Investor Perceptions about Financial Statement Fraud and their Use of Red Flags

Joseph F. Brazel*
Department of Accounting
College of Management
North Carolina State University
Campus Box 8113
Nelson Hall
Raleigh, NC 27695
919-513-1772
joe_brazel@ncsu.edu

Keith L. Jones
Department of Accounting
George Mason University
Enterprise Hall, MSN 5F4
Fairfax, VA 22030-4444
703-993-4819
kjonesm@gmu.edu

Rick C. Warne
Department of Accounting
George Mason University
Enterprise Hall, MSN 5F4
Fairfax, VA 22030-4444
703-993-1763
rwarne@gmu.edu

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* Corresponding Author
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ABSTRACT

We develop a model that examines nonprofessional investors’ utilization of financial statement information, their perception of the frequency of fraud occurrence, the importance they place on fraud risk assessment as an investment activity, and ultimately, their use of fraud red flags. To test our model, we administered a survey to 194 nonprofessional investors. Our model predicts and we find that the positive relation between investor reliance on financial statement information and the importance of fraud risk assessment becomes stronger as investor perceptions of the rate of fraud increase (i.e., when investors are more likely to question the validity of financial statement information). Investors who perceive fraud risk assessment to be an important activity appear to act on these perceptions. We find a positive association between the importance of making fraud risk assessments and investors’ use of fraud red flags (e.g., analyses of accruals, management turnover) when making investment decisions. With respect to the importance of red flags that have been documented in the literature, additional analysis reveals that investors tend to focus on SEC investigations, pending litigation, violations of debt covenants, and high management turnover. In contrast, investors seem to rely less on company size, age of the company, the need for external financing, and the use of a non-Big 4 auditor. Also, we illustrate that investors appear to rely more on analysts, regulators, external auditors, and audit committees to detect and report fraud. Investors expect less from low/mid-level employees, upper management, the media, and short-sellers. Last, we provide initial empirical evidence that nonprofessional investors may be achieving higher market returns by assessing fraud risk and using red flags when investing.

Keywords: fraud; fraud detection; investor; red flags

Data availability: Contact the authors
I. INTRODUCTION

Investors experience significant financial losses when fraud occurs at publicly-traded companies such as Enron and WorldCom. Some experts suggest that the rate of fraudulent financial reporting will likely increase during the current economic recession (Mintz 2009). According to a 2006 report by the North American Securities Administrators Association, investors lose $40 billion annually due to securities fraud (NASAA 2006). According to Glass Lewis & Co. (2005), investors lost nearly $900 billion in market capitalization from 1997 to 2004 due to high profile frauds. Though losses to investors from fraud remain significant, research to date has not examined how and to what extent investors consider the possibility of fraud before making investment decisions. Specifically, there is a paucity of data regarding how investors evaluate the likelihood of financial statement fraud via fraud risk assessments or utilize “red flags” (i.e., fraud warnings signals) to avoid investing in fraudulent companies.

Audit standards require auditors to assess the risk of fraud for each audit engagement (AICPA 2002). Prior research in fraudulent financial reporting has identified many red flags such as high accrual levels, a large number of employees on the board of directors, and unusually high equity-based compensation (e.g., Beasley 1996). However, little is known regarding if and how investors perform these activities prior to making investment decisions.

Despite the fact that investors are often the victims of fraudulent financial reporting, we are unaware of any prior research that investigates investors’ perceptions, judgments, and actions related to financial statement fraud. Our study takes an important first step in this area. We develop a model (see Figure 1) that examines investors’ reliance on financial statement
information, their perception of the frequency of fraud occurrence, the importance they place on fraud risk assessment as an investment activity, and, ultimately, their use of fraud red flags.

[Insert Figure 1]

To test our model, we administered a survey to 194 nonprofessional investors. Participants were pre-screened to ensure they had purchased or sold individual company stocks within the prior 12 months. Our sample consists of a geographically diverse group of active investors from all 50 states and the District of Columbia. For a sample of fraud firms, Larson (2008) finds that the mean percentage of equity held by institutional investors is approximately 29%. Thus, historically, nonprofessional investors are likely to have held a significant percentage of fraud firm shares prior to these frauds being revealed to the public. Indeed, approximately 25% of our nonprofessional investor sample held the stock of a company that was found to have been committing financial statement fraud, which underscores the need for relevant research in this area.

Prior research in psychology reveals that, as decision makers rely more heavily on an information source, they become increasingly concerned with the credibility of the information and the source (Coleman and Irving 1997). Our model predicts that as investors rely more on financial statements to make investment decisions, they perceive fraud risk assessment to be a more important investment activity. With specific reference to accounting information and the potential for misstatements, prior accounting research indicates that the credibility of information provided by management influences investors’ judgments (Jennings 1987; Mercer 2004). Also, greater occurrences of an event (i.e., fraud) often lead to increased predictions of the event (Manis et al. 1980). Consequently, for investors who perceive that a higher rate of fraud exists for publicly-traded companies, it is likely that the aforementioned positive relation between
financial statement reliance and fraud risk assessment will be more acute as the perceived possibility of non-credible information increases. We hypothesize and find that the positive relation between investors’ utilization of financial statement data and the importance of making fraud risk assessments is positively moderated by investors’ perceptions of the current rate of fraudulent financial reporting in the market.

We also examine whether investors act on their fraud risk assessments by using red flags to avoid potentially fraudulent investments. According to Prospect Theory, individuals would rather avoid a loss than experience a gain of equal magnitude (Kahneman and Tversky 1984; Linville and Fischer 1991). For investors who believe that fraud risk assessments are an important investing activity, this theory predicts that they should take appropriate measures to avoid losses by incorporating fraud red flags into their judgments. On the other hand, investors may not have the training or capacity to effectively process red flags in light of all available investment information (see Kahneman 1973; Schick et al. 1990), or investors may simply rely on other information when making judgments (cf. Elliott et al. 2008). Despite these other impediments, we find a positive association between the importance of making a fraud risk assessment and investors’ use of fraud red flags when making investment decisions.

To test the appropriateness of the entire model in describing investors’ behavior, we conduct a mediation analysis consistent with Baron and Kenny (1986). The results of the mediation analysis support the relations described by our model and the results of our analyses. We thus conclude that investor behavior related to fraud is consistent with our model.

While extensive research examining the usefulness of red flags to identify fraudulent financial reporting exists (e.g., Beasley 1996; Lee et al. 1999, Erickson et al. 2006), we are the first study to provide empirical evidence on investor use of these red flags. With respect to the
importance of red flags, our additional analysis reveals that investors tend to focus on SEC investigations, pending litigation, violations of debt covenants, and high management turnover. In contrast, investors rely less on company size, age of the company, the need for external financing, and the use of a non-Big 4 auditor. Additionally, we are aware of no other study that compares the responsibility to detect fraud (at least perceived by investors) across a wide spectrum of capital market participants. We illustrate that investors appear to rely more on analysts, regulators, external auditors, and audit committees to detect and report fraud. Investors expect less from low/mid-level employees, upper management, the media, and short-sellers. Finally, given the considerable amount of archival research devoted to the link between accruals and market returns and whether this link is driven by nonprofessional or professional investors (e.g., Sloan 1996; Ali et al. 2000), we offer a unique contribution to this research stream. We provide empirical evidence that nonprofessional investors who are more apt to consider accruals as a red flag achieve higher market returns.

Despite numerous high-profile frauds in the past and the high cost of fraud to market participants, investors’ \textit{a priori} decision processes vis-à-vis fraud remain largely unknown. Levitt and Dubner (2005) posit that little is known about fraud-related issues because there is a paucity of good data. We offer initial descriptive evidence of, and key insights into, investors’ fraud-related perceptions, judgments, and actions. Our model can help policymakers and standard-setters who are currently using a behavioral approach to implement financial reforms and better protect individual investors (e.g., Zweig 2009). Our findings can guide and fuel future research into the decision processes of nonprofessional investors in relation to fraud.
The remainder of the paper is organized as follows. Section II describes the background and develops our hypotheses. Sections III and IV provide the methods and results of the study, respectively. Section V concludes the paper.

