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# HOW DO NONPROFESSIONAL INVESTORS UNDERSTAND AND USE RELEVANCE AND RELIABILITY OF FINANCIAL INFORMATION?

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HOW DO NONPROFESSIONAL INVESTORS UNDERSTAND AND USE THE RELEVANCE AND RELIABILITY OF FINANCIAL INFORMATION?

A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

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# DEDICATION

I would like to dedicate this dissertation to my grandmother, Sue H. Jurney, who passed away during the completion of this dissertation. She had tremendous faith in me, more faith than I had, that I would succeed in achieving my goals.

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ABSTRACT

With recent and ongoing changes to the conceptual framework, it is important to gain an understanding of how users of financial information understand and use the relevance and reliability of financial information in their judgments and decisions in an investing context. An important subset of financial statement users is nonprofessional investors. While nonprofessional investors will not be impacted directly by changes to the conceptual framework, they will be affected indirectly by these changes. If standard setters make trade-offs between relevance and reliability in setting new standards, the resulting information provided to users will reflect varying degrees of relevance and reliability due to these trade-offs. Therefore, I examine how investors use such information in their judgments and decisions. The goal of this study is explore how nonprofessional investors think about relevance and reliability, and then examine how they are affected by variations in relevance and reliability of financial information in making investment-related decisions.

This study first explores how nonprofessional investors perceive relevance and reliability and the attributes that they ascribe to these characteristics. Then I test the effects of relevance and reliability of financial information on nonprofessional investors' judgments of the attractiveness of a stock, the amount to invest in the stock, and the effect of the information on the price of the stock. I do this experimentally with MBA students.

The results are consistent with some of the hypotheses. Overall, relevance of financial information is more important to nonprofessional investors' judgments and decisions, indicating that highly relevant information is more likely to affect judgments regardless of the reliability of the information. In addition, results suggest that

nonprofessional investors have poor self-insight regarding the importance that they place on relevance and reliability with respect to investment-related judgments and decisions.

# I. INTRODUCTION

The overall goal of the financial reporting system is to provide information that is useful in making economic decisions. In its original model or Conceptual Framework, the Financial Accounting Standards Board (FASB) identified relevance and reliability as two primary qualitative characteristics of financial information that make the information useful to these decisions. However, not much is known about how market participants incorporate the relevance and reliability of financial information in their decision-making process and how their decisions are affected by these information characteristics (Maines and Wahlen 2006; Schipper 2007). In this study, I examine how nonprofessional investors think about the concepts of relevance and reliability, and then I use that information in an experiment designed to explore how investors assess relevance and reliability of financial information and use information with varying levels of those characteristics in making judgments and investment decisions. Currently, the FASB is reconsidering its conceptual framework as it works with the International Accounting Standards Board (IASB) to provide a unified framework. This study can inform the debate over changes to the conceptual framework at this important point in time for financial accounting.

Practitioners and researchers continue to debate relevance and reliability of financial information and which items should be recognized or disclosed in the financial reporting process. In fact, the debate between historical cost and fair value can be considered a philosophical debate between relevance (fair value) and reliability (historical cost). The objective of the joint FASB/IASB initiative is to design a framework that provides "a sound foundation for developing future accounting

standards."[1] As the FASB and IASB consider changes to the conceptual framework in general and the two primary qualitative characteristics in particular, the understanding of these qualitative characteristics by users of financial information should be examined. With the emphasis on fair value accounting and increasing attention on timely information, the FASB is considering designating relevance the primary quality and reliability ("faithful representation") would be secondary (FASB 2008).[2] If standard setters focus on relevance first, this can potentially shift the standards they promulgate. For example, assume that the standard setters debate a standard on the valuation of a particular asset. If the standard setters decide that it is most relevant to report this asset at its fair value, yet the only way to measure its fair value is to use a Level 3 valuation (no active market or observable inputs to the valuation model), different weightings on relevance and reliability in the standard setter's conceptual framework could lead to very different standards being set.[3]

The overriding goal for both the FASB and the IASB is to provide information that is useful in making economic decisions (FASB/IASB 2005), and according to the FASB, relevance and reliability are the two primary qualities that make accounting information useful for decision making. Understanding the effect of these two qualities on investor decisions can help the FASB understand how changing the conceptual framework and any proposed trade-offs between relevance and reliability may affect

[1] http://fasb.org/project/conceptual_framework.shtml

[2] The plan was previously discussed in the preliminary views document on the objective of financial reporting and qualitative characteristics of decision-useful financial reporting information (issued by the FASB on July 6, 2006). The exposure draft was issued on May 29, 2008 with comment period ending September 29, 2008. A final document will not be issued until the conclusion of all phases of the conceptual framework project.

[3] In order to develop fair value estimates, SFAS 157 establishes a fair value hierarchy, where the hierarchy gives priority to quoted prices in active markets for identical assets (Level 1). Level 2 is where inputs to the valuation model consist of observable inputs, and Level 3 is where inputs to the valuation model consist of unobservable inputs (Herz and MacDonald 2008).

investors' future information use and their judgments and decisions. According to Dye and Sridhar (2004), how to make relevance-reliability trade-offs is one of the most fundamental and persistent problems of financial accounting. Examples of these trade-offs include deciding what valuation to use (e.g., historical cost versus fair value), what transactions to recognize or to disclose, and when a transaction is sufficiently complete to qualify for recognition. The new framework is attempting to clarify *how* standard setters should make these trade-offs by considering relevance first and essentially placing an unknown threshold on reliability ("faithful representation"). While any changes to the conceptual framework will have an indirect effect on users of financial information (through the standards used to present financial information), an understanding of this effect on users making investment decisions is important because it will lead to real allocation effects.

Thus, in this study, I examine experimentally how the decisions of financial statement users are affected by the relevance and reliability of financial information. This will help us to learn more about their decision making and may also help in considering the appropriate specification of the framework. The experiment uses a 2 x 2 between-participants design with levels of relevance and reliability of company information manipulated, and the dependent variables include stock price judgments as well as the attractiveness of the company's stock and amount to invest in the company's stock. If standard setters make trade-offs between relevance and reliability in setting new standards, the resulting information provided to users will reflect levels of relevance and reliability determined by the trade-offs exercised by standard setters. Therefore, I examine how investors use such information in their judgments and decisions. I find

nonprofessional investors are affected by and use the relevance and reliability of financial information in differing ways depending on the type of judgment or decision required in the context. For example, in deciding how much to invest in a particular stock, the results suggest that nonprofessional investors first consider the relevance of the information and if it is high, then they consider the reliability of the information. The results also suggest that an increase in reliability does not compensate for a lack of relevance. Similarly, in a different aspect of the investing process, when nonprofessional investors are asked to make judgments of the attractiveness of the stock and the effect of the information on stock price, the results suggest that only relevance is important. Reliability does not significantly affect these judgments.

Prior to running this experiment, I conducted a pre-experimental study to find out how financial statement users think about and value relevance and reliability of financial information. I find that nonprofessional investors state they value reliability more than relevance when judging the importance of relevant and reliable information for making an investment decision. In addition, I find that the attributes that nonprofessional investors ascribe to the characteristics of relevance and reliability differ from the expectations of the FASB. For example, the results suggest that attributes commonly thought to be a part of reliability (verifiability, representational faithfulness, and the amount of measurement error) may be perceived also as a part of relevance.

This study contributes to the literature in several ways. First, this study attempts to answer the call put forth by Maines and Wahlen (2006) and Schipper (2007) for more evidence on how reliability is understood. In comment letters to the FASB and IASB regarding the preliminary views for revising the conceptual framework and the

subsequent exposure draft, many were concerned with the change in terminology. Although confusion exists regarding what reliability means or entails, letter writers note that replacing it with a new term (i.e., faithful representation) does not clear up the confusion, and can, in fact, exacerbate the situation. Secondly, this study contributes evidence on the joint effect of relevance and reliability. Prior studies examine reliability perceptions, but not in conjunction with relevance. This study provides some evidence on the intended and unintended consequences of the revised conceptual framework. Finally, this study also extends the literature on nonprofessional investors by further investigating their perceptions of relevance and reliability, and then how differences in relevance and reliability may affect their judgments and decision making.

The rest of the paper is organized as follows. The next section provides a review of the literature relating to relevance and reliability of accounting information. The third section develops a model of how relevance and reliability potentially interact and affect information use and judgments. The fourth section details the research method. The fifth section presents the results. The conclusion discusses the contributions and limitations of my research as well as future research opportunities.

## II. BACKGROUND

### Standard Setting

As a part of the conceptual framework, Statement of Financial Accounting Concepts (SFAC) No. 2 discusses the characteristics of accounting information that make it useful. SFAC No. 2 states that relevance and reliability are the two primary qualitative characteristics that make accounting information useful. According to SFAC No. 2, for information to be relevant, it must be timely and have predictive value and/or feedback

value. Thus, in order to be relevant, the "information must be capable of making a difference in a decision" (SFAC No. 2, para. 47). In contrast to relevance, reliability is "inherent in the information itself, not in the use of the information" (IASB 2006). Information is reliable if "users can depend on it to represent the economic conditions or events it purports to represent" (SFAC No. 2, para. 62). Reliable information, according to SFAC No. 2, consists of "representational faithfulness, verifiability, and neutrality" with an overlay of completeness, freedom from bias, precision, and uncertainty (SFAC No. 2, para. 33).

However, research regarding the effectiveness of SFAC No. 2 is scarce. The benefits of clearly setting forth the important qualitative characteristics of accounting information are unclear. Joyce et al. (1982) attempt to test the assumption that identifying the appropriate qualitative characteristics of accounting information will help standard setters in selecting financial accounting methods. In a study with former members of the APB and the FASB as participants, they find substantial disagreement between experienced policy makers on what the qualitative characteristics mean in the context of particular accounting policy issues and of the relative importance of the qualitative characteristics.

According to SFAC No. 2, if either of these characteristics (relevance or reliability) is completely missing, the information will not be useful. However, in a joint project with the IASB, the FASB is considering revising SFAC No. 2 to change the terminology related to reliability and to change how the FASB views the relation between the qualitative characteristics (FASB 2008). The FASB has proposed replacing "reliability" with "faithful representation." In addition, instead of being jointly

considered, the qualitative characteristics of relevance and faithful representation will be considered sequentially in that the most relevant element should be identified first, then the standard setter must decide how the element can be faithfully represented. If it cannot be faithfully represented, then the next most relevant element would be considered. The FASB expects this process to identify the most decision-useful financial information.

**Traditional Measurement Theory**

The concept of reliability is prevalent in traditional measurement theory. However, the manner in which the FASB uses reliability differs substantially from the psychometric understanding of reliability. As used by FASB and in accounting practice, reliability is more qualitative rather than quantitative; in fact, it is difficult to assign a true measurement of reliability to a piece of accounting information. Conversely, in traditional measurement theory, the degree of random error indicates the relative reliability of the measuring instrument and data produced. Accurate data are considered to be reliable data, resulting from an instrument that measures consistently. Several methods exist in psychometrics to measure reliability such as test-retest, coefficient of equivalence, coefficient of stability, Cronbach's alpha, and internal consistency (Maxwell and Delaney 2004). Reliability procedures are concerned with minimizing random error by increasing the precision and consistency of the measuring instrument. If something is deemed reliable, then we can depend on it.

Although the concept of reliability as discussed by the FASB and in accounting practice differs substantially from the psychometric understanding of reliability, some commonalities exist that are discussed below. One of the main issues with reliability in the psychometric sense is to assess the measure's validity. The question of validity arises

when addressing the systematic error in measurement. Thus, are we measuring what we think we are measuring or is there some systematic error involved (Kerlinger 1986)? Similarly, the validity of the qualitative characteristics of information (relevance and reliability) as used by the FASB is critical. Thus, it is beneficial to frame relevance and reliability (as FASB defined them in SFAC No. 2) in terms common to traditional measurement theory.

First, in order to be relevant, information must be timely and have predictive and/or feedback value. Even though relevance is not a mathematical construct, the qualities of relevance correspond to the concept of criterion validity in traditional measurement theory. Criterion validity is concerned with demonstrating effectiveness in predicting criterion or indicators of a construct. A form of criterion validity is predictive ability, which correlates with the requirement for relevance to have predictive value. Another form of criterion validity is that of concurrent validity, which is similar to feedback value (Cronbach and Meehl 1955). In addition, in order to be relevant, information must be capable of making a difference to a decision; thus, there must be a correspondence between the predictor and the outcome.

Second, in order to be considered reliable under SFAC No. 2, information must be faithfully represented, verifiable, and neutral. According to Kerlinger, "construct validity is one of the most significant scientific advances of modern measurement theory and practice" because it connects psychometric practices to theoretical ideas (420). The construct is meant to capture the phenomena being studied or measured and of concern is whether the construct is a valid conceptualization of the phenomena. According to the FASB, representational faithfulness occurs when there is "correspondence or agreement

between a measure or description and the phenomenon that it purports to represent" (SFAC No. 2, glossary, 10). Construct validity, therefore, is the same idea as faithful representation. In addition, the idea of convergent validity is similar to that of verifiability. If different sources provide evidence collected in different ways, convergence occurs when that evidence signifies the same or similar meaning of the construct (Kerlinger 1986). Neutrality, by definition, is freedom from bias. Thus, by framing relevance and reliability attributes in terms of measures of validity, we see that while we cannot map a function onto the criterion for reliability (or for relevance) and solve mathematically to create empirical measures of these qualitative characteristics, we can use these ideas from measurement theory to help us better understand relevance and reliability and place them and their attributes in context.

Although a limited number of research studies in accounting investigate how relevance and reliability of information affects investment decisions, some streams of research exist that relate more broadly to relevance and reliability of information. These research streams are briefly summarized in the next two sections. These are followed by a discussion of the importance of studying the impact of relevance and reliability on judgments of nonprofessional investors. This group is of particular concern to standard setters.

**Relevance**

According to SFAC No. 2, accounting information must be relevant for it to be useful. For accounting information to be relevant, it must be timely and have predictive value and/or feedback value (SFAC No. 2, para. 46-57). In other words, relevant information is capable of influencing a decision by assisting users of the information in

making predictions about the outcomes of present and future events or to confirm or correct prior expectations. As standard setters seek to increase the decision-usefulness of information, the relevance of financial information has played a major role in their deliberations (Barth 2006). This increased focus on relevance may have some implications for standard setters, preparers, and users of financial information. For example, in order to be able to provide information that reflects current economic conditions, standard setters are requiring the use of more estimates in financial reporting (Barth 2006). This has implications for reliability of information as well as its relevance. In this section, I will look at the prior research that documents the fair value/historical cost debate, implications of the debate, and perceptions of relevance of accounting information by standard setters, preparers, and users of financial information.

Over the past few years, the debate between historical cost measurement and fair value measurement has intensified, and some suggest that the root of the disagreement between the two is a "philosophical debate over relevance versus reliability" (Shortridge et al. 2006, 37). Proponents of fair value accounting argue that historical cost information is not as relevant as fair value because it does not provide information about the current economic environment in which the company operates. The same sentiments were expressed in the early 1990s when there was a push to mark-to-market accounting. At the Securities and Exchange Commission's (SEC) Market Value Conference in 1991, the participants recommended a shift to valuing a company's assets and liabilities based on current market value (mark-to-market accounting), and one of the champions of mark-to-market accounting was the SEC chairman who called the continuing relevance of historical-cost accounting one of the most significant accounting issues.

What often is not clear to investors when there is a push for more relevant financial information is that the information is provided with a loss of reliability. Furthermore, the amount of the loss may not be understood. In an archival study of value relevance and reliability of brand assets in the U.K., Kallapur and Kwan (2004) find that brand assets are value relevant because of their association with market values, but the brand asset measures may not be reliable (i.e., may have substantial bias or error due to contracting incentives). In this situation, the information provided is more relevant, but may be provided with a loss of reliability.

In a study examining nonprofessional investors' beliefs regarding earnings quality, Hodge (2003) finds that the perceived reliability of audited financial information has declined over time, while the perceived relevance of the audited financial information has increased over time. In a survey of 414 individual investors who are members of the National Association of Investors Corporation (NAIC), Hodge also finds that the perceived earnings quality of publicly-traded firms has declined over time as have perceived auditor independence and perceived reliability of audited financial information. Yet, according to the survey, the perceived relevance of the audited financial information has increased over time. Perhaps these investor perceptions reflect the increased emphasis on estimates and fair value.

In addition to changes in investor perceptions of financial statement relevance and reliability, a disconnect may exist between what is perceived as relevant by providers of financial information and users of financial information. McKinnon (1984) conducted a cost-benefit analysis of financial disclosure requirements for multinational corporations (MNC) that surveyed financial analysts (representing users of financial information) and

controllers of US-based MNCs (representing information providers). McKinnon finds substantial differences in the perceptions of the analysts and the controllers as to what is more relevant and, thus, more decision useful.

