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Seasoned Equity Offerings and Disclosure Sentiment Effects: Evidence from the U.S.

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Abstract

This paper updates the data regarding Seasoned Equity Offering firms (SEOs) long-term performance and finds evidence in line with prior research that they underperform in the long-term. Furthermore, using automated textual analysis on the relevant disclosure filings SEO firms in the United States publish (Form 10-K, Form 8-K and Form 424B), we investigate the relationship between disclosure sentiment variables and long-term return performance. The evidence shows that more frequent use of negative and uncertain words is associated with worse performance. However, no clear implication of the use of disclosure sentiment variables as viable trading predictors can be shown, after controlling for specific conditions and risk.

Keywords: Seasoned Equity Offerings, Long-Term Event Study, Buy-and-Hold Abnormal Returns, Textual Analysis, Disclosure Sentiment, Disclosure Tone.

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1. Introduction

A Seasoned Equity Offering (SEO) serves as a method for a public firm to raise additional funds after its initial public offering (IPO) through issuing shares to the market. Prior studies indicate that firms issuing stocks through an SEO often prove to be poor long-run investments (Spiess & Affleck-Graves, 1995). Firms issuing stock through an SEO underperform in relation to non-issuing firms five years after the offering date (Loughran & Ritter, 1995; Jegadeesh, 2000).

When the firm announces the SEO, the firm could either reveal specific information or be ambiguous. The degree of information a firm discloses depends on the firm's specific situation. If a rival would benefit from the firm revealing excessive information, it is probably unwise to do so (Walker & Yost, 2008).

The communication provided by the firm when issuing an SEO may also have an impact on the way it is interpreted by the firm's shareholders. Walker & Yost (2008) indicate that explicit *ex ante* plans for the use of the raised capital are associated with better economic performance, following decreased information asymmetry. Walker & Yost (2008) indicate that explicit *ex ante* plans for the use of the raised capital are associated with better economic performance, following decreased information asymmetry. According to Adverse selection theory, there exists an information gap between the firms and their shareholders. This implies that signals, such as financial disclosures, can have a great impact on how shareholders perceive the firm (Connelly *et al*., 2011).

Consequently, it is of interest to investigate whether the sentiment of the firms' financial disclosures, in relation to the SEO, is related to the performance of the firm post-issuance. In this paper, we analyze whether mandatory financial disclosures that American SEO firms publish, namely Form 10-K (annual report), Form 8-K (current report), and Form 424B (final SEO prospectus), are related to long-run stock market returns. Using textual analysis, we identify keywords to investigate whether there exists a correlation between the sentiment of financial disclosures and the long-term firm return performance.

Prior studies on disclosure sentiment show that more frequent use of uncertain words is associated with a negative effect on the offering price of an SEO (Huang *et al.*, 2022). Brau *et al.* (2021) identify a relationship between the use of positive and negative words and the pricing of the SEO,

where more frequent use of positive words decreases investors' uncertainty, and hence leads to a decrease in the underpricing of the SEO.

Our analysis is of interest to several stakeholders, including public firms, investors, and managers, and thus offers numerous intended contributions. Firstly, we provide updated empirical evidence of the long-term performance of SEOs in the United States (U.S.). Furthermore, we are updating the evidence regarding textual analysis on whether the disclosure sentiment of a firm from a comprehensive annual report (Form 10-K), a required document by the U.S. Securities and Exchange Commission (SEC), in relation to their SEO, correlates with 12-month return performance of said firms.

Finally, numerous studies link return performance and automated textual analysis of firm's disclosures. (See, e.g., Loughran & McDonald, 2011; Brau *et al*., 2021; Huang *et al*., 2022). However, to the best of our knowledge, there have not been any studies observing whether there exists a correlation between 12-month returns and the sentiment of mandatory filings (Form 424B and Form 8-K) that SEO firms publish, and no prior research that has researched these filings in conjunction with each other and Form 10-K. Hence, further contributing to the current literature, both relating to SEOs and automated textual analysis.

Concluding from the introduction, we predict that seasoned equity offerings (SEOs) are associated with negative long-term economic performance (H1a), and positive (negative) disclosure sentiment is associated with better (worse) long-term economic performance (H1b).

The remaining parts of the report are structured as follows; Literature review with research related to SEOs and textual analysis, followed by a theory section with brief descriptions of relevant theories. Next, we outline our research methodology and data. Finally, we present the results, conclusions, contributions, and further suggestions to the current research.

2. Literature Review

2.1 Seasoned Equity Offerings (SEO)

Reasons for performing SEOs can differ substantially. For instance, a firm might seek funding to expand the business, or it may be because the firm is in financial distress and needs liquidity to pay off its loans. The issuance of new shares can lead to a dilutive effect on the existing shareholders, if the existing shareholders do not invest into the newly issued shares. Consequently, their proportional ownership of the firm decreases as the total number of shares increases (Welch, 1989).

In several empirical studies of seasoned equity offerings, most are interested in the performance or pricing of SEOs. Prior research indicates a long-run underperformance within seasoned equity offerings from firms during 1975-1989. Investing in firms that do not issue equity through SEOs yields a significantly higher return than investing in firms that issue SEOs. Moreover, the youngest and smallest firms perform the worst (Spiess & Affleck-Graves, 1995). Further research shows this underperformance amounts to about eight percent annually compared to firms similar in size that do not issue SEOs (Loughran & Ritter, 1995). The loss of market value upon the announcement of SEOs is significant compared to the equity issued through the offering (Armitage, 1998). In an empirical study by Ghosh *et al.* (2000), the authors examine the pricing of SEOs in Real Estate Investment Trusts (REITs) during 1991–1996. The results illustrate that the market reacts negatively to SEO announcements, and the offering price is significantly lower than the market price. Factors such as REIT size, leverage, and performance affect the discount between the offering and market prices. Furthermore, REITs that adopt SEOs as a financing tool must confront a high cost to finance their operations when they need external capital (Ghosh *et al.*, 2000).

The underperformance of firms issuing SEOs may result from managers leveraging inside information about the firm to issue equity when the stock is overvalued, potentially misleading investors. This theory is supported by the observation that most firms issuing equity do so following a significant stock increase (Spiess & Affleck-Graves, 1995; Loughran & Ritter, 1997). Research in the U.S. and U.K. confirms that firms are successful when it comes to timing their SEOs when the stock is overvalued due to the long-term underperformance of the stocks following the SEOs. Therefore, it can be argued that the initial reactions to the SEOs are not negative enough.

This long-term underperformance of stocks following the issuance of SEOs may be an indication that markets are not fully efficient (Armitage, 1998).

A previous study focuses on a sample of SEOs in the U.S. Market between 1998 and 2002. Considering the firm's actions and how the market reacts, firms tend to announce SEOs when they have favorable news to release, such as positive earnings announcements. Additionally, they find that firms with larger financial deficits, lower past earnings, and higher price-to-book ratios are likelier to conduct an SEO. Although they find that SEOs are generally met with negative abnormal returns, this effect is less pronounced for firms with more substantial growth opportunities (Walker & Yost, 2008).

The evidence advocates for firms to incorporate marketing when offering equity. Marketing is a vital tool SEOs should consider. Firms using marketing are more informative and experience higher quality marketing materials, lower underpricing, and higher aftermarket performance of their shares. Marketing tools are increasingly influential, especially in situations with higher asymmetric information. To decrease the negative effect of information asymmetry in SEOs, firms should not ignore marketing and consider it as an important instrument for achieving a higher post-offer price. (Gao & Ritter, 2010)

2.2 Disclosure Analysis

Textual analysis in finance involves using Natural Language Processing (NLP) techniques to analyze written or spoken language, including various financial textual data sources, such as regulatory filings, news, articles, or social media (Loughran & McDonald, 2020). One of the most influential works regarding disclosure sentiment in an economic setting is developed by Loughran and McDonald (2011). They reveal how textual analysis programs are often used in the examination of the sentiment in financial disclosures. Their paper shows that the word lists most often used by researchers are misclassifying words in financial contexts. For this reason, they develop an alternative set of word lists that is more applicable to analyzing financial documents (Loughran & McDonald, 2011). The dictionaries by Loughran and McDonald (2011) are used in an abundance of studies concluding that the tone of financial disclosures provides signals to the market (Marton *et al.*, 2022).

Applications extend to predicting market movements, detecting fraud, and evaluating the impact of corporate news and announcements on stock prices. Linking disclosure analysis and return, one prior study investigates the relationship between investors and stock returns on the New York Stock Exchange (NYSE) by using textual analysis of social media posts, and finds that investor sentiment exerts a positive and significant effect on abnormal stock returns (McGurk *et al.*, 2020).

Cohen *et al*. (2020) demonstrate that the changes in language in Form 10-K (annual report) and 10-Q (quarterly report) can affect the future returns of firms and predict firms' financial situations and risk of bankruptcies. They also show that annual and quarterly reports contain significant information that investors ignore or are slow to incorporate, hence leading to potential abnormal return in categories of firms.

Additionally, newer research tries to expand on the use of word lists in finance. For example, one paper investigates the relationship between future tense language in annual 10-K reports and stock returns. The study measures the frequency of future tense verbs (such as *will, shall,* and *going to*) in 10-K documents and their relation to future returns. The paper provides empirical evidence that investors can generate positive abnormal returns when investing in firms using fewer verbs associated with future tense in their reports. (Karapandza, 2016). Furthermore, textual analysis is used on disclosures other than Form 10-K. For example, Rawson *et al.* (2022) investigate firms' current reports (Form 8-K) using textual analysis to determine whether an event is positive or negative. Thereafter, investigating whether managers try to produce concurrent unrelated press releases to reduce the reaction to the negative event and hence its effect on short-term stock returns. Another paper also investigates Form 8-K reports on similar premises but focuses on the timing of the Form 8-K, i.e., when the current reports are published. (Goldstein & Wu, 2015). Other examples include investigating the language used in Form S-1 filings (the first SEC filing in an IPO process) and its impact on offer day IPO returns (Loughran & McDonald, 2013) and Earnings Conference Calls (Huang *et al.*, 2014; Suslava, 2021), among others.

Textual analysis in finance is also used in a wide variety of contexts other than observing stock returns. For example, to detect financial fraud using textual analysis as a tool, one article linked features extracted from 10-K and 10-Q filings with unusually high levels of off-balance sheet items to predict material accounting misstatements in firms. The study by Dechow *et al*. (2011) shows that textual analysis can identify potential accounting irregularities. As another example, one paper

uses textual analysis of banks' annual reports as a predictor of their likelihood of performing acquisitions, and whether positive (negative) sentiment correlates with the probability of being a bidder (target) in a bank merger (Katsafados *et al.*, 2021).

Managerial characteristics can also influence the tone of a firm's financial reports. Berns *et al.* (2021) investigate the changes in managerial tone to predict firms' corporate investment activities. They research changes in the Management Discussion and Analysis (MD&A), a section of the Form 10-K, and find that changes in disclosure tone are positively related to subsequent capital investments and M&A activity. Research also shows that CEOs' narcissistic traits can impact the tone in the firms' 10-K filings (Buchholz *et al*., 2018). They find that an optimistic tone from the CEO increases the likelihood of investments in SEOs and R&D. Investors and shareholders get influenced by the optimistic tone of the firm's CEO, which the firm can then use to get support in upcoming investments.

Davis *et al.* (2015) mention that prior research on the sentiment of corporate disclosures has a relationship with current and future firm profitability, but also as strategic incentives, which could be hyping up a stock before there is an announcement of an SEO.

Loughran and McDonald (2020) mention several challenges of using textual analysis in finance, such as data quality issues, the need for specific knowledge, and difficulty interpreting ambiguous language. However, despite these issues, textual analysis can allow financial researchers to measure relevant economic variables that are difficult to explain with traditional quantitative data.

2.3 Seasoned Equity Offerings and Disclosure Sentiment Analysis

More disclosures from firms often equate to higher transparency, i.e., reducing the information asymmetry gap and positive market effects. The information within the disclosure from the firm could result in positive or negative market effects depending on its consequences. (Marton *et al.*, 2022).

With the SEC prospectus forms, firms that frequently use weak modal (e.g., *conceivable, depend* and *nearly*) and uncertain (e.g., *anticipate, approximately,* and *cautious*) words in their prospectuses have a lower offer price on their SEOs. The negative information from cautionary tone in the filing of SEOs is then gradually incorporated into the stock price (Huang *et al.*, 2022). Moreover, focusing on specific types of SEOs, an earlier study that examines the use of soft

information in REIT SEO filings questions whether the use of this kind of information can influence the underpricing of SEOs. Similar to what Huang *et al*. (2022) find, empirical evidence shows that SEOs using fewer negative words in their prospectuses (Form 424B) see a decrease in investor pricing uncertainty, which in turn, reduces the underpricing of the SEO (Brau *et al.*, 2021).

Concluding from prior empirical findings, and as indicated by the literature review, SEOs are expected to underperform over the long term. From disclosure analyses, research indicates that positive (negative) disclosure sentiment is associated with positive (negative) market reactions. Examining multiple disclosures in conjunction with each other is an area where research is scarce. To the best of the authors' knowledge, no prior research has explored multiple disclosures simultaneously and their long-term effects, marking a contribution to current literature.

3. Theoretical Framework

3.1 Adverse Selection

Adverse selection pertains to the problem in the market where buyers and sellers rank market products with varying quality. However, only the seller has access to information regarding the quality of goods that are sold. This can imply that the buyer only makes decisions under the condition of previously sold goods (Wilson, 1980).