II. BACKGROUND AND DEVELOPMENT OF HYPOTHESES

Investor Perceptions about Fraudulent Financial Reporting

As the capital markets continue to attract new investors, nonprofessional investors (hereafter, investors) have come to represent a significant part of these markets (Elliott et al. 2008). Prior research has shown that accounting information, including its presentation format, affects investors' judgments and investment decisions (Maines and McDaniel 2000; Elliott 2006; Warne 2009). As such, the effects of accounting information on investors' judgments remains a significant topic of interest to standard setters, academics, Congress, and investors alike (e.g., Public Law [107-204] 2002; cf. Cox 2005).

Recent research has provided insights into investors' judgment processes in relation to accounting information sources (Elliott et al. 2008), comprehensive income (Maines and McDaniel 2000), pro-forma earnings (Elliott 2006), fair-market valuations (Warne 2009), and auditor opinions over internal controls (Smith 2009). This research stream provides interesting insights into the relation between accounting information and the investment decisions of nonprofessional investors. However, research has yet to examine how investors address the possibility that the accounting information supplied to them may be intentionally materially misstated.
Fraud at publically-traded companies has a significant impact on investors. Investors in Enron lost a reported $60 billion (Vinod 2002), and trial testimony revealed that investors in WorldCom lost up to $200 billion (Rakoff 2003). The recent $50 billion fraud committed by Bernie Madoff indicates that investors continue to suffer serious consequences from financial statement fraud (Feiden and Zambito 2008). Though fraud impacts all investors in the capital markets, nonprofessional investors appear to absorb a disproportionate share of the losses. Larson (2008) finds that institutional investors own only 28.8% of firms known to have committed fraud.

Despite the possible damaging consequences of fraud, the extent to which investors actually consider or assess the risk of fraud remains largely unexamined. Auditors, who are required to make fraud risk assessments, brainstorm to help identify fraud risk factors or “red flags” that have been previously associated with fraud (AICPA 2002). Prior research has examined auditors’ fraud risk assessments and analyses of red flags (e.g., Carpenter 2007; Hoffman and Zimbelman 2009; Brazel et al. 2009). Though investors may benefit from considering whether fraud exists in a company before making an investment decision, research to date has not examined if or how investor deliberately perform such fraud-related activities.

To investigate investor decision processes in relation to fraud, we propose a model that illustrates investor motivations, perceptions, judgments, and actions. Developing a model is an important first step to understand the processes whereby investors make investment decisions. As stated previously, Figure 1 provides an illustration of our proposed model. We discuss the relations in the model below and develop hypotheses to test the model.

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1 We use the term “fraud” in the context of fraudulent financial reporting as described in SAS 99 (AICPA 2002) as opposed to misappropriation of assets.
Investor Fraud Risk Assessments

To be useful to investors, accounting information should be relevant and reliable (FASB 1980). Since investors rely on financial statements to make investment decisions (Elliot et al. 2008), these investors likely have concerns regarding the accuracy of this information and the possibility of material misstatements. Still, it is unlikely that all investors rely on accounting information to the same extent or have the same concerns about its reliability.

Individuals examine the source of the information when determining whether to rely on that information. When information comes from an outside source, prior research in psychology indicates that source credibility is an important consideration for decision makers (Coleman and Irving 1997). Decision makers search for knowledge biases and reporting biases when they receive information from an outside source (Eagly et al. 1978). Specifically, in ambiguous situations where the decision is important, prior research finds that source credibility significantly influences individuals’ judgments (Chaiken and Maheswaran 1994). In a capital market context, investment decisions involve uncertainty and financial statement information from an outside party (the company and its management). Thus, these findings suggest that source credibility would be important to investors who rely on financial information.

Though investors may face difficulty evaluating the credibility of financial information, the presence of financial statement fraud would obviously indicate inaccurate information from a non-credible source. Similar to auditors’ actions required by SAS 99 (AICPA 2002), one way investors can assess the credibility of financial statement data is by actively considering the possibility of fraud before making an investment decision. Fraud risk assessments can help investors evaluate the credibility of the financial statements and may improve their ability to

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2 For example, prior accounting research has shown that auditors attend to the reliability of a source when making judgments (e.g., Hirst 1994).
avoid investing in fraudulent companies. Once again, source credibility is only relevant when an individual utilizes that information when making a judgment. Consequently, the more reliance an investor places on financial statement data, the more important the accuracy of that information would be to that investor. In short, investors who rely more in financial statement data should be more motivated to assess the risk that this information is fraudulent. As shown in our model (see Figure 1), we believe a positive association exists between the extent an investor utilizes financial statement data and the importance of making fraud assessments.

The aforementioned relation between financial statement reliance and fraud risk assessment may be influenced by an investor’s perception of the rate of fraudulent financial reporting. Because higher base rates can lead to higher predictions of an outcome (Manis et al. 1980), higher perceived fraud rates should fuel investor concerns over the credibility of financial statement data. Prior accounting research shows that the credibility of information disclosed by management influences investors’ actions (Jennings 1987; Mercer 2004). For investors who perceive a higher rate of fraud (and lower credibility), given a level of financial statement reliance, one would expect fraud risk assessment to be a more important activity when making investment judgments (vs. investors who perceive a lower rate of fraud). We therefore predict that the perceived frequency of fraud occurrence will positively moderate the positive relation between investor reliance on financial statement data and the importance they place on making a fraud risk assessment. We formally state Hypothesis 1 as follows:

H1: The positive relation between investor reliance on financial statement information and the importance of fraud risk assessment becomes stronger as investor perceptions of the rate of fraud increase.
Investor Use of Red Flags

Prior accounting research has examined firms that engaged in financial statement fraud and documented the characteristics of “fraud firms.” Hogan et al. (2008) summarize prior accounting research that investigates financial statement fraud, including auditors’ assessments of fraud and red flags that may indicate fraud (e.g., accrual levels, board of director composition, equity-based compensation). Notably absent from the literature is any evidence regarding investors’ use of fraud red flags prior to making investment decisions.

Though some investors may believe that making a fraud risk assessment is important, the use of fraud red flags (i.e., investor action) may not necessarily follow. Just as a manager’s strategy does not necessarily lead to actions or successful implementation (Auer and Reponen 1995), investors’ opinions regarding fraud risk assessments may not lead to their use of fraud red flags for a variety of reasons. First, an investor may not have the domain-specific knowledge to identify and interpret relevant red flags from information sources (cf. Anderson 1982). Second, since decision makers often disregard information inconsistent with their prior expectations (Fischer et al. 2008), some investors may attend to confirming information rather than utilizing red flags that may call into question the validity of financial statements. Third, because investors have access to a large quantity of publicly-available information, such quantities may exceed an investor’s processing abilities or overshadow red flag data (e.g., Kahneman 1973; Hasher and Zacks 1979). Finally, there exists the possibility (perhaps remote) that investors utilize red flags equally regardless of how important they perceive fraud risk assessment. Thus, whether investors actually utilize fraud red flags when they believe fraud risk is important becomes an empirical question.
Given any equity investment, investors may experience a loss due to fraud. According to Prospect Theory, a loss of a given magnitude causes greater disutility to an individual than the utility from a gain of equal magnitude (Kahneman and Tversky 1984; Linville and Fischer 1991). Researchers have documented this aversion to losses in a variety of contexts (e.g., Pinello 2008). Thus, as investors perceive fraud risk assessment to be a more important exercise, they should have greater motivation to engage in behaviors designed to avoid investments in fraudulent companies and the losses that follow. In short, the importance investors place on fraud risk assessment can be seen as a measure of their aversion to loss. A primary way to avoid fraudulent investments is to evaluate red flags that have been previously shown to discriminate fraud from non-fraud firms (e.g., boards of directors with a high proportion of insiders [Beasley 1996]). Thus, the application of Prospect Theory to our setting suggests that, when investors place more value on fraud risk assessment, they are more likely to act on this perception by analyzing red flags prior to investment. Despite the impediments described above, we predict that Prospect Theory will describe investors’ use of red flags because of the robustness of that theory to multiple contexts and decision-makers (see Pinello 2008). We formally state Hypothesis 2 as follows:

**H2:** The importance of fraud risk assessment is positively associated with investor use of red flags.

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3 Indeed, within our sample of investors, we find that the most recent 12-month return for investors that invested in a fraud company is significantly lower than that of investors who did not invest in a fraudulent company (p-value = .02).
III. METHOD

Sample

One hundred ninety-four nonprofessional investors (hereafter, investors) completed an online survey related to financial statement fraud for this study. The survey was distributed by Greenfield Online (http://www.greenfield.com). For the purposes of our survey, Greenfield screened their database for participants that actively traded individual shares of stock (vs. simply investing in a mutual fund). We further screened participants by requiring that they answer “yes” to the following statement in order to complete the survey: “I have bought or sold individual company stock in the last 12 months.” Greenfield distributed the survey to 1,178 participants. Thus, our response rate is 16.5%, which is comparatively high given the response rates of previous studies that have attempted to have active investors complete a survey (e.g., the response rate for Elliott et al. [2008] was approximately 3%). Participants completed the survey from August 21 - 25 of 2008. Our data collection occurred prior to the current economic recession.

