THE IMPACT OF TAGGING QUALITATIVE FINANCIAL INFORMATION ON INVESTOR DECISION MAKING: IMPLICATIONS FOR XBRL

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ABSTRACT

The SEC has mandated use of XBRL to tag financial statements and the accompanying footnotes in filings by registrants, but considers the current tagging taxonomy for narrative information such as the MD&A to be insufficient to justify use at this point. We extend prior research examining the benefits of information tagging for financial statement information to the use of tagging for these more complex narrative disclosures. We use an extended, hierarchical structure proposed for use in tagging the MD&A to examine how tagging of narrative information facilitates both professional and non-professional investors assimilation of such information in formulating stock price predictions. Participants (110 professional analysts and 219 nonprofessional retail investors) used a standard presentation or a searchable, tagged presentation to analyze a company's financial condition and expected future performance. As theorized, the results indicate strong improvement in the assimilation of risk information for non-professional investors throughout the decision process, while professional analysts remain constant in their analysis processes regardless of the presentation mode. Risk information does increase in saliency, however, for professional analysts when making their stock price predictions. The results support the investor community concerns that the failure to tag narrative information under the SEC mandates may hinder non-professional investors' assimilation of key qualitative information in their investment decisions.

Key Words: XBRL, Investment decisions, Risk, Material Weakness, MD&A

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I. INTRODUCTION

The U.S. Securities and Exchange Commission (SEC 2008) recently issued mandates requiring all public companies to file their annual financial statements with the SEC using interactive tagged data (i.e. eXtensible Business Reporting Language or XBRL). However, the SEC also clearly indicated that at this time, interactive tagged data was not appropriate for narrative aspects of the annual report such as Management's Discussion and Analysis (MD&A) and executive compensation, because current tagging sets provided under XBRL are considered inadequate (SEC 2008; Laux 2009; Rummell 2008; Schneider and So 2009). This latter aspect of the XBRL mandate has been controversial among the investor community given the weight placed on MD&A disclosures by experienced investors (Laux 2009). The public discourse in the investor community has questioned whether the failure to provide tagging of the MD&A has negated the SEC's ability to meet its stated desire to protect nonprofessional investors and provide a more "level playing field" (e.g. Ciesielski 2008; Locke 2009) or its obligations to the general investor community to provide better information disclosure (e.g. Ciesielski 2008; Larsen 2007; Larsen 2008; Laux 2009).

Research has shown that tagging quantitative data in the financial statements, along with the associated footnotes, can facilitate nonprofessional investors' search for information and their ability to link financial information with manager's choices for reporting that information (Hodge et al. 2004). However, research on XBRL and the narrative aspects of annual reports has focused on the tagging itself and the inconsistency of tags used in practice by different companies to report similar types of information. These studies are somewhat limited in scope due to the limited use of XBRL tagging to date for companies' narrative disclosures in their

annual reports. For instance, in a study of the SEC's Voluntary Information Filer program where companies could elect to use XBRL for filing, only one company chose to tag the MD&A (Boritz and No 2008). Further organizations using XBRL for narrative data have widely created their own tags[1] as they appeared unable to find appropriate standardized tags in XBRL (Boritz and No 2008; Plumlee and Plumlee 2008; Bonson et al. 2009) and comparability of narrative information across filers was not possible without manual reconciliation (Boritz and No 2008; Bonson et al. 2009). This use of non-standardized tags has been a major concern for professional analyst groups (Larsen 2007).

The purpose of the current study is to investigate the impact of presenting MD&A information in a tagged form on both nonprofessional and professional investors' ability to search and assimilate key qualitative financial information, and to incorporate that information into their performance predictions (i.e. risk assessments and stock price predictions). We use a tagged presentation format based on the Enhanced Business Reporting Consortium's (EBRC) proposed framework for MD&A disclosure and tagging (EBRC 2009; Laux 2009; Schneider and So 2009) as validated and extended in research supported by the EBRC (Arnold et al. 2008b; Schneider and So 2009). We compare the decision behavior and performance of 105 nonprofessional investors and 57 professional investors using a traditional MD&A presentation using headings that are normally seen in an annual report with that of 114 nonprofessional investors and 53 professional investors using a tagged form of the MD&A. Participants were provided with a full MD&A (enhanced by EBRC recommended disclosures), summary financial information, auditor's report on financial statements, and auditor's report on internal controls.

[1] With XBRL, as is true with all XML-based tagging schemes, a user can extend the tags available in a taxonomy by creating their own set of tags. This usually occurs when a user believes there are not appropriate tags available in the taxonomy to depict accurately a given piece of information.

Embedded in the disclosure materials were multiple references to a possible Foreign Corrupt Practices Act violation under investigation by the SEC. This information indicates a source of risk to the company on multiple levels. We examine participants' search for information on the possible violation, the assimilation of this risk information into their risk assessments, and the effects of the saliency of the risk issue on stock price predictions.

The study provides several interesting findings. Consistent with earlier research (e.g. Frederickson and Miller 2004; Elliott 2006), we find that nonprofessional investors react much more to the risks associated with the potential violation under investigation by the SEC. The tagged presentation led to greater saliency of risk information and a stronger relationship of risk information with risk assessments of nonprofessional investors. We also found that the relationship between use of risk assessments and stock price predictions became stronger for both nonprofessional and professional investors. While there was a strong and significant relationship between risk assessments and stock price predictions, we did not find that this relationship significantly strengthened with the use of the tagged presentation. Overall, the results indicate that the use of a tagged presentation that facilitates information search improves nonprofessional investors' ability to identify and assimilate risks. There are some indications that professional investors may also benefit from the tagged information.

