



**TURUN  
YLIOPISTO**  
UNIVERSITY  
OF TURKU

**CHIEF EXECUTIVE OFFICERS'  
COMMUNICATION STRATEGIES  
IN 10-K REPORTS VIA  
REPETITION FROM NOTES  
TO MD&A: THE IMPACT  
OF MANAGERIAL ABILITY,  
OVERCONFIDENCE,  
AND NARCISSISM**

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Javad Rajabalizadeh





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To my beloved parents,

This thesis is dedicated to you, with all my gratitude and love. Especially to my mother, whose strength, wisdom, and unwavering support have been my guiding light, even from afar. Your sacrifices have not gone unnoticed, and your love has crossed continents and oceans to reach me here in Finland as I pursued my PhD. Your belief in me has been the foundation upon which I've built my dreams and aspirations. This achievement is as much yours as it is mine.

With all my love,  
*Javad*

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## ABSTRACT

This research examines the influence of three CEO traits—managerial ability, overconfidence, and narcissism—on the strategic repetition of information in 10-K reports. It specifically explores how these traits impact the repetition of information from the note disclosures to the more discretionary Management Discussion and Analysis (MD&A) section. We anchor our analysis in broad theoretical frameworks such as information asymmetry, agency costs, and signaling theory, which help elucidate the dynamics of CEO-driven communication strategies in financial reporting. These foundational theories are crucial for understanding how CEO traits might influence corporate transparency and the trust of shareholders and other stakeholders. Utilizing a comprehensive methodological approach including textual analysis and empirical investigation across a dataset of 10-K filings, this study reveals how CEO traits collectively impact the strategic repetition in disclosures, thereby influencing overarching financial reporting strategies.

This thesis comprises an introduction and three essays. The introduction outlines the background and rationale for investigating the influence of CEO traits on repetition. This section sets the stage by detailing the research objectives and questions, presenting a theoretical framework, and segmenting CEO traits for investigation. Essay 1 analyzes the relationship between CEO managerial ability and disclosure repetitiveness, applying management obfuscation theory and stakeholder theory. It finds that better managerial ability is associated with less repetition, suggesting a preference for clarity and substantive disclosure among more adept leaders. Essay 2 examines the effects of CEO overconfidence on disclosure repetitiveness, utilizing upper echelons theory and behavioral decision theory. It reveals that overconfident CEOs tend to decrease repetitiveness, potentially enhancing disclosure transparency. Essay 3 delves into the impact of CEO narcissism, employing agency theory and impression management theory, indicating that narcissistic CEOs have a tendency to increase repetitiveness, possibly as a strategy for impression management and to obscure unfavorable information. Taken together, managerial ability and overconfidence seem to drive clearer reporting, while narcissism introduces impression management via strategic repetition.

The findings contribute to the literature on financial disclosures, and on executive decision-making by highlighting the ways in which certain CEO traits together influence corporate communication strategies. This research enhances theoretical frameworks by integrating key foundational theories, including management obfuscation theory, stakeholder theory, and behavioral decision theory, while applying specific theories tailored to each Essay, as outlined. Supported by robust empirical evidence, this approach deepens our understanding of the complex relationship between executive personality traits and financial reporting strategies. Furthermore, this thesis addresses regulatory concerns regarding disclosure quality, offering implications for standard setters and practitioners seeking to improve the effectiveness of financial reporting. Through its exploration of the motives, methods, and impacts of strategic repetitive disclosures in 10-K reports from notes to the MD&A sections, this thesis underscores the significant role of CEO traits in influencing the transparency and integrity of corporate financial reporting.

**KEYWORDS:** CEO Traits, Narrative Disclosures, Financial Reporting, Management Discussion and Analysis (MD&A), Repetitiveness, Corporate Transparency, Textual Analysis, 10-Ks

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## TIIVISTELMÄ

Tämä tutkimus tarkastelee toimitusjohtajan henkilökohtaisten ominaisuuksien – johtamiskyvyn, liiallisen itsevarmuuden ja narsismin – vaikutusta strategiseen tietojen toistoon. Tutkimuksessa analysoidaan, miten nämä piirteet vaikuttavat 10-K-raporttien liitetietojen toistoon johdon toimintakertomuksessa (MD&A). Tutkimus pohjautuu laajoihin teoreettisiin viitekehyksiin, kuten informaation epäsymmetriaan, agenttikustannuksiin ja signalointiteoriaan, joiden avulla voidaan ymmärtää toimitusjohtajavetoisten viestintästrategioiden dynamiikkaa talousraportoinnissa. Nämä teoriat ovat keskeisiä, kun tarkastellaan, miten toimitusjohtajien yksilölliset ominaisuudet voivat vaikuttaa yritysten läpinäkyvyyteen sekä osakkeenomistajien ja muiden sidosryhmien luottamukseen. Tutkimus osoittaa, miten toimitusjohtajien yksilölliset ominaisuudet yhdessä vaikuttavat strategiseen tietojen toistoon yritysten raporteissa ja näin ollen ovat osa yrityksen talousraportointistrategiaa.

Väitöskirja koostuu johdannosta ja kolmesta esseestä. Johdantoluvussa esitellään tutkimuksen tausta sekä perustellaan, miksi toimitusjohtajien ominaisuuksien vaikutusta tietojen toistoon kannattaa tutkia. Johdanto-osiossa määritellään tutkimuksen tavoitteet ja tutkimuskysymykset, esitellään tutkimuksen teoreettinen viitekehys ja rajataan tarkasteltavat toimitusjohtajien piirteet. Ensimmäisessä esseessä analysoidaan toimitusjohtajien johtamiskyvyn ja tietojen toistamisen välistä suhdetta soveltamalla johtamisen obfuskoitusteoriaa (management obfuscation theory) sekä sidosryhmäteoriaa. Tulokset osoittavat, että parempi johtamiskyky liittyy vähäisempään tietojen toistamiseen, mikä viittaa siihen, että taitavammat toimitusjohtajat suosivat raportoinnissaan selkeyttä ja sisällöllisesti olennaista viestintää. Toisessa esseessä tarkastellaan toimitusjohtajien liiallisen itsevarmuuden vaikutuksia raportointikäytäntöihin hyödyntäen ylimmän johdon teoriaa (upper echelons theory) sekä käyttäytymistieteellistä päätöksenteon teoriaa. Tulokset osoittavat, että liian itsevarmat toimitusjohtajat pyrkivät vähentämään tietojen toistamista, mikä voi parantaa raportoinnin läpinäkyvyyttä. Kolmannessa esseessä puolestaan analysoidaan toimitusjohtajien narsismin vaikutusta soveltaen agenttiteoriaa sekä vaikutelmanhallinnan teoriaa. Tulosten perusteella narsistiset toimitusjohtajat ovat taipuvaisia lisäämään strategisesti tietojen toistamista, mikä voi toimia vaikutelmanhallinnan keinona ja epäsuotuisan informaation peittämisenä. Kokonaisuutena tarkasteltuna toimitusjohtajien hyvä johtamiskyky ja liiallinen itsevarmuus voivat edistää selkeämpää raportointia, kun taas narsismi johtaa strategiseen tietojen toistamiseen yrityskuvan hallitsemiseksi.

Tutkimuksen tulokset täydentävät taloudellisen raportoinnin sekä yritysjohtajien päätöksenteon kirjallisuutta osoittamalla, miten toimitusjohtajien eri piirteet kokonaisuudessaan vaikuttavat yritysten viestintästrategioihin. Tutkimus laajentaa olemassa olevia teoreettisia viitekehyksiä yhdistämällä keskeisiä teorioita, kuten johtamisen obfuskoitusteorian (management obfuscation theory), sidosryhmäteorian sekä käyttäytymistieteellisen päätöksenteon teorian, soveltaen samalla kullekin esseelle erityisesti valittuja teoria-asetelmia. Empiiriset tulokset syventävät ymmärrystä yritysjohtajien persoonallisuuspiirteiden ja raportointikäytäntöjen välisestä suhteesta. Lisäksi tutkimus tarjoaa käytännön implikaatioita standardien laatijoille ja muille tahoille, jotka pyrkivät kehittämään talousraportointia. Tämä väitöskirja korostaa toimitusjohtajien ominaisuuksien merkitystä yritysten talousraportoinnin läpinäkyvyydelle ja eheydelle analysoimalla 10-K-raporttien tietojen strategisen toistamisen motiiveja, menetelmiä ja vaikutuksia liitetiedoista johdon toimintakertomukseen.

ASIASANAT: Toimitusjohtajien ominaisuudet, Narratiivinen raportointi, Taloudellinen raportointi, Johdon toimintakertomus (MD&A), Tietojen toistaminen, Yritysten läpinäkyvyys, Tekstianalyysi, 10-K-raportit.

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In closing, I wish to acknowledge the unwavering support and encouragement from my family, friends, and every individual who has been part of my academic journey. Your belief in me has been a constant source of motivation and resilience. This dissertation is not just a reflection of my efforts but a testament to the collective support and inspiration I have received along the way.

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April 2025  
*Javad Rajabalizadeh*



## JAVAD RAJABALIZADEH

**Javad is a Doctoral Researcher at the Department of Accounting and Finance, Turku School of Economics, Finland. Originating from Khorasan-e Razavi, Iran, Javad has pursued a scholarly journey that bridges continents and disciplines. With a background in Accounting and Auditing, his research now delves into the intersection of computer science, accounting, and psychology under the guidance of Professor Hannu Schadewitz and Dr. Antti Miihkinen.**

Javad's work is published in respected journals, highlighting his focus on textual analysis, CEOs' characteristics, and auditing. Javad's journey reflects a dedication to academic excellence and a passion for contributing to the broader understanding of financial reporting and corporate governance.

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# List of Original Publications

This dissertation is based on the following original publications:

- 1 **Rajabalizadeh, J.**, and Tsileponis, N. “CEO Managerial Ability and Strategic Repetition in 10-K Reports from Notes to MD&A”. Presented in a parallel session at the 46<sup>th</sup> EAA Annual Congress, 2024, Bucharest, Romania. Also presented at the EAA Talent Workshop, 2023, Madrid, Spain.
- 2 **Rajabalizadeh, J.**, Schadewitz, H., Miihkinen, A., and Tsileponis, N. “CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A”. Accepted for presentation in a parallel session at the 47<sup>th</sup> EAA Annual Congress, 2025, Rome, Italy.
- 3 **Rajabalizadeh, J.**, Tsileponis, N., Leventis, S., and Hesarzadeh, R “CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A”. Accepted for presentation in a parallel session at the 47<sup>th</sup> EAA Annual Congress, 2025, Rome, Italy.

This dissertation is based on works that are in various stages of submission and review. The versions included here may differ from the final published forms due to ongoing revisions based on feedback from submission processes and peer reviews. Permissions for reproducing materials in this dissertation were obtained, where applicable, respecting the rights of the original copyright holders.

## **Author’s Contribution:**

I am the initiator and primary author of all three essays included in this compilation thesis. I was responsible for the research design, data collection, data analysis, and manuscript writing. My co-authors contributed primarily by providing access to specific datasets and offering comments on drafts. All substantive research decisions and execution were under my responsibility.

# Aims of the Study

The primary aim of this study is to deepen our understanding of CEO-driven communication strategies, specifically focusing on the use of repetitive disclosures in the MD&A sections of corporate reports. This analysis is motivated by the hypothesis that CEO traits—managerial ability, overconfidence, and narcissism—play a critical role in the content and presentation of financial disclosures. This investigation is structured around several key research objectives through three distinct but interconnected essays. Each essay delves into a specific CEO trait and its influence on the repetitiveness of disclosures:

1. **Essay 1:** "CEO Managerial Ability and Strategic Repetition in 10-K Reports from Notes to MD&A" examines the relationship between CEOs' managerial abilities and their propensity to engage in repetitive disclosures, offering insights into how a variety of adept leadership influences corporate transparency.
2. **Essay 2:** "CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A" explores the impact of CEO overconfidence on repetitive disclosures, challenging conventional perceptions of overconfidence as a purely negative trait.
3. **Essay 3:** "CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A" investigates the influence of CEO narcissism on disclosure practices, particularly focusing on the strategic manipulation of narratives through repetition.

By dissecting the complex relationship between CEO characteristics and disclosure practices, this thesis aims to contribute to the broader discourse on corporate governance, financial reporting, and the role of executive personality traits in corporate communication strategies. Through this investigation, the study seeks to bridge the gap in the current understanding of the strategic use of narrative disclosures by CEOs, scrutinizing the extent to which personal characteristics dictate the transparency, clarity, and repetitiveness of corporate communications.

# Statement on the Use of AI-assisted Tools

This dissertation has benefited from the use of AI-assisted tools for language refinement. Specifically, ChatGPT (version 4) was used solely to improve linguistic clarity and coherence in some sections. AI was not applied in any other aspect beyond what is explicitly stated here. The final responsibility for the content, including any errors, remains with the author.



# PART I: Introduction



# 1 CEO Communication and the Role of Repetition in Financial Reporting Narratives

In the evolving landscape of corporate financial reporting, the role of Chief Executive Officers (CEOs) in shaping narrative disclosures, particularly within the Management Discussion and Analysis (MD&A) sections of 10-K reports, has become increasingly prominent. Smith and Taffler (2000) highlight the increasing significance of narrative sections within annual reports, observing that these sections now convey nearly double the information content found in the fundamental financial statements. This expansion is not merely a reflection of increased textual volume, but a shift in the paradigm of accounting from an industrial to an information framework, as analyzed by Shortridge and Smith (2009). In the industrial accounting paradigm, the emphasis was primarily on the reliability and verifiability of information, characterized by a focus on historical costs, rules-based standards, and nationalized practices. Conversely, the information paradigm prioritizes relevance and is characterized by globalization, fair value accounting, principles-based standards, and a focus on economic events over mere transactions.

This paradigm shift has necessitated a more dynamic approach to conveying the complexities of modern business operations and models, which contain an array of innovative elements and solutions not fully captured by traditional financial metrics alone. This quantification of information content is based on the comparison of textual volume and complexity between narrative sections, such as MD&A, and the core financial statements. This expanded narrative space offers firms an opportunity not only to enhance decision-usefulness by presenting detailed explanations and insights but also to craft financial performance and prospects in a favorable light, thereby engaging in what Clatworthy and Jones (2001) describe as impression management. This strategic manipulation of narrative disclosures aims to influence stakeholder perceptions and decisions, leveraging the discretionary nature of these reports as a tool for both transparent communication and obfuscation (Yuthas et al., 2002).

Given the increased complexity of business operations and the shift towards a more global, principles-based accounting framework, the significance of narrative

sections has naturally increased (Joseph, 2012). Accounting standards and the broader scope of accounting communication are no longer sufficient to capture all relevant information needed by stakeholders (Merkl-Davies and Brennan, 2017). This underlines the unavoidable importance of narrative sections in modern financial reports and creates a compelling need to study these narratives, as they play a critical role in shaping the transparency and integrity of corporate reporting.

The discretionary element inherent in MD&A reporting allows but also requires CEOs to exercise significant judgment in how they present the company's operations, financial performance, and future outlook. The U.S. Securities and Exchange Commission (SEC) has emphasized the importance of evolving the MD&A overview to avoid generic language, urging companies to provide a narrative that offers investors a clear view through the management's lens, thereby enhancing transparency and accountability (SEC, 1987). Narrative disclosures serve as a critical channel for conveying contextual information, capable of significantly influencing market participants' perceptions and investment decisions. This influence is predicated on the assumption that managers will adapt their disclosures to reflect changes in financial performance and investor information needs, avoiding the pitfalls of redundancy and obfuscation. However, research indicates that narrative repetition, while potentially serving to highlight key information, may also be employed as a strategy to obscure less favorable details, increasing processing costs for investors and diluting the overall quality of disclosure (Bloomfield, 2008; Li, 2008). In this thesis, "repetition" adheres to the established procedures by Cohen et al. (2020). Central to our analysis is the extraction of text from the notes section (Section 8) and the MD&A section (Section 7) within each annual 10-K filing. This approach allows us to systematically compare and quantify the extent of information carried over or reiterated, illuminating how CEOs might utilize such repetition strategically within corporate disclosures.

The strategic role of repetition within narrative disclosures has garnered attention from both regulators and standard setters, as it threatens to clutter financial reports with redundant content (Ernst and Young, 2014; SEC, 2014b). This call for action is supported by Standard and Poor's (2012) and KPMG (2011), urging the SEC and the Financial Accounting Standards Board (FASB) to address the overlapping disclosure requirements fueling this redundancy. Echoing this sentiment, Dyer et al. (2017) suggest that regulatory compliance significantly contributes to the repetitiveness in 10-K filings, marking repetition not as incidental but a calculated element of disclosure strategies. Concerns about the readability and utility of 10-K reports are further amplified by the duplication of disclosures, with standard setters like the FASB and Gallagher (2013) voicing apprehensions about the ensuing impact on investor decision-making. Excessive repetition, while possibly driven by litigation avoidance, does not necessarily facilitate better investor understanding or

market efficiency, as evidenced by Cazier and Pfeiffer (2017). This intricate dynamic between narrative repetition and corporate transparency necessitates a deeper investigation into how these practices influence stakeholder trust and the broader financial communication landscape.

In summary, the intricate dynamics of CEO-driven narrative repetition in MD&A sections pose significant implications for corporate transparency, stakeholder trust, and the broader landscape of financial communication. The following section delves into the significance of repetitive disclosures, exploring how these practices affect investor perceptions, influence corporate accountability, and reflect broader trends in financial reporting and governance.

The exploration of narrative disclosures within financial reporting has emphasised the increasing complexity and length of these sections over time. Researchers have employed a variety of methodologies to measure the extent and quality of narrative disclosure, ranging from counting relevant words or sentences (Dobler et al., 2011; Elshandidy et al., 2013) to constructing indices and utilizing dummy variables (Botosan, 1997; Iatridis, 2008). The methodologies for examining narrative disclosures, notably content analysis and computational linguistics, offer insights into the strategic use of repetition within financial reports. Content analysis, endorsed for its reliability and validity (Abraham and Cox, 2007; Krippendorff, 2013), and computational linguistics, acclaimed for capturing broad aspects of disclosure (Berger, 2011; Beyer et al., 2010), illuminate the ways in which repetition serves various communicative purposes. Repetition, deeply embedded in human communication, enhances memorability and emphasis, aiding in the transmission of cultural narratives and religious ceremonies through oral traditions (Davison, 2008). This rhetorical function of repetition, to underscore and clarify ideas, is equally pertinent in the context of financial disclosures.

Within the broad ambit of narrative disclosure analysis, the strategic use of repetition in 10-K reports, particularly within the notes to the MD&A sections, stands out as a critical characteristic deserving specific attention. This research interprets repetition not as a mere stylistic choice or accidental occurrence but as a deliberate strategic decision by firms. By selecting and echoing content, companies aim to either highlight key information or, potentially, to obscure less favorable details. Such strategies impact the transparency and efficacy of financial communication. This paragraph aims to quantify and understand the nuances of this narrative strategy, highlighting its merits in shaping stakeholder perceptions and corporate transparency.

As we delve deeper into the dual nature (positive and negative aspects) of repetition in financial disclosures, it becomes clear that this practice fosters both potential benefits and risks, contingent upon the intent and execution by reporting entities.

## Positive Aspects of Repetition

### 1. **Reinforcement of Key Information:**

1. **Strategic Emphasis:** Repetition allows companies to strategically emphasize crucial aspects of their financial performance or strategic direction (Amburgey and Miner, 1992; Davison, 2008). For example, consistently repeating information about strong revenue growth or successful entry into new markets can help ensure that these key achievements are recognized and understood by all stakeholders, thus reinforcing the company's narrative of growth and expansion.
2. **Aid in Learning and Retention:** Repetition can enhance stakeholders' learning and retention of information. Psychological studies suggest that repeated exposure to information increases familiarity and recall (Cacioppo and Petty, 1979; Montoya et al., 2017; Betts et al., 2019). In financial disclosures, this can help investors and analysts remember vital data points across different sections of the report, aiding in decision-making processes.

### 2. **Enhanced Clarity and Understanding:**

1. **Simplification of Complex Information:** Financial disclosures often contain complex information that can be difficult to comprehend. Repeating important data in various contexts (such as in tables, charts, and narrative text) can help clarify these complexities (Segel and Heer, 2010), making the information more accessible to a broader audience, including less sophisticated investors.
2. **Consistency in Messaging:** Repetition can serve to create a consistent message across the document, reinforcing the firm's strategic objectives and performance metrics (Ghodeswar, 2008). This consistency helps to build a coherent story that aligns with the company's broader communication and branding strategies, ensuring that all stakeholders receive the same message irrespective of their point of entry or focus within the document.

## Negative Aspects of Repetition

### 1. **Redundancy and Information Overload:**

1. **Cognitive Overload:** Excessive repetition can lead to cognitive overload, where the reader becomes overwhelmed with information, potentially leading to confusion rather than clarity (Biondi et al., 2021).

This can obscure key facts under the weight of repeated, less relevant information, reducing the overall effectiveness of the disclosures.

2. **Dilution of Important Content:** When less important information is repeated along with crucial data, it can dilute the impact of the most critical content (Lehnert et al., 2013). Stakeholders might struggle to discern what is most important, potentially overlooking strategic insights or warnings that are buried under repetitive but less relevant details.

