hooli Tech, Inc. must choose between two available projects both of which are meant to achieve greater efficiency and improve sales to improve the firm's competitive position. Due to financial constraints, the manager must choose between two projects, although both projects are designed to have a positive net present value. The materials provide information about the estimated sales, costs, and earnings that each of the projects is expected to contribute to the company's annual earnings. Both

⁹ As a result, I do not have to assume that GAAP earnings are generally superior to non-GAAP earnings in capturing economic value creation. In the present case, however, GAAP earnings align with the underlying expected cash flows of the two projects and choosing the project with lower expected net cash inflows is considered a suboptimal decision.

projects are designed to be similar in all aspects except for the cost classification which, in turn, affects the accounting treatment. One project (Project A) features higher GAAP Net Income and is therefore considered superior in terms of economic value creation, relative to the other project (Project B). However, some of Project B's costs are classified as Restructuring Costs which are excluded from Adjusted Income. In contrast, Project A does not include any restructuring-related expenses. As a result, Project A has higher Net Income but Project B shows a higher Adjusted Income due to the exclusion of Restructuring Costs.

Two measures are designed to capture the participants' project choice. First, the participants make a binary choice between Project A and Project B, which constitutes the first dependent measure. Second, the materials also ask the participants to indicate the strength of their project preferences on a 15-point Likert Scale (ranging from -7, strong preference for the Project B, to +7, strong preference for Project A, including a neutral point of 0). This scale represents a more sensitive measure of the participants' investment preferences and is used as a secondary dependent measure. I expect that the participants will be more inclined to choose the economically inferior Project B when the firm uses non-GAAP performance measures.

Participants

I use the Amazon Mechanical Turk (Mturk) platform and a pre-screening questionnaire to identify a sample of qualified participants (Guggenmos 2016). All participants must have management experience and are (or have been) in charge of making spending or investment decisions for a company to qualify for the study.

In total, 86 individuals completed the experiment on Mturk. Six participants indicated in the post-experimental questionnaire that they did not meet the screening criteria, which contradicts the participants' answers to the screening questionnaire.¹⁰ I also exclude six participants who do not make a consistent investment decision, i.e. they choose the Project A (B) but indicate a preference for Project B (A), since their behavioral intentions are unclear. After imposing these restrictions, the final sample size is 74. The median participant has five years of management experience and has completed two (two) college-level accounting (finance) courses. In line with the screening criteria, all participants are (or have been) in charge of making large spending and/or investment decisions for a company. Given the straightforward nature of the task and the underlying theory, the participants are considered appropriate for the study (Libby, Bloomfield, and Nelson 2002). All participants receive a fixed salary for completing the task which translates into an effective hourly rate of a little over US\$ 8.00.

Results

Manipulation and Attention Checks

The study features a comprehension and attention-check question which is included after the participants read background information about the case and before they view the manipulations. Specifically, I ask the participants how the company's financial performance changed over the last three years (right after they were shown the relevant information) to ensure that they read and process

¹⁰ Five participants indicated that they do not have experience with spending or investment decisions for a company and one participant had no management experience.

the information carefully.¹¹ More than 75 percent of the participants (56 out of 74) answer this question correctly.¹²

Participants also responded to two manipulation check questions. First, participants indicate whether the firm's financial reporting policy states that US GAAP-based Net Income is reported, or not. The answer should be "yes" regardless of conditions, and more than 87 percent of the participants choose this option. Second, I ask participants whether the firm also includes Adjusted Income, a non-GAAP measure, in its financial disclosures. Across conditions, approximately 61 percent of participants identify the correct answer.^{13, 14}

Hypothesis Tests

In H1, I posit that the use of non-GAAP measures leads executives to place greater weight on desirable reporting features of a project, rather than economic value, which, in turn, will increase the likelihood of suboptimal resource allocation. To test this prediction, I examine the participants' responses to the dependent measures.

¹¹ Question: "How would you describe the company's performance over the last three financial years (from 2014 to 2016)?" Options: "a) Performance improved a lot over time; b) Performance neither improved nor declined much over time; c) Performance declined a lot over time." The financial performance of the hypothetical firm exhibited only minor changes over time, some of which were slightly positive while some others were slightly negative, so that b) is the correct answer.

¹² The results reported below are inferentially similar and statistically more significant if I limit the analyses to the participants that correctly answer the attention check question (all $p < 0.01$, one-tailed).

¹³ The rate of manipulation check failure for this second question is significantly higher for the GAAP-only relative to the non-GAAP condition (69% vs. 13%, $p < 0.01$). This is not entirely surprising. While the case states that the company only reports GAAP figures in the GAAP-only condition, I nevertheless include Adjusted Income figures in the project comparison tables across conditions to keep information and presentation effects of the project information constant. As a result, some participants in the GAAP-only condition answer this question incorrectly when they (correctly) recall seeing an Adjusted Income figure at some point during the study.

¹⁴ The reported results are unchanged if I limit the analyses to the participants that correctly answer the manipulation check questions.

I provide descriptive statistics in Table 1 Panel A; the results of the logistic regression are presented in Table 1 Panel B. H1 predicts that executives are more (less) likely to invest in the suboptimal (optimal) project when the firm uses non-GAAP performance measures. In line with this, I find that about 77% of participants (27 out of 35) choose to invest in the optimal project in the GAAP-only condition.¹⁵ This number drops to about 54% of participants (21 out of 39) when the firm also discloses non-GAAP figures, implying that more than 45% of participants in this condition invest in the suboptimal project. The results of a logistic regression, which is used due to the binary nature of the dependent variable, show that the difference in project choice is significant ($p = 0.02$, one-tailed).

In addition to the binary project choice measure, I also ask participants to indicate the strength of their project preferences on a 15-point Likert Scale (ranging from -7, strong preference for the “bad” project, to +7, strong preference for “good” project, including a neutral point of 0). The average preference of participants in the GAAP-only condition is 1.97 (sig. higher than the midpoint, $t = 3.05$, $p < 0.01$) which means that participants, on average, prefer the optimal project in this condition. In contrast, participants in the non-GAAP condition exhibit a mean of -0.28 implying a slight preference for the suboptimal project, on average. However, this value is not statistically different from the midpoint ($t = -0.36$, $p = 0.72$) meaning that participants in the GAAP-plus-non-GAAP

¹⁵ At first, it may seem surprising that a non-trivial share of participants (23%) chooses the suboptimal project in the GAAP-only condition. As discussed in the method section, participants in both conditions receive the non-GAAP earnings information to rule out presentation effects and information salience as alternative explanations. This design choice may lead some participants to consider non-GAAP performance, which is significantly higher for the suboptimal project, even in the GAAP-only condition.

condition are, on average, indifferent between the optimal and the suboptimal project. An ANOVA confirms that the difference between the means of the two conditions (1.97 vs. -0.28) is significant ($p = 0.02$, one-tailed) which suggests, in line with H1, that a non-GAAP reporting policy makes the suboptimal project significantly more attractive to managers. The results of the ANOVA are reported in Table 1 Panel C.

Taken together, the results of the binary and the continuous project choice measures provide evidence in favor of H1. Non-GAAP reporting leads to significantly more suboptimal investment decisions, i.e. managers are willing to sacrifice economic value in exchange for favorable reporting features.

ADD TABLE 1 & FIGURE 2 ABOUT HERE

Mediation Analysis

The theory predicts that the issuance of non-GAAP disclosures by the firm affects managers' project choice because the manager focuses more on the non-GAAP performance measure and, based on that, considers the anticipated non-GAAP financial reporting implications of the project when making the investment decision. I ask the participants the following questions: "How important is [Adjusted Income] for your investment decision?" Answers are captured on a 15-point Likert Scale (ranging from 0, not at all important, to 14, extremely important, including a mid-point of 7, labeled moderately important). "In your opinion, which alternative [project] has more favorable financial reporting implications for [the company]? Answer Choices: a) Project A, b) Project B, and c) No Difference." The answers are coded such that choosing the optimal (suboptimal) project is coded as 1 (-1), while choosing c) is coded as 0.

I use Structural Equations Modelling to formally test the notion that the manipulation of the firm's financial reporting policy affects the extent to which participants consider Adjusted Income important, which then leads to a preference for the suboptimal project's financial reporting characteristics; in turn, this affects the manager's investment decision. I also include a link from the importance of Adjusted Income to the investment decision.

As shown in Figure 3 Panel A, the presence of a non-GAAP financial disclosure policy causes managers to consider Adjusted Income a more important performance indicator for their investment decision ($z = 3.22$, $p < 0.01$, one-tailed) which leads them to prefer the financial reporting implications of the suboptimal project ($z = -3.33$, $p < 0.01$, one-tailed) which subsequently causes them to invest in the lower value project ($z = 5.23$, $p < 0.01$), relative to the condition in which the firm only discloses GAAP measures. In addition, there is a significant link between the importance of Adjusted Income and the manager's investment decision ($z = -3.26$, $p < 0.01$).¹⁶ This implies that the participants are willingly trading off economic value in favor of favorable financial reporting characteristics of a project.