The following definition for financial statement fraud was provided to all participants: Financial Statement Fraud is intentionally undertaking actions that cause reported earnings to differ materially from “true” (i.e., unbiased and accurate) earnings. Financial statement fraud results in VIOLATIONS of Generally Accepted Accounting Principles and is an extreme case of earnings management, which occurs when an intentional misstatement of the financial statements is made to meet a pre-determined target (e.g., EPS forecast) (AICPA 2002). To limit any ambiguity in the questions and responses, we had early drafts of the survey reviewed by academics familiar with investor survey research.

Because not all individuals responded to our survey, we examined the potential for non-response bias. Oppenheim (1992) recommends comparing data from late respondents to early respondents as a way of assessing this bias. Accordingly, we compared the responses from the first quartile of respondents to those of the last quartile of respondents. There were no statistically significant differences between early and late responses on any of our hypothesized variables.

The CBOE Volatility Index® (VIX®) is a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices. Since its introduction in 1993, the VIX has been considered by many to be the world’s premier barometer of investor sentiment and market volatility (see http://www.cboe.com/micro/vix/vixwhite.pdf). In short, higher indices are indicative of greater market fear. During the period our data was collected the highest measure of the index was 21.22, whereas in mid-September 2008 the index rose above 30 and did not fall below 30 until June 1, 2009 (see Lauricella 2009 and http://www.cboe.com/micro/vix/historical.aspx). As of August 21, 2009, the VIX was 24.49 and the 52-week range for the index was 18.64 - 89.53 (http://finance.yahoo.com/q/bc?s=%5EVIX&t=2y).
Participants were residents from all 50 states and Washington DC, approximately 50% male, well educated (75% had a bachelor’s degree or higher), used a wide variety of investment strategies, were, on average, between 40-49 years old, and had an average of 6-10 years of investing experience. These demographic data, as well as other control variables will be further discussed in our review of descriptive statistics below. Given that MBA students are commonly used to proxy for individual investors in studies of nonprofessional investor judgment, it appears that we obtained a relatively diverse and experienced sample of active investors.

**Regression Models**

In Hypothesis One we posit that the positive relation between investor reliance on financial statement information and the importance of fraud risk assessment becomes stronger as investor perceptions of the rate of fraud increase. To test Hypothesis One, we estimate the following model via ordinal logistical regression:

$$FR = \beta_0 + \beta_1 \text{RELIANCE ON FINANCIAL} + \beta_2 \text{PERCEPTION OF FRAUD} + \beta_3 \text{RELIANCE ON FINANCIAL X PERCEPTION OF FRAUD} + \beta_4 \text{CONTROL VARIABLES} + \epsilon \text{ (Model 1)}$$

Our first hypothesis is supported if the interaction term RELIANCE ON FINANCIAL X PERCEPTION OF FRAUD (\(\beta_3\)) is positive and significant. Hypothesis Two predicts that the importance of the fraud risk assessment is positively associated with investor use of red flags. To test Hypothesis Two, we estimate the following model via ordinary least squares regression:

$$\text{USE OF RED FLAGS} = \beta_0 + \beta_1 \text{FR} + \beta_2 \text{CONTROL VARIABLES} + \epsilon \text{ (Model 2)}$$

Hypothesis Two is supported if the variable FR (\(\beta_1\)) is positive and significant. We define our variables as follows:

$$\text{FR} = \text{Importance of fraud risk assessment, relative to other factors, when making buy/sell decisions for stock that you currently hold, measured on a scale where 1 = “not at all important” and 7 = “extremely important.”}$$
RELIANCE ON FINANCIAL = Mean reliance on direct financial statement information / Mean reliance on non-financial statement information (further described below and in Table 1).

PERCEPTION OF FRAUD = In your opinion, how often do managers of publicly-traded companies commit financial statement fraud, measured on a scale where 1 = “0% of the time” and 11 = “100% of the time.”

USE OF RED FLAGS = Mean use of red flags (further described below and in Table 1).

CONTROL VARIABLES:
OWNED THE STOCK OF A FRAUD COMPANY = Have you ever owned the stock of an individual company when it was found to have been committing financial statement fraud, measured 1 = “yes” and 0 = “no.”

LOSS RECOVERY = If you held the stock of a firm that committed financial statement fraud, how likely do you believe it is that you would recover your losses through shareholder lawsuits, measured on a scale where 1 = “extremely unlikely” and 7 = “extremely likely.”

RELIANCE ON OTHERS = Mean reliance on others to detect and report fraud (further described below and in Table 2).

INVESTING EXPERIENCE = How many years have you been actively buying/selling the stocks of individual companies (as opposed to mutual funds, etc.), measured on a scale where 1 = “less than one year” and 6 = “more than 20 years.”

TIME ALLOCATED = In an average week, how much time do you spend thinking about and evaluating stocks that you are screening for possible investment or that you currently hold in your personal investment portfolio, measured on a scale where 1 = “less than one hour” and 7 = “more than 10 hours.”

TRADING ACTIVITY = Approximately, how many times, on average, do you buy or sell stocks of individual companies in a one-year period, measured on a scale where 1 = “1-5 times” and 5 = “more than 20 times.”

DIVERSIFICATION OF INVESTMENTS = In how many individual companies do you own stock (i.e., directly owning shares, not via a mutual fund, or pension), measured on a scale where 1 = “1-5 companies” and 5 = “more than 20 companies.”

VALUE OF PORTFOLIO = What is the approximate value of your personal investment portfolio, measured on a scale where 1 = “less than $10,000” and 8 = “more than $1,000,000.”

RETURN ON INVESTMENTS = Over the last twelve months, what was the approximate return on your personal investment portfolio, measured on a scale where 1 = “less than -20 percent” and 11 = “more than 20%.”
RELY ON OTHERS VS. OWN ANALYSIS = To what extent are your decisions to buy or sell stocks based on your own analysis relative to the advice of others, measured on a scale where 1 = “based completely on my own analysis” and 7 = “based completely on the advice of others.”

TRADING STRATEGY = MOMENTUM, GROWTH, LOW-RISK, LAST YEAR’S WINNER, VALUE, HIGH YIELD, TECHNICAL ANALYSIS, FAMILIARITY WITH THE COMPANY = Each strategy measured with the following question and scale: How often do you use the following investment strategies in your decisions to buy or sell stocks, where 1 = “never” and 7 = “often.”

INDUSTRY = MANUFACTURING, RETAIL, GOVERNMENT/NOT-FOR-PROFIT, ENERGY, HIGH TECH/COMMUNICATIONS, HEALTHCARE/PHARMACEUTICALS, FINANCIAL SERVICES, MISCELLANEOUS INDUSTRIES = Measured with one question: In what industries do you most often buy and sell stocks of individual companies, response coded 1 if participant selected the industry, 0 otherwise. Participants could select more than one industry.

EDUCATION = Please indicate the highest level of education you have completed, measured on a scale where 1 = “high school” and 5 = “post-graduate degree.”

UNDERGRADUATE DEGREE = Coded 1 if participant obtained an undergraduate degree or higher, 0 otherwise.