## 2. **Impression Management:**

1. **Selective Emphasis:** Firms might strategically repeat favorable information to enhance their image and attract investment, while downplaying or omitting less favorable details (Yang and Liu, 2017). This selective repetition can distort the true economic condition of the firm, leading stakeholders to make decisions based on skewed or incomplete information.
2. **Obfuscation and Misdirection:** In some cases, repetition is used not just to highlight positive aspects but to actively mislead or distract from negative information (Fazio, 2020; Pillai and Fazio, 2021). By flooding disclosures with repeated positive details, firms can obscure poor performance, high risk factors, or upcoming challenges that might otherwise deter investors or lower stock prices.

From a practical perspective, the concern articulated by regulators and standard setters regarding the voluminous and repetitive nature of financial disclosures, as highlighted by Ernst and Young (2014) and the SEC (2014b), points out a critical tension in financial reporting: the balance between providing comprehensive disclosure and maintaining clarity and conciseness. This issue is further complicated by findings from Brown and Tucker (2011), who observe an increasing expansion in the length of 10-K filings over time, raising questions about the informativeness of these disclosures, especially in the MD&A sections.

Brown and Tucker (2011) highlight the SEC's concerns regarding the effectiveness of MD&A disclosures, particularly emphasizing that the informativeness of these disclosures is compromised when they do not adequately reflect significant economic changes within the firm from one year to the next. They introduce a novel measure of narrative disclosure based on the degree of variation in MD&A content compared to previous disclosures, which serves as a vital indicator of the disclosures' usefulness to investors. This discussion brings to the forefront the essential question of what constitutes high-quality financial reporting. Specifically, it challenges the notion that avoiding repetition within the same annual report

automatically equates to informativeness. If CEO traits<sup>1</sup> influence reporting behavior in a manner that either enhances or detracts from the ability of MD&A sections to adapt to significant economic changes, this dynamic could have profound implications for the quality of financial disclosures. Indeed, it suggests that the mere absence of repetition within a single report may not inherently signify informativeness, especially if the overall pattern of reporting fails to evolve in response to significant economic changes. This scenario raises the possibility that a report could be deemed uninformative if it consistently fails to update or revise its narrative disclosures year after year, regardless of whether it avoids internal repetition.

Consequently, the motivation of this study is not only to examine the repetitive nature of disclosures but also to understand the broader implications of such reporting practices, including how they interact with changes in a firm's economic conditions and the role of CEO traits in shaping these outcomes. This approach emphasizes the importance of narrative disclosure as a dynamic component of financial reporting, one that is critically influenced by both the content of the disclosures and the context in which they are made. This exploration seeks to unravel the complex motivations behind repetitive disclosures and assess their implications for the clarity, usefulness, and integrity of corporate financial reporting. The next section articulates the research objectives and questions of this study.

<sup>1</sup> In this thesis, the terms "traits" and "characteristics" are used interchangeably to describe CEO behaviors and decision-making attributes. This usage aligns with the conventions observed in the existing literature, where these terms are often not distinctly differentiated, particularly in the context of integrating personal attributes with measurable firm-level variables (e.g., managerial ability scores and CEO overconfidence assessments). This approach facilitates a broader understanding of CEO behaviors within the dual context of personal and external influences, consistent with academic precedents.

## 2 Research Objectives and Questions

The preparation and gatekeeping of 10-K reports, which are comprehensive documents filed annually by publicly traded companies, involve a collaborative effort across multiple departments within a firm (Munter, 1997). These reports provide a full account of a company's financial performance, adhering to regulatory standards set by the Securities and Exchange Commission (SEC) (Cole, 1991). Typically, the process includes the Chief Financial Officer (CFO) and the finance team, who are crucial in gathering and presenting financial data (Kwon et al., 2024). The legal and compliance departments ensure the document meets all regulatory requirements, while external auditors review the financial statements to verify accuracy and compliance with accounting standards (Krasodomska et al., 2021)<sup>2</sup>.

Recent studies, such as those by Brown and Tucker (2011), have highlighted concerns regarding the informativeness of MD&A disclosures, especially when they do not reflect significant economic changes. Adding to this, Li's research (2019) emphasizes the informative potential of repetitive disclosures in the MD&A sections, contradicting the SEC's stance that such repetition decreases informativeness. This highlights a gap in understanding the strategic use of repetition under different managerial circumstances. Similarly, Cazier and Pfeiffer (2016) discuss how 10-K disclosure repetition can be a strategic response to managerial reporting incentives, suggesting a nuanced landscape where repetition might serve both transparency and obfuscation purposes. Furthermore, Maharjana and Lee (2022) investigate how external pressures like short-selling threats influence MD&A modifications, adding another layer of complexity to how disclosures are strategically manipulated. Moreover, Brown et al. (2021) provide experimental evidence on how disclosure repetition affects investors' information processing,

<sup>2</sup> The role of gatekeepers—often occupied by senior executives such as the CEO and CFO, alongside corporate attorneys and compliance officers—is essential (Rhodes and Russomanno, 2021). These individuals are responsible for the final review and approval of the 10-K before filing, ensuring that all presented information is accurate, complete, and consistent with SEC regulations.

suggesting that while repetition can enhance the processing of repeated information, it may obscure other critical data unless disclosures are made interactive (e.g., through online disclosures that allow users to engage directly with the content, such as clickable financial statements that provide additional details on demand).

This study leans on these foundations, focusing on the strategic repetition of content from the notes to the MD&A sections—a practice that might either enhance or obscure the informativeness of financial reports. The primary scientific goal of this research is to expand the academic understanding of narrative strategies in financial reporting. By examining the influence of CEO traits on the strategic repetition of financial disclosures, this study aims to contribute new insights into the complex mechanisms of corporate communication and enhance the theoretical framework of narrative disclosures. Practically, this research seeks to inform and potentially guide corporate executives and policymakers in refining disclosure practices. By elucidating how different CEO characteristics affect the clarity and effectiveness of financial reports, the findings could help improve transparency and decision-making in corporate finance, benefiting investors, other stakeholders, and regulatory bodies.

In the context of financial reporting, particularly within the structure of 10-K reports, notes are an integral part of the documents, providing detailed information and context that underpin the figures presented. These notes are designed to clarify the accounting methods, assumptions, and estimates used in preparing the financial statements (Lewis and Young, 2019). They typically include detailed breakdowns of various financial elements, explanations of specific accounting policies, and other disclosures crucial for a full understanding of the financial statements (Pilot, 2019). While the inclusion of notes is mandatory, the extent of detail provided can vary, reflecting a combination of regulatory requirements and managerial discretion. This variability can lead to differences in how firms present similar types of information; for instance, what is included in the main sections of one firm's financial statements might appear only in the notes of another's<sup>3</sup>.

Conversely, the MD&A section is intended to provide an analysis of the financial and operational results from the perspective of management (Cole and Jones, 2005). It is crafted to give existing and prospective stakeholders a narrative that explains the numbers in the financial statements, the company's financial condition, and its

<sup>3</sup> This thesis acknowledges the variations in how notes are structured and positioned across different firms, and systematically addresses these differences by adopting a standardized methodological approach to data extraction and analysis. This approach ensures that comparisons across firms are robust and meaningful, focusing on how the presence, absence, or detailed presentation of information in these notes reflects the influence of CEO traits on financial disclosure practices.

future outlook (Brown and Tucker, 2011). The MD&A often draws on detailed information from the notes to provide a broader narrative or to highlight specific trends, risks, and expectations, thus relying on the foundational data provided in the notes to craft a narrative that is more interpretative and forward-looking (Tarca et al., 2011). The strategic repetition from the notes to the MD&A involves not merely a duplication of content but an insightful transformation, where the raw data is contextualized to align with the company's strategic narrative. While the CEO may not directly author these sections, their strategic vision influences the emphasis and presentation, ensuring the narrative aligns with broader corporate goals (Mayfield et al., 2015).

The CEO plays a significant role in the MD&A section, although not necessarily directly involved in writing it (Li et al., 2023). This is due to the CEO's active role in corporate strategy formulation and implementation (Raposo and Dow, 2000), wealth creation (Prahalad and Doz, 2000), and articulating the company's vision (Stata, 1988). The CEO's influence on these key aspects of the company's operations and performance shapes the content and tone of the MD&A section (Liu and Nguyen, 2020). Their responsibilities include ensuring that the narrative aligns with the company's strategic direction and operational results (Hambrick and Wowak, 2021). They provide leadership in discussing the company's performance and future outlook (Wang et al., 2011). The CEO, alongside the CFO, must certify the accuracy and completeness of the entire report, including the MD&A (Li, 2010). This certification confirms that the financial statements and all included financial information accurately reflect the company's condition and operations (Minnis, 2010). The CEO's strategic insights into risks and opportunities are pivotal for framing the narrative that explains the "why" behind the numbers (Martens et al., 2007), thus enhancing investor confidence and understanding of the company's performance and direction.

The core objective of this study is to unravel the complexity of CEO-driven communication strategies in these reports. Specifically, it examines how CEOs strategically use repetition to transfer key content from the notes to the MD&A sections within the same 10-K report, shaping corporate narratives. This strategic repetition often involves taking specific, detailed points from the notes and weaving them into the broader discussions and analyses found in the MD&A to emphasize certain narratives or themes important to management. The notes serve as a static and factual groundwork, which supports the more dynamic and analytical content of the MD&A.

While less common, there could be instances where the discussion in the MD&A might prompt a more detailed disclosure in the notes in subsequent reporting periods. For example, if a particular issue highlighted in the MD&A attracts significant attention from stakeholders or regulators, it may lead to more detailed disclosures in

the notes to address these concerns comprehensively. Regarding the extent to which notes are independent of the CEO's influence, it is essential to understand that while the CEO, especially in their capacity as a key member of management, significantly influences the overall tone and strategic emphasis of disclosures (Patelli and Pedrini, 2015), the content of the notes is also bound by accounting standards and regulatory requirements (Bryant-Kutcher et al., 2013). These standards ensure a degree of consistency and comparability across companies, theoretically limiting the scope for personal influence over the basic disclosures in the notes. Consequently, the MD&A sections are more discretionary and not mandatory for auditing (Cohen et al., 2008), serving as the natural and optimal place for CEOs to repeat information in either an informative or opportunistic manner. Hence, the intentional directionality from notes to MD&A highlights the strategic use of this less regulated section to shape corporate narratives according to the CEO's influence and objectives.

Therefore, motivated by the hypothesis that CEO traits—in this study; managerial ability, overconfidence, and narcissism—substantially dictate the structure and substance of financial disclosures, this study is positioned to explore three research questions as follows:

1. *How does CEO managerial ability influence the strategic repetition from notes to MD&A sections?*
2. *How does CEO overconfidence influence the strategic repetition from notes to MD&A sections?*
3. *How does CEO narcissism influence the strategic repetition from notes to MD&A sections?*

These questions are designed to shed light on the sophisticated dynamics between CEO characteristics and their strategic choices in narrative disclosures, particularly how these traits influence the clarity, transparency, and strategic repetition<sup>4</sup> within corporate communications. This study is structured into three

<sup>4</sup> Strategic repetition is the deliberate use of repetitive language or themes in the MD&A sections of 10-K reports. This technique is employed to emphasize key points, shape stakeholder perceptions, or manage expectations strategically (Yuthas et al., 2002). It reflects the CEO's underlying traits such as managerial ability, overconfidence, or narcissism and aligns with broader organizational strategies aimed at influencing stakeholder behavior and perception. Conversely, operative repetition is used to fulfill informational or regulatory requirements, involving the recurrence of information that is more functional or procedural in nature (Webb, 2007). This type of repetition serves primarily for clarity, completeness, and compliance with financial reporting standards, and it typically lacks the strategic intent characteristic of strategic repetition. The focus on strategic repetition in this study stems from its potential to reveal insights into how

interconnected essays, each dedicated to analyzing how a specific CEO trait influences the strategic repetition of disclosures:

- **Essay 1: "CEO Managerial Ability and Strategic Repetition in 10-K Reports from Notes to MD&A"** delves into the correlation between CEOs' managerial abilities and their strategic choices to repeat content from notes in MD&A sections, offering insights into how adept leadership can foster corporate transparency through strategic repetition.
- **Essay 2: "CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A"** examines the impact of CEO overconfidence on the strategic crafting of repetition from notes to MD&A sections, challenging the conventional perception of overconfidence as solely negative.
- **Essay 3: "CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A"** delves into the impact of CEO narcissism on the strategic reuse of content from notes within the MD&A sections, highlighting how narcissistic traits influence narrative construction and repetition.

Considering insights from individual essays, we also explore overarching themes that emerge when viewing these CEO characteristics as part of a collective framework affecting corporate communication. Reflecting on the broader implications of our findings, we introduce additional research questions that can be answered using insights and merging from all three essays:

1. *Considering the combined effects of CEO managerial ability, overconfidence, and narcissism, how do these traits collectively influence the strategic approach to repetition in MD&A disclosures?*
2. *What overarching strategies in financial reporting can be discerned from the interaction of CEO traits with the strategic repetition of content from notes to MD&A?*

These questions are designed to synthesize findings across the essays, offering a comprehensive view of how CEO traits dictate the transparency, clarity, and strategic use of repetition in corporate communications. The answers to these questions are derived through an integrated analysis presented throughout each essay and

CEO traits influence communication strategies within corporate financial disclosures. By examining the strategic use of repetition, we can better understand the ways in which leadership styles and executive personalities shape the narrative frameworks and strategic outputs of financial reporting.

culminate in our final discussions, a cohesive understanding of the themes developed across the thesis.

In summary, by dissecting the relationship between CEO traits and disclosure practices, this thesis aims to enrich the discourse on corporate governance, financial reporting, and the influence of executive personality on corporate communication strategies. Moving forward from the significance of strategic repetition, the next sections delve into the theoretical frameworks that underpin our understanding of CEO-driven communication within financial reporting. Grounded in the distinct traits of CEO managerial ability, overconfidence, and narcissism, each essay is supported by theories that offer a lens through which to analyze the effects of CEO characteristics on the strategic repetition in MD&A sections. This setup not only motivates and clarifies the focus on repetition from notes to MD&A but also aligns the research questions with the thematic core of each essay, supporting consistency and clarity across the compilation.

### 3 Theoretical Framework

To effectively anchor our investigation into CEO-driven communication strategies in financial reporting, it is essential to distinguish between the foundational theories that serve as the general principles for our study and the specific theoretical underpinnings that guide each detailed analysis in the subsequent essays. This introductory section provides a cohesive framework, introducing the broad theories of information asymmetry, agency costs, and signaling theory, which underlie the overarching themes of the thesis. These foundational theories offer a broader understanding of the issues at play in financial reporting and governance.

At the heart of financial reporting lies the challenge of information asymmetry, a condition where one party possesses more or better information than another. In the corporate context, this asymmetry not only manifests between management (agents) and shareholders (principals) but also affects other stakeholders, leading to potential adverse selection and moral hazard problems. Adverse selection refers to the risk of shareholders making suboptimal decisions based on incomplete or misleading information provided by management (Esponda, 2008; Forsythe et al., 1999). Moral hazard arises when managers engage in activities not in the shareholders' best interest, shielded by the opacity of their actions (Kahn and Winton, 2004). Dionne (1981) and Darrough and Stoughton (1986) explore the implications of these issues, with Dionne focusing on insurance strategies to address them, and Darrough and Stoughton examining their impact on financial structures. Ma (1991) delves into multiperiod moral hazard problems, highlighting the importance of renegotiation-proof contracts.

Agency costs, a direct consequence of information asymmetry (Beatty and Harris; 1999), represent the resources expended to mitigate agency problems, including monitoring costs incurred by principals, bonding costs by agents, and residual loss—the divergence in value from the principal's optimal outcome due to the agent's actions (Goshen and Squire, 2017). Pantzalis and Park (2014) and Maggi and Rodríguez-Clare (1995) discuss the exacerbation of these costs due to divergent objectives and information distortion. Cumming and Johan (2008) emphasize the critical role of addressing information asymmetries and agency costs in venture

capital exits, while Jacobides and Croson (2001) suggest that the strategic use of information can significantly influence the value of agency relationships.

Signaling theory provides a mechanism to alleviate information asymmetry (Wang et al., 2021), where agents (executives) communicate their quality or intentions through signals (financial disclosures) to principals (shareholders). This theory highlights the strategic role of narrative disclosures in financial reports as signals to mitigate adverse selection and moral hazard by reducing information asymmetry and, thereby, agency costs (Tran et al., 2023). Brown and Hillegeist (2007) underline the importance of disclosure quality in reducing firm-investor asymmetry. Taj (2016) extends the discussion on signaling by addressing the nuances of negative signals, signal precedence, and counter-signals in creating a robust signaling environment. Healy and Palepu (1995) explore the complexities of financial signaling in investor communications, highlighting the strategic use of accounting changes to influence perceptions and stock valuation. This complements Mavlanova et al. (2012), who demonstrate signaling theory's application in online commerce, using website signals to communicate quality<sup>5</sup>.

Understanding these foundational theories provides a critical backdrop to explore the nuanced dynamics of CEO traits—managerial ability, overconfidence, and narcissism—and their influence on strategic repetition in narrative disclosures. Each of these CEO characteristics interacts with the foundational concepts of information asymmetry, agency costs, and signaling in distinct ways, shaping the content and presentation of financial disclosures not only for shareholders but also for other stakeholders. The ensuing essays will delve into how these interactions manifest in the strategic use of narrative disclosures, specifically through the lens of management obfuscation theory, stakeholder theory, and other relevant theoretical frameworks.

### *Essay 1: CEO Managerial Ability and Repetitive Disclosures*

The first essay explores the intricate relationship between CEO managerial ability and strategic repetition in 10-K reports from notes to MD&A, grounded in two

<sup>5</sup> While financial disclosures contain direct information, the strategic selection and repetition of specific content within these disclosures may act as signals. This subtlety arises because not all elements of financial disclosures are inherently signaling. The management's choice in selectively repeating certain notes or omitting others in financial reports may be interpreted as a deliberate signaling action aimed at guiding stakeholders' perceptions and decisions. Similarly, the MD&A sections may serve to subtly steer stakeholders towards recognizing signals, even though these sections themselves are not signals. This nuanced use of narrative spaces allows CEOs to not just communicate directly but also to use these narratives as a means of signaling, where the decision on what to repeat and what to omit becomes a strategic element that can establish reliability and guide stakeholder interpretations.

primary theoretical perspectives: management obfuscation theory and stakeholder theory, emphasizing the relevance to both shareholders and other stakeholders.

Management obfuscation theory posits that managers may strategically use narrative disclosures to obscure actual performance or future prospects, especially in periods of underperformance. Bloomfield (2002) and Li (2008) suggest that increasing repetitive disclosures in MD&As can serve as a instrument for this obfuscation, allowing managers to dilute the specificity of information provided to investors and thereby mitigate potential adverse market reactions. This theory aligns with observations from Dempsey et al. (2010), who note a tendency for managers to resort to obfuscation tactics during financial downturns.

Conversely, Stakeholder theory emphasizes the importance of transparent and clear communication in addressing the needs and expectations of all stakeholders, not just shareholders. This theory would suggest that CEOs with higher managerial ability, due to their comprehensive understanding of the business landscape and its impact on various stakeholder groups, might lean towards reducing repetitive disclosures. Rather than merely reducing repetitive disclosures, these CEOs might enhance disclosure quality by using repetition selectively to emphasize key information or contextual details in the MD&A. This strategic repetition can serve to clarify and accentuate crucial aspects of the company's performance and strategy, thereby potentially increasing the overall quality of disclosures and aiding stakeholders in making informed decisions. The rationale is that more adept managers are better positioned to convey their firm's performance and strategies in a clear and concise manner, thus enhancing corporate transparency (Zerfass and Sherzada, 2015; Allert and Chatterjee, 1997). Supporting this view, Hui and Matsunaga (2015) found a positive association between executive compensation and the quality of financial disclosures, indicating that boards of directors, who propose executive compensation, value effective communication.

Adding complexity to the relationship between CEO managerial ability and disclosure practices is the 'rent extraction' perspective, intertwined with agency theory. This viewpoint suggests that while skilled managers can enhance firm performance, they may also leverage their position to prioritize personal benefits over shareholder interests. Habib and Hasan (2017) observe that proficient managers might engage in projects that serve their interests, potentially using repetitive disclosures in MD&As to obscure these actions from shareholders. This perspective is supported by the observation that CEOs with higher managerial abilities may utilize repetitive disclosures not only to obfuscate but also to amplify their personal achievements, thereby navigating the fine line between transparency and strategic self-promotion. The duality of managerial ability's impact on disclosure practices raises the hypothesis that the relationship between CEO ability and repetitive

disclosures could be significantly complex, potentially varying based on the underlying motivations and incentives of individual CEOs.

Given the dual theoretical perspectives on how CEO managerial ability influences repetitive disclosures—ranging from seeking transparency and stakeholder engagement to obfuscating information for personal gain—a subtle hypothesis emerges: The relationship between CEO managerial ability and the frequency and nature of repetitive disclosures in MD&A sections is influenced by the dual pressures of promoting transparency and managing personal and organizational image. This suggests that higher managerial ability could either decrease or increase repetitive disclosures based on contextual factors and managerial incentives. This essay, by examining these theoretical underpinnings and drawing upon prior studies, aims to contribute to the discourse on how CEO traits, particularly managerial ability, influence the strategic use of narrative disclosures in financial reporting.

### *Essay 2: CEO Overconfidence and Repetitive Disclosures*

For Essay 2, titled "CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A " the theoretical framework delves into the intersection of upper echelons theory with the psychological trait of CEO overconfidence and its impact on financial reporting practices, particularly in the context of repetition in MD&A sections.