In recent years, a considerable amount of attention has focused on improving the relevance of financial information (as illustrated by changes to standards on pensions, asset retirement obligations, and derivatives), but some argue that this focus on relevance adversely affected financial reporting reliability (Glover et al. 2005). In addition, prior research studies noted above suggest that what users perceive as relevant to their needs may not be what the providers of financial information perceive as relevant information. The next section discusses some of the research regarding reliability.

**Reliability**

According to SFAC No. 2, reliability is necessary for accounting information to be useful. The FASB does define reliability, but other definitions may be used in practice and in research. In this section, I examine the prior literature that attempts to define reliability, study the effects of differences in reliability, and investigates how reliability is assessed by users of financial information.

Reliable information, according to SFAC No. 2, must have representational faithfulness and be verifiable and neutral. However, in research and in practice, reliability has not been so easy to define or capture. In their work summarizing the previous archival and experimental research on reliability of accounting information, Maines and Wahlen (2006) define reliability as:

> "…the degree to which a piece of accounting information (1) uses an accounting construct that objectively represents the underlying economic construct it purports

> to represent, and (2) measures that construct without bias or error using the measurement attribute it purports to use (p. 403)."

While this definition does not explicitly include verifiability and neutrality, it does closely correspond to the FASB's idea of representational faithfulness. In addition, while some research on reliability, particularly on the relative reliability of disclosed versus recognized items, may appear to presume general agreement on the construct and its measurement, Schipper (2007) believes that there is no general agreement on what is meant by the term "reliability." As Schipper explains, some believe reliability is the ability of information to be confirmed by an external source; others believe that reliability means a high degree of consensus among independent measurers; and others believe that reliability refers to precision of measurement.

Although disagreement on the exact meaning of reliability exists, many prior studies attempt to investigate the effect of differences in reliability. One stream of research provides evidence that users treat recognized items differently than disclosed items (Davis-Friday et al. 1999; Espahbodi et al. 2002; Hirst et al. 2004), and many researchers attribute that result to perceived differences in reliability (Cotter and Zimmer 2003; Davis-Friday et al. 2004). Their reasoning is that the decision to recognize versus disclose may be driven by information's reliability and that differential investor reaction to recognized versus disclosed items are in response to the item's reliability. However, these conclusions are based on indirect evidence. That is, archival researchers cannot observe market participants' assessments of the information's reliability. Frederickson et al. (2006) attempt to specifically examine whether the decision to recognize versus disclose provides investors with a signal about reliability in the context of stock options.

Providing part of the FASB's definition of reliability to experimental participants,[4] they find that users' assessments of reliability of stock option information are affected by firms' choices to recognize versus disclose the information. This suggests that reliability can determine the location of the information, but situations could also exist in which information location influences reliability. In examining this issue, Libby et al. (2006) find that auditors allow more misstatement in disclosures than in recognized amounts because they view the recognized amounts to be more material than the disclosed amounts. The studies reviewed above suggest that information's perceived reliability affects the judgments of users and auditors of financial statements.

In the field of auditing, many studies examine reliability effects. Since auditors must gather evidential matter, a major component of doing so is to assess the reliability of the information. Rebele et al. (1988) and Hirst (1994) provide empirical evidence that independent auditors are sensitive to the reliability of audit evidence. However, other studies find that auditors are not sensitive to the reliability of the information (Joyce and Biddle 1981). In general, these studies vary the reliability of the information by manipulating either the competence or the objectivity of the source of the information. However, these characteristics are not part of the definition of reliability itself. Instead they relate more to credibility of the information or its source. Since operationalizing reliability has been difficult in prior research studies, and credibility has often been used to proxy for reliability of financial information (Miller and Sedor 2007), it is also useful to understand how investors think about credibility in relation to reliability. While no generally accepted accounting definition of credibility exists, the underlying

[4] Frederickson et al. (2006) define reliable information as "information that is verifiable, reflects a business' activities in an unbiased manner, and is measured with little uncertainty" (p. 1083).

characteristics of credibility appear to be competence, objectivity, trustworthiness, and believability (Hodge et al. 2006; Mercer 2004).[5] Hodge et al. (2006) specifically define credibility as "the extent to which users perceive that management's disclosures represent management's unbiased beliefs about the true nature of the transactions and events" (p. 624).

In addition to research on the effects of perceived information reliability, other studies attempt to examine how users of financial information assess the reliability of accounting estimates. Since estimation is necessary to provide relevant accounting information, understanding how users assess the reliability of those estimates is of interest, particularly because the reliability can vary substantially due to factors inherent in the estimation. In addition, financial information users must assess the reliability of accounting estimates in order to evaluate the information risk associated with financial reports (Hirst et al. 2003; Elliott et al. 2007). Although significant research exists on the achievement of accounting information reliability, limited research exists regarding how financial statement users understand reliability. In their study regarding disclosures of estimates, Elliott et al. (2007) find that estimate-related sensitivity disclosures affect investor's perceptions of the reliability of the estimate.

According to Maines and Wahlen (2006), even though reliability is essential for information to be useful, it is a "complex and elusive construct in theory, practice, and research" (399). If, however, we can gain a better understanding of reliability, then we can seek to discover how financial statement users' judgments and decisions are influenced by this information characteristic.

[5] When addressing credibility issues, distinctions can be made between the credibility of the *source* and the credibility of the *disclosure* (Hodge et al. 2006; Khuranana and Raman 2006; Mercer 2004; Miller et al. 1999).

In this study, I investigate the impact of information relevance and reliability on the investment judgments of *nonprofessional investors*. Next I discuss the reasons for focusing on this group of market participants.

**Nonprofessional Investors**

Although changes to the conceptual framework will have an indirect effect on investors (i.e., changing the framework will have direct impact on forthcoming standards which then affects the information available to investors), there is much to be learned about how investors understand and utilize relevance and reliability of financial information. In particular, we need to understand how they could be affected by trade-offs made by FASB/IASB in setting standards in accordance with the updated conceptual framework. A concern of several who commented on the preliminary views document as well as on the exposure draft was that the users of financial information would be inundated with information via disclosures and other means used to disseminate relevant information and would not be capable of processing the information in order to make informed decisions and judgments. In addition, they would not be aware of possible changes in the reliability of the information provided.[6]

In this study, I focus on nonprofessional investors for several reasons.[7] First, the FASB/IASB are clearly concerned with investors, not only current shareholders but also

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[6] http://www.iasb.org/Current+Projects/IASB+Projects/Conceptual+Framework/Discussion+Paper+and+Comment+Letters+-+Phase+A/Comment+Letters/Comment+Letters.htm; http://www.iasb.org/Current+Projects/IASB+Projects/Conceptual+Framework/Exposure+Draft+and+Comment+Letters+-+Phase+A/Comment+Letters/Comment+Letters.htm

[7] Investment activities of nonprofessional investors continue to grow due to the increased ease of making an investment (Clark-Murphy and Soutar 2004; Torre and Rudd 2004; Vogelheim et al. 2001).

future investors.[8] Second, nonprofessional investors are of particular interest to the Securities and Exchange Commission (SEC), the regulatory agency that has authority over accounting rules. For example, while the SEC was concerned with all market participants in mandating Regulation Fair Disclosure (Reg FD) to level the playing field for all investors, their primary concern related to nonprofessional investors.[9] Third, research studies examining the judgments made by nonprofessional investors are increasing in number (Elliott et al. 2007) due to evidence that individual investors can significantly affect the market (Bloomfield et al. 1998; Vogelheim et al. 2001). More than 90 million nonprofessional investors own shares of stock either directly or through mutual funds (NYSE 2006); in addition, nonprofessional investors have 34 percent ownership of all outstanding shares (Bogle 2005). Finally, how nonprofessional investors use and understand financial information disseminated by companies is still unclear. Thus, this is an area in which there is much to be learned.

**Changes to the Conceptual Framework**

The FASB proposes changing the conceptual framework by prioritizing relevance and relegating reliability to a secondary consideration (for more on FASB's plan, see Appendix 1). In addition, in an effort to clarify what is meant and intended by the term reliability, the FASB is considering replacing reliability with "faithful representation." This would be more than a change in terminology in that it would "make clear that faithful representation is attained when substance of an economic phenomenon is depicted completely and neutrally" (FASB Project Update 2007). In addition,

[8] As a part of the joint FASB/IASB project updating the conceptual framework, the boards identified current and potential investors and creditors as their primary user group for financial information (FASB 2007; IASB 2007). One subset of this group is nonprofessional investors.
[9] http://sec.gov/news/extra/endseldi.htm

verifiability would be identified as a distinct qualitative characteristic, not as an attribute of faithful representation (reliability). Relevance and faithful representation would be treated as fundamental characteristics for decision usefulness, and comparability, verifiability, timeliness, and understanding would be treated as enhancing characteristics (FASB 2008). With the continuing work of the FASB and IASB in updating the conceptual framework, my study investigates how relevance and reliability of financial information affects information use and decisions made by users of financial information.

## III. MODEL DEVELOPMENT

SFAC No. 2 sets forth the characteristics of financial information, including the primary characteristics of relevance and reliability, which make information useful. In this concept statement, the FASB states that all financial reporting is concerned to varying degrees with decision making, and the usefulness of information must be evaluated in relation to the purposes served (e.g., the need for information on which to base investment, credit, and similar decisions). The guidance provided by SFAC No. 2 suggests the basic model shown in Figure 1. The basic model identifies possible links between the relevance and reliability of information and judgments of users of financial information.

SFAC No. 2 suggests that relevance and reliability have significant effects on judgments (links A and B). The effect of relevance also is predicted by definition. According to the Random House Dictionary of the English Language, relevance is *bearing upon or connected with the matter in hand; to the purpose; pertinent* (RHD 1981). Thus, if information is related to a judgment or investment decision, then it is relevant. Correspondingly, the FASB states that for accounting information to be

relevant, it must be capable of making a difference to a decision by influencing users' predictions of outcomes or confirming/disconfirming their prior expectations.

Studies suggest highly relevant information affects judgments but information with low relevance may also affect judgments. In the context of auditing, Hackenbrack (1992) examined the effect of seemingly irrelevant information on audit judgments by providing auditors with a combination of diagnostic and nondiagnostic evidence in a laboratory experiment. He finds that those that received both diagnostic (relevant) and nondiagnostic (irrelevant) evidence made less extreme decisions than those using only diagnostic information—that is, irrelevant information had a dilution effect on the judgments. In a related experimental study with fraud judgments in the presence of relevant and irrelevant information, Hoffman and Patton (1997) find that accountability to superiors does not eliminate the dilution effect. Interestingly, another study shows that relevant information sometimes does not affect decisions. In a cost accounting context, Vera-Munoz (1998) uses an experiment to examine why decision makers tend to ignore relevant information (opportunity costs) in their resource allocation decisions. She finds that experimental participants with high accounting knowledge tend to ignore more opportunity costs than those with less accounting knowledge, and that they tend to do so to a greater degree in a business context versus a personal context. In discussing the results, Vera-Munoz suggests that the tendency to ignore opportunity costs is due to the knowledge schema that the participants accessed (i.e., based on GAAP rules that do not incorporate opportunity costs). Thus, dependent on the schema accessed for a particular task, the use of that schema could obscure relevant information. Perhaps, overall, the mixed results are due to the fact that human beings face bounded rationality (Simon

1955) as we are subject to limited processing capacities (Hogarth 1993). If a significant amount of information is provided to users, they may use information that should not be relevant to their decisions and ignore information that should be relevant. In addition, even if users have sufficient information processing capacity, dependent on characteristics of the task, they may be more inclined to use irrelevant or nondiagnostic informational cues (Payne et al. 1992).

These studies suggest that the basic model's predicted impact of information relevance on decision making may not hold. However, theoretically (by definition), relevance should affect judgment and decision making, and this has not been studied experimentally in financial reporting. This leads to my first hypothesis:

**H1:** Information that is more relevant affects judgments more than information that is less relevant (Link A).

In addition, theory suggests that reliability is expected to have a significant effect on judgments. In situations where the reliability of the source could be questioned, Schum and Du Charme (1971) separate the report of an event (i.e., medical diagnosis) from the event itself (i.e., an illness). They develop a model that demonstrates that the inferential impact of the report of an event varies as information source (i.e., physician) reliability changes; in fact, a small variation in source reliability can have a significant impact on the inferential value of information. Thus, judgments based on a piece of information should be affected by the reliability of that piece of information.

Prior research provides some evidence that reliability of information affects judgments. Bamber (1983) extends the model of source reliability developed by Schum and Du Charme for use in an audit context by also incorporating the potential content of

the audit procedures and the reliability of the audit senior. Experimentally, he finds that audit managers' judgments were sensitive to the reliability of the audit seniors conducting the audit procedures, verifying the Schum and Du Charme model. While experimental research on reliability shows positive effects on decision making (Bamber 1983, Rebele, Heintz, and Briden 1988, Hirst 1994, Mercer 2005), users of financial statement information do not always correctly adjust their judgments for impairments to reliability (Desira and Baldacchino 2005, Glover et al. 2005, Maines and Wahlen 2006), perhaps due to insufficient disclosures regarding the level of reliability of the information provided or the transparency of the auditing procedures used on that information. In addition, users may not be able to correctly adjust due to cognitive limitations. For example, McDaniel et al. (2002) experimentally find that financial experts' assessments of financial reporting quality (where reliability would be expected to matter) are based on relevance and comparability and not reliability. McDaniel et al. suggest that the financial experts are able to make reasonable assessments of these qualities at a disaggregated level, but when asked to combine to make an overall assessment of financial reporting quality, they are unable to incorporate all of the assessments (although they do incorporate some). Thus, although, theoretically, reliability of information should affect the use of that information, experimental evidence is mixed on this effect. Further, these prior experimental studies are not necessarily about *information* reliability (i.e, some are about source reliability). So while theory suggests that information reliability matters, there is a need for evidence on this matter, particularly in the context of financial accounting. This leads to my second hypothesis:

**H2:** Information that is more reliable affects judgments more than information that is less reliable (Link B).

The proposed changes in the joint FASB/IASB Conceptual Framework suggest relevance and reliability effects are not independent. This suggests an additional link in the model. The augmented model is shown in Figure 2. Link C indicates the potential interaction between relevance and reliability of information.[10] The interaction could represent (1) a trade-off or (2) an ordered importance of the two concepts. If the interaction represents a trade-off, then users integrate all obtainable cue information and would allow a low value on one cue to be compensated by a high value on another (Einhorn 1970; Simon 1955); users would trade the cue with the low value for the cue with a high value. Conversely, due to bounded rationality, other approaches may be used more in line with the idea of ordered importance. These approaches typically ignore some of the available information (Pachur et al. 2008). According to the FASB, "though, ideally, the choice of an accounting alternative should provide information that is both more reliable and more relevant, it may be necessary to sacrifice some of one quality for a gain in another" (SFAC No. 2 , 5). However, information may possess both characteristics to varying degrees, and it "may be possible to trade relevance for reliability or vice versa, though not to the point of dispensing with one of them altogether" (SFAC No. 2, para. 42 [page 23]). Relevance and reliability of information move along a continuum, such that degrees of relevance and reliability exist (SFAC No. 2, 6). Reliability, in particular, is not an all or nothing concept. A trade-off relation

[10] Theoretically, link C should be just one direction in that an increase in relevance should not be able to make information more reliable. Relevance is typically context specific and reliability is inherent within the information itself. However, people may think about this differently, so the arrows are drawn to capture both potential directions (see Figure 2).

would indicate that an increase in relevance could make up for a decrease in reliability and vice versa.[11] For example, while aware of concerns about the reliability of measurements of postretirement health care obligations, the FASB believed that the improved relevance of recognizing estimates of these liabilities offset the decreased reliability of the resulting financial statements containing these numbers (SFAS 106, Summary, FASB 1990; Glover et al. 2005).

A few studies examine the trade-off between relevant and reliable accounting information. In the context of fair value accounting, Kirschenheiter (1997) attempted to investigate the trade-off between relevant and reliable accounting information by modeling an optimal disclosure policy when two signals (accounting information) about asset value are available to be disclosed. He modeled reliability as the precision of the signal (accounting information) and relevance as covariance between the signal and the asset's true value. Essentially, he finds that an increase in relevance more than offsets a decrease in reliability in his setting. However, human decision making effects were not considered in Kirschenheiter's model.