Closely related to the theory on attribute substitution (Kahneman and Frederick 2002), the participants may also (falsely) equate the level of Adjusted Income with profitability, especially in the GAAP-plus-non-GAAP condition, thereby assessing the suboptimal project as more profitable. In this case, the

¹⁶ The model fits the data reasonably well. Model fit indices for the specified full mediation model; i.e. without Link 5, are as follows: (a) $\chi^2 = 6.12$, $df = 4$, and $p = 0.19$, implying that the model fit is comparable to a fully saturated model (in line with the insignificant Link 5); (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.08; (c) the model's Comparative Fit Index (CFI) is 0.96, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.06, below the acceptable cut-off of 0.08.

issuance of non-GAAP disclosures by the firm affects managers' project choice because the manager believes that the suboptimal project is more profitable than the alternative.

To test this prediction, I ask the participants the following question: "How do you assess the two projects in terms of Profitability?". Answers are captured on a 15-point Likert Scale (ranging from -7, the "bad" project is more profitable, to +7, the "good" project is more profitable, including a neutral point of 0). A second Structural Equations Model is used to formally test this channel.

As shown in Panel B of Figure 3, the presence of a non-GAAP financial disclosure policy causes managers to assess the suboptimal project as relatively more profitable ($z = -2.36$, $p = 0.01$, one-tailed) which, in turn, causes them to invest in the lower value project ($z = 7.52$, $p < 0.01$), relative to the condition in which the firm only discloses GAAP measures.¹⁷ This result is consistent with attribute substitution as it suggests that the participants equate the Adjusted Income measure with the underlying construct of interest, i.e. economic value creation.

When I test both mediation models jointly, both channels remain directionally unchanged and highly significant.

ADD FIGURE 3 ABOUT HERE

¹⁷ The model fits the data well. Fit indices for the specified full mediation model, i.e. without Link 3, are as follows: (a) $\chi^2 = 0.68$, $df = 1$, and $p > 0.40$, implying that the model fit is comparable to a fully saturated model; (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.00; (c) the model's Comparative Fit Index (CFI) is 1.00, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.02, below the acceptable cut-off of 0.08.

Within-Participants Tests

To provide further insights into the participants' decision process, I also include a within-participants condition. At the end of the study, after the demographic questionnaire, the participants are shown both financial reporting policies (GAAP-only and GAAP-plus-non-GAAP) side-by-side on the same page.¹⁸ They are asked two questions: "Assume you are the manager of Hooli Tech, Inc. and the company uses [GAAP-only / GAAP-plus-non-GAAP], please indicate your preference for Project A or Project B." The question uses a 15-point Likert Scale to capture the investment preference (ranging from -7, strong preference for the "bad" project, to +7, strong preference for "good" project, including a neutral point of 0).

The results of the within-participants condition are consistent with the findings of the between-participants tests. When the company employs a GAAP-only reporting policy, participants generally prefer to invest in the optimal project (mean = 1.16, significantly above the midpoint of 0, $t = 3.09$, $p < 0.01$). In contrast, a non-GAAP reporting policy leads participants to prefer the suboptimal project (mean = -0.77, significantly below the midpoint of 0, $t = -2.04$, $p = 0.04$). The mean of the non-GAAP condition is also significantly lower than the mean of the GAAP-only condition (1.16 vs. -0.77, $t = 3.82$, $p < 0.01$). These results offer additional support for H1 and suggest that the differences in investment decision are the result of a deliberate choice made by the managers as a function of the change in financial reporting policies of the firm.

¹⁸ The presentation format of the two policies is randomized to avoid order effects and the participants are informed that they would have seen one of the policies earlier, to avoid confusion.

Supplemental Analysis: Is the Decision-Making Strategic or an Unconscious Bias?

The participants appear to have a good general understanding of the advantages and disadvantages of the two projects. Most participants recognize that Project A, the optimal project, has a higher lifetime Net Income (GAAP) than Project B and there is no significant difference between the two financial reporting conditions ($t = 1.28$, $p = 0.20$). Similarly, participants on average correctly indicate that Project B results in higher Adjusted Income (non-GAAP) than Project A and I observe no significant differences between the two manipulated conditions ($t = -0.98$, $p = 0.33$). These results indicate that the project information is sufficiently understood and processed by the participants.

Participants in both conditions report that the Net Income of the project is an important factor when making their investment decision (mean = 10.24 out of 14). However, the perceived importance of Net Income differs slightly by condition (GAAP-only: mean = 10.86; GAAP-plus-non-GAAP: mean = 9.69; $t = 1.75$, $p = 0.08$) and, in line with the manipulation, participants in the non-GAAP reporting condition assess Adjusted Income as relatively more important than participants in the GAAP-only condition (9.64 vs. 7.0 out of 14, $t = -3.18$, $p < 0.01$). While participants in the GAAP-only condition consider Net Income a more important performance indicator than Adjusted Income (10.86 vs. 7.0, $t = 5.68$, $p < 0.01$), participants in the non-GAAP condition perceive the two as similarly important (Net Income: mean = 9.69; Adjusted Income: mean = 9.64; $t = 0.06$, $p = 0.95$).

Jointly, these results suggest that the effect of non-GAAP disclosures on managers' investment choices is largely strategic. The financial reporting policy

of the firm affects what aspects of a project the participants consider important. However, the results of the mediation analysis reported above indicate that strategy surrogation may play a role as well.

IV. EXPERIMENT 2

Experiment 2 is designed to test H2 and H3, and extend the first experiment by examining managers' concern for financial reporting and the effect of non-GAAP financial reporting consistency. Non-GAAP reporting consistency is an important construct, especially in the current context, because managers generally have a lot of discretion regarding whether and how to report on their non-GAAP performance. In contrast to mandatory disclosures such as GAAP-compliant performance measures, managers may choose to omit or change the definition of non-GAAP measures. Indeed, recent archival studies report that non-GAAP reporting differs significantly not only among firms but also over time for a significant share of firms.

In line with H2, I expect that a firm's financial reporting policy will have less of an influence (if any) on a manager's investment decision when the manager is more concerned about economic substance, rather than financial reporting implications. Finally, it is also expected that a manager's resource allocation decisions will be affected relatively more by a consistent non-GAAP measure and relatively less, if at all, by an inconsistent measure (in line with the hypothesis development for H3).

Method

Research Design and Independent Variables

The second experiment follows the same general procedure as Experiment 1. I use a 2 by 3 between-participants design in which I measure participants' concern for financial reporting to create two subsamples while also randomly assigning participants to one of three different financial reporting regimes (GAAP-only vs. GAAP-plus-non-GAAP Inconsistent vs. GAAP-plus-non-GAAP Consistent). I use a nested design because GAAP reporting is largely consistent by default due to the constant application of GAAP. That is, a GAAP-only Inconsistent condition does not exist in current practice because firms have much less discretion over how GAAP is applied.

The instrument used in the experiment, including the manipulation of non-GAAP reporting consistency, is included in Appendix A. To test H2 and examine the effect of a manager's concern about financial reporting features of a project, I add the following question (not asked in Experiment 1) to the instrument: "To what extent are you concerned about the following consequences of your project choice." Answers are captured on a 15-point Likert Scale ranging from -7, "[m]ore concerned about financial reporting," to +7 "[m]ore concerned about economic implications."

To manipulate financial reporting consistency, I provide participants in the non-GAAP conditions with a table that summarizes the firm's non-GAAP reporting over the last three years. In the Consistent condition, the non-GAAP reporting policy has not changed over time. In the Inconsistent condition, however, the table shows that the non-GAAP reporting policy has changed every

year over the last three years—the firm excluded different types of expenses every year.

This type of manipulation was deliberately chosen and it is worth highlighting a few key aspects of this design choice. According to Black et al. (2017), the three cost types in the table (Restructuring Items, Acquisition Items, and Impairment Items) are the most commonly excluded items in their sample. They are all in the top 4 in terms of exclusion frequency, meaning that firms exclude them on a regular basis.¹⁹ I choose the three items mentioned in the table to have conceptually similar, straightforward cost types. I keep the number of exclusions (1 per year) and the displayed cost types constant across conditions. Finally, I inform participants in the notes that all three cost types are common exclusions in the industry to mitigate concerns about aggressiveness and justifiability. All other features of the experiment, specifically the task and the dependent variables, are identical to Experiment 1.

Participants

The process and criteria for participant recruitment are unchanged from Experiment 1, however, no participant who completed the first experiment is allowed to complete Experiment 2. In total, 224 individuals completed the study on Mturk. Ten participants indicated in the post-experimental questionnaire that

¹⁹ A potential concern is the recurring nature of Restructuring Costs, especially in the Consistent condition since the firm will exclude Restructuring Costs three years in a row. Restructurings are commonly thought of as non-recurring or “one time.” In contrast, Black, Christensen, Ciesielski, and Whipple (2017) find that, over their sample period, firms are rather consistent with respect to Restructuring Costs. On page 31, the authors note: “Interestingly, we find that restructuring charges, which are often labeled by firms and researchers as not relating to core performance, have a high frequency score.” Their measurement shows that, if a firm excludes this type of cost, it generally does so throughout most of the sample period (in about 72% of the firm-years). To put this into context, a firm that excludes Restructuring Costs does so in almost 3 out of 4 years, on average. As a result, my manipulation, which has three years in a row in the Consistent condition, is in line with financial reporting in the real world.

they did not meet the screening criteria, which contradicts the participants' answers to the screening questionnaire.²⁰ I exclude 30 participants who do not make a consistent investment decision, i.e. they choose the Project A (B) but indicate a preference for Project B (A), since their behavioral intentions are unclear. After imposing these restrictions, the final sample size is 184. The median participant has five years of management experience and has completed two (two) college-level accounting (finance) courses. In line with the screening criteria, all participants are (or have been) in charge of making large spending and/or investment decisions for a company. As before, all participants receive a fixed salary for their participation which translates into an effective hourly rate of approximately US\$ 8.00.