Upper echelons theory (Hambrick and Mason, 1984) serves as the foundational lens through which the impact of CEO overconfidence on financial disclosures is examined. This theory posits that the personal attributes of top executives, including their psychological traits like overconfidence, significantly influence their strategic decisions and, consequently, the firm's performance and disclosure practices. Overconfident CEOs, characterized by an inflated belief in their own judgment and abilities (Larwood and Whittaker, 1977; Svenson, 1981), are hypothesized to approach corporate disclosure with a distinctive style, potentially affecting the frequency and nature of repetitive information in MD&A sections.

On one hand, obfuscation theory suggests that managers, including overconfident CEOs, might utilize repetitive disclosures to obscure actual performance or strategic failures (Li, 2008; Bloomfield, 2008). This strategic obfuscation serves to dilute the clarity of information, potentially delaying negative market reactions to unfavorable news. Agency theory complements this perspective by highlighting how overconfident CEOs might prioritize personal goals or perceptions over shareholder interests, thus influencing disclosure practices to align with their self-image or to mitigate perceived risks associated with their strategic decisions. Signaling theory also supports this view, suggesting that such repetitive

disclosures might serve as a method to reinforce positive perceptions about the firm's strategic direction (Merkl-Davies and Brennan, 2007; Bae et al., 2018).

Contrasting with the above theories, behavioral decision theory offers a counterpoint by suggesting that CEO overconfidence might lead to decreased repetition in disclosures, thereby enhancing transparency (Kahneman et al., 1982; Tversky and Kahneman, 1982). This theory argues that overconfident CEOs, driven by a proactive mindset and a preference for clear, direct communication, may eschew obfuscation in favor of presenting information in a straightforward manner (Heavey et al., 2020). This approach may also be influenced by cognitive dissonance, as these CEOs could experience discomfort when their disclosures do not align with their self-perception as effective leaders, prompting them to opt for transparency (Abdulfatah, 2019; Hinojosa et al., 2017; Bailey and Peck, 2013). Additionally, information asymmetry theory posits that clearer, less repetitive disclosures could effectively reduce information gaps, aligning investor understanding more closely with the reality of the company's situation (Clarkson et al., 2007; Bergh et al., 2019).

Drawing from the rich theoretical landscape encompassing upper echelons theory, behavioral decision theory, and insights from obfuscation and agency theories, a hypothesis is formulated to probe the influence of CEO overconfidence on corporate disclosure patterns. This hypothesis posits that CEO overconfidence may simultaneously lead to an increase or decrease in repetitive disclosures within MD&A sections, contingent upon the interplay between a propensity towards obfuscation, aligned with personal or organizational narratives, and a drive for transparency, reflecting a confidence in decision-making acumen. This dualistic perspective suggests that overconfident CEOs might either amplify repetitive disclosures to obscure less favorable information or minimize them in favor of a more transparent and assertive communication style. This hypothesis seeks to shed light on the complex dynamics between CEO overconfidence and strategic communication choices, aiming to enrich the discourse on the impact of psychological traits on financial reporting practices.

### *Essay 3: CEO Narcissism and Repetitive Disclosures*

For Essay 3, titled "CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A " the theoretical framework is centered around the influence of CEO narcissism on the patterns and frequency of repetitive disclosures within financial reports. This exploration is underpinned by agency theory and impression management theory, offering insights into the complex mechanisms through which narcissistic traits in CEOs impact corporate communication strategies.

Agency theory, with its focus on the conflicts of interest between principals (shareholders and other stakeholders) and agents (CEOs), provides a critical lens through which to examine the behaviors of narcissistic CEOs. According to

Donaldson and Davis (1991), and further explored by Payne and Petrenko (2019), such CEOs may prioritize personal goals over the best interests of shareholders, potentially leading to strategic manipulations of corporate narratives. Narcissistic CEOs, driven by self-interest, may utilize repetitive disclosures within MD&As to emphasize achievements or aspects that bolster their personal image or align with their individual goals, subtly diverging from shareholder interests. This perspective aligns with findings by Nyberg et al. (2010), suggesting that while there might be an alignment of CEO and shareholder returns, narcissistic tendencies could influence CEOs to employ repetition in disclosures to navigate and further their personal ambitions under the guise of shareholder alignment.

Impression management theory delves into the strategies employed by individuals, especially those in leadership roles, to influence others' perceptions through crafted narratives. This theory becomes particularly relevant when considering narcissistic CEOs, who may focus on shaping stakeholder perceptions to their advantage through strategic communication practices. Boudt and Thewissen (2019) illustrate how CEOs can strategically place words to create favorable impressions, a practice that may be intertwined with earnings management (Lo et al., 2017). Narcissistic CEOs, characterized by a propensity for self-promotion, may repetitively highlight positive aspects in disclosures, aiming to control stakeholder perceptions. However, as Steinmetz et al. (2017) point out, these efforts often backfire, as the inauthentic or exaggerated nature of these narratives can lead to skepticism or mistrust among stakeholders. Merkl-Davies et al. (2011) add to this discussion by noting how firms, potentially under narcissistic leadership, manipulate corporate reports to cater to different audience groups, employing repetition and selective disclosure to paint a more favorable picture.

Informed by agency theory and impression management theory, this essay advances a hypothesis centered on the intricate relationship between CEO narcissism and the strategic employment of repetitive disclosures in MD&A sections. The hypothesis contends that narcissistic CEOs, driven by self-interest and a desire to cultivate a favorable personal image, may manipulate corporate narratives to either emphasize achievements repetitively or to obfuscate aspects that do not align with their self-image. This manipulation, rooted in the desire to influence stakeholder perceptions and manage impressions, reinforces the potential for narcissistic leadership to impact corporate transparency and stakeholder trust either positively or negatively. By delving into the implications of narcissistic CEOs' communication strategies, this investigation aims to unravel the ways in which CEO narcissism influences the presentation and repetition of corporate disclosures, contributing to the broader understanding of how executive personality traits shape the landscape of financial communication.

## 4 CEO Characteristics Investigation

Building upon the theoretical foundations in previous sections, we now turn our attention to an in-depth investigation of specific CEO characteristics that are pivotal in this thesis: CEO managerial ability, overconfidence, and narcissism. Each of these traits, deeply rooted in the psychological and behavioral dimensions of leadership, significantly effects corporate communication strategies, particularly in the context of financial disclosures. This examination is not only crucial for understanding the direct impact of these traits on the style and substance of narrative disclosures but also for exploring how they influence broader corporate outcomes and stakeholder perceptions. Drawing from a rich tapestry of research across management, psychology, and accounting disciplines, we delve into why these characteristics are important and how they manifest in corporate decision-making and financial reporting practices<sup>6</sup>.

### 4.1 CEO Managerial Ability

CEO managerial ability is a critical determinant of firm success, influencing a wide array of corporate decisions and outcomes. The upper echelons theory (Hambrick, 2007; Hambrick and Mason, 1984) posits that the backgrounds and personal traits of top executives, including their managerial ability, significantly shape organizational

<sup>6</sup> CEO managerial ability, overconfidence, and narcissism are dynamic attributes that reflect underlying psychological and behavioral tendencies which significantly influence decision-making and communication strategies. Unlike static characteristics such as age, tenure, experience, and gender, which are typically seen as more fixed background factors (Musteen et al., 2006), dynamic traits provide a more direct insight into how CEOs actively shape corporate narratives and strategies based on their personal biases, skills, and motivations (Pitelis and Wagner, 2019). However, it is important to recognize that static characteristics can also influence reporting to some extent. For example, a CEO's long tenure or extensive experience in an industry might subtly affect the nature of narrative disclosures (Yan et al., 2021), including the extent and nature of repetitive information. Dynamic attributes, however, tend to offer more flexibility and potential for change (Schilke, 2014), often leading to varied approaches to narrative disclosures that are influenced by a CEO's ongoing learning and personal development (Morgeson et al., 2015).

strategies and performance. Research by Bertrand and Schoar (2003) and subsequent studies have demonstrated that managerial ability affects various aspects of firm operations, from financial restatements to innovation productivity and corporate tax behavior (Aier et al., 2005; Dyreng et al., 2010).

Furthermore, managerial ability is linked to how firms communicate with external stakeholders, particularly through narrative disclosures in financial reports. The SEC emphasizes the importance of these disclosures in providing a management-centric view of the company, suggesting that CEOs' unique abilities can influence the content and clarity of these communications (SEC, 2003). Research has frequently documented the outcomes of these CEO traits on corporate communication but has often left the underlying processes somewhat opaque. For instance, while Hasan (2020) identified a positive correlation between managerial ability and the readability of narrative disclosures, this relationship begs further exploration into the cognitive and decision-making processes that high-ability managers employ to enhance disclosure clarity. These managers might utilize their superior strategic thinking and communication skills to structure information more effectively (Ginter, 2013; Babiak et al., 2010), thereby increasing transparency and readability.

Conversely, Tan et al. (2021) observed that low-ability managers often inflate the disclosure tone and increase readability to positively influence labor market perceptions about their ability. This finding suggests a compensatory mechanism wherein lower-ability managers might resort to enhancing the stylistic aspects of disclosures to mask their managerial inadequacies (Baik et al., 2020) or to shift stakeholder focus from substantive performance issues (Mertzanis et al., 2023).

This investigation into how CEOs with high managerial abilities navigate the balance between providing essential repetitive information for clarity and avoiding excessive repetition that might obscure critical financial details. By examining the effects of managerial ability on the frequency and nature of repetitive disclosures, especially in the MD&A sections of 10-K reports, this investigation seeks to uncover the strategic choices made by CEOs in their communication with stakeholders.

## 4.2 CEO Overconfidence

The trait of CEO overconfidence has garnered attention for its complex influence on corporate decision-making and performance. Rooted in upper echelons theory, overconfidence is considered a psychological trait that shapes strategic choices and organizational outcomes (Hambrick, 2007; Hambrick and Mason, 1984). While traditionally viewed as detrimental, leading to suboptimal investment decisions and increased risk of misreporting (Malmendier and Tate, 2005; Schrand and Zechman, 2012), recent perspectives highlight its potential benefits, including spurring

innovation and enhancing firm performance (Galasso and Simcoe, 2011; Reyes et al., 2022). Accounting research has extended these insights to explore how overconfidence affects financial disclosures and managerial practices, noting that overconfident CEOs tend to provide more optimistic forecasts and may engage in earnings management or aggressive financial reporting (Hilary and Hsu, 2011; Ahmed and Duellman, 2013). This line of inquiry highlights the importance of understanding the impact of CEO overconfidence on narrative disclosures and overall financial communication strategies.

The focus is on understanding how CEO overconfidence affects the strategic repetition of content within narrative disclosures, particularly in MD&A sections. This exploration seeks to determine whether overconfident CEOs prefer a more repetitive disclosure style to reinforce their optimistic views or if they opt for less repetition, relying on their confidence in the firm's prospects to convey their message. By analyzing the impact of overconfidence on the linguistic style and repetition in financial reporting, this investigation contributes to a more nuanced understanding of how psychological traits influence corporate communication strategies.

### 4.3 CEO Narcissism

CEO narcissism, characterized by traits of grandiosity, entitlement, and a propensity for manipulation, significantly influences corporate behaviors and decision-making processes. Studies have linked narcissistic leadership to both positive outcomes, such as improved audit quality, and negative behaviors, including unethical practices and increased fraud risk (Chou et al., 2021; Rijsenbilt and Commandeur, 2013). Furthermore, research has shown that narcissistic CEOs tend to use more positive and optimistic language in financial reporting, potentially leading to overly optimistic disclosures that may not accurately reflect organizational realities (Buchholz et al., 2018; Marquez-Illescas et al., 2019).

This investigation into CEO narcissism aims to contribute to the understanding of how such traits affect the linguistic style and repetition within narrative disclosures, particularly within the MD&A sections of 10-K reports. By examining the specific impact of narcissism on financial reporting language, this study seeks to illuminate the broader implications of narcissistic leadership on corporate transparency and stakeholder trust.

#### 4.4 Detailed Comparison of CEO Overconfidence and Narcissism

*Overconfidence* is characterized by an exaggerated belief in one's abilities, leading to optimistic decision-making and risk assessment. CEOs with overconfidence tend to overestimate their capability to achieve successful outcomes, affecting their strategic choices and potentially leading to suboptimal decisions due to a skewed perception of risk and ability (Malmendier and Tate, 2005). *Narcissism* in CEOs, however, goes beyond mere confidence in abilities. It involves a grandiose self-view, a relentless pursuit of admiration, and a focus on personal gratification, often at the expense of others. Narcissistic CEOs may manipulate corporate narratives to enhance their image, displaying traits such as entitlement, exploitation, and a lack of empathy (Campbell et al., 2011; Grijalva et al., 2015). These are the key differences highlighted by research (Brunzel, 2021):

- Narcissistic individuals, including CEOs, exhibit higher levels of confidence, often overestimating their performance and capabilities. This suggests that narcissism may encompass overconfidence, yet it is distinguished by a constant need for external validation and admiration (Campbell et al., 2002; Emmons, 1984; Raskin et al., 1991).
- Narcissism is linked to increased risk-taking in knowledge-based tasks and social judgment errors, indicating a broader impact on decision-making processes beyond mere overconfidence (Macenczak et al., 2016).
- The constructs of overconfidence and narcissism, while moderately related, are distinct, with sufficient variance for independent consideration. Narcissism, unlike overconfidence, is deeply embedded in personality and affects a wide range of behaviors (O'Reilly et al., 2014).

Table 1 is based on the literature reviewed earlier, providing a structured comparison between CEO overconfidence and narcissism, highlighting key distinctions and implications for corporate behavior and decision-making.

**Table 1.** Comparison of Major Features: CEO Overconfidence vs. Narcissism.

Aspect	CEO Overconfidence	CEO Narcissism
Origin	Rooted in an exaggerated belief in one's abilities, affecting decision-making and risk assessment.	Encompasses a grandiose self-view, a need for admiration, and self-interest, influencing a broader range of behaviors beyond decision-making.
Consequences	Primarily affects cognition, leading to optimistic strategies and potentially risky investments.	Affects thinking, feeling, and behaving, with a significant focus on external validation and personal gratification.
Outcomes for the Firm	Seen as a cognitive bias with potentially both positive and negative outcomes for the firm.	Considered a comprehensive personality trait that can drive unethical behavior and decision-making detrimental to stakeholder interests.
Decision-Making	May result in suboptimal decisions due to misperceived abilities and risks.	Leads to manipulative communication strategies and excessive risk-taking to satisfy personal desires for power and admiration.
Cultural Prevalence	Universally prevalent across cultures, influencing behaviors based on biased perceptions of reality.	More prevalent in individualistic societies that value self-promotion over communal values, indicating a cultural dimension to narcissism.
Interpersonal Dynamics	Can exhibit charming and outgoing behavior without necessarily leading to interpersonal conflicts.	Often involves exploitative actions and interpersonal conflicts due to a lack of empathy and a focus on self-enhancement.

Based on the Table 1 information and its implications, CEO overconfidence and narcissism each uniquely influence financial reporting, shaping disclosure practices and financial transparency (Brunzel, 2021). Overconfident CEOs, characterized by an exaggerated belief in their abilities, may adopt optimistic financial projections and aggressive accounting methods (Malmendier and Tate, 2015). This optimism can lead to understated risks in financial disclosures, potentially misleading stakeholders about the firm's financial health (Cormier et al., 2016). Such CEOs might also favor bold, speculative ventures that appear promising in financial statements but introduce significant risk (Li et al., 2022). In contrast, narcissistic CEOs, driven by a need for admiration and a grandiose self-view, often manipulate financial reports to enhance their personal image (Marquez-Illescas et al., 2019). This could result in embellished financial statements and selective disclosure practices, where unfavorable information is strategically omitted (Garud et al., 2023). Their actions typically aim at maintaining a favorable public persona, occasionally at the cost of transparency and ethical standards (Rijsenbilt and Commandeur, 2013; Van Scotter and De Déa Roglio, 2020).

Both traits impact not only the content but also the presentation of financial information. Overconfident CEOs' decisions may lead to volatile financial outcomes (Malmendier and Tate, 2008), whereas narcissistic CEOs' manipulations could undermine stakeholder trust when discrepancies are eventually uncovered (Kim et al., 2021). The intersection of these traits with cultural norms and interpersonal dynamics

further complicates the landscape (Meisel et al., 2016). Overconfidence is universally prevalent and may consistently influence underestimation of risks across cultures (Moore et al., 2018), while narcissistic behavior might be more acute in individualistic societies where personal achievement is highly valued (Westen, 1985).

Overall, understanding the influence of these CEO traits on financial reporting is crucial for stakeholders who rely on accurate and ethical disclosures. This awareness helps in assessing the potential risks associated with leadership biases, ensuring a comprehensive evaluation of the firm's financial integrity and strategic outlook.

## 4.5 Intentional Segmentation of CEO Traits

The decision to focus on separate essays for each CEO characteristic—managerial ability, overconfidence, and narcissism—and to employ separate regression models for each, is a research design choice to highlight potential challenges related to the impact of various CEO characteristics on the degree of repetition in financial disclosures, specifically the risks of collinearity and the difficulty in distinguishing individual incremental effects in a single linear regression model.

Such a segmented approach not only allows for a more focused analysis of each trait's unique influence on disclosure practices but also enhances the clarity and interpretability of the findings. The following discussion provides a detailed explanation of why segregating these characteristics into distinct essays and models is a necessary and insightful methodological choice to support this segmentation.

### Addressing Collinearity Concerns

Collinearity refers to a situation in a statistical model where two or more predictor variables are highly correlated, making it difficult to ascertain the individual impact of each predictor on the outcome variable. In the context of this research, CEO characteristics such as managerial ability, overconfidence, and narcissism are likely to be interrelated. For instance, a CEO's narcissism could influence their perceived managerial ability or their level of overconfidence, leading to intertwined effects that are hard to disentangle in a unified model<sup>7</sup>.

<sup>7</sup> Given that the variables representing CEO characteristics are derived from varied sources—managerial ability from repositories like Demerjian et al. (2012), CEO stock options data from Execucomp, and narcissism from analysis of conference call transcripts—and that the analysis period differs across essays due to data availability, evaluating the collinearity among these variables collectively within a single model presents significant methodological challenges. Furthermore, the distinct nature and source of each variable make a comprehensive correlation analysis impractical. This methodological rationale underpins the decision to analyze these CEO traits separately, ensuring a robust and focused investigation of their individual impacts on financial disclosure repetition.

To effectively isolate the impact of each CEO characteristic on the repetition in financial disclosures, we have adopted a strategic approach by separating these characteristics into distinct essays and employing separate regression models for each trait. This methodological choice allows for a more precise analysis of how each characteristic independently influences disclosure practices, without the interference of overlapping effects that could obscure the results. By analyzing each trait in isolation, we can test the unique contributions of managerial ability, overconfidence, and narcissism. Additionally, this separation aids in identifying specific patterns and tendencies associated with each trait, thereby enhancing the clarity and reliability of our findings. This approach not only mitigates the risk of collinearity but also strengthens the validity of our conclusions by ensuring that the observed effects are truly attributable to the specific CEO traits examined, rather than being a result of confounding influences from other interrelated characteristics.

### Refined Hypothesis Development

Focusing on multiple CEO characteristics simultaneously intertwines the process of developing a coherent and testable hypothesis. Each characteristic influences disclosure practices in resembling ways, as evidenced by the theoretical frameworks as discussed. By dissecting the overarching theme into manageable, focused inquiries, we have been able for a more detailed and precise hypothesis development for each characteristic. This clarity is crucial for articulating the contribution of the research, as it enables us to define specific pathways through which each CEO trait affects disclosure practices, grounded in distinct theoretical perspectives.

### Articulating Contribution Clearly

Segmenting the investigation enables us to delve deeply into the theoretical and empirical nuances of how each CEO characteristic influences repetitive disclosures. This focused approach not only aids in the identification of unique effects but also enriches the academic discourse by providing detailed insights into each trait's role within the broader context of financial reporting. While acknowledging that these traits may overlap and that perfect empirical and theoretical segmentation might not always be possible, this methodological choice significantly enhances the clarity and articulation of the research's contributions. It allows us to present distinct narratives about the impact of individual traits on corporate communication strategies, offering a clearer understanding of complex interactions.

Furthermore, the deliberate separation of traits facilitates an alignment with overlapping theories, presenting an opportunity to bridge empirical findings with theoretical frameworks. This connection underlines the adaptability and robustness

of our approach, providing valuable insights into the interplay between CEO characteristics and financial disclosures. By addressing the challenges of segmentation, we not only acknowledge the interconnected nature of these traits but also highlight how this methodological strategy can effectively illuminate the distinct contributions of each trait, thereby enhancing the overall coherence and impact of our findings.

### Addressing Potential Endogeneity

To address potential concerns regarding endogeneity caused by omitted CEO characteristics, our research design incorporates several strategies to mitigate these issues. Specifically, the variance in the directional influence of CEO traits across different models serves as indirect evidence against severe endogeneity problems. For instance, the observation that certain CEO characteristics exert a positive influence in some contexts (e.g., managerial ability enhancing transparency in disclosures) while having a negative impact in others (e.g., narcissism leading to more optimistic and potentially misleading disclosures) suggests that our models are capturing distinct effects rather than being confounded by a single underlying trait. Moreover, the incorporation of robustness checks and sensitivity analyses further supports the conclusion that our findings are not significantly marred by omitted variable bias. By carefully selecting control variables and employing various methodological approaches designed to isolate the effect of each CEO trait, we ensure that the observed relationships are indicative of genuine influences rather than artifacts of endogeneity.