The interaction represented by Link C could also represent an ordered importance of the two concepts. The idea of ordered importance comes from the FASB/IASB's proposed changes to the conceptual framework. The boards are considering having a process that would consider relevance and reliability sequentially; first, identify the most relevant piece of information and then determine if it is reliable (faithfully represented). Thus, reliability would only matter if the information is relevant. McCaslin and Stanga (1983) find a quite different relation of relevance and reliability of information in their

[11] I am assuming neither a complete lack of reliability nor a complete lack of relevance. A situation with a complete lack of reliability or a complete lack of relevance is unlikely, and in this case, an increase in the level of relevance could not make up for the lower level of reliability.

study examining the trade-offs between relevance and reliability perceived by users and preparers of accounting information. The specific context they examine is a change in the accounting measurement basis from the historical cost to constant dollar or current cost accounting. They surveyed chief financial officers, financial analysts, and chief commercial loan officers about the relevance and reliability of 30 financial information items prepared using different measurement bases. They find that the perceived relevance of accounting information is dependent on its perceived reliability. This contrasts with the FASB/IASB proposal where reliability is considered after relevance is established.

The proposed changes to the conceptual framework suggest that the two concepts of relevance and reliability are not independent. However, the specific nature of this interaction is uncertain. This leads to my third hypothesis:

**H3:** Relevance and reliability effects on judgments are not independent.

The form of the interaction will be explored experimentally. Since prior research shows in other contexts that irrelevant information affects judgments, the reliability of information may be able to mask if the information lacks relevance; thus, users would be unaware of the irrelevance of the information if it has a high degree of reliability.

In the following section, I discuss the method used to investigate nonprofessional investors' perceptions of the qualitative characteristics of financial information and how they use these characteristics in making judgments and decisions.

# IV. METHOD

## Overall Experimental Plan

Before I can examine how nonprofessional investors use the relevance and reliability of financial information in making judgments and decisions, I first need to understand how these investors perceive these concepts so that I can manipulate them at high and low levels in the experiment. Investors may perceive relevance and reliability of information in a manner unlike that of the FASB or researchers. In addition, based on prior research and anecdotal evidence, nonprofessional investors may not be able to distinguish between relevant and reliable information. For example, an IASB report describes how some financial statement users dismiss a piece of information as reportedly not *relevant*, although their decision really seems to be based on concerns about the *reliability* of the information (IASB 2005).

Thus, before I can set up my experiment to investigate how the relevance and/or reliability of information affect investor decision-making, I first conduct a pre-experimental study to examine the attributes that these investors associate with relevance and reliability. After gaining a better understanding of how nonprofessional investors perceive these qualitative characteristics, the experiment tests how these investors use relevant and/or reliable information to make an investment decision. In designing the materials for the experiment, I use the attributes underlying relevance and reliability discovered in the pre-experimental study.[12]

[12] Since credibility is often used as a proxy for reliability in research studies, I will also investigate how nonprofessional investors perceive credibility and if they distinguish between reliability and credibility.

**Pre-Experimental Study: Participants, Design, and Procedures**

The overall goal of the pre-experimental study is to gather evidence regarding how nonprofessional investors think about relevance and reliability. The pre-experimental study has three aspects: to examine the importance of relevance and reliability to investors, to explore how investors perceive the two characteristics of relevance and reliability, and to determine the attributes associated with relevance and reliability to be used in the main experiment. In order to examine all three aspects, the pre-experimental study utilizes two tasks. For the first task, nonprofessional investors, proxied by MBA students, are asked to either rank or rate relevance and reliability in terms of the importance that the participants place on these two characteristics when making a decision.[13] This task is illustrated in Table 1. Note that the ranking and rating tasks are varied between participants so that no one is asked to do both. Also note that the ranking task instructions indicate that relevance and reliability may be ranked equally. The results from the ranking and rating tasks address the first aspect of the pre-experimental study.

The second task addresses the final two aspects of the pre-experimental study. For the second task, participants are given pieces of information about a company in which they are interested in investing (e.g., press release, CFO conference call excerpt, sales). Essentially, the investors are given pieces of information that vary in terms of relevance and reliability, and they are asked to assess the overall decision usefulness of the information and various characteristics that relate to attributes of relevance and

[13] Based on Elliott et al. (2007), MBA students are good proxies for nonprofessional investors in tasks that are relatively low in integrative complexity.

reliability (e.g., how timely is the information, how precise is the information).[14] Each participant is given general background information about a hypothetical company and told that they have the means to invest and are considering investing in this company. Participants are presented with 10 financial information items that vary in terms of relevance and reliability. These items are listed in Table 2, Panel A.[15] For example, one item is a footnote disclosure from the company's annual report, another item is an excerpt from the CFO's conference call (other examples are shown in Table 2, Panel B). For each item presented, the participant is asked 19 questions regarding aspects of relevance and reliability (and credibility) of the financial information item. These are listed in Table 3, Panel A. Each question's response is assessed on a 0-100 scale, as illustrated in Table 3, Panel B. The questions relate to attributes of the information characteristics (relevance, reliability, and credibility) that are suggested by the FASB or IASB or in the case of credibility, suggested by prior research. Table 3, Panel A indicates the characteristic thought to be related to each attribute and the source suggesting the attribute. The presentation of the 10 financial items is varied so that participants did not evaluate the items in the same order. In addition, I reverse the scale for two of the questions (i.e., measurement error and bias).

Once the participants completed this set of questions, they were then asked to complete a background and demographic questionnaire containing questions about their finance and accounting education and their work experience, as well as a few demographic questions such as age and gender. Again, the goal of this pre-experimental

[14] The hypothetical company is based on a Fortune 500 company with all identifying information altered to prevent participant's knowledge about the actual company to confound their responses.
[15] The ten items were chosen so that they varied in terms of the relevance and reliability of the information provided. That is, items were included that were likely low relevance and high reliability, and so forth.

study is to gain an understanding of how nonprofessional investors evaluate relevance and reliability and how they perceive these characteristics and what information attributes nonprofessional investors associate with relevance and reliability.

**Demographics**

Sixty-five MBA students from a private university participated in the pre-experiment; however, one participant did not complete the demographic information in Part B. On average, the participants have 8.7 years of work experience and 48% have directly invested in a common stock while 84% plan to invest in a common stock in the future. The average age of the participants was 31 years with a range of 22 to 59 years.

**Analysis: Importance of Relevance and Reliability**

The three aspects to the pre-experimental study are to examine the importance of relevance and reliability to investors, to explore how investors perceive the attributes related to relevance and reliability, and to determine which attributes should be used to represent relevance and reliability in the main experiment. First, in order to gauge the importance nonprofessional investors believe they place on relevance and reliability, I examine ratings and rankings gathered in the first part of the pre-experimental study (Table 1). In this task, participants evaluate whether it is more important for information to be relevant or reliable in order to be useful in their decision making. Half of the participants *rated* the importance of relevance and reliability of financial information (Table 1, Panel A), and half of the participants *ranked* the importance of relevance and reliability (Table 1, Panel B). The participants who rated the importance of these two characteristics on a scale of 0 to 10 rated reliability (mean=9.31) as more important that relevance (mean= 8.53, t= 2.71, p=.01). Of the participants who ranked the importance

of relevance and reliability as either 1 (most important) or 2 (less important), 43% ranked reliability first (relevance second), 33% ranked relevance and reliability as equally important, 12% ranked relevance first (reliability second), and 12% did not respond. Thus, the participants who ranked the importance of relevance and reliability ranked reliability (mean=1.11) as more important than relevance (mean=1.50, t= -3.03, p<.01). These results suggest that investors think they value reliability of financial information more than relevance.[16] Prior research (Evans et al. 2003; Luft and Shields 2001; Nelson et al. 2001; Reilly and Doherty 1989), however, shows that people often have poor self-insight into the weights they place on specific pieces of information. Thus, whether these investors would place the same importance on reliability when making an investment decision or judgment as they indicated in this abstract task is not clear. Whether the importance of reliability will still be greater than relevance in the main experiment is an interesting question.

**Analysis: Exploration of Relevance and Reliability**

The second aspect of the pre-experimental study is to explore overall how investors perceive relevance and reliability of financial information. In order to understand more about the underlying structure of the attributes of these concepts, I perform a principal-axis factor analysis. Factor analysis can be used either for data reduction (to remove highly correlated variables) or, as in this case, for structure detection (to examine the underlying relation between the variables). Table 4 presents

[16] I also performed non-parametric tests on the rankings with results that correspond to the t-tests. Using a Wilcoxon Signed-Rank Test, participants rank relevance as significantly less important compared to reliability (z=-2.668, p<.01).

the results of the factor analyses.[17] Only the factors with eigenvalues greater than one are shown.

All of the attributes of relevance, reliability, and credibility are included in this first analysis in order to obtain an overview of the structure of these attributes. This first factor analysis also gives insight into whether relevance and reliability are separate and distinct concepts, without forcing the attributes into a particular factor or analysis. Panel A shows that a factor analysis of all attributes extracted four factors. The factors suggest that the following attributes - accuracy, believability, verifiability, plausibility, objectivity, precision, trustworthiness, and confirmatory or disconfirmatory - behave in a similar manner and relate to reliability and credibility. The second factor suggests that uncertainty, represent economic event, and completeness behave in a similar manner and relate to relevance. The third factor suggests that the two attributes, timeliness and predictive ability, behave in a similar manner; this suggests another aspect to relevance. In a similar manner, the fourth factor suggests that biased and measurement error behave in a similar manner that is different from the other attributes; this is perhaps capturing another aspect of reliability.

In order to further explore the attributes related to reliability and relevance, I perform two other factor analyses. Panel B reports the factor analysis for reliability judgments with only the reliability related attributes, and it suggests that the following attributes-precision, represent economic event, verifiability, accuracy, completeness, and uncertainty-behave in a similar manner. However, biased and measurement error were in a second factor, which suggests that these attributes capture something different from the

[17] Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity are two tests that indicate the suitability of the data for structure detection. Both tests indicate that my data are suitable for structure detection.

attributes in the first factor. Thus, reliability has two underlying factors. Interestingly, Panel C shows that relevance has one underlying factor encompassing ability to predict future value, timely, and confirmatory or disconfirmatory.[18] Thus, these analyses indicate that there may be two separate aspects of reliability; one related to its measurement attributes and one related to how it captures the underlying economic event.

**Analysis: Attributes of Relevance and Reliability**

The third aspect of the pre-experimental study is to determine which attributes of relevance and reliability should be used in the main experiment. In order to do this, I estimate three models using ordinary least squares regressions. Since the overall goal of the financial reporting system is to provide information that is useful for decision-making, I first estimate a regression model to determine if users' perceptions of relevance and reliability relate to decision usefulness. For this model, I use judged decision usefulness as the dependent measure and judged relevance and judged reliability as the independent variables. Then to determine what attributes are associated with relevance and with reliability, I estimate two other regression models, one with judged relevance as the dependent measure and the judged relevance-related attributes (as discussed in Section II) as the independent variables and the second with judged reliability as the dependent measure and the judged reliability-related attributes (as discussed in Section II) as the independent variables. Since each participant rated all 10 items, an indicator variable for each participant is included to control for differences in average ratings across individuals. Table 5 shows the regression results. In addition, I examined the

[18] An additional factor analysis was conducted using a different rotation that assumes that the constructs correlate with one another. A varimax rotation (as used above) is orthongonal and assumes that the constructs are independent. Thus, I also used an oblique rotation (oblimin), and the results were substantially the same as those reported above.

correlations between the independent variables; the correlations are reported in Table 6. Since the predictor variables are highly correlated, multicollinearity could be an issue. Thus, I examine the variance inflation factors (VIFs) and tolerance levels. In each of the regressions reported below, there are no VIFs greater than 10, and the tolerance levels are not below 0.2. This suggests that collinearity is not a concern with this set of data (Der and Everitt 2002).

Model 1 regresses decision usefulness on relevance and reliability, and as expected, both coefficients are positive and statistically significant. Model 2 regresses reliability on the reliability-related attributes, and only accuracy, precision, represent economic event, and completeness are statistically significant. This shows that perceived reliability is more strongly affected by these attributes than by verifiability, uncertainty, biased, or measurement error. The attributes that are prescribed by the FASB in SFAC No. 2 are in italics in Table 5. Model 3 regresses relevance on the relevance-related attributes. Surprisingly, timeliness is not statistically significant, but predictive ability and confirmatory or disconfirmatory are significant. Again, this shows that perceived relevance is strongly affected by some of the mentioned attributes, but not all.

As a sensitivity analysis to determine if any of the attributes overlap (i.e., affect both the perceptions of relevance and reliability), I estimate two additional models to capture the crossover.[19] Model 4 regresses reliability judgments on all of the judged reliability-related and relevance-related attributes. Model 5 regresses judged relevance on all of the judged reliability-related and relevance-related attributes. The purpose of

[19] While arguing that fair value is not relevant, several respondents to an IASB survey based their arguments on perceptions of a lack of reliability rather than on a lack of relevance (IASB Observer Notes, May 2005). This suggests that there may be an overlap in the attributes ascribed by nonprofessional investors to relevance and reliability.

examining the results from these unrestricted regressions is to discover any overlap. For example, one attribute - represent economic event - is statistically significant for both relevance and reliability (i.e., models 4 and 5). Thus, to vary this factor in my main experiment in order to manipulate reliability would be problematic because it also affects perceived relevance. However, it is the only attribute that was significant in the restricted Models 2 and 3 that poses this problem.[20]

The results from the factor analyses used to explore the underlying structure of all of the attributes associated with relevance, reliability, and credibility and the results from the regression models used to estimate which attributes investors ascribe to each characteristic suggest that investors' perceptions of relevance and reliability are not exactly the same as the SFAC definitions. First, the factor analyses indicate that there may be two separate and distinct aspects of reliability, one related to its measurement attributes (measurement error and bias) and one related to how it captures the underlying economic event (represent economic event, precise, complete, accurate, and verifiable). Second, the regression analyses (focusing on the results from Models 2 and 3) give an idea of the attributes that investors ascribe to the characteristics of relevance and reliability. I use this information to manipulate relevance and reliability of financial information in my main experiment. Based on the results from Model 2, I manipulate precision and completeness in order to vary reliability in the stimuli for the main experiment.[21] Similarly, based on the results from Model 3, I manipulate the ability to

[20] An interesting result of the sensitivity analysis is that in the unrestricted relevance model, only one of the relevance related attributes, predictive ability, is significant, while three of the reliability related attributes, verifiability, represent economic event, and measurement error are significant. This suggests that relevance seems to be a function of attributes traditionally considered to be aspects of reliability.

[21] Precision and completeness both also loaded highly on factor 1 in the factor analysis on the reliability-related attributes (Table 4, Panel B).

predict future value and the ability to confirm or disconfirm prior expectations to vary relevance.[22] In addition, based on the sensitivity analysis, I do not manipulate the attribute of represent economic event since it was significant in both the unrestricted reliability and relevance regressions (Models 4 and 5).

## Main Experiment

### *Design Overview*

In my main experiment, as previously discussed, I use what I learned from the pre-experimental study in order to manipulate the relevance and reliability of information available to nonprofessional investors who are making an investment decision. I test the hypotheses in an experiment using a between-participants design. All participants are presented with identical background information for a firm; they are also presented with a press release from the firm. I manipulate the relevance of the press release information (at high and low levels) and the reliability of the press release information (at high and low levels). Since I was able to explore the attributes nonprofessional investors perceive as related to relevance and reliability of financial and related information, I manipulate those attributes to examine the use of the two characteristics. However, given that I am using what I learned from the pre-experiment rather than manipulations established in prior research, pilot-testing the instrument is of utmost importance; thus, I conducted several pilot tests. I will discuss the results of the pilot tests next and then discuss the method for the main experiment in greater detail.

[22] Predict future value loaded highly on factor 1 in the factor analysis on the relevance-related attributes (Table 4, Panel C). Confirm or disconfirm did not load highly in any of the factor analyses.

**Experiment: Pilot Test I**

Sixty-five undergraduate business students served as participants for the pilot test during class time.[23] Participation was voluntary and a small amount of extra credit was offered for their participation. The purpose of the pilot test is to determine whether the manipulation of the relevance and reliability of the information provided in the press release is at appropriate high and low levels. Participants in the pilot test rated the levels of relevance and reliability of four pieces of information, representing four potential firm press releases. The four press releases consisted of information that was meant to be high relevance/high reliability, high relevance/low reliability, low relevance/high reliability, and low relevance/low reliability. Each participant is asked to rate the relevance and reliability of each press release on scales from 0 (not at all) to 100 (very much).