There are several important implications from this research to both theory and practice. First, the study extends prior research on the impacts of information tagging from the context of financial statement information to broader, qualitative business reporting information. The findings from this study indicate that tagging narrative information has important implications to investors and investor search behavior. Second, and relatedly, our findings indicate that nonprofessional investors' decisions may improve with the availability of tagged and searchable

narrative information, thus facilitating the SEC's objective to protect nonprofessional investors and "level the playing field". Third, the study specifically addresses the SEC's exclusion of the MD&A from mandatory XBRL filings in the short-term. The MD&A is considered a key part of management's business disclosure package (e.g. Clarkson et al. 1999; Barron et al. 1999; IFAC 2008; Ciesielski 2008; Larsen 2008; Laux 2009; Locke 2009). Our findings support the argument that tagging MD&A information to enhance searchability should be a priority for the SEC and XBRL standard-setters.

The remainder of the paper proceeds in four additional sections. In the following section, we discuss the background of our study, and develop our research hypotheses. Section III describes our research methods, and Section IV presents results. The final section of the paper discusses our main findings and the study's limitations.

II. BACKGROUND, THEORY, AND HYPOTHESIS DEVELOPMENT

Background of the Study

Corporate Financial Reporting and XBRL

XBRL is an open-source structure for providing information. As noted on its web site (http://www.xbrl.org/Home/), XBRL provides an identifying tag for each individual item of data, making it computer readable. Thus, data items can be automatically read by machine and combined according to user specifications, both within and across companies. This facility should enable more rapid and efficient processing of information, as well as increase decision usefulness by improving consistency and comparability of data (Baldwin et al. 2006; Plumlee and Plumlee 2008). Securities regulators in many countries have implemented voluntary and/or mandatory programs for XBRL filings. For example, the SEC adopted a voluntary filing program (VFP) in 2005 that allows registrants to submit filings using XBRL; and, Canada

implemented a similar voluntary program in 2007 (Plumlee and Plumlee 2008). The SEC recently voted to require all publicly traded companies to file their financial reports using XBRL (SEC 2008) with the requirement being phased in over three years beginning mid-2009. Plumlee and Plumlee (2008) note other mandatory programs are now in place in China and Japan, as well as a 2010 requirement in Australia,

The SEC's plan for mandatory filing highlights a critical issue for XBRL, however, because it does not allow tagging key narrative sections including the MD&A and executive compensation (Schneider and So 2009). Rather, the SEC mandate focuses on the financial statements and accompanying notes to those statements. Thus, advocates of XBRL use, who have been very supportive of mandatory XBRL filing, are emphasizing the need to quickly expand tagging of qualitative information beyond the financial statements (Ciesielski 2008; Larsen 2007; Larsen 2008; Rummell 2008; Laux 2009; Locke 2009; Schneider and So 2009). The SEC indicated in its ruling (33-9002, 40-41) that such disclosures are desirable, but not ready for broad use and consumption:

> We did not propose, and are not adopting, a requirement that filers provide interactive data for their Management's Discussion and Analysis (MD&A), executive compensation, or other financial, statistical or narrative disclosure . . . In deciding not to require the tagging of this information at this time, we agree with the commenters who believed that more experience with interactive data and a greater understanding of the costs and time associated with compliance with the requirements as proposed is needed before expanding the requirement to other information. We will continue to consider, however, the advisability of permissible optional or required interactive data for disclosures made outside a set of financial statements prepared in accordance with U.S. GAAP or IFRS as issued by the IASB or related financial statement schedules required under Commission rules (33-9002, pages 40-41).

The MD&A is an integral component of the "disclosure package" prepared by registrants of the SEC. Regulation S-K (Item 303) and subsequent releases contain the SEC's guidelines for MD&A content. Because the MD&A is management's portrayal of the company's past

performance and future prospects, it is a key component of the disclosures and often considered critical to understanding the information content and meaning of the accompanying financial statements (Ciesielski 2008; Larsen 2008). Prior research indicates that investors value the information in the MD&A (Rogers and Grant 1997; Clarkson et al. 1999; Bryan 1997; Barron et al. 1999; Thomas 2003/04). From a review of the MD&A literature, Cole and Jones (2005) conclude that the information in MD&A is critical to financial predictions, but appears to not be efficiently incorporated into market prices. This implies the need for research to better understand how investors might more fully utilize MD&A information, such as alternative presentation formats for communicating that information effectively.

The perceived importance of the MD&A to investor decision making coupled with the weak taxonomy currently available for tagging the information with XBRL suggests that efforts to improve tagging should begin immediately. As Laux (2009) notes, the XBRL taxonomy for the MD&A currently consists of 70 tags in a relatively flat organizing structure (i.e. not in an hierarchical structure that would allow drill-down capabilities for greater detail and granularity). The open source nature of XBRL allows for multiple constituencies to consider this deficiency and address it, but at the same time the regulatory control of the XBRL bodies and accounting standard-setters hinders the normal growth that might come from open source standards (Locke and Lowe 2007). Nonetheless, one group, the EBRC, has focused extensively on tagging of the MD&A and has put forth more detailed tagging recommendations to extend MD&A capability. These efforts are continuing to expand under the EBRC's efforts (Laux 2009).

Theory and Hypothesis Development

Similar to Hodge et al. (2004), we apply theory from Hogarth (1980) as used by Maines and McDaniel (2000) to model judgment processes of financial report users. The model

considers three stages of information assimilation: information acquisition, information evaluation, and information combination. Information acquisition is the process of searching for and identifying information of interest. Information evaluation is the process of assessing how that information influences assessment of a particular sub-decision within the overall judgment process (e.g. assessing the implications of risk information on risk assessments that lead to an overall performance evaluation of a company). Information combination involves assimilating this information and sub-decisions into an overall set of information and sub-decisions in order to assess company performance (e.g. a stock price prediction).