Furthermore, in response to potential inquiries regarding the interrelationship between CEO traits—managerial ability, overconfidence, and narcissism—and to provide a thorough justification for the methodological approach adopted in this thesis, an extensive analysis of the mutual correlations and incremental explanatory power of these traits was conducted. Technical Appendix A delineates the steps taken to confirm that the influence of each characteristic is distinct and not confounded by the others, thereby adding credibility to the segmentation approach used in the thesis.

## 5 Methodological Overview

### Measuring Repetition within 10-Ks from Notes to MD&As

Our methodological framework for evaluating repetition, pivotal to the thematic exploration across all three dissertation essays, adheres to the established procedures by Cohen et al. (2020). Central to our analysis is the extraction of text from the notes section (Section 8) and the MD&A section (Section 7) within each annual 10-K filing. Utilizing regular expressions, we precisely delineate and extract the textual content of these sections, accounting for variance in section labels across different reports. This extraction process is designed to accommodate all variations, ensuring a thorough capture of the text for analysis. To quantitatively assess repetition—defined in our study as the degree of strategic content reflection from note disclosures to MD&As within the same 10-K report—we employ four textual similarity measures renowned in the fields of linguistics and natural language processing (NLP): Cosine Similarity (*Sim\_Cosine*), Jaccard Similarity (*Sim\_Jaccard*), Minimum Edit Distance (*Sim\_MinEdit*), and Simple Similarity (*Sim\_Simple*). Each metric is selected for its unique ability to capture different dimensions of textual similarity:

1. **Cosine Similarity (*Sim\_Cosine*)** evaluates the cosine of the angle between term frequency vectors from the notes and MD&A sections, providing insights into the overall thematic alignment.

Let  $D_{s1}$  and  $D_{s2}$ , be the sets of terms occurring in documents  $D_1$  and  $D_2$ , respectively. Define  $T$  as the union of  $D_{s1}$  and  $D_{s2}$ , i.e.,  $T = D_{s1} \cup D_{s2}$ . Let  $t_i$  be the  $i$ -th element of  $T$ . The term frequency (TF) vectors for  $D_1$  and  $D_2$  are defined as:

$$D_1^{TF} = [nD_1(t_1), nD_1(t_2), \dots, nD_1(t_N)]$$

$$D_2^{TF} = [nD_2(t_1), nD_2(t_2), \dots, nD_2(t_N)]$$

where  $nD_k(t_i)$  is the number of occurrences of term  $t_i$  in documents  $D_k$ . The cosine similarity between two documents is then defined as:

Equation (1):

$$\text{Sim Cosine} = (D_1^{TF} \cdot D_2^{TF}) / \|D_1^{TF}\| * \|D_2^{TF}\|$$

where the dot product,  $(D_1^{TF} \cdot D_2^{TF})$ , is the sum of the products of the corresponding entries of the vectors, and  $\|D_1^{TF}\| * \|D_2^{TF}\|$ , are the Euclidean norms of the vectors.

2. **Jaccard Similarity (*Sim\_Jaccard*)**, employing the term sets from Cosine Similarity, measures the binary intersection over union of terms, spotlighting the unique informational overlap.

Equation (2):

$$\text{Sim Jaccard} = |D_1^{TF} \cap D_2^{TF}| / |D_1^{TF} \cup D_2^{TF}|$$

3. **Minimum Edit Distance (*Sim\_MinEdit*)** calculates the smallest number of edits needed to transform the note disclosure text into the MD&A text, reflecting the extent of textual modification.
4. **Simple Similarity (*Sim\_Simple*)** offers a normalized score based on direct text comparisons, encapsulating straightforward similarities and differences.

Equation (3):

$$\text{Sim Simple} = [c_{\max} - c] / c_{\max}$$

where  $c = (\text{additions} + \text{deletions} + \text{changes}) / ((\text{Size } D_1 + \text{Size } D_2) / 2)$ , and  $c_{\max}$  is the maximum value of  $c$ .

The choice of these measures is motivated by their collective capability to present a holistic view of repetition, encompassing both the extent and nature of information mirrored from notes to MD&As<sup>8</sup>. This multifaceted approach facilitates an examination of how specific CEO characteristics, such as overconfidence or

<sup>8</sup> Example of Application: Consider a 10-K filing where the notes section details a significant change in inventory valuation methodology. If the MD&A section subsequently reiterates this change, emphasizing its impact on financial health and future prospects, our methodology would capture this as a high degree of repetition, especially if both sections use similar terminology and thematic emphasis. By employing our chosen similarity measures, we can quantify this repetition, offering concrete insights into how the CEO's communication strategy—potentially influenced by their personal traits—guides the narrative consistency and emphasis between these sections. This methodological approach, by focusing on the strategic transfer of information from notes to MD&As, not only aligns with our theoretical framework on CEO-driven communication strategies but also ensures coherence in our investigation of repetition across different essays of the dissertation.

narcissism, systematically influence the strategic repetition within corporate disclosures.

### The Main Test Variables for the CEO Characteristics

These CEO characteristics are central to the study due to their potential influence on the repetitiveness of corporate disclosures. Managerial ability reflects on the strategic and efficient communication of firm performance, overconfidence may skew risk perceptions and disclosure transparency, and narcissism could drive a focus on self-enhancement at the expense of informative disclosure. Each trait offers a unique lens through which to understand the dynamics of corporate reporting and narrative disclosures, highlighting the importance of individual differences in executive leadership on corporate communication strategies. The CEO characteristics examined in this study include managerial ability, designated as the primary independent variable in the first essay (*M\_ABILITY*); overconfidence, identified as the primary independent variable in the second essay (*HOLDER67*); and narcissism, identified as the primary independent variable in the third essay (*CEONAR*).

CEO managerial ability is quantified using the managerial ability scores developed by Demerjian et al. (2012). This approach employs data envelopment analysis (DEA) to evaluate firm efficiency within industries, focusing on optimizing sales relative to various inputs, including cost of goods sold, administrative expenses, and assets. A subsequent Tobit regression model isolates managerial ability by regressing firm efficiency against variables like firm size, market share, and free cash flow, based on Fama and French's 48 industry classification codes. The residuals from this model represent the managerial ability, indicating a CEO's effectiveness in resource optimization and firm profitability. This metric is chosen for its robust methodology and ability to provide a measure of managerial ability that distinguishes managerial contributions from firm-specific factors. It captures the essence of managerial efficiency in driving firm success, beyond what can be attributed to external factors or firm characteristics.

CEO overconfidence is assessed through their behavior regarding stock option holdings, inspired by Malmendier and Tate's (2005) methodology. This involves analyzing the timing of option exercises and identifying CEOs who hold options that are significantly in-the-money (over 67% of the stock price exceeding the exercise price). This behavior is indicative of overconfidence, as rational actors would diversify their portfolio to reduce risk, whereas overconfident CEOs delay option exercises, betting on future stock price increases. The *HOLDER67* metric is selected due to its empirical basis and the intuitive link between overconfidence and financial decision-making behavior. It provides a clear, quantifiable indicator of

overconfidence that can be directly observed through financial disclosures, offering insights into how such traits influence disclosure practices.

CEO narcissism is measured by analyzing the ratio of first-person singular pronouns to the total count of first-person pronouns, which includes both singular (I, me, my, mine, myself) and plural forms (we, us, our, ours, ourselves), in earnings call transcripts, following the method established by Capalbo et al. (2018). This linguistic analysis provides a proxy for narcissism by capturing a CEO's tendency to focus on themselves versus the collective organization. The higher the ratio, the greater the indication of narcissistic tendencies. This linguistic approach to measuring CEO narcissism is innovative and grounded in psychological research, offering a non-intrusive, objective means of assessing personality traits through publicly available corporate communications. It allows for the examination of how narcissistic tendencies might manifest in corporate disclosures, particularly in the strategic use of language and narrative framing.

## Data and Sample Selection

Our study constructs datasets from SEC 10-K filings across multiple essays, each focusing on specific aspects of CEO traits and their impact on strategic repetition from notes to the MD&A sections of each 10-K report. The selection process across essays prioritizes data filtering and matching to ensure a robust analytical foundation, specifically emphasizing the significance of notes and MD&A sections as a pivotal source of narrative information.

For Essay 1, the initial dataset spanning from 1994 to 2020 comprises 189,085 10-K filings. The selection process entails removing duplicates, matching filings with Compustat's gvkey, and ensuring significant narrative content within MD&A and notes sections, among other criteria. This filtering results in a final sample of 55,581 firm-year observations. The decision to conclude the sample period in 2020 is dictated by the availability of managerial ability scores from the Demerjian et al. (2013) repository, which is crucial for our analysis and is updated only up to that year.

For Essay 2, we begin with 202,218 10-K filings from 1994 to 2022. Through a process of deduplication, gvkey matching, and ensuring substantive MD&A and notes sections, in addition to integrating data from Compustat, BoardEx, and ExecuComp, the final refined sample consists of 23,132 firm-year observations.

For Essay 3, adopting a similar approach to Essay 2, the dataset also starts with 202,218 10-K filings. After applying the same filtering and integrating additional data from conference calls, the sample is narrowed down to 20,511 firm-year observations.

Throughout this selection process, any reports lacking substantial narrative content in their MD&A sections were excluded to ensure the analysis focuses on disclosures with enough depth for a meaningful examination of strategic repetition. This approach aligns with our aim to delve into the complexities of CEO-driven communication strategies in financial reporting.

## 6 Results and Contributions

This dissertation endeavors to transcend the insights obtained from individual essays by synthesizing the collective impact of CEO traits on disclosure repetitiveness within MD&A sections. The unified analysis reveals a complex picture of how varied executive characteristics interact to influence corporate communication strategies and financial reporting quality. By examining managerial ability, overconfidence, and narcissism in a cohesive framework, the research uncovers a multifaceted influence of CEO psychological traits on the strategic use of repetition in disclosures, offering an understanding that could not be fully appreciated through isolated investigations. By examining each trait within its distinct context, we avoid the pitfalls of overly simplistic analyses that might overlook the complex interplay between these traits. This approach ensures a comprehensive exploration of how each psychological characteristic uniquely contributes to corporate communication strategies.

### Overview of CEO Traits and Disclosure Quality

The intersection of CEO traits—managerial ability, overconfidence, and narcissism—with the strategic use of repetition in disclosures presents a multifaceted vista on how executive characteristics can either enhance or diminish the quality of corporate communication. Contrary to a one-size-fits-all perspective, the relationship between repetition and disclosure quality is not linear but contingent upon the context and intention behind the repetition. Repetition, when employed strategically by adept leaders, can serve as a tool for emphasizing critical information, thereby enhancing transparency and stakeholder comprehension. In this light, repetition can contribute to higher disclosure quality by clarifying complex or vital information. However, excessive or unnecessary repetition may obfuscate essential details, leading to lower disclosure quality by diluting the informativeness of reports and potentially misleading stakeholders.

This understanding suggests that the impact of repetition on disclosure quality is inherently linked to the underlying executive traits driving the communication strategy. By delving into this complex dynamic, the dissertation highlights how varied CEO characteristics influence the strategic deployment of repetition within disclosures, thereby impacting financial reporting quality.

## Integrative Analysis of CEO Traits and Disclosure Practices: Detailed Essay Insights and Theoretical Synthesis

The aggregated results draw from integrating insights across all essays, advancing theoretical frameworks especially management obfuscation theory, stakeholder theory, agency theory, and impression management theory. This integration bridges empirical evidence with theoretical expectations, enriching the academic discourse on the role of CEO psychological traits in shaping disclosure quality.

### 6.1 CEO Managerial Ability and Repetitive Disclosures

Essay 1 presents a rigorous analysis that correlates CEO managerial ability inversely with the repetitiveness in MD&A disclosures. Utilizing advanced methodologies such as entropy balancing and a variety of robustness tests, the essay demonstrates that adept managers tend to decrease repetition in disclosures. Additionally, it delves into investment efficiency and audit firm influences, offering a richer understanding of managerial ability's role in financial reporting.

Furthermore, it advances the management obfuscation theory and stakeholder theory within the financial disclosures domain, providing empirical support for an understanding of managerial ability's role in corporate communication. By evidencing a negative relationship between CEO managerial ability and repetitive disclosures, the study challenges traditional obfuscation practices, underscoring adept managers' propensity for clearer reporting (Bloomfield, 2002; Li, 2008). This finding enriches stakeholder theory by showcasing skilled managers' broader engagement with stakeholder communication, aligning with Zerfass and Sherzada (2015) and Allert and Chatterjee (1997). It bridges theoretical expectations with empirical evidence, enhancing our grasp of how managerial proficiency shapes corporate communication strategies. Furthermore, the research contributes to the dialogue on repetitive disclosures, addressing regulators and standard setters' concerns. It introduces computational linguistic tools into accounting disclosure research (El-Haj et al., 2019), enriching communication and accounting literature's understanding of recurrent communication within a financial reporting context. The study broadens our comprehension of financial reporting and repetitive communication, laying groundwork for future explorations into managerial traits' impact on disclosure quality.

This study highlights the important role that CEO managerial ability plays in shaping the transparency and effectiveness of MD&A disclosures, revealing that more adept managers tend to reduce repetitiveness in financial reporting. The implications of these findings are multifaceted: they not only challenge prevailing norms around managerial communication strategies but also highlight the potential for enhanced stakeholder communication through more discerning and less

redundant disclosures. By aligning computational linguistic analyses with empirical investigation, this research paves the way for future studies to further explore the nuances of executive influence on corporate transparency. Ultimately, these insights enrich the dialogue on financial reporting standards and practices, offering valuable perspectives to regulators, practitioners, and scholars seeking to foster clearer and more accountable corporate communication landscapes.

## 6.2 CEO Overconfidence and Repetitive Disclosures

This essay explores the impact of CEO overconfidence on disclosure repetitiveness, revealing a trend towards decreased repetition among overconfident CEOs. By leveraging comprehensive datasets and employing textual similarity measures, it provides insights into the communication styles fostered by CEO overconfidence. The analysis extends behavioral decision theory, suggesting that overconfident CEOs may contribute to more transparent and direct financial disclosures. Signaling theory further enhances our understanding by positing that less repetitive and more focused disclosures act as strategic signals of confidence and control. These focused signals are intended to positively influence investor perceptions and market valuations (Cheng et al., 2015; Connelly et al., 2016; Baier et al., 2022), demonstrating a clear and deliberate choice of what information to highlight or downplay. Additionally, information asymmetry theory is employed to illustrate how managing redundancy in disclosures can be effective. While repetition of consistent and aligned information across different sections does not necessarily increase the information gap, reducing unnecessary redundancy can help clarify and emphasize the strategic objectives and real performance of the company, thereby narrowing any remaining information disparities between shareholders and management.

Besides, it provides insights into how overconfidence manifests in corporate communication, adding depth to previous research on corporate behaviors and accounting choices influenced by CEO traits (Hirshleifer et al., 2012; Malmendier and Tate, 2005, 2008). The research contributes to understanding the factors influencing corporate disclosures, especially regarding the strategic use of repetition in MD&As. It suggests that CEO overconfidence leads to decreased repetition, proposing a shift towards greater transparency in corporate disclosures, a novel insight that complements existing literature on earnings information and press releases. The study also highlights managerial discretion's role in enhancing or impairing disclosure transparency, aligning with findings that narrative disclosures become less readable and more complex when performance is poor (Jones and Shoemaker, 1994; Li, 2010).

The findings from this essay significantly advance the dialogue on how psychological traits of CEOs, particularly overconfidence, influence corporate

communication strategies. Demonstrating that overconfident CEOs tend to reduce repetitiveness in financial disclosures, this study challenges conventional beliefs about overconfidence merely adding to disclosure complexity. Instead, it reveals a potential for these traits to contribute to clearer and more strategic communication. These results not only provide empirical support for theories of behavioral finance and signaling but also deepen our understanding of how deliberate communication choices can serve as nuanced signals. This nuanced approach to signaling, where selective repetition and focused disclosures convey strategic intentions, offers practical insights for investors and regulators. Understanding the impact of CEO overconfidence can lead to more informed assessments of disclosure quality and ultimately, more effective governance practices aimed at enhancing transparency and reducing information asymmetry. This fresh perspective enriches the current understanding of the interplay between executive personality and financial reporting, setting the stage for future research to explore other CEO traits that might similarly affect corporate disclosure practices.

### 6.3 CEO Narcissism and Repetitive Disclosures

Focusing on CEO narcissism, Essay 3 examines its contribution to increased repetitiveness in corporate disclosures. Through textual analysis of earnings conference call transcripts, the essay identifies narcissistic CEOs' tendencies towards increasing repetitive disclosures. It investigates the broader implications of CEO narcissism on disclosure practices, applying agency and impression management theories to understand the strategic use of repetitive language. The essay also explores CEO origin and gender's intersection with narcissism, offering novel insights into the complex dynamics between CEO traits and financial reporting.

Integrating behavioral decision theory, the study illuminates the strategic communication behaviors of narcissistic CEOs, enriching theoretical discussions in agency theory and impression management (Boudt and Thewissen, 2019; Steinmetz et al., 2017). By applying textual analysis to examine the impact of CEO narcissism on disclosure repetition, showing increased repetition, this research offers insights into the behavioral implications of narcissistic tendencies in corporate communication. It also demonstrates the significant association between CEO narcissism and repetition in MD&As, expanding upon the works of Chatterjee and Hambrick (2007) and Ham et al. (2018). The study points out the strategic use of communication by narcissistic CEOs to manipulate stakeholder perceptions, potentially complicating stakeholders' ability to discern genuine performance insights, thereby affecting their decision-making negatively. Additionally, by examining the impact of CEO origin and the intersection of narcissism with gender on MD&A repetitions, it opens new avenues in the research on CEO characteristics

and financial reporting, adding a fresh perspective to the discourse on gender dynamics and CEO traits in corporate leadership.

This essay sheds significant light on how narcissistic characteristics in CEOs can influence corporate disclosure practices, particularly the tendency towards increased repetitiveness. The insights provided here expand our understanding of the psychological drivers behind financial reporting behaviors, suggesting that narcissistic traits can lead to disclosures that may not effectively communicate the underlying business realities. This study not only challenges traditional notions of effective leadership but also raises important questions about the transparency and reliability of communications from narcissistic leaders. The findings highlight a critical need for boards and regulators to consider personality traits when evaluating CEO performance and communication strategies. By exploring the intersections of CEO narcissism with gender and origin, the research also opens up new dialogues about diversity in leadership and its implications for financial disclosure practices. Moving forward, these insights could help inform more approaches to corporate governance and disclosure regulations that take into account the complex interplay between CEO traits and communication effectiveness.

Table 2 below summarizes how these research questions interconnect with each essay's focus. It aligns each CEO trait with its corresponding influence on strategic repetition.

**Table 2.** Alignment of CEO Traits and Their Influence on Strategic Repetition.

CEO Trait	Essay Title	Related Theories	Key Insight
Managerial Ability	CEO Managerial Ability and Strategic Repetition in 10-K Reports from Notes to MD&A	Upper Echelons Theory, Obfuscation Theory, Stakeholder Theory, Agency Theory	Adept leaders tend towards transparent disclosures with less repetition.
Overconfidence	CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A	Upper Echelons Theory, Obfuscation Theory, Agency Theory, Signalling Theory, Behavioral Decision Theory, Information Asymmetry Theory, Cognitive Dissonance Theory	Overconfident CEOs use more diverse language, reducing repetition, potentially enhancing stakeholder understanding and disclosure transparency.
Narcissism	CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A	Upper Echelons Theory, Agency Theory, Impression Management Theory	Narcissistic CEOs exhibit more repetitive language, suggesting strategic narrative manipulation. The effect on stakeholders varies, some may appreciate the clarity, while others could struggle with the reduced transparency.

Based on the above results for each of the three essays, the additional research questions can be addressed by synthesizing the key findings from each essay to explore the collective impact of CEO traits on strategic repetition in MD&A disclosures and overarching financial reporting strategies.

Considering the combined effects of CEO managerial ability, overconfidence, and narcissism, how do these traits collectively influence the strategic approach to repetition in MD&A disclosures?

From the essays, it's clear that each CEO trait influences the strategic repetition in MD&A disclosures in unique ways. CEOs with higher managerial ability tend to reduce repetition, aiming for clarity and transparency in disclosures. This suggests that adept leadership is associated with a preference for substantive over redundant information, possibly as a means to enhance corporate transparency. Additionally, overconfident CEOs show a tendency towards more diverse communication, reducing the extent of repetition. This indicates that overconfidence, contrary to conventional beliefs, may foster more unique and varied narrative disclosures. Lastly, narcissistic CEOs are found to increase repetition, likely as part of a strategic narrative manipulation to control firm image or obfuscate less favorable details. When considering these traits collectively, it's plausible to argue that the overall strategic approach to repetition in MD&A disclosures is a complex interplay and mix of seeking transparency, striving for innovation in communication, and managing impressions. The balance among these traits could determine the extent and nature of repetition, suggesting that firms led by CEOs who exhibit a balanced mix of these traits might adopt a strategically diversified approach to narrative disclosures.

What overarching strategies in financial reporting can be discerned from the interaction of CEO traits with the strategic repetition of content from notes to MD&A?

The interaction of CEO traits with strategic repetition reveals a multifaceted strategy in financial reporting that balances transparency with the need for impression management. The findings across the essays suggest that:

1. Firms may utilize strategic repetition as a tool for clarity and emphasis when led by CEOs with high managerial ability, particularly in contexts requiring the reinforcement of positive developments or the clarification of complex information.
2. Overconfident CEOs' propensity for less repetition and more diversified disclosures might reflect a strategy to captivate and engage stakeholders with

novel and varied narratives, potentially enhancing the perceived innovativeness and dynamism of the firm.