Table 8 presents the results of the pilot test. In the high relevance conditions, the mean judgment of relevance was 61.5, significantly higher than the mean judgment of 52.5 in the low relevance conditions ($t=-4.33$, $p<.01$).[24] In the high reliability conditions, the mean judgment of reliability was 68.9, significantly higher than the mean judgment of 61.5 in the low reliability conditions ($t=-4.33$, $p<.01$).[25] The results of the pilot test suggest that the manipulations of relevance and reliability were successful.[26]

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[23] A previous pilot test was also administered to undergraduate business students. This initial pilot test consisted of 4 different types of information (e.g., legal contingency, shopper club program) manipulated at varying levels of relevance and reliability. The initial pilot test helped to identify the piece of information to be used in the experiment's press release and led to clarification of the manipulation of relevance and reliability.

[24] While the levels of judged relevance and reliability appear to be at relatively high levels, the difference between the high and low conditions is statistically significant.

[25] In addition, the pilot tests also checked whether the participants noted the timeliness of the information given in the press release. In the high timeliness conditions, the mean judgment of timeliness was 67 (on the 0-100 scale) compared to 57 in the low timeliness conditions ($t=-4.02$, $p<.01$).

[26] Since each participant judged the relevance and reliability of all four pieces of information, I examined whether the results hold using just the first judgment of each participant. I find similar results.

**Experiment: Pilot Test II**

In the first pilot study, the press releases were either labeled as being released on a particular eleven months-prior date (i.e., August 9, 2007, low relevance) or "this morning" (high relevance). In order to address concerns that manipulating the timeliness of the press release in this manner could result in a "no relevance" condition instead of the planned "low relevance" condition, an additional pilot test was run. The purpose of this pilot test was to determine whether the timeliness of the information could be increased for the low relevance condition, without obscuring the differences in the high and low relevance conditions. Thus, the pilot test examined the effect of changing the date of the press release in the low relevance condition from "August 9, 2007" to "this morning". Twenty undergraduate business students served as participants for the pilot test during class time. Participation was voluntary and a small amount of extra credit was offered for their participation. Again, the purpose of this pilot test was to determine whether the manipulation of the relevance and reliability of the information provided in the press release successfully varied the perceived relevance and reliability of the information. Participants in the pilot test rated the levels of relevance and reliability of the four potential press releases on scales from 0 (not at all) to 100 (very much).

In the high relevance conditions, the mean judgment of relevance was 62.3, significantly higher than the mean judgment of 55.4 in the low relevance conditions ($t=2.26$, $p<.05$). In the high reliability conditions, the mean judgment of reliability was 71.1, significantly higher than the mean judgment of 58.3 in the low reliability conditions ($t=3.92$, $p<.01$). The results of the pilot test suggest that the manipulations of relevance and reliability were successful. However, since the results are not as strong as the

differences between high and low relevance conditions in the earlier pilot test, I decided to use a 3x2 design for the main experiment, with relevance manipulated at three levels (high, low, and none). The details of the cases for the no relevance condition are the same as described below for the low relevance condition except that the date for the press release in the 'no relevance' condition is August 9, 2007, a prior date, rather than "this morning". If no difference between the low relevance and the no relevance conditions exists, then I will collapse the conditions into the planned 2x2 study.

***Participants***

One-hundred and thirty nine MBA students from a private university participated in the main experiment. On average, the participants have 6.3 years of work experience and 40% have directly invested in a common stock while 89% plan to invest in a common stock in the future. The average age of the participants is 30 years with a range of 21 to 60 years. Fifty-three percent of the participants are male. Table 10 provides demographic information.

***Design***

The experiment used a 3x2 between-participants design, with relevance and reliability manipulated. All information presented to participants about the target firm (such as abbreviated financial st

atements) is identical except for a piece of new information. This piece of new information, in the form of a press release, contains the manipulated relevance and reliability factors; each is manipulated at high and low levels based on the results from the pre-experiment. Relevance has a third level, 'no relevance' where the press release provides old information. Table 7 provides an example of the press release (high

relevance/high reliability; Panel A), illustrates which attributes are manipulated (Panel B), and how the attributes are manipulated to achieve varying levels of relevance and reliability (Panel C). In addition to the four attributes isolated in the pre-experimental study, based on prior research, I also manipulate two other attributes in my main experiment: source credibility (reliability) and timeliness (relevance).

***Materials***

Each participant receives a packet containing the institutional review board consent page, general instructions, and three envelopes (A, B, and C). Envelope A contains specific instructions for the task, case information, and questions. The information section includes abbreviated financial and related information about a hypothetical company (current stock price, financial statements, and a brief financial analysis of the firm) and a press release regarding an activity of the company. Participants are asked to assume that they have the funds to invest and they are considering investing in the hypothetical company.

Envelope B contains a post-experimental questionnaire with demographic information and manipulation check questions. In addition, the participants are asked to rank (as the participants did in the pre-experiment) the importance of relevance and reliability of information to their investment decision. Envelope C contains a short task in which the participants are asked to rate the relevance and reliability of the press release that they received in Envelope A. A copy of the experimental stimuli is included in Appendix 2. The press release contains the information that is varied in terms of its relevance and reliability. Details of the manipulation of the information are included in Appendix 3.

***Procedure***

The participants complete the questions in envelope A and return the case information and questions to envelope A prior to opening envelope B. Once they start the post-experiment questionnaire in envelope B, they cannot go back to the information contained in envelope A. After they complete the questions in envelope B and return the questions to envelope B, they open envelope C and answer the questions related to the relevance and reliability of the press release.

***Dependent Variables***

In order to test the effects of relevance and reliability of information on nonprofessional investors' investment decisions, participants are asked to judge (1) the attractiveness of the company's stock (on a scale from 0 to 100, with 0 as very unattractive and 100 as very attractive) before *and* after reading the press release and (2) the portion of $10,000 that they would invest in this particular company (on a scale from $0 to $10,000) only after reading the press release. After reading the press release, the participants are also asked to evaluate (1) whether the stock price would change from a baseline stock price (i.e., significantly increase, increase, significantly decrease, decrease, or stay the same) and (2) the price at which the stock would close on that day. The latter questions are based on the stock prediction task in Hopkins (1996). The responses enable an analysis of how relevance and reliability affect investment decisions. Under the scenario in the cases in this study, the news is positive and could have a positive effect on judgments of the price of the stock after the news. I would expect, therefore, that participants would predict an increase in stock price and be more inclined to invest in the stock in the high relevance/high reliability condition, and I would expect no change in the

stock price and a lower desire to invest in the stock in the low relevance/low reliability condition. However, since the form of any interaction of relevance and reliability is unknown, I make no predictions for the high relevance/low reliability and low relevance/high reliability conditions.

## V. RESULTS

MBA students participated in this study during their scheduled meeting times in June 2008. Participation was completely voluntary, and participants were randomly assigned to one of six conditions (3 levels of relevance x 2 levels of reliability).

### Manipulation Checks

In order to verify the manipulations of the relevance and reliability of the information provided in the press release, participants in the study were asked six manipulation check questions. Three of the questions relate to the relevance of the information (date, type of information provided, and presence of marketing tests), and three relate to the reliability of the information (source of the information, type of estimate—point or range, and specific details). If the participant marked two out of three correct for relevance and two out of three correct for reliability, then I consider the participant to have answered the manipulation checks correctly. Overall, 85 out of 139 (61%) participants marked two out of three correctly on the manipulation check questions. It is clear from the results of the manipulation check questions that the participants had difficulty in recalling the information provided.[27] One possibility is that the manipulations worked, but participants were not able to answer the recall questions correctly (thus, an issue of memory). As a secondary test to determine if the

[27] In conversations with participants after the study, several remarked that they remembered seeing some of the things mentioned in the manipulation check questions, but they were not sure of the correct answer.

manipulations had worked, I examine the participants' ratings of relevance and reliability in part C to see if they coincide with the manipulations for their cells. However, the ratings were not in accordance with the manipulations for the cells. For example, the ratings of reliability in the low relevance conditions were an average of 64.9 in the high reliability condition and an average of 64.5 in the low reliability condition (Table 9). I conclude that the manipulations were not successful in the way I had planned.

**Tests of Hypotheses**

Since the manipulation checks were unsuccessful, I decided to use the measured variables of relevance and reliability rather than the manipulated variables.[28] Part C of the experimental materials asked participants to judge the relevance and reliability of the information provided in their particular press release. For each characteristic, I use a median split, which results in four groups. Thus, I analyze these data as a 2x2 design. To verify that differences exist between the groups, I perform t-tests for the median split of the measured variables. For judged relevance, high relevance has a mean judgment of 67.58 and low relevance has a mean judgment of 23.55 ($t=-16.467$, $p<.01$). For judged reliability, high reliability has a mean judgment of 74.56 and low reliability has a mean judgment of 36.34 ($t=-17.119$, $p<.01$).[29] Thus, it is possible to test the hypotheses using the measured variables.

[28] I first analyzed the data using the original 3x2 design with responses from the 89 participants who correctly answered the manipulation check questions. However, untabulated results with these data were not significant for any of the ANOVA models, and I could not then conduct planned comparisons to test my hypotheses. In addition, the attrition from the manipulation checks resulted in extremely uneven cell sizes; for example, the low relevance/high reliability condition had a cell size of 6 compared with 18 in the low relevance/low reliability condition. I then analyzed the data (using the original 3x2 design) with responses from all 139 participants. Again, untabulated results with these data were not significant for any of the ANOVA models.

[29] The decision to use measured variables rather than the manipulated variables was not one taken lightly. In fact, I performed a fourth pilot test in July 2008 to determine if I should rerun the experiment with different participants (i.e., was there something about that time and situation that caused the participants to

Relevance and reliability of financial information can affect several judgments and decisions made by nonprofessional investors when evaluating financial information. These judgments and decisions include how attractive the stock is as an investment (ATTRACT), how much they would invest in the stock (AMT INVEST), and the price of the stock (PRICE EST). Nonprofessional investors often have difficulty in estimating the price of the stock, so I also ask in general terms (PRICE EFFECT) the direction of the change expected (significantly increase, increase, no change, decrease, or significantly decrease). Thus, the four dependent variables of interest relate to these judgments and decisions. I use analysis of variance (ANOVA) models and planned comparisons to test my hypotheses. The overall model with PRICE EST as a dependent variable is not significant.[30] The overall ANOVA models with AMT INVEST (Table 11) as a dependent variable ($F_{1,129}$=13.74, p< .01) and with PRICE EFFECT (Table 12) as a dependent variable are significant ($F_{1,129}$=4.76, p< .01). In addition, I used an ANCOVA model with post-attractiveness of the stock (POST ATTRACTIVE) as the dependent variable and pre-attractiveness of the stock (PRE ATTRACTIVE) as a covariate in order to isolate the effect of the change in attractiveness due to the press release information

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not pay attention). This pilot test included clarification of the task and the manipulation check questions. Graduate students, either in a Masters of Accountancy program or a Masters of Business Administration program, participated in this pilot test. However, about 10% still missed too many of the manipulation check questions, and the ratings of relevance and reliability were not as expected. Seventy-one percent missed at least one of the manipulation check questions, including 19% who missed the press release date and 33% who could not identify whether an estimate in the press release was a point or a range. The results from this fourth pilot test suggest that the manipulation of relevance and reliability is not stable across participants and that there is a possible difference between graduate and undergraduate students. The first three pilot tests used undergraduate business students as participants and in each of those, the manipulated high and low levels of relevance and reliability were judged as high and low and statistically significantly different. However, in the actual experiment itself, and in the fourth pilot test, graduate business students were the participants, and relevance and reliability were judged at inexplicable levels.

[30] It is not surprising that the model with PRICE EST as a dependent variable was not significant since several participants either did not answer the question, answered just the amount of the change, or gave a price estimate contrary to their estimated direction of the price change.

that varied in terms of its relevance and reliability.[31] The overall ANCOVA model with POST ATTRACTIVE (Table 13) as the dependent variable is significant ($F_{1,120}$=108.67, p<.01). Thus, I test the hypotheses using ANOVAs on AMT INVEST and PRICE EFFECT and an ANCOVA for POST ATTRACTIVE.

***Hypothesis 1***

Hypothesis 1 states that information that is more relevant will affect judgments more than information that is less relevant. The results indicate that the main effect of relevance is significant for AMT INVEST (F=23.26, p<.01, Table 11, Panel B). If the information is more relevant, then nonprofessional investors are likely to invest more, as shown by the mean of $4,000 for the high relevance condition compared to the mean for the low relevance condition of $2,237 (Table 11, Panel A). The results also indicate a main effect of relevance for the PRICE EFFECT (F=9.12, p<.01, Table 12, Panel B). Thus, as the means indicate, if the information is highly relevant, then it is more likely that nonprofessional investors will judge that the stock price will increase. The high relevance condition has a mean of .86 and the low relevance condition has a mean of .48 (Table 12, Panel A). The results also indicate a main effect of relevance for the POST ATTRACTIVE (F=6.24, p=.01, Table 13, Panel B). Specifically, as the means indicate, with more relevant (good) information, then it is more likely that nonprofessional investors will judge that the stock is a more attractive investment (i.e., 69.47 versus

[31] Another way to analyze the effect of relevance and reliability on the attractiveness of the stock would be to use an ANOVA model with the change in attractiveness (POST-PRE) as the dependent variable. However, using the change as the dependent variable can impose a restriction on the data, and this analysis may obscure the relation between POST ATTRACTIVE and relevance and/or reliability. Further analysis suggests that the change does impose a restriction on this data and using an ANCOVA model with POST ATTRACTIVE as the dependent variable and PRE ATTRACTIVE as a covariate is a more appropriate way to analyze this data. One of the effects of including a covariate is the adjustment of the estimated magnitude of the treatment, and this adjustment is affected by how different the four conditions are on the covariate. The mean of PRE ATTRACTIVE varies significantly across the four conditions.

53.24). Thus, results indicate that relevance (as perceived by the participants) affects these investment-related judgments, supporting H1.

***Hypothesis 2***

Hypothesis 2 states that information that is more reliable will affect judgments more than information that is less reliable. There is a main effect of reliability on AMT INVEST ($F=7.50$, $p<.01$, Table 11, Panel B). If the information is more reliable, then nonprofessional investors are likely to invest more; mean of $3,859 for the high reliability condition compared to $2,643 for the low reliability condition (Table 11, Panel A). In this analysis, however, there is also a marginal interaction, so I will revisit this result in the next section. The main effect of reliability is not significant for PRICE EFFECT ($F=0.73$, $p=.39$, Table 12, Panel B). The results do indicate a statistically significant main effect of reliability for POST ATTRACTIVE ($F=6.24$, $p<.05$, Table 13, Panel B). Again, the mean attractiveness is higher with high reliability (67.78) than with low (56.96). The results indicate that reliability (as perceived by the participants) affects some investment-related judgments, providing partial support for H2.

***Hypothesis 3***

Hypothesis 3 posits a possible interaction of relevance and reliability of financial information for investment-related judgments. However, the form of this interaction is an empirical question. The results suggest that little evidence exists of such an interaction; only one model has even a marginally significant interaction. To test H3 and examine the interaction effect, I use planned contrasts and graphical representations. First, for the dependent variable of AMT INVEST, the interaction is marginally significant, and the graph of the marginal means suggests that the interaction is ordinal (i.e., does not cross,

see Figure 3). The linear contrast of cell means is significant ($F_{1,129}$=31.46, p< .01). The first contrast tests the effect of reliability when relevance is high, and this effect is statistically significant (t=3.81, p<.01). The nonprofessional investors in the high relevance/high reliability condition assessed a larger amount to invest in the stock ($4,616.67) than those in the high relevance/low reliability condition ($3,011.76). However, when relevance is low, the effect of reliability is not statistically significant (t=.80, p=.42). The results suggest that an increase in reliability cannot compensate for a lack of relevance.[32]

For AMT INVEST, I also examine simple effects holding reliability constant. When reliability is at a high level, the effect of relevance is statistically significant (t=4.94, p<.01). The nonprofessional investors in the high relevance/high reliability condition assessed a larger amount to invest in the stock than those in the low relevance/high reliability condition (a difference in means of $2,112.50). This again suggests that a high level of reliability cannot compensate for a low level of relevance. Finally, when reliability is low, relevance has a marginally statistically significant effect (t=1.92, p=.057). Those in the high relevance/low reliability group assessed a slightly higher amount to invest in the stock that those in the low relevance/low reliability condition (a difference in means of $930.28). This suggests that a high level of relevance can affect the amount to invest even when reliability is low.

The results suggest overall that relevance has a greater effect on investment-related judgments than does reliability. The partial support for H2 (i.e., reliability

[32] In addition, using a Games-Howell post-hoc test (used when sample sizes are unequal) to further explore the interaction, a significant difference exists between the means of the high relevance/high reliability group compared to the means of the other three groups. The differences in the means between the high relevance/low reliability, low relevance/high reliability, and the low relevance/low reliability groups were not significant.

effects) comes from one dependent variable and only when relevance is high. This is the only condition in which reliability seems to matter, and it is of importance for only the judgment of amount to invest, not the other investment-related judgments.