Results

Manipulation and Attention Checks

Using the same attention check question as in Experiment 1, I find that a little more than 76 percent of the participants (141 of 184) pass. Participants also responded to several manipulation check questions. First, participants indicate whether the firm's financial reporting policy states that US GAAP-based Net Income is reported, or not. The answer should be "yes" regardless of condition, and more than 86 percent of the participants choose this option. Second, I ask participants whether the firm also includes Adjusted Income, a non-GAAP measure, in its financial disclosures. Across conditions, approximately 72

²⁰ All ten participants indicated that they do not have experience with spending or investment decisions for a company.

percent of participants identify the correct answer.^{21, 22} As a check on whether the consistency manipulation is successful, participants also rate to what extent the financial reporting policy of the firm is consistent and constant. I ask the following questions: “To what extent is Hooli Tech’s financial reporting policy consistent over time?”; and “[t]o what extent has Hooli Tech’s financial reporting policy been constant over the last few years?” Answers are captured on a 15-point Likert Scale ranging from 0, “not at all consistent (constant)”, to 14, “extremely consistent (constant).” Participants in the Inconsistent condition rate financial reporting as less consistent ($t = -3.73, p < 0.01$) and as less constant ($t = -4.07, p < 0.01$) relative to participants in the Consistent condition. Overall, I conclude that my manipulation of non-GAAP reporting consistency is successful.

Hypothesis Tests

Table 2 provides descriptive statistics in Panel A and reports the results of the statistical analysis for Experiment 2 in Panels B and C, respectively. I find that the share of participants who choose the optimal project is highest in the GAAP-only condition (59.38%) and lower in the GAAP-plus-non-GAAP Consistent condition (52.38%) and the GAAP-plus-non-GAAP Inconsistent condition (54.39%). For easier interpretation of the statistical analysis, I perform simple effects tests to formally examine the hypothesized shape. In contrast to

²¹ As in Experiment 1, the rate of manipulation check failure for this second question is significantly higher for the GAAP-only relative to the two non-GAAP conditions (53% vs. 14%, $p < 0.01$).

²² The reported results are unchanged if I exclude the seven participants who fail both manipulation check questions. The results are directionally consistent but become insignificant if I limit the sample to participants who answer both manipulation check questions correctly. This is somewhat expected since this requirement reduces the sample size by 68 participants.

the predictions, I find that the propensity to invest in the optimal project does not differ significantly by experimental condition (all $p > 0.20$, one-tailed).

H2 posits that managers' propensity to make suboptimal investment decisions will be greater when they are more concerned about the financial reporting implications of their investment decision while H3 posits that this effect is greater when non-GAAP reporting is consistent. Jointly, these hypotheses predict a significant interaction between the experimental manipulations and the measure of managers' focus on financial reporting. I conduct a logistic regression analysis of the binary project choice with the mean-centered, continuous participant focus on financial reporting measure, a factor variable for the experimental condition, and two interaction terms as the independent variables (for details, see Table 2, Panel B)(Tan and Kao 1999). The results show insignificant main effects of the experimental conditions, as well as an insignificant interaction term for the non-GAAP Inconsistent condition. However, the interaction between participant focus on financial reporting and the non-GAAP Consistent condition is negative and significant ($p = 0.04$, one-tailed). This suggests that participants are increasingly likely to invest in the suboptimal project as participants focus more on financial reporting when the firm uses a Consistent non-GAAP performance measure.²³

To examine the specific shape of the interaction, I use a median split to divide the sample into two groups based on the participants' financial reporting focus.²⁴

²³ I find comparable results when I re-run the analysis with participant focus on financial reporting as a binary variable (using a median split) and all other specifications unchanged.

²⁴ Using an ANOVA and a logistic regression respectively, I confirm that the manipulation of financial reporting policy has no significant effect on the continuous and the binary measure of financial reporting focus. The mean does not differ between the experimental conditions (GAAP-only: 1.09, GAAP-plus-non-GAAP Inconsistent: 1.19, and GAAP-plus-non-GAAP Consistent: 1.22; all $p > 0.86$).

^{25, 26} The results are summarized in Table 2 Panel C. Participants who focus more on the financial reporting implications are more likely to choose the optimal project in the GAAP-only condition relative to the GAAP-plus-non-GAAP Consistent condition ($p = 0.02$, one-tailed). Similarly, participants in the GAAP-plus-non-GAAP Inconsistent condition are more likely to choose the optimal project than participants in the GAAP-plus-non-GAAP Consistent condition ($p = 0.05$, one-tailed). There is no significant difference between the GAAP-only and the GAAP-plus-non-GAAP Inconsistent condition ($p = 0.70$). These differences disappear when participants are less concerned with financial reporting (all $p > 0.17$) which is consistent with H2. Results of the planned contrast are in line with the predictions ($z = 2.19$, $p = 0.03$).²⁷

When comparing the GAAP-only condition to the two non-GAAP conditions, regardless of financial reporting consistency, I find a significantly lower propensity of participants to choose the optimal project when non-GAAP reporting is present ($p = 0.07$, one-tailed) but only when participants focus more on the financial reporting implications of their project choice (see Table 2, Panel C for details). The difference is not significant for participants who focus

²⁵ I confirm that the characteristics of the two groups are comparable on other dimensions. They do not exhibit significant differences with respect to management experience, accounting courses, finance courses, and familiarity with investment decisions / financial reporting / non-GAAP (all $p > 0.25$).

²⁶ In line with the results using the continuous measure, an ANOVA with the binary project choice as the dependent variable suggests a significant interaction term between the financial reporting regime of the firm and indicator variable of financial reporting concern ($p = 0.03$, one-tailed).

²⁷ The specific contrast, tested using logistic regression, was: GAAP-only/high Financial Reporting Focus > non-GAAP Inconsistent/high Financial Reporting Focus > non-GAAP Consistent/high Financial Reporting Focus. The alternative specification with [GAAP-only/high Financial Reporting Focus = non-GAAP Inconsistent/high Financial Reporting Focus] > non-GAAP Consistent/high Financial Reporting Focus leads to comparable results ($z = 2.16$, $p = 0.03$).

relatively less on financial reporting ($p > 0.86$). These results are consistent with H2.

For completeness, I repeat the above analyses with the continuous project preference measure; descriptive statistics are reported in Table 3, Panel A. I conduct a regression analysis of participants' project preference with the mean-centered, continuous participant focus on financial reporting measure, a factor variable for the experimental condition, and two interaction terms as the independent variables (see Table 3, Panel B for details). The results show insignificant effects for all independent variables except for the interaction between participant focus on financial reporting and the non-GAAP Consistent condition, which is negative and significant ($p = 0.09$, one-tailed). Overall, these results match the findings based on the binary project choice measure reported above.

Follow-up tests of simple effect are reported in Table 3 Panel C and show that participants who are more focused on financial reporting are more likely to choose the optimal project in the GAAP-only condition relative to the GAAP-plus-non-GAAP Consistent condition ($p = 0.04$, one-tailed). While participants in the GAAP-plus-non-GAAP Inconsistent condition are more likely to choose the optimal project than participants in the GAAP-plus-non-GAAP Consistent condition, this difference is not statistically significant at conventional levels ($p = 0.14$, one-tailed). I continue to find no significant difference between the GAAP-only and the GAAP-plus-non-GAAP Inconsistent condition ($p = 0.59$). Results of the planned contrast are consistent with the predictions ($t = 1.72$, $p = 0.09$). As before, I find no significant differences between the experimental

conditions when participants are less focused on financial reporting implications (all $p > 0.33$) which is consistent with H2 (see Table 3 Panel C for details).

Taken together, the results are largely consistent with the hypotheses. Non-GAAP reporting leads to significantly more suboptimal investment decisions when participants are more focused on the financial reporting implications of their investment choices; i.e. managers are willing to sacrifice economic value in exchange for favorable reporting features. In line with H3, this result holds only when the non-GAAP reporting policy is consistent.²⁸ However, the financial reporting policy has no effect on project choice when participants are relatively less focused on financial reporting.

ADD TABLE 2 & 3 ABOUT HERE

Mediation Analysis

The general setup of the mediation analysis is as discussed in Experiment 1. I use Structural Equations Modelling to formally test the notion that a Consistent non-GAAP reporting policy affects managers' project choice because the manager focuses more on the non-GAAP performance measure and, based on that, considers the anticipated non-GAAP financial reporting implications of the project when making the investment decision. In line with the main results, I find that this process only describes the decision-making process of managers who

²⁸ The findings with respect to H3 also rule out an alternative explanation for the results of Experiment 1. It could be argued that the reference to how management assesses firm performance, which is part of the financial reporting policy manipulation in the non-GAAP condition, drives the change in project choices because the participants simply follow the prescribed firm policy. However, in this case one would not expect any difference between the two non-GAAP conditions in Experiment 2 since this component is identical in the Consistent and the Inconsistent condition.

focus relatively more on the financial reporting implications of their investment decision.