3. The increase in repetition observed under narcissistic CEOs could be indicative of a deliberate strategy to maintain control over the firm's narrative, possibly serving to highlight favorable information repeatedly or to dilute the impact of negative information through narrative obfuscation.

The overarching strategy, therefore, seems to involve leveraging CEO traits to fine-tune the balance between providing necessary repetition for emphasis and clarity, and avoiding excessive redundancy that may impair the informativeness and readability of financial reports. This strategy highlights the importance of CEO traits in shaping not just the content but also the strategic delivery of financial disclosures, reflecting a sophisticated understanding of how narrative techniques can influence stakeholder perceptions and decision-making. These responses highlight the significant impact of CEO traits on the strategic use of repetition within MD&A disclosures, offering insights into the complex dynamics that underlie corporate communication strategies in financial reporting.

In sum, this thesis provides a detailed exploration of how CEO traits—managerial ability, overconfidence, and narcissism—impact financial disclosure practices, making contributions primarily to the literature on management obfuscation theory, stakeholder theory, and behavioral decision theory. Through rigorous analysis across distinct essays, it presents a perspective on the interplay between CEO characteristics and financial reporting behaviors, particularly focusing on the effects these traits have on the repetitiveness and transparency of corporate disclosures. By delving into the complexities of executive traits, the thesis theoretical frameworks and offers empirical findings that augment our understanding the role of CEO in financial reporting.

The research methodologies employed in this thesis have been carefully selected and applied to scrutinize the validity and reliability of the findings. Rigorous textual analysis, combined with empirical investigation, provides a solid foundation for the conclusions drawn regarding the influence of CEO traits on disclosure practices. Validity is further supported by the alignment of findings with existing theoretical frameworks, while reliability is underscored by the use of robust datasets and reproducible analytical techniques. However, it is essential to acknowledge that, as with any empirical study, this study involve unavoidable some degree of interpretation. This subjectivity primarily arises from the choices made in defining variables, selecting models, and interpreting complex data patterns. The scope for interpretation and the application of findings can introduce elements of subjectivity that might affect the validity and reliability of the conclusions.

## 6.4 Bridging CEO Traits with Disclosure Dynamics: Research Contribution in its Context

*Reinforcing Integration of CEO Traits:* While prior studies like those by Hilary and Hsu (2011) and Ahmed and Duellman (2013) focus primarily on the effects of singular traits such as overconfidence or narcissism on financial reporting individually, this thesis presents a more holistic integration of three CEO traits—managerial ability, overconfidence, and narcissism. It examines their collective impact on the strategic repetition of information within 10-K filings, especially the transition from note disclosures to the MD&A section. This approach unveils the interplay of these traits followed in disclosure practices, filling the gap in previous research which often treated these traits in isolation.

*Deepening Theoretical and Empirical Foundations:* Previous studies such as Buchholz et al. (2018) and Marquez-Illescas et al. (2019) have effectively utilized psychological frameworks to link CEO personality with financial disclosures. However, they do not dynamically integrate multiple theories to explain variations in disclosure practices across different contexts. This thesis advances this approach by employing a sophisticated blend of theories—management obfuscation theory, stakeholder theory, upper echelons theory, and behavioral decision theory—across three distinct essays. This theoretical scaffolding not only underpins the psychological aspects of CEO decision-making but also intricately links these decisions to broader corporate governance frameworks such as stakeholder theory and information asymmetry.

*Methodological Innovations in Textual Analysis:* Although innovative measures of CEO traits like those explored by Hu et al. (2024) have marked a significant advancement in understanding CEO influence on disclosures, they often overlook the sophisticated textual analysis across the CEO's behavioral spectrum. This thesis enhances methodological rigor by employing advanced textual analysis techniques to dissect the MD&A sections of 10-K filings. The detailed examination of how CEO traits; narcissism, overconfidence, and managerial ability, affect disclosure content and presentation is a pivotal advancement over previous methodologies, providing deeper insights into the subtleties of corporate communication influenced by executive psychology.

*Enhancing Practical Implications and Policy Recommendations:* Research such as Li's (2019) insightful study on repetitive disclosures in 10-K filings has underscored certain patterns in financial reporting. However, it often falls short of linking these patterns directly to the underlying CEO traits that drive them. By correlating CEO traits with repetitive disclosures, this thesis not only illuminates the influence of executive characteristics on reporting practices but also offers clear, actionable insights for regulators and corporate governance practitioners. This connection is crucial in crafting targeted reforms to enhance disclosure transparency

and effectiveness. It provides a foundational basis for regulatory and policy enhancements in financial reporting, prompting a vital discussion on whether such repetition should be regulated. If regulation is considered necessary, it should aim to mitigate excessive redundancy in disclosures while preserving the essential information that supports investor decision-making.

*Expanding Global Perspectives; CEO Narcissism and Risk Disclosure Practices:* Complementing the findings from the third chapter of this thesis, the study titled "Personality and Perception: Assessing the Role of CEO Narcissism in Risk Disclosure Practices in an Emerging Market" investigates the implications of CEO narcissism on risk disclosure within Iran's corporate governance framework (Rajabalizadeh, 2025). This research utilizes a unique measure of CEO narcissism—signature size on annual reports—to examine its influence on the extent of risk disclosures. Notably, this approach reveals that narcissistic traits significantly enhance the visibility of risk disclosures, paralleling the increase in repetition of financial information by narcissistic CEOs in U.S. firms. Although the methodologies differ—with the Iranian study employing signature size and the U.S. study utilizing first-person pronouns—the underlying theme of narcissism enhancing disclosure is consistent across both contexts. This comparative insight emphasizes the broader applicability of the thesis findings and enriches the discussion on how CEO personality traits universally impact financial reporting practices.

In conclusion, the thesis extends existing literature by delivering a more intricate model of how diverse CEO traits influence financial reporting behaviors. It bridges theoretical frameworks with empirical evidence, offering a detailed understanding of CEO personality traits on disclosure practices. This comprehensive approach not only enriches academic discourse but also contributes to practical applications in corporate governance, enhancing the transparency and integrity of financial disclosures.

## 7 Extended Additional Analysis, Future Research Directions, and Limitations: Addressing Examiners' Concerns

In response to the valuable feedback received during the examination process, this section is dedicated to expanding the analysis and addressing several pivotal concerns highlighted by the examiners. Recognizing the critical importance of these insights, we have incorporated both tabulated and untabulated additional tests to deepen our investigation. Moreover, we carefully consider and discuss certain findings as limitations and pinpoint specific areas ripe for future research. This deliberate approach emphasizes our commitment to conducting a thorough and reflective examination of the key themes central to our dissertation. By doing so, we aim to ensure that our conclusions are not only robust but also provide comprehensive and insightful contributions to the field.

### 7.1 Additional Analysis

#### Integrative Analysis of CEO Traits and Disclosure Obfuscation Strategies

In this section, we integrate findings from individual essays to provide a holistic view of the impact of CEO traits on the strategic use of repetition and its potential role in obfuscating corporate disclosures. This comprehensive analysis includes additional variables related to narrative strategies that may coincide with repetition to form a broader obfuscation toolkit. Here, we detail the inclusion of these variables into the main models and discuss their implications.

Initially, the primary focus was to isolate and examine the direct influence of CEO traits on the use of repetition from notes into MD&A sections of same year 10-K reports. The decision to not include measures of positive tone, readability, and self-attribution bias in the main models was strategic, aimed at eliminating confounding effects that could obscure the specific impact of repetition. By simplifying the analysis, we ensured a clear and direct understanding of how

repetition alone, influenced by various CEO characteristics, affects the transparency and clarity of financial reporting. This approach was essential to establish a baseline understanding before introducing more complex interactions within the narrative strategies.

Given the foundational insights developed in earlier chapters, this section expands the scope to include the following additional obfuscation measures into the main analysis models:

- **Positive Tone:** We assess the positivity of the language used in MD&A sections using advanced textual analysis tools. This measure helps to understand if a more positive tone accompanies higher levels of repetition, potentially indicating a strategic use of optimistic language to enhance or obscure financial narratives.
- **Readability:** By calculating readability scores, such as the Flesch-Kincaid and Gunning Fog Index, we evaluate how the complexity of the information presented might interact with repetition to affect stakeholder comprehension and perception.
- **Self-attribution Bias:** The analysis of personal pronouns usage provides insights into self-attribution bias, where executives might emphasize their personal role in positive company achievements. This measure complements the repetition analysis by examining how executives might frame their achievements in repeated narratives.

These additional variables were integrated into the regression models of each chapter<sup>9</sup>. The inclusion of these additional narrative obfuscation measures did not fundamentally alter the main findings from the regression analysis concerning the relationship between CEO traits and repetition. The results consistently demonstrated that CEO traits significantly influence repetition patterns across all chapters, and this effect persisted even when accounting for the broader set of narrative strategies. This comprehensive integration confirms that repetition serves

<sup>9</sup> In the first chapter of the thesis, untabulated additional analyses were conducted to explore the moderator effects of readability and tone on the relationship between CEO managerial ability and repetition. This exploration was aimed at understanding how the clarity and emotional framing of MD&A sections might influence the impact of repetition, providing insights into the interaction between narrative style and the strategic use of repetition. Besides, in the third chapter, CEO tone and complexity (i.e., readability) from conference calls were incorporated as control variables. This inclusion was crucial for assessing how external communication styles might differ from written disclosures in terms of narrative clarity and potential obfuscation. These variables helped to explore the broader communication strategies employed by executives and their reflection in the financial reporting.

both informative and potentially obfuscatory purposes within corporate disclosures. By including these additional measures, we enriched our understanding of the complex interplay between executive traits and their communication strategies.

### Sentence-Level Analysis of Repetition Using Bigrams

In response to the examiners' comments and as an integral part of our thesis, we conducted an additional analysis to explore sentence-level repetition in 10-K filings using a methodology inspired by plagiarism detection techniques, specifically focusing on bigrams. This approach, initially based on research by Cazier and Pfeiffer (2017), involves analyzing two-word sequences to detect exact text repetitions within and between documents.

The choice of bigrams was intended to provide a finer granularity in identifying verbatim repetition compared to broader text similarity measures like cosine similarity. By focusing on two-word sequences, the analysis aimed to capture more direct instances of text reuse or repetition, which could indicate areas where information is either emphasized for clarity or potentially obfuscated. Methodological steps are:

- **Text Extraction:** Similar to our primary analysis, we extracted text from the notes section (Section 8) and the MD&A section (Section 7) of annual 10-K filings. This ensured that we were comparing the repetition of content within the most narrative-driven sections of the filings.
- **Bigram Construction:** We constructed bigrams from the extracted text, generating pairs of consecutive words throughout the documents. This allowed us to map the frequency and distribution of these word pairs across different sections of the filings.
- **Repetition Measurement:** We measured the repetition by identifying bigrams that appear in both the notes and the MD&A sections of the same filing. This measure was intended to capture the direct verbatim transfer of textual content between these sections.

Despite the theoretical robustness of this approach, the initial results did not yield meaningful insights into the strategic use of repetition. The primary challenges encountered included:

- **Complexity and Variability of Language:** The language used in 10-K filings is highly specialized and variable across different firms and industries. This diversity often altered the effectiveness of bigram analysis, as many legitimate repetitions did not signify strategic disclosure

practices but rather common financial terminology or required legal phrases.

- **Limitations in Detecting Strategic Repetition:** The bigram analysis was sensitive to minor word changes, which could disrupt the detection of longer sequences of repetition that might be more strategically significant. This sensitivity often resulted in a high rate of Type I errors (false positives), where common or incidental word pairs were incorrectly flagged as strategic repetitions.

Given the limitations encountered with the bigram approach, our thesis subsequently adopted a broader text similarity approach as recommended by Cohen et al. (2020). This method allowed for a more comprehensive assessment of thematic alignment and content overlap, albeit at a higher level of textual aggregation.

The findings and challenges from this bigram analysis have been invaluable in shaping our understanding of textual repetition within corporate disclosures. They underscore the need for a multi-faceted approach that combines both granular and aggregate analyses to effectively decipher the strategic use of language in financial reporting.

## Bounded Similarity Measures in Repetition Analysis

In response to the insightful feedback regarding the bounded nature of the similarity measures employed in this thesis, particularly Cosine Similarity and Jaccard Similarity, this section explores additional methodological tests to address these concerns. These measures, while effective in capturing textual similarity, are indeed bounded between 0 and 1, potentially affecting the interpretation and behavior of the regression models used. This segment outlines the additional tests conducted to examine the robustness of our results under alternative transformations and to ensure the validity of our conclusions.

The primary concern raised pertains to the potential for regression fitted values to lie outside the feasible range of our bounded variables. To address this, we undertook the following approaches:

- **Fitted Value Analysis:** We first examined if the fitted values from our original regression models lay outside the 0 to 1 range. This involved a detailed review of residuals and predictive accuracy to assess if any values extended beyond the logical bounds of the similarity scores.
- **Transformation of Variables:** To mitigate the issues associated with bounded variables and to explore alternative analytic perspectives, we applied a logit transformation to the similarity scores. This transformation

is defined as follows for a bounded variable (in our case, similarity measures):

$$\text{Logit}(x) = \log(x / 1-x)$$

This transformation maps the (0,1) interval to  $(-\infty, +\infty)$ , making it suitable for linear regression modeling. The dataset was adjusted to include the logit-transformed values of the similarity scores. Care was taken to handle values at the boundaries (0 and 1) by adjusting them slightly to avoid issues with the transformation (e.g.,  $x=0.0001$  for 0 and  $x=0.9999$  for 1). New regression models were estimated using both the original bounded measures and their logit-transformed counterparts. This dual approach allowed for a direct comparison between the models to see how the transformation affects the regression coefficients and significance levels.

The additional regression analyses provided several key insights:

- **Fitted Values:** The examination of fitted values from the original models showed that none extended beyond the 0 to 1 range, indicating that the original regression specifications were appropriately calibrated for the bounded nature of the data.
- **Transformed Models:** The regression results using the logit-transformed Jaccard Similarity showed that while the levels of statistical significance varied slightly, the overall direction and substantive conclusions remained consistent with those obtained from the original models. This suggests that the original findings are robust to the specification of the similarity measures.

The additional analyses addressing concerns about the bounded nature of our similarity measures suggest that the core findings remain largely consistent, despite slight variations in statistical significance. However, it is important to acknowledge that while fitted value analyses confirmed that our original regression specifications produced values within logical bounds, the logit transformation tests revealed some sensitivity in significance levels. Thus, although the substantive conclusions remain robust, this sensitivity highlights inherent limitations in our measures and methodologies. Recognizing these limitations transparently, rather than overstating robustness, is crucial. Future research could further explore alternative transformations or modeling techniques to better handle bounded data and provide clearer distinctions regarding statistical versus substantive significance.

## 7.2 Future Research Directions

### Beyond the Present: Proposing Alternative Methodologies for Assessing CEO Traits

This study opens several avenues for future research to enhance the understanding of CEO personality traits and their impact on corporate disclosure practices. One promising direction involves the integration of alternative measurement approaches that could offer deeper insights into CEO characteristics. For instance, psychometric assessments or qualitative analyses could be utilized to capture dimensions of CEO personality not fully accessible through secondary data analysis. Expanding on this, future studies could explore the use of executives' educational backgrounds or personal experiences as proxies for managerial ability. These could offer a more detailed understanding of a leader's decision-making style and strategic thinking. Additionally, innovative measures such as the analysis of signature sizes, as suggested by Ham et al. (2017, 2018) and Church et al. (2020), could serve as intriguing, albeit unconventional, indicators of narcissism.

Employing these alternative methods could help mitigate some of the biases inherent in secondary data analysis and provide a more comprehensive view of how CEO traits influence corporate communication strategies. Furthermore, incorporating direct assessments like psychometric tests, while challenging, could significantly refine the precision of trait measurement and enhance the validity of research findings in the domain of executive personality and corporate governance.

### Exploring Exogenous Influences on CEO Communication Styles

In the evolving landscape of corporate financial reporting, the communication styles of CEOs play a pivotal role in shaping the narratives conveyed through disclosures. Recognizing the potential for exogenous factors to influence these styles is crucial for a comprehensive understanding of disclosure dynamics. This section delves into how external elements independent of the firm's internal reporting mechanisms might affect the way CEOs communicate in financial disclosures.

One promising approach to unraveling these effects involves the use of instrumental variables (IVs) that are related to, yet exogenous from, the specific content of financial disclosures. For instance, media coverage and the CEO's communication style in non-financial contexts offer a unique lens through which to examine these influences. Media coverage, reflecting the extent of public scrutiny and external pressure, could significantly shape a CEO's communication approach, potentially leading them to adopt a more repetitive or emphatic style to reinforce certain messages (Godos-Díez et al., 2020; Liu and McConnell, 2013). Similarly, a

CEO's style in non-financial public appearances might provide insights into their inherent communicative tendencies, which could permeate their financial disclosure practices (Aerts and Yan, 2017). These variables are particularly valuable as they likely influence CEO communication without being directly affected by the financial content being disclosed, thus serving as suitable IVs.

However, the integration of such variables into current research is hampered by significant data accessibility challenges. The availability of detailed, consistent data on media coverage specific to individual CEOs, or comprehensive records of their public communication styles outside of financial contexts, is currently limited. This data constraint restricts the depth of analysis that can be conducted at this stage, posing a notable limitation to our understanding of the exogenous influences on CEO communication styles. The potential for future studies to incorporate these variables is considerable. As data accessibility improves, future researchers could harness these insights to gain a more complex understanding of how external factors influence CEO communication in financial reporting. This could significantly enrich the literature on financial disclosures, offering new perspectives on how CEO traits interact with external influences to shape corporate narratives.

## Deepening the Understanding of Repetition and Cross-Referencing

This thesis primarily focuses on the strategic use of repetition within corporate disclosures, specifically how CEO traits influence the repetition from the notes to the MD&A sections in the same year's 10-K reports. Given the critical nature of these sections in informing investors and stakeholders about a company's financial status and future outlook, understanding the nuances of repetition is vital. However, the feedback received highlights an important aspect that warrants further investigation: cross-referencing between different sections of the financial reports. The following detailed discussion clarifies the significance of both repetition and cross-referencing and outlines why these are pivotal areas for future research.

“Repetition” in this context refers to the practice of echoing textual content from the notes section directly within the MD&A section of the same 10-K report. This strategy can serve multiple purposes. By repeating information, executives can emphasize key financial metrics or operational results, ensuring that critical data are noticed and understood by stakeholders (Wang et al., 2023; Amel-Zadeh and Faasse, 2016). Repetition may also be used to highlight positive outcomes or progress towards strategic goals, shaping investor perceptions and potentially influencing investment decisions (Li, 2019; Chen et al., 2023).

“Cross-referencing” involves directing the reader to other parts of the financial report for additional details (Lewis and Young, 2019; Pilot, 2019). Unlike repetition, which reinforces information within the same section, cross-referencing can

complicate the narrative by requiring readers to integrate information from multiple sections. This practice can have several implications (Strampelli, 2018). Cross-referencing might disrupt the narrative flow, making it harder for stakeholders to process the information efficiently (Higgins et al., 2014). Some regulators view cross-referencing as potentially obfuscating, particularly if it is used excessively or unnecessarily, as it might detract from the narrative's clarity and lead to information overload (Cazier and Pfeiffer, 2017).

Given the importance of understanding these narrative strategies, future research should aim to:

- **Differentiate Effects:** Investigate how repetition and cross-referencing each affect the readability and comprehensibility of financial disclosures. This includes studying the conditions under which each strategy improves or diminishes narrative clarity.
- **CEO Influence:** Explore deeper how different CEO traits influence the choice between using repetition and cross-referencing. This could involve psychological assessments or detailed analyses of CEO communications beyond 10-K reports, such as earnings call transcripts and public interviews.
- **Impact on Stakeholder Decisions:** Assess how these strategies affect stakeholder decisions, including investment and valuation judgments. This can be linked to behavioral finance, where the cognitive effects of information presentation are considered.

The initial focus of this thesis on repetition has provided valuable insights into the strategic use of narratives in corporate disclosures. However, incorporating an analysis of cross-referencing will greatly enhance our understanding of the comprehensive strategies employed by executives to communicate through financial reports. Future investigations into these areas will not only enrich academic literature but also offer practical guidance for improving the effectiveness and transparency of corporate reporting. By exploring these dimensions, subsequent research can build on the foundational work of this thesis to develop a more context-specific view of narrative techniques in financial communication.

## Identifying and Analyzing Repeated Accounting Issues in Notes and MD&As

The suggestion to conduct a more granular analysis of specific notes within 10-K filings that are prone to repetition in the MD&A sections presents an opportunity to refine our theoretical framework and predictions. By identifying and examining the nature and implications of repeated accounting issues, this analysis could illuminate

why certain notes are repeatedly emphasized and the circumstances under which repetition might either enhance or obfuscate the quality of corporate disclosures.

To advance our understanding of strategic repetition in corporate disclosures, future research can concentrate on:

- **Identification of Commonly Repeated Notes:** Utilizing natural language processing (NLP) techniques such as topic modeling and text clustering to systematically identify and categorize notes that are frequently repeated in MD&As. This would involve parsing a large corpus of 10-K filings to detect patterns and commonalities in the notes section that consistently appear in subsequent MD&A narratives.
- **Contextual Analysis of Repetition:** Once the commonly repeated notes are identified, a qualitative and quantitative analysis could be conducted to understand the contexts in which these repetitions occur. This would include assessing the complexity of the accounting issues discussed, the clarity of the initial disclosures, and the apparent intent behind the repetition (e.g., enhancing understanding vs. obscuring details).
- **Bag of Words and Sentiment Analysis:** Developing a 'bag of words' specific to complex accounting issues that frequently require repetition. This can be complemented by sentiment analysis to gauge the tone and intent behind the repeated phrases or sections, helping to differentiate between constructive repetition and potential obfuscation.
- **Empirical Testing of Theoretical Predictions:** Incorporating the identified themes and issues into an empirical model to test specific hypotheses about the effects of repetition on disclosure quality. This could involve regression analyses that control for various firm-specific factors, such as industry, size, and profitability, to isolate the impact of repeated disclosures on investor perception and firm valuation.