***Additional Analyses***

The pre-experiment showed that nonprofessional investors think they value reliability more than relevance in making investment decisions. Participants in the main experiment also ranked the importance of relevance and reliability to their investment-related judgments. Participants did the ranking task in Part B, after the main task of the experiment. Forty-eight percent of the participants ranked reliability first (relevance second), 32% ranked relevance and reliability as equally important, 15% ranked relevance first (reliability second), and 5% did not respond. In all, the participants ranked reliability (mean=1.23) as more important than relevance (mean=1.79, t=2.366, p=.02).[33] These results again show that nonprofessional investors believe they value reliability more than relevance, consistent with the results from the pre-experiment. This contrasts with the actual experimental results that show a significant main effect for reliability for only one (AMT INVEST) of the dependent measures, but significant effects of relevance for three of the measures.

In case the participants' perception of the risk of the stock differed across the conditions, I also asked participants to assess the riskiness of this particular stock as an investment. The analyses with attractiveness of the investment and amount to invest as dependent variables were re-run with assessed riskiness included as a covariate. This covariate was included because riskiness of the stock could affect how attractive the

[33] Non-parametric tests on the rankings are consistent with the results from the t-tests. Using a Wilcoxon Signed-Rank Test, participants rank relevance as significantly less important compared to reliability (z=-4.770, p<.01).

stock is as an investment and how much the participants would be willing to invest in it. However, riskiness was not significant in either ANCOVA.[34]

## VI. DISCUSSION, LIMITATIONS, AND CONCLUSION

The goal of this study is to explore how nonprofessional investors think about relevance and reliability, and then examine how they are affected by variations in relevance and reliability of financial information in making investment-related decisions. The first step was to run a pre-experiment to find out how financial statement users think about and value relevance and reliability of financial information. The second step was to examine experimentally how the decisions of financial statement users are affected by the relevance and reliability of financial information, using a between-participants design with differing levels of relevance and reliability of company information. If standard setters make trade-offs between relevance and reliability in setting new standards, the resulting information provided to users will reflect varying degrees of relevance and reliability due to these trade-offs. Therefore, I examine how investors use such information in their judgments and decisions.

The results from the pre-experimental study show that investors think that they place more value on the reliability of information than on the relevance of information in their decision making. In addition, the results suggest that the attributes that investors ascribe to be a part of reliability and to be a part of relevance differ from expectations of the FASB. The results suggest that attributes commonly thought to be a part of reliability may be perceived also as a part of relevance, and that one characteristic-"represent

[34] Other variables, such as age, business experience, accounting experience, number of accounting courses taken, and number of MBA courses taken, were considered as covariates, but were not significantly different across the conditions. Only number of years of finance experience was significantly different; however, when this variable was included as a covariate in all four of the models, it was not significant and did not qualitatively affect the results of the hypothesis tests.

economic event"-is perceived to be a part of both relevance and reliability. This suggests that it is an extremely important attribute of information, and the FASB is on the right track in making "faithful representation" a primary qualitative characteristic of information for decision usefulness. Also, the results from the pre-experiment suggest that reliability may contain two separate aspects. The first aspect relates how the information represents the underlying economic event (including the attributes of represent economic event, precise, complete, accurate, and verifiable). The second aspect relates to the measurement features of the information (measurement error and bias). The first aspect corresponds to the idea of construct validity from traditional measurement theory (i.e., that the representation of what is measured is a valid conceptualization of the phenomena of concern). The second aspect is similar to the idea of convergent validity from measurement theory, which is similar to the concept of verifiability. In the exposure draft, the FASB/IASB state that "verifiable information lends credibility to the assertion that financial reporting information represents the economic phenomena that it purports to represent" (2008, xi). Convergent validity occurs when evidence provided from different sources in different ways indicates the same or similar meaning of the construct. Thus, if evidence from a different source verifies the evidence provided by a piece of financial information, then the information has convergent validity. In the revised conceptual framework, "representational faithfulness" is a fundamental characteristic (which agrees with the idea of construct validity) and "verifiability" is an enhancing characteristic (which agrees with the idea of convergent validity).

The results from the main experiment provide some evidence that nonprofessional investors are affected by and use the relevance and reliability of financial information in

differing ways, dependent on the type of investment-related judgment or decision that is being made. First, for each of the dependent variables, relevance has the predicted positive effect. This is true for judgments of attractiveness, price changes, and amount to invest. The results provide solid support for H1; relevance does affect judgments. Secondly, reliability's effect is only significant for one of the dependent variables (amount to invest) and that model has a marginal interaction. The results provide only limited support for H2; reliability affects the judgments of the amount to invest but only when relevance is high. Finally, the interaction effect posited in H3 is only evident for the judgments of the amount to invest. When exploring this interaction further though, the results show that reliability only matters when relevance is high. This indicates that the interaction is not compensatory (i.e., a high amount of reliability cannot compensate for a low level of relevance). Rather, the results suggest that, overall, relevance affects judgments, and reliability only matters in the high relevance condition for one of the investment-related judgments. This suggests that nonprofessional investors may be best served by maximizing relevance while satisficing reliability (i.e., requiring only that a minimum threshold be met, perhaps). The results from this study are consistent with the changes to the conceptual framework; first, determine the relevance of a piece of information and second, determine if it is reliable ("faithfully represented").

The participants in both the pre-experiment and the main experiment indicated that they place more importance on reliability instead of relevance. However, as shown in the results above, when making investment-related judgments, the participants' judgments respond more to relevance than reliability (relevance significantly affected three of the judgments while reliability only affected one of the judgments). These

results are compatible with prior research that shows that people often have poor self-insight (Weitz and Wright 1979). In this context, nonprofessional investors have poor self-insight regarding the importance they place on relevance and reliability in making investment-related judgments. They *think* they value reliability more than relevance; however, the results suggest that they actually value relevance more than reliability.

Important limitations exist with this study, particularly with regard to the manipulations of relevance and reliability of financial information provided in the experimental materials. While I attempted to have low and high levels of relevance and reliability in the experiment, I may have not had enough of a difference in the manipulations for low and high reliability, in particular. For example, the low level of reliability as assessed in the pilot tests was at mid-levels of the range, and this may have not been enough of a difference from the high levels of reliability. Future studies can examine whether or not a minimum threshold of reliability exists that information must meet, and once it does, it is considered to be reliable. My manipulations of high and low reliability both may have exceeded this threshold, and thus, may not have been strong enough to cause a concern about the level of reliability. In addition, I focused on a subset of users of financial information by limiting my study to nonprofessional investors. Thus, the perceptions and use of relevant and reliable financial information by other groups of users may be different from what I find in this study.

Since the conceptual framework is such a fundamental issue in accounting and one of present concern, several other research opportunities exist in this topic area. First, an opportunity exists to explore how other sets of users (such as managers, auditors, sophisticated investors, and so on) perceive relevance and reliability and use these

characteristics in preparing financial reporting documents, auditing financial statements, or utilizing the financial information in making resource allocation decisions. For example, as new standards are created and implemented, this affects the ability of auditors to effectively audit the affected financial statements, and any change to the concepts of verifiability or neutrality, or to their importance in the conceptual framework, could affect auditability. In addition, auditors may look more to the conceptual framework in designing an audit as financial reporting standards become more principles-based. As rules-based standards ("bright line") shift to principles-based standards during the convergence with international standards, the procedures necessary for auditing certain transactions or activities may not be as clear. Thus, auditors may look for guidance from the conceptual framework in determining the appropriate audit procedures for those transactions or activities. Second, with the recent economic turmoil, the credibility of financial reporting continues to be of utmost importance, and opportunities exist to explore how the financial reporting process can maintain its credibility and communicate that to the users. The results from this study suggest that only relevance has a significant impact on many investment-related judgments; however, this result may be due to a lack of salience for the reliability of the information or that the manipulated low level of reliability exceeded some implicit threshold (thus, it did not significantly affect the judgments and decisions).

While a significant amount of research has attempted to address the means to achieve and assess accounting information's reliability, many opportunities still exist to provide new insights, especially with regard to how it is used in conjunction with the concept of relevance. Maines and Wahlen (2006) encourage research that is directed

toward determining the characteristics of reliability, particularly with how participants in the financial reporting process characterize reliability, and whether or not characteristics of reliability exist that are not currently captured in the conceptual framework. The same concerns apply to relevance. Increasing our understanding of relevance and reliability can help the FASB and IASB make distinctions and changes to the conceptual framework that will help them meet the goal of providing useful information for decision making.

This study provides timely information regarding relevance and reliability of financial and related information that should be of value to standard setters, researchers, and investors. While prior studies examine how investors may assess reliability (Elliott et al. 2007), these studies do not examine reliability in the presence of measured or manipulated relevance, and in fact, how to define reliability or how investors perceive reliability is not clear in the prior research. Currently, little is known about how investors use relevance and reliability of information in making judgments or investment decisions. This study provides such information.

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**Figure 1**
**Basic Model of Information Relevance and Reliability**

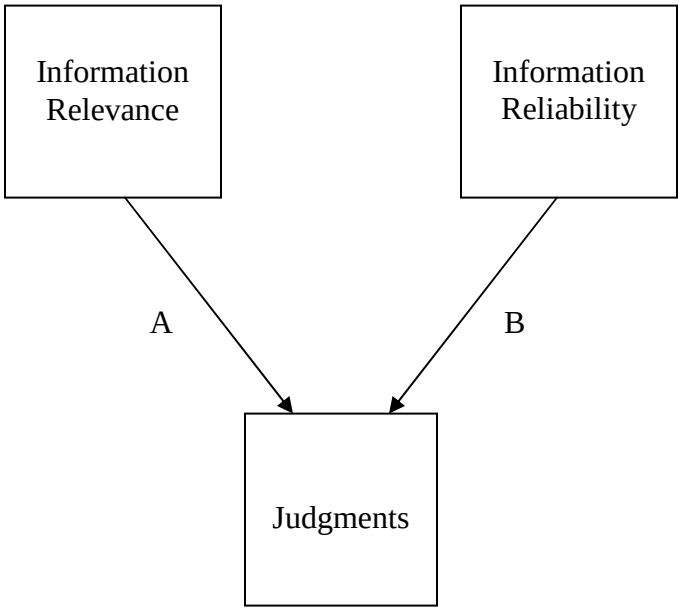


**Figure 2**
**Augmented Model of Information Relevance and Reliability**

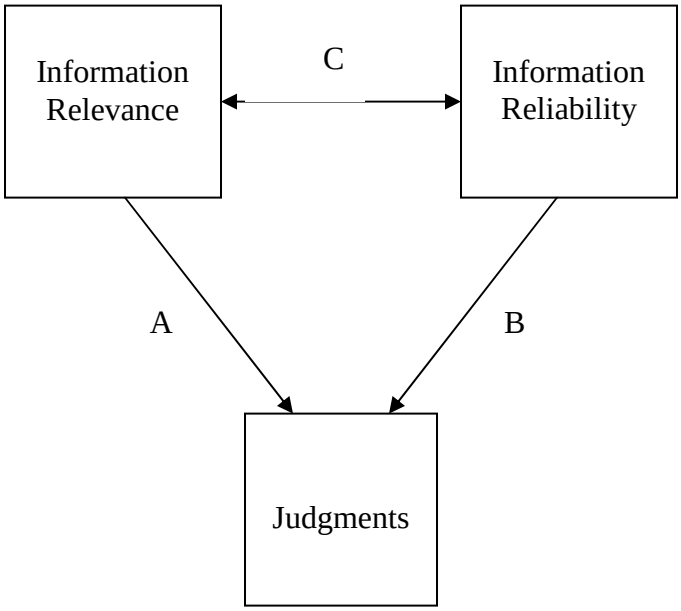


**Figure 3**
**Amount to Invest**

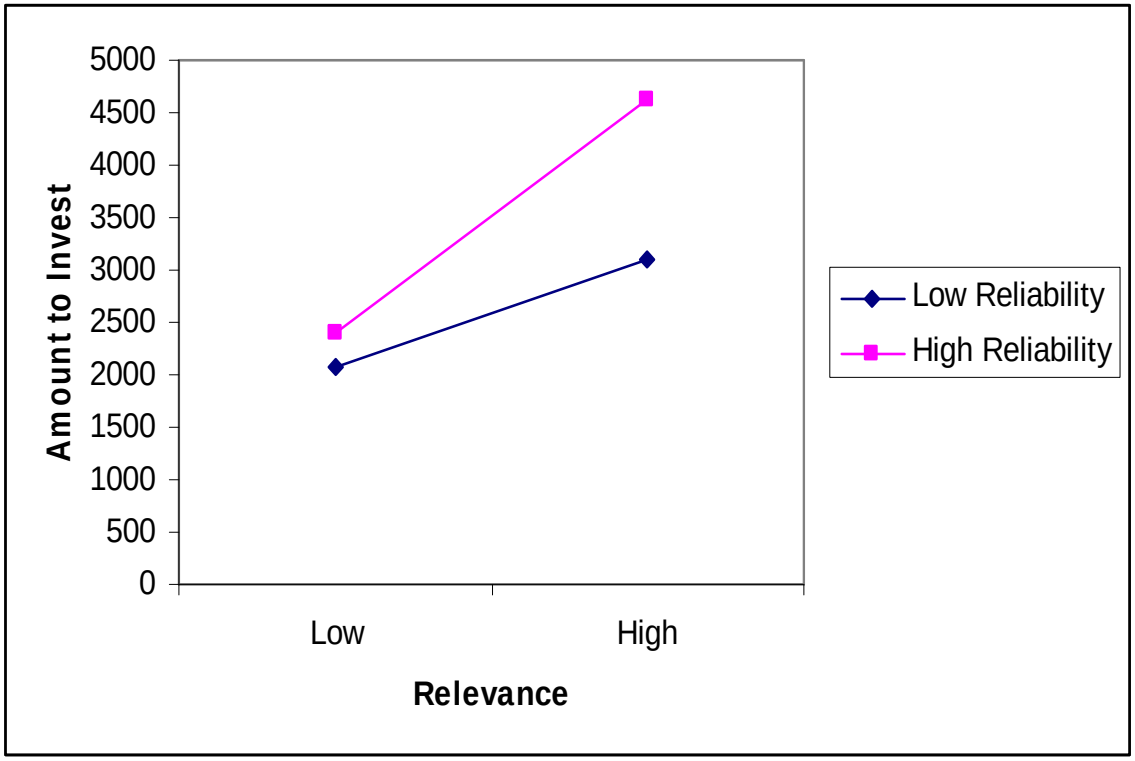


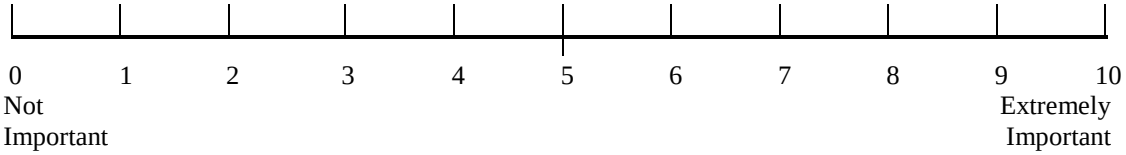
**Table 1**
**Pre-Experimental Study: Rating/Ranking of Importance of Characteristics**

Panel A: Rating of Characteristics

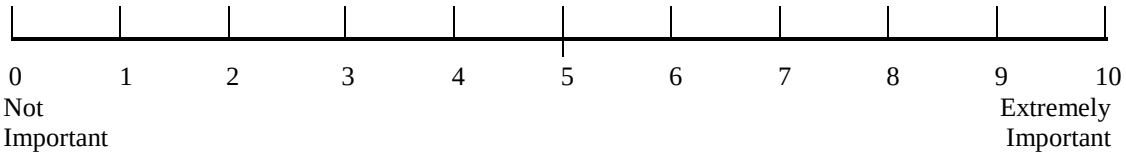
A particular piece of financial information could be relevant to a decision that you are making or not relevant. A piece of financial information could be reliable or not reliable.

In making a decision using financial information, how important would these two characteristics of the information – relevance and reliability – be to you? Please rate each one on a scale from 0 to 10, where 0 is not important and 10 is extremely important to helping with your decision.

Relevance:




Reliability:




Panel B: Ranking of Characteristics

For financial information to be useful in your decision making, do you think it is more *important* for it to be relevant or reliable?