For easier interpretation, I use the GAAP-only condition as the baseline. This implies that, as shown in the mediation model, a GAAP-plus-non-GAAP Consistent policy causes managers to perceive the Adjusted Income measure as more important ($z = 2.10$, $p = 0.02$, one-tailed), which leads them to prefer the financial reporting implications of the suboptimal project ($z = -2.51$, $p = 0.01$, one-tailed). In turn, this then subsequently causes the executive to invest in the lower value project, relative to the condition in which the firm uses an Inconsistent non-GAAP reporting policy ($z = 7.85$, $p < 0.01$). In addition, there is a significant link between the importance of Adjusted Income to the manager's investment decision ($z = -3.24$, $p < 0.01$).²⁹ This implies that the participants are willing to trade off economic value in favor of favorable financial reporting characteristics of a project in the context of non-GAAP reporting. After including the mediator, the direct links from financial reporting policy indicators to the managers' investment decision (link 5) become insignificant (both $p > 0.45$) which suggests a full mediation.

The results of the mediation analysis remain unchanged if I use the project preference measure instead of the binary project choice (not tabulated).

ADD FIGURE 4 ABOUT HERE

²⁹ Fit indices for a full mediation model, i.e. without Link 5, are as follows: (a) $\chi^2 = 5.36$, $df = 4$, and $p = 0.25$, implying that the model fit is comparable to a fully saturated model (in line with the insignificant Link 5); (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.06; (c) the model's Comparative Fit Index (CFI) is 0.98, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.05, below the acceptable cut-off of 0.08. Overall, these metrics suggest an acceptable model fit.

I perform a factor analysis to confirm the robustness of the proposed process model (untabulated). After the participants make their investment decision, I ask a total of seven questions to examine which of the two projects they prefer on several dimensions. Specifically, the following questions are included: “In your opinion, which alternative will result in a (1) higher annual net income / (2) higher annual adjusted income / (3) more favorable financial reporting implications / (4) a higher short-term stock price / (5) a higher long-term stock price / (6) higher net cash inflows / (7) higher risk or stock price volatility for [the company]?” As before, the answer choices are: a) Project A, b) Project B, and c) No Difference. The answers are coded such that choosing the optimal (suboptimal) project is coded as 1 (-1), while choosing c) is coded as 0.

The factor analysis suggests that the participants’ answers to these seven questions load on a single factor (Eigenvalue = 1.97, the next factor has an Eigenvalue = 0.47) which accounts for most of the variance (about 98%). Items (1) through (6) load positively on the factor while item (7) exhibits a negative loading. In line with the loadings, I call this factor “Desirable Project Characteristics” since managers should prefer investment projects with higher payoffs and lower risk. Positive (negative) factor scores imply that the participants perceive Project A (B) as possessing more desirable characteristics.

After performing the above analysis, I use the resulting project characteristics factor as the mediator in a Structural Equations Model. I expect that a Consistent non-GAAP reporting policy affects managers’ project choice because it alters the managers’ preference for and perception of several project characteristics in favor of the suboptimal project. In line with the main results, this process model is expected to apply only to managers who focus on the financial reporting

implications of their investment decision. Measurement of the other variables is unchanged and I use the GAAP-only condition as the baseline.

The results of the mediation model show that a GAAP-plus-non-GAAP Consistent policy causes managers to perceive the project characteristics of the suboptimal project as more desirable ($\beta = -0.489$, $z = -2.22$, $p = 0.01$, one-tailed), which leads them to invest in the lower value project ($\beta = 0.473$, $z = 13.13$, $p < 0.01$, one-tailed). In contrast, a GAAP-plus-non-GAAP Inconsistent policy has no such effect on the perceived project characteristics ($z = -0.85$, $p = 0.40$). After including the factor as a mediator, the direct links from the financial reporting policy indicators to the managers' investment decision are no longer significant (both $p > 0.58$); this suggests a full mediation.³⁰ The proposed mediation model does not explain the decisions of managers who are less concerned with the financial reporting implications of their project choice. In this case, the links from the financial reporting policy indicators to the perception of the project characteristics are not significant (both $p > 0.35$).

As before, the results of the mediation analysis remain unchanged if I use the project preference measure instead of the binary project choice (not tabulated).³¹

Within-Participants Tests

Experiment 2 also features a within-participants condition which participants attend to after they completed the main task and answered demographic

³⁰ The model fits the data well. Model fit indices for the specified full mediation model; i.e. without Link 3, are as follows: (a) $\chi^2 = 1.22$, $df = 2$, and $p = 0.54$, implying that the model fit is comparable to a fully saturated model (in line with the insignificant direct effect); (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.000; (c) the model's Comparative Fit Index (CFI) is 1.00, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.03, below the acceptable cut-off of 0.08.

³¹ I find comparable results when I perform the same mediation analysis with the data from Experiment 1.

questions. As in Experiment 1, the participants are shown both financial reporting policies side-by-side on the same page without any information about, or mention of, non-GAAP reporting consistency.³²

The results of the within-participants condition are consistent with the findings of the first experiment. When the company employs a GAAP-only reporting policy, participants generally prefer to invest in the optimal project (mean = 1.85, significantly above the midpoint of 0, $t = 6.08$, $p < 0.01$). In contrast, a non-GAAP reporting policy leads participants to prefer the suboptimal project (mean = -0.94, significantly below the midpoint of 0, $t = -2.88$, $p < 0.01$). The mean given the non-GAAP policy is also significantly lower than the mean given the GAAP-only policy (-0.94 vs. 1.83, $t = 7.10$, $p < 0.01$). I find that this difference is significant across all conditions (all $p < 0.01$). These results offer additional support for H1 and suggest that the differences in investment decision are the result of a deliberate choice made by the managers as a function of the change in financial reporting policies of the firm.

Supplemental Analysis: The Interaction Between Participants' Focus on Financial Reporting and Non-GAAP Financial Reporting Consistency

If one ignores the GAAP-only condition, the result seem to follow the pattern of a cross-over interaction. Visually, the effect of non-GAAP financial reporting consistency appears to flip for participants who have a low focus on financial reporting. Namely, participants with a high focus on financial reporting are more likely to make a suboptimal investment decision in the consistent non-GAAP reporting condition, relative to the inconsistent non-GAAP reporting. In contrast,

³² The within-participants analysis is based on the responses of 169 participants as 15 participants did not complete this last part of the study.

participants with a low focus on financial reporting seem more likely to make a suboptimal investment decision in the inconsistent non-GAAP reporting condition, relative to when the firm's non-GAAP reporting is consistent. While this pattern is in line with a cross-over interaction, the differences among the participants with low focus on financial reporting fail to reach conventional levels of statistical significance (see Table 2, Panel A for the relevant descriptive statistics).^{33, 34}

The theory predicts that participants with a lower focus on financial reporting should be less affected by financial reporting consistency, but the theory does not predict that this effect reverses. I speculate that the consistent exclusion of restructuring costs makes participants with a low focus on financial reporting, i.e. those who are more concerned with the economic implications of their project choice, question whether this adjustment is economically justifiable. This mechanism is briefly discussed in the hypothesis development section as providing some tension for the prediction in H3. When a firm consistently excludes a (presumably) non-recurring expense item for three consecutive years, such as restructuring costs, this item may appear as more recurring and economically relevant. If so, participants who are focusing less (more) on the financial reporting (economic) implications of the investment decision may be more likely to choose the optimal project when non-GAAP reporting is consistent

³³ As reported in Table 2, Panel C: Non-GAAP Inconsistent > non-GAAP Consistent, given high focus on financial reporting: $t = 1.66$, $p = 0.05$ (one tailed); Non-GAAP Inconsistent = non-GAAP Consistent, given low focus on financial reporting: $t = 1.23$, $p = 0.22$. In addition: High focus on financial reporting = low focus on financial reporting, given non-GAAP Inconsistent: $t = 1.53$, $p = 0.13$; High focus on financial reporting = low focus on financial reporting, given non-GAAP Consistent: $t = 1.37$, $p = 0.18$.

³⁴ This pattern is consistent but fails to reach statistical significance across the binary project choice and the continuous project preference measure.

because they consider the exclusion of restructuring costs inappropriate. Inconsistent non-GAAP reporting, however, does not raise such concerns because management appears to be making case-by-case adjustments so that these participants are more inclined to rely on the non-GAAP performance measure when allocating firm resources.

Directionally in line with this argument, I observe that participants who focus less on financial reporting consider the non-GAAP measure as somewhat more important when the measure is inconsistent than when the reporting is consistent ($t = 1.23$, $p = 0.11$, one tailed). In contrast, participants who focus more on financial reporting consider the non-GAAP measure as more important when the measure is consistent than when it is inconsistent ($t = 2.44$, $p = 0.01$, one tailed) in line with the main results and the hypothesis development leading to H3. The perceived importance of the non-GAAP measure, in turn, alters the participants' investment decision, in line with the proposed process and the mediation analyses.

It is difficult to draw more definite conclusions on this phenomenon from the current study since the experiments were not specifically designed to explore this process. As a result, the results are marginal at best but may offer an interesting avenue for future research. The shape of the interaction suggests that financial reporting characteristics such as financial reporting consistency may be dissimilarly perceived and interpreted by different types of managers.