Furthermore, the problem of adverse selection can be linked to the theory of the market for lemons, as proposed by Akerlof (1970). This theory scrutinizes the quality of goods traded in a market and discounts the price of the goods in the presence of information asymmetry between buyers and sellers. When sellers possess more information about a product's quality than buyers, low-quality products will drive out high-quality products from the market, which is referred to as the "lemons" problem. The apparent market to explain adverse selection and the lemon problem is the used car market, where only sellers of low-quality cars will be willing to sell at the market price, and high-quality cars will be driven out of the market due to the information asymmetry discount. Consequently, the average quality of cars in the market decreases over time. However, it can be applied to any market where buyers and sellers have asymmetric information (Akerlof, 1970).

The market will be at the equilibrium stage when $S(p) = D(p, \mu)$ where the supply (S) is equivalent to the demand for used cars that include the cars price (p) and the quality of cars' (μ). Wilson (1980) applies a variant of Akerlof's model of the used car market and experiments under

three conditions to find the equilibrium: an auctioneer sets the price, buyers set the price, and sellers set the price. The empirical result shows that only in the auctioneer's case is the equilibrium necessarily characterized by a single price that equals supply and demand. When buyers or sellers set the price, it may contain excess supply or demand at some point. Therefore, allocating goods where the market confronts adverse selection, it is imperative to carefully consider who sets prices, as this process is sensitive to the convention (Wilson, 1980).

3.2 Signaling Theory

Signaling theory, as first formulated by Spence (1973), centers on the understanding that different actors in the market have access to varying amounts of information. The two primary actors in the signaling timeline are the signaler and the receiver. The signaler, being the person or party with information not accessible to the market, plays a significant role due to the information gap that exists between the two parties (Connelly *et al*., 2011).

Every action or decision that the signaler undertakes communicates a signal to the receiver. Signaling theory focuses on the intentional positive signals the signaler communicates to enhance its market perception. In recent years, the studies of negative communication through signaler actions have grown significantly. The receiver is the person or party that gains from the signals communicated by the signaler because of the receiver's lack of information (Connelly *et al.*, 2011). Receivers can, for example, be equity holders in need of information regarding the firm. The equity holders benefit from information obtained through signals in their pursuit to make positive investments, since it gives them a better understanding of the firm's future (Certo *et al*., 2001). This indicates that the actions taken by firms will alter the behavior of the market, and depending on what type of signal is communicated, the behavior change could either benefit the firm or not. For example, even though being specific about the use of capital in an SEO may be a positive signal from the firm, the firm may bear a signaling cost when revealing excessive information that potentially benefits competitors (Walker & Yost, 2008).

Ross (1977) presents a theoretical model focusing on how firms choose their financial structure based on signaling. He asserts that firms with promising investment opportunities might opt to issue debt rather than equity, as managers with positive private information about the firm's prospects would want to prevent dilution of their ownership stake. Conversely, firms with lower-quality projects (i.e., worse investment prospects) would find meeting stringent financial

obligations resulting from debt issuance more challenging, and would thus prefer to issue equity instead, representing a signaling cost for firms with poorer prospects. Myers and Majluf (1984) provide comparable conclusions as to why firms with positive prospects would be more hesitant to issue equity and would prefer debt if external financing is required. Huang *et al.* (2014) mention that if managers of firms with worse financial outlooks indicate over-opportunistic language not warranted by firm fundamentals, firms should experience *ex post* worse economic performance over time, hence representing a signaling cost when mimicking the language used by firms with better future financial outlooks, even though the immediate market response might be positive, both of which their evidence indicate.

4. Data and Methodology

4.1 Data

The sample in our research is retrieved from Thomson Reuters Refinitiv Eikon, specifically focusing on the U.S. stock trading market. Our principal rationale for choosing the U.S. market is to ensure intra-sample comparability. Additionally, it enables us to align our findings with other prior studies conducted in the same market context. Our initial sample period is decided as the beginning of 2021 (01-01-2021) to the end of 2021 (31-12-2021), representing the most recent full year for which data are available at the time of writing, using 12-month returns. The initial number of observations is 1,205.

Following common practice in the literature, we exclude the following: SEOs of financial firms (Standard Industrial Classification [SIC] codes 6000-6999) and utilities (SIC codes 4900-4949) according to Karapandza (2016) and Huang *et al*. (2022), among others. Thereafter, we exclude SEOs with an offer price of less than $5 per share,[1] American Depository Receipts (ADRs), rights offerings, unit offerings, best efforts, pure secondary offerings, and closed-end funds in accordance with Huang *et al*. (2022). Moreover, we exclude SEO's second-and-following offerings within our observation period (in line with Healy & Palepu, 1990; Loughran & Ritter, 1997; Mitchell & Stafford, 2000) and delete the SEOs where PERMNO and CIK do not match (Loughran & McDonald, 2011). We also omit firms that file for an SEO but cancel the SEO before finalizing

[1] We also run regressions including SEOs with offer prices less than five dollars, but it did not materially affect the outcome of the results.

the offering.[2] Lastly, we also require that our sample have all variables of interest, control variables, and their respective filings available. This process yields a final sample of 242 SEOs.[3]

4.1.1 Definitions of Filing Sentiment Measures

This section provides details of SEC filing and disclosure sentiment measurement, including filing selection and the document parsing process. In this study, we investigate the disclosure tone of three distinct filings: Form 10-K, Form 424B, and Form 8-K.

Form 10-K filings are the comprehensive annual reports publicly traded companies must disclose to the U.S. Securities and Exchange Commission (SEC) and contain initial statements to inform stakeholders of the firm's financial performance over the past year. (SEC.gov, 2021; 2023a)

Form 424B filings serve as the prospectus form, disclosing information, facts, or events required for firms to file (SEC.gov, 2023b). For example, it presents the event of an IPO or an SEO offering. For our research, we require Form 424B (and its variants, e.g., 424B1, 424B2, et cetera) to be filed within five days of the filing date of SEOs event, henceforth collectively named 424B filings.[4] However, if the 424B filings are unavailable, we will use S-filings (initial prospectus, i.e., S-1, S-2, and S-3) with the same condition, in accordance with Huang *et al*. (2022). We will manually identify the correct form if there are multiple filings within the period.

Form 8–K, or the current report, is a report of unscheduled events or corporate changes from publicly traded companies to inform shareholders and the SEC. For example, it includes acquisitions, bankruptcies, the resignation of directors, a change in the fiscal year, or equity offering events (SEC.gov, 2017). For the Form 8-Ks in our sample, we will follow the same procedure as for the 424B filings. Thus, we obtain Form 8–K from EDGAR and require that Form 8–K are filed within five days of the SEO filing date to ensure that the Form 8-K is the correct one mentioning the SEO. If there are multiple 8-K within the period, we will likewise manually identify the correct Form 8-K.

[2] As we are only interested in the firms that perform an SEO, this could potentially create a survivorship bias. Hence, we also test our results when including these firms in the data sample. It did not materially affect our results, however.

[3] For the complete sample selection procedure, see Appendix B: Sample selection.

[4] We collect the filings within the 11-day window, e.g., if the SEO is filed on April 4th, 2021, we will use the 424B fillings that are filed between March 30th ,2021, and April 9th, 2021.

4.1.2 Descriptive Statistics

For our sample, in line with Loughran and McDonald (2013) and Huang *et al*. (2022), we report the median number of words of each disclosure and its respective disclosure ratios.[5] See Table 1 to 3 for the full descriptive statistics. The disclosure sentiment ratios in Tables 1 to 3 are the number of respective disclosure words divided by the total number of words in the filing, [6] multiplied by 100. Loughran and McDonald (2013) report a median number of words of 42,027 and 45,890 for S-1 and 424B filings, respectively. Huang *et al*. (2022) report a median number of words of 18,338 and 29,686 for S-filings and 424B filings, respectively. In comparison, we find a median of 25,717 words for our 424B filings. Furthermore, observing the other disclosures used in our data sample, we find a median number of words used in Form 8-K of 20,946, while the more extensive Form 10-K reports show a median of 62,768 words.

When we compare the disclosure variables of Form 10-K (Loughran & McDonald, 2011) and Form 424B (Huang *et al.*, 2022), we observe a mixture of similarities and contrasts. First, we find that the median value for *NegativeRatio* aligns with both Loughran and McDonald (2011) and Huang *et al.* (2022), which show median *NegativeRatio* of 1.36% and 1.40%, compared to our median *NegativeRatio* of 1.47% (Form 10-K) and 0.71% (Form 424B), respectively.

Similarly, their median values for *UncertaintyRatio* align with our sample. They report medians of 1.20% and 1.73%, respectively, compared to our medians of 1.41% (Form 10-K) and 1.30% (Form 424B), respectively. However, we find substantially lower ratios for *Weak-ModalRatio.* They report medians of 0.39% (Loughran & McDonald, 2011) and 1.01% (Huang *et al.*, 2022), respectively. In comparison, our medians differ noticeably with 0.00% (Form 10-K) and 0.00% (Form 424B). We cannot discern feasible reasons for this discrepancy, as the other ratios are in line with previous research. Thus, it is important to further investigate whether other potential factors could affect *Weak-ModalRatio*.

[5] Full description of all variables is available in Appendix A: Variable Definitions.
[6] After XBRL, HMTL and ASCII-embedded data that do not improve inference have been removed, as done by Loughran and McDonald (2011); Huang *et al.* (2022), among others.

Table 1. Descriptive Statistics of Form 10-K.

	Mean	*Std Dev*	*Min*	*Max*	*Q1*	*Median*	*Q3*
Tone of 10 - K							
PositiveRatio	*0.5808*	*0.1426*	*0.2547*	*0.9556*	*0.4647*	*0.5761*	*0.6742*
NegativeRatio	*1.4694*	*0.2827*	*0.7893*	*2.2499*	*1.2582*	*1.4666*	*1.6566*
SentimentRatio	*-0.8882*	*0.2311*	*-1.6715*	*-0.3457*	*-1.0327*	*-0.8663*	*-0.7210*
Positive words	*391*	*180*	*120*	*975*	*254*	*362*	*483*
Negative words	*978*	*377*	*258*	*2,148*	*688*	*925*	*1,233*
Number of words	*65,510*	*20,053*	*28,222*	*147,085*	*51,755*	*62,768*	*75,362*
UncertaintyRatio	*1.4079*	*0.2662*	*0.8070*	*2.0216*	*1.2135*	*1.4059*	*1.6140*
LitigiousRatio	*0.7444*	*0.2243*	*0.2728*	*1.8930*	*0.5835*	*0.7111*	*0.8767*
Uncertainty words	*927*	*348*	*315*	*2,013*	*650*	*872*	*1,136*
Litigious words	*507*	*271*	*77*	*2 045*	*314*	*460*	*648*
Strong-ModalRatio	*0.0019*	*0.0023*	*0.0000*	*0.0116*	*0.0000*	*0.0012*	*0.0032*
Weak-ModalRatio	*0.0009*	*0.0017*	*0.0000*	*0.0117*	*0.0000*	*0.0000*	*0.0014*
Strong Modal words	*1*	*2*	*0*	*8*	*0*	*1*	*2*
Weak Modal words	*1*	*1*	*0*	*5*	*0*	*0*	*1*

Table 1 shows descriptive statistics of the sample 10-K filings and disclosure variables. Ratios indicate the number of words in relation to the total number of words in the filing, presented in percentages, while words indicate the number of words. PositiveRatio, Positive words, Strong-ModalRatio, and Strong Modal words are included for purposes of completeness only.

Table 2. Descriptive Statistics of Form 8-K.

	Mean	*Std Dev*	*Min*	*Max*	*Q1*	*Median*	*Q3*
Tone of 8 - K							
PositiveRatio	*0.3225*	*0.1466*	*0.0912*	*1.1736*	*0.2624*	*0.2939*	*0.3251*
NegativeRatio	*1.0532*	*0.3805*	*0.0000*	*2.6328*	*0.9938*	*1.1512*	*1.2343*
SentimentRatio	*-0.7307*	*0.4089*	*-1.8895*	*0.6745*	*0.2624*	*-0.8571*	*-0.6837*
Positive words	*69*	*67*	*1*	*479*	*47*	*61*	*73*
Negative words	*253*	*197*	*0*	*1,523*	*196*	*254*	*302*
Number of words	*22,073*	*19,377*	*411*	*159,927*	*17,155*	*20,946*	*24,731*
UncertaintyRatio	*0.5697*	*0.3491*	*0.0000*	*2.8942*	*0.413*	*0.4779*	*0.5505*
LitigiousRatio	*2.1360*	*0.7138*	*0.0000*	*3.0293*	*2.112*	*2.4229*	*2.5693*
Uncertainty words	*118*	*140*	*1*	*1,240*	*69*	*96*	*124*
Litigious words	*507*	*391*	*3*	*3,043*	*421*	*520*	*622*
Strong-ModalRatio	*0.0004*	*0.0016*	*0.0000*	*0.0138*	*0.0000*	*0.0000*	*0.0000*
Weak-ModalRatio	*0.0007*	*0.0029*	*0.0000*	*0.0246*	*0.0000*	*0.0000*	*0.0000*
Strong Modal words	*0*	*1*	*0*	*8*	*0*	*0*	*0*
Weak Modal words	*0*	*1*	*0*	*15*	*0*	*0*	*0*

Table 2 shows descriptive statistics of the sample 8-K filings and disclosure variables. Ratios indicate the number of words in relation to the total number of words in the filing, presented in percentages, while words indicate the number

of words. PositiveRatio, Positive words, Strong-ModalRatio, and Strong Modal words are included for purposes of completeness only.

Table 3. Descriptive Statistics of Form 424B.