Please rank the two information characteristics below, with 1 designating the characteristic that you feel is more important for decision usefulness and 2 the less important characteristic. If you consider both characteristics to be equally important, then assign "1's" to both characteristics. However, if one is more important than the other, please assign a "1" to that characteristic and a "2" to the other characteristic.

__ Relevance

__ Reliability

**Table 2**
**Information Items Used in the Pre-Experimental Study**

Panel A: List of Information Items in the Pre-Experimental Study

| # | **Information Item** |
|---|---|
| 1 | Press Release |
| 2 | Comments from an Internet Chat Room for Investors |
| 3 | Revenues from Income Statement in the Annual Report |
| 4 | Excerpt from CFO Conference Call of 3rd Quarter Earnings Release |
| 5 | Property, Plant and Equipment from Balance Sheet in the Annual Report |
| 6 | Costs Estimate (Note to F/S) |
| 7 | Excerpt from BusinessWeek Interview with CEO |
| 8 | Customer Loyalty Program Rules |
| 9 | Earnings Estimate Summary from Investor Relations Section of the Company's Website |
| 10 | Marketing Information |

Panel B: Sample of Information Items in the Pre-Experimental Study

**INFORMATION ITEM #1:**

## Cinebarre to Debut in Troy, MI

Former CEO of Panhandle Cinemas partners with Global Theaters Group for rollout of cinema eatery concept

CHICAGO, IL.--(BUSINESS WIRE)—Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of a joint venture, Cinebarre, LLC, with Cecil Williams. Mr. Williams, previously the CEO of the Panhandle Cinemas, will serve as CEO of the new venture. The new joint venture will increase revenues of Global Theaters Group by 80% with its creation of a whole new way to see movies.

*Source: Global Theaters Group Press Release.*

**INFORMATION ITEM #5:**

| **ASSETS (in millions)** | **December 28, 2006** | **December 29, 2005** |
|---|---|---|
| PROPERTY AND EQUIPMENT: | | |
| Land | 133.2 | 136.8 |
| Buildings and leasehold improvements | 1,667.3 | 1,599.2 |
| Equipment | 852.6 | 830.2 |
| Construction in progress | 31.7 | 21.8 |
| Total property and equipment | 2,684.8 | 2,588.0 |
| Accumulated depreciation and amortization | (763.0) | (600.3) |
| TOTAL PROPERTY AND EQUIPMENT, NET | 1,921.8 | 1,987.7 |

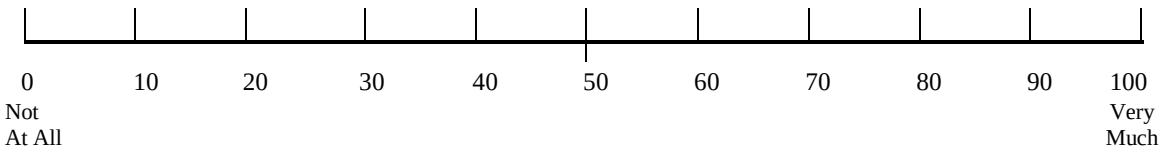
*Source: 2006 Annual Report Balance Sheet.*

## Table 3

Panel A: List of Questions for Each Information Item in the Pre-Experimental Study

| # | Questions | Information Characteristic | Source |
|---|---|---|---|
| 1 | How **reliable** is the above information? | Reliable | SFAC #2 |
| 2 | How **relevant** is the above information to your investment decision? | Relevant | SFAC #2 |
| 3 | How **credible** is the above information? | Credible | Mercer 2004 |
| 4 | How **accurate** is the above information? | Reliable | IASB/SFAC #2 |
| 5 | How **believable** is the above information? | Credible | Mercer 2004 |
| 6 | How **timely** is the above information? | Relevant | SFAC #2 |
| 7 | To what extent is the above information **verifiable**? | Reliable | SFAC #2 |
| 8 | How **plausible** is the above information? | Credible | Mercer 2004 |
| 9 | To what extent can the above information be used to **predict the future value** of the company? | Relevant | SFAC #2 |
| 10 | Does the above information adequately consider the **uncertainty** that may exist in this business situation? | Reliable | SFAC #2 |
| 11 | How **objective** is the above information? | Credible | Mercer 2004 |
| 12 | How **precise** is the above information? | Reliable | IASB |
| 13 | To what extent does the above information **represent the underlying economic event or situation**? | Reliable | SFAC #2 |
| 14 | How **trustworthy** is the above information? | Credible | Mercer 2004 |
| 15 | Does the above information provide a **complete picture** of the situation? | Reliable | SFAC #2 |
| 16 | Does the above information **confirm or disconfirm** your prior expectations regarding Global Theaters Group? | Relevant | SFAC #2 |
| 17 | To what extent is the above information likely to be **biased**? | Reliable | SFAC #2 |
| 18 | To what extent is the above information likely to contain **measurement error**? | Reliable | SFAC #2 |
| 19 | Overall, how **useful** is the above information to your investment decision? | Useful | SFAC #2 |

Panel B: Scale for Questions 1-18



## Table 4
## Pre-Experimental Study: Factor Analysis

**Panel A: All Financial Information Attributes**

| | Factor 1 *(Reliability)* | Factor 2 *(Relevance)* | Factor 3 *(Relevance)* | Factor 4 *(Reliability)* |
|---|---|---|---|---|
| Reliable | ***0.7880*** | 0.3470 | 0.1400 | -0.0350 |
| Relevant | 0.3880 | *0.4020* | 0.2650 | -0.2820 |
| Credible | ***0.8210*** | 0.3280 | 0.1600 | -0.0440 |
| Accurate | ***0.8460*** | 0.2390 | 0.0470 | -0.0600 |
| Believable | ***0.6650*** | 0.2020 | 0.0990 | 0.0790 |
| Timely | 0.3440 | 0.0340 | ***0.6150*** | 0.0490 |
| Verifiable | ***0.7950*** | 0.0900 | 0.1700 | -0.1070 |
| Plausible | ***0.7490*** | 0.1160 | 0.3460 | -0.1290 |
| Predict Future Value | 0.0850 | 0.5150 | ***0.7830*** | 0.0060 |
| Uncertainty | 0.1950 | *0.4940* | 0.1370 | -0.0140 |
| Objective | *0.5810* | 0.3600 | 0.0850 | 0.0180 |
| Precise | ***0.7420*** | 0.3730 | 0.2310 | 0.0170 |
| Represent Economic Event | 0.3640 | ***0.6570*** | 0.2480 | -0.1540 |
| Trustworthy | ***0.8180*** | 0.3680 | 0.1050 | 0.0350 |
| Complete | 0.4080 | ***0.6730*** | -0.0340 | -0.0800 |
| Confirm or Disconfirm | *0.4410* | 0.3630 | 0.1590 | -0.3350 |
| Biased | 0.0260 | 0.0670 | -0.0880 | ***0.6630*** |
| Measurement Error | -0.0200 | -0.2680 | 0.2220 | ***0.7370*** |

**Panel B: Reliability Attributes**

| | Factor 1 | Factor 2 |
|---|---|---|
| Precise | ***0.858*** | 0.082 |
| Represent Economic Event | ***0.679*** | -0.180 |
| Verifiable | ***0.703*** | 0.040 |
| Accurate | ***0.819*** | 0.023 |
| Complete | ***0.684*** | -0.201 |
| Uncertainty | *0.432* | -0.097 |
| Biased | 0.004 | *0.483* |
| Measurement Error | -0.143 | ***0.882*** |

**Panel C: Relevance Attributes**

| | Factor 1 |
|---|---|
| Timely | ***0.618*** |
| Predict Future Value | ***0.866*** |
| Confirm or Disconfirm | *0.393* |

This table presents the factor patterns obtained from a structure detection factor analysis with a varimax rotation, using participants' responses to all questions for Panel A, the reliability attribute questions for Panel B, and the relevance attribute questions for Panel C. In Panels A and B, italicized numbers indicate the largest factor loading for a particular question, and bolded numbers indicate the factor loadings greater than .6. *Note: Labels on factors in Panel A are inferred from the results and are included for convenience.*

## Table 5
## Pre-Experimental Study: Regression Results

| Variables | Model 1 *(Dec. Usefulness)* Coefficients | **Model 2** ***(Reliability)*** **Coefficients** | **Model 3** ***(Relevance)*** **Coefficients** | Model 4 *(Reliability)* Coefficients | Model 5 *(Relevance)* Coefficients |
|---|---|---|---|---|---|
| | | | | | |
| Intercept | 1.120 | **1.296** | **6.041** | -.937 | 8.340 |
| *Relevant* | 0.073*** | | | | |
| *Reliable* | 0.870*** | | | | |
| Accurate | | **0.392*** ** | | 0.387*** | 0.052 |
| *Verifiable* | | **0.029** | | 0.019 | 0.248*** |
| *Uncertainty* | | **0.005** | | 0.009 | 0.055 |
| Precise | | **0.372*** ** | | 0.353*** | 0.013 |
| *Represent Economic Event* | | **0.095*** ** | | 0.098*** | 0.295*** |
| *Complete* | | **0.063** ** | | 0.067** | -0.053 |
| *Biased* | | **-0.014** | | -0.005 | -0.008 |
| *Measurement Error* | | **0.014** | | -0.007 | -0.206*** |
| *Timely* | | | **-0.016** | 0.061** | -0.029 |
| *Predict Future Value* | | | **0.361*** ** | -0.028 | 0.222*** |
| *Confirm or Disconfirm* | | | **0.505*** ** | 0.025 | 0.073 |
| | | | | | |
| Adjusted $R^2$ | 0.800 | **0.703** | **0.317** | 0.703 | 0.481 |

*, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively, based on two-tailed tests. Included in each regression are participant-specific indicator variables. These intercepts are suppressed for presentation purposes. *Italics* denotes attributes that are from SFAC #2. Variables are shown in Table 3.

This table reports the results of the following regression models:

Model 1:

$$\text{Decision Usefulness} = \alpha_1 + \beta_1 (\text{Relevant}) + \beta_2 (\text{Reliable}) + \varepsilon_1$$

Model 2:

$$\text{Reliable} = \alpha_2 + \beta_1 (\text{Accurate}) + \beta_2 (\text{Verifiable}) + \beta_3 (\text{Uncertainty}) + \beta_4 (\text{Precise}) + \beta_5 (\text{Represent Economic Event}) + \beta_6 (\text{Complete}) + \beta_7 (\text{Biased}) + \beta_8 (\text{Measurement Error}) + \varepsilon_2$$

Model 3:

$$\text{Relevant} = \alpha_3 + \beta_1 (\text{Timely}) + \beta_2 (\text{Predict Future Value}) + \beta_3 (\text{Confirm or Disconfirm}) + \varepsilon_3$$

Model 4:

$$\text{Reliable} = \alpha_4 + \beta_1 (\text{Accurate}) + \beta_2 (\text{Verifiable}) + \beta_3 (\text{Uncertainty}) + \beta_4 (\text{Precise}) + \beta_5 (\text{Represent Economic Event}) + \beta_6 (\text{Complete}) + \beta_7 (\text{Biased}) + \beta_8 (\text{Measurement Error}) + \beta_9 (\text{Timely}) + \beta_{10} (\text{Predict Future Value}) + \beta_{11} (\text{Confirm or Disconfirm}) + \varepsilon_4$$

Model 5:

$$\text{Relevant} = \alpha_5 + \beta_1 (\text{Accurate}) + \beta_2 (\text{Verifiable}) + \beta_3 (\text{Uncertainty}) + \beta_4 (\text{Precise}) + \beta_5 (\text{Represent Economic Event}) + \beta_6 (\text{Complete}) + \beta_7 (\text{Biased}) + \beta_8 (\text{Measurement Error}) + \beta_9 (\text{Timely}) + \beta_{10} (\text{Predict Future Value}) + \beta_{11} (\text{Confirm or Disconfirm}) + \varepsilon_5$$

## Table 6
## Pre-Experimental Study: Correlation Matrix

| | Reliable | Relevant | Accurate | Timely | Verifiable | Predict Future Value | Uncertainty | Precise | Represent Economic Event | Complete | Biased | Measurement Error | Confirm or Disconfirm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Reliable | 1 | .516*** | .767*** | .383*** | .619*** | .353*** | .303*** | .773*** | .561*** | .553*** | 0.004 | -.108*** | .486*** |
| Relevant | | 1 | .449*** | .260*** | .469*** | .455*** | .337*** | .467*** | .574*** | .397*** | -.152*** | -.277*** | .448*** |
| Accurate | | | 1 | .330*** | .738*** | .255*** | .289*** | .708*** | .473*** | .503*** | 0.014 | -.137*** | .484*** |
| Timely | | | | 1 | .369*** | .532*** | .138*** | .438*** | .272*** | .165*** | -0.019 | -145*** | .240*** |
| Verifiable | | | | | 1 | .238*** | .259*** | .624*** | .386*** | .366*** | -0.063 | -0.071 | .441*** |
| Predict Future Value | | | | | | 1 | .417*** | .423*** | .554*** | .354*** | -0.026 | 0.011 | .345*** |
| Uncertainty | | | | | | | 1 | .293*** | .416*** | .421*** | -0.022 | -.109*** | .317*** |
| Precise | | | | | | | | 1 | .593*** | .576*** | 0.029 | -0.047 | .504*** |
| Represent Economic Event | | | | | | | | | 1 | .607*** | -0.080** | -.218*** | .506*** |
| Complete | | | | | | | | | | 1 | -0.001 | -.283*** | .429*** |
| Biased | | | | | | | | | | | 1 | .467*** | -.216*** |
| Measurement Error | | | | | | | | | | | | 1 | -.319*** |
| Confirm or Disconfirm | | | | | | | | | | | | | 1 |

*, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively.

**Table 7**
**Manipulations of Press Release Information**

**Panel A: GTG Loyalty Club Press Release Example (High Relevance/High Reliability)**

## GTG to Debut Loyalty Club to Entice Moviegoers

CHICAGO, IL.—This morning—(BUSINESS WIRE)—Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club. According to independent industry analysts, the loyalty club will encourage repeat customers and will enable revenue per theater to grow by 12% during the next fiscal year. The details of the loyalty club are outlined below. GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day. For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day. Members receive awards (small popcorn, small soft drink, or movie ticket) each time 40 credits are earned. Once a member earns 120 credits, the member reaches "Star Status." Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.

**Panel B: Relevance-Related and Reliability-Related Items Manipulated in the Press Release**

| # | Characteristic | Attribute | Press Release Item |
|---|---|---|---|
| **1.** | **Relevance** | **Predict Future Value (Pre-Experiment)** | **Type of information**<br>• **Loyalty club (high)**<br>• **Savings cards in all industries (low)** |
| **2.** | **Relevance** | **Confirm/Disconfirm (Pre-Experiment)** | **Market test results**<br>• **Information included (high)**<br>• **None (low)** |
| **3.** | **Relevance** | **Timeliness** | **Date**<br>• **Current (high)**<br>• **August 2007 (low)** |
| **4.** | **Reliability** | **Precision (Pre-Experiment)** | **Precision of estimates**<br>• **Point (high)**<br>• **Range (low)** |
| **5.** | **Reliability** | **Completeness (Pre-Experiment)** | **Details of loyalty club**<br>• **Many (high)**<br>• **None (low)** |
| **6.** | **Reliability** | **Source Credibility** | **According to (person)…**<br>• **Independent industry analyst (high)**<br>• **Marketing director (low)** |

**Table 7 cont.**
**Manipulations of Press Release Information**

**Panel C: Details of Manipulations of Specific Attributes**

**Relevance**

- Manipulate ability to ***predict future value***
  - High
    - *the loyalty club will encourage repeat customers and will enable revenue per theater to grow by* (SOME PERCENTAGE) *during the next fiscal year.*
  - Low
    - *Information presented at a recent marketing conference indicated that the number of applications for savings cards (such as those used in grocery stores) in all industries increased by* (SOME PERCENTAGE) *in the past year.*
- Manipulate ability (of the information) to ***confirm or disconfirm*** prior expectations
  - High
    - *Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.*
  - Low
    - Nothing included about market tests
- Manipulate ***timeliness*** of the information
  - High
    - This morning (or *today's date*)
  - Low
    - Over six months ago (*August 9, 2007*)

**Reliability**

- Manipulate ***precision*** of the info
  - High
    - Point estimate of increase or growth *(12%).*
  - Low
    - Range estimate of increase or growth *(8-16%)*
- Manipulate ***completeness*** of the info
  - High
    - Include details of loyalty club and what credits will earn repeat customers
  - Low
    - No details of loyalty club included
- Manipulate ***source credibility*** of the info
  - High
    - Source: Independent Industry Analysts
  - Low
    - Source: GTG Marketing Manager

**Table 8**
**Pilot Test I Results**

**Panel A: Cell Means**

| | *High Relevance* | *Low Relevance* | |
|---|---|---|---|
| **High Reliability** | **67.7** | **70.2** | **Reliability** |
| | *60.5* | *55.2* | *Relevance* |
| **Low Reliability** | **61.3** | **61.7** | **Reliability** |
| | *62.5* | *49.8* | *Relevance* |

Note: Means of Reliability judgments are presented in bold (not italics).
Means of Relevance judgments are presented in italics (not bold).