V. CONCLUSION

In this study, I examine the real effect of non-GAAP earnings disclosures on managers' resource allocation decisions. Specifically, this study reports the

results of two experiments in which a firm's financial reporting policy, i.e., the presence and consistency of non-GAAP disclosures, is independently manipulated. Experiment 1 documents that firm's decision to disclose non-GAAP earnings can lead to lower economic value creation as managers discount cost types that are ignored by the non-GAAP measure and, as a result, make suboptimal investment decisions. Experiment 2 expands our understanding of this process by examining managers' focus on financial reporting and the influence of non-GAAP reporting consistency, i.e., the extent to which a firm's non-GAAP measures are defined consistently over time. The results show that the adverse effect of non-GAAP disclosures is present only when the reporting is consistent and the manager focuses on the financial reporting implications of the investment decision; resource allocation is not significantly affected when non-GAAP disclosures are inconsistently defined over time.

While regulators and auditors both advocate consistency to ensure comparability and to limit managerial opportunism, my results show that consistency can be costly because it lowers executive's investment efficiency. As regulators, such as the SEC, have the power to actively enforce consistency in the context of non-GAAP reporting (McKeon and Usvyatsky 2017; Securities and Exchange Commission (SEC) 2017), the take-aways from the present study suggest that such efforts can have adverse, unintended consequences.

My findings are significant in light of the continuing popularity of non-GAAP reporting among public firms in the US and elsewhere. The investigation is also timely as regulators continue to debate possible responses to the prevalence of and interest in non-GAAP performance measures. Under the label "management (defined) performance measure," the IASB is currently debating

whether to allow non-GAAP measures as a separate line item in the financial statements. The findings of my study can inform the debate by highlighting a potential cost that has been noticeably absent from any of the discussions, namely, the real effect of this change in financial reporting regulations on firms' resource allocation. The debates so far have centered around disclosure informativeness and the issue of opportunistic reporting. However, the notion that changes to non-GAAP disclosure regulations have real economic consequences, particularly when managers pay a lot of attention to financial reporting considerations, has not been considered. Compared to the current regime, an inclusion of non-GAAP measures in the primary financial statements of firms, as it is currently being discussed, would likely amplify the effect documented in this study because it would increase the salience and perceived importance of non-GAAP measures relative to GAAP earnings. Relatedly, such a regime change likely also increases managers' concern about the (non-GAAP) financial reporting implications of their resource allocation decisions.

In addition to their practical significance, my findings contribute to the accounting literature on non-GAAP disclosures and the real effect of financial reporting in several ways. While the existing literature on non-GAAP measures and pro forma earnings mainly focuses on their informativeness, this study investigates how this popular type of voluntary disclosure affects managerial resource allocation decisions. Relatedly, I examine how executives perceive financial reporting consistency in the context of non-GAAP disclosures and how their focus on financial reporting affects resource allocation decisions. Ex-ante, it is not clear whether, and how, managers react to non-GAAP consistency as the firm has discretion over the content and format of this voluntary disclosure. My

results suggest that managers are, in fact, sensitive to this disclosure characteristic, especially when they are concerned about the financial reporting implications of their investment decisions. Moreover, my research informs the literature on the real effects of non-GAAP accounting disclosures by documenting how this type of disclosure can shape executives' preference for specific financial reporting characteristics. Finally, the current research is related to the literature on classification shifting and misclassification. Rather than misclassify transactions, managers may also be inclined to make suboptimal resource allocation decisions which benefit reported performance at the expense of true value creation

The present study is subject to the following limitations, which simultaneously offer interesting opportunities for future research. The experiment is necessarily a simplified task and, to be mindful of participant's time, I presented them only with a limited amount of information. In addition, I only examine how participants choose between a set of two projects. While these design choices are necessary to ensure feasibility of the study and to maintain experimental control, they also limit the complexity of the setting. Future research can examine how the presence of non-GAAP disclosures interacts with other characteristics of the information environment and whether the results translate to other resource allocation decisions. Specifically, it may be interesting to examine whether non-GAAP disclosures have the same real effect on recurring and more routine spending decisions, such as employee compensation. In addition, the behavioral consequences may also change depending on factors such as the type and justifiability of a non-GAAP adjustment.

Furthermore, this study tests a setting in which a financial reporting policy that is fixed for a given year affects concurrent investment decisions. In practice, managers have some ability to alter both resource allocation and financial reporting decisions. As discussed in the context of the real effects hypothesis, financial reporting and real decisions are mutually influential and the investment decision a manager has made, or is about to make, may influence the concurrent and future financial reporting choices, especially with respect to highly discretionary non-GAAP earnings disclosures. Future research can examine how factors such as the perceived disclosure costs and the perceived costs of suboptimal economic decisions affect managers' propensity to alter either the resource allocation or the disclosure, or both. Finally, future research can examine potential remedies to foster investment efficiency by mitigating the adverse effects of non-GAAP disclosures, including corporate governance, regulatory intervention, for example, an upfront disclaimer, and the effect of investor characteristics such as sophistication, short-selling pressure, and activism.

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APPENDIX A – INSTRUMENT

Manipulation of Financial Reporting Policy

Financial Reporting Policy of Hooli Tech, Inc.

The company reports its quarterly financial results in the form of quarterly financial statements and earnings press releases.

GAAP-only Condition [Experiment 1]

Hooli Tech has a policy of exclusively using U.S. GAAP-compliant metrics, for example, **Net Income**, to measure and report on its firm performance. **Net Income** is the most relevant performance metric used by management and management believes that investors' understanding of firm performance is enhanced by disclosing this performance measure in line with U.S. GAAP.

The following are examples of how Hooli Tech's management utilizes the **Net Income** measure:

- Senior management receives a monthly analysis of our operating results that is prepared on a **Net Income** basis; and
- The annual budgets are prepared on a **Net Income** basis.

GAAP-plus-non-GAAP Condition [Experiment 1]

Hooli Tech has a policy of using non-GAAP metrics, such as **Adjusted Income**, in addition to U.S. GAAP-compliant metrics, for example, Net Income, to measure and report on its firm performance. **Adjusted Income** is an alternative view of performance used by management and management believes that investors' understanding of firm performance is enhanced by disclosing this performance measure in addition to traditional GAAP earnings. We have defined **Adjusted Income** as Net income attributable to Hooli Tech, Inc. before the impact of restructuring costs.

The following are examples of how Hooli Tech's management utilizes the **Adjusted Income** measure:

- Senior management receives a monthly analysis of our operating results that is prepared on an **Adjusted Income** basis; and
- The annual budgets are prepared on an **Adjusted Income** basis.

This non-GAAP measure is presented solely to permit investors to more fully understand how management assesses performance.

Financial Reporting *Consistent* [Experiment 2]

[The information of the GAAP-plus-non-GAAP Condition is shown here]

Historical Changes of Hooli Tech’s Non-GAAP Financial Reporting Policy (if any)

Cost Type	Definition of Adjusted Income (non-GAAP)		
	FY 2015	FY 2016	FY 2017 (current)
Restructuring Costs	Excluded	Excluded	Excluded
Acquisition Costs	Not Excluded	Not Excluded	Not Excluded
Impairment Costs	Not Excluded	Not Excluded	Not Excluded

Note(s):

- Irrespective of whether the company actually incurred the three types of costs mentioned above, the table summarizes the historical changes of the firm’s non-GAAP reporting policy.
- The cost types mentioned above are the most commonly excluded items in the industry.
- “Not Excluded” implies that this cost is not excluded from Net Income (GAAP) when calculating Adjusted Income (non-GAAP). In FY 2016, for example, Adjusted Income (non-GAAP) is calculated by the following formula: Net Income (GAAP) + Restructuring Costs = Adjusted Income (non-GAAP).

Financial Reporting *Inconsistent* [Experiment 2]

[The information of the GAAP-plus-non-GAAP Condition is shown here]

Historical Changes of Hooli Tech’s Non-GAAP Financial Reporting Policy (if any)

Cost Type	Definition of Adjusted Income (non-GAAP)		
	FY 2015	FY 2016	FY 2017 (current)
Restructuring Costs	Not Excluded	Not Excluded	Excluded
Acquisition Costs	Not Excluded	Excluded	Not Excluded
Impairment Costs	Excluded	Not Excluded	Not Excluded

Note(s):

- Irrespective of whether the company actually incurred the three types of costs mentioned above, the table summarizes the historical changes of the firm's non-GAAP reporting policy.
- The cost types mentioned above are the most commonly excluded items in the industry.
- "Not Excluded" implies that this cost is not excluded from Net Income (GAAP) when calculating Adjusted Income (non-GAAP). In FY 2016, for example, Adjusted Income (non-GAAP) is calculated by the following formula: $\text{Net Income (GAAP)} + \text{Acquisition Costs} = \text{Adjusted Income (non-GAAP)}$.

Investment Task

Investment Decision

In response to the aggressive competition in the IT hardware industry, management has decided to heavily invest in Hooli Tech's competitiveness this year. Two projects are proposed to achieve greater efficiency and improve sales.

Based on the analysis of industry-level historical data, the project consultant for Hooli Tech is making sales and costs forecasts for Project A and Project B.

The below tables show the estimated sales, costs, and earnings that each of the projects is expected to contribute to the company's annual earnings. The consultant believes that estimated annual earnings for both projects will be realized at a 90% confidence level. The classification of project costs follows from applicable accounting and financial reporting standards. The two projects are similarly attractive to Hooli Tech based on other dimensions, not specifically mentioned in the tables.