	Mean	***Std Dev***	***Min***	***Max***	***Q1***	***Median***	***Q3***
Tone of 424B							
PositiveRatio	*0.3532*	*0.1305*	*0.0517*	*1.1112*	*0.2749*	*0.3246*	*0.4008*
NegativeRatio	*0.7957*	*0.3273*	*0.0000*	*2.2591*	*0.6315*	*0.7121*	*0.8521*
SentimentRatio	*-0.4521*	*0.2681*	*-1.5433*	*0.2527*	*0.5185*	*-0.3881*	*-0.3165*
Positive words	*119*	*143*	*1*	*1,213*	*60*	*84*	*119*
Negative words	*270*	*315*	*0*	*2,579*	*140*	*186*	*241*
Number of words	*30,620*	*22,816*	*450*	*209,000*	*21,228*	*25,717*	*32,166*
UncertaintyRatio	*1.3359*	*0.2441*	*0.6654*	*2.2808*	*1.1996*	*1.3016*	*1.4449*
LitigiousRatio	*0.7243*	*0.1690*	*0.3510*	*1.5508*	*0.6201*	*0.7160*	*0.8023*
Uncertainty words	*420*	*321*	*19*	*2,537*	*269*	*339*	*420*
Litigious words	*234*	*212*	*21*	*1,830*	*150*	*183*	*240*
Strong-ModalRatio	*0.0006*	*0.0019*	*0.0000*	*0.0170*	*0.0000*	*0.0000*	*0.0000*
Weak-ModalRatio	*0.0025*	*0.0043*	*0.0000*	*0.0210*	*0.0000*	*0.0000*	*0.0036*
Strong Modal words	*0*	*1*	*0*	*6*	*0*	*0*	*0*
Weak Modal words	*1*	*1*	*0*	*9*	*0*	*0*	*1*

Table 3 shows descriptive statistics of the sample 424B filings and disclosure variables. Ratios indicate the number of words in relation to the total number of words in the filing, presented in percentages, while words indicate the number of words. PositiveRatio, Positive words, Strong-ModalRatio, and Strong Modal words are included for purposes of completeness only.

4.2 Methodology

4.2.1 Long-Term Event Study

To address our research questions, we conduct an event study following the methodologies provided by Kothari and Warner (2004). Loughran and McDonald (2011) and Arslan-Ayaydin *et al*. (2016) provide the methods used to calculate the disclosure sentiment. The formula for calculating long-term abnormal returns is provided by Kothari and Warner (2004) and is calculated as follows:

$$BHAR_{i,t} = \prod_{t=1}^{T}(1 + R_{i,t}) - \prod_{t=1}^{T}(1 + R_{m,t}) \quad (1)$$

Where equation (1) represents Buy-and-Hold Abnormal Return (*BHAR*) of firm i, in period t, where T is twelve months from the filing date of the seasoned equity offering. The *BHAR* is the difference between the month t return of firm i, and the t month return of our market index, twelve months from the SEO filing date. Furthermore, Kothari and Warner (2004) mention that most long-term event studies use a sample period of twelve months or longer. They also provide arguments for why the statistical power decreases with horizon length, such as increasing difficulties separating the effects of an event on firm performance. Hence, a sample period of twelve months is chosen in this paper. The disclosures being examined are the closest available 10-K before the filing of the SEO, whilst Form 8-K and Form 424B are published in conjunction with the SEO filing.

We use a dictionary method to textually analyze the disclosures. The dictionary specifications used in the text analysis are the ones developed by Loughran and McDonald (2018). To measure sentiment, we include the ratios (negative, uncertain, litigious, and weak modal) according to Loughran and McDonald (2011), which is the count of specific words in the dictionary (i.e., the number of negative words, or the number of uncertain words and so on) divided by the total number of words in the filing.

We have chosen to apply the same calculations (equation 2) used by Arslan-Ayaydin *et al*. (2016). They measure the tone of the disclosure by taking the difference between the number of positive words and number of negative words, in relation to the total amount of words in the filing (Arslan-Ayaydin *et al*., 2016). Zhang *et al*. (2022) also used equation (2) when examining Initial Coin Offerings (ICO) and defined tone as the difference between positive and negative words. If the difference is positive, it is classified as positive tone, and vice versa. They find that most of the words used in their disclosures are negative (Zhang *et al.*, 2022).

$$Sentiment\ Ratio\ = \frac{(Number\ of\ positive\ words - Number\ of\ negative\ words)}{(Total\ number\ of\ words)} \times 100 \quad (2)$$

Furthermore, we will conduct a regression analysis where our return measure, i.e., equation (1), serves as a dependent variable and relevant explanatory variables commonly used in prior research. Accordingly,[7]

$$BHAR_i = \beta_0 + \beta_i Disclosure\ Tone_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad (3)$$

4.2.2 Assumption of Ordinary Least Squares (OLS)

Prior to executing the regression through Ordinary Least Squares (OLS), we must ensure that the assumptions of linear regression hold. The four potential OLS assumptions that need to be tested are linearity, reliability of measurement, homoscedasticity, and normality. The initial assumption that should be tested is linearity. OLS presupposes that the relationship between dependent and independent variables is linear in nature. Otherwise, if the relationship between independent and dependent variables is nonlinear, the result of the regression estimation will be misestimated (Osborne & Waters, 2002). To test the linearity assumption, we exploit the Ramsey RESET test and examine the linearity between the dependent and the independent variables in all regression models of this analysis. Appendix D – 1 shows that according to the Ramsey RESET test, our models do not suffer from severe Omitted Variable Bias (OVB), as the test accepts the null hypothesis that the model does not suffer from OVB. Hence, the linearity assumption should hold.

Subsequently, the second assumption assumes that our variables exhibit low levels of multicollinearity in the regression model. Multicollinearity refers to the high intercorrelation between two or more independent variables, which can cause problems estimating the regression coefficients and increases standard errors. To investigate the correlation between exploratory variables, we observe the correlation matrices (pairwise correlation) and test the variables by using the variance influence factor (VIF) model. Typically, a VIF value higher than 4 to 10 ($\geq$ 4 to 10) can indicate high multicollinearity, which can impact the accuracy and reliability of the regression model. However, it should not be used as a single measure to determine whether the regression has issues or not (O'Brien, 2007). According to Kutner *et al.* (2004), a VIF value greater than 10 indicates serious multicollinearity and a VIF greater than 100 implies severe multicollinearity

[7] See the full specified regression models used on Form 10 – K, Form 8 – K, and Form 424B in Appendix C and variable definitions in Appendix A.

problems. For illustrative purposes, Appendix D-2.1 shows an exemplary regression when all disclosure variables are run together. From the table, one can observe that *NegativeRatio* and *SentimentRatio* display very high VIF values throughout the different filings. This is not surprising, as the words used in *NegativeRatio* are also used in *SentimentRatio*. To control for this issue, we separate our main disclosure variables into five different regressions, whilst still confirming to the Ramsey RESET test for omitted variable bias, to investigate the influence between every disclosure measure in Form 10-K, Form 8-K, and Form 424B individually.

Moreover, we assess whether the third assumption of homoscedasticity holds in our regression models using the Breusch - Pagan test (seen in Appendix D-3). As the test implies, the regression models show signs of heteroskedasticity. Hence, we use robust standard errors when running the regressions, as recommended by Wooldridge (2016).

The final assumption we consider is the OLS assumption of normality, which stipulates that the residuals should be normally distributed. To test the normality of residuals, we exploit the Shapiro - Wilk test, and the result from this test is presented in Appendix D-4. The test indicates that our underlying distribution is not normal. However, as mentioned by Wooldridge (2016), given the Central Limit Theorem (CLT), the normality assumption can be approximated with larger sample sizes. Therefore, the sample is inspected using histograms, all of which are available in Figures E1 - E3 in Appendix E.

4.2.3 Sharpe Ratio

To investigate whether disclosure sentiment correlates with long-term return performance, addressing our second research question, we test our results and evaluate the performance using Sharpe Ratios. The Sharpe ratio was proposed by Sharpe (1994) to measure risk–adjusted returns and assess the performance of the investment portfolio or strategy. The formula is calculated accordingly,

$$Sharpe\ ratio = \frac{R_p - R_f}{\sigma_p} \qquad (4)$$

where R_p is calculated as the excess return of the investment portfolio, R_f is the risk-free rate, and σ_p is the standard deviation of the portfolio's excess return.

4.2.4 Treynor Ratio

Similar to the Sharpe ratio, we also assess the performance using the Treynor Ratio. The Treynor Ratio was proposed by Treynor (1961) as a measurement to estimate reward to volatility. The formula is calculated accordingly,

$$Treynor\ ratio = \frac{R_p - R_f}{\beta_p} \quad (5)$$

where R_p is calculated as the excess return of the investment portfolio, R_f is the risk-free rate, and β_p is the average of the portfolio's beta.

5. Analysis and Results

5.1 SEO Long-Term Firm Performance

As outlined in the introduction and the literature review, prior evidence indicates that SEOs are on average expected to underperform over extended periods. To answer the first research question, we conduct a paired two-sided t-test on our sample, rejecting the null if the BHAR is statistically different from a mean of zero. Our results yield a t-statistic of -2.444 and a probability associated with student's t-test of 0.0152 post-winsorization. Hence, we reject the null at the five percent significance level.

On average, the SEOs in our sample exhibit a negative 12-month CRSP value-weighted BHAR of 7.00%, indicating significant underperformance compared to the benchmark index before winsorizing at the 1 percent and 99 percent level. The firm that manifests the most substantial gain in the period is A-Mark Precious Metals, Inc (AMRK), with a BHAR of 128.51% using the value-weighted index. Following winsorization at the 1 percent and 99 percent levels to mitigate the impact of outliers in our sample, the average SEO shows a negative value-weighted BHAR of 6.59%. An increase in returns of 0.41%.[8]

Result 1: *The SEOs in our sample confirm prior research and show significant underperformance over the long term compared to benchmark indices.*

[8] Using an alternative index, CRSP Equal-weighted returns, similar results is received, but at the one percent significance level. Our BHAR results are reexamined using the alternative index and is discussed in section 5.4.1. Change in return index to CRSP Equal-weighted.

5.2 Correlation and Bivariate Analysis

As one could expect, there might exist a correlation between our explanatory variables, an observation also noted by prior researchers, such as Huang *et al*. (2022). This correlation could potentially lead to issues of multicollinearity in our models. Hence, pairwise correlation tables for all disclosure variables on all our filings are examined and presented in Table 4.

As noted earlier, *SentimentRatio* and *NegativeRatio* demonstrate a very high correlation, between 0.8617 to 0.9450, throughout our filings. This can be attributed to the fact that the words used in *NegativeRatio* are also used in *SentimentRatio*. The correlation between *NegativeRatio* and *SentimentRatio* shows the highest of the presented correlations, followed by the correlation between *NegativeRatio* and *UncertaintyRatio* (0.7900) on Form 10-K.

These findings align with our expectations, considering the use of these negative and uncertain words is presumably used in tandem to some extent. The results differ slightly when the pairwise correlations are run on different filings (i.e., Form 10-K, Form 8-K, and Form 424B), but the implications remain relatively consistent. When observing Table 4 separately, the Pairwise Correlation would indicate that all disclosure variables should be executed in separate regressions. In conjunction with our VIF levels and the Ramsey RESET test for Omitted Variable Bias (OVB), we decided to separate each disclosure variable into five separate regressions, as have been done by previous research (Loughran & McDonald, 2011; Brau *et al.*, 2021; Huang *et al.*, 2022). The complete set of pairwise correlation tables is available in Appendix G.[9]

Table 4. Pairwise Correlation
Form 10 – K Pairwise Correlation

Form 10 - K

Variables	**1)**	**2)**	**3)**	**4)**	**5)**
NegativeRatio	*1.0000*				
UncertaintyRatio	*0.7900****	*1.0000*			
LitigiousRatio	*0.4946****	*0.2778****	*1.0000*		
Weak-ModalRatio	*-0.0229*	*-0.1082**	*0.0283*	*1.0000*	
SentimentRatio	*-0.8617****	*-0.5591****	*-0.4304****	*-0.0538*	*1.0000*

[9] For the full table, see Table G1 - G3 in the Appendix G illustrating all the pairwise correlations.

Form 8 – K Pairwise Correlation

Form 8 - K

Variables	**1)**	**2)**	**3)**	**4)**	**5)**
NegativeRatio	*1.0000*				
UncertaintyRatio	*-0.0445*	*1.0000*			
LitigiousRatio	*0.5923****	*-0.5683****	*1.0000*		
Weak-ModalRatio	*0.0190*	*0.0007*	*-0.0025*	*1.0000*	
SentimentRatio	*-0.9361****	*0.1705****	*-0.7202****	*0.0028*	*1.0000*

Form 424B Pairwise Correlation

Form 424B

Variables	**1)**	**2)**	**3)**	**4)**	**5)**
NegativeRatio	*1.0000*				
UncertaintyRatio	*0.6583****	*1.0000*			
LitigiousRatio	*0.4880****	*0.1937****	*1.0000*		
Weak-Modal Ratio	*-0.0287*	*0.1267***	*-0.0855*	*1.0000*	
SentimentRatio	*-0.9450****	*-0.6540****	*-0.4727****	*0.0274*	*1.0000*

*Table 4 shows the Pairwise Correlation table between our disclosure sentiment variables on each filing. ***, **, and * indicate significance and the 1%, 5% and 10% level, respectively.*

5.3 Multivariate Analysis

In this section, we estimate regressions to examine the relationship between disclosure variables on our sample SEC filings and their respective 12-month returns. The dependent variable, Buy-and-Hold-Abnormal Returns (BHAR), is calculated to estimate the post-SEO performance of our sample. As used in previous literature (e.g., Ritter, 1991; Loughran & McDonald, 2011; 2013; Huang *et al*., 2022) we use the CRSP value-weighted returns. Our main independent variables are *NegativeRatio, UncertaintyRatio, SentimentRatio, Weak-ModalRatio,* and *LitigiousRatio*. The regressions control for several different firm characteristics used in previous relevant literature (e.g., Loughran & Ritter, 1995; Spiess & Affleck-Graves, 1995; Eckbo *et al.,* 2008; Lyandres *et al.,* 2008; Huang *et al.,* 2022).