As Hodge et al. (2004) note, XBRL should assist users in information acquisition by providing tags to facilitate search for specific information content. This content, in a refined tagging presentation, should be lifted out of the various locations of the MD&A in which relevant information is contained. Only the relevant information should be extracted from each of these locations. At the same time, because information items could be relevant to more than one search tag, XBRL allows each item to have multiple tags so that it will be extracted each time one of the relevant tags is searched. As noted by Baldwin et al. (2006, 104), XBRL should "give greater context to data, turning text-based information into documents that are efficiently and effectively retrievable, searchable and analyzable". This combination of efficient extraction of desired information and facilitation of linkages between information items implies that users should be able to more efficiently develop mental representations of company performance, with stronger mental associations among relevant information items. Thus, we base our hypotheses on the general notion that a tagged presentation will provide greater ability for users to link disparate information elements in the MD&A.

Based on the three-stage decision model for financial analysis (Maines and McDaniels 2000; Hogarth's 1980), our first hypothesis relates to information acquisition and the relationship with information evaluation during risk assessment. We expect that the capability provided by search software (commonly referred to as a filter) that extracts tagged information and presents related information from across the MD&A in a single view will better allow users to focus on the information item of interest without the noise of information provided in the surrounding context within the overall MD&A text. This should make the information more salient during the information evaluation stage. Within the context of our study, the information of interest is the risk related items and the relationship between viewing this information and evaluation outcomes in the form of risk assessments. H1 is accordingly stated as:

> **H1:** The positive association between use of risk information and risk assessments will be stronger for investors using a tagged presentation, relative to using a standard presentation.

We expect similar effects to carry over to the information combination stage. In the information combination stage, information acquired (e.g. risk information) to make sub-decisions, and the sub-decisions made (e.g. risk assessments), are integrated with other acquired information and sub-decisions as information combination is executed and overall performance decisions are made (e.g. stock price prediction). The saliency of risk information, consistent with H1, should be higher for tagged information based on the same theoretical basis supporting that hypothesis. Thus, theoretically we expect that risk information viewed will influence overall stock price predictions (H2). Further, because sub-decision risk assessments will be will be better calibrated to risk information, risk assessments should be more tightly coupled with overall stock price predictions (H3). Formally, H2 and H3 are as follows:

H2: The negative association between use of risk information and projected stock price will be stronger for investors using a tagged presentation, relative to using a standard presentation.

H3: The negative association between risk assessment and projected stock price will be stronger for investors using a tagged presentation, relative to using a standard presentation.

Prior research has shown that experienced professional investors follow specific decision patterns (Frederickson and Miller 2004) and use targeted information search strategies (Bouwman et al. 1987; Hunton and McEwen 1997). Thus, while XBRL tagging of financial information should facilitate information acquisition for professional investors, the tagging is less likely to alter professional investors' information acquisition, evaluation, and combination than it is for nonprofessional investors. Nonprofessional investors tend to use less-defined information acquisition, evaluation, and combination processes (Frederickson and Miller 2004); thus, their decision processes are more likely to be affected by use of XBRL tagged information. Accordingly, we expect to see stronger effects across all of the hypothesized relationships for nonprofessional investors than we do for professional investors.

III. METHOD

Sample and Data Collection Methods

Professional investors were obtained through a private survey company specializing in solicitation of professionals for research studies on a national level. Our criterion for inclusion was experience indicative of expertise in evaluating information for valuation of stocks; and, participants were only forwarded to the experimental website if from an array of possible job descriptions they selected the option for "Financial (Venture Capitalist, Fund Manager, Financial Analyst, etc)". For the professional investors, 119 participants completed the instrument. Of

those, nine failed to pass the manipulation check and were dropped from further analysis, leaving 110 useable responses.

Nonprofessional participants were solicited by a second survey company with experience in providing experienced nonprofessional investors for research. Criteria for inclusion in the nonprofessional investor survey included income greater than $75,000, readily available assets of over $50,000 that are currently invested or could be invested, and a current investment portfolio that included self-purchased corporate stocks or other corporate issue securities.[2] A total of 234 experienced nonprofessional investors who use financial information in making their personal investment decisions completed the instrument. Of those, 15 failed the manipulation check and were dropped from the analysis leaving 219 useable responses. All participants were compensated by the survey firms for their participation.

Computerized process tracing was used to capture each information item acquired and the time spent viewing each acquired information item. Participants performed a case analysis, using information adapted from the MD&A of a real public company (with identifying information altered to protect anonymity of the firm). Case information was accessible through a dedicated website and organized into separate web-linked components. This research method allows the researchers to observe patterns of information acquisition and usage to determine whether those patterns are associated with variation in individual judgments and decision outcomes.

On entering the web site, participants were randomly assigned to one of two conditions providing qualitative financial information from a 10K. Upon completion of the case analysis, participants were asked to judge company risk, forecast the future stock price,

[2] Potential participants who logged on to the web site but did not meet the criteria were directed away from the experiment.

and respond to a demographic questionnaire.

Experimental Design and Case

This study uses a 2 X 1 (standard vs. tagged presentation) between-subjects design. The two versions differ only in presentation; their content is identical. Because the existing XBRL tagging for the MD&A is considered inadequate for investors information needs (SEC 2008; Laux 2009; Schneider and So 2009), we used a tagging scheme put forth by the EBRC that includes an expanded set of MD&A information disclosures (EBRC 2009), and validated through academic research supported by the EBRC, funded by the FINRA Investors Education Foundation (e.g. Arnold et al. 2008b). To build an MD&A that is consistent with the EBRC information disclosure recommendations, most of the information was taken from the company's original MD&A, and supplemented with information from other sections of the annual report (e.g. the financial statement footnotes, the "Business Data and Risk Factors" section, and the "Other Required Information" section) and the company's website (e.g. environmental strategies and compliance efforts).

Both versions of the case (i.e. standard and tagged presentations) contain five years of summary financial data from the income statement, cash flow statement, and balance sheets. Both versions also contain the independent auditor's report on financial statements and internal control over financial reporting under SOX Section 404. The Section 404 report notes a material weakness related to possible violations of the FCPA, as follows: the company "… did not maintain effective internal control over financial reporting as of December 31, 2007, because of the effect of the lack of controls in place to prevent unauthorized payments made to intermediaries in China that have been brought to the attention of the Department of Justice, based on criteria established in Internal Control—Integrated Framework issued by the

Committee of Sponsoring Organizations of the Treadway Commission (COSO).” This issue is also referred to by management in several other parts of the case company’s information.