UNDERGRADUATE BUSINESS-RELATED DEGREE = Coded 1 if participant obtained an undergraduate business-related degree, 0 otherwise.

GRADUATE BUSINESS-RELATED DEGREE = coded 1 if participant obtained an graduate business-related degree, 0 otherwise.

CERTIFIED = Coded 1 if person obtained CPA, CFA, or CFP, 0 otherwise.

GENDER = Coded 1 if male, 0 otherwise.

AGE = Measured on a scale where 1 = “under 20” and 8 = “80 or above.”

HOUSEHOLD INCOME = What is your total annual household income, measured on a scale where 1 = “$0 - $30,000” and 6 = “more than $150,000.”

Hypothesized Variables

Financial Statement Reliance

Descriptive statistics for our hypothesized variables are presented in Table 1. We present mean responses and standard deviations for our measures of direct financial statement reliance.
(items 1-6), and the same data for reliance on non-financial statement information (items 8-14).
All of these items were measured via a scale where 1 = “very unimportant” and 7 = “very important.” The mean reliance on financial statement information (Item 7) and the mean reliance on non-financial statement information (item 15) were 5.13 and 4.69, respectively. For each participant, similar to Elliott at al. (2008), we calculate a relative measure of financial statement reliance for each participant (item 16) by dividing item 7 by item 15. This measurement is termed RELIANCE ON FINANCIAL and is an independent variable in Model 1 above. With respect to the importance of financial statement information, investors appear to rely more on balance sheet data (see statistical test in footnote c, Table 1) and rely less on the footnotes to the financial statements (footnote d, Table 1). In relation to non-financial statement information, investors seem to rely more on stock price information and advice from professionals (footnote f, Table 1) and rely less on advice from nonprofessionals, advice from the media, non-financial information related to operations, and company risk (footnote g, Table 1).

[Insert Table 1]

**Perception of the Rate of Fraud**

Table 1 also provides descriptive statistics for our variables PERCEPTION OF FRAUD (item 17) and FR (item 18). We asked participants, “In your opinion, how often do managers of publicly-traded companies commit financial statement fraud?” Participants responded on a scale, 1 = “0% of the time” and 11 = “100% of the time.” The mean response was 5.06, indicating that investors perceive fraudulent financial reporting to be an issue. This rather high rate may result from the fact that approximately 25% of our sample reported owning shares of a company when it was found to have committed financial statement fraud (see item 2 in Table 2). This perception also appears consistent with research by Graham et al. (2006) who find, in a survey of 401 senior
financial executives, that the presence of earnings management is pervasive. One CFO in the study stated, “You have to start with the premise that every company manages earnings” (Graham et al. 2006, 30). In addition, what constitutes a “material” fraud is likely to be lower for investors than those involved in the financial reporting process (Jennings et al. 1987), which would explain participants’ high perceptions of fraud in our study.

Importance of Fraud Risk Assessment

Given the high perception of the rate of fraud, one would expect that fraud risk assessment, relative to other factors, would be fairly important to investors when making buy/sell investment decisions. Participants provided data on the importance of fraud risk assessment on a scale where 1 = “not at all important” and 7 = “very important.” The mean response was 4.67, which indicates that investors perceive fraud risk assessment to be a relatively important investment activity. As stated previously, our study is the first academic study to examine such investor perceptions related to fraud and to determine if they are associated with investor behavior (e.g., use of red flags).

Use of Red Flags

Prior research in the areas of fraud, restatements, and earnings management has created an extensive list of red flags that correlate with financial statement quality. For example, Dechow et al. (1996) find that companies in need of external financing may have incentives to manipulate revenues in anticipation of accessing the capital markets. Also, companies have incentives to manage earnings prior to an acquisition or merger in order to raise their stock price (Erickson and Wang 1999; Louis 2004). Beasley (1996) concludes that fraud firms tend to have a higher proportion of insiders (i.e., employees) on their boards of directors, and Efendi et al. (2007) find a link between equity-based compensation and fraudulent financial reporting. In short, there are a
large number of potential red flags that prior research has validated and investors might use to assess fraud risk and avoid investing in companies with questionable financial statements. In Table 1, we provide data on the use of 21 red flags (items 19 – 39). For the use of each red flag, participants responded to a scale where 1 = “never” and 7 = “often.” For each participant, we calculate their mean use of red flags. We label this variable USE OF RED FLAGS, which becomes the dependent variable in Model 2 above.\(^7\) The mean use of red flags for our sample is 4.91 (item 40 in Table 1). With respect to the importance of red flags, we find that investors tend to focus on SEC investigations, pending litigation, violations of debt covenants, and high management turnover (see statistical test in footnote n, Table 1). Investors seem to rely less on the following red flags: need for external financing, company size, age of the company, and the use of a non-Big 4 auditor (footnote l, Table 1). While extensive research has examined the usefulness of red flags to identify fraudulent financial reporting, we are the first study to provide empirical evidence on investor use of these red flags.

**Control Variables**

We control for numerous variables that could potentially affect investor perceptions related to fraud and their use of red flags. Descriptive statistics for these control variables are presented in Table 2. These data also highlight the diversity and appropriateness of our sample. First, we document that 100% of our participants reported buying or selling individual company stock in the 12 months prior to our survey (item 1). Intuitively, one would expect that prior fraud experiences (item 2), the perception that losses due to fraud can be recovered (item 3), and reliance on other parties to detect and report fraud (items 4 - 14) could impact our hypothesized

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\(^7\) In all instances where we use the mean of multiple variables to create one variable (e.g., USE OF RED FLAGS), factor analyses were performed. Without exception, all factor analyses indicated that the items satisfactorily loaded in excess of .50 on one factor (Nunnally 1978). Also, all tests of measurement reliability provided Cronbach’s alpha levels exceeding the generally accepted threshold of .70 (Nunnally 1978).
variables. As noted previously, 25% of our sample reported that they held shares of a company that committed financial statement fraud (item 2). While we use the mean RELIANCE ON OTHERS to detect and report fraud (item 15) as a control variable in our analyses, Table 2 illustrates that investors see various capital market participants as more and less responsible in this area. For each party, reliance was measured on a scale ranging from 1 = “not at all” to 7 = “completely.” We are aware of no other study that compares the responsibility to detect fraud (at least perceived by investors) across such a wide spectrum of capital market players. Investors appear to rely more on analysts, regulators, external auditors, and audit committees to detect and report fraud (see statistical test in footnote e, Table 2).\(^8\) Investors expect less from low/mid-level employees, upper management, the media, and short-sellers (footnote f, Table 2). Overall, mean RELIANCE ON OTHERS to detect and report fraud was moderate (mean = 4.56, item 15).

[Insert Table 2]

Consistent with Elliott et al. (2008) and Barber and Odean (2001), we control for a number of variables related to participants’ investing experiences, activities, and returns (items 16 – 21). These data suggest that our sample consists of a diverse and experienced set of active investors. For example, we measured investing experience (item 16) by asking, “How many years have you been actively buying/selling the stocks of individual companies (as opposed to mutual funds, etc.)?” Participants responded on a scale where 1 = “less than one year” and 6 = “more than 20 years.” The mean response for our sample was 3.34 (i.e., between 6 – 10 years). Although not tabulated, 32 of our participants (16% of our sample) have actively invested for over 20 years.

\(^8\) Since our results suggest that investors rely on auditors to detect fraud, we confirm the relevancy of research that investigates jurors’ verdicts when auditors fail to detect financial statement fraud (e.g., Lowe and Reckers 1994; Kadous 2001; Cornell et al. 2009).
As suggested by prior research (e.g., Markowitz 1952; Elliott et al. 2008), we control for participant trading strategies/risk preferences (items 22 – 30) and, given that fraud may be more prevalent in certain industries (e.g., Dechow et al. 2009), we control for the industries in which participants invested most heavily (items 31 – 38). The results indicate that our sample of investors employed a diverse set of investment strategies and invested heavily in a wide array of industries. Finally, consistent with Bertaut (1998), Masters (1989), Barber and Odean (2001), and Elliott et al. (2008), we control for a host of demographic data (items 39 – 46). Our sample appears to be well educated (items 39 – 42), approximately half male/female (item 44) and, on average, between 40 – 49 years old (item 45).