We use *Book to market* (as an indicator of valuation), *Return On Assets (ROA)* (a proxy for profitability), *ln(Mkt Cap)* (natural logarithm of a firm's market capitalization, a proxy for size), *Leverage* (total debt to total assets, a proxy for capital structure) and *Investments to asset* (defined

according to Lyandres *et al.*, 2008, a proxy for investment factor). Furthermore, following Huang *et al*. (2022), we incorporate three additional dummy variables. Namely, *TradingMarketDummy*, if a firm is trading on NASDAQ or not, *RecentIPODummy*, if a firm has completed an IPO within one year from their SEO and *LitigationCodeDummy*. The last dummy is defined according to Huang *et al*. (2022) and is equal to 1 if the firm operates in an industry with a higher risk of litigation.[10]

In all models, all continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effects of outliers. For the complete illustration of our regression results, see Table A1 to Table A3. For a comprehensive description of all variable definitions and their calculations, refer to Appendix A: Variable definitions.

Our results indicate that our main explanatory variables are inconclusive. *NegativeRatio* show negative significance when performing regressions on Form 10-K filings and on Form 424B filings, at the five percent and one percent levels, respectively. The coefficient is negative for all filings implying that more negative words are associated with negative return performance. However, *NegativeRatio* does not exhibit statistical significance when performed on the Form 8-K filings.

Loughran and McDonald (2011) identify *NegativeRatio* as negatively significant when assessing short-term returns on Form 10-K. However, Huang *et al*. (2022) do not observe similar significant results when run on Form 424B filings. Hence, we observe similar results to Loughran and McDonald (2011) but contrasting results to Huang *et al.* (2022).

Furthermore, a similar pattern is observed when examining *UncertaintyRatio*. The variable is negatively significant only on Form 10-K and Form 424B but not on Form 8-K, at the ten percent and one percent levels, respectively. Although Loughran and McDonald (2011) and Huang *et al*. (2022) both find *UncertaintyRatio* negatively significant in the short-term (i.e., within a few days), we find this effect to hold over a longer timeframe (i.e., twelve months) when observing both 10-K and Form 424B filings.

[10] Defined according to Huang et al. (2022) as firms that operate in industries with SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374.

Additionally, *Weak-ModalRatio* does not demonstrate significance on any of our filings. *LitigiousRatio*, which are words associated with litigation, only exhibit significance on Form 424B, albeit at the ten percent level. The coefficient is negative on all our filings, resulting in contrasting findings to Loughran and McDonald (2011), who report a positively significant coefficient.

Moreover, *SentimentRatio* shows negative significance solely on Form 424B, at the one percent level. The coefficient is negative, which is not surprising, as almost all our SEOs have more negative words than positive words in their filings. Nevertheless, before extracting the *SentimentRatio* from our filings, we anticipated *SentimentRatio* to be positive on average, as Aslans-Ayaydin *et al.* (2016) results show a positive mean. In accordance with signaling theory, managers should be more inclined to use positive words more frequently rather than negative words. However, Aslans-Ayaydin *et al.* (2016) investigate Earnings Conference Calls and not mandatory filings required by the SEC, which potentially affect the results.

One possible explanation for the significance of certain disclosure variables on Form 424B but not on Form 10-K could be attributable, in part, to differences in filing dates. Most SEOs in our sample publish a new Form 10-K filing before the end the return calculation, which begins from the SEO filing date. The updated Form 10-K presents the market with new information that could potentially influence the return outcome. Further discussion about this issue is mentioned in the robustness checks section, 5.4.2. Change in time interval on Form 10-K (Annual Report).

Neither *Book to market* nor *ROA* show significance among the firm characteristic variables. However, additional firm characteristic variables show significance at various levels between one and ten percent. *Ln(Mkt Cap)* is consistently significant at the one percent level on all filings, and the coefficients are negative, implying that size has a negative impact on returns. Furthermore, *Leverage* is negatively significant between five and ten percent on our filings, implying that leverage has a negative effect on the SEOs in our sample. Additionally, we investigate whether SEOs investments into the firm positively effect long-term returns. We investigate this through *Investment to asset* (defined according to Lyandres *et al.*, 2008). The coefficient is positively significant on all our filings between the five and ten percent level, implying positive effects from firm investments.

In the regressions, we include three dummy variables. Firstly, *RecentIPODummy* is investigated to see whether firms that conducted an SEO within one year of their IPO underperform. However, we find no such relationship, which aligns with Huang *et al*. (2022) findings. Secondly, *LitigationCodeDummy* is tested to see whether SEOs operating in industries with a higher litigation risk underperform. However, we find neither such relationship.

Lastly, *TradingMarketDummy* is included in the regressions to see whether firms trading on NASDAQ are associated with underperformance. In contrast to Huang *et al*. (2022) findings, who did not find significant effects, both 3-day and 10-day post-offer, we find *TradingMarketDummy* significant at the five percent level for all three filings when measured using 12-month BHARs. The result indicates that the NASDAQ underperformance in our sample only becomes pronounced over longer timeframes.

A noteworthy observation is that none of our disclosure variables exhibit significance when run on Form 8-K. This result makes us suspect that the filing size may affect the disclosure variables' usefulness. Form 8-K filings are the smallest filings on average. In our sample, Form 8-K shows, on average, 8,547 and 43,437 words less than Form 424B and Form 10-K, respectively. Tables A1 to A3 below outline our full regression results. [11]

Table A1: Regression of Disclosure tone on Form 10 - K using Value-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.1967***				
	(0.050)				
UncertaintyRatio		*-0.1789**			
		(0.100)			
LitigiousRatio			*-0.0242*		
			(0.849)		
Weak-ModalRatio				*-0.2152*	
				(0.176)	
SentimentRatio					*-0.0242*
					(0.849)
Firm characteristics					
Book to market	*0.0680*	*0.0819*	*0.0796*	*0.0724*	*0.0796*
	(0.518)	*(0.436)*	*(0.453)*	*(0.453)*	*(0.453)*

[11] The tables, namely Table A1-A3, Table B1-B3, and Table C1, are separate and not linked to the main tables in the Appendix A to C.

ROA	*0.1355*	*0.1352*	*0.1452*	*0.1492*	*0.1452*
	(0.171)	*(0.170)*	*(0.159)*	*(0.159)*	*(0.159)*
Ln(Mkt Cap)	*-0.0493****	*-0.0478****	*-0.0488****	*-0.0514****	*-0.0488****
	(0.003)	*(0.004)*	*(0.004)*	*(0.004)*	*(0.004)*
Leverage	*-0.1667***	*-0.1588***	*-0.1584***	*-0.1675***	*-0.1584***
	(0.018)	*(0.024)*	*(0.027)*	*(0.027)*	*(0.027)*
Investment to asset	*0.2993***	*0.3094***	*0.2876***	*0.2763***	*0.2876***
	(0.040)	*(0.035)*	*(0.048)*	*(0.048)*	*(0.048)*
Dummy Variables					
TradingMarketDummy	*-0.1639***	*-0.1718***	*-0.1721***	*-0.1695***	*-0.1721***
	(0.031)	*(0.024)*	*(0.024)*	*(0.024)*	*(0.024)*
LitigationCodeDummy	*0.0632*	*0.0600*	*0.0257*	*0.0171*	*0.0257*
	(0.277)	*(0.321)*	*(0.678)*	*(0.678)*	*(0.678)*
RecentIPODummy	*0.0252*	*0.0383*	*0.0171*	*0.0329*	*0.0171*
	(0.735)	*(0.589)*	*(0.796)*	*(0.796)*	*(0.796)*
Adj. R^2	*0.1114*	*0.1080*	*0.0981*	*0.0981*	*0.0981*

*Table A1 examines the relationship between 12-month BHAR on Form 10-K using the CRSP Value-weighted return index as the dependent and independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%,5%, and 10% levels, respectively.*

Table A2: Regression on Disclosure Tones on Form 8 - K using Value-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.0115*				
	(0.887)				
UncertaintyRatio		*-0.0140*			
		(0.891)			
LitigiousRatio			*-0.0046*		
			(0.908)		
Weak-ModalRatio				*-0.1263*	
				(0.858)	

Sentimentratio					*-0.0039*
					(0.858)
Firm characteristics					
Book to market	*0.0723*	*0.0700*	*0.0737*	*0.0727*	*0.0727*
	(0.497)	*(0.510)*	*(0.486)*	*(0.491)*	*(0.491)*
ROA	*0.1507*	*0.1522*	*0.1495*	*0.1497*	*0.1497*
	(0.130)	*(0.126)*	*(0.142)*	*(0.136)*	*(0.136)*
Ln(Mkt Cap)	*-0.0475****	*-0.0475****	*-0.0477****	*-0.0472****	*-0.0472****
	(0.005)	*(0.005)*	*(0.005)*	*(0.006)*	*(0.006)*
Leverage	*-0.1605***	*-0.1608***	*-0.1598***	*-0.1617***	*-0.1617***
	(0.024)	*(0.023)*	*(0.026)*	*(0.022)*	*(0.022)*
Investment to asset	*0.2751**	*0.2772**	*0.2750**	*0.2745**	*0.2745**
	(0.062)	*(0.059)*	*(0.063)*	*(0.062)*	*(0.062)*
Dummy Variables					
TradingMarketDummy	*-0.1732***	*-0.1738***	*-0.1722***	*-0.1717***	*-0.1717***
	(0.025)	*(0.022)*	*(0.024)*	*(0.026)*	*(0.026)*
LitigationCodeDummy	*0.0256*	*0.0244*	*0.0237*	*0.0245*	*0.0245*
	(0.679)	*(0.692)*	*(0.702)*	*(0.690)*	*(0.690)*
RecentIPODummy	*0.0058*	*0.0138*	*0.0065*	*0.0096*	*0.0096*
	(0.938)	*(0.842)*	*(0.936)*	*0.885)*	*(0.885)*
Adj. R^2	*0.0951*	*0.0951*	*0.0951*	*0.0952*	*0.0950*

*Table A2 examines the relationship between 12-month BHAR on Form 8-K using the CRSP Value-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

Table A3: Regression on Disclosure Tones on Form 424B using Value-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.2255****				
	(0.001)				
UncertaintyRatio		*-0.2744****			

		(0.007)			
LitigiousRatio			*-0.2417**		
			(0.100)		
Weak-ModalRatio				*-1.3087*	
				(0.864)	
SentimentRatio					*-0.2705****
					(0.001)
Firm characteristics					
Book to market	*0.0707*	*0.0790*	*0.0844*	*0.0733*	*0.0811*
	(0.501)	*(0.452)*	*(0.425)*	*(0.490)*	*(0.441)*
ROA	*0.1363*	*0.1266*	*0.1456*	*0.1499*	*0.1372*
	(0.164)	*(0.203)*	*(0.144)*	*(0.130)*	*(0.161)*
Ln(Mkt Cap)	*-0.0442****	*-0.0501****	*-0.0434***	*-0.0476****	*-0.0445****
	(0.007)	*(0.003)*	*(0.011)*	*(0.005)*	*(0.007)*
Leverage	*-0.1187**	*-0.1143**	*-0.1508***	*-0.1603***	*-0.1182**
	(0.100)	*(0.100)*	*(0.032)*	*(0.023)*	*(0.100)*
Investment to asset	*0.2882***	*0.3083***	*0.2645**	*0.2756***	*0.2747**
	(0.046)	*(0.037)*	*(0.080)*	*(0.060)*	*(0.054)*
Dummy Variables					
TradingMarketDummy	*-0.1847***	*-0.1630***	*-0.1823***	*-0.1710***	*-0.1777***
	(0.015)	*(0.029)*	*(0.017)*	*(0.027)*	*(0.019)*
LitigationCodeDummy	*0.0128*	*0.0270*	*0.0275*	*0.0235*	*0.0109*
	(0.834)	*(0.655)*	*(0.651)*	*(0.705)*	*(0.859)*
RecentIPODummy	*0.0539*	*-0.0270*	*0.0455*	*0.0091*	*0.0321*
	(0.504)	*(0.731)*	*(0.558)*	*(0.891)*	*(0.664)*
Adj. R^2	*0.1221*	*0.1165*	*0.1028*	*0.0951*	*0.1212*

*Table A3 examines the relationship between 12-month BHAR on Form 424B using the CRSP Value-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

5.4 Active Trading Strategies

Several of our disclosure variables are significant in the filings following the multivariate analysis. To that end, we attempt to identify whether our disclosure tone variables can function as viable trading strategies for investors. Therefore, we assess active trading strategies that involve taking long and short positions in the SEOs within our observational period, from January 1st to December 31st, 2021. These strategies are contingent on the disclosure variables retrieved from the prospectuses (Form 424B).

Specifically, we test two distinct trading strategies, The first strategy involves continuously taking long and short positions in SEO firms throughout the year, using a holding period of twelve months from the respective SEO filing date for each firm.[12] Explicitly, if a firm performs an SEO on January 5th, 2021, the Form 424B is analyzed and the firm is thereafter either invested into, shorted or ignored based on the ratio from the Form 424B. If the firm is either invested into or shorted, the position is held until January 5th, 2022. If a second firm performs an SEO on January 7th, 2021, the same procedure is conducted, (either ignored or held until January 7th, 2022, through a long or short position), and so on for each firm throughout the year.

The second trading strategy involves sorting all SEOs based on the prospectuses at a specific date (e.g., mid-year, year-end or the first trading day of the subsequent year, as in this paper), after which a long-short portfolio is created and rebalanced twelve months later. Explicitly, on January 3rd, 2022 (first trading day of the year 2022) a long-short portfolio is created and held until January 3rd, 2023. In our analysis, we categorize the SEOs into quintiles based on their specific disclosure variables. For instance, the quintile with the highest *NegativeRatio* is shorted, while we take a long position in the quintile with the lowest *NegativeRatio,* and so on for each disclosure variable.[13]

[12] This strategy would require that you *ex ante* decide a pre-determined threshold for when either to long or short a particular firm (e.g., short firms with *NegativeRatio* above 2.0% and long firms with *NegativeRatio* below 0.75%). In this paper we select firms by sorting top and bottom quintiles, hence for *NegativeRatio* this represented 0.92% and 0.60%, respectively.