Independent Variable: Presentation Format

The between-subjects manipulation in this study constitutes two alternative presentations of common company information. Figure 1, Panels A and B, show the user interface for the standard vs. tagged presentation respectively. In the tagged presentation, each of the main categories of information shown in Panel B could be expanded so that sub-categories of information appear. All of the information categories contained in the two presentations are shown in Table 1.

Insert Figure 1 and Table 1 About Here

The standard presentation mimics the presentation of MD&A information in the annual report for U.S. companies. This presentation consists of a series of paragraphs describing the company and its operations. Section headings from the standard presentation include MD&A Overview, Results of Operations, Liquidity and Capital, Contractual Obligations and Commercial Commitments, Business and Risks Overview, Product Development, Business Landscape & Industry Competition, Regulatory and Environmental Issues, Sales, Marketing, and Logistics, Critical Accounting Policies, Related Party Transactions, and Management Ownership and Compensation.

The other version mimics a “tagged” format such as XBRL, in which selecting one item leads to available links to related items. To construct the tagged presentation condition, we used the model categories developed by the EBRC (EBRC 2009). This presentation consists of the following main headings: Business Landscape, Strategy Overview, Resources, Processes, and Performance. Within each main EBRC category are several subheadings. For

example, Business Landscape subheadings include: Economic, Industry Analysis, Technological Trends, Political & Legal, Environmental, and Corporate Social Responsibility. Both standard and tagged presentations have main headings for the Auditor's Reports and Summary Financial Information (from the company's website).

In both the standard and tagged conditions, the specific topics containing information relating to the possible violation of the FCPA is specified in Table 1. The sections containing this information are shaded in Table 1.

Variable Definitions and Hypothesis Tests

Table 2 describes variables used in the study, which relate to tests of H1 and H2. These hypotheses predict that the association of use of risk information with company risk assessment (H1) and projected stock price (H2) will be greater in the tagged presentation relative to the standard presentation. We employ two measures of information use—the number of visits to items containing risk information (*VIEW RISK INFORMATION*), and the time spent viewing items containing risk information (*TIME RISK INFORMATION*). These variables represent the sum of number of visits to information categories in the shaded categories in Table 1, and the time spent viewing those categories, respectively.

Insert Table 2 About Here

Our measure of investors' risk assessments comprises four questions taken from Koonce et al. (2005). Due to constraints on the number of questions we could ask our participants, four questions were selected from those used by Koonce et al. (2005), on the basis of significance in their models and relevance to our case situation. These relate to overall risk, relative worry about the company, the relative difficulty of management in controlling risk, and the possibility of catastrophic risk. Each is measured on a seven-point Likert scale, increasing in risk. The test

variable is *COMPANY RISK ASSESSMENT*, which is the sum of the four components. H1 is tested by comparing the strength of the correlations between information use measures and *COMPANY RISK ASSESSMENT*.

To test H2, we focus on investors' stock price projections as of 12/31, the end of the year the fiscal year. Case information notes that the stock price on March 15, the date of release of the 10-K, was $25.25. H2 is tested by comparing the strength of the correlations between information use measures and *PROJECTED STOCK PRICE*. H3 is tested by comparing the strength of the correlations between *COMPANY RISK ASSESSMENT* and *PROJECTED STOCK PRICE*.

Research in psychology shows that professionals' greater expertise and well-developed knowledge structures lead to more effective use of information (e.g., Chi et al. 1982). Recent research in accounting that investigates both professionals and nonprofessionals indicates that the two types of investors acquire and use financial information very differently (Frederickson and Miller 2000; Elliott 2006, Hodge and Pronk 2006, Arnold et al. 2008a). Since prior research has shown that professional and nonprofessionals make different decisions, we compared the predictions made by the two groups and the results indicate they are significantly different ($p > .05$). Thus, all of the hypotheses are tested separately for professionals and nonprofessionals.

IV. RESULTS

Demographic Data

Professional participants in this study have on average 13.4 years of professional experience, and 57.5 percent are male. In terms of professional qualifications, 34 percent are Certified Financial Analysts and 35 percent are Certified Public Accountants. Nonprofessional

investor participants have a mean of 13.5 years of personal investing experience, and 56.8 percent are male.

Comparison of Web Site Usability Between Experimental Conditions

As with many *ex ante* behavioral studies analyzing effects of policy change, this study compares a familiar technology to one not currently in general use. Due to the possible impacts of this difference across conditions, we include a measure of web site usability in our design. If investors can locate relevant information more easily, then they should consider the website containing that information to be more usable. However, a counter-argument is that because the data structure is unfamiliar and contains more information categories than the usual MD&A presentation, investors may find it more difficult to use, at least at first. Either an overly positive or overly negative reaction could affect our ability to isolate the effects of information presentation on users' decision processes.

In order to assess any potential effect from differing user reactions to the websites used to implement the presentation manipulation, web site usability was measured using several questions adapted from the framework developed and refined by McKnight et al. (2002) for perceived web site quality. Participants responded to each question on a scale ranging from one (strongly disagree) to seven (strongly agree). The following questions were included as web site usability measures: (1) Overall, this site worked very well technically; (2) Visually, this site resembled other sites I think highly of; (3) This site was simple to navigate; and (4) On this site, it was easy to find the information I wanted.