**Correlation Matrix**

A correlation matrix is presented in Table 3. To present a parsimonious correlation matrix, control variables were excluded from presentation in Table 3 if they were not significantly correlated (p-value < .05) with at least two of the four hypothesized variables (e.g., reliance on financial statement information, importance of fraud risk assessment). Reducing this constraint from two to one led to a substantially larger correlation matrix. Of particular note is that neither reliance on financial statement information (Reliance) nor the investor’s perception of the rate of fraudulent financial reporting (Rate) is significantly correlated with the importance of fraud risk assessment (FR). However, as Hypothesis One posits, these two variables may positively interact to affect FR. Consistent with Hypothesis Two, FR is significantly, positively correlated with the use of red flags (Flags). We will test Hypotheses One and Two in multivariate settings in the next section. Also, it is interesting to note that Reliance is not significantly correlated with Rate. Thus, investors’ perceived rates of fraud appear to be independent from the extent to which they use financial statement information. With respect to
multicollinearity, all reported regression analyses of our models provide variance inflation factors for all of our variables that are less than 3.00 and substantially below the standard threshold of 10 (e.g., Neter et al. 1996; Kennedy 1998).

[Insert Table 3]

IV. RESULTS

Hypothesis One Testing

Table 4 provides the results of Hypothesis One testing. Hypothesis One predicts that the positive relation between investor reliance on financial statement information and the importance of fraud risk assessment becomes stronger as investor perceptions of the rate of fraud increase. Thus, Hypothesis One would be supported by regression results that provide a positive and significant interaction between RELIANCE ON FINANCIAL INFORMATION and the PERCEPTION OF FRAUD on FR. For presentation purposes, only effects related to our control variables with $p$-values < .10 are presented in our tables related to hypotheses testing. As predicted by Hypothesis One, we find a significant and positive interaction between RELIANCE ON FINANCIAL and PERCEPTION OF FRAUD (A X B in Table 4) on FR ($p$-value = .027). Thus, our results provide support for Hypothesis One.

[Insert Table 4]

To illustrate the form of this interactive effect, we partition the sample into two groups: high and low PERCEPTION OF FRAUD. We partition the sample at the median PERCEPTION OF FRAUD (5.00) and delete observations at the median. We then re-perform the regression analysis described above for each of the two groups (removing the interaction term). For the high PERCEPTION OF FRAUD group, the relation between RELIANCE ON FINANCIAL and FR is significant and positive ($p$-value = .06). For the low PERCEPTION OF FRAUD group, the
relation between RELIANCE ON FINANCIAL and FR is not significant ($p$-value = .23). Thus, the form of the interaction presented in Table 4 is consistent with the form of the interaction posited by Hypothesis One.

**Hypothesis Two Testing**

Hypothesis Two predicts a positive relation between the importance of fraud risk assessment and investor use of red flags. Table 5 presents the results of our Hypothesis Two testing. We find support for Hypothesis Two as the relation between FR and USE OF RED FLAGS is positive and significant ($p$-value < .01).

[Insert Table 5]

**Discussion of Control Variables**

With respect to the direct effects of control variables in Tables 4 and 5, several observed relations contribute to our understanding of fraud-related investor judgments and decisions and should spur future research. First, we note that investors who most often invest in the financial services and manufacturing industries are most likely to consider fraud risk assessment important and use red flags, respectively. Given the recent crisis in the financial services market, investors in this industry are likely even more concerned with fraud risks today. Whether red flags are more transparent/easier to analyze in the manufacturing industry, and potentially less so in other industries, is a fruitful area of research. Second, it is interesting to note the counter-intuitive negative relations between household income and value of the portfolio on fraud risk and use of red flags, respectively. Why investors, with potentially more to lose due to fraud, are less concerned with fraud risks and less likely to analyze fraud red flags is an interesting question for future research. Third, as will be discussed later, we see a positive association between return on investments and the important placed on fraud risk assessment. Finally, we see that investors
with higher levels of education are more likely to use red flags. Perhaps the training received or the complex analysis skills required at higher levels of education are necessary to collect and analyze red flags. How investors can use both their general and domain-specific knowledgebases to effectively use fraud red flags could be addressed in future research.

Mediation Analysis of the Overall Model

As Figure 1 illustrates, the importance of fraud risk assessment (FR) should mediate the interactive effect of RELIANCE ON FINANCIAL X PERCEPTION OF FRAUD on the USE OF RED FLAGS. Following Baron and Kenney (1986), we conduct a mediation analysis to determine the validity of the model presented in Figure 1.

Statistical evidence of FR mediating the relation between RELIANCE ON FINANCIAL X PERCEPTION OF FRAUD on the USE OF RED FLAGS first requires that the interaction significantly affect the USE OF RED FLAGS. In non-tabulated regression analysis, controlling for all variables described above with the exception of FR, we find the interaction to be positive and statistically significant (p-value = .03). Second, the interaction must affect FR. Our test of Hypothesis One finds this relation to be positive and significant. Third, FR must also be significantly correlated with the USE OF RED FLAGS. Our test of Hypothesis Two finds this relation to be positive and significant. Lastly, when both FR and the interaction are included in Model 2: (1) FR must be significant, and (2) the interaction term must either be insignificant (full mediation) or its significance must decline (partial mediation). Non-tabulated regression results find (1) FR is positive and significant, and (2) the significance level for the interaction has dropped from the previously described level (p-value = .03) to a lower level of significance (p-value = .07). These results point to FR partially mediating the interactive effect of RELIANCE ON FINANCIAL and PERCEPTION OF FRAUD on the USE OF RED FLAGS. Specifically,
investors that rely more on financial statements perceive that fraud risk assessment is a more important investing activity. This relation is positively moderated by the rate at which investors believe that fraud occurs. In turn, investors who perceive fraud risk to be an important part of investing appear to act on these perceptions. They are more likely to use red flags to avoid investing in companies that might be committing financial statement fraud.

Additional Analysis

Sloan (1996) finds investors fixate on earnings and have difficulty distinguishing between earnings derived from cash flows and earnings derived from accruals. Consequently, Sloan finds a negative association between accruals and future abnormal stock returns. Ali et al. (2000) posit that the negative association between accruals and future abnormal returns is due to earnings fixation by naïve or nonprofessional investors. Contrary to their expectation, Ali et al. (2000) find that the negative association between accruals and stock returns is stronger for larger firms which are more likely to be followed by analysts and held by institutions, and weaker for smaller firms which are less likely to be of interest to these sophisticated market participants. This counter-intuitive result suggests that any failure to appreciate the valuation implications of accruals is more pronounced for sophisticated investors than for naïve investors. Given our dataset related to nonprofessional investors, we are in a unique position to add to this research stream. Specifically, we have a measure of investor usage of accrual data (item 36, Table 1) and their investment returns (item 21, Table 2). Similarly, Elliott et al. (2008) use survey data to study variables associated with investor returns (e.g., types of information used, experience levels). In a non-tabulated regression controlling for the variables used in Elliott et al. (2008), we find the relation between the consideration of accruals by nonprofessional investors and their
market returns to be positive and significant \((p\text{-value} = .02)\).\(^9\) As illustrated in Table 4, we also observe a positive and significant association between FR and investor returns. Thus, we are able to provide initial empirical evidence that nonprofessional investors benefit from using accrual data and assessing fraud risk when investing.

V. CONCLUSION

This paper models nonprofessional investors’ use of financial statement information, their perception of the frequency of fraud, the importance of assessing fraud risk, and their use of fraud red flags (i.e., fraud warning signs). Investors are often victims of fraudulent financial reporting; however, very little prior research investigates investors’ perception of fraud and how investors protect themselves from fraudulent financial reporting. To shed light on these issues, we administered a survey to 194 nonprofessional investors. We find that the positive relation between investor reliance on financial statement information and the importance of fraud risk assessment becomes stronger as investor perceptions of the rate of fraud increase (i.e., when investors are more likely to question the validity of financial statement information). We also consider whether investors act on their fraud risk assessments by utilizing various fraud red flags in an effort to avoid potentially fraudulent investments. We find a positive association between the importance of making a fraud risk assessment and investors’ use of fraud red flags when making investment decisions.