[13] On *SentimentRatio*, you would take a long position on the highest ratio and a short position on the lowest, as a high *SentimentRatio* would indicate a more positive filing and vice versa.

However, the results show that even though alpha is positive for some of the disclosure variables, the trading strategies do not warrant active trading when risk is considered. As can be shown by the Sharpe Ratios and Treynor Ratios for all our disclosure variables outlined in Table 5 below.[14]

Table 5. Form 424B (prospectus) Trading Strategies following disclosure tones

Disclosure Tones	***Beta***	***Abnormal Return (alpha)***	***Sharpe Ratio***	***Treynor Ratio***
NegativeRatio	*1.5962*	0.7346	*0.1508*	*0.0046*
	[0.8276]	*[0.0358]*	*[0.2065]*	*[0.0433]*
UncertaintyRatio	*1.5428*	*-0.1480*	*-0.0361*	*-0.0009*
	[1.5575]	*[0.0278]*	*[0.1614]*	*[-0.0260]*
LitigiousRatio	*1.6359*	*1.1644*	*0.2519*	*0.0071*
	[1.6100]	*[0.0275]*	*[0.1585]*	*[0.0179]*
SentimentRatio	*1.6148*	*0.6793*	*0.1426*	*0.0042*
	[1.6681]	*[-0.0434]*	*[-0.2512]*	*[0.0171]*

Table 5 outlines the returns of long-short portfolios using active trading strategies based on the results from Form 424B. Beta refers to the average beta of the respective portfolio. Abnormal Return (alpha) refers to the average of the 12-month excess return from the respective portfolio after Form 424B is filed, expressed in percent. Sharpe Ratios and Treynor Ratios are calculated according to Equation 4 and Equation 5, respectively. Numbers in square brackets show the results from the second trading strategy, instead starting on the first trading day (3rd of January 2022) and rebalancing twelve months later.

Result 2: *More frequent use of negative words is associated with worse performance. However, no clear implication of the use of disclosure variables as viable trading predictors can be shown after risk is considered.*

[14] *NegativeRatio* also shows significance (at the one percent level) when changing the time interval according to the convention mentioned in section *5.4.2. Change in time interval on Form 10-K (Annual Report)*, we test *NegativeRatio* once again but receive similar results.

5.5 Robustness Checks

We perform several different robustness checks to test whether our results from the event study and subsequent regressions hold. Hence, investigating whether our results of interest are sensitive to changes in conditions and model specifications.

5.5.1. Change in Return Index to CRSP Equal-Weighted

We use the CRSP value-weighted return index as our principal index alternative. CRSP value-weighted return is used as comparative indices in both Loughran and McDonald (2011) and Huang *et al*. (2022) among several others. However, both Brav *et al*. (2000) and Loughran and Ritter (2000), as examples, emphasize the fragility of certain research's design, by mentioning that it is often sensitive to changes in return indices. Hence, as robustness checks, our results and regressions presented in *5.1 SEO Long-Term Firm Performance* and *5.3 Multivariate Analysis* are re-estimated using the 12-month BHAR against CRSP equal-weighted returns. As seen in Table B1 - B3, when changing the market index from value-weighted to equal-weighted, our results show minimal variation. These outcomes indicate that the results from our sample are quantitatively robust to this market index adjustment. When re-estimating our t-tests, our results show significance at similar levels (with a probability associated with Student's t-test of 0.0034) and average 12-month CRSP equal-weighted BHAR of -7.92% before winsorizing at the 1 and 99 percent level and -8.02% after winsorzing.[15]

Table B1: Regression of Disclosure tone on Form 10 - K using CRSP Equal-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.1908**				
	(0.058)				
UncertaintyRatio		*-0.1701**			
		(0.100)			
LitigiousRatio			*-0.0023*		
			(0.9860)		
Weak-ModalRatio				*-2.4982*	
				(0.109)	

[15] Using a completely different but less representative index, the S&P 500 Total Return index (SPTM) changes the BHARs noticeably, but it did not change our conclusions. The SEOs in our sample show significant underperformance compared to this additional index, but the underperformance is more pronounced.

SentimentRatio					*-0.1070*
					(0.373)
Firm characteristics					
Book to market	*0.0627*	*0.0762*	*0.0747*	*0.0654*	*0.0682*
	(0.562)	*(0.482)*	*(0.492)*	*(0.554)*	*(0.531)*
ROA	*0.1456*	*0.1455*	*0.1586*	*0.1588*	*0.1617*
	(0.149)	*(0.146)*	*(0.132)*	*(0.119)*	*(0.109)*
Ln(Mkt Cap)	*-0.0471****	*-0.0457****	*-0.0466****	*-0.0496****	*-0.0488****
	(0.005)	*(0.006)*	*(0.006)*	*(0.003)*	*(0.005)*
Leverage	*-0.1735***	*-0.1659***	*-0.1647***	*-0.1763***	*-0.1694***
	(0.015)	*(0.020)*	*(0.023)*	*(0.015)*	*(0.018)*
Investment to asset	*0.2974***	*0.3068***	*0.2864**	*0.2729**	*0.2909**
	(0.048)	*(0.042)*	*(0.056)*	*(0.068)*	*(0.053)*
Dummy Variables					
TradingMarketDummy	*-0.1694***	*-0.1772***	*-0.1779***	*-0.1742***	*-0.1776***
	(0.027)	*(0.021)*	*(0.021)*	*(0.022)*	*(0.020)*
LitigationCodeDummy	*0.0625*	*0.0586*	*0.0243*	*0.0165*	*0.0331*
	(0.295)	*(0.345)*	*(0.700)*	*(0.790)*	*(0.584)*
RecentIPODummy	*0.0542*	*0.0665*	*0.0460*	*0.0646*	*0.0430*
	(0.448)	*(0.331)*	*(0.476)*	*(0.321)*	*(0.521)*
Adj. R^2	*0.1105*	*0.1070*	*0.0981*	*0.1064*	*0.1012*

*Table B1 examines the relation between 12-month BHAR on Form 10-K using the CRSP Equal-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%,5%, and 10% levels, respectively.*

Table B2: Regression on Disclosure Tones on Form 8 - K using CRSP Equal-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.0128*				
	(0.875)				
UncertaintyRatio		*-0.0166*			
		(0.874)			

LitigiousRatio			*-0.0033*		
			(0.935)		
Weak-ModalRatio				*-3.0684*	
				(0.793)	
SentimentRatio					*-0.0013*
					(0.985)
Firm characteristics					
Book to market	*0.0660*	*0.0632*	*0.0672*	*0.0665*	*0.0665*
	(0.546)	*(0.562)*	*(0.536)*	*(0.539)*	*(0.542)*
ROA	*0.1605*	*0.1622*	*0.1597*	*0.1588*	*0.1610*
	(0.114)	*(0.111)*	*(0.124)*	*(0.121)*	*(0.116)*
Ln(Mkt Cap)	*-0.0452****	*-0.0452****	*-0.0454****	*-0.0447****	*-0.0453****
	(0.008)	*(0.008)*	*(0.008)*	*(0.009)*	*(0.008)*
Leverage	*-0.1679***	*-0.1682***	*-0.1675***	*-0.1695***	*-0.1684***
	(0.019)	*(0.019)*	*(0.021)*	*(0.018)*	*(0.019)*
Investment to asset	*0.2726**	*0.2750**	*0.2728**	*0.2715**	*0.2735**
	(0.073)	*(0.069)*	*(0.074)*	*(0.073)*	*(0.072)*
Dummy Variables					
TradingMarketDummy	*-0.1786***	*-0.1792***	*-0.1777***	*-0.1765***	*-0.1780***
	(0.022)	*(0.019)*	*(0.020)*	*(0.023)*	*(0.023)*
LitigationCodeDummy	*0.0262*	*0.0249*	*0.0243*	*0.0251*	*0.0246*
	(0.676)	*(0.691)*	*(0.700)*	*(0.687)*	*(0.694)*
RecentIPODummy	*0.0339*	*0.0431*	*0.0367*	*0.0376*	*0.0411*
	(0.648)	*(0.529)*	*(0.650)*	*(0.566)*	*(0.573)*
Adj. R^2	*0.0949*	*0.0950*	*0.0948*	*0.0951*	*0.0948*

*Table B2 examines the relation between 12-month BHAR on Form 10-K using the CRSP Equal-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%,5%, and 10% levels, respectively.*

Table B3: Regression on Disclosure Tones on Form 424B using CRSP Equal-weighted BHAR

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.2397****				
	(0.001)				
UncertaintyRatio		*-0.3032****			
		(0.003)			
LitigiousRatio			*-0.2408**		
			(0.100)		
Weak-ModalRatio				*-1.0158*	
				(0.868)	
SentimentRatio					*-0.2851****
					(0.001)
Firm characteristics					
Book to market	*0.0643*	*0.0734*	*0.0781*	*0.0670*	*0.0753*
	(0.551)	*(0.493)*	*(0.470)*	*(0.539)*	*(0.485)*
ROA	*0.1451*	*0.1338*	*0.1554*	*0.1597*	*0.1462*
	(0.146)	*(0.187)*	*(0.127)*	*(0.115)*	*(0.143)*
Ln(Mkt Cap)	*-0.0417***	*-0.0481**	*-0.0411***	*-0.0453****	*-0.0421***
	(0.012)	*(0.004)*	*(0.017)*	*(0.008)*	*(0.011)*
Leverage	*-0.1235**	*-0.1168**	*-0.1582***	*-0.1677***	*-0.1232**
	(0.093)	*(0.100)*	*(0.026)*	*(0.018)*	*(0.095)*
Investment to asset	*0.2865**	*0.3092**	*0.2621**	*0.2732**	*0.2721**
	(0.055)	*(0.042)*	*(0.092)*	*(0.070)*	*(0.064)*
Dummy Variables					
TradingMarketDummy	*-0.1908***	*-0.1672***	*-0.1876***	*0.2732***	*-0.1833***
	(0.013)	*(0.026)*	*(0.015)*	*(0.024)*	*(0.016)*
LitigationCodeDummy	*0.0125*	*0.0278*	*0.0279*	*0.0239*	*0.0106*
	(0.839)	*(0.650)*	*(0.651)*	*(0.704)*	*(0.864)*
RecentIPODummy	*0.0853*	*-0.0022*	*0.0742*	*0.0380*	*0.0621*
	(0.278)	*(0.977)*	*(0.327)*	*(0.563)*	*(0.393)*
Adj. R^2	*0.1247*	*0.1205*	*0.1024*	*0.0949*	*0.1233*

*Table B3 examines the relation between 12-month BHAR on Form 10-K using the CRSP Equal-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%,5%, and 10% levels, respectively.*

5.5.2. Change in Time Interval on Form 10-K (Annual Report)

As the time of publishing of our disclosure filings differs, namely, as the Form 10-K is by requirement published before both Form 8-K and Form 424B, the subsequent year's Form 10-K will be published before the end of our BHAR calculation for the SEOs in our sample. This, in turn, can potentially affect the firms' returns, as new information is provided to the market when the new Form 10-K is published.

To illustrate, if a firm has a fiscal year (FY) equal to a calendar year, they are obliged to publish their 10-K within 90 days of the end of their fiscal year (Karapandza, 2016; SEC, 2023b), which in this example would be March 30th. In other words, if a firm executes its SEO on May 1st, 2021, the original BHAR calculation will be from May 1st, 2021, until May 1st, 2022. However, by March 30th, 2022, a new Form 10-K for FY 2021 will be published, potentially affecting returns.

To control for this effect and to observe whether our disclosure variables' coefficients are persistent, we will perform additional regressions, changing the start of BHAR calculation according to the literature on long-term event studies (e.g., Fama & French, 2008; Karapandza, 2016). This alteration ensures we avoid introducing look-ahead bias. Explicitly, for firms with fiscal years equal to calendar years, their 2020 Form 10-K is available by the end of March 2021, and the start of the BHAR calculation will be from July 1st, 2021, to June 30th, 2022. Firms with fiscal years equal to non-calendar years will be dropped, as return data is yet to be available following standard literature practice. This exclusion reduces our sample by 18 observations, from 242 to 224 observations.

This time interval modification slightly affects *NegativeRatio*. Post-change, *NegativeRatio* displays negative significance at the one percent level, compared to the five percent level pre-change. Additionally, *UncertaintyRatio* do not change and remain negatively significant at the ten percent level, post-change.

According to this result from changing time intervals, our disclosure variables are not noticeably sensitive to changes in time conditions when observing Form 10-K. However, it affects our firm characteristic variables. No firm characteristic variables are significant when changing the time interval. Implying that these variables are susceptible to changes in time intervals when observing Form 10-K, further illustrating the importance testing the robustness of your results. Likewise, the dummy variables *TradingMarketDummy* and *LitigationCodeDummy* show similar results (negatively significant at the ten percent level and no significance, respectively). [16] Table C1 below outlines the complete regression results when the time interval changes.