**Panel B: Paired Samples T-tests**

| | **Relevance** | | | | |
|---|---|---|---|---|---|
| | High | Low | n | t | p |
| Means | 61.5 | 52.5 | 129 | -4.333 | <0.01 |

| | **Reliability** | | | | |
|---|---|---|---|---|---|
| | High | Low | n | t | p |
| Means | 68.9 | 61.5 | 129 | -4.331 | <0.01 |

In pilot test I, participants received four pieces of information that varied in terms of its reliability and relevance. The mean judgments of reliability and relevance for the four pieces of information are presented in Panel A. Panel B displays the results from two paired samples t-tests that find significant differences between the judgments of relevance for the high and low pieces of information and significant differences between the judgments of reliability for the high and low pieces of information.

**Table 9**
**Participants' Ratings of Relevance and Reliability in the Main Experiment**

| | | Relevance: High | Relevance: Low | Relevance: None | | |
|---|---|---|---|---|---|---|
| Reliability: High | | *51.1* | *64.9* | *59.1* | *Reliability* | *58.0* |
| | | **58.0** | **54.4** | **40.1** | **Relevance** | |
| Reliability: Low | | *50.3* | *64.5* | *53.7* | *Reliability* | *57.4* |
| | | **50.3** | **53.8** | **42.9** | **Relevance** | |
| | | **54.1** | **54.1** | **41.5** | | |

Participants were assigned to one of six conditions. See Table 7 for details of the manipulations and Appendix 3 for the specific manipulations for each condition. Part C of the experiment asked participants to rate the relevance and reliability of the press release information provided in their condition (see Appendix 2 for the instrument). As a secondary test of the manipulations, I analyzed the participants' judgments of the relevance and reliability of the press release information to ascertain whether the judgments were in the expected directions. Table 9 presents the mean judgments of the participants' ratings of relevance and reliability.

**Table 10**
**Main Experiment Demographics**

| ***Total Sample*** | ***n=139*** |
|---|---|
| Invested in common stock (%) | 55 (39.56%) |
| Plan to invest (%) | 124 (89.20%) |
| Invested in common stock mutual funds (%) | 71 (51.07%) |
| Number of finance courses taken (sd) | 2.78 (2.67) |
| Number of accounting courses taken (sd) | 3.61(3.95) |
| Number of years business experience (sd) | 6.29 (6.72) |
| Number of years finance experience (sd) | 0.38 (1.35) |
| Number of years accounting experience (sd) | 1.23 (2.97) |
| Age (sd) | 30.04 (7.61) |
| Males (%) | 74 (53%) |
| Females (%) | 65 (47%) |

This table presents the results from the post-experiment questionnaire that participants answered in Part B of the instrument (see Appendix 2). Participants were asked three questions to gauge their interest and prior investing experience: the number of times they had invested in common stock prior to this experiment (number and percentage of total respondents are reported), if they plan to invest in common stock in the future (number and percentage of total respondents are reported), and if they had invested in common stock mutual funds (number and percentage of total respondents are reported). In addition, participants were asked several questions about their education and prior experience (mean and standard deviation are reported for each): number of finance courses taken in undergraduate and graduate work, number of accounting courses taken in undergraduate and graduate work, number of years of total business experience, number of years of finance experience, and number of years of accounting experience. In addition, participants also reported their age (mean and standard deviation reported) and gender (number and percentage of total respondents reported). The demographics above are reported in total for the whole sample. In addition, demographics were examined by condition to determine if results differ across the six conditions (results untabulated). The only one that was significantly different was number of years of finance experience.

**Table 11**
**The Effects of Relevance and Reliability on Amount to Invest**

Panel A: Mean (sd) of Amount to Invest (AMT INVEST)

| | High Relevance | Low Relevance | Row Means |
|---|---|---|---|
| High Reliability | 4,616.67<br>(2150.05)<br>n=48 | 2,404.00<br>(1740.33)<br>n=25 | 3,858.90<br>(2268.249)<br>n=73 |
| Low Reliability | 3,103.03<br>(1839.24)<br>n=33 | 2,081.48<br>(1447.55)<br>n=27 | 2,643.33<br>(1738.046)<br>n=60 |
| Column Means | 4,000.00<br>(2151.51)<br>n=81 | 2,236.54<br>(1587.45)<br>n=52 | |

Panel B: ANOVA with Dependent Variable *AMT INVEST*

| Source | DF | Mean Square | F-Value | Pr > F |
|---|---|---|---|---|
| *Relevance* | 1 | 81,610,000 | 23.256 | 0.000*** |
| *Reliability* | 1 | 26,300,000 | 7.496 | 0.007*** |
| *Relevance X Reliability* | 1 | 11,070,000 | 3.154 | 0.078* |
| Error | 129 | 3,509,199 | | |

*, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A reports the mean (standard deviation) by condition of the response to the question of how much of a fund of $10,000, assuming a sufficiently diversified portfolio, each participant would invest in the stock of the company (this is asked after the participants receive the information provided about that particular company and the press release). Responses ranged from $0 to $10,000.

Panel B reports the results of the hypothesis tests with the amount to invest (AMT INVEST) as the dependent variable.

**Table 12**
**The Effects of Relevance and Reliability on Effect on Price**

Panel A: Mean (sd) of Effect of Price (PRICE EFFECT)

| | High Relevance | Low Relevance | Row Means |
|---|---|---|---|
| High Reliability | 0.98<br>(.668)<br>n=48 | 0.44<br>(.583)<br>n=25 | 0.79<br>(.686)<br>n=73 |
| Low Reliability | 0.70<br>(.637)<br>n=33 | 0.52<br>(.753)<br>n=27 | 0.62<br>(.691)<br>n=60 |
| Column Means | 0.86<br>(.666)<br>n=81 | 0.48<br>(.671)<br>n=52 | |

Panel B: ANOVA with Dependent Variable *PRICE EFFECT*

| Source | DF | Mean Square | F-Value | Pr > F |
|---|---|---|---|---|
| *Relevance* | 1 | 4.018 | 9.117 | 0.003*** |
| *Reliability* | 1 | 0.324 | 0.734 | 0.393 |
| *Relevance X Reliability* | 1 | 1.015 | 2.304 | 0.132 |
| Error | 129 | 0.441 | | |

Note: PRICE EFFECT coded as 2 (significantly increase), 1 (increase), 0 (no change), -1 (decrease), and -2 (significantly decrease).

*, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A reports the mean (standard deviation) by condition of the response to the question of the price effect of the information provided in the press release. Participants were asked to judge the likely effect on the stock price today given the information provided in the press release. The information could significantly increase the price, increase the price, not change the price, decrease the price, or significantly decrease the price from the prior price of $10.50.

Panel B reports the results of the hypothesis tests with effect of price (PRICE EFFECT) as the dependent variable.

**Table 13**
**The Effects of Relevance and Reliability on Attractiveness**

Panel A: Mean (sd) of Post-Attractive (*POST ATTRACTIVE*)

| | High Relevance | Low Relevance | Row Means |
|---|---|---|---|
| High Reliability | 73.49<br>(11.70)<br>n=43 | 57.96<br>(16.22)<br>n=25 | 67.78<br>(15.39)<br>n=68 |
| Low Reliability | 63.90<br>(15.80)<br>n=31 | 48.69<br>(21.05)<br>n=26 | 56.96<br>(19.75)<br>n=57 |
| Column Means | 69.47<br>(14.28)<br>n=74 | 53.24<br>(.671)<br>n=51 | |

Panel B: ANCOVA with Dependent Variable *POST ATTRACTIVE*

| Source | DF | Mean Square | F-Value | Pr > F |
|---|---|---|---|---|
| *Pre-Attractive (Covariate)* | 1 | 21,688.08 | 290.989 | 0.000*** |
| *Relevance* | 1 | 464.75 | 6.236 | 0.014** |
| *Reliability* | 1 | 51.94 | 0.697 | 0.405 |
| *Relevance X Reliability* | 1 | 112.11 | 1.504 | 0.222 |
| Error | 120 | 74.53 | | |

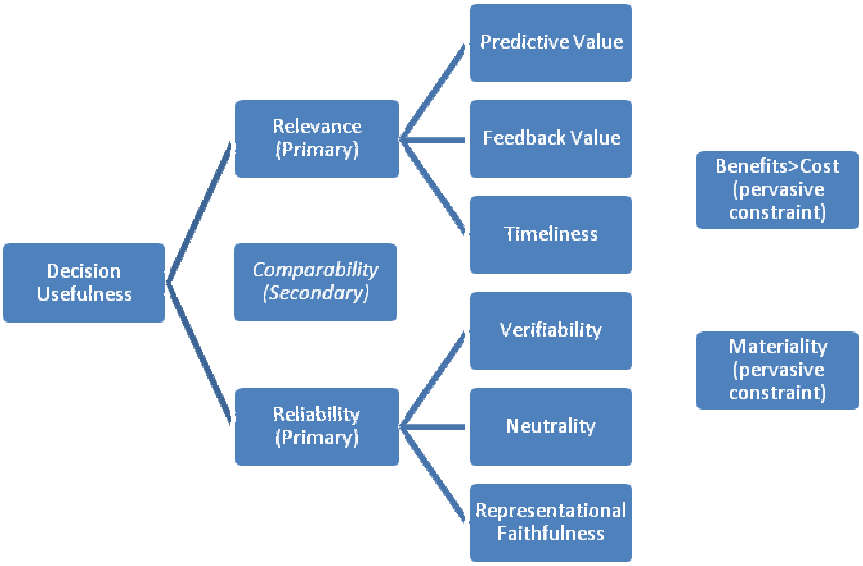
*, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively.

Panel A reports the mean (standard deviation) by condition of the response to the question of how attractive is the stock. Participants first rated the attractiveness of the stock (PRE ATTRACTIVE) after reading the background information and limited financial statements about the company. They were then given a press release about the company and then asked to rate the attractiveness of the stock (POST ATTRACTIVE) again. Responses ranged from 0 to 100.

Panel B reports the results of the hypothesis tests with the attractiveness of the stock (POST ATTRACTIVE) as the dependent variable. PRE ATTRACTIVE is included as a covariate.

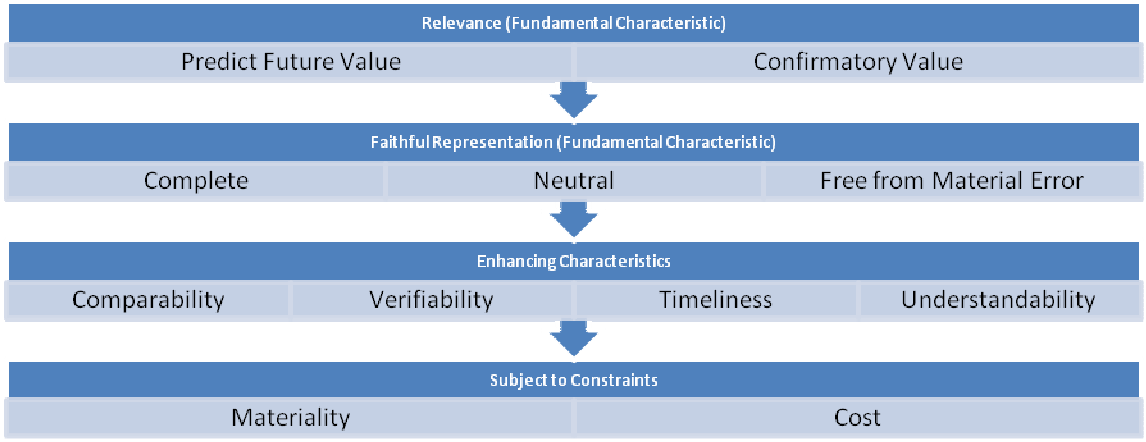
## Appendix 1
## Current and Proposed Conceptual Frameworks

### Current Conceptual Framework




Application: Relevance and reliability are the primary qualities for decision usefulness, and they are assessed simultaneously. Comparability is a secondary quality that interacts with relevance and reliability to add to the usefulness of the information. Two constraints exist: must be beneficial to provide the information and must exceed the minimum threhold for recognition. *Source: SFAC No. 2 (FASB 1980)*

### Proposed Conceptual Framework




Application: Under the FASB/IASB proposed conceptual framework, the fundamental characteristics would be assessed sequentially. First, apply relevance to determine which economic phenomena should be represented in financial reports. Second, once relevance has been applied, apply faithful representation to determine which depiction best agrees with the relevant phenomena. Application of the enhancing characteristics should improve the usefulness of the financial information and should be maximized as possible with an iterative process. However, they cannot make irrelevant information or information not faithfully represented useful for decisions. *Source: Exposure Draft (FASB 2008)*

**Appendix 2**
**Experimental Stimuli**

# GENERAL INSTRUCTIONS

This study has three parts to it – Parts A, B, and C. Although that seems like a lot, this study should only take you 15-20 minutes in total. In each part, you will be asked some questions. Please assume that you have the means to invest in the stock market and that you are considering a particular firm described herein. There are no right or wrong answers in this study. We are interested in **YOUR** perceptions. *Thank you for participating in this study.*

# SPECIFIC INSTRUCTIONS

**Assume that you have the means to invest in the common stock of a company and that you are considering investing in GTG Corporation.** Below is some information for GTG, including a brief description of the business, data on its financial performance for the past couple of years, and information regarding its stock's performance. Next you will find the most recent balance sheet and income statement for GTG and a press release regarding GTG's Loyalty Club. Once you have looked at the information provided, you will be asked to make some judgments about the firm including whether or not you would like to invest in the firm.

*Company Description:*
Global Theaters Group (GTG) and its subsidiaries operates one of the largest and most geographically diverse theater circuits in the United States, consisting of 6,000 screens in 495 theaters in 42 states as of December 27, 2007, with over 200 million annual attendees for the fiscal year ended December 27, 2007. The Company develops, acquires, and operates multi-screen theaters primarily in mid-sized metropolitan markets and suburban growth areas of larger metropolitan markets throughout the U.S. The Company's business strategy is to continue to enhance its position in the motion picture exhibition industry by capitalizing on prudent industry consolidation opportunities, realizing selective growth opportunities through new theater construction, expanding and upgrading of its existing asset base, and creating incremental revenue growth. To market its theaters, the Company utilizes advertisements, including radio advertising, and movie schedules published in newspapers and over the Internet informing its patrons of film selections and show times.

*Recent Financial Results for 2007:*

| | |
|---|---|
| Profit Margin | 4.8% |
| Return on Assets | 4.9% |
| Current Ratio (most recent quarter) | 1.403 |

*Financial Markets Data:*
Historically, companies in this industry have traded at an average P/E (market price to trailing net income) of 16 (with a range of 8 to 24 times trailing net income). Prior to today, the most recent closing price for GTG's common stock was $10.50.