The methodology for future studies could be enhanced by:

- **Advanced Text Analytics:** Leveraging more sophisticated NLP and machine learning algorithms to improve the accuracy and depth of text extraction and analysis. This includes using deep learning models for better context capture and sentiment assessment.
- **Cross-Referencing External Databases:** Integrating information from databases like Compustat, BoardEx, and others to enrich the analysis with additional data points related to corporate governance, executive compensation, and financial performance.

- **Longitudinal Studies:** Conducting longitudinal studies to track changes in repetition patterns over time and their long-term effects on firm performance and investor reactions.

By delving deeper into the specifics of repetition within corporate disclosures, future research can provide more detailed insights that bridge the gap between theoretical predictions and practical observations in financial reporting.

## Addressing the Impact of Repetition on Stakeholder Decision-Making and Market Reactions

The feedback we have received illuminates a significant gap in our existing research regarding the direct effects of textual repetition within 10-K filings on stakeholder decision-making and market reactions. While our studies have predominantly focused on identifying the determinants of repetition, incorporating market-based tests and real effects analyses could considerably enhance our comprehension of the practical consequences of repetitive disclosures.

One proposed area of research is to investigate how repetitive disclosures influence investor behavior and market performance, potentially using event study methodologies. This analysis would include examining stock price volatility and trading volume before and after the publication of 10-K filings that exhibit varying levels of textual repetition. Accessing market data through databases such as CRSP would allow for comprehensive event studies and calculations of cumulative abnormal returns (CAR). Although similar hypotheses have been previously explored, as in the work by Li (2019), our research could introduce new dimensions by exploring the impact of repetition across different sectors or under diverse economic conditions, providing fresh insights into how markets process repetitive information.

Another key initiative is to examine how various stakeholder groups, including investors, analysts, and creditors, respond to the frequency and nature of repetition in corporate disclosures. This could involve conducting surveys and experimental studies to assess stakeholders' perceptions and decision-making processes in response to repeated disclosures. Analyzing stakeholders' subsequent actions, such as investment decisions or credit evaluations, could provide tangible insights into the behavioral impacts of repetition. This approach aims to address the "so what?" criticism by demonstrating the concrete effects of repetition on critical financial decisions and stakeholder trust.

By exploring these new avenues, our future research endeavors aim to provide a more detailed understanding of how textual repetition within corporate disclosures impacts the decisions of various market participants, thus responding robustly to critiques and setting a substantive agenda for further investigation. This expansion

into market-based and real effects studies will not only bridge the identified research gap but also enhance the relevance and applicational value of our findings.

### 7.3 Limitations

#### Exploring the Boundaries: Reflecting on the Methodological Limitations in CEO Trait Measurement

In this section, we acknowledge and discuss the inherent limitations associated with the measurement of CEO traits using secondary data sources in our study. While the indicators used—such as financial behaviors for overconfidence and linguistic analysis for narcissism—provide empirical robustness and are grounded in the literature, they may carry potential biases. Secondary data, by nature, may not capture the full spectrum of a CEO's personality and may reflect a biased representation influenced by corporate narrative controls or media portrayals.

For instance, our reliance on the linguistic analysis of earnings call transcripts to gauge narcissism, although innovative, is subject to the formal nature of these communications which are often prepared with the assistance of professional consultants. This might dilute the authentic linguistic footprint of the individual CEO. Similarly, using stock option holding patterns to infer overconfidence could be confounded by other strategic financial management practices not necessarily linked to overconfidence.

To mitigate these concerns, future research could incorporate primary data sources or direct assessments. However, these alternatives also come with their own set of challenges such as higher costs to execute, feasibility issues, and the potential reluctance of top executives to participate in psychometric testing or in-depth personal interviews. By presenting these limitations, we aim to provide a balanced view of the methodological constraints, affirming the need for cautious interpretation of the findings.

#### CEO Overconfidence and Narcissism: Measurement Challenges and Limitations

While the use of first-person pronouns has been linked to both narcissism and overconfidence, it is crucial to refine our measurement approaches to distinctly capture these traits. Li (2010) suggests that an increase in the use of first-person pronouns, indicative of self-serving attribution bias (SAB), correlates with managerial overconfidence. This is observed particularly when managers attribute positive outcomes to their own efforts while dissociating from negative outcomes. This behavior reflects a skewed perception of reality—a hallmark of

overconfidence—where managers overestimate the mean and underestimate the variance of future outcomes.

In contrast, our approach to measuring narcissism through the ratio of first-person singular pronouns to total first-person pronouns seeks to capture a broader psychological trait that extends beyond mere attribution of outcomes to self. Narcissistic tendencies encompass a pervasive focus on self-promotion and personal gratification, often manifested through a consistent pattern across various corporate communications, not just linked to discussions of outcomes. Therefore, while both overconfidence and narcissism may involve heightened use of personal pronouns, the context and consistency across communications differentiate narcissism from overconfidence.

To further clarify this distinction, it is helpful to consider additional linguistic and behavioral markers that may uniquely signify narcissism. For instance, examining the consistency of self-referential pronouns across different communication settings (earnings calls, interviews, public appearances) can provide a more comprehensive view of a CEO's narcissistic tendencies. Additionally, incorporating analysis of other linguistic features such as tone positivity, use of superlatives, and frequency of vision-related words may enrich the differentiation between narcissism and overconfidence. By integrating these aspects, future research can more accurately discern the unique impacts of CEO narcissism and overconfidence on corporate decision-making and strategy. This approach not only addresses the overlap noted in the use of personal pronouns but also enhances the robustness of our measurements by considering the broader, more consistent behavioral patterns characteristic of narcissism compared to the situation-specific expressions of overconfidence.

### Text Similarity Measures in Assessing Verbatim Repetition

The critical feedback regarding the distinction between text similarity and verbatim repetition is well-taken and highlights an essential limitation of the methodologies employed in this dissertation. While the bag-of-words (BoW) approach, including measures such as Cosine Similarity, provides a broad quantitative assessment of thematic alignment and textual overlap, it inherently lacks the granularity necessary to capture exact verbatim repetitions at the sentence or phrase level within large text sections like the entire MD&A.

- **Text Similarity vs. Verbatim Repetition:** Text similarity, as measured by BoW and other similar metrics, generally assesses how closely the topics or themes of two text sections align based on the occurrence and frequency of common words. However, it does not necessarily indicate

that the same sentences or phrases are repeated verbatim, which is the core focus of analyzing repetition as per the thesis.

- **Aggregate Level Analysis:** BoW measures calculate similarity by aggregating word frequencies across entire sections, which can dilute the visibility of exact repetitions of specific statements or phrases. This aggregation makes it challenging to pinpoint where and how verbatim repetition occurs within the texts.
- **Lack of Contextual Sensitivity:** These measures do not account for the context or order of words, thus overlooking the complex meaning that might be conveyed by the specific arrangement of words within a sentence.

Initially, an attempt was made to analyze sentence-level repetition using bigrams following the methodology proposed by Cazier and Pfeiffer (2017). However, this approach did not yield meaningful results due to the complexity and variability of 10-K filings, leading to the adoption of a broader text similarity approach as recommended by Cohen et al. (2020). The shift to these methods was motivated by their broader applicability and the ability to capture thematic consistencies across large datasets, albeit at the cost of missing finer details on verbatim repetition. Given these limitations, future research is encouraged to develop and refine methods that can more accurately differentiate and measure verbatim repetition within corporate disclosures.

## 8 Technical Appendix. Addressing Mutual Correlations and Incremental Explanatory Power in CEO Traits Analysis

### Analysis of Mutual Correlations and VIF Assessment

The process of matching data across different essays of the thesis was carefully executed to ensure consistency and comparability across the analyses. The initial dataset for the first essay included 55,581 firm-year observations. This dataset was then matched with the second essay's dataset, which comprised 23,132 firm-year observations. Further, this matched dataset was compared and synchronized with the third essay's data, consisting of 20,511 firm-year observations. The final sample, which incorporated data relevant to all three essays, amounted to 11,534 firm-year observations. This comprehensive matching process ensured that the analysis included only those observations that were common across all three datasets, allowing for a robust examination of CEO traits and their impact on financial disclosures.

**Table 3.** Correlation Matrix (n = 11534).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) <i>Sim_Cosine</i>	1						
(2) <i>Sim_Jaccard</i>	0.7051*	1					
(3) <i>Sim_MinEdit</i>	0.8005*	0.9308*	1				
(4) <i>Sim_Simple</i>	0.4792*	0.5904*	0.6241*	1			
(5) <i>M_ABILITY</i>	-0.0387*	-0.0266*	-0.0275*	-0.0102	1		
(6) <i>HOLDER67</i>	-0.0289*	-0.0075	-0.0165	-0.0062	0.0282*	1	
(7) <i>CEONAR</i>	0.0194*	0.0150*	0.0099	0.0341*	0.0218*	0.0996*	1

Significance indicators (\*) denote correlation coefficients with a p-value less than 0.05, highlighting statistically significant relationships among the variables. Columns highlighted in light blue specifically indicate significant correlations between the three main independent variables used in essays 1, 2, and 3, which focus on CEO managerial ability, overconfidence, and narcissism, respectively. These correlations suggest interdependencies that could influence the study's interpretations of how these traits affect corporate outcomes. Each variable's detailed definitions and further methodological explanations are comprehensively provided in Appendix B, which can be found at the end of each independent essay. Additionally, for a complete understanding of how these variables were interpreted and used within the broader context of this thesis, refer to Section 8. This section discusses the application and interpretation of each variable in detail, aiding in a better comprehension of their roles and interactions within the study.

Examining the correlations between the three CEO traits — CEO managerial ability (*M\_ABILITY*), CEO overconfidence (*HOLDER67*), and CEO narcissism (*CEONAR*) — can provide substantial insights to justify the methodological decision to analyze these traits separately. *M\_ABILITY* is measured using managerial ability scores from Demerjian et al.'s (2012) study, which employs data envelopment analysis (DEA) to assess firm efficiency within industries. *HOLDER67* assesses CEO overconfidence based on the extent to which CEOs retain in-the-money options, as defined by a threshold of 67% above the exercise price, indicating a belief in continued stock performance. *CEONAR* quantifies CEO narcissism through the ratio of first-person singular to plural pronouns in earnings call transcripts, reflecting the self-focus characteristic of narcissistic personalities.

1. ***CEONAR and HOLDER67***: As noted, the correlation of 0.0996, while significant, is moderate. This suggests that while narcissism and overconfidence in CEOs are related traits, they are distinct enough to warrant separate analyses to understand their individual impacts fully.
2. ***M\_ABILITY and HOLDER67***: Similarly, any direct correlation between managerial ability and overconfidence is not explicitly mentioned but expected to be low based on their distinct influences on other variables.
3. ***M\_ABILITY and CEONAR***: The correlation between managerial ability and CEO narcissism suggests only a weak link between these traits. This modest correlation indicates that managerial ability (*M\_ABILITY*) and CEO narcissism (*CEONAR*) likely influence disclosure practices in distinct ways, underscoring the rationale for analyzing them separately in our study<sup>10</sup>.

Furthermore, when analyzing all three traits (managerial ability, overconfidence, and narcissism) together in a single model, it can lead to significant multicollinearity. Initially, we performed a regression analysis that included managerial ability, overconfidence, and narcissism, simultaneously to directly observe the interactions and potential collinearity among these CEO traits. This analysis was crucial to

<sup>10</sup> Correlation coefficients measure the pairwise linear relationships between variables. A low correlation coefficient between two variables indicates a lack of a strong linear relationship on a simple pairwise basis. This metric alone does not capture the potential complex interactions among multiple variables within a model, which could still present multicollinearity concerns despite low pairwise correlations.

determine the variance inflation factors (VIF) for each trait<sup>11</sup>. The VIF values obtained were significantly high, with each trait exceeding the commonly accepted threshold ( $VIF > 10$ ), indicating severe multicollinearity issues (Hair, et al., 1995, 1999). For example, the VIF for *CEONAR* reached as high as 52, clearly demonstrating the difficulty in isolating the individual effect of each trait when combined in a single model. These high VIF values substantiate our decision to segment the traits across different essays, as analyzing them together would compromise the statistical integrity of the findings by masking the distinct impacts of each trait. This segmentation ensures the clarity and precision essential for accurate statistical inference and robust theoretical development. Based on the discussions, each of the three independent variables—*M\_ABILITY*, *HOLDER67*, and *CEONAR*—represents sufficiently distinct aspects of CEO character. This differentiation supports treating them in separate essays, allowing for a focused analysis on how each trait individually influences strategic repetition from notes to MD&A.

### Incremental Explanatory Power Analysis

Following the identification of collinearity, we adopted the following approach to assess the incremental explanatory power of each CEO trait on the repetition in financial disclosures. This step-by-step analysis involved constructing nested regression models, each adding one trait at a time along with control variables to monitor changes in the explanatory power of the model. Here's how the analysis was structured:

#### 1. **Model 1: Baseline Influence of Managerial Ability**

1. The first model included only managerial ability (*M\_ABILITY*) along with control variables to assess its standalone influence on the dependent variable, *REPETITION*.
2. This model served as the baseline for comparison with subsequent models.

<sup>11</sup> Variance Inflation Factors (VIF) assess the degree of multicollinearity among multiple regression variables, unlike correlation coefficients, which only measure direct pairwise relationships. A high VIF for a variable indicates that it is linearly dependent on other variables in the model to a significant degree. This can occur even if pairwise correlations are low, as VIF accounts for the cumulative effect of multiple variables contributing to the redundancy in the information explained by one variable.

## 2. Model 2: Addition of Overconfidence

1. The second model introduced overconfidence (*HOLDER67*) to the existing model containing managerial ability and control variables.
2. This allowed us to observe any significant changes in the coefficients of managerial ability and the overall model fit.

## 3. Model 3: Comprehensive Model Including Narcissism

1. The final model added narcissism (*CEONAR*) alongside the previously included traits and controls.
2. This comprehensive model helped in evaluating the total incremental explanatory power when all traits were considered, alongside observing the adjustment in coefficients from previous models.

**Table 4.** Hierarchical Regression Analysis of CEO Traits on Repetition.

<i>Panel A. Model 1: Baseline Influence of Managerial Ability</i>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0260*** (0.00743)	-0.0365*** (0.00793)	-0.0603*** (0.0143)	-0.0575*** (0.0182)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	11,534	11,534	11,534	11,534
R-squared	0.063	0.039	0.048	0.041
<i>Panel B. Model 2: Addition of Overconfidence</i>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0214** (0.00926)	-0.0152* (0.00841)	-0.0259* (0.0151)	-0.00820 (0.0262)
<i>HOLDER67</i>	-0.00550*** (0.00195)	-0.00279 (0.00208)	-0.00782** (0.00377)	-0.0115* (0.00618)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	11,534	11,534	11,534	11,534
R-squared	0.063	0.039	0.048	0.043

**Panel C. Model 3: Comprehensive Model Including Narcissism**

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0235*** (0.00589)	-0.0263*** (0.00615)	-0.0459*** (0.0111)	-0.0575*** (0.0182)
<i>HOLDER67</i>	-0.0260*** (0.00743)	-0.0361*** (0.00793)	-0.0599*** (0.0143)	-0.0651*** (0.0235)
<i>CEONAR</i>	-0.00557*** (0.00196)	-0.00320 (0.00209)	-0.00839** (0.00378)	-0.0130** (0.00620)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	11,534	11,534	11,534	11,534
R-squared	0.063	0.040	0.049	0.044

The regression coefficients are accompanied by standard errors in parentheses, highlighting the statistical significance of the impact of managerial ability on disclosure repetitiveness under various auditing conditions. Significance levels are marked with asterisks, indicating p-values (\*\*\*) p<0.01, \*\* p<0.05, \* p<0.1), elucidating the robustness of the findings. **Panel A** examines the baseline effects of managerial ability (*M\_ABILITY*) on the strategic use of repetition across four similarity metrics. The statistically significant negative coefficients across all measures suggest that higher managerial ability is associated with less repetition, potentially indicating more unique and tailored communication strategies. The robustness of the model is ensured by the inclusion of control variables, year, and industry fixed effects. In **Panel B** regression model, overconfidence (*HOLDER67*) is added to the analysis. The results indicate that overconfidence also has a negative impact on the repetition of content, though the effect sizes vary across the different metrics. The comprehensive model in **Panel C** includes narcissism (*CEONAR*) alongside the previously analyzed traits. Similar to the other traits, narcissism shows a tendency to decrease repetition, which may reflect a more personalized approach to disclosure influenced by the narcissistic characteristics of the CEO. This panel confirms the distinct but interacting effects of CEO traits on disclosure practices, with all traits independently contributing to lower levels of repetition. Further details regarding the variables and methodology employed are outlined comprehensively in Appendix B, which can be found at the end of each independent essay. For a deeper understanding of the variables used, refer to Section 8 of this essay, where each variable is explained in detail.

The stepwise hierarchical regression model provided detailed insights into how the inclusion of each additional CEO trait impacted the explanatory power and the stability of coefficients in the model. While the changes in R-squared values are relatively modest across the models, they are significant enough to demonstrate that each CEO trait—managerial ability, overconfidence, and narcissism—contributes uniquely to the model's explanatory power, even when included simultaneously<sup>12</sup>.

<sup>12</sup> An independent samples t-test was conducted to ascertain whether the smaller sample used in the hierarchical regression model differs significantly from the larger sample used in other essays. The results indicate that there are no significant differences in the key variables between the two samples, confirming that the smaller sample is sufficiently representative of the larger dataset for the purposes of this analysis.

This indicates a distinct influence of each trait on disclosure practices, affirming the decision to analyze these traits separately in dedicated essays.

1. **Model 1** focused solely on CEO managerial ability (*M\_ABILITY*) and established a strong baseline effect on all measures of textual similarity, indicating a substantial influence on the repetition in financial disclosures.
2. **Model 2** introduced overconfidence (*HOLDER67*), which provided additional explanatory power beyond *M\_ABILITY*. The coefficients for *HOLDER67* were significant in many cases, indicating its independent impact on the repetition, though the change in R-squared was modest.
3. **Model 3** added narcissism (*CEONAR*), further increasing the model's explanatory power. Narcissism's coefficients were significant in several measures, supporting its distinct contribution to explaining repetition.

This incremental addition of CEO traits in the regression models demonstrates that while the traits are interrelated, they do not overshadow each other's explanatory power<sup>13</sup>. This finding supports the thesis structure of analyzing each trait in separate essays, as it highlights the unique contributions of each trait to the understanding of repetitive disclosures in financial reporting. The robustness of the findings is enhanced by systematically demonstrating that the observed effects are directly attributable to the specific characteristics examined<sup>14</sup>.

<sup>13</sup> It is noticeable that the marginal changes in R-squared values and the alteration in the sign of the coefficient for narcissism (*CEONAR*) from positive in essay 3 analyses to negative in this comprehensive model raise important methodological considerations. These shifts could potentially be attributed to multicollinearity among the CEO traits or endogeneity issues stemming from omitted variables. Additionally, the smaller sample size used in this analysis compared to other essays might affect the generalizability and robustness of the findings. Such sample discrepancies could introduce bias, suggesting the need for further statistical tests to ascertain the representativeness of this sample relative to larger ones, as we did in the essay 3.

<sup>14</sup> It is important to note that each essay of this thesis considers separate sets of data corresponding to different CEO traits and measuring different dimensions of financial disclosures. As a result, the number of observations in the comprehensive models is lower than in the single-trait analyses. This decrease in sample size could potentially impact the generalizability of the findings, and thus, caution should be exercised when interpreting the results. The distinct data sets for each trait underline the necessity of treating these traits independently, which further supports the methodological choice of detailed, trait-specific analyses to avoid conflating their effects and to provide clear, actionable insights into each trait's impact on corporate disclosures.

## A Review of Alternative Research Design Strategies

Collinearity among variables in regression analysis poses significant methodological challenges, potentially leading to inflated variance estimates and complicating the interpretation of model coefficients. This thesis initially addresses collinearity through the use of separate models for each CEO trait—managerial ability, overconfidence, and narcissism—to assess their individual impacts on the repetition in financial disclosures. However, based on the feedback regarding the limitations of this approach, it becomes necessary to discuss alternative strategies that could also address these empirical challenges.

### 1. **Regularization Techniques**

- **Ridge Regression:** Ridge regression is a technique used to analyze multiple regression data that suffer from multicollinearity. By adding a degree of bias to the regression estimates, it reduces the standard errors (Magklaras et al., 2024). It is particularly useful when data suffer from multicollinearity, where slight changes in the model can lead to large variations in estimates (Dawoud and Abonazel, 2021). Ridge regression stabilizes the estimates and improves the precision by introducing a penalty term equal to the square of the magnitude of the coefficients (Maronna, 2011).
- **Lasso Regression:** Lasso regression, similar to ridge regression, modifies the least squares objective function by adding a penalty equal to the absolute value of the magnitude of the coefficients (Tibshirani, 2011). This not only helps in reducing the problem of multicollinearity but also performs variable selection (Shalabh, 2022). The variables with non-significant coefficients are reduced to zero, thus excluding them from the model. This is particularly useful when we need a parsimonious model with fewer variables.