Table C1: Regression on Disclosure Tones on Form 10 – K, Changing the time interval

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Disclosure Tone					
NegativeRatio	*-0.3415****				
	(0.002)				
UncertaintyRatio		*-0.2265**			
		(0.067)			
LitigiousRatio			*-0.0146*		
			(0.999)		
Weak-ModalRatio				*-12.2870*	
				(0.451)	
SentimentRatio					*-0.2670*
					(0.370)
Firm characteristics					
Book to market	*0.1525*	*0.1823*	*0.1852*	*0.1802*	*0.1647*
	(0.207)	*(0.121)*	*(0.114)*	*(0.123)*	*(0.172)*
ROA	*-0.1290*	*-0.1132*	*-0.0841*	*-0.0866*	*-0.0886*
	(0.226)	*(0.289)*	*(0.466)*	*(0.422)*	*(0.404)*
Ln(Mkt Cap)	*-0.0098*	*-0.0062*	*-0.0084*	*-0.0098*	*-0.0147*
	(0.607)	*(0.738)*	*(0.662)*	*(0.615)*	*(0.443)*
Leverage	*-0.0775*	*-0.0663*	*-0.0607*	*-0.0674*	*-0.0721*
	(0.229)	*(0.315)*	*(0.364)*	*(0.318)*	*(0.272)*
Investment to asset	*0.0417*	*0.0487*	*0.0237*	*0.0161*	*0.0375*

[16] *RecentIPODummy* is dropped in the regression as the time interval changes.

	(0.742)	*(0.699)*	*(0.849)*	*(0.898)*	*(0.765)*
Dummy Variables					
TradingMarketDummy	*-0.1455**	*-0.1527**	*-0.1568**	*-0.1557**	*-0.1596***
	(0.065)	*(0.058)*	*(0.056)*	*(0.055)*	*(0.049)*
LitigationCodeDummy	*0.0598*	*0.0328*	*-0.0049*	*-0.0104*	*0.0141*
	(0.412)	*(0.668)*	*(0.942)*	*(0.880)*	*(0.839)*
Adj. R^2	*0.0991*	*0.0755*	*0.0584*	*0.0605*	*0.0784*

*Table C1 examines the relationship between 12-month BHAR on Form 10-K, changing the date interval from our prior respective SEO filing dates to 1st of July according to standard literature practice, keeping all other model specifications constant. In other words, using the CRSP Value-weighted return index as the dependent variable and the independent variables defined in Appendix A: Variable definitions. Our main independent variables are our disclosure tone variables. Control variables are divided into two categories, firm characteristics and dummy variables. P-values in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

6. Conclusions and Discussions

6.1 Conclusions

Using automated textual analysis, this paper examines the evidence of the association between the U.S. SEOs' long-term return performance and disclosure sentiments on relevant financial documents, namely, Form 10-K, Form 8-K, and Form 424B. Our sample consists of filed SEO events between 1st January – 31st December 2021 and their respective 12-month Buy-and-Hold Abnormal Return (BHAR) after the filing of the SEOs. We set up two research questions involving the long-term performance of SEOs; the first investigate whether SEOs are associated with negative long-term economic performance, and the second research question investigate whether positive (negative) disclosure sentiment is associated with better (worse) long-term performance. The results suggest that the SEOs in our sample significantly underperform in the long term when compared to benchmark indices. This outcome aligns with prior research demonstrating historical underperformance of SEOs, both in the short-term and the long-term, thus validating our first research question.

Thereafter, by testing various conditions, we also present results from using disclosure sentiment approximations and their implications on the performance of SEOs. The results indicate that even

though there seems to a weak relation between the use of negative words in our disclosure filings, with *NegativeRatio* being the only variable that remained significant when changing model specifications, negative words are not a clear implication of long-term return performance. Additionally, we test disclosure sentiment investment strategies on the prospectus (Form 424B) using long–short portfolios and calculate the Sharpe Ratios and Treynor Ratios of the portfolios. The result from our sample also indicates that disclosure sentiments are not significant enough to warrant active investment.

Moreover, we detect no significant effects on either disclosure variables on current reports (Form 8-K), potentially indicating that automated textual is less valuable on shorter reports when examining extended time frames.

Based on the results from our analysis, the SEOs in our sample underperform in the long-term. However, the relationship between financial disclosure tones and SEOs long-term performance remains ambiguous and requires more investigation to fully understand the association between long-term performance and financial disclosure sentiments.

6.2 Contribution

To the best of our knowledge, this is the first paper to evaluate the disclosure sentiment of Form 10-K, Form 8-K, and Form 424B in conjunction. Likewise, to the best of our knowledge, this is the first paper that evaluates the long-term return performance using disclosure sentiment on Form 8-K and Form 424B. Furthermore, the paper updates the evidence regarding the long-term return performance of SEOs in the U.S. As noted earlier, we present evidence regarding the long-term return underperformance of firms conducting SEOs, which answers our first research question.

Additionally, this paper also contributes with preliminary evidence that active investment strategies over longer time periods based on automated disclosure sentiment analysis, although producing alphas, are not satisfactory enough when risk is considered, as indicated by the Sharpe Ratios and the Treynor Ratios. Even though several disclosure variables are significant, all but negative word frequency and uncertainty word frequency are subject to changes in underlying conditions, and none would produce above-average risk-adjusted returns. Hence, answering our second research question.

6.3 Limitations

Certain limitations with respect to the data collection process of this study is notable. Firstly, the coding system we develop to collect the relevant document lacks the sophistication to distinguish which document correlated to the correct SEOs within a specific timeframe when there are multiple documents within our time window. Leading to the necessity of us having to manually select the correct document. However, to mitigate the potential error resulting from manual selection, identification of the correct document is made in pairs of both authors, and discussions are held when difficulties identifying the correct form arise.

Furthermore, we acknowledge that the chosen time interval may affect the results to an extent. Following this, we tried to make our study comparable to prior research, as to increase comparability.

Lastly, we recognize that a not insignificant number of our observations are removed in our data processing. Although most observations are removed by design following literature practice, and several robustness checks are tested to identify potential changes in results from changes in our sample, we admit the possibility of introducing error through the requirement that all variables of interest must be available, as the firms that are excluded may exhibit different characteristics than the sample included.

6.4 Suggestions for the future research

As the literature review outlines, textual analysis is an area where the research is growing noticeably. However, research regarding disclosure analysis and SEOs is relatively scarce. Hence, as suggestions for future researchers, our research's scope and width can be extended to include more observational years, as well as extending the 12-month observational period.

Furthermore, disclosure analysis in finance is heavily focused on using English as the primary observational language. However, an interesting investigation for further research would be to translate current dictionaries into additional languages, thus extending the current literature into other markets, such as emerging markets, to see whether similar or different results can be observed.

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Appendix

Appendix A: Variable definitions

This appendix gives definitions of disclosure variables, firm characteristics, and dummy variables used in this research. All of the disclosure variables are retrieved using automated textual analysis. In addition, we retrieve firm characteristics and dummy variables from WRDS Database, CRSP, and S&P Capital IQ databases.

Variable Name	Variable Definition
Dependent variable	
BHAR	Buy-and-Hold Abnormal Return, defined as the difference between a firm's Buy-and-Hold Return and index return.
Disclosure variables	
PositiveRatio	Number of Positive words divided by total number of words in the filing, multiplied by 100.
SentimentRatio	(Number of Positive words - Number of Negative words) / total number of words in the filing, multiplied by 100.
NegativeRatio	Number of Negative words divided by total number of words in the filing, multiplied by 100.
UncertaintyRatio	Number of Uncertain words divided by total number of words in the filing, multiplied by 100.
LitigiousRatio	Number of Litigious words divided by total number of words in the filing, multiplied by 100.
Strong-ModalRatio	Number of Strong Modal words divided by total number of words in the filing, multiplied by 100.
Weak-ModalRatio	Number of Weak Modal words divided by total number of words in the filing, multiplied by 100.
Firm Characteristics	
Book To Market	Book value of Equity / Market Value of Equity retrieved from the 10-K used in the regression; Firm growth proxy.
Ln(Mkt Cap)	Natural logarithm of Market Value of Equity, 1-day before the SEO filing; Firm size proxy.
ROA	Return On Assets; Proxy for firm profitability.
Leverage	Total Debt divided by total assets.
Investments to Assets	Investments to Assets Ratio; Defined according to Lyandres *et al.* (2008) as the annual change in gross PPE plus annual change in inventory divided by the lagged book value of assets.
Dummy variables	
TradingMarketDummy	

	Dummy variable equal to 1 if the firm trades on the NASDAQ, and 0 otherwise.
LitigationCodeDummies	Dummy variable equal to 1 if the firm operates in an industry with higher risk of litigation (SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, and 7370-7374.) and 0 otherwise.
RecentIPODummy	Dummy variable equal to 1 if the firm has completed an IPO within 12-months from the SEO filing date.

Table A Variable definitions define all variables used in the regression analyses. All continuous variables are winsorized at the 1st and 99th percentiles to minimize the effect of outliers.

Appendix B: Sample Selection

Table B – 1 Sample Selection

Number of observations of SEOs filed between January 1st and 31st December 2021.	1,205
Less:	
SEOs by financials (SIC codes 6000-6999) and utilities (SIC codes 4900 – 4949).	(103)
SEOs that file but do not proceed with offerings.	(16)
SEOs where PERMNO and CIK numbers do not match.	(162)
Second- and following offerings within the same year.	(201)
ADRs, rights offerings, unit offerings, pure secondary offerings, best efforts, and closed-end funds	(214)
SEOs from issuers that do not have all variables of interest.	(50)
SEOs where Form 10 - K, 8 - K and 424B are not available.	(121)
SEOs where offer price is of less than 5$	(96)
Final Sample	**242**

The table B – 1 above shows our sample selection less our criteria for inclusion. The sample is retrieved from Refinitiv Eikon database and S&P Capital IQ Database.

Appendix C: The regression models

$$BHAR_i = \beta_0 + \beta_i NegativeRatio_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad \textit{(Model 1)}$$

$$BHAR_i = \beta_0 + \beta_i UncertaintyRatio_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad \textit{(Model 2)}$$

$$BHAR_i = \beta_0 + \beta_i LitigiousRatio_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad (Model\ 3)$$

$$BHAR_i = \beta_0 + \beta_i WeakModal_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad (Model\ 4)$$

$$BHAR_i = \beta_0 + \beta_i SentimentRatio_i + \sum_{j=1}^{5} \beta_j Controls + \sum_{k=1}^{3} \beta_k Dummies + \epsilon_i \quad (Model\ 5)$$

Appendix C above illustrates the different regression run on all disclosure filings (Form 10-K, Form 8-K and Form 424B).

Appendix D: Diagnostic Tests

Appendix D – 1 Test for linearity

Ramsey RESET test for omitted variables

Form 10 - K						
Model 1	F(3, 229)	=	0.95	Prob > F	=	0.4155
Model 2	F(3, 229)	=	0.96	Prob > F	=	0.4106
Model 3	F(3, 229)	=	0.11	Prob > F	=	0.9543
Model 4	F(3, 229)	=	0.13	Prob > F	=	0.9942
Model 5	F(3, 229)	=	0.19	Prob > F	=	0.9012

H0: Model has no omitted variables

Form 8 - K						
Model 1	F(3, 229)	=	0.11	Prob > F	=	0.9612
Model 2	F(3, 229)	=	0.19	Prob > F	=	0.9021
Model 3	F(3, 229)	=	0.18	Prob > F	=	0.9711
Model 4	F(3, 229)	=	0.17	Prob > F	=	0.9182
Model 5	F(3, 229)	=	0.12	Prob > F	=	0.9455

H0: Model has no omitted variables

Form 424B						
Model 1	F(3, 229)	=	0.18	Prob > F	=	0.9121
Model 2	F(3, 229)	=	0.25	Prob > F	=	0.8586
Model 3	F(3, 229)	=	0.87	Prob > F	=	0.4551
Model 4	F(3, 229)	=	0.11	Prob > F	=	0.9537
Model 5	F(3, 229)	=	0.21	Prob > F	=	0.8864

H0: Model has no omitted variables

Table D – 1 illustrates the Ramsey RESET test for linearity for our models and per filing.

Appendix D – 2 Test for multicollinearity

Variance Inflation Factor (VIF)

Form 10 - K

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
NegativeRatio	1.26	-	-	-	-
UncertaintyRatio	-	1.23	-	-	-
LitigiousRatio	-	-	1.21	-	-
Weak -ModalRatio	-	-	-	1.05	-
SentimentRatio	-	-	-	-	1.07
Book to market	1.21	1.20	1.20	1.20	1.21
ROA	1.41	1.42	1.50	1.40	1.41
Ln(Mkt Cap)	1.35	1.35	1.35	1.37	1.37
Leverage	1.05	1.05	1.05	1.06	1.05
Investment to asset	1.06	1.07	1.06	1.06	1.06
TradingMarketDummy	1.33	1.33	1.33	1.33	1.33
LitigationCodeDummy	1.57	1.59	1.45	1.42	1.44
RecentIPODummy	1.03	1.04	1.03	1.04	1.03
Mean VIF	**1.25**	**1.25**	**1.24**	**1.21**	**1.22**

Form 8 - K

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
NegativeRatio	1.11	-	-	-	-
UncertaintyRatio	-	1.06	-	-	-
LitigiousRatio	-	-	1.18	-	-
Weak -ModalRatio	-	-	-	1.03	-
SentimentRatio	-	-	-	-	1.10
Book to market	1.20	1.24	1.21	1.20	1.20
ROA	1.40	1.41	1.44	1.41	1.41
Ln(Mkt Cap)	1.35	1.35	1.35	1.36	1.35
Leverage	1.05	1.05	1.06	1.05	1.05
Investment to asset	1.06	1.06	1.06	1.06	1.06
TradingMarketDummy	1.33	1.34	1.33	1.34	1.33
LitigationCodeDummy	1.43	1.41	1.41	1.41	1.42
RecentIPODummy	1.10	1.04	1.13	1.03	1.10
Mean VIF	**1.23**	**1.22**	**1.24**	**1.21**	**1.22**

Form 424B

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
NegativeRatio	1.08	-	-	-	-
UncertaintyRatio	-	1.15	-	-	-
LitigiousRatio	-	-	1.10	-	-
Weak -ModalRatio	-	-	-	1.05	-
SentimentRatio	-	-	-	-	1.06
Book to market	1.2	1.20	1.21	1.20	1.20
ROA	1.41	1.42	1.41	1.41	1.41
Ln(Mkt Cap)	1.35	1.35	1.39	1.35	1.35
Leverage	1.09	1.12	1.06	1.05	1.10
Investment to asset	1.06	1.07	1.06	1.06	1.06
TradingMarketDummy	1.33	1.33	1.34	1.36	1.33
LitigationCodeDummy	1.41	1.41	1.41	1.42	1.42
RecentIPODummy	1.04	1.04	1.06	1.04	1.03
Mean VIF	**1.22**	**1.23**	**1.22**	**1.21**	**1.22**

Table D – 2 Variance Inflation Factor (VIF) illustrates the VIF factors in our models and per filing.