The board has only approved sufficient funds to invest in one of the projects. As the general manager, you are in charge of picking the project.

Project A <i>(in million dollars)</i>				
	FY 2017 (expected)	FY 2018 (expected)	FY 2019 (expected)	Total (expected)
Net Sales	1,821	1,913	2,008	5,742
Investment Costs ^[Note 1]	(1,200)	(1,260)	(1,323)	(3,783)
Restructuring Costs ^[Note 1]	-	-	-	-
Other Costs	(420)	(441)	(463)	(1,324)
Total Costs	<u>(1,620)</u>	<u>(1,701)</u>	<u>(1,786)</u>	<u>(5,107)</u>
Net Income (GAAP)	201	212	222	635
Adjusted Income, excl. restructuring costs (non-GAAP) ^[Note 2]	201	212	222	635

^[Note 1] Investment Costs and Restructuring Costs include identical amounts of cash- vs. non-cash expenses and recurring vs. one-time expenses.

^[Note 2] Some firms exclude restructuring costs when calculating Income.

Project B <i>(in million dollars)</i>				
	FY 2017 (expected)	FY 2018 (expected)	FY 2019 (expected)	Total (expected)
Net Sales	1,803	1,875	1,969	5,647
Investment Costs ^[Note 1]	(1,000)	(1,050)	(1,103)	(3,153)
Restructuring Costs ^[Note 1]	(320)	(336)	(353)	(1,009)
Other Costs	(300)	(315)	(331)	(946)
Total Costs	<u>(1,620)</u>	<u>(1,701)</u>	<u>(1,786)</u>	<u>(5,107)</u>
Net Income (GAAP)	183	174	183	540
Adjusted Income, excl. restructuring costs (non-GAAP) ^[Note 2]	503	510	536	1,549

^[Note 1] Investment Costs and Restructuring Costs include identical amounts of

cash- vs. non-cash expenses and recurring vs. one-time expenses.
[Note 2] Some firms exclude restructuring costs when calculating Income.

Assume you are the manager of Hooli Tech, Inc., which project do you want to invest in?

Project A

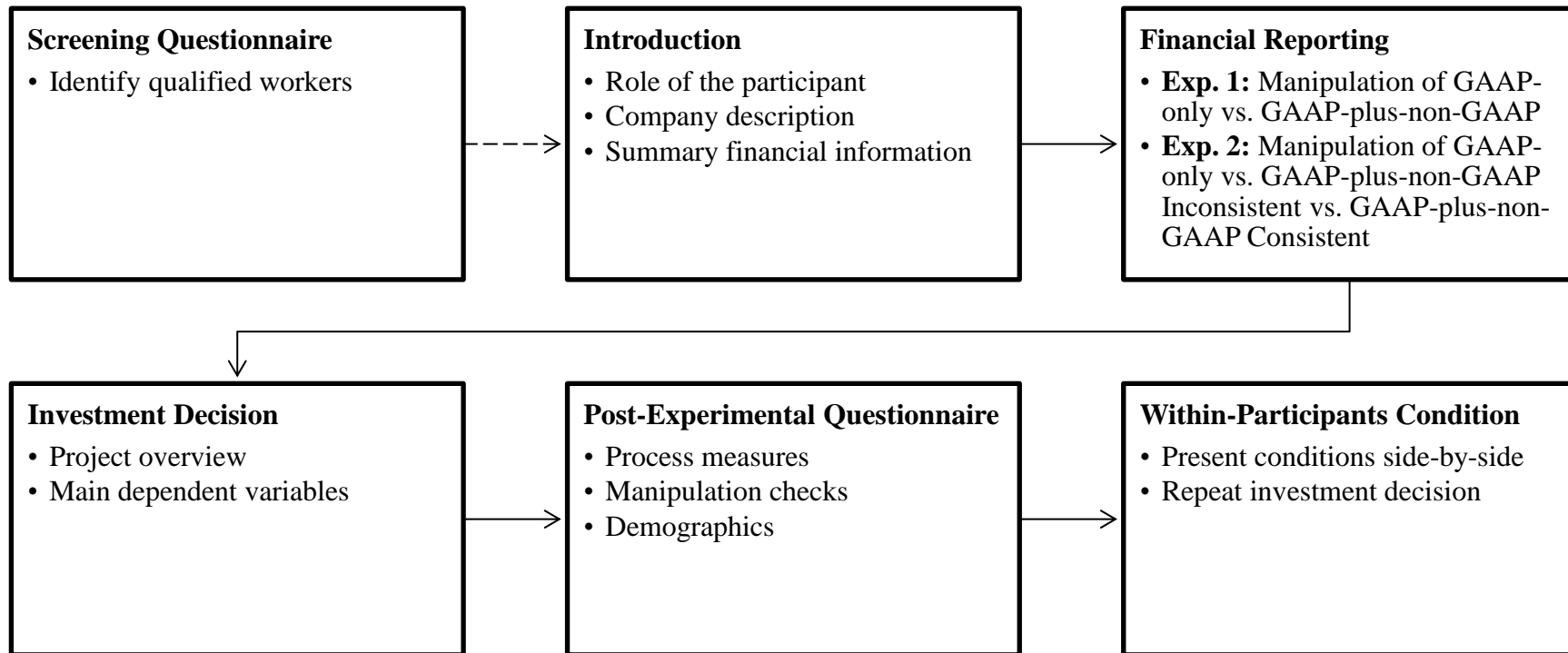
Project B

Please indicate the strength of preference of your above choice

Definitely Project		Neutral		Definitely Project										
A				B										
-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7

Briefly, explain the reasons for your decision

APPENDIX B – EXPERIMENTAL PROCEDURE

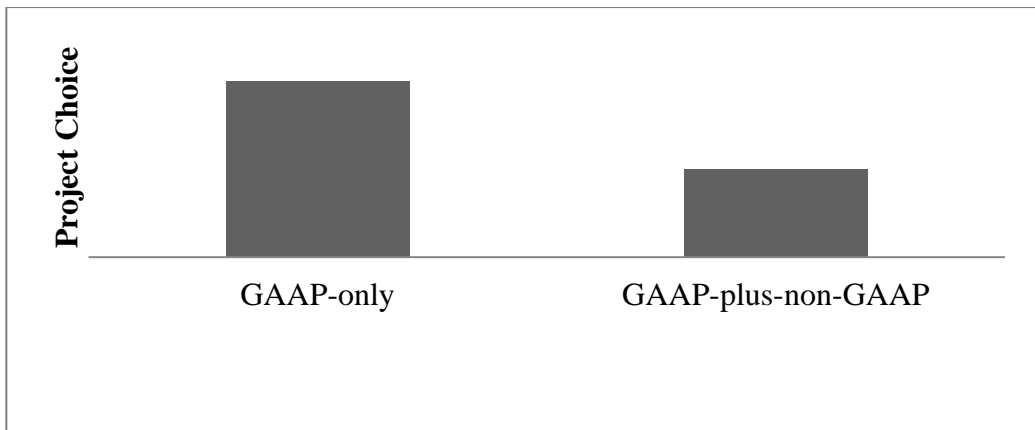


FIGURES

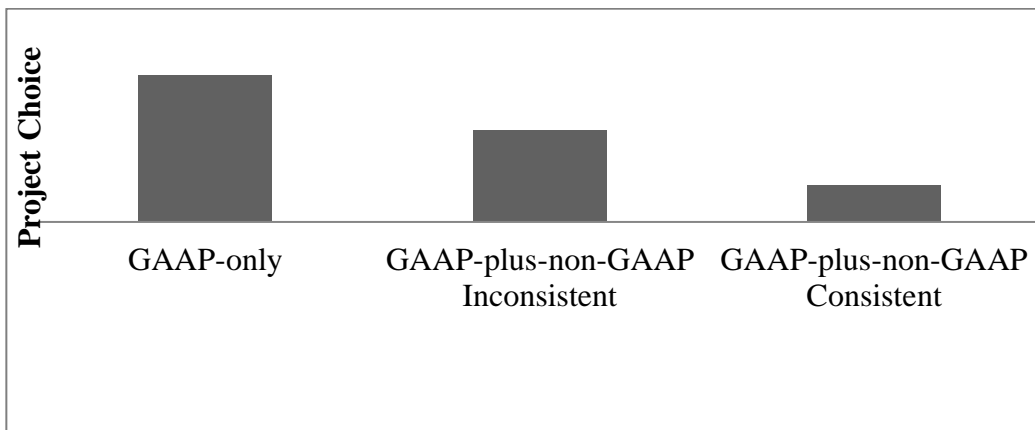
FIGURE 1

Predicted Effects of non-GAAP Financial Reporting Policy on Participants' Project Choice

Panel A: Hypothesis 1



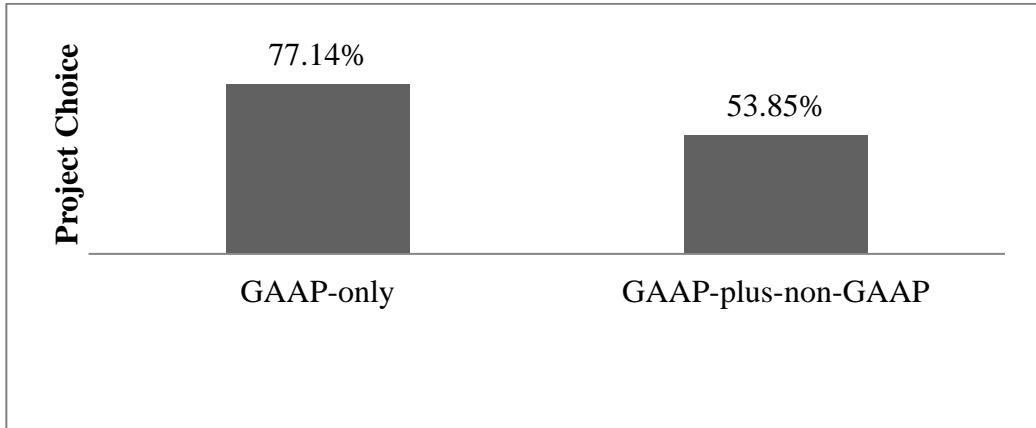
Panel B: Hypothesis 3



Notes: Figure 1 summarizes H1 in Panel A and H3 in Panel B. Financial reporting policy is independently manipulated between-participants. The Project Choice variable captures participants propensity to choose the optimal project whereby lower levels imply lower economic efficiency (see the research design section of Experiment 1 for details).