Table 3 provides descriptive statistics on responses to these questions. T-tests of differences between conditions on each of the measures among professional and nonprofessional investors were used to isolate differences. Among nonprofessionals, mean responses to the

question regarding whether the site worked very well technically, whether the site resembles other sites the respondent thinks highly of, and whether it was easy to find information on the site are not significantly different between the standard and tagged information presentation conditions. However, responses for whether the site is simple to navigate are 6.08 (5.68) for standard (tagged) presentation, representing a significant difference at $p < 0.05$. Thus, there is some evidence that nonprofessional investors found the standard presentation easier to navigate. Among professional investors, none of the differences across presentations are significant. These results generally indicate that both investor groups felt that the two sites were similarly usable.

Insert Table 3 About Here

Descriptive Statistics

Table 4 reports descriptive statistics on information use. Among nonprofessionals, the mean number of information items viewed in the standard presentation is 11.74, while the mean number in the tagged presentation is 14.56. This difference is significant at $p = 0.010$. However, because the tagged presentation has 35 individual information categories and the standard presentation has only 14, Table 4 also presents the number of views scaled by the available number of categories in each respective condition. In the standard presentation, the mean scaled views for nonprofessionals is 0.83, while in the tagged presentation, the mean scaled views is 0.41. This difference is also significant $p = 0.000$). Thus, while nonprofessional participants in the tagged presentation viewed more information items, they viewed fewer items relative to the number available. Among professional investors, the mean number of items viewed is 11.65 in the standard presentation and 12.15 in the tagged presentation. While that difference is not significant, the difference in the scaled number of views between standard (0.83) and tagged (0.35) presentations is significant ($p < 0.01$). Thus, based on the number of items available, both

the professional and nonprofessional investors viewed relatively more information in the standard as opposed to the tagged presentation.

Insert Table 4 About Here

Regarding the total time spent viewing case information, nonprofessional participants in the tagged presentation spent significantly less time looking at information than those in the standard presentation (10:52 versus 13:06, p = 0.039). For the professional investors, the time spent viewing information in the tagged presentation is numerically higher than in the standard presentation (12:09 compared to 10:49), but the difference is not significant.

Focusing on the categories containing information regarding the case company's possible FCPA violation, we find more visits to items containing this information, and more time spent on those visits, in the standard presentation relative to the tagged presentation, for both investor groups. For nonprofessionals, the mean of *VIEW RISK INFORMATION* is 3.23 (2.70) in the standard (tagged) presentation (p = 0.047), and the mean of *TIME RISK INFORMATION* is 5:57 (2:16) in the standard (tagged) presentation (p = 0.000). For professionals, mean values of *VIEW RISK INFORMATION* are 3.56 (2.13) in the standard (tagged) presentation (p = 0.000), and the mean of *TIME RISK INFORMATION* is 4:20 (1:56) in the standard (tagged) presentation (p = 0.000). These results show that investors spend relatively more effort to acquire and analyze information in the standard presentation than in the tagged presentation. This suggests that the tagged presentation is more efficient to use by making the salient information more readily available.

Table 5 provides descriptive statistics on investors' judgments and predictions relating to case information, which are used for hypothesis testing. *COMPANY RISK ASSESSMENT* is a composite variable measured as the sum of responses to four questions on various dimensions of

risk described in the Methods section. The mean of the composite is approximately 21 in all four cells (of a maximum of 28), suggesting fairly high risk judgments. No differences in company risk between the standard vs. tagged presentations are observed for either investor group.

Table 5 also presents descriptive statistics on projected stock price. The projected stock price for nonprofessionals is $24.96 ($23.93) for standard (tagged) presentation and this difference is significant at p = 0.037. For professional investors, the projected stock price predictions are $25.47 ($25.31) for standard (tagged) presentation but this difference is not significant.

Hypothesis Tests

Table 6 shows results of testing H1, which predicts that the positive association of use of risk information with company risk assessments will be stronger in the tagged presentation, relative to the standard presentation. Table 6 shows correlations of information use, measured as time viewing items containing information on the possible violation of the FCPA in the company's China subsidiary, with risk assessments. For nonprofessionals, time spent viewing risk information is positively correlated with company risk assessments for both the tagged (0.252; p = 0.003) and standard (0.175; p = 0.037) presentation. Table 6 also uses number of visits to information items referencing the company's FCPA problem in China as a measure of information use. The results show that among nonprofessionals, the correlation between number of views and company risk assessments is significant for the tagged presentation (0.136; p = .074). In the standard presentation, the sign is unexpectedly negative but is not significantly different from zero. These findings indicate that the company risk assessment and number of visits to risk items are more closely associated in the tagged presentation. The results of these

two tests provide support for H1 for nonprofessional investors' use risk information in forming their risk assessments.

Insert Table 6 About Here

Table 6 also shows the same set of statistics for professional investors. The correlation of time viewing risk information with risk assessments is not significant in either presentation. Similarly, the correlation between number of visits to items containing risk information with company risk assessments is not significant. Therefore, H1 is not supported for professional investors.

Table 7 shows the results of testing H2, which predicts that the negative association of use of risk information with projected stock price will be stronger in the tagged presentation relative to the standard presentation. Using time spent viewing information on FCPA violation as a measure of information use, the correlation with the projected stock price is marginally significant in the standard presentation (-0.131; p = .091), but highly significant in the tagged presentation (-0.331; p = .000). Using the number of visits to the potential FCPA violation as a measure in formation use, the correlation with projected stock price is not significant (0.014; p = .442) in the standard presentation, but, in the tagged presentation, the correlation is highly significant (-0.237; p = .006). The results provide support for H2 for nonprofessional investors suggesting that the tagged condition provides better incorporation and understanding of risks to the company from the possible FCPA violation, among nonprofessional investors.

Insert Table 7 About Here

Table 7 also shows the same set of statistics for professional investors. For both presentations, we observe no significant correlations between time viewing risk information and projected stock price. Apparently, time spent viewing risk information is not as important for

professionals as for nonprofessionals in affecting their mental model of a company's performance. This is likely due to some professional investors with greater expertise having developed standardized decision processes for analyzing financial information, thus enabling them to process information more efficiently than others. Table 7 also shows the correlation of use of risk information measured as the number of visits to information items referencing the company's FCPA problem in China and projected stock price. While the correlation is insignificant in the standard presentation, this correlation is negative and significant (-0.353; $p = 0.005$) in the tagged presentation. These results provide some support for H2 for professional investors.