Table D – 2.1 Test For Multicollinearity between All Disclosure Variables

Variable	**10 - K**	**8 - K**	**424B**
PositiveRatio	373.57	67.02	6.25
NegativeRatio	1,409.51	467.70	52.11
SentimentRatio	927.64	532.06	38.42
UncertaintyRatio	1.57	5.80	2.49
LitigiousRatio	1.85	1.26	1.45
Strong-ModalRatio	3.12	1.29	1.17
Weak-ModalRatio	2.85	6.06	1.08
Book to market	1.29	1.30	1.25
ROA	1.76	1.51	1.44
Ln(Mkt Cap)	1.55	1.47	1.42
Leverage	1.06	1.10	1.13
Investment to asset	1.11	1.09	1.10
TradingMarketDummy	1.37	1.33	1.40
LitigationCodeDummy	1.76	1.53	1.46
RecentIPODummy	1.09	1.17	1.19
Mean VIF	**170.77**	**72.78**	**7.16**

Table D – 2.1 Variance Inflation Factor (VIF) presents the VIF factors in Regression model 0. Where all disclosure variables are run in conjunction, illustrating the issue of multicollinearity, and motivating the use of separate regression.

Appendix D – 3 Test for heteroskedasticity

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity

Form 10 - K		
Model	**Chi - squared**	**Prob > Chi - squared**
Model 1	3.43	0.0639
Model 2	3.00	0.0835
Model 3	4.98	0.0256
Model 4	4.01	0.0451
Model 5	4.55	0.0330
H0: Constant variance		

Form 8 - K		
Model	**Chi - squared**	**Prob > Chi - squared**
Model 1	4.93	0.0263
Model 2	4.92	0.0265
Model 3	5.04	0.0248
Model 4	5.03	0.0249
Model 5	5.10	0.0239
H0: Constant variance		

Form 424B		
Model	**Chi - squared**	**Prob > Chi - squared**
Model 1	6.16	0.0131
Model 2	5.07	0.0244
Model 3	4.75	0.0293
Model 4	4.93	0.0264
Model 5	6.58	0.0103
H0: Constant variance		

Table D – 3 present the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity.

Appendix D – 4 Test for Normality

Form 10 - K

Variable	Obs	W	V	z	Prob > z
Residuals1	242	0.93427	11.586	5.691	0.00000
Residuals2	242	0.93355	11.712	5.716	0.00000
Residuals3	242	0.93732	11.047	5.580	0.00000
Residuals4	242	0.93476	11.499	5.673	0.00000
Residuals5	242	0.93571	11.331	5.639	0.00000

Form 8 - K

Variable	Obs	W	V	z	Prob > z
Residuals1	242	0.93726	11.057	5.582	0.00000
Residuals2	242	0.93681	11.137	5.599	0.00000
Residuals3	242	0.93756	11.006	5.571	0.00000
Residuals4	242	0.93758	11.002	5.570	0.00000
Residuals5	242	0.93758	11.002	5.570	0.00000

Form 424B

Variable	Obs	W	V	z	Prob > z
Residuals1	242	0.93577	11.321	5.637	0.00000
Residuals2	242	0.93632	11.224	5.617	0.00000
Residuals3	242	0.93415	11.606	5.695	0.00000
Residuals4	242	0.93700	11.033	5.577	0.00000
Residuals5	242	0.93631	11.225	5.617	0.00000

Table D – 4 Test for Normality illustrates the Shapiro-Wilk test.

Appendix E: Distribution of regression model

Figure E – 1 Fitted Values Distribution of Form 10 – K regression model

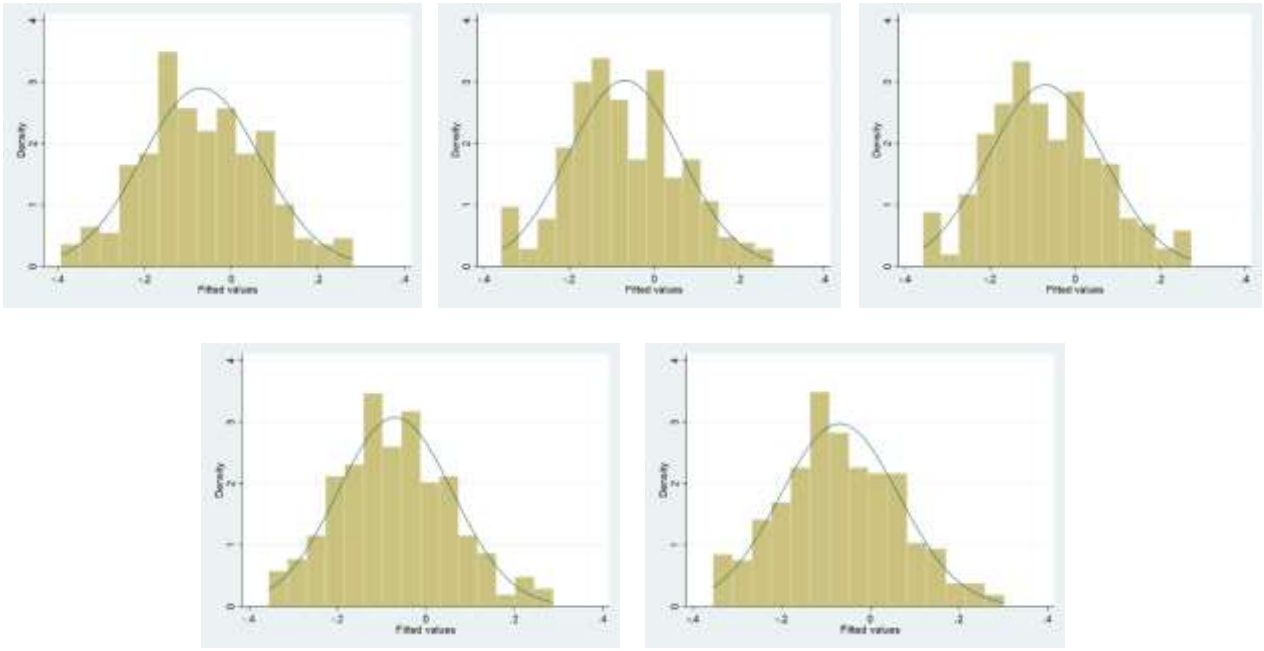


Figure E – 1 show the distribution of fitted values on Form 10 – K using Model 1 to Model 5.

Figure E – 2 Fitted Values Distribution of Form 8 – K regression model

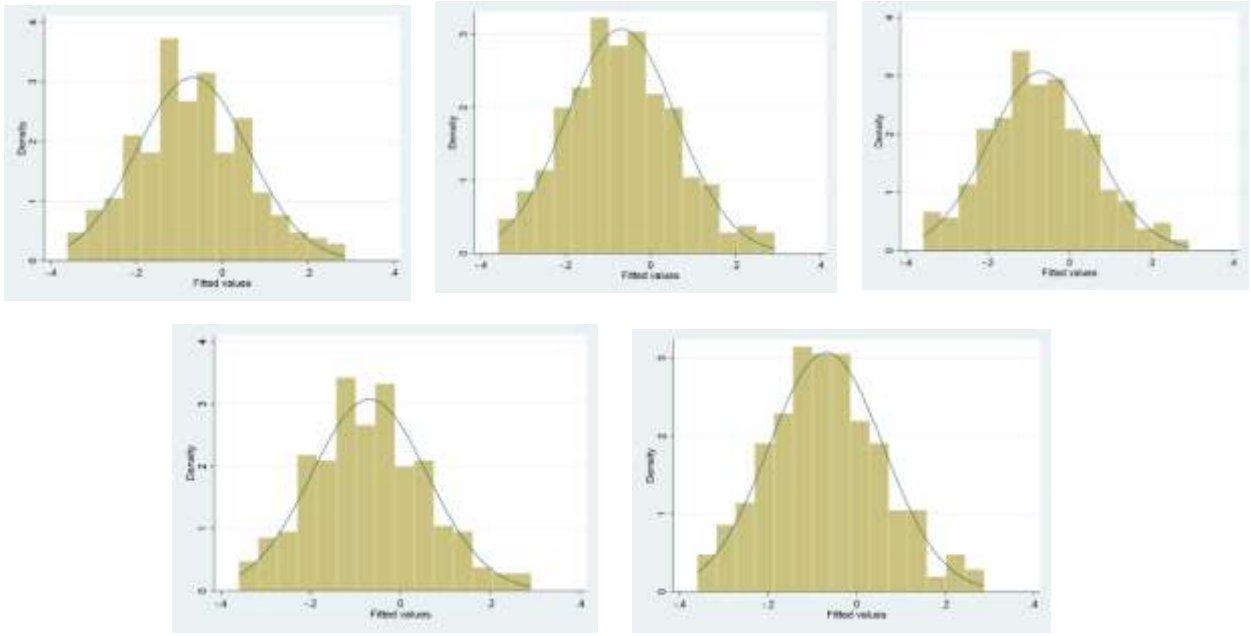


Figure E – 2 show the distribution of fitted values on Form 8 – K using Model 1 to Model 5.

Figure E – 3 Fitted Values Distribution of Form 424B regression model

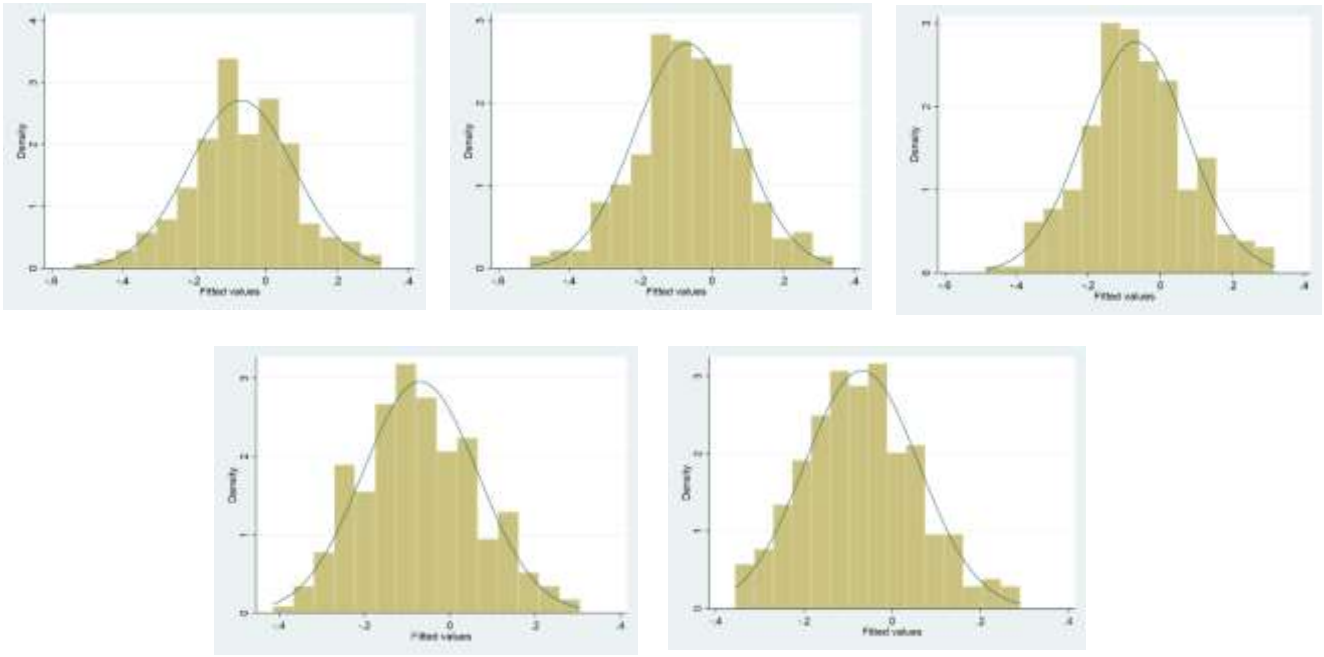


Figure E – 3 show the distribution of fitted values on Form 424B using Model 1 to Model 5.

Appendix F: Cover of Form 10 – K, Form 8 – K and Form 424B

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

OMB APPROVAL	
OMB Number:	3235-0063
Expires:	May 31, 2025
Estimated average burden hours per response	2,255.26

(Mark One)

FORM 10-K

[ ] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended _____

or

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission file number _____

_____
(Exact name of registrant as specified in its charter)

State or other jurisdiction of incorporation or organization	(I.R.S. Employer Identification No.)

_____
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code _____

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered

Securities registered pursuant to section 12(g) of the Act:

_____
(Title of class)

_____
(Title of class)

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. ☐ Yes ☐ No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. ☐ Yes ☐ No

Note – Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Exchange Act from their obligations under those Sections.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.

SEC 1673 (02-23)

Figure F – 1 Cover of Form 10 – K

OMB APPROVAL	
OMB Number:	3235-0060
Expires:	October 31, 2024
Estimated average burden hours per response	9.21

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 OR 15(d) of The Securities Exchange Act of 1934

Date of Report (Date of earliest event reported) _____

_____

(Exact name of registrant as specified in its charter)

(State or other jurisdiction of incorporation)	(Commission File Number)	(IRS Employer Identification No.)