With respect to the importance of red flags, our additional analysis reveals that investors tend to focus on SEC investigations, pending litigation, violations of debt covenants, and high management turnover. In contrast, investors seem to rely less on company size, age of the

\(^9\) We do not include the variable “training” from Elliott et al. (2008) because this variable (a) was specific to trainings provided by the investment club from which their sample was derived and (b) was not statistically significant in their analysis.
company, the need for external financing, and the use of a non-Big 4 auditor. Additionally, we illustrate that investors appear to rely more on analysts, regulators, external auditors, and audit committees to detect and report fraud. Investors rely less on low/mid-level employees, upper management, the media, and short-sellers. Finally, we provide initial empirical evidence that nonprofessional investors who are more apt to consider fraud risk and accruals as a red flag achieve higher market returns. This finding adds to our understanding of whether investors specifically consider accruals when making investments decisions. Prior archival evidence suggests that investors do not adequately understand the transitory nature of accruals (Sloan 1996).

Our model and our comprehensive set of control variables provide much detail into the factors that investors consider important when making investment decisions vis-à-vis fraud. As current policymakers have become increasingly concerned with the behavioral aspects of the market (e.g., Zweig 2009), our descriptive results and model should inform future policies aimed to protect investors from fraud. Our results also provide an important first step in examining how investors both fall prey to, and avoid investments in, fraud firms. The results may help policymakers as they determine what type of company information should be readily available to investors.

Because fraud risk assessments and red flag usage appear to be a common activity for some investors, experimentally manipulating fraud red flags in investment settings and measuring investor reactions (e.g., investment decisions) would be a fruitful area of research. Future research may also investigate which investor characteristics leads to more appropriate fraud risk assessments. Continuation of such research will help standard setters make informed public-policy decisions designed to protect individual investors.
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FIGURE 1

Investor Perceptions about Financial Statement Fraud and their Use of Red Flags

This figure provides a model of investor perceptions about financial statement fraud and their use of red flags.
TABLE 1
Descriptive Statistics – Hypothesized Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Response [n = 194]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliance on Financial Statement and Non-Financial Statement Information When Investing</td>
<td></td>
</tr>
<tr>
<td>1. Income statement&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td>5.23 (1.72)</td>
</tr>
<tr>
<td>2. Balance sheet&lt;sup&gt;a, c&lt;/sup&gt;</td>
<td>5.32 (1.64)</td>
</tr>
<tr>
<td>3. Cash flow statement&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td>5.30 (1.57)</td>
</tr>
<tr>
<td>4. Statement of owner’s equity&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td>4.98 (1.59)</td>
</tr>
<tr>
<td>5. Notes to financial statements&lt;sup&gt;a, d&lt;/sup&gt;</td>
<td>4.91 (1.59)</td>
</tr>
<tr>
<td>6. Internal control effectiveness&lt;sup&gt;a, b&lt;/sup&gt;</td>
<td>5.01 (1.66)</td>
</tr>
<tr>
<td>7. Mean reliance on financial statement information&lt;sup&gt;e&lt;/sup&gt;</td>
<td>5.13 (1.47)</td>
</tr>
<tr>
<td>8. Stock price&lt;sup&gt;a, f&lt;/sup&gt;</td>
<td>5.46 (1.75)</td>
</tr>
<tr>
<td>9. Advice from professionals&lt;sup&gt;a, f&lt;/sup&gt;</td>
<td>5.06 (1.74)</td>
</tr>
<tr>
<td>10. Advice from nonprofessionals&lt;sup&gt;a, g&lt;/sup&gt;</td>
<td>4.03 (1.80)</td>
</tr>
<tr>
<td>11. Advice from the media&lt;sup&gt;a, g&lt;/sup&gt;</td>
<td>4.09 (1.77)</td>
</tr>
<tr>
<td>12. Non-financial information related to operations&lt;sup&gt;a, g&lt;/sup&gt;</td>
<td>4.17 (1.77)</td>
</tr>
<tr>
<td>13. Company risk&lt;sup&gt;a, g&lt;/sup&gt;</td>
<td>4.98 (1.66)</td>
</tr>
<tr>
<td>14. Macroeconomic factors&lt;sup&gt;a, h&lt;/sup&gt;</td>
<td>4.75 (1.60)</td>
</tr>
<tr>
<td>15. Mean reliance on non-financial statement information&lt;sup&gt;i&lt;/sup&gt;</td>
<td>4.69 (1.31)</td>
</tr>
<tr>
<td>16. RELIANCE ON FINANCIAL&lt;sup&gt;j&lt;/sup&gt;</td>
<td>1.12 (.28)</td>
</tr>
</tbody>
</table>

Perception of Rate of Fraudulent Financial Reporting

17. PERCEPTION OF FRAUD<sup>j</sup>                                          | 5.06 (2.38)
Importance of Fraud Risk Assessment When Investing

18. Use of Red Flags

19. Need for external financing

20. Size

21. Age

22. Use of non-Big 4 auditor

23. Recent stock or debt issuance

24. Anticipated merger or acquisition

25. SEC investigation

26. Auditor change

27. Equity-based compensation

28. Pending litigation

29. Violation of debt covenant

30. High management turnover

31. Material weakness in internal control

32. Number of insiders on board of directors

33. Abnormally high valuation ratios

34. Abnormally high revenue growth

35. Abnormal decline in non-financial measures

36. Large difference between cash flow from operations and net income

37. Large change in a reserve account
38. Large difference between revenue growth and non-financial measure growth $^k, m$ 4.82 (1.56)

39. Insider trades $^k, m$ 5.13 (1.59)

40. USE OF RED FLAGS $^j$ 4.91 (1.23)

$^a$ Importance of financial statement information and non-financial statement information when deciding to buy or sell a company’s stock, measured on a scale where 1 = “very unimportant” and 7 = “very important.”

$^b$ In non-tabulated t-tests, mean response for financial statement item was not significantly different than ($p$-value > .05) the mean reliance on financial statement information (item 7).

$^c$ In non-tabulated t-tests, mean response for financial statement item was significantly greater than ($p$-value < .05) the mean reliance on financial statement information (item 7).

$^d$ In non-tabulated t-tests, mean response for financial statement item was significantly less than ($p$-value < .05) the mean reliance on financial statement information (item 7).

$^e$ Calculated as the mean response to items 1-6.

$^f$ In non-tabulated t-tests, mean response for non-financial statement item was significantly greater than ($p$-value < .05) the mean reliance on non-financial statement information (item 15).

$^g$ In non-tabulated t-tests, mean response for non-financial statement item was significantly less than ($p$-value < .05) the mean reliance on non-financial statement information (item 15).

$^h$ In non-tabulated t-tests, mean response for non-financial statement item was not significantly different than ($p$-value > .05) the mean reliance on non-financial statement information (item 15).

$^i$ Calculated as the mean response to items 8-14.

$^j$ RELIANCE ON FINANCIAL = Mean reliance on financial statement information / Mean reliance on non-financial statement information (item 7 / 15).

PERCEPTION OF FRAUD = In your opinion, how often do managers of publicly-traded companies commit financial statement fraud, measured on a scale where 1 = “0% of the time” and 11 = “100% of the time.”

FR = Importance of fraud risk assessment, relative to other factors, when making buy/sell decisions for stock that you currently hold, measured on a scale where 1 = “not at all important” and 7 = “extremely important.”

USE OF RED FLAGS = Mean use of red flags (mean of items 19 - 44).

$^k$ How often do you consider the following factors in assessing the risk of financial statement fraud in companies that you are screening for investment or in firms that you currently hold in your personal investment portfolio, measured on a scale where 1 = “never” and 7 = “often.”

$^l$ In non-tabulated t-tests, mean response for red flag was significantly less than ($p$-value < .05) the mean for use of red flags (item 45).

$^m$ In non-tabulated t-tests, mean response for red flag was not significantly different than ($p$-value > .05) the mean for use of red flags (item 45).

$^n$ In non-tabulated t-tests, mean response for red flag was significantly greater than ($p$-value < .05) the mean for use of red flags (item 45).
TABLE 2
Descriptive Statistics – Control Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Response [n = 194] Mean (Std. Dev.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening Question</strong></td>
<td></td>
</tr>
<tr>
<td>1. % bought or sold individual company stock in the last the last twelve months</td>
<td>100.00</td>
</tr>
<tr>
<td><strong>Fraud-related Measures</strong></td>
<td></td>
</tr>
<tr>
<td>2. % that OWNED THE STOCK OF A FRAUD COMPANY</td>
<td>24.74</td>
</tr>
<tr>
<td>3. LOSS RECOVERY</td>
<td>3.37 (1.78)</td>
</tr>
<tr>
<td>4. Rely on other investors to detect and report fraud</td>
<td>4.54 (1.34)</td>
</tr>
<tr>
<td>5. Rely on analysts to detect and report fraud</td>
<td>4.79 (1.31)</td>
</tr>
<tr>
<td>6. Rely on regulators to detect and report fraud</td>
<td>5.02 (1.46)</td>
</tr>
<tr>
<td>7. Rely on external auditors to detect and report fraud</td>
<td>4.86 (1.45)</td>
</tr>
<tr>
<td>8. Rely on internal auditors to detect and report fraud</td>
<td>4.52 (1.50)</td>
</tr>
<tr>
<td>9. Rely on audit committees to detect and report fraud</td>
<td>4.56 (1.48)</td>
</tr>
<tr>
<td>10. Rely on low/mid-level employee to detect and report fraud</td>
<td>4.32 (1.54)</td>
</tr>
<tr>
<td>11. Rely on upper management to detect and report fraud</td>
<td>4.34 (1.48)</td>
</tr>
<tr>
<td>12. Rely on internal controls to detect and report fraud</td>
<td>4.52 (1.39)</td>
</tr>
<tr>
<td>13. Rely on media to detect and report fraud</td>
<td>4.31 (1.50)</td>
</tr>
<tr>
<td>14. Rely on short sellers to detect and report fraud</td>
<td>4.29 (1.59)</td>
</tr>
<tr>
<td>15. RELIANCE ON OTHERS</td>
<td>4.56 (1.06)</td>
</tr>
<tr>
<td><strong>Investing Experience, Activity, and Return</strong></td>
<td></td>
</tr>
<tr>
<td>16. INVESTING EXPERIENCE</td>
<td>3.34 (1.53)</td>
</tr>
<tr>
<td>17. TIME ALLOCATED</td>
<td>2.64 (1.63)</td>
</tr>
<tr>
<td>18. TRADING ACTIVITY</td>
<td>2.10 (1.33)</td>
</tr>
<tr>
<td></td>
<td>Investment Strategies and Industries</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>19.</td>
<td>DIVERSIFICATION OF INVESTMENTS</td>
</tr>
<tr>
<td>20.</td>
<td>VALUE OF PORTFOLIO</td>
</tr>
<tr>
<td>21.</td>
<td>RETURN ON INVESTMENTS</td>
</tr>
<tr>
<td>22.</td>
<td>RELY ON OTHERS VS. OWN ANALYSIS</td>
</tr>
<tr>
<td>23.</td>
<td>MOMENTUM STRATEGY</td>
</tr>
<tr>
<td>24.</td>
<td>GROWTH STOCK STRATEGY</td>
</tr>
<tr>
<td>25.</td>
<td>LOW-RISK STOCK STRATEGY</td>
</tr>
<tr>
<td>26.</td>
<td>LAST YEAR’S WINNER STRATEGY</td>
</tr>
<tr>
<td>27.</td>
<td>VALUE STOCK STRATEGY</td>
</tr>
<tr>
<td>28.</td>
<td>HIGH YIELD STOCK STRATEGY</td>
</tr>
<tr>
<td>29.</td>
<td>A STRATEGY BASED ON TECHNICAL ANALYSIS</td>
</tr>
<tr>
<td>30.</td>
<td>A STRATEGY BASED ON YOUR FAMILIARITY WITH THE COMPANY</td>
</tr>
<tr>
<td>31.</td>
<td>% invested heavily in MANUFACTURING</td>
</tr>
<tr>
<td>32.</td>
<td>% invested heavily in RETAIL</td>
</tr>
<tr>
<td>33.</td>
<td>% invested heavily in GOVERNMENT/NOT-FOR-PROFIT</td>
</tr>
<tr>
<td>34.</td>
<td>% invested heavily in ENERGY</td>
</tr>
<tr>
<td>35.</td>
<td>% invested heavily in HIGH TECH/COMMUNICATIONS</td>
</tr>
<tr>
<td>36.</td>
<td>% invested heavily in HEALTHCARE/PHARMACEUTICALS</td>
</tr>
<tr>
<td>37.</td>
<td>% investing heavily in FINANCIAL SERVICES</td>
</tr>
<tr>
<td>38.</td>
<td>% investing heavily in MISCELLANEOUS INDUSTRIES</td>
</tr>
</tbody>
</table>
Demographic Data

39. EDUCATION $b$ 3.22 (1.14)

40. % with at least an UNDERGRADUATE DEGREE $b$ 74.22

41. % with UNDERGRADUATE BUSINESS-RELATED DEGREE $b$ 15.97

42. % with GRADUATE BUSINESS-RELATED DEGREE $b$ 9.79

43. % CERTIFIED $b$ 17.01

44. GENDER $b$ 51.51

45. AGE $b$ 4.31 (1.41)

46. HOUSEHOLD INCOME $b$ 3.18 (1.32)

$^a$Participants were asked to respond to the following statement (screening question): I have bought or sold individual company stock in the last twelve months. Participants could respond “yes” or “no.”

$^b$OWNED THE STOCK OF A FRAUD COMPANY = Have you ever owned the stock of an individual company when it was found to have been committing financial statement fraud, measured 1 = “yes” and 0 = “no.”

LOSS RECOVERY = If you held the stock of a firm that committed financial statement fraud, how likely do you believe it is that you would recover your losses through shareholder lawsuits, measured on a scale where 1 = “extremely unlikely” and 7 = “extremely likely.”

RELIANCE ON OTHERS = Mean reliance on others to detect and report fraud (mean of items 4 - 14).

INVESTING EXPERIENCE = How many years have you been actively buying/selling the stocks of individual companies (as opposed to mutual funds, etc.), measured on a scale where 1 = “less than one year” and 6 = “more than 20 years.”

TIME ALLOCATED = In an average week, how much time do you spend thinking about and evaluating stocks that you are screening for possible investment or that you currently hold in your personal investment portfolio, measured on a scale where 1 = “less than one hour” and 7 = “more than 10 hours.”

TRADING ACTIVITY = Approximately, how many times, on average, do you buy or sell stocks of individual companies in a one-year period, measured on a scale where 1 = “1-5 times” and 5 = “more than 20 times.”

DIVERSIFICATION OF INVESTMENTS = In how many individual companies do you own stock (i.e., directly owning shares, not via a mutual fund, or pension), measured on a scale where 1 = “1-5 companies” and 5 = “more than 20 companies.”

VALUE OF PORTFOLIO = What is the approximate value of your personal investment portfolio, measured on a scale where 1 = “less than $10,000” and 8 = “more than $1,000,000.”
RETURN ON INVESTMENTS = Over the last twelve months, what was the approximate return on your personal investment portfolio, measured on a scale where 1 = “less than -20 percent” and 11 = “more than 20%.”

RELY ON OTHERS VS. OWN ANALYSIS = To what extent are your decisions to buy or sell stocks based on your own analysis relative to the advice of others, measured on a scale where 1 = “based completely on my own analysis” and 7 = “based completely on the advice of others.”

MOMENTUM STRATEGY, GROWTH STOCK STRATEGY, LOW-RISK STOCK STRATEGY, LAST YEAR’S WINNER STRATEGY, VALUE STOCK STRATEGY, HIGH YIELD STOCK STRATEGY, A STRATEGY BASED ON TECHNICAL ANALYSIS, A STRATEGY BASED ON FAMILIARITY WITH THE COMPANY = Each strategy measured with the following question and scale: How often do you use the following investment strategies in your decisions to buy or sell stocks, where 1 = “never” and 7 = “often.”

MANUFACTURING, RETAIL, GOVERNMENT/NOT-FOR-PROFIT, ENERGY, HIGH TECH/COMMUNICATIONS, HEALTHCARE/PHARMACEUTICALS, FINANCIAL SERVICES, MISCELLANEOUS INDUSTRIES = Measured with one question: In what industries do you most often buy and sell stocks of individual companies, response coded 1 if participant selected the industry, 0 otherwise. Participants could select more than one industry.

EDUCATION = Please indicate the highest level of education you have completed, measured on a scale where 1 = “high school” and 5 = “post-graduate degree”

UNDERGRADUATE DEGREE = coded 1 if participant obtained an undergraduate degree or higher, 0 otherwise.

UNDERGRADUATE BUSINESS-RELATED DEGREE = coded 1 if participant obtained an undergraduate business-related degree, 0 otherwise.

GRADUATE BUSINESS-RELATED DEGREE = coded 1 if participant obtained a graduate business-related degree, 0 otherwise.

CERTIFIED = coded 1 if person obtained CPA, CFA, or CFP, 0 otherwise.

GENDER = Coded 1 if male, 0 otherwise.

AGE = Measured on a scale where 1 = “under 20” and 8 = “80 or above.”

HOUSEHOLD INCOME = What is your total annual household income, measured on a scale where 1 = “$0 - $30,000” and 6 = “more than $150,000.”

To what extent do you rely on the following parties to detect and report financial statement fraud in companies that you are screening for investment or in firms that you currently hold in your personal investment portfolio, measured on a scale where 1 = “not at all” and 7 = “completely.”

In non-tabulated t-tests, mean response for reliance was not significantly different than (p-value > .05) the mean for others to detect and report fraud (item 15).

In non-tabulated t-tests, mean response for reliance was significantly greater than (p-value < .05) the mean for others to detect and report fraud (item 15).

In non-tabulated t-tests, mean response for reliance was significantly less than (p-value < .05) the mean for others to detect and report fraud (item 15).
### Table 3

**Correlation Matrix**

<table>
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<tr>
<th>Variables</th>
<th>Rate</th>
<th>Reliance</th>
<th>Rate</th>
<th>FR</th>
<th>Flags</th>
<th>Recovery</th>
<th>Others</th>
<th>Time</th>
<th>Return</th>
<th>Momentum</th>
<th>Growth</th>
<th>Low</th>
<th>Last</th>
<th>Value</th>
<th>High</th>
<th>Technical</th>
<th>Familiarity</th>
<th>Misc</th>
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Pearson correlation statistic. Correlations with two-tailed p-values < .05 are italicized and in boldface type.

*RELIANCE ON FINANCIAL (Reliance), PERCEPTION OF FRAUD (Rate), FR, and USE OF RED FLAGS (Flags) are defined in Table 1. LOSS RECOVERY (Recovery), RELIANCE ON OTHERS (Others), TIME ALLOCATED (Time), RETURN ON INVESTMENTS (Return), MOMENTUM STRATEGY (Momentum), GROWTH STOCK STRATEGY (Growth), LOW-RISK STOCK STRATEGY (Low), LAST YEAR’S WINNER STRATEGY (Last), VALUE STOCK STRATEGY (Value), HIGH YIELD STOCK STRATEGY (High), A STRATEGY BASED ON TECHNICAL ANALYSIS (Technical), A STRATEGY BASED ON FAMILIARITY WITH THE COMPANY (Familiarity), MISCELLANEOUS INDUSTRIES (Misc), and GENDER (Gender) are defined in Table 2.*
<table>
<thead>
<tr>
<th>Independent Variables a</th>
<th>Estimated Coefficient</th>
<th>Wald-statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELIANCE ON FINANCIAL (A)</td>
<td>0.336</td>
<td>0.28</td>
<td>0.595</td>
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<tr>
<td>PERCEPTION OF FRAUD (B)</td>
<td>-0.039</td>
<td>0.20</td>
<td>0.653</td>
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<td>A X B</td>
<td>0.158</td>
<td>3.71</td>
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<td>LOSS RECOVERY</td>
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<td>RELIANCE ON OTHERS</td>
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<td>RETURN ON INVESTMENTS</td>
<td>0.125</td>
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<tr>
<td>TIME ALLOCATED</td>
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<td>FINANCIAL SERVICES</td>
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<td>HOUSEHOLD INCOME</td>
<td>-0.228</td>
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<td>0.086</td>
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</table>

Model Chi-Square statistic = 77.464
(p-value = < .001)
R² = .329

a FR = Importance of fraud risk assessment, relative to other factors, when making buy/sell decisions for stock that you currently hold, measured on a scale where 1 = “not at all important” and 7 = “extremely important.”
RELIANCE ON FINANCIAL (A) = Mean reliance on financial statement information / Mean reliance on non-financial statement information (items 7/14 in Table 1).
PERCEPTION OF FRAUD (B) = In your opinion, how often do managers of publicly-traded companies commit financial statement fraud, measured on a scale where 1 = “0% of the time” and 11 = “100% of the time.”
A X B = Interaction term: RELIANCE ON FINANCIAL X PERCEPTION OF FRAUD
LOSS RECOVERY = If you held the stock of a firm that committed financial statement fraud, how likely do you believe it is that you would recover your losses through shareholder lawsuits, measured on a scale where 1 = “extremely unlikely” and 7 = “extremely likely.”
RELIANCE ON OTHERS = Mean reliance on others to detect and report fraud (mean of items 4 – 14 in Table 2).
RETURN ON INVESTMENTS = Over the last twelve months, what was the approximate return on your personal investment portfolio, measured on a scale where 1 = “less than -20 percent” and 11 = “more than 20%.”
TIME ALLOCATED = In an average week, how much time do you spend thinking about and evaluating stocks that you are screening for possible investment or that you currently hold in your personal investment portfolio, measured on a scale where 1 = “less than one hour” and 7 = “more than 10 hours.”
FINANCIAL SERVICES = Measured with one question: In what industries do you most often buy and sell stocks of individual companies, response coded 1 if participant selected the industry, 0 otherwise. Participants could select more than one industry.
HOUSEHOLD INCOME = What is your total annual household income, measured on a scale where 1 = “$0 - $30,000” and 6 = “more than $150,000.”
### TABLE 5
Hypothesis Two Testing: Linear Regression Results for USE OF RED FLAGS $^a$

<table>
<thead>
<tr>
<th>Independent Variables $^a$</th>
<th>Estimated Coefficient</th>
<th>$t$-statistic</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
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<td>FR</td>
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<td>4.28</td>
<td>&lt;.001</td>
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<tr>
<td>RELIANCE ON OTHERS</td>
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<td>&lt;.001</td>
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<td>VALUE OF PORTFOLIO</td>
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<td>1.93</td>
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<td>MANUFACTURING</td>
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<td>ENERGY</td>
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<tr>
<td>VALUE STOCK STRATEGY</td>
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<td>EDUCATION</td>
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</table>

Model $F$-statistic = 7.36 ($p$-value < .001)  
$R^2 = .611$

$^a$ USE OF RED FLAGS = Mean use of red flags (mean of items 18 – 44 in Table 1).  
FR = Importance of fraud risk assessment, relative to other factors, when making buy/sell decisions for stock that you currently hold, measured on a scale where 1 = “not at all important” and 7 = “extremely important.”  
RELIANCE ON OTHERS = Mean reliance on others to detect and report fraud (mean of items 4 – 14 in Table 2).  
VALUE OF PORTFOLIO = What is the approximate value of your personal investment portfolio, measured on a scale where 1 = “less than $10,000” and 8 = “more than $1,000,000.”  
MANUFACTURING and ENERGY = Measured with one question: In what industries do you most often buy and sell stocks of individual companies, response coded 1 if participant selected the industry, 0 otherwise. Participants could select more than one industry.  
VALUE STOCK STRATEGY = Each strategy measured with the following question and scale: How often do you use the following investment strategies in your decisions to buy or sell stocks, where 1 = “never” and 7 = “often.”  
EDUCATION = Please indicate the highest level of education you have completed, measured on a scale where 1 = “high school” and 5 = “post-graduate degree.”