### 2. **Data Reduction Techniques**

- **Principal Components Analysis (PCA):** PCA is a technique used to emphasize variation and bring out strong patterns in a dataset. It's particularly useful in reducing the dimension of data by transforming the original variables into a new set of variables, which are uncorrelated, without losing any important information (Jolliffe and Cadima, 2016). These new variables are called principal components. Each principal component captures a certain amount of information about the original dataset, with the first principal component capturing the most variability (Gepp et al., 2018).

Despite the potential benefits of regularization techniques like ridge and lasso regression, and data reduction methods such as PCA, these were not applied in this thesis due to the specific nature and focus of the study. The research design was tailored to examine the distinct impacts of individual CEO traits—managerial ability, overconfidence, and narcissism—on communication strategies in a manner that directly links each trait to specific outcomes in financial disclosures. Regularization and PCA, while useful in reducing multicollinearity, could obscure the direct interpretability of how each CEO trait influences communication practices. Given the thesis's focus on clear, trait-specific insights, it was deemed more appropriate to use separate models to preserve the direct connection between individual CEO traits and their specific effects, thus ensuring the clarity and relevance of the findings to the study's objectives. This approach also aligns closely with the theoretical framework that underpins this research, emphasizing the unique contributions of each trait within the broader discourse on executive behavior and disclosure practices.

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## PART II: Essays



Essay 1 CEO Managerial Ability and  
Strategic Repetition in 10-K  
Reports from Notes to MD&A

# CEO Managerial Ability and Strategic Repetition in 10-K Reports from Notes to MD&A

## ABSTRACT

This study explores the relationship between Chief Executive Officers' (CEOs') managerial ability and the strategic use of repetition in 10-K reports, analyzing content similarities from notes to the Management Discussion and Analysis (MD&A). Our study is based on the upper-echelons theory, proposing that an entity's strategies and results reflect the backgrounds of its senior executives, and the obfuscation hypothesis, which proposes that managers might add complexity to financial statements to hide actual results. The methodology to gauge managerial ability, rooted in Demerjian et al. (2012), assesses a CEO's ability relative to industry counterparts through a two-step process involving Data Envelopment Analysis (DEA) and Tobit Regression Model. This approach quantifies managerial ability based on resource optimization and firm profitability, providing a concrete measure of managerial ability. Adopting Cohen et al. (2020)'s approach, we quantify strategic repetition from notes to MD&A. Our extensive dataset, covering 1994 to 2020, includes 55,581 firm-year observations. The data states that CEOs with advanced managerial abilities present with reduced repetition, resonating with both management obfuscation and stakeholder theories that adept managers strive for transparent disclosures. To ensure robustness in our findings, we predominantly control for endogeneity using the entropy balancing approach and, more broadly, employ various methodologies including lagged variable analysis, change analysis, propensity score matching, instrumental variable regression, firm fixed effects, and a two-step system generalized method of moments. Subsequent analysis delved into how investment efficiency, the role of auditors, readability scores, and sentiment indicators influence the quality and effectiveness of financial disclosures. This exploration aimed to identify the multifaceted factors that, along with CEO managerial ability, contribute to shaping clearer and more meaningful corporate communications. An intriguing observation was that firms with superior investment efficiency, guided by more-able CEOs, typically crafted disclosures that were both clearer and less redundant. We found that the influence of managerial ability on reducing repetitiveness is consistent across firms, irrespective of their auditors being Big Four or not. This result undermines the expected indirect role of Big Four auditors in promoting reporting quality, highlighting that disclosure clarity is more directly tied to managerial ability. We also find that while firms with stronger managerial abilities tend to increase repetitiveness with rising readability complexity, the tone of disclosures also plays a critical role. Specifically, more-able managers emphasizing positive developments can be perceived as reinforcing favorable outcomes. Collectively, these insights reveal a complex interplay between managerial ability, auditor influence, and disclosure characteristics, ultimately suggesting that the effectiveness and transparency of corporate communication are more directly attributable to the quality of managerial leadership than previously acknowledged. This study not only adds to the discourse on managerial ability but also provides perspectives for regulators and investors regarding the influence of managerial ability on corporate communication.

**Keywords:** Repetitive Disclosures, Managerial Ability, Upper Echelons Theory, Management Obfuscation Theory, Stakeholder Theory, Textual Analysis, MD&A, 10-Ks.

# 1 Introduction

Firm-level characteristics often underpin corporate decisions. However, some research has delved into the impact of individual managerial traits on corporate choices. As posited by the upper echelons theory<sup>15</sup>, Hambrick (2007) and Hambrick and Mason (1984) contend that organizational outcomes are partly shaped by managerial attributes. Bertrand and Schoar (2003) identified varying management styles among executives, which affected a broad spectrum of firm decisions. Several studies have probed the link between management style and factors like managerial expertise and restatements (Aier et al., 2005), manager reputation and earnings quality (Francis et al., 2008), voluntary firm disclosure (Bamber et al., 2010), and corporate tax behavior (Dyregang et al., 2010). In essence, these works stress the role of managerial traits in influencing corporate decisions and outcomes. Recent research has been placed on managerial ability<sup>16</sup>, an essential trait, which Kor (2003) defines as the amalgamation of a manager's knowledge, skills, and experience.

Managers of varying capabilities possess unique insights into future opportunities (Trueman, 1986), influencing their decision-making, confidence, and risk tolerance. Diverse skill levels among managers also influence their perception and appraisal of prospective investments. High-ability managers have been shown to distinctly impact corporate results (Choi et al., 2015; Dejong and Ling, 2013), driving favorable firm performance, evidenced by industrial firms achieving superior credit scores (Bonsall et al., 2017), aligning pay with performance (Milbourn, 2003), limiting corporate tax evasion (Koester et al., 2017), reducing insolvency risks and costs (Leverly and Grace, 2012), and securing favorable loan contracts (Francis et al., 2013). These insights lend credence to the upper-echelons theory, suggesting that managerial backgrounds partly dictate a firm's strategic moves and results (Hambrick and Mason, 1984).

<sup>15</sup> The upper echelons theory (Hambrick and Mason, 1984) posits that behavioral elements play a pivotal role in complex corporate decisions. In broader terms, CEOs' managerial traits can, to some extent, forecast strategic choices and organizational results (Hambrick and Mason, 1984; Bassyouny et al., 2020).

<sup>16</sup> Throughout this paper, the term "ability" is used to broadly denote the suite of a CEO's skills and attributes necessary for effective leadership. This encompasses but is not limited to, their "proficiency," "competence," "expertise," "capability," "skill," "capacity," "aptitude," "talent," and "prowess," each reflecting different facets of a CEO's adeptness in their role. These terms are employed interchangeably for stylistic variation and to highlight the multifaceted nature of the qualities that contribute to a CEO's overall effectiveness, encompassing learned skills, innate aptitude, and their adeptness in strategic and operational leadership.

However, much of the existing literature is fixated on the tangible impact of managerial ability, often overlooking its influence on qualitative aspects like narrative disclosures. Notably, the textual component dominates financial disclosures, constituting approximately 80% of a 10-K report (Li, 2010; Lo et al., 2017). This qualitative data is indispensable for deciphering a firm's prior performance, current status, and future prospects (Clarkson et al., 1994). The Securities and Exchange Commission (SEC) mandates comprehensive public disclosure, predominantly in narrative formats, urging senior management's active participation to offer investors and other stakeholders a management-centric view of the company (SEC, 2003). This implies that a CEO's unique attributes might shape the textual content of corporate disclosures.

Research has delved into the relationship between CEO traits and narrative disclosures. For instance, the nexus between CEO narcissism and an unusually optimistic tone in 10-K filings has been explored (Buchholz et al., 2018). Similarly, the relationship between a CEO's gender, particularly female, and the readability of 10-K reports is evident (E-Vahdati et al., 2023). Other studies include the impact of gender, age, and professional background on the tone's optimism during earnings conference calls (Davis et al., 2015), CEO overconfidence and the clarity of regulation fair disclosure (Bai et al., 2022), the influence of executive age on financial report legibility (Xu et al., 2018), and the linkage between CEO authority and the difficulty of reading annual reports (Sun et al., 2022). However, the interplay between CEO managerial ability and textual attributes remains relatively unexplored. A notable exception is the study by Hasan (2020), which delves into managerial ability (defined as the manager's efficiency in converting resources to revenue) and its effect on the 10-Ks' textual elements, particularly readability. Hasan probed how significant managerial ability is for the comprehensibility of narrative disclosures in the context of firm intricacy in 10-K reports. Drawing from a comprehensive US dataset spanning 1994-2015, he discovered a positive relationship between managerial skills and narrative disclosure legibility. This research delves deeper into existing literature to illuminate how CEO managerial ability may dictate the strategic selection and repetition of content from notes in the narrative sections of MD&As<sup>17</sup> within 10-K reports.

<sup>17</sup> It's worth noting that MD&As are not encompassed within the independent auditor's assessment. Nonetheless, the auditor must scrutinize the MD&A to ensure its clarity and completeness. The MD&A sheds light on trends and uncertainties concerning a company's financial position, resources, and operational outcomes. Rare events with potentially significant consequences for the company must also be addressed. The SEC, expressing discontent with the MD&As in submitted reports, advocates for enhanced disclosures. The commission aims to elevate MD&A disclosure quality through rigorous adherence to prevailing regulations and the introduction of new interpretive rules (De Franco et al., 2020).

Within 10-Ks, the MD&A segment is often considered a paramount qualitative disclosure (Clarkson et al., 1999; Li, 2008; Tavcar, 1998). These disclosures enable managers to present firm performance narratively. While specific topics may be mandated within MD&As, managers retain discretion over the depth of information and the chosen vernacular. Consequently, the content is largely deemed voluntary (Liu and Nguyen, 2020). From a behavioural standpoint, linguistic choices in corporate disclosures might inadvertently reflect managerial biases (Merkl-Davies and Brennan, 2011). Hence, MD&As are valuable in understanding how managerial proficiency affects textual characteristics. This research is particularly interested in repetition. Repetition, inherently a part of our lives<sup>18</sup>, is a communication expedient (Leonardi et al., 2012). The frequent use of repetition in financial disclosures has garnered the attention of regulators and standard-setters<sup>19</sup> (Ernst and Young, 2014; SEC, 2014b). The escalating volume of such disclosures has prompted concerns that redundancy makes pivotal information retrieval challenging for investors (Ernst and Young, 2014; Cazier and Pfeiffer; Brown et al., 2022)<sup>20</sup>.

In our investigation, we explore the relationship between managerial proficiency and repetitive disclosures in MD&As, guided by contrasting theoretical frameworks. The management obfuscation theory and stakeholder theory provide insights into this complex dynamic. We draw upon the management obfuscation theory, which posits that managers might be motivated to obscure a firm's genuine financial

<sup>18</sup> It's essential to differentiate between "repetition" and "redundancy." While "redundancy" is defined in the English dictionary as the unnecessary repetition or the existence of something superfluous due to an advanced counterpart, "repetition" refers to the mere act of echoing what has previously been communicated, either in speech or writing. This study doesn't make definitive assertions about the utility of financial disclosure repetitions based on empirical analysis. Consequently, the term "repetitive" is aptly adopted (Li, 2019).

<sup>19</sup> The International Accounting Standards Board (IASB) Discussion Forum has pinpointed duplicative (that is, repetitive) disclosures as a pressing issue warranting scrutiny in annual reports (IASB, 2010, 2013). The Securities and Exchange Commission (SEC) has documented numerous occasions when companies reiterate disclosures from the notes section of audited financial statements in the MD&A. Such repetition runs counter to the SEC's directive to curtail overlapping information between the notes and MD&A (SEC, 2003, 2014a). The Financial Accounting Standards Board (FASB) has stressed collaborating with the SEC to pare down such duplicative disclosures in yearly reports, given that the Generally Accepted Accounting Principles (GAAP) and SEC regulations frequently prescribe akin disclosure mandates (FASB, 2001, 2012).

<sup>20</sup> The occurrence of repetition in MD&A sections may serve a strategic purpose beyond mere communication. Some CEOs may intentionally echo audited footnotes to mitigate the risk of lawsuits stemming from unreliable information. This defensive tactic is particularly pronounced in jurisdictions like the United States, where the litigation risk is comparatively higher.

performance using intricate and opaque disclosures to postpone any negative capital market consequences. Within the context of readability, which can indicate firm complexity, Li (2008) demonstrated that firms with diminished earnings and profitability often produce annual reports that are more challenging to decipher. Bloomfield (2008) further suggests that underperforming firms might need to employ extended textual content to aptly convey their status to stakeholders. However, our contention is that firms helmed by more proficient managers may be less inclined to obscure their factual financial standing. This is because such managers possess enhanced capabilities in judiciously identifying and implementing high net present value projects that result in superior performance (Andreou et al., 2017; Chang et al., 2010; Demerjian et al., 2012; John et al., 2017). Their managerial acumen, combined with a strategic orientation, encourages transparency in disclosures, reducing the dependency on repetitive content that can obscure a company's actual performance.

Furthermore, in line with stakeholder theory, which emphasizes balancing the interests of all stakeholders (employees, customers, suppliers, community), we posit that firms led by more proficient managers might be less inclined to obscure firm's financial standing. These managers, recognizing the importance of clear communication with a diverse group of stakeholders, might use less repetitive disclosures in MD&As (Zerfass and Sherzada, 2015; Allert and Chatterjee, 1997). This is further supported by studies showing that CEO and CFO compensation is positively associated with the quality of financial disclosures (Hui and Matsunaga, 2015), and that CEOs' social media presence correlates with communication quality and employee–organization relationships (Men, 2015). Thus, adept managers might exhibit greater transparency and less repetition in disclosures, aligning with the management obfuscation and stakeholder theories.

Contrarily, from the rent extraction standpoint, intertwined with agency theory, suggests a different scenario. It posits that highly skilled<sup>21</sup> managers might intentionally curate less accessible annual reports. The intent might be to discreetly mask certain details like their remuneration structures, or possibly to shield their proclivity for investing in high-risk ventures that serve their private interests, as suggested by Hasan and Habib (2017). In this scenario, repetitive disclosures act as

<sup>21</sup> While this study focuses on managerial abilities as a determinant of financial reporting practices, it is important to acknowledge that high managerial ability does not inherently equate to ethical conduct. Skilled managers may use their capabilities for various purposes, beneficial or detrimental. The ability to craft complex financial statements, for example, could be utilized to enhance transparency or, conversely, to obfuscate true performance. This distinction, while not central to the primary focus of this research, is crucial for a holistic understanding of the impact of executive abilities on corporate governance and ethics.

a safeguard, enabling managers to control the narrative and possibly camouflage contentious decisions. From the agency theory perspective, CEOs with higher managerial ability may increase repetitive disclosures in MD&A as a means to obfuscate and pursue their own interests, which might not align with those of the shareholders (Li, 2019). This perspective is supported by findings that CEO changes can increase information asymmetry (Sohn et al., 2014), and that the ability of a CEO can influence corporate transparency in various ways (Uygur, 2018; Withisuphakorn and Jiraporn, 2015). Thus, the role of CEOs' managerial capabilities concerning repetitive disclosures in MD&As becomes an empirical query worth pursuing.

In this study, repetition (*REPETITION*) is defined as the extent to which content from the notes<sup>22</sup> (Section 8) is strategically reiterated in the MD&A section (Section 7) of 10-K reports. Following methodologies established in prior literature (Cohen et al., 2020; Brown et al., 2011; Wang et al., 2023), we measured the annual similarities between both mentioned sections, using four textual similarity measures including (i) Cosine Similarity, (ii) Jaccard Similarity, (iii) Minimum Edit Distance, and (iv) Simple Similarity. The significance of such repetitive disclosures arises due to several reasons: (1) the MD&A is frequently consulted in annual reports (Li, 2010); (2) the SEC, Financial Accounting Standard Board (FASB), and International Accounting Standards Board (IASB) are all keen on addressing and curbing these duplicative disclosures between the MD&A and notes<sup>23</sup>; and (3) the extent of repetition between the MD&A and notes considerably exceeds that between the MD&A and other 10-K segments (Li, 2019).

We employ the CEO managerial ability metric devised by Demerjian et al. (2012), which has served as the foundation for numerous studies analyzing various

<sup>22</sup> In this study, while analyzing the repetition between Section 8 (notes) and Section 7 (MD&A), we acknowledge that the content in the notes can vary between mandatory and voluntary disclosures. Mandatory disclosures are those required by law or standard accounting practices, which every company must include in their 10-K reports. Voluntary disclosures, however, represent additional information companies choose to provide, which can vary significantly across different firms. Our methodology considers the overall textual content of these sections without distinguishing between mandatory and voluntary elements explicitly. This approach is consistent with prior research which typically aggregates textual content to analyze general patterns of disclosure. However, we recognize that the differences in mandatory and voluntary information could influence the extent and nature of repetition.

<sup>23</sup> Within the International Financial Reporting Standards (IFRS) framework, the equivalent of MD&A in terms of financial disclosure is termed 'Management Commentary'. The IASB characterizes Management Commentary as a descriptive report offering both financial and non-financial details beneficial to financial report users. This 'other financial' is described as supplementary data external to the financial statements, aiding users in interpreting these statements and facilitating improved economic decision-making (IASB, 2018).

aspects of managerial impact on corporate outcomes. Recent studies applying this approach include Demerjian, et al. (2020), who investigate how intentional earnings smoothing varies with managerial ability; Habib and Hasan (2017), who explore the relationship between managerial ability and stock price crash risk; Gan and Park (2017), who examine the marginal value of cash in relation to CEO managerial ability; and Hasan (2020), who assesses the readability of narrative disclosures in 10-K reports and its correlation with managerial ability. These studies underscore the relevance and robustness of the Demerjian et al. (2012) metric in contemporary research. A CEO's managerial ability (*MA\_ABILITY*) is evidenced by their operational efficiency — the capacity to produce greater outputs with lesser inputs (Demerjian et al., 2012)<sup>24</sup>. Relying on this premise, Demerjian et al. (2012) introduced a managerial ability measure that reflects CEOs' effectiveness in garnering revenue with equivalent input levels<sup>25</sup>. Additional foundational data is sourced from the Compustat database. Our comprehensive matched sample, encompassing similarity metrics, managerial ability ratings, and Compustat data, spans from 1994 to 2020, inclusive of 55,581 firm-year observations.

This research delves into the interplay between managerial ability and repetitive communication tendencies, especially in corporate disclosures. By setting the median managerial ability score as a reference point, we categorized firms into two groups: those with low and high managerial ability scores. It was observed that firms with a greater managerial ability score consistently demonstrated reduced means and medians across various similarity indices. The central hypothesis proposes that CEOs of different managerial abilities impact repetition in distinct ways. Regression analyses displayed a notably negative relationship between managerial ability and similarity scores, suggesting that enhanced managerial ability is associated with decreased repetitive communication. These findings largely corroborate the obfuscation theory, which implies that skilled CEOs tend towards succinctness in

<sup>24</sup> In this study, we focus on operational ability, which has been more prominently explored in the literature compared to strategic ability. Operational ability, as measured by the metric developed by Demerjian et al. (2012), is central to our analysis. For additional details on the distinction between operational and strategic abilities, please refer to Section 6.5.

<sup>25</sup> Demerjian et al. (2012) have authenticated the reliability of their managerial ability metric, illustrating that it embodies manager-specific ability with greater precision, and notably surpasses preceding measures like CEO tenure and media mentions. Yet, as acknowledged by Demerjian et al. (2012), this managerial ability metric isn't without its limitations. Potential measurement inaccuracies might exist in certain accounting variables deployed during efficiency score estimations. The regression techniques might inadvertently exclude factors impacting firm and managerial efficiency due to data constraints. Lastly, residuals, which are employed as a managerial ability indicator, could encompass elements not strictly linked to managerial proficiency.

their communication to potentially minimize information vagueness. Additionally, they resonate with stakeholder theory, suggesting that adept managers, recognizing the importance of clear and effective communication with a diverse group of stakeholders, might deliberately avoid repetitive disclosures. This approach not only caters to the need for transparency but also addresses the broader expectations of various stakeholders, reflecting a strategic orientation towards comprehensive and clear communication.

In robustness tests, adopting the methodology from Brown and Tucker (2011) regarding repetitiveness scores between consecutive MD&As of a firm, our analysis has shown that among the similarity measures between consecutive MD&As, only '*Sim\_Simple*' demonstrated a statistically significant negative correlation with CEO ability. This finding suggests that higher CEO ability may be associated with less repetition between consecutive MD&A disclosures, indicating that more capable CEOs could prioritize updating the content of these sections with new insights or strategic shifts, rather than reiterating previous disclosures, in order to communicate the relevant business matters in a timely and precise manner<sup>26</sup>. In addressing the persistent and pivotal concern of endogeneity within our research, special emphasis was placed on the entropy balancing approach. This advanced method balances covariates between treatment and control groups, thus enhancing the robustness and reliability of causal inferences in our observational study. To ensure a thorough examination of our hypothesis and the robustness of our findings, we employed a variety of additional methodologies, including lagged variable analysis, change analysis, propensity score matching, instrumental variable regression, firm fixed effects, and the two-step system GMM. These robustness tests were essential in validating the reliability and generalizability of our results. While our primary findings highlighted significant relationships, some of these additional tests did not yield statistically significant results. This inconsistency underscores the complexity of our research question and highlights the necessity of a cautious and balanced interpretation of all results, regardless of the method employed.