H3 suggests that risk assessment and projected stock price will be negatively associated and that association will be stronger for investors using a tagged presentation. The correlation between company risk assessment and the projected stock price was used to test H3; results are also presented in Table 7. For nonprofessional investors using the standard presentation, the correlation of -0.196 is significant at $p = 0.023$. In the tagged presentation, the correlation of -0.304 is also significant at $p = 0.001$. Thus, this association is very strong in both presentation formats. For professional investors, the results are similar. In the standard presentation, the correlation of -0.328 is significant at $p = 0.007$; and, in the tagged presentation, the correlation of -0.367 is significant at $p = 0.003$. Both groups appear to incorporate their risk assessment into the projected stock price.

In summary, we find that H1 is supported for nonprofessional investors, in that the associations of company risk assessments with both time viewing risk information, and number of views to risk information, are stronger in the tagged presentation than in the standard presentation. However, H1 is not supported for professional investors. We find partial support

for H2. The association between projected stock price and the number of views to risk information is stronger in the tagged presentation than in the standard presentation for both investor groups. However, the association between projected stock price and the time spent viewing risk information is stronger in the tagged presentation than in the standard presentation only for nonprofessional investors. Tests of H3 indicate that company risk assessment and projected stock price are highly correlated regardless of the presentation. The following section presents our conclusions and the limitations of our analysis.

V. CONCLUSIONS AND LIMITATIONS

In this study, we examine the effect of varying the presentation of qualitative financial statement information on decision processes and outcomes of professional and nonprofessional investors. Specifically, we employ a between-subjects comparison of the standard presentation of MD&A information in U.S. annual reports to a presentation that mimics software for extracting tagged data as is possible with XBRL tagging of financial information. Due to limitations in the current XBRL taxonomy for the MD&A, we use a an extended, hierarchical MD&A tagging structure based on a framework proposed by the EBRC (EBRC 2009) and EBRC sponsored research validating the framework components (Arnold et al. 2008b; Laux 2009; Schneider and So 2009). This study is important as implementation of XBRL for financial information is rapidly progressing, but implementation of XBRL for narrative information in corporate annual reports has been inhibited by limitations in the current XBRL taxonomy. As a result of the limitations in the taxonomy, leading companies have chosen not to voluntarily present tagged MD&A information (Boritz and No 2008) and the SEC has chosen not to allow companies to disclose MD&A information under the current XBRL framework (Schneider and So 2009). As a

result, very little is known about how the tagging of narrative information may help investors in assimilating that information into their decisions.

We examine this issue using case materials adapted from the 10-K of a public company to enhance the external validity of our study. We propose and test several hypotheses, which are focused on professional and non-professional investors' ability to assimilate narrative information into investment decision making processes. Studying both professional and nonprofessional investors is motivated by prior research finding differences in decision processes and outcomes of individuals at different levels of task experience, as well as recent research specifically in the investment context. The results have important implications to both research on investor decision making and for standard-setters governing MD&A disclosure and tagging—as well as other similar narrative disclosures in the annual report.

First, because our design provides the ability to track information chosen by participants for use in the task, we are able to observe elements of their decision processes, and compare information acquisition processes across experimental conditions. We find evidence that when the number of available information items in each condition is considered, relatively fewer of the available information items are acquired by investors in the tagged presentation, compared with the standard presentation, in both investor groups. Nonprofessional investors also spent less time overall in viewing case information in the tagged condition.

To highlight investors' attention to financial risk when processing financial information, we focus on a specific event in the company: the discovery of a possible violation of the FCPA due to a company employee in China charged with bribery of local officials, which resulted in a Section 404 material weakness. We measure relative use of information about this event by tracking the number of visits to information items referring to it, and the time spent on those

visits. Results show that both groups of investors spent less time viewing information on this source of risk in the tagged presentation, and made fewer visits to that information. This suggests greater efficiency of their decision processes with regard to this information.

Second, we examine this issue by investigating the association of attention to company risk information with financial judgments and decisions, in both presentation formats. We expect that if presentation facilitates information evaluation and combination through incorporation of risk information into an investor's mental model of the company, that relatively greater use of this information should be associated with higher perceptions of risk, and lower predictions of future stock prices. For nonprofessionals, we find evidence consistent with these expectations is stronger in the tagged presentation than in the standard presentation. However, for professional analysts, only number of views has a significant association with projected stock price, and not time viewing that information. This is consistent with prior research indicating professional analysts have adopted regular routines for using financial information through extensive practice, and thus they can incorporate new information efficiently without spending more time doing so (Bouwman et al. 1987; Hunton and McEwen 1997). Taken as a whole, our findings with professional and non-professional investors suggest they are better able to consider the implications of key risk information using a tagged presentation, despite spending relatively less time and effort doing so.

In sum, this study's results suggest that the tagged presentation results in more effective and efficient incorporation of risk information into financial decision-making. Generalization of these results beyond the current sample is limited by several design features of our study. First, although our case materials are based on an actual company to improve realism, they reflect only a single company. Second, we present case materials on a web site in specific formats, with

hyperlinked information. While use of these formats was necessary to test our research hypotheses, investors may prefer to use other formats; i.e., they may prefer a .pdf format, as shown by Hodge and Pronk (2006) or, in the case of professional analysts, they may have proprietary formats that are commonly used in the workplace. Third, while our tagged presentation condition replicates important features of XBRL, limitations in the existing XBRL tagging system for the MD&A necessitated we use an alternative proposed detailed and hierarchical tagging system that is more in the spirit of what XBRL aspires to provide investors. Further research should explore various aspects of XBRL, in order to build a body of ex ante research that will help guide XBRL implementation and evolution, and provide an understanding of the likely impact of tagged qualitative information from annual reports once the associated taxonomies have attained a greater maturity level.