FIGURE 2

Experiment 1: Effects of non-GAAP Financial Reporting Policy on Participants' Project Choice

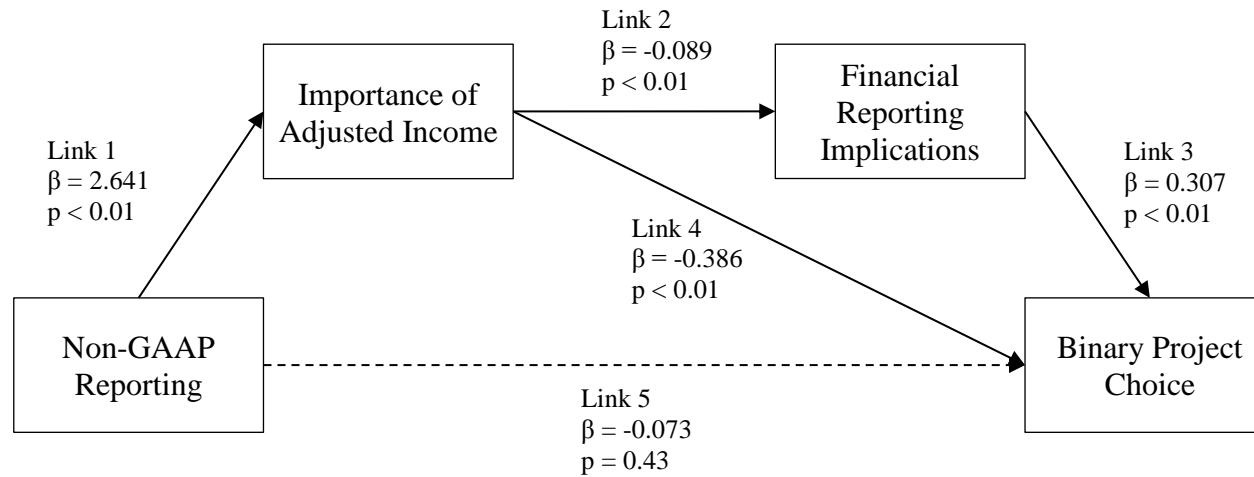


Notes: Figure 2 summarizes the results of Experiment 1. Financial reporting policy is independently manipulated between-participants. The Project Choice variable captures participants propensity to choose the optimal project, using the binary project choice measure, whereby lower levels imply lower economic efficiency (see the research design section of Experiment 1 for details).

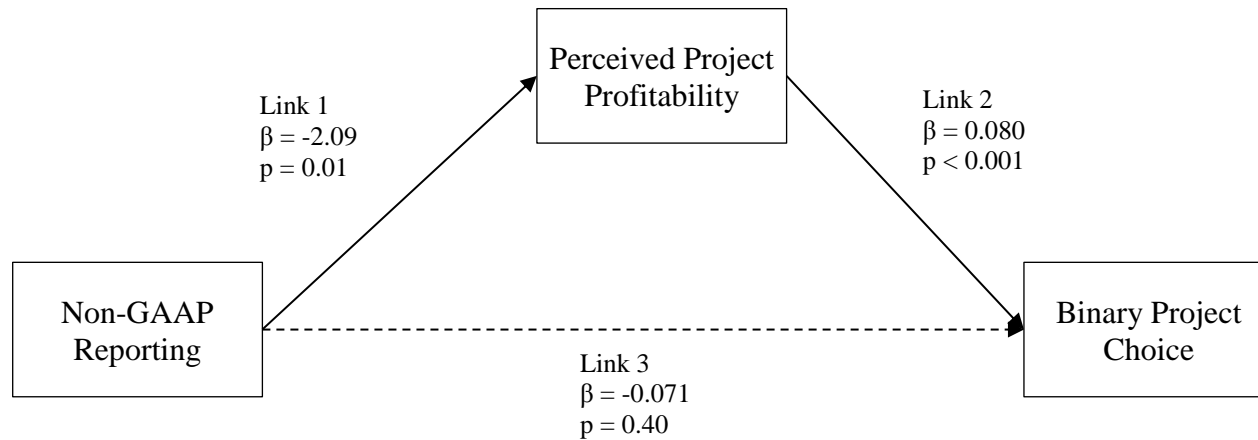
FIGURE 3

Experiment 1 Structural Equations Modelling: Mediators of the Effects of non-GAAP Financial Reporting Policy on Participants' Project Choice

Panel A: Importance of Adjusted Income and Financial Reporting Implications ^{a, b}



Panel B: Perceived Project Profitability^{a, c}



Notes: Figure 3 summarizes the results of two Structural Equations Models for the mediating role of Importance of Adjusted Income, Financial Reporting Implications, and Perceived Project Profitability. The standardized coefficients and corresponding, one-tailed p-values are reported next to each link.

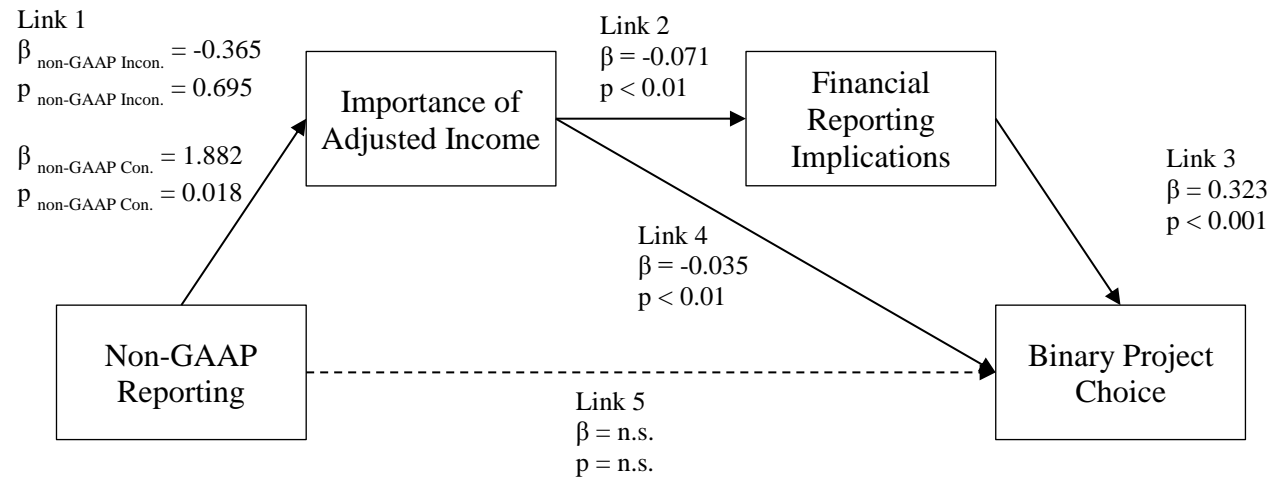
^a Non-GAAP Reporting is independently manipulated between-participants. Importance of Adjusted Income is measured as follows: “How important is [Adjusted Income] for your investment decision?” Answers are captured on a 15-point Likert Scale (ranging from 0, not at all important, to 14, extremely important, including a mid-point of 7, labeled moderately important). Financial Reporting Implications are measured with the following question: “In your opinion, which alternative [project] has more favorable financial reporting implications for [the company]? Answer Choices: a) Project A, b) Project B, and c) No Difference.” Choosing the optimal (suboptimal) project is coded as 1 (-1), while choosing c) is coded as 0. Perceived Project Profitability is measured using the following question: “How do you assess the two projects in terms of Profitability?”. Answers are captured on a 15-point Likert Scale (ranging from -7, the “bad” project is more profitable, to +7, the “good” project is more profitable, including a neutral point of 0). The Project Choice variable captures participants propensity to choose the optimal project, using the binary project choice measure, whereby lower levels imply lower economic efficiency. See the research design section of Experiment 1 for details.

^bThe model fits the data reasonably well. Fit indices for the specified full mediation model, i.e. without Link 5, are as follows: (a) $\chi^2 = 2.68$, $df = 2$, and $p = 0.26$, implying that the model fit is comparable to a fully saturated model; (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.07; (c) the model's Comparative Fit Index (CFI) is 0.989, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.06, below the acceptable cut-off of 0.08.

^cModel fit indices for the specified full mediation model in Panel B, i.e. without Link 3, are as follows: (a) $\chi^2 = 0.68$, $df = 1$, and $p > 0.40$, implying that the model fit is comparable to a fully saturated model; (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.00; (c) the model's Comparative Fit Index (CFI) is 1.00, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.02, below the acceptable cut-off of 0.08.

FIGURE 4

Experiment 2 Structural Equations Modelling: Importance of Adjusted Income and Financial Reporting Implications as a Mediator of the Effects of non-GAAP Financial Reporting Policy on Participants' Project Choice



Notes: Figure 4 summarizes the results of a Structural Equations Model for the mediating roles of Importance of Adjusted Income and Financial Reporting Implications when managers focus on financial reporting implications of the project choice. The standardized coefficients and corresponding, one-tailed p-values are reported next to each link. Non-GAAP Reporting is independently manipulated between-participants. Importance of Adjusted Income is measured as follows: “How important is [Adjusted Income] for your investment decision?” Answers are captured on a 15-point Likert Scale (ranging from 0, not at all important, to 14, extremely important, including a mid-point of 7, labeled moderately important). Financial Reporting Implications are measured with the following question: “In your opinion, which alternative [project] has more favorable financial reporting implications for [the company]? Answer Choices: a) Project A, b) Project B, and c) No Difference.” Choosing the optimal (suboptimal) project is coded as 1 (-1), while choosing c) is coded as 0. The Project Choice variable captures participants propensity to choose the optimal project, using the binary project choice measure, whereby lower levels imply lower economic efficiency. See the research design section of Experiment 2 for details. Model fit indices for the specified full mediation model, i.e. without Link 5, are as follows: (a) $\chi^2 = 5.36$, $df = 4$, and $p = 0.25$, implying that the model fit is comparable to a fully saturated model (in line with the insignificant Link 5); (b) Root Mean Squared Error of Approximation (RMSEA) value = 0.06; (c) the model’s Comparative Fit Index (CFI) is 0.98, where values of > 0.95 exhibit good fit (Iacobucci 2010); and, (d) the Standardized Root Mean Squared Residual value equals 0.05, below the acceptable cut-off of 0.08. Overall, these metrics suggest an acceptable model fit.

TABLES

TABLE 1
Experiment 1: Results for Participants' Project Choice

Panel A: Mean (Standard Deviation)

	Financial Reporting Policy		
	GAAP-only	GAAP-plus-non-GAAP	Total
% choosing the optimal project	77.14% (0.426)	53.85% (0.505)	64.86% (0.481)
Project Preference	1.97 (3.823)	-0.28 (4.930)	0.78 (4.555)
	N = 35	N = 49	N = 74

Panel B: Logistic Regression ^a

Source	Coef.	Std. Err.	z	p-value
Non-GAAP	-1.062	0.515	-2.06	0.02 *
Constant	1.216	0.403	3.02	<0.01

Panel C: Analysis of Variance (ANOVA) ^a

Source	SS	Df	F	p-value
Non-GAAP	93.672	1	4.75	0.02 *

^a Financial Reporting Policy is independently manipulated between-participants. During the statistical analysis, I use an indicator variable for the manipulated variable such that Non-GAAP equals 1 (0) in the GAAP-plus-non-GAAP (GAAP-only) condition. The logistic regression was performed with binary project choice (Optimal Project = 1; Suboptimal Project = 0) as the dependent variable. The ANOVA was performed with project preference (ranging from -7 to +7) as the dependent variable. All measures are as previously defined, see research design section for details.

* The reported p-values are one-tailed given the directional predictions.

TABLE 2
Experiment 2: Results for Participants' Project Choice

Panel A: Participants Choosing the Optimal Project Mean (Standard Deviation) ^a

Participant Focus on Financial Reporting	Financial Reporting Policy			Total
	GAAP-only	GAAP-plus-non-GAAP Inconsistent	GAAP-plus-non-GAAP Consistent	
High	70.37% (0.465) N = 27	65.38% (0.485) N = 26	43.33% (0.504) N = 30	59.03% (0.495) N = 83
Low	51.35% (0.507) N = 37	45.16% (0.504) N = 31	60.61% (0.496) N = 33	52.48% (0.502) N = 101
Total	59.38% (0.495) N = 64	54.39% (0.503) N = 57	52.38% (0.503) N = 63	N = 184

Panel B: Logistic Regression ^b

Source	Coef.	Std. Err.	z	p-value
GAAP-plus-non-GAAP Inconsistent	-0.207	0.373	-0.56	0.58
GAAP-plus-non-GAAP Consistent	-0.295	0.363	-0.81	0.42
Participant Focus on Financial Reporting	0.130	0.090	1.45	0.15
GAAP-plus-non-GAAP Inconsistent x Participant Focus on Financial Reporting	-0.062	0.123	-0.51	0.61
GAAP-plus-non-GAAP Consistent x Participant Focus on Financial Reporting	-0.207	0.118	-1.76	0.04 *
Constant	0.387	0.260	1.49	0.14

Panel C: Simple Effects Tests ^a

Comparison: Participant Focus on Financial Reporting High	t	p-value
GAAP-only > GAAP-plus-non-GAAP Consistent	2.10	0.02 *
GAAP-plus-non-GAAP Inconsistent > GAAP-plus-non-GAAP Consistent	1.66	0.05 *
GAAP-only > GAAP-plus-non-GAAP Inconsistent	0.38	0.70
GAAP-only > GAAP-plus-non-GAAP Consistent & GAAP-plus-non-GAAP Inconsistent	1.46	0.07 *

Comparison: Participant Focus on Financial Reporting Low	t	p-value
GAAP-only > GAAP-plus-non-GAAP Consistent	0.77	0.44
GAAP-plus-non-GAAP Inconsistent > GAAP-plus-non-GAAP Consistent	1.36	0.22
GAAP-only > GAAP-plus-non-GAAP Inconsistent	0.62	0.62
GAAP-only > GAAP-plus non-GAAP Consistent & GAAP-plus-non-GAAP Inconsistent	0.10	0.87

^a High (low) focus on financial reporting participants are those who score above (below) the median score.

^b Financial Reporting Policy is independently manipulated between-participants. I use the mean-centered, continuous participant focus on financial reporting measure, a factor variable for the experimental condition, and corresponding interaction terms. All measures are as previously defined, see research design section of Experiment 2 and Table 1 for details.

* The reported p-values are one-tailed given the directional predictions.

TABLE 3
Experiment 2: Results for Participants' Project Preference

Panel A: Project Preference Mean (Standard Deviation) ^a

Participant Focus on Financial Reporting	Financial Reporting Policy			
	GAAP-only	GAAP-plus-non-GAAP Inconsistent	GAAP-plus-non-GAAP Consistent	Total
High	1.52 (3.817) N = 27	0.92 (4.204) N = 26	-0.27 (3.868) N = 30	0.69 (3.985) N = 83
Low	0 (4.466) N = 37	-0.45 (4.426) N = 31	0.67 (4.628) N = 33	0.08 (4.485) N = 101
Total	0.64 (4.240) N = 64	0.18 (4.305) N = 57	0.22 (4.275) N = 63	N = 184

Panel B: Logistic Regression ^b

Source	Coef.	Std. Err.	t	p-value
GAAP-plus-non-GAAP Inconsistent	-0.446	0.782	-0.57	0.57
GAAP-plus-non-GAAP Consistent	-0.407	0.762	-0.53	0.59
Participant Focus on Financial Reporting	0.221	0.177	1.25	0.21
GAAP-plus-non-GAAP Inconsistent x Participant Focus on Financial Reporting	-0.133	0.249	-0.53	0.60
GAAP-plus-non-GAAP Consistent x Participant Focus on Financial Reporting	-0.324	0.238	-1.36	0.09 *
Constant	0.624	0.537	1.16	0.25

Panel C: Simple Effects Tests ^a

Comparison: Participant Focus on Financial Reporting High	t	p-value
GAAP-only > GAAP-plus-non-GAAP Consistent	1.75	0.04 *
GAAP-plus-non-GAAP Inconsistent > GAAP-plus-non-GAAP Consistent	1.10	0.14 *
GAAP-only > GAAP-plus-non-GAAP Inconsistent	0.54	0.59
GAAP-only > GAAP-plus-non-GAAP Consistent & GAAP-plus-non-GAAP Inconsistent	1.33	0.09 *

Comparison: Participant Focus on Financial Reporting Low	t	p-value
GAAP-only > GAAP-plus-non-GAAP Consistent	0.61	0.54
GAAP-plus-non-GAAP Inconsistent > GAAP-plus-non-GAAP Consistent	0.99	0.33
GAAP-only > GAAP-plus-non-GAAP Inconsistent	0.42	0.68
GAAP-only > GAAP-plus non-GAAP Consistent & GAAP-plus-non-GAAP Inconsistent	0.13	0.89

^a High (low) focus on financial reporting participants are those who score above (below) the median score.

^b Financial Reporting Policy is independently manipulated between-participants. I use the mean-centered, continuous participant focus on financial reporting measure, a factor variable for the experimental condition, and corresponding interaction terms. All measures are as previously defined, see research design section of Experiment 2 and Table 1 for details. Financial Reporting Policy is independently manipulated between-participants. All measures are as previously defined, see research design section of Experiment 2 and Table 1 for details.

* The reported p-values are one-tailed given the directional predictions.