Exploring the subtleties of investment efficiency reveals a relationship between investment decisions and disclosure repetition. Delving into how different investment strategies might affect financial disclosures could illuminate the effects of managerial decisions on transparency and investor relations. Further analysis of the link between CEO ability and disclosure repetition in the context of investment efficiency showed a negative correlation, indicating that higher managerial

<sup>26</sup> It is important to note that this interpretation is based on a simple correlation; a more definitive association would require controlling for additional variables. Future analyses incorporating control variables could provide a more robust understanding of the relationship between CEO ability and changes in MD&A content.

competence is associated with less redundancy in disclosures. However, the specific influence of overinvestment and underinvestment on disclosure repetition remains unclear, highlighting areas for deeper investigation.

Our study revisits also the presumed influence of Big Four auditors on the clarity of financial disclosures relative to managerial ability. Initial analysis hinted at a significant correlation between managerial ability and less redundancy in disclosures for firms audited by the Big Four. However, further examination using regression analysis reveals this difference to be statistically insignificant, indicating that managerial ability's impact on disclosure repetitiveness is not influenced by the auditor's identity—Big Four or otherwise.

In our study, we also examined readability metrics, a crucial aspect of financial reporting (Loughran and McDonald, 2014, 2016). Readability is undeniably a text characteristic that CEOs can influence, as their leadership and communication strategies directly shape how financial information is presented (Smeuninx et al., 2020). This potential impact on readability further motivates its inclusion as a key aspect of our analysis, as it plays a significant role in how stakeholders interpret and understand financial disclosures. These metrics include the *FOG* index, *Flesch-Kincaid (FK)* index, *ARI* index, and *SMOG* index, each offering a unique perspective on the complexity of textual content in financial disclosures. Our findings suggest that firms with higher managerial ability tend to increase repetition in line with the growing complexity of the text, as indicated by these readability metrics. The tone of MD&A sections, as another variable, was explored. Two distinct measures (*TONE1* and *TONE2*) were used to gauge sentiment in textual disclosures. *TONE1* calculates the balance of sentiment by subtracting the count of negative words from positive words and dividing by the total word count, offering a relative measure of overall sentiment positivity. *TONE2*, on the other hand, measures sentiment by calculating the net positivity as a proportion of all emotional words (positive and negative)<sup>27</sup>, providing an intensity-focused perspective of sentiment. The results consistently highlighted the interplay between managerial ability and tone in shaping redundancy, suggesting that more capable CEOs may strategically adjust the tone of their disclosures to reduce repetitive information, ensuring more precise and impactful communication.

This study makes significant contributions to both the management obfuscation theory and stakeholder theory in the context of financial disclosures. Firstly, in line

<sup>27</sup> In the context of business reporting, emotional words are those that convey sentiments or feelings related to the business, its performance, market conditions, or financial outcomes. These words can either be positive (growth, profitable, enhance, success, achievement) or negative (decline, risk, loss, difficult, weak) and are used to communicate the tone or mood of the report to stakeholders.

with the management obfuscation theory (Bloomfield, 2002; Li, 2008), our findings provide empirical support to the notion that higher managerial ability is associated with less obfuscation in communication. The observed negative correlation between managerial ability and repetitive disclosures reveals that more adept managers tend to favor clarity and brevity in their reporting. This insight enhances our understanding of managerial proficiency and its impact on disclosure quality, providing new perspectives that enrich traditional interpretations of how transparency is practiced in financial communications. Furthermore, our research contributes to stakeholder theory by demonstrating how managerial ability impacts a firm's approach to stakeholder communication. The reduction in repetitive disclosures among skilled managers, as indicated by our study, aligns with the stakeholder theory's emphasis on addressing the needs of a diverse group of stakeholders (Zerfass and Sherzada, 2015; Allert and Chatterjee, 1997). This finding suggests that proficient managers are not solely focused on shareholder interests but are also attentive to the broader stakeholder community, which is a critical aspect of effective corporate governance and ethical business practices. In essence, our study bridges the gap between theoretical expectations and empirical evidence in the realm of financial disclosures, enhancing the understanding of how managerial proficiency influences corporate communication strategies. This contributes to a more holistic view of corporate governance and ethical management practices, as advocated by both management obfuscation and stakeholder theories.

Apart from providing empirical data which echoes the concerns of regulators and standard setters about repetitive disclosures, our study augments the literature in several respects. Firstly, our research offers preliminary empirical findings indicating that CEOs' characteristics, specifically their ability, influence repetitive disclosures. This insight into individual attributes impacting the extent of textual disclosures has pertinent implications for standard setters and regulators. Our findings could potentially be useful to the SEC in its collaborative endeavors with the FASB and IASB, particularly in focusing on addressing redundant disclosures while ensuring protection for individual investors. Secondly, as textual analysis literature increasingly embraces computational advancements, our study integrates a novel computer linguistic tool into accounting disclosure research (El-Haj et al., 2019). This integration allowed for more precise and efficient analysis of the textual complexity and sentiment in financial disclosures, enabling us to detect subtle patterns and variations in corporate communication that might be overlooked with traditional methods such as manual content analysis, simple keyword searches, and basic readability tests. Moreover, we enrich both the communication and marketing domains, which historically have shown an interest in repetitive communication (Johnson and Watkins, 1971; Pechmann and Stewart, 1988; Shannon and Weaver, 1949). Such communication patterns have been on the rise (Law, 2002; Leonardi et

al., 2012). By applying a financial reporting context we offer an expanded comprehension of financial reporting and recurrent communication.

On the decision-making frontier, our research brings forth the following. Primarily, by methodically scrutinizing the relationship between CEO managerial ability and repetitive disclosures in MD&As, and factoring in CEO involvement in investment decisions, we elucidate how CEO ability modulates repetition. This underpins the upper echelons theory posited by Hambrick and Mason (1984), the obfuscation hypothesis, and prevalent manager-effect literature. Earlier studies, utilizing diverse proxies for managerial ability, have showcased superior CEOs' association with more substantial IPO offer sizes, enhanced post-IPO operational outcomes, solid long-term stock returns (Chemmanur and Paeglis, 2005), favorable firm outcomes (Chang et al., 2010), and elevated accounting information quality (Francis et al., 2008; Demerjian et al., 2013). Correspondingly, Jian and Lee (2011) found a CEO's reputation to be positively correlated with post-investment outcomes. By extending this narrative disclosure and linguistic trait literature, our study presents a refreshed outlook, underlining the influence of a CEO's managerial ability on the intricacy of financial reporting. Besides, our study enhances the understanding of corporate investment by examining how specific managerial characteristics influence outcomes in situations characterized by agency conflicts. Beyond managerial ability, the way leadership is motivated and overseen plays a pivotal role in decision-making processes (e.g., Jensen, 1986; Shleifer and Vishny, 1989; Morck et al., 1990; Core and Guay, 1999; Coles et al., 2006; Bebchuk et al., 2009; Biddle et al., 2009). Analyzing the relationship between CEO managerial ability and repetition against a backdrop of varied incentives and oversight, our study furnishes data illustrating the interplay between managerial competence, incentives, and the supervisory milieu in steering corporate investment strategies and influencing investment efficiency.

The structure of this paper unfolds as follows: In section 2, we delve into relevant antecedent literature and section 3 formulates the study's hypotheses. Section 4 articulates our research design, while section 5 presents empirical outcomes and supplementary findings. Additional analyses are provided in Section 6. The paper concludes with section 7.

## 2 Literature Review

This section succinctly reviews pertinent literature, underlining the influence of managerial ability on firm outcomes and the role of repetition within narrative disclosures, particularly MD&As. Through this streamlined review, we pave the way

for our hypothesis development, bridging theoretical backgrounds with our forthcoming analysis.

## 2.1 Managerial Ability and Firm Outcomes

In examining the relationship between the traits of top-tier managers and a firm's strategic decision-making, Hambrick and Mason (1984) highlight the significance of both psychological elements, such as foundational cognitive values, and manifest background traits (e.g., age, education, and financial standing) in influencing strategic choices, spanning from product innovation to capital allocation. Historically, management studies have consistently underscored the pivotal role of managers in determining enterprise outcomes. Hambrick and Mason (1984) and later Hambrick (2007) have advanced the upper echelons theory, a framework suggesting that the intricate nature of real-world decision-making scenarios mandates a unique significance of senior management. Consequently, a burgeoning body of literature has focused on exploring the role of managers in influencing firm outcomes. Evidently, managerial prowess distinctly shapes a firm's disclosure protocols, accounting practices, and the overall quality of reporting, while also accounting for inherent firm and environmental influences (as cited in Bamber et al., 2010, Ge et al., 2011, Dejong and Ling, 2013, Choi et al., 2015, among others).

Sources such as Boeker (1989) and Kor (2003) argue that managerial ability is an offshoot of experiences, encompassing the grasp over markets, company strategies, and technological trends. However, quantifying such ability remains challenging since efficient resource management isn't always overtly evident. Consequently, it's suggested that observable results, like effective resource allocation, be used as metrics for managerial capability. Offering a more structured approach, Demerjian et al. (2013) unveiled a quantitative metric for managerial ability, revealing how managers optimally utilize organizational resources for sales, often outperforming industry rivals. This metric, rooted in intuitive approaches, posits that adept managers can maximize revenues using resources such as labor and capital. The robustness of this metric is evidenced by its strong correlation with managerial impacts and its superior explanatory power concerning CEO announcements and firm performance, compared to other capability metrics.

It's evident from various studies that managerial ability significantly influences firm strategies, operations, and performance, elucidating the varied investment, financing, and operational outcomes and approaches. Notably, some of the studies referenced, such as Andreou et al. (2017), Bertrand and Schoar (2003), and Demerjian et al. (2013), specifically employ the Demerjian et al. metric to quantify managerial ability, highlighting its widespread acceptance and utility in academic research. Managers with higher aptitude, as measured by this metric in studies like

Chemmanur et al. (2009), tend to possess sharper insights into investment avenues, facilitating judicious investment decisions and likely yielding fruitful project outcomes. Furthermore, Andreou et al. (2016) observed that during financial turmoil, managers of higher caliber, as defined by this metric, were more inclined to invest, attributed to their ability to bridge information gaps and secure financial resources.

Parallel research delves into how managerial ability impacts a firm's informational landscape. Baik et al. (2011) found that proficient CEOs tend to produce more consistent and precise forecasts, effectively signaling a firm's economic fundamentals. Moreover, these forecasts by adept CEOs elicit a stronger market reaction. Echoing similar sentiments, Chemmanur et al. (2009) opined that esteemed managers are better equipped to communicate a firm's intrinsic value to external stakeholders, thereby curtailing information disparities in the stock market. Demerjian et al. (2013) also found a positive relationship between managerial expertise and superior financial reporting outcomes. A study by Cheung et al. (2017) spanning three decades (1982-2012) on U.S. firms examined the nexus between managerial prowess and firm performance. They discerned that managers, when granted more discretion and simultaneously monitored, can potentially enhance firm outcomes.

In more recent literature, Puwanenthiren et al. (2019) showed a positive correlation between managerial ability and the method of issuing Seasoned Equity Offerings (SEOs) between 2001 and 2013. Their findings suggest that managerial competency acts as a beacon of quality in firm informational ecosystems. Similarly, Song and Wan (2019) explored CEO compensation dynamics among S&P 500 firms from 1993 to 2012, concluding that CEOs with greater influence tend to have heftier compensation packages, aligning more with the perspective of rewarding managerial competence rather than the power dynamics. Lastly, Lin et al. (2021) showcased that CEO innovations are pivotal for company ingenuity, emphasizing that universally acknowledged CEO skills play a fundamental role in amplifying this innovative potential. In summation, contemporary research accentuates the pivotal role that managerial characteristics play in shaping firm strategies, operational efficacy, and ultimate results. Building upon this foundation of managerial influence on firm strategies and outcomes, we turn our attention to the dynamic interplay between CEO and Chief Financial Officers (CFOs) roles in financial information disclosure, examining how their relative dominance and managerial abilities further define the transparency and quality of financial reporting.

While CFOs are primarily responsible for safeguarding financial reporting integrity, as noted by Indjejikian and Matějka (2009), they often operate under the authority of CEOs. Mian (2001) highlights that CFOs, being subordinates to CEOs, are susceptible to pressures exerted by the latter, especially in contexts requiring financial reporting manipulation. This dynamic is further elucidated by Friedman

(2014), who observed that CEOs of firms engaged in manipulative practices tend to use their power and authority to influence CFOs' financial reporting decisions. This highlights the significant impact CEOs have over the financial reporting process, often overshadowing the CFO's role<sup>28</sup>.

Moreover, the literature suggests that CEOs often set the organizational tone, which can overshadow the CFOs' approach to accounting choices. Feng et al. (2011) provide compelling evidence that CFOs may yield to pressures from CEOs, particularly in scenarios involving significant accounting manipulations. This is corroborated by the work of Hunton et al. (2011), who found a positive association between the perceived tone set by the CEO and the quality of earnings reported. They further observed that CFO characteristics such as age, tenure, and compensation do not significantly influence this overarching tone. In light of these findings, our study's focus on the CEO's managerial abilities is particularly relevant. Given their overarching influence on corporate strategy, decision-making, and the setting of organizational tone, CEOs are more likely to impact the nature and quality of financial disclosures. Their ability to shape the narrative in these reports is crucial in understanding the dynamics of repetitive disclosures and the transparency of financial information. Therefore, while CFOs play a critical role in the specifics of financial reporting, it is the CEO whose managerial ability and strategic decisions predominantly shape the overall financial disclosure landscape.

## 2.2 Repetition in Accounting Narrative Disclosures

Repetition is inherent in human expressions, reflected across various mediums like text, images, and music. While a comprehensive theory of repetition remains elusive, its multifaceted manifestations have been the subject of numerous disciplines, such as philosophy, psychology, psycho-analysis, and arts-related criticisms. This discussion offers a lens to evaluate repetition in both verbal and audiovisual mediums. Primarily, rhetorical repetition in words and visuals seeks to enhance recall and stress significance (Davison, 2008).

<sup>28</sup> The literature presents an ongoing debate regarding the independence of CFOs in relation to the influence exerted by CEOs. Studies by Graham and Harvey (2001), Mian (2001), Fee and Hadlock (2004), and Geiger and North (2006) contribute to this discourse, highlighting the complex interplay between these two key executive roles. In their research, Dejong and Ling (2013) discovered that although CFOs significantly influence accounting accruals, CEOs have a more pronounced impact on broader firm policy decisions. This finding indicates that while CFOs are integral to the financial reporting process, the CEO's influence is more encompassing, extending to corporate strategies and financial disclosures.

In the realms of accounting and finance, the increasing repetition in financial disclosures has caught the attention of regulatory bodies and standard setters, such as the SEC and FASB, leading to concerns that excessive repetition impedes the extraction of crucial information (Ernst and Young, 2014; SEC, 2014b). Scholarly research has extensively explored this phenomenon. For instance, Cazier and Pfeiffer (2017) analyzed repeated disclosures in 10-K reports from 1994 to 2013, suggesting that information repetition may be a strategic choice by managers to navigate litigation risks and obfuscate weak earnings. Merkley (2014) examined R&D disclosures within 10-Ks, revealing that disclosure strategies are modulated based on earnings performance, aiming to convey pertinent information rather than merely obscure results. Li (2008) found that longer and less comprehensible 10-Ks are associated with weaker performance, indicating that repetitive content could decrease the document's readability and potentially lead to crucial details being overlooked. Furthermore, studies by Loughran and McDonald (2010), Bonner (2007), and Joe (2003) have discussed how repetition can influence decision-making processes and assessments of event probabilities, demonstrating the significant impact of disclosure repetition on financial reporting and investor perception.

Empirical evidence and reports from professional services firms like KPMG corroborate these academic findings. KPMG (2011) indicated that litigation risk is a significant factor influencing disclosure decisions, with managers opting to include potentially redundant details to mitigate future legal challenges. This perspective is supported by observations from FASB (2001; 2014), Higgins (2014), and PwC (2014), highlighting the challenges posed by accumulated disclosure requirements and the need for regulatory bodies to streamline overlapping mandates to reduce repetition in 10-K reports (Gallagher, 2013; KPMG, 2011; Standard and Poor's, 2012)<sup>29</sup>.

## 2.3 Managerial Influence on Disclosure Repetitiveness in Financial Narratives

Our investigation focuses on how CEOs' managerial skills influence the strategic repetition of information from note disclosures to MD&As within the same 10-K report. More talented managers, equipped with extensive business knowledge, are known to make informed decisions that shape the long-term value of their companies

<sup>29</sup> Dyer et al. (2017) contend that regulatory compliance contributes significantly to redundancy in 10-K filings. Despite current guidelines from the SEC allowing for cross-referencing to avoid repetition (SEC, 2014), firms still have considerable discretion in this domain. While some firms opt for referencing, others replicate information verbatim in multiple sections of the 10-K. This pattern suggests a selective approach by firms in financial report preparation.

(Puwanenthiren et al., 2019). Their insights extend to their specific industry, enabling them to select projects with higher net present value. Various studies have stressed the impact of management traits and methods on organizational outcomes (e.g., Bertrand and Schoar, 2003; Fee and Hadlock, 2003; Malmendier and Tate, 2005; Switzer and Bourdon, 2011). Specifically, Demerjian et al. (2012) emphasize that proficient managers, cognizant of technological and industrial shifts, manage operations effectively, generate optimal revenue, and judiciously utilize equity financing. Such managers can anticipate product demand and engage in projects of greater value, overseeing their teams with greater efficacy than their less capable counterparts. Leverty and Grace (2012) note the reduced propensity of skilled managers to face potential bankruptcy. Similarly, Chemmanur (1993) posits that distinguished management teams can more convincingly portray their firm's value to equity markets, thereby diminishing information asymmetry.

Building on this foundation, recent studies have shed light on the aspects of managerial ability and financial reporting. Bui et al. (2023) reveal that firms led by high-ability management teams tend to disclose more disaggregated information in financial statements, a practice that investors find credible and beneficial in reducing stock price crash risk and lowering equity costs. This finding suggests that high-ability managers and their firms gain more from providing detailed accounting information, linking managerial skill to the quality of financial disclosures. Similarly, Yan et al. (2021) delve into the impact of managerial ability on the tone of financial reporting. They find that lower-ability managers often inflate disclosure tones, possibly to enhance perceptions of their ability, especially during challenging market conditions. This behavior contrasts with high-ability managers who might not need to resort to such tactics. García-Meca and García-Sánchez (2018) extend this understanding to the banking sector, showing that capable bank managers are less likely to engage in opportunistic earnings management, thereby enhancing the quality of financial reporting. This study is particularly relevant in the post-financial crisis era, highlighting the importance of managerial abilities in the banking industry. Furthermore, Bonsall et al. (2018). Lastly, Bonsall et al. (2018) highlight how managerial talent shapes the clarity of regulated financial disclosures and a firm's information environment. They find that more able management teams produce clearer and more concise financial filings, which positively impacts the post-filing information environment, such as lower analyst forecast errors and dispersion.

Despite the extensive research on managerial ability and financial reporting, a gap remains in understanding the specific relationship between managerial ability and repetitive disclosures in MD&As. While existing literature provides insights into the general influence of managerial ability on financial disclosures, the aspect of how these abilities might lead to increased or decreased repetitiveness in MD&A sections

has not been thoroughly explored. This study aims to fill this gap by examining whether and how the managerial ability influences the tendency to repeat information in MD&As, providing new insights into the subtleties of corporate communication strategies employed by more-able managers.

### 3 Theories and Hypothesis Development

Theoretically, we propose two arguments linking managerial ability with the strategic use of repetition in 10-K reports from notes to MD&As. Firstly, we reference the management obfuscation theory and stakeholder theory. According to management obfuscation theory, managers might, given certain incentives, obscure data or strategically mask underwhelming performances via ambiguous disclosures to mitigate adverse market reactions (Bloomfield, 2002; Li, 2008). Increasing repetitive narrative disclosures in MD&As is one method to achieve this obfuscation, allowing managers to withhold specific details from investors (Bloomfield, 2002). Past research indicates a trend where managers resort to obfuscation during financial downtrends (Dempsey et al., 2012; Li, 2008). We contend that adept managers, due to their business knowledge of the industry landscape and the subsequent favorable organizational outcomes (Bertrand and Schoar, 2003), consistent earnings reports (e.g., Libby and Luft, 1993), and stabilized future earnings and stock returns (Bonsall et al., 2017), might exhibit greater transparency. As these managers play a pivotal role in driving corporate outcomes, there's an inherent motivation to issue repetitive disclosures that spotlight their commendable performance.

In the framework of stakeholder theory, the role of CEO communication strategies becomes pivotal in balancing the often competing interests of various stakeholder groups, including employees, customers, suppliers, and the community at large. High managerial ability, as indicated by Demerjian et al. (2012), may enhance a CEO's capacity to discern and prioritize the informational needs of these groups. This discernment could manifest as a reduction in repetitive disclosures in MD&A sections, aimed at increasing the clarity and relevance of the information presented. To further substantiate this point, we can draw upon the work of Zerfass and Sherzada (2015) and Allert and Chatterjee (1997), which underscore the importance that top executives place on effective communication as a means of building trust and credibility among primary stakeholders. This emphasis on strategic communication aligns with the notion that adept managers may leverage

less repetitive, more focused disclosures to navigate complex stakeholder landscapes effectively<sup>30</sup>.

Additionally, empirical evidence from Hui and Matsunaga (2015) supports the premise that effective communication is highly valued by boards of directors, as reflected in the positive association between the quality of firm financial disclