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Article

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Leveling the playing field for less-sophisticated non-professional investors

Does plain English matter?

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Abstract

Purpose – The purpose of this paper is to explore how non-professional investors (NPIs) with varying levels of financial sophistication interpret and perceive corporate disclosures and management credibility, specifically risk factors, when those disclosures are presented in readable and less-readable formats.

Design/methodology/approach – The paper uses an online experiment to test hypotheses related to the effects of financial sophistication (measured) and readability (manipulated) on NPIs' equity valuations and perceptions of management credibility (competence and trustworthiness).

Findings – Increased readability appears to counteract less-sophisticated NPIs' conservatism in equity valuations, such that they are not statistically significantly different from more-sophisticated NPIs' equity valuations. Further, less-sophisticated NPIs judge management as less competent when disclosures are less readable, while more-sophisticated NPIs judge management as more competent when disclosures are less readable.

Research limitations/implications – The paper has important implications for the SEC's regulations related to plain English requirements for risk factor and other corporate disclosures. Financial sophistication varies among NPIs, and readability appears to influence these individuals in different ways.

Practical implications – The SEC's Concept Release (April 13, 2016) acknowledges the need to update and improve risk factor disclosure regulations. This study provides evidence that contributes to those decisions.

Originality/value – The paper extends the research on processing fluency, by examining readability of disclosures with a consistent tone (negative). The NPIs surveyed are directly representative of the population of interest for risk factor disclosure regulations.

Keywords Risk factor, Processing fluency, Corporate disclosures, Regulation S-K, Non-professional investor
Paper type Research paper

Introduction

With the increase in online trading and wider stock market access for non-professional investors (NPIs), in the USA, and especially globally, it is of interest to examine how current reporting standards and practices may differentially influence subsets of this group. In the USA, the SEC has offered guidance on ways to improve disclosures by making them more timely and understandable; i.e., investors must be able to read and understand corporate disclosures in order to make informed decisions and manage their risk (Linsley and Shrivs, 2005). Research finds that NPI underperformance in the market



largely arises from their inability to understand financial information (e.g. Barber and Odean, 2000; Odean, 1999). Coram (2010) further proposed that a lack of task-specific knowledge by NPIs results in conservatism in equity valuation and investment behavior.

In 1998, the SEC helped to increase the understandability of financial information by passing the Plain English Rule 421(d), accompanied by the “Plain English Handbook” (Securities and Exchange Commission, 1998), which provides guidance to registrants in writing certain disclosures using plain English principles. Such principles include short sentences; definite, concrete, and everyday words; active voice; tables or bullet point lists; no legal jargon and highly technical business terms; and no multiple negatives (Securities and Exchange Commission, 1998).

The rationale for increasing readability through plain English seems clear and logical. Plain English disclosures should improve readability by presenting information akin to individuals’ normal processing style (Securities and Exchange Commission, 1998). This “processing fluency” represents the ease with which individuals process external information (Winkelman *et al.*, 2003). Such disciplines as psychology, communications, and marketing have studied fluency (for a review see Alter and Oppenheimer, 2009), and consistently find that fluency influences judgments over and above content (Schwarz *et al.*, 1991). Disclosure information presented in plain English should be more readable and more fluent, and thus be easier for NPIs to process.

Research indicates, however, that financial information has become too disfluent and complex for NPIs to process (Miller, 2010; Li, 2008; Curtis, 1995, 1998, 2004; Linsley and Lawrence, 2007; Jones and Shoemaker, 1994). Additionally, registrants may use lower readability to hide information or confuse investors. Some studies find evidence that managers use less-readable disclosures to obfuscate negative and declining performance in communications to investors such as the MD&A (Curtis, 2004; Subramanian *et al.*, 1993; Li, 2008; Rutherford, 2003; Jones and Shoemaker, 1994). Other managers may go so far as to decrease readability to deceive investors into believing that performance is better than the numbers show (Lee *et al.*, 2013).

While it seems logical that plain English disclosures would be more useful to investors than less-readable or other complex language disclosures, this is far from proven. Questions remain about whether plain English is always better for communicating information; particularly in communicating corporate information to investors, researchers have questioned the effects of requiring plain English on investors’ understanding, perceptions, and decision making (Cui, 2016; Tan *et al.*, 2014, 2015; Rennekamp, 2012). Overall, these studies suggest that we need more research to understand the varied effects of readability on understanding, perceptions, and decision making, and that the relationship between readability and investor behavior is more complex than previously assumed.

This paper explores the effects of readability in the context of risk disclosures, which became part of the required SEC registrants’ disclosures since 2005. This regulation requires registrants to disclose risks “[...] that may adversely affect the issuer’s business, operations, industry, or financial position, or its future financial performance” (Securities and Exchange Commission, 2004, 2005). Because the SEC intended this disclosure to help all investors, including NPIs, it falls under the above plain English principles. This study is especially timely in light of the SEC’s Concept Release on April 15, 2016 that seeks public comment on suggested changes to business and financial disclosures required by regulation S-K, and presents the results of “a comprehensive evaluation of the Commission’s disclosure requirements recommended in the staff’s report on Review of Disclosure Requirements in Regulation S-K, which was mandated by Section 108 of the Jumpstart Our Business Startups Act (‘JOBS’ Act)” (Securities and Exchange Commission, 2016, p. 9).

Using survey responses from 359 NPIs, we examine how readability and task-specific knowledge (i.e. financial sophistication) affect judgments about equity valuation, ease of understanding, and management credibility (i.e. competence and trustworthiness).

Overall, findings indicate that investors with low financial sophistication (measured using a composite index similar to Tan *et al.*, 2014) consistently provided lower valuation estimates than those with high financial sophistication, regardless of readability. However, all investors are influenced by readability and provide higher valuation estimates when readability is high. No evidence finds plain English significantly increases less-sophisticated NPIs' understanding over more-sophisticated NPIs. Although understanding does increase for all investors under plain English, it is more pronounced in the more-sophisticated NPI group. Financial sophistication and readability interact to influence perceptions of management credibility. Low-readability results in decreased perceptions of credibility among less financially sophisticated investors and increased perceptions among more financially sophisticated investors. This finding implies that less financially sophisticated investors may be skeptical of managers who use difficult-to-read language, but financially sophisticated investors may actually reward managers who use complex language.

Importantly, we find an apparent similarity of decisions and perceptions between less-sophisticated NPIs presented with plain English disclosures and high sophisticated NPIs presented with less-readable disclosures. On most measures, both groups exhibited nearly identical behaviors, implying that increasing the readability of disclosures does help compensate for a lack of task-specific knowledge, and "levels the playing field" between less- and more-sophisticated NPIs. Of course, corporations will not produce disclosures in two different formats, and since plain English did appear to impact more-sophisticated NPIs as well, more research is needed to determine whether increasing readability is beneficial to the NPI population overall.

Similarly, to the studies by Rennekamp (2012) and Cui (2016), we conclude that readability is one part of a complex formula for investor judgments, and that plain English requirements are not a panacea for improving corporate disclosure usefulness. Readability differences have inconsistent effects across a variety of disclosures studied in prior research, and across the NPI population. Focusing on plain English may divert attention from other challenges to the SEC's goal to provide useful information to the investing public. The results contribute to the growing body of research on the style and presentation of disclosures, and the subsequent effect on investors' behavior. Unlike the study by Miller (2010), which examined the entire 10-K, this study isolates risk disclosures, thereby limiting the potential influence of other information and information overload. This study adds to Rennekamp's (2012) findings that are based on a single press release regarding earnings, by exploring the effects of sophistication on non-financial disclosure judgments. It also complements Tan *et al.*'s (2014) findings by holding language sentiment constant. The findings indicate that readability affects NPIs regardless of management's choice of positive or neutral language. Further, this study contributes to this literature because our subject pool comprises members of NPIs' education and support association. Thus, the conclusions are based upon individual respondents who are the target of the SEC's initiatives on plain English disclosures.

These results should be of interest to public company registrants, the SEC, and other investor protection agencies (e.g. Financial Industry Regulatory Authority), NPIs and their supporting organizations (e.g. BetterInvesting), and standard-setters. Further, because US investors have access to many resources, such as analyst reports, financial media, etc., it may be even more important for regulatory bodies in countries other than the USA to be aware of our findings. Overall, this area will benefit from additional research, and theory development and testing, to understand and predict how written language influences investment decisions.

Background and hypotheses

Task-specific knowledge (sophistication)

In concert with the substantial increase of NPIs in the market (Coram, 2010), much research has examined their use of financial information to make investment decisions. Such research

has indicated that the internet-fueled increase in access to valuable financial information has not seen improved investment behavior. NPIs systematically misinterpret the financial information available (Odean, 1999), such that they underperform the market by 3.7 percent annually (Barber and Odean, 2000). This research indicates that a lack of financial knowledge and an inability to understand financial information contribute to NPIs' investment underperformance. In keeping with prior literature, we use the term sophistication to refer to the level of investor's task-specific knowledge, namely, their familiarity with investing and financial analysis.

Coram (2010) proposed that a lack of sophistication results in conservatism in equity valuation and investment behavior because the likelihood of unintended effects (i.e. conservatism) of cognitive impairment is negatively related to such knowledge (Smith and Kida, 1991). When compared to professional investors who are sophisticated, NPIs make more conservative judgments when reading positive non-financial disclosures (Coram, 2010).

Thus, sophistication impacts NPIs' investment behavior vs professional investors; it may also influence behavior within the NPI group. NPIs are not a homogenous group (Pinsker and Wheeler, 2009), and some NPIs are likely to be more financially sophisticated than are others. Sophistication is a contributing factor to investment behavior because it enables an investor to understand and appropriately use the value-relevant information (Victoravich, 2010; Frederickson and Miller, 2004). However, because it is not possible, nor fair to exclude NPIs from the capital markets based on their lack of sophistication, it is important to determine if any interventions can compensate for this shortcoming. Readability may be a solution.

Readability

Encouraging readability in financial reporting has been a consistent theme in the SEC's ongoing effort to assist "least-sophisticated investors" (Securities and Exchange Commission, 1998). In discussing the usefulness of financial reporting, "Probably the most familiar theme is plain language. The swamp of legalese found in many annual reports and mutual fund prospectuses can frustrate even the most experienced investor" (Securities and Exchange Commission, 2007). Research supports the sentiment that financial reports have become too complex for small investors to understand and process. Jones and Shoemaker (1994) concluded that the reading level of nearly all corporate annual reports is difficult or very difficult, requiring an undergraduate or graduate degree for comprehension. Several subsequent readability studies (Courtis, 1995, 1998, 2004; Linsley and Lawrence, 2007; Smith and Taffler, 1995) agree that annual reports are "inaccessible to a large proportion of private lay shareholders" (Jones and Shoemaker, 1994). Most recently, Li (2008) labeled 10-Ks as "unreadable" and found that readability has significantly decreased from 1993-2004 (p. 226). Miller (2010) supported Li's (2008) conclusions. Using the FOG Readability Index (Gunning, 1952), Li reported a mean readability level for a sample of 2006 10-Ks as 19.4, much greater than the level considered difficult for most people to read, which ranges from 14 to 18, and certainly greater than the ideal, which ranges from 12 to 14. Miller (2010) also generated a multidimensional measure of readability using the SEC's plain English principles. This measure indicates a mean readability level of 20.795 for the same sample and year, again representing an unreadable level for most.

We also find negative effects of complexity and readability on investor decisions that the archival literature documented. For example, You and Zhang (2009) found investors under-react to 10-K information, which is greater for firms with more complex reports. Miller (2010) found that more complex 10-Ks result in lower trading activity by, and less consensus among, small investors, concluding that complex disclosures may be too costly for NPIs to process.

Plain English disclosures should improve readability by presenting information consistent with individuals' normal processing style (Securities and Exchange Commission, 1998). This "processing fluency" represents the ease with which individuals can process external information (Winkielman *et al.*, 2003). Disciplines such as psychology, communications, and marketing have studied fluency (for a review see e.g. Alter and Oppenheimer, 2009), which is shown to impact judgments beyond content (Schwarz *et al.*, 1991). Disclosure information presented in plain English should be more readable, or more fluent, and thus should be easier for less-sophisticated NPIs to process.

However, despite regulators, legislators, and professional groups' contentions on plain English's positive effects, research evidence is inconsistent. Some studies suggest that plain English results in greater comprehension of bank contracts (Campbell, 1999), insurance policies (Blazzard and Hasenauer, 1998), and mutual fund prospectuses (Johnson, 2004). Others, however, caution that plain English initiatives may not always result in the intended outcome. Bernstein (2006) reported that some earlier SEC attempts to make 10-Ks more readable to average investors caused companies to simply eliminate disclosures. Jacoby *et al.* (1982) found that the Federal Trade Commission's attempts to improve communications by using plain English actually resulted in greater confusion in a wide range of audiences.

Recent research in accounting raises even more questions about the effects of plain English disclosures. Rennekamp (2012) found small investors susceptible to overreaction, responding more positively to good news and more negatively to bad news when press releases are more readable. This finding is based on a homogenous pool of NPIs, and is therefore unclear if the effect holds across all NPIs (i.e. those with both high and low sophistication).

Recent readability and sophistication studies find both variables affecting investor decisions and behavior. Tan *et al.* (2014) showed that readability effects may reverse when considered jointly with other variables such as positive or negative language sentiment. Tan *et al.* (2015) found that inconsistencies in benchmarks affect the response of investors to strategically readable management disclosures. Cui (2016) also examined inconsistencies, and found that sophistication and readability interact.

While these studies examine readability and NPI's sophistication levels in the context of some inconsistent message and/or tone, and use either MBA students (Cui, 2016; Tan *et al.*, 2014, 2015) or Amazon MTurk participants, the present study differs. We examine readability and sophistication in a consistent message (presentation of risk factors, a negative disclosure), and the participants are all active non-professional US nationwide investors who have earned varying educational degrees ranging from high school to PhDs and MDs. Thus, this adds generalizability to Tan *et al.*'s (2014, 2015) and Cui's (2016) findings. Tan *et al.* (2014) noted that their sample may be unrepresentative of the continuum of investor sophistication, and suggested future research on this topic. These points do not criticize Tan *et al.* (2014, 2015) or Cui (2016), but rather point to divergence to indicate the complementary aspects of this work.

Based on prior research, a more conservative bias should prevail for less-sophisticated NPIs, if they cannot fully process a risk disclosure. Increasing the readability of disclosures should increase understanding and reduce conservatism. *H1a* tests whether less-sophisticated NPIs are more conservative than more-sophisticated NPIs. *H1b* tests the effect of readability on conservatism. If readability of risk factors reduces conservatism (increases equity valuations) for less-sophisticated NPIs, then the SEC's focus on readability is justified. Formally:

H1a. Less-sophisticated NPIs will estimate lower equity valuations than more-sophisticated NPIs.

H1b. Less-sophisticated NPIs will estimate lower equity valuations when a disclosure is less readable than when it is more readable.

If support suggests that less-sophisticated investors are influenced by readability, before whole-heartedly recommending plain English across the board, we must also explore readability's effects on more-sophisticated investors. Does readability similarly affect both high- and low-sophistication NPIs? High-sophistication NPIs should understand disclosures regardless of readability, which should result in little difference in their equity valuations. When considered with the above hypotheses, this would indicate an ordinal interaction: the more-sophisticated investors' valuations forming a straight line between readability conditions and the less-sophisticated forming a diagonal line increasing from low to high readability (approaching, but remaining below the more-sophisticated investors). However, an important factor affecting the use of disclosures is the perception of message or source credibility (Pinsker and Wheeler, 2009; Mercer, 2004). NPIs' perceptions of credibility may be influenced by assurance (Pinsker and Wheeler, 2009), labeling (Koonce *et al.*, 2005), and other factors (Mercer, 2004), including readability. Lower source credibility may negatively influence equity valuations, introducing complexity into the judgment.

On this relationship, Rennekamp (2012) found a positive effect of readability on management credibility indirectly through increased processing fluency. But again this result relies on studying NPIs as a homogenous group. Tan *et al.* (2014) reported that more-sophisticated NPIs may view less-readable disclosures as management's attempt to obfuscate information, and that they see through management's strategic intentions when a stimulus is difficult to read by punishing management with lower equity valuations. Supplemental analysis indicates that this effect arises partially from lower perceptions of credibility when positive language is difficult to read. This conforms to psychology research that perceived bias from a source reduces the message's credibility (Birnbbaum and Stegner, 1979). The management obfuscation hypothesis proposes that managers have an incentive to make annual reports difficult to read to impair investors from incorporating adverse information into stock prices (Bloomfield, 2002). Thus, more-sophisticated NPIs may be more skeptical of complex wording regardless of whether the message is positive or adverse. They may then react by lowering their opinion of managers who use difficult-to-read language, thus resulting in a lower equity valuation. The effect of readability on equity valuations for this more-sophisticated group of NPIs is proposed in *H2* below:

H2. More-sophisticated NPIs will estimate lower equity valuations when a disclosure is less readable than when it is more readable.

While *H1a* and *H2* predict lower equity valuations for all NPIs using less-readable disclosures, we propose there are different reasons at the different investor sophistication levels. To test directly these proposals, we examine whether the hypothesized effects arise from less-sophisticated NPIs' increased understanding of plain English disclosures or more-sophisticated NPIs' reduced perceptions of management credibility using less-readable disclosures. Prior research implies that it may be both. Plain English should compensate for the lack of task-specific knowledge (sophistication) expected to contribute to less-sophisticated NPIs' conservatism[1], leading to *H3*:

H3. Less-sophisticated NPIs will perceive lower understanding when disclosure readability is lower than when readability is higher.

At the same time, low readability should decrease perceptions of management credibility, but only for more-sophisticated NPIs. Stated formally:

H4. More-sophisticated NPIs will perceive lower management credibility when disclosure readability is lower than when readability is higher.

Method

Participants

Study participants consisted of 359 NPIs. Participants completed an online survey distributed by BetterInvesting Inc., an organization that provides educational webinars, web-based mutual funds and stock tools, in-person learning events, and similar activities for NPIs. The sample contains 207 (58 percent) males and 152 (42 percent) females. Average years investing is 23.38 years, average trades per year is 10.23, and average age is 65.03. Although this average age appears high, it is common for research samples of NPIs (Coram, 2010; Elliott *et al.*, 2008). Of the 44,000 people who received the e-mail survey invitation, 1,279 people started the survey, for an initial response rate of 3 percent. We eliminated incomplete attempts, resulting in 359 complete, usable responses. Full demographic information appears in Table I.

Design

A 2 × 2 (disclosure readability by investor sophistication level) between-participants design tests the hypotheses. Participants are randomly assigned to either more- or less-readable treatments. Investor sophistication level is measured through demographic information. Tan *et al.* (2014) created a sophistication index using the number of accounting and finance courses, and the frequency of reading annual reports and earnings releases to determine delineation of sophistication of participants. Following similar logic, the sophistication index in the present study uses the presence of an accounting or finance degree and the frequency of buying and selling stock over the last year.

	<i>n</i>	Mean (SD) Range
Number of years investing	358	23.38 (13.09) 0-62 years
Average no. of trades per year	359	10.23 (14.25) 0-120
Average age	359	65.03 (10.06) 23-90
Gender = 58% Male (207/359); 42% Female (152/359)		
Certified public accountant or certified financial analyst = 4% (16/359)		
	Frequency	%
<i>Highest degree earned</i>		
High school	5	1.4
Some college/associate's degree	42	11.7
Bachelor's degree	141	39.3
Graduate degree	171	47.6
Total	359	100
<i>Field of highest degree</i>		
Accounting and finance	36	10.0
Other business	64	17.8
Healthcare	50	13.9
Engineering	39	10.9
Education	36	10.0
Physical sciences	31	8.6
Other college degree	98	27.3
High school diploma	5	1.5
Total	359	100

Table I.
Demographic data

Task

Participants received identical financial statements and background information for a fictional company (see Appendix 1), followed by the disclosure that is the subject of the readability manipulation (see Appendix 2). The experiment investigates the readability and sophistication issue in the context of one specific type of required disclosure: risk factors. Regulation S-K, implemented by the SEC in 2005, requires that companies list and discuss “[...] the most significant factors that may adversely affect the issuer’s business, operations, industry, financial position, or its future financial performance” within their 10-K filing (Securities and Exchange Commission, 2004, 2005). The regulation represents the latest in the SEC’s ongoing goal of providing full and fair risk disclosure: a focus that began in earnest in 1994 after massive derivative losses surprised investors of companies such as Procter & Gamble (Linsmeier and Pearson, 1997). We examine risk disclosure readability because the SEC specifically required companies to use plain English for these disclosures. Related research uses earnings’ press releases (e.g. Tan *et al.*, 2014, 2015; Rennekamp, 2012) that have no plain English requirements, and additionally, are quantitative. Thus, this study complements this research by examining a qualitative disclosure that the SEC currently mandates be written in plain English.

To develop the disclosure, we reviewed risk factors from the 10-Ks of a sample of 90 Fortune 500 companies. A review of item 1a disclosures (2004-2008) shows that companies report a range of risks (Blaskovich *et al.*, 2012). Some are simple and common, while others are complex and company specific. Examples of common risks include lost revenues from competition, regulation, and unforeseen natural disasters. Less commonly mentioned risks include inability to produce accurate financial reports due to control weaknesses, forced repayment due to debt covenant violations, and risk of declining financial performance due to changes in accounting rules. The frequency of other risks falls somewhere between such as risk of litigation due to computer hacking or security lapses.

To simulate reality, disclosures in three diverse areas were created: sales, data security, and control over financial reporting[2]. Investor’ reactions to risk are partially based on familiarity (Song and Schwarz, 2009), warranting a diverse set of factors along this continuum. The first risk factor describes a common risk of sales revenue declines, due to a competitive environment and potentially negative effects of changing consumer preferences. The second risk factor discusses the moderately common risk of data security breaches, related to the increasing practice of collecting and storing sensitive client data. The third risk factor addresses the uncommon risk that an internal control weakness may compromise the reliability of the financial reports. We varied risk presentation order to test and control for potential order effects.

To manipulate readability, we chose the text of a risk factor disclosure from an actual 10-K, which served as the low-readability condition[3]. The SEC’s “Plain English Handbook” (Securities and Exchange Commission, 1998) served as a guide for revision of each risk factor into a high-readability condition, using readability scores from MS Word.

An important consideration is the difference in length that is inherent in a plain English disclosure, which by definition, calls for short sentences and active voice. Since length is related to disfluency (Miller, 2010), prior studies hold length constant across readability (Rennekamp, 2012). However, length was allowed to occur naturally in the plain English disclosures. If firms adhere to the SEC mandate, current disclosures would most likely be shorter and more concise. Thus, these disclosures more closely represent what investors would see in a plain English disclosure. Although the impact of report length is a consideration in investor behavior, we must note that Miller’s findings are based on the length of a full 10-K. This study’s experimental materials are a small subset of information, and the effect of the difference in overall length between the two readability conditions is small. To investigate the effect of length, participants were asked to report their perception of the

length of the disclosures. Although the perception of length between the groups differs significantly, it does not correlate significantly with their equity valuation or their perceptions of credibility (not tabulated). Accordingly, length differences are not believed to affect the hypothesized results.

Two questions assessed the language manipulation's effectiveness. Differences between both readability conditions are significant in the expected direction for the following questions: the risk factors were easy to read ($t = -5.040$, $p < 0.000$, two-tailed), and written in plain English ($t = -5.206$, $p < 0.000$, two-tailed). These results hold when the questions are examined for investor sophistication level, as both less- and more-sophisticated participants successfully indicate more-readable vs less-readable language. Accordingly, the conclusion is that the readability manipulation was successful.

After reviewing the information, participants provided their expected equity valuation and perceptions of management credibility (discussed in more detail in the following section). Finally, standard demographic data were collected.

Results

Sample

Following the index procedure discussed previously, the sophistication scores of the sampled NPIs range from -2.56 to 5.32 . Investors were split into sophistication groups based on the median, resulting in 169 (190) less-sophisticated (more-sophisticated) participants. The mean sophistication scores for more and less sophistication are -0.66 and 0.86 , respectively. Less (more) sophisticated investors buy and sell stock an average of 7.97 (12.56) times per year. No significant differences arose between the two groups for mean age or years investing. Less- vs more-sophisticated investors' mean age is 65.77 and 64.28 years, and mean years investing is 23.35 and 24.01 years, respectively[4].

Equity valuations

The first two hypotheses test whether the equity valuations of NPIs differ based on their sophistication level; and whether readability influences equity valuations for less-sophisticated investors. These hypotheses were tested by examining the stock price estimates of less-vs more-sophisticated participants who were provided with more-readable vs less-readable risk disclosures. Descriptive statistics appear in Panel A of Table II.

Our two-way ANOVA helped us to determine the effects of sophistication and readability on equity valuations. Results from Panel B of Table II, indicate that the interaction is not significant ($F = 0.75$, $p = 0.39$). A statistically significant main effect difference in stock price estimates arose for all investors because of sophistication level ($F = 3.89$, $p = 0.02$), and for all investors because of readability ($F = 5.28$, $p = 0.05$). As shown in Figure 1, less-sophisticated investors estimate lower stock prices than more-sophisticated investors, and all investors estimate lower equity values when disclosures are less readable. Because of unequal sample sizes, the main effects of sophistication and readability using the estimated marginal means are used for interpretation. The marginal means for equity value are $\$25.46$ for less-sophisticated NPIs and $\$25.92$ for more-sophisticated NPIs, a statistically significant difference of $\$-0.47$ ($p = 0.05$). This supports *H1a*, which predicted that less-sophisticated investors would estimate lower equity prices than more-sophisticated investors. Turning to readability, the marginal means for equity value are $\$25.42$ for less-readable disclosures and $\$25.96$ for more-readable disclosures, a statistically significant difference of $\$-0.54$ ($p = 0.02$). *H1b* and *H2* predict lower equity prices when disclosures appear in less-readable vs more-readable language.

These results support the overall expectation that a lack of task-specific knowledge contributes to less-sophisticated NPIs' conservatism. It also supports the proposal that disclosure readability influences NPIs' judgments, the SEC's main target for

Panel A: descriptive statistics: mean (standard deviation); range

Sophistication	Readability		Overall (<i>n</i> = 359)
	Low (<i>n</i> = 169)	High (<i>n</i> = 190)	
Less financially sophisticated (<i>n</i> = 182)	\$25.08 (3.09) \$11.25-\$29.00 <i>n</i> = 84	\$25.82 (1.85) \$18.00-\$30.00 <i>n</i> = 98	\$25.48 (2.52)
More financially sophisticated (<i>n</i> = 177)	\$25.75 (2.02) \$18.63-\$31.00 <i>n</i> = 85	\$26.09 (1.80) \$20.00-\$30.00 <i>n</i> = 92	\$25.93 (1.91)
Overall (<i>n</i> = 359)	\$25.42 (2.62)	\$25.96 (1.83)	\$25.70 (2.25)

Panel B: ANOVA tests of between-subjects effects

	Type III SS	df	MSE	<i>F</i>	<i>p</i> -Value
Financial Sophistication	19.35	1	19.35	3.89	0.02
Readability	26.25	1	26.25	5.28	0.05
Sophistication × readability	3.72	1	3.72	0.75	0.39
Error	1,766.25	355	4.98		

Panel C: pairwise comparisons based on estimated marginal means

	Means	Difference (\$)	SE	95% confidence interval for difference	
				Lower bound	Upper bound
H1 – sophistication: less vs more	\$25.46 vs \$25.92	0.47	0.24	−0.929	−0.001
H2 – readability: low vs high	\$25.42 vs \$25.96	0.54	0.24	0.078	1.006

Note: DV = What is your estimate of the most likely stock price for the year ended December 31?

Table II.
Non-professional
investors' equity
valuation judgments

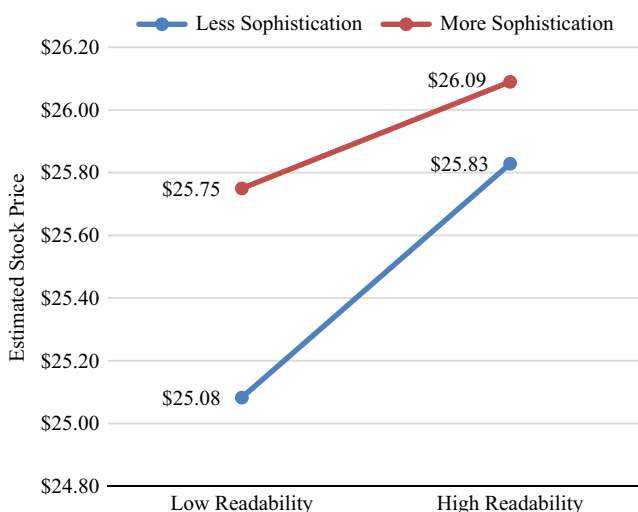


Figure 1.
Equity valuation
by readability and
sophistication level

plain English requirements. Of critical note in the results is the similarity between less-sophisticated NPIs using plain English disclosures and more-sophisticated NPIs using less-readable disclosures. A *t*-test performed between these two groups finds no significant difference between their mean equity valuations (\$25.83 vs \$25.75, respectively, *t* = 0.27, *p* = 0.79, not tabulated). This suggests that an increase in

readability does appear to compensate for task-specific knowledge in less-sophisticated investors to the point of creating a “level playing field” with more-sophisticated investors. Considering that the current state of readability in financial information is quite low, this provides support for the SECs continuing effort to encourage plain English.

Understanding and management credibility

The final two hypotheses investigate whether the difference in equity valuations relates to increased understanding (for less-sophisticated NPIs) and decreased management credibility perceptions (for more-sophisticated NPIs). Specifically, less-sophisticated NPIs are expected to report greater understanding when readability is high vs low. More-sophisticated investors are expected to be more skeptical of management when readability is low vs high, as they are more likely to recognize management obfuscation. To measure understanding, we asked participants how difficult it was for them to understand the disclosures. Descriptive statistics of the dependent variable for ease of understanding by treatment condition are presented in Table III, Panel A, and ANOVA results in Panel B. The interaction between sophistication and readability on understanding is not significant ($F = 0.56, p = 0.45$). A significant main effect of readability on all investors ($F = 7.56, p = 0.01$) is found, indicating that NPIs viewed the plain English disclosure as easier to understand, regardless of sophistication level. $H3$ is not supported, as increased readability results in increased ease of understanding for NPIs overall, but not solely for less-sophisticated NPIs. When each sophistication level is examined separately, the more-sophisticated NPIs perceive a difference in understanding from readability. t -Tests on the two levels indicate that while not statistically significant for less-sophisticated NPIs (t -statistic = 1.55, $p = 0.12$), the difference in ease of understanding is significant for more-sophisticated NPIs (t -statistic = 2.26, $p = 0.03$). The more-sophisticated NPIs drive the overall significant effect of readability on ease of understanding. This unexpected result is considered in the “Discussion” section of the paper (Figure 2).

Panel A: descriptive statistics: mean (standard deviation); range

Financial sophistication	Readability		
	Low ($n = 169$)	High ($n = 190$)	Overall ($n = 359$)
Less financially sophisticated ($n = 182$)	5.17 (1.26) 2-7 $n = 84$	5.44 (1.11) 2-7 $n = 98$	5.31 (1.18)
More financially sophisticated ($n = 177$)	4.88 (1.58) 1-7 $n = 85$	5.36 (1.18) 2-7 $n = 92$	5.13 (1.40)
Overall ($n = 359$)	5.02 (1.43)	5.40 (1.14)	5.22 (1.30)

Panel B: ANOVA tests of between-subjects effects

	Type III SS	df	MSE	F	p-Value
Financial sophistication	2.97	1	2.97	1.79	0.18
Readability	12.52	1	12.52	7.56	0.01
Sophistication \times readability	0.93	1	0.93	0.56	0.45
Error		355			

Panel C: t-Tests of ease of understanding

	Mean difference of low vs high readability	t-Statistic	p-Value
Less sophisticated	0.27	1.55	0.13
More sophisticated	0.48	2.26	0.03

Note: DV = disclosure was easy to understand (1 = strongly disagree, 7 = strongly agree)

Table III.
Non-professional
investors' perceptions
of understanding

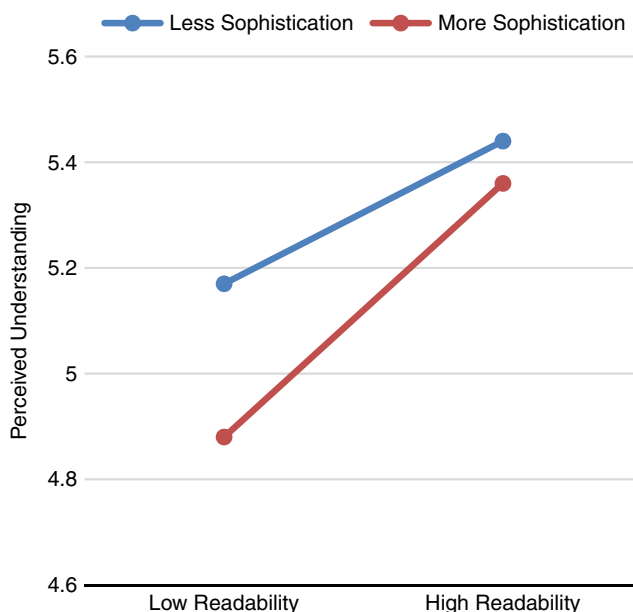


Figure 2.
Perceptions
of understanding
by readability and
sophistication level

A six-item questionnaire assessed perceptions of credibility, which we adapted (presented in Appendix 3) from the studies by McCroskey (1966) and Leathers (1992), and validated in the study by Mercer (2005). Following Mercer, a composite measure of management credibility is calculated, based on trustworthiness and competence, which we evaluated individually below. Descriptive statistics of the composite measure of credibility by treatment condition appear in Table IV, Panel A, and ANOVA results appear in Panel B. A significant interaction arises between sophistication and readability on management credibility ($F = 4.76$, $p = 0.03$). Simple main effects analysis indicates a statistically significant difference in management credibility between less-sophisticated NPIs in the two readability conditions. These results appear in Panel D of Table IV. When readability is low, less-sophisticated NPIs' perceptions of management credibility are significantly lower than when using more-readable disclosures (3.88 vs 4.05, $p = 0.04$). However, more-sophisticated NPIs' perceptions of management are not significantly affected by readability (4.04 low readability vs 3.97 high readability, $p = 0.32$). Also, when readability is low, less-sophisticated NPIs' perceptions of management credibility are significantly lower than more-sophisticated NPIs (3.88 vs 4.04, $p = 0.05$). Taken together, these results imply that it is less-sophisticated NPIs who are more skeptical of management who use low-readability disclosures, not more-sophisticated NPIs. Thus, $H4$ is not supported, and rather, is the opposite of expected for sophistication level (Figure 3).

Per Mercer (2005), the credibility scale contains two factors: competence (the first three questions) and trustworthiness (the last three questions). We examine both components separately. Tables V and VI present descriptive statistics (Panel A) and ANOVA results (Panel B) for respective measures of competence and trustworthiness. While no significant differences in results on the trustworthiness measure are found, results do support an interactive effect of readability and education on competence. As presented in Panel B of Table V, the interaction is significant ($p = 0.04$). Simple effects tests (Panel C) indicate a significant difference in mean competence perceptions by less- vs more-sophisticated NPIs when readability is low (3.68 vs 3.92, $p = 0.04$). Additionally, the lowest perception of

Table IV.
Non-professional
investors' perceptions
of management
credibility

Panel A: descriptive statistics: mean (standard deviation); range					
Financial sophistication	Low	High	Readability		
	(n = 169)	(n = 190)	(n = 359)		
Less financially sophisticated (n = 182)	3.88 (0.53)	4.05 (0.48)	3.97 (0.51)		
	2.0-5.2	2.3-5.3			
	n = 84	n = 98			
More financially sophisticated (n = 177)	4.04 (0.50)	3.97 (0.57)	4.0 (0.54)		
	2.8-5.5	2.5-5.2			
	n = 85	n = 92			
Overall (n = 359)	3.96 (0.52)	4.01 (0.53)	3.98 (0.52)		
Panel B: ANOVA tests of between-subjects effects					
	Type III SS	df	MSE	F	p-Value
Financial sophistication	1.1	1	1.17	0.43	0.51
Readability	0.16	1	0.16	0.61	0.44
Sophistication × readability	1.29	1	1.29	4.76	0.03
Error	96.13	355	0.27		
Panel C: simple main effects tests					
	df	MSE	F	p-Value	
Readability within low sophistication	1	1.20	4.44	0.04	
Readability within high sophistication	1	0.26	0.97	0.32	
Financial sophistication within low readability	1	1.03	3.81	0.05	
Financial sophistication within high readability	1	0.34	1.26	0.27	
Note: DV = composite measure of credibility					

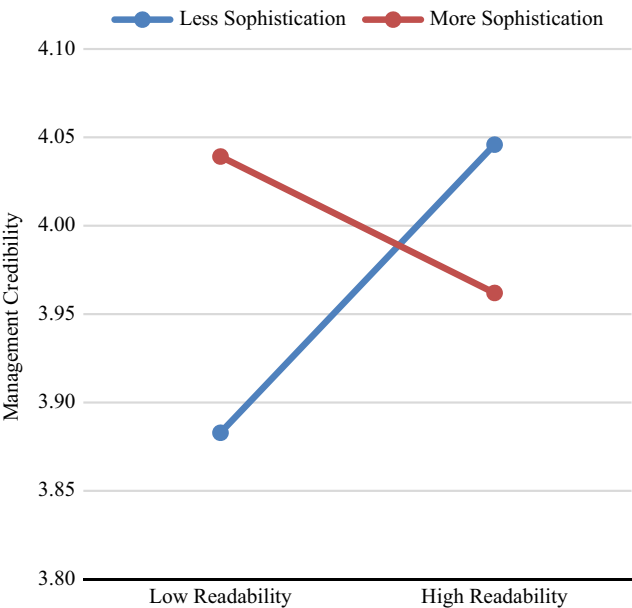


Figure 3.
Management
credibility by
readability and
sophistication level

management competence is found when less-sophisticated NPIs experience low-readability disclosures (mean = 3.68) and the highest perception is noted when less-sophisticated NPIs experience high-readability disclosures (mean = 3.97). This difference is significant ($p = 0.01$). When readability is high, less-sophisticated investors will perceive higher

Panel A: descriptive statistics: mean (standard deviation); range

	Low	Readability High	Overall
Financial sophistication	(<i>n</i> = 169)	(<i>n</i> = 190)	(<i>n</i> = 359)
Less financial sophistication (<i>n</i> = 182)	3.68 (0.76) 1.0-5.3 <i>n</i> = 84	3.97 (0.69) 2.3-6.3 <i>n</i> = 98	3.84 (0.74)
More financial sophistication (<i>n</i> = 177)	3.92 (0.71) 1.7-5.3 <i>n</i> = 85	3.88 (0.78) 2.3-5.7 <i>n</i> = 92	3.90 (0.74)
Overall (<i>n</i> = 359)	3.80 (0.74)	3.92 (0.74)	3.86 (0.74)

Panel B: ANOVA tests of between-subjects effects

	Type III SS	df	MSE	<i>F</i>	<i>p</i> -Value
Financial sophistication	0.45	1	0.45	0.83	0.36
Readability	1.36	1	1.36	2.51	0.11
Sophistication × readability	2.29	1	2.29	4.24	0.04
Error	192.28	355	0.54		

Panel C: simple main effects tests

	df	MSE	<i>F</i>	<i>p</i> -Value
Financial sophistication within low readability	1	−2.26	4.17	0.04
Financial sophistication within high readability	1	0.38	0.70	0.40
Readability within low sophistication	1	−0.28	6.71	0.01
Readability within high sophistication	1	−0.04	0.11	0.74

Note: DV = competence of management**Table V.**
Non-professional
investors' perceptions
of management
competence*Panel A: descriptive statistics: mean (standard deviation); range*

	Low (<i>n</i> = 169)	Readability High (<i>n</i> = 190)	Overall
Financial sophistication			
Less financial sophistication (<i>n</i> = 182)	4.08 (0.54) 3.0-5.7 <i>n</i> = 84	4.17 (0.66) 2.0-6.3 <i>n</i> = 98	4.13 (0.61)
More financial sophistication (<i>n</i> = 177)	4.16 (0.52) 2.7-5.7 <i>n</i> = 85	4.07 (0.62) 1.0-6.0 <i>n</i> = 92	4.12 (0.57)
Overall (<i>n</i> = 359)	4.12 (0.539)	4.12 (0.64)	4.12 (0.59)

Panel B: ANOVA tests of between-subjects effects

	Type III SS	df	MSE	<i>F</i>	<i>p</i> -Value
Financial sophistication	0.00	1	0.004	0.01	0.92
Readability	0.00	1	0.002	0.00	0.94
Financial sophistication × readability	0.69	1	0.69	1.97	0.16
Error	123.90	355	0.35		

Note: DV = trustworthiness of management**Table VI.**
Non-professional
investors' perceptions
of management
trustworthiness

competence of management than when readability is low, while more-sophisticated investors will perceive lower competence of management when readability is high than when low. These results may result from expectations gaps between more- and less-sophisticated investors when it comes to management competence.

Plain English as a compensating factor

The primary results above indicate the similarity between the equity valuations of less-sophisticated NPIs using plain English disclosures and more-sophisticated NPIs using

less-readable disclosures. Increased readability may compensate for less-sophisticated investors' lack of task-specific knowledge to help create a "level playing field" with more-sophisticated investors. With the exception of ease of understanding, the same results are found for the other variables examined. The means of less-sophisticated NPIs using high-readability disclosures and more-sophisticated NPIs using low-readability disclosures are nearly identical on overall management credibility (4.05 vs 4.04, respectively), management competence (3.97 vs 3.92, respectively), and management trustworthiness (4.17 vs 4.16, respectively). These results mirror the findings presented earlier on equity valuations, bolstering the proposition that plain English pulls less-sophisticated NPIs to a similar standing as more-sophisticated NPIs.

Discussion and conclusion

Research indicates that financial reports have become too complex for NPIs to grasp (Miller, 2010), requiring at least a graduate degree to understand. A lack of task-specific knowledge contributes to less-sophisticated investors' conservatism (Coram, 2010). The SEC, which wants to level the playing field for NPIs, has responded by requiring that risk disclosures in the 10-K be written using plain English principles. Some research questions the seemingly intuitive belief that plain English communications are "better," and can create a level playing field for NPIs, particularly among varying levels of NPI sophistication. This study provides experimental evidence on this issue. This study hypothesizes that less- and more-sophisticated NPIs' equity assessments, ease of understanding, and perceptions of management credibility differ when risk disclosures are presented in plain English vs less-readable language.

The significant main effect for both sophistication and readability indicates that less-sophisticated NPIs provide lower equity valuations, and that low-readability disclosures result in lower equity valuations. But, a noteworthy result is that less-sophisticated NPIs report significantly higher valuation estimates when disclosures are more readable, to the extent that they make judgments similar to those of more-sophisticated NPIs with less-readable disclosures. This implies that sophistication level is, in fact, an important consideration in the readability of financial reports, and that plain English affects less-sophisticated investors in such a way as to level the playing field – a primary objective of the SEC's mandate. Three of the four perception measures follow the same pattern. The means of less-sophisticated NPIs using high-readability disclosures and more-sophisticated NPIs using low-readability disclosures are nearly identical on composite management credibility, management competence, and management trustworthiness. Taken together, these results provide further evidence that plain English disclosures compensate for a lack of task-specific knowledge, and increase credibility perceptions of management among less-sophisticated NPIs.

Readability also affects the perceived fluency of disclosures. Surprisingly, this effect is significant for more-sophisticated NPIs only, which is opposite of our expectation. Perhaps less-sophisticated investors do not consciously perceive a difference in understandability afforded by plain English disclosures, or they are less likely to admit a lack of understanding. The lowest perception of fluency was noted by the more-sophisticated NPIs with low-readability disclosures. This may be because these investors are experienced in reading financial information and are thus more likely to recognize the complexity of current financial reporting. They may be more cognizant of the growing chorus of complaints regarding the lack of readability present in financial reporting, and identify "legalese" as such. These explanations are speculative, and encourage additional research to identify the factors that contributed to this result.

In another unexpected result, less-sophisticated NPIs perceive lower management credibility for less-readable disclosures. The opposite effect occurs for more-sophisticated NPIs.

Prior research finds more-sophisticated NPIs should be more sensitive to management obfuscation and to punish management for providing low-readability disclosures. More-sophisticated NPIs, who expect low-readability disclosures, may question the sincerity and authenticity of plain English disclosures. Some recent research suggests that difficult-to-process stimuli can actually increase perceived source credibility because the recipient ascribes greater intelligence and favorability to someone who can use big words and complex linguistics (e.g. Alter *et al.*, 2007). If more-sophisticated NPIs are accustomed to seeing disclosures written in “legalese,” they may question the intelligence of the source and reduce their perceived credibility. This supports Tan *et al.*’s (2014) suggestion that there are boundaries to expected effects on NPI behavior. They found that NPIs with greater sophistication may punish management for strategically disfluent communications, but evidence presented in the present paper indicates that this may not hold if there is not a perceived strategic intent to obfuscate.

For regulators, the question becomes whether the readability of financial disclosures improves investor judgments, and for which investors. Within the recent SEC concept release, “One commenter suggested that current disclosure is too complicated for the everyday person to read and that it should be less duplicative and more straightforward. Another commenter noted the diversity of the investor community and that the Commission’s mandate is to protect all investors” (Securities and Exchange Commission, 2016, p. 48). These comments indicate the importance of acknowledging investors with varying sophistication levels, and the concept release call for comment on the very issue of whom the disclosures should serve. The SEC has long pushed plain English reporting, to provide a more level playing field for NPIs. Our study indicates that it does help level the playing field for the least-sophisticated NPIs, but it also influences the more-sophisticated NPIs. Because reports will be either plain English or not, the implications and consequences must be examined in detail. More research should help us understand and predict the effects and limitations of disclosure presentation style. Is the effect on perceptions of credibility a positive outcome? Does increased readability reduce conservatism for less-sophisticated investors, and is that outcome truly beneficial to the investor in the long term, or does such conservatism act as a protection for overconfidence? Finally, should the SEC worry about this type of investor at all, or assume that efficient markets will effectively constrain and guide them? The SEC calls attention to this in the concept release by stating, “To the extent some investors rely on market prices to efficiently incorporate all public information, rather than relying on disclosures directly, it could be argued that disclosures should be tailored to those users most likely to actively follow a registrant, transact in the registrant’s securities and set the market price” (Securities and Exchange Commission, 2016, p. 58). Future research should examine these questions to guide regulators’ attempts to provide useful information and improve capital market efficiency.

As for all experimental research, these findings face several limitations. The experimental materials are limited, and NPIs would have access to much more information for making equity valuation decisions. We also make no claims of the accuracy of equity assessments or management credibility, and thus offer no normative solutions. Future research that includes additional disclosures and financial information offers the potential to further examine the effect of information overload and readability on NPIs, in conjunction. Lastly, the respondents likely expended less effort on a hypothetical case than they would in an actual investment situation. A controlled experiment involving compensation for investment choices may increase participants’ engagement. Despite these limitations, the results, obtained from a relatively large sample of active NPIs, provide important information for regulators as well as opportunities for future research.

Notes

1. More-sophisticated NPT's understanding should not be sensitive to readability.
2. Of the 90 companies reviewed, 86 included a factor regarding the competitive environment, 56 included a factor on sensitive client data, and only 15 included a factor on internal control weaknesses.
3. Our own review of risk disclosures from a random sample of 100 companies from the Fortune 500 companies for the period 2005-2008 finds that they are primarily written in what is often called legalese, and lack the readability intended by the SEC mandate. We calculated the Flesch Reading Ease (Flesch, 1948) score for the risk disclosure section of this random sample. The average grade level necessary to comprehend the 10-Ks is 17.0, which is representative of post-graduate study.
4. The differences in mean age and mean years investing are not statistically significant.

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Further reading

Securities Industry Association (2002), "Equity ownership in America", Securities Industry Association, New York, NY.

Appendix 1. Information provided to all conditions

Please review the information for Genyx, a fictitious US company. Assume that you do not own stock in the company yet, but are considering whether to invest in it.

Genyx information appears below in the following order:

- Short summary about the company – provided by management.
- Three basic audited financial statements – provided by management.
- Three company risk factors – provided by management.
- Analyst estimates of earnings per share (EPS) and stock price (publicly available information).

Note: Genyx's CPA firms have provided unqualified (clean) opinions on the financial statements and on internal control. The opinion letters are not included in these materials to save space.

Summary

Genyx Incorporated was founded in 2003 to provide human resource and payroll services to technology companies. The company grew successfully and went public in 2005 – it is currently traded on the New York Stock Exchange and the share price since going public has ranged from \$14.00-\$28.18.

In thousands, except share and per share data	Statement of operations				
	Historical-year ended December 31				
	2009	2008	2007	2006	2005
Sales	\$95,204	\$85,170	\$60,640	\$46,246	\$36,122
SG&A	77,005	70,239	52,362	44,230	32,000
Income (loss) from operations	15,499	14,931	8,278	2,016	2,848
<i>Net income (loss) per common share</i>					
Basic	\$0.97	\$0.96	\$0.60	\$0.15	\$0.23
<i>Weighted average common shares outstanding</i>					
Basic	14,169,140	13,833,590	12,181,221	11,853,732	11,032,449

Table AI.
Genyx income
statement

In thousands	Consolidated balance sheet				
	Historical as of December 31				
	2009	2008	2007	2006	2005
Cash	\$16,278	\$15,751	\$12,425	\$8,650	\$7,239
Accounts receivable	24,650	16,378	11,772	9,127	5,576
Total current assets	46,629	32,771	24,848	18,337	13,417
Non-current assets	16,557	16,205	15,336	13,588	10,237
Total assets	63,186	48,976	40,184	31,925	23,654
Current liabilities	16,224	15,300	12,708	9,628	7,113
Non-current liabilities	919	820	203	183	204
Total liabilities	17,143	16,120	12,911	9,811	7,317
Total shareholders' equity	46,043	32,856	27,273	22,114	16,337

Table AII.
Genyx balance sheet

In thousands	Statement of cash flows				
	Historical-year ended December 31				
	2009	2008	2007	2006	2005
Operating activities	\$804	\$7,295	\$4,986	\$-296	\$-842
Investing activities	-1,764	-5,030	-4,230	450	267
Financing activities	1,487	1,061	3,019	1,257	9

Table AIII.
Genyx statement
of cash flows

Appendix 2. Risk factor disclosure in low vs high readability**Risk factor 1 – less readable**

We must continue to differentiate our services from those of our competitors; we operate in an evolving industry that requires us to anticipate changes in client preferences and deliver services that demonstrate value to our clients. We operate in a highly competitive environment and in an industry that is subject to significant ongoing changes from market pressures brought about by client demands,

as well as business consolidations, strategic alliances, legislative reform, and marketing practices. These factors require us to differentiate our services by anticipating changes in client preferences and delivering services that demonstrate value to our clients. Failure to anticipate changes in client preferences and deliver services that demonstrate value to our clients can affect our ability to retain or grow our client base, which can adversely affect our results of operations.

Flesch Reading Ease 24.2.

Flesch-Kincaid Grade Level 16.4.

Risk factor 1 – more readable (plain English)

Our sales and profits depend on our competitors and clients' behavior. We operate in a constantly changing industry where many different events occur that might hurt our sales and profits. We need to be aware of market trends and respond quickly to our competitors and clients' behaviors. If we do not keep up with the competition, we could lose clients, sales, and profits.

Flesch Reading Ease 59.2.

Flesch-Kincaid Grade Level 8.9.

Risk factor 2 – less readable

We would be adversely affected if we fail to adequately protect client payroll and other sensitive information. We maintain large amounts of client payroll and other sensitive data about our clients in the ordinary course of our business. Our business therefore depends substantially on our clients' willingness to entrust us with their human resource related and other sensitive information. Events that negatively affect that trust, including failing to maintain appropriate safeguards to keep sensitive information secure, whether as a result of our action or inaction or that of one of our vendors, could expose us to litigation and other proceedings, fines and/or penalties, any of which could adversely affect our business, operating results or financial condition.

Flesch Reading Ease 21.6.

Flesch-Kincaid Grade Level 17.5.

Risk factor 2 – more readable (plain English)

As part of our daily operations, we receive and retain large amounts of personal information about our clients and their employees. Our clients provide this information to us because they believe we will keep it confidential. If we do not keep their information confidential, we will lose their trust and our reputation might suffer. Additionally, clients could sue us and we could be fined and assessed penalties.

Flesch Reading Ease 53.4.

Flesch-Kincaid Grade Level 9.9.

Risk factor 3 – less readable

The Company's internal controls may not be sufficient to ensure timely and reliable financial information. As reported under Item 9a of this Form 10-K, the Company's management completed its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2009 and based on that assessment, concluded that the Company maintained effective internal control over financial reporting as of December 31, 2009. The Company's auditor has issued an attestation report on management's assessment that expresses unqualified opinions on management's assessment and on the effectiveness of the Company's internal control over financial reporting. Still, however, the Company's growth continues to place stress on its internal controls, and there can be no assurance that the Company's control procedures will continue to be adequate. The effectiveness of the Company's controls and procedures may be limited by a variety of risks, including, among other things, faulty human judgment, simple errors, omissions and mistakes, collusion of two or more people or inappropriate management override of procedures. If the Company fails to have effective internal controls and procedures for financial reporting in place, it could be unable to provide timely and reliable financial information.

Flesch Reading Ease 2.6.

Flesch-Kincaid Grade Level 20.9.

Risk factor 3 – more readable (plain English)

In order to produce timely and reliable financial reports, we need effective internal controls. We completed a formal assessment of our internal control system and found it to be effective. Our auditors agree. If our existing controls weaken, we may be unable to prepare timely and reliable financial information. This could happen because of our growth, human errors and mistakes, collusion, or management override.

Flesch Reading Ease 35.2.

Flesch-Kincaid Grade Level 11.5.

Appendix 3. Management Credibility Questionnaire (competence and trustworthiness)

- (1) I believe that Genyx management is very competent at providing risk factor disclosures.
- (2) I believe that Genyx management has little knowledge of the factors involved in providing useful risk factor disclosures.
- (3) I believe that few people are as qualified as Genyx management to provide useful risk factor disclosures about Genyx.
- (4) I believe that Genyx management is very trustworthy.
- (5) I believe that Genyx management is very honest.
- (6) I believe that Genyx management may not be truthful in their risk factor disclosures.

Scale = 1 (strongly disagree) to 7 (strongly agreed).

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