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Table 1. Website Presentation Manipulation

Standard Presentation	*Tagged Presentation*
Overview	*Business Landscape*
Results of Operations	Economic
Liquidity and Capital	Industry Analysis
Contractual Obligations and Commercial Commitments	Technological Trends
	Political & Legal
Business and Risks	Environmental
Business and Risks Overview	Corporate Social Responsibility
Product Development	*Strategy Overview*
Business Landscape and Industry Competition	History of Company
Regulatory and Environmental Issues	Vision and Mission
Sales, Marketing, and Logistics	Strengths
Critical Accounting Policies	Weaknesses
Related Party Transactions	Opportunities
Management Ownership and Compensation	Threats
Auditor's Reports	Corporate Strategy
Summary Financials	Demographics and Growth Strategy
	International Operations
	Resources
	Monetary Capital
	Physical Capital
	Relationship Capital
	Organizational Capital
	Products & Research and Development
	Human Capital
	Top Management Team
	Human Resources Analysis
	Employee Stock Ownership
	Processes
	Manage Products and Services
	Manage External Relationships
	Performance
	GAAP Performance
	Company-specific Performance
	Management's Goal Achievement
	Capital-Markets Based Performance
	Analysis of Analyst Projections
	Auditor's Reports
	Summary Financials

Notes: The specific portions of the MD&A containing information relating to the possible violation of the FCPA are shaded.

Table 2. Variable Definitions

Variable Name	***Variable Definition***
VIEW RISK INFORMATION	Number of visits to sections of case information regarding the possible FCPA violation in the company's China subsidiary
TIME RISK INFORMATION	Time spent by an investor to sections of case information regarding the possible FCPA violation in the company's China subsidiary
WEBSITE USABILITY	Four measures of web site usability taken from McKnight et al. (2002), relating to: working well technically, resembling other sites the user thinks highly of, simplicity of navigation, and ease in finding information.
COMPANY RISK ASSESSMENT	The sum of responses to four questions regarding company risk from Koonce et al. (2005), each on a ten-point scale (1 = low, 10 = high), relating to: overall risk, relative worry, difficulty of management to control, catastrophic risk. (Full wording of questions is shown in Table 3 Panel A.)
PROJECTED STOCK PRICE	Investors' prediction of the most likely stock price at the end of the current year

Table 3. Descriptive Statistics and Tests for Differences for Website Usability

	Nonprofessionals			**Professionals**		
	Standard ***(n = 105)***	***Tagged*** ***(n = 114)***	***p-value***	***Standard*** ***(n = 63)***	***Tagged*** ***(n = 56)***	***p-value***
WEBSITE USABILITY (H1)						
Technical	6.05 (1.450)	5.78 (1.655)	.207	6.02 (1.421)	5.98 (1.352)	.890
Resemble	4.45 (1.845)	4.60 (1.743)	.377	5.31 (1.332)	5.08 (1.504)	.394
Simple	**6.17 (1.451)**	**5.75 (1.430)**	***.033***	6.09 (1.506)	5.92 (1.542)	.572
Easy to find	5.85 (1.610)	5.83 (1.233)	.941	5.89 (1.571)	5.60 (1.548)	.341

Notes: This table presents means (standard deviations) for measures of website usability. We test for differences between standard and tagged presentations within each participant group using univariate statistics.

Table 4. Descriptive Statistics and Test for Differences on Information Use Measures

	Nonprofessionals			Professionals		
	Standard ***(n = 105)***	***Tagged*** ***(n = 114)***	***p-value***	***Standard*** ***(n = 63)***	***Tagged*** ***(n = 56)***	***p-value***
Total number of case information items viewed	***11.74*** ***(6.610)***	***14.56*** ***(9.212)***	***.010***	11.65 (4.790)	12.15 (8.488)	.701
Total number of case information items viewed scaled by number available in each category	***0.83*** ***(0.475)***	***0.41*** ***(0.263)***	***.000***	***0.83*** ***(0.342)***	***0.35*** ***(0.23)***	***.000***
Total time spent viewing case information	***13:06*** ***(8:04)***	***10:52*** ***(7:53)***	***.039***	10:49 (8:31)	12:09 (8:40)	.419
Number of visits to information regarding the possible FCPA violation (*VIEW RISK INFORMATION)*	***3.23*** ***(1.825)***	***2.70*** ***(2.065)***	***.047***	***3.56*** ***(1.701)***	***2.13*** ***(1.932)***	***.000***
Time spent viewing information regarding the possible FCPA violation in the company's China subsidiary (*TIME RISK INFORMATION)*	***5:57*** ***(5:41)***	***2:16*** ***(4:14)***	***.000***	***4:20*** ***(4:546)***	***1:56*** ***(2:707)***	***.000***

Notes: This table presents means (standard deviations) of information use variables. Differences between standard and tagged presentations within each participant group are tested using univariate statistics.

Table 5. Descriptive Statistics and Tests for Differences on Response Variables: Risk Assessment and Stock Price Projections

	Nonprofessionals			**Professionals**		
	Standard ***(n = 105)***	***Tagged*** ***(n = 114)***	***p-value***	***Standard*** ***(n = 63)***	***Tagged*** ***(n = 56)***	***p-value***
COMPANY RISK ASSESSMENT	21.11 (3.312)	21.61 (3.417)	.282	21.04 (3.053)	20.81 (3.070)	.702
PROJECTED STOCK PRICE	**$24.96 ($3.55)**	**$23.93 ($3.72)**	***.037***	$25.47 ($4.02)	$25.31 ($5.04)	.854

Notes: This table presents means (standard deviations) of response variables. We test for differences between standard and tagged presentations within each participant group using univariate statistics.