_____

(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code _____

_____

(Former name or former address, if changed since last report.)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

[ ] Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

[ ] Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

[ ] Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

[ ] Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

SEC 873 (03-21)

Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.

1 of 22

Figure F – 2 Cover of Form 8-K

Filed Pursuant to Rule 424(b)(5)
Registration No. 333-252196

PROSPECTUS SUPPLEMENT
(to Prospectus dated January 28, 2021)

750,000 Shares

Common Stock

Polar Power, Inc.

We are offering 750,000 shares of our common stock. The purchase price for each share is $18.00.

Our common stock is listed on The Nasdaq Capital Market under the symbol "POLA." On February 4, 2021, the last reported sale price of our common stock on The Nasdaq Capital Market was $21.14 per share.

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page S-3 of this prospectus supplement and the documents incorporated by reference into this prospectus supplement for a discussion of information that you should consider in connection with an investment in our common stock.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement is truthful or complete. Any representation to the contrary is a criminal offense.

	Per Share	Total
Public offering price	$ 18.00	$ 13,500,000
Underwriting discounts and commissions (1)	$ 1.17	$ 877,500
Proceeds to us, before expenses	$ 16.83	$ 12,622,500

(1) We refer you to "Underwriting" beginning on page S-9 of this prospectus supplement for additional information regarding underwriters' compensation.

The underwriters expect to deliver the shares to purchasers on or about February 10, 2021.

Figure F – 3 Example Cover of Form 424B (Prospectus)

Appendix G: Pairwise Correlation between disclosure tones and explanatory variables

Table G – 1 Pairwise Correlation between Form 10 – K disclosure tones and explanatory variables

Form 10 - K

Variables	1)	2)	3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)
NegativeRatio	*1.0000*												
UncertaintyRatio	*0.7900***	*1.0000*											
LitigiousRatio	*0.4946***	*0.2778***	*1.0000*										
Weak-ModalRatio	*-0.0229*	*-0.1082**	*0.0283*	*1.0000*									
SentimentRatio	*-0.8617***	*-0.5591***	*-0.4304***	*-0.0538*	*1.0000*								
Book to market	*-0.2159***	*0.1466***	*-0.1819***	*-0.0385*	*0.1158*	*1.0000*							
ROA	*-0.2418***	*-0.2208***	*-0.3510***	*-0.0624*	*0.0968*	*0.1967***	*1.0000*						
ln(MKtCap)	*-0.1030*	*-0.0438*	*-0.1144**	*-0.1335***	*0.1507***	*-0.0861*	*0.4126***	*1.0000*					
Leverage	*-0.0011*	*0.0382*	*-0.0280*	*-0.1162**	*0.0328*	*-0.0251*	*0.0057*	*-0.0269*	*1.0000*				
Investment to asset	*-0.0044*	*0.0385*	*-0.0299*	*-0.0525*	*-0.0033*	*-0.0712*	*-0.0249*	*0.1081**	*-0.0572*	*1.0000*			
TradingMarketDummy	*0.2553***	*0.1801***	*0.1972***	*0.0553*	*-0.1286**	*-0.2645***	*-0.2467***	*-0.2621***	*0.0405*	*0.0217*	*1.0000*		
LitigationCodeDummy	*0.4196***	*0.3992***	*0.3031***	*-0.0445*	*-0.1996***	*-0.2766***	*-0.3249***	*-0.1562**	*0.1790***	*-0.1382***	*0.4047***	*1.0000*	
RecentIPODummy	*0.0630*	*0.1110**	*0.0615*	*0.1012*	*0.0096*	*-0.0553*	*-0.1316**	*-0.0111*	*-0.0781*	*0.0326*	*0.0561*	*0.0351*	*1.0000*

*Table G – 1 shows the Pairwise Correlation between our independent variables. ***, **, * indicate significance at 1%,5%, and 10% level, respectively.*

Table G – 2 Pairwise Correlation between Form 8 – K disclosure tones and explanatory variables

Form 8 - K

Variables	**1)**	**2)**	**3)**	**4)**	**5)**	**6)**	**7)**	**8)**	**9)**	**10)**	**11)**	**12)**	**13)**
NegativeRatio	*1.0000*												
UncertaintyRatio	*-0.0445*	*1.0000*											
LitigiousRatio	*0.5923****	*-0.5683****	*1.0000*										
Weak-ModalRatio	*0.0190*	*0.0007*	*-0.0025*	*1.0000*									
SentimentRatio	*-0.9361****	*0.1705****	*-0.7202****	*0.0028*	*1.0000*								
Book to market	*-0.0609*	*-0.1688****	*0.0807*	*0.0544*	*0.0112*	*1.0000*							
ROA	*-0.0265*	*0.0676*	*-0.1323***	*0.0653*	*0.0521*	*0.1967****	*1.0000*						
ln(MKtCap)	*0.0092*	*0.1113**	*-0.1557***	*-0.0526*	*0.0123*	*-0.0861*	*0.4126****	*1.0000*					
Leverage	*0.0772*	*0.0007*	*0.1367***	*0.0425*	*-0.1041*	*-0.0251*	*0.0057*	*-0.0269*	*1.0000*				
Investment to asset	*-0.0605*	*0.0770*	*-0.0664*	*0.0351*	*0.0812*	*-0.0712*	*-0.0249*	*0.1081**	*-0.0572*	*1.0000*			
TradingMarketDummy	*0.0150*	*-0.0535*	*0.0645*	*-0.0850*	*0.0098*	*-0.2645****	*-0.2467****	*-0.2621****	*0.0405*	*0.0217*	*1.0000*		
LitigationCodeDummy	*0.1521***	*-0.0029*	*0.0143*	*-0.0709*	*-0.1215**	*-0.2766****	*-0.3249****	*-0.1562***	*0.1790****	*-0.1382***	*0.4047****	*1.0000*	
RecentIPODummy	*-0.2519****	*0.0893*	*-0.2878****	*0.0489*	*0.2496****	*-0.0553*	*-0.1316**	*-0.0111*	*-0.0781*	*0.0326*	*0.0561*	*0.0351*	*1.0000*

*Table G – 2 shows the Pairwise Correlation between our independent variables. ***, **, * indicate significance at 1%,5%, and 10% level, respectively.*

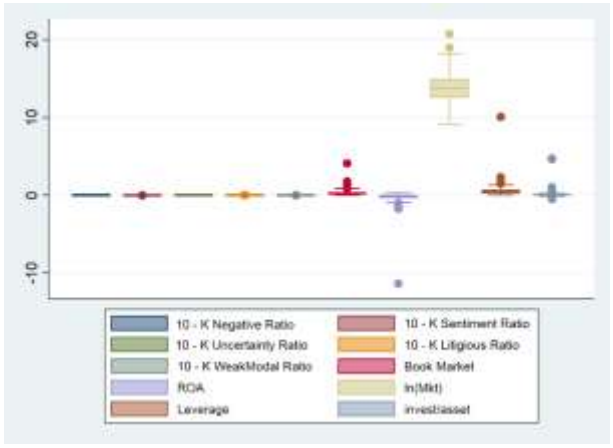
Table G – 3 Pairwise Correlation between Form 424B disclosure tones and explanatory variables

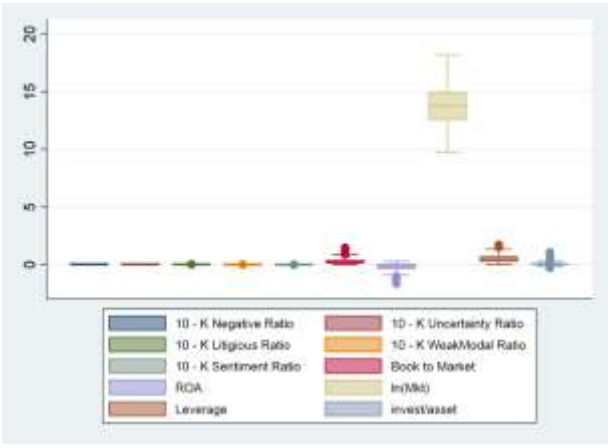
Form 424B

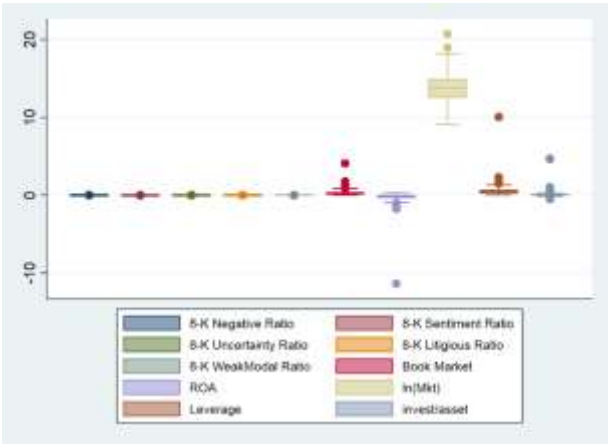
Variables	**1)**	**2)**	**3)**	**4)**	**5)**	**6)**	**7)**	**8)**	**9)**	**10)**	**11)**	**12)**	**13)**
NegativeRatio	*1.0000*												
UncertaintyRatio	*0.6583****	*1.0000*											
LitigiousRatio	*0.4880****	*0.1937****	*1.0000*										
Weak-ModalRatio	*-0.0287*	*0.1267***	*-0.0855*	*1.0000*									
SentimentRatio	*-0.9450****	*-0.6540****	*-0.4727****	*0.0274*	*1.0000*								
Book to market	*-0.0044*	*-0.0209*	*0.0750*	*-0.0010*	*-0.0419*	*1.0000*							
ROA	*-0.0125*	*-0.1642***	*0.0388*	*-0.0917*	*0.0004*	*0.1967****	*1.0000*						
ln(MKtCap)	*0.0816*	*-0.1400***	*0.1715****	*-0.0790*	*-0.0592*	*-0.0861*	*0.4126****	*1.0000*					
Leverage	*0.1821****	*0.2644****	*0.0801*	*0.0454*	*-0.1945****	*-0.0251*	*0.0057*	*-0.0269*	*1.0000*				
Investment to asset	*0.0483*	*0.0767*	*-0.0535*	*0.0009*	*-0.0055*	*-0.0712*	*-0.0249*	*0.1081**	*-0.0572*	*1.0000*			
TradingMarketDummy	*-0.0878*	*0.1207**	*-0.1369***	*0.1533***	*0.0679*	*-0.2645****	*-0.2467****	*-0.2621****	*0.0405*	*0.0217*	*1.0000*		
LitigationCodeDummy	*-0.0570*	*0.1196**	*-0.0084*	*0.0113*	*0.0634*	*-0.2766****	*-0.3249****	*-0.1562***	*0.1790****	*-0.1382***	*0.4047****	*1.0000*	
RecentIPODummy	*0.0988*	*-0.1063**	*0.1509***	*-0.0935*	*-0.0397*	*-0.0553*	*-0.1316*	*-0.0111*	*-0.0781*	*0.0326*	*0.0561*	*0.0351*	*1.0000*

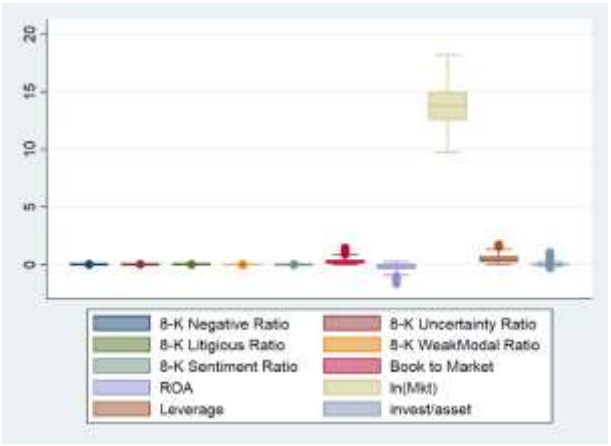
*Table G – 3 shows the Pairwise Correlation between our independent variables. ***, **, * indicate significance at 1%,5%, and 10% level, respectively.*

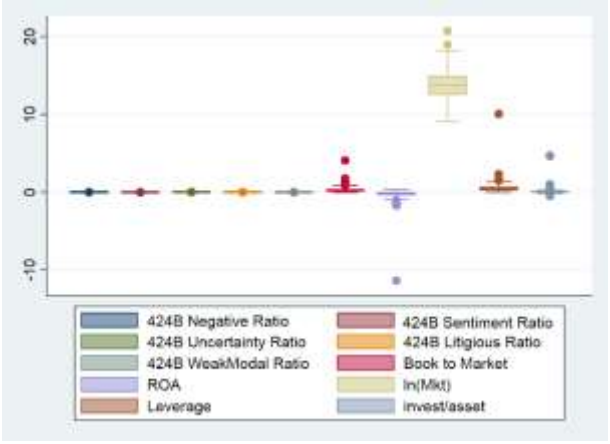
Appendix H: Winsorization of continuous variables

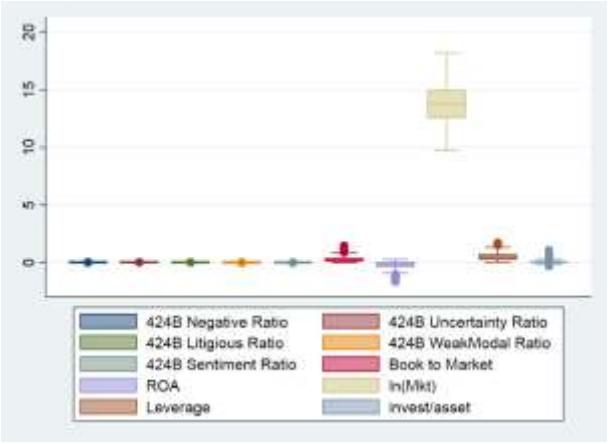












Appendix H present the continuous variables before and after winsorizing at the 1st and 99th percentiles to remove the effect of the most extreme outliers in our observations.