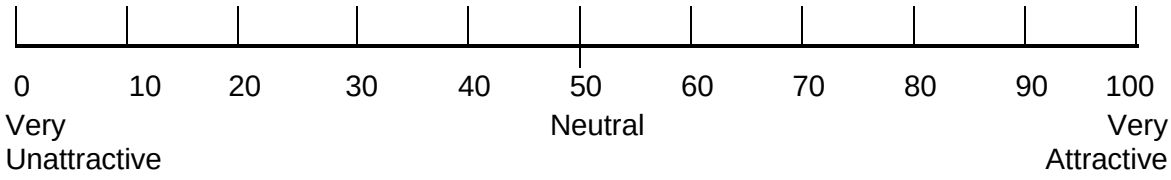
**GTG Consolidated Balance Sheet**
**(in millions)**

| **Assets** | **12/27/2007** | **12/28/2006** |
|---|---|---|
| CURRENT ASSETS: | | |
| Cash and cash equivalents | 162.2 | 196.3 |
| Trade and other receivables, net | 59.8 | 55.6 |
| Inventory | 8.0 | 7.8 |
| Other current assets | 11.0 | 2.9 |
| TOTAL CURRENT ASSETS | 241.0 | 262.6 |
| Property, Plant, and Equipment, net | 2,010.8 | 1,987.7 |
| Goodwill | 214.9 | 223.8 |
| Other non-current assets | 91.1 | 58.7 |
| TOTAL ASSETS | 2,557.8 | 2,532.8 |
| | | |
| **Liabilities and Stockholders' Equity** | | |
| CURRENT LIABILITIES: | | |
| Accounts Payable | 168.1 | 181.3 |
| Current portion of debt obligations | 146.2 | 260.4 |
| Other current liabilities | 242.0 | 251.9 |
| TOTAL CURRENT LIABILITIES | 556.3 | 693.6 |
| Long term debt | 1,724.1 | 1,638.1 |
| Other Liabilities | 91.1 | 83.4 |
| Minority Interest | 1.9 | 1.8 |
| TOTAL LIABILITIES | 2,373.4 | 2,416.9 |
| Common Stock | 0.1 | 0.1 |
| Additional paid-in capital | 51.5 | 59.1 |
| Retained earnings | 119.2 | 44.6 |
| Accumulated other comprehensive income, net | 13.6 | 12.1 |
| TOTAL STOCKHOLDERS' EQUITY | 184.4 | 115.9 |
| TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY | 2,557.8 | 2,532.8 |

**GTG Consolidated Income Statement**
**(in millions, except share data)**

| | 12/27/2007 | 12/28/2006 |
|---|---|---|
| TOTAL REVENUE | 2,598.1 | 2,516.7 |
| OPERATING EXPENSES | | |
| General and Administrative expenses | 2,077.4 | 2,036.2 |
| Depreciation and amortization | 197.1 | 199.3 |
| Non-recurring expenses | 15.1 | 11.6 |
| TOTAL OPERATING EXPENSES | 2,289.6 | 2,247.1 |
| INCOME FROM OPERATIONS | 308.5 | 269.6 |
| OTHER EXPENSE (INCOME): | | |
| Interest expense, net | 125.2 | 117.3 |
| Minority interest | 0.1 | (0.2) |
| TOTAL OTHER EXPENSE (INCOME) | 125.3 | 117.1 |
| INCOME BEFORE INCOME TAXES | 183.2 | 152.5 |
| PROVISION FOR INCOME TAXES | 57.7 | 60.7 |
| NET INCOME | 125.5 | 91.8 |
| | | |
| EARNINGS PER SHARE: | | |
| Basic | $ 0.84 | $ 0.63 |
| Diluted | $ 0.81 | $ 0.59 |
| | | |
| AVERAGE SHARES OUTSTANDING (in thousands): | | |
| Basic | 149,019 | 146,275 |
| Diluted | 155,124 | 154,330 |

At this point, how attractive is GTG's stock as an investment? *Place a mark ( / ) on the scale at the spot that corresponds to your judgment.*



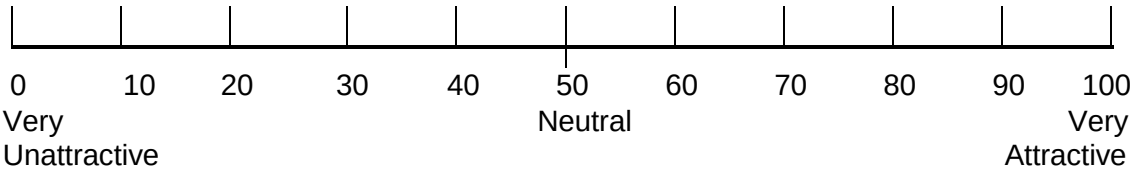
**This is a press release from today regarding GTG's Loyalty Club.**

## GTG to Debut Loyalty Club to Entice Moviegoers

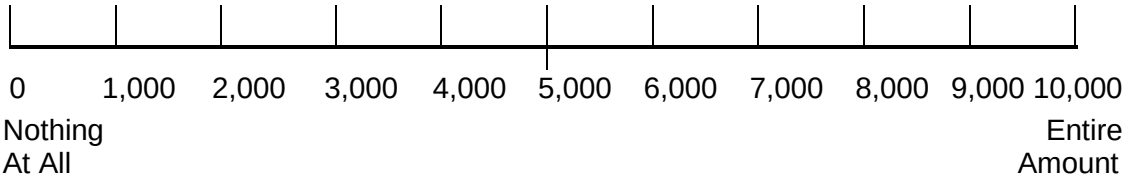
CHICAGO, IL.—This morning—(BUSINESS WIRE)—Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theater circuit in the United States, today announced the formation of the GTG Loyalty Club. According to independent industry analysts, the loyalty club will encourage repeat customers and will enable operating income per theater to grow by 12% during the next fiscal year. The details of the loyalty club are outlined below. GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day. For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day. Members receive awards (small popcorn, small soft drink, or movie ticket) each time 40 credits are earned. Once a member earns 120 credits, the member reaches "Star Status." Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.

Please answer the following questions in the order in which they are presented. To respond to the questions with scales, place a mark ( / ) on the scale at the spot that corresponds to your judgment.

1. At this point, how attractive is GTG's stock as an investment?




2. Assume that you have a sufficiently diversified portfolio and that you have a $10,000 fund that you plan to invest in a stock or stocks. Indicate on the scale below how much of the $10,000 you would invest in GTG.



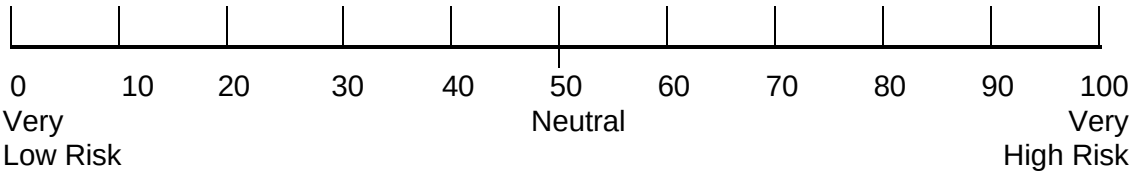

3. With regard to the press release information on the prior page, what is the most likely effect of that information on the value of GTG's outstanding common stock **today**? (Please check one of the following blanks.)

___The value of the outstanding common stock will **significantly increase** from the $10.50 prior price.
___The value of the outstanding common stock will **increase** from the $10.50 prior price.
___The value of the outstanding common stock will **not change** from the $10.50 prior price.
___The value of the outstanding common stock will **decrease** from the $10.50 prior price.
___The value of the outstanding common stock will **significantly decrease** from the $10.50 prior price.

4. What is your estimate of the most likely closing market price per share of GTG's common stock **today**? Your price estimate should be based only on events pertaining to GTG and not due to general market conditions.

Price: _____per share

5. In the context of a diversified portfolio, I believe that an investment in GTG is a _____ investment. (Please place a mark ( / ) on the scale that corresponds to your judgment.)

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# Please return Part A to Envelope A and proceed on to Part B.

# PART B – SPECIFIC INSTRUCTIONS

On the next page, you will be asked some demographic and background questions. Please complete these and return them to Envelope B.

Please circle your response and/or fill in the blank for the following questions.

1. Have you ever made direct investments in the common stock of a company?

   YES NO

   If yes, approximately how many times? _____ times

2. Do you plan to invest in the common stock of a company at some time in the future?

   YES NO

3. Have you ever made investments in a common stock mutual fund? YES NO

4. For financial information to be useful in your decision making, do you think it is more *important* for it to be relevant or reliable?

Please rank the two information characteristics below, with 1 designating the characteristic that you feel is more important for decision usefulness and 2 the less important characteristic. If you consider both characteristics to be equally important, then assign "1's" to both characteristics. However, if one is more important than the other, please assign a "1" to that characteristic and a "2" to the other characteristic.

__ Reliability

__ Relevance

5. How many undergraduate and graduate finance and accounting <u>courses</u> have you taken (including the current term)?

   Finance_____ Accounting_____

6. What is your total business experience? _____years

7. Have you ever worked in the following capacities? If so, how long?

   Finance _____years

   Accounting _____years

8. Are you a CFA? YES NO If yes, how many years? _____

9. Are you a CPA? YES NO If yes, how many years? _____

10. What is your age? _____

11. What is your gender? Male Female

12. How many courses have you taken so far in the MBA program, including this term? _____

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For the following questions, please circle the answer that corresponds to the information provided to you in the press release in part A.

13. What was the date on the press release?

    A. August 9, 2007 B. This morning

14. The press release included some specific information from:

    A. Independent Industry Analysts B. GTG Marketing Manager

15. The information provided from the source in question #14 related to:

    A. GTG Loyalty Club's repeat customers and operating income growth

    B. Savings cards (in all industries) and increase in number of applications

16. The information provided from this source included an estimate of growth. Was this estimate a point (12%) or a range (8-16%)?

    A. Point B. Range

17. The press release may have contained specific details for GTG's Loyalty Club, including how credits are earned and what credits will earn repeat customers. Did the press release that you saw include these details?

    A. Yes B. No

18. The press release may have included information about preliminary market tests regarding how GTG customers feel about the Loyalty Club and whether they are more likely to choose GTG over other theaters. Did the press release that you saw include information about preliminary market tests?

    A. Yes B. No

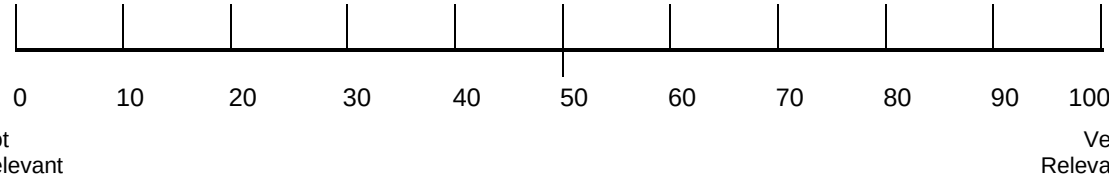
---

# Please return Part B to Envelope B and proceed on to Part C.

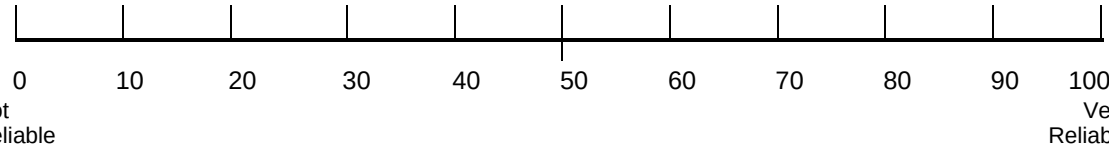
# PART C

In the information provided in packet A, you were given a press release regarding GTG's Loyalty Club. A copy of the press release is shown below for your convenience. The questions below refer to the information given in the press release:

How **relevant** is the information to your investment decision?




How **reliable** is the information?




## GTG to Debut Loyalty Club to Entice Moviegoers

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Thank you for your participation!!!
This concludes the study. Please place the materials back in Envelope C and turn in all three envelopes.

## Appendix 3
## Press Release Manipulations

***Instrument #1***

**GTG to Debut Loyalty Club to Entice Moviegoers**

CHICAGO, IL.—This morning—(BUSINESS WIRE)—Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club. According to Jane Snyder, GTG Marketing Manager, the loyalty club will encourage repeat customers and will enable operating income per theater to grow by 8% to 16% during the next fiscal year. GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day. Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.

**High Relevance/Low Reliability**

(1) CHICAGO, IL.—*This morning*—(BUSINESS WIRE)—

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *Jane Snyder, GTG Marketing Manager, the loyalty club will encourage repeat customers and will enable operating income per theater to grow by 8% to 16% during the next fiscal year.*

- Low Reliability (Source Credibility)
- High Relevance (Predict Future Value)
- Low Reliability (Precision)

(6) GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.

(7) Details of GTG Loyalty Club not included.

- Low Reliability (Completeness-few details)

(8) *Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.*

- High Relevance (Confirm/Disconfirm expectations)

***Instrument #2***

## GTG to Debut Loyalty Club to Entice Moviegoers

CHICAGO, IL.—This morning—(BUSINESS WIRE)—Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club. According to independent industry analysts, the loyalty club will encourage repeat customers and will enable operating income per theater to grow by 12% during the next fiscal year. The details of the loyalty club are outlined below. GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day. For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day. Members receive awards (small popcorn, small soft drink, or movie ticket) each time 40 credits are earned. Once a member earns 120 credits, the member reaches “Star Status.” Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.

**High Relevance/High Reliability**

(1) CHICAGO, IL.—*This morning*—(BUSINESS WIRE)—

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *independent industry analysts, the loyalty club will encourage repeat customers and will enable operating income per theater to grow by 12% during the next fiscal year.*

- High Reliability (Source Credibility)
- High Relevance (Predict Future Value)
- High Reliability (Precision)

(6) *The details of the loyalty club are outlined below.* GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.

- High Reliability (Completeness- details)

(7) *For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day.*

- High Reliability (Completeness- details)

(8) *Preliminary market tests find that current GTG customers are excited about this loyalty club and are more likely to choose GTG over other theaters.*

- High Relevance (Confirm/Disconfirm expectations)

***Instrument #3***

## GTG to Debut Loyalty Club to Entice Moviegoers

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**Low Relevance/Low Reliability**

(1) CHICAGO, IL.— *This morning*—(BUSINESS WIRE)—

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *Jane Snyder, GTG Marketing Manager*, *information presented at a recent marketing conference indicated that the number of applications for savings cards (such as those used in grocery stores) in all industries increased by 8 to 16% in the past year.*

- Low Reliability (Source Credibility)
- Low Relevance (Predict Future Value)
- Low Reliability (Precision)

(6) GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.

(7) Details of GTG Loyalty Club not included.

- Low Reliability (Completeness-few details)

(8) Preliminary market test information not included.

- Low Relevance (Confirm/Disconfirm expectations)

***Instrument #4***

## GTG to Debut Loyalty Club to Entice Moviegoers

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**Low Relevance/High Reliability**

(1) CHICAGO, IL.— *This Morning*—(BUSINESS WIRE)—

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *independent industry analysts, information presented at a recent marketing conference indicated that the number of applications for savings cards (such as those used in grocery stores) in all industries increased by 12% in the past year.*

- High Reliability (Source Credibility)
- Low Relevance (Predict Future Value)
- High Reliability (Precision)

(6) *The details of the loyalty club are outlined below.* GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.

- High Reliability (Completeness-details)

(7) *For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day.*

- High Reliability (Completeness-details)

(8) Preliminary market test information not included.

- Low Relevance (Confirm/Disconfirm expectations)

***Instrument #5***

## GTG to Debut Loyalty Club to Entice Moviegoers

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**No Relevance/Low Reliability**
**(the only change in this condition from the low relevance/low reliability is the timeliness of the press release)**

(1) CHICAGO, IL.— *August 9, 2007*—(BUSINESS WIRE)—
- No relevance (timeliness of press release)

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *Jane Snyder, GTG Marketing Manager, information presented at a recent marketing conference indicated that the number of applications for savings cards (such as those used in grocery stores) in all industries increased by 8 to 16% in the past year.*
- Low Reliability (Source Credibility)
- Low Relevance (Predict Future Value)
- Low Reliability (Precision)

(6) GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.

(7) Details of GTG Loyalty Club not included.
- Low Reliability (Completeness-few details)

(8) Preliminary market test information not included.
- Low Relevance (Confirm/Disconfirm expectations)

***Instrument #6***

## GTG to Debut Loyalty Club to Entice Moviegoers

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**No Relevance/High Reliability**
**(the only change in this condition from the low relevance/high reliability is the timeliness of the press release)**

(1) CHICAGO, IL.— *August 9, 2007*—(BUSINESS WIRE)—
- No relevance (timeliness of press release)

(2) Global Theaters Group, a leading motion picture exhibitor owning and operating the largest theatre circuit in the United States, today announced the formation of the GTG Loyalty Club.

(3-5) According to *independent industry analysts, information presented at a recent marketing conference indicated that the number of applications for savings cards (such as those used in grocery stores) in all industries increased by 12% in the past year.*
- High Reliability (Source Credibility)
- Low Relevance (Predict Future Value)
- High Reliability (Precision)

(6) *The details of the loyalty club are outlined below.* GTG Loyalty Club members will receive 1 credit per dollar spent on ticket purchases at the box office, with a maximum of 12 credits per card, per day.
- High Reliability (Completeness-details)

(7) *For the purpose of calculating credits earned at the box office, the system will round transaction totals to the nearest whole dollar. Example: Transaction Total = $7.50, Credits earned = 8; Transaction Total = $6.25, Credits earned = 6. All members earn extra credits on concession purchases. Two extra credits are earned for a concession transaction, or 4 extra credits are earned for a specified promotional transaction, such as a Candy Combo. "Star Status" members receive 2 additional credits for a concession transaction. Example: Promo Transaction = 4 extra credits; Star Status Promo Transaction = 6 (4 + 2) extra credits. A maximum of one concession transaction is awarded extra credits per card, per day.*
- High Reliability (Completeness-details)

(8) Preliminary market test information not included.
- Low Relevance (Confirm/Disconfirm expectations)