Table 6. Correlations between Company Risk Assessment and Use of Risk Information (H1)

	Nonprofessionals		**Professionals**	
Correlations between:	***Standard*** ***(n = 105)***	***Tagged*** ***(n = 114)***	***Standard*** ***(n = 57)***	***Tagged*** ***(n = 53)***
Company Risk Assessment and Total Time Viewing Information on FCPA Violation	***0.175***** ***(.037)***	***0.252****** ***(.003)***	0.038 (.389)	-0.060 (.336)
Company Risk Assessment and Total # of Visits to Information on FCPA Violation	-0.082 (.202)	***0.136**** ***(.074)***	-0.049 (.360)	0.170 (.112)

Notes: This table presents correlations (p-values) of company risk assessments with measures of use of risk information (i.e., information concerning the subject company's possible violation of the Foreign Corrupt Practices Act). Use of risk information is measured as total time viewing information categories containing risk information, and the total number of views to those categories. The following symbols indicate significant correlations (one-tailed): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 7. Correlations between Projected Stock Price and Use of Risk Information (H2 and H3)

	Nonprofessionals		**Professionals**	
Correlations between:	***Standard (n = 105)***	***Tagged (n = 114)***	***Standard (n = 57)***	***Tagged (n = 53)***
Total Time Viewing Information on FCPA Violation and Projected Stock Price (H2)	-0.131* (.091)	***-0.331*** (.000)***	0.034 (.401)	-0.026 (.426)
Total # of Visits to Information on FCPA Violation and Projected Stock Price (H2)	-0.014 (.442)	***-0.237*** (.006)***	-0.050 (.357)	***-0.353*** (.005)***
Company Risk Assessment and Projected Stock Price (H3)	***-.196** (.023)***	***-.304*** (.001)***	***-.328*** (.007)***	***-.367*** (.003)***

Notes: This table presents correlations of projected stock price, with measures of use of risk information (i.e., information concerning the subject company's possible violation of the Foreign Corrupt Practices Act) and perceived riskiness of investing in this company. Use of risk information is measured as total time viewing information categories containing risk information, and the total number of views to those categories. The following symbols indicate significant correlations (one-tailed): *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Figure 1: Panel A

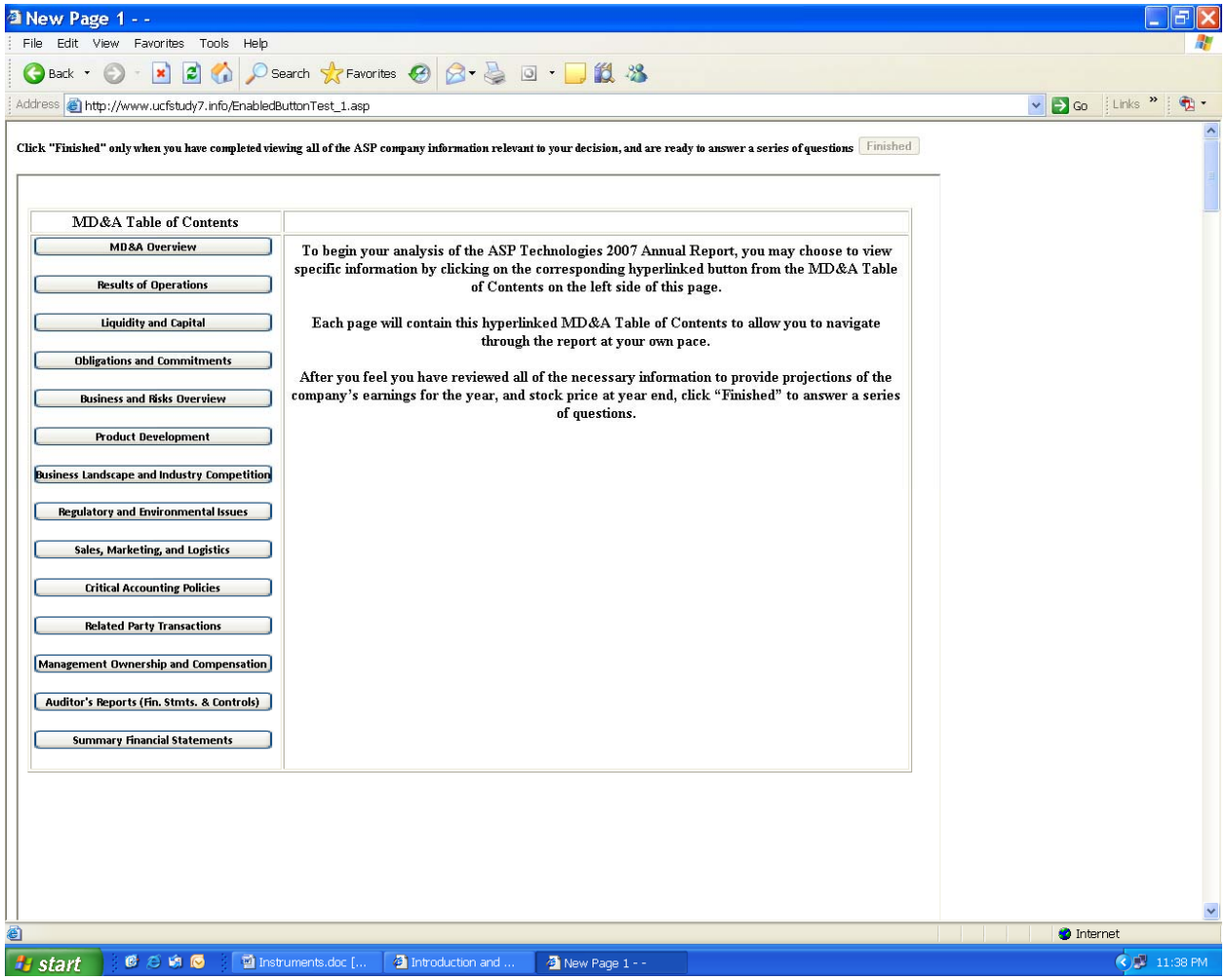

Figure 1: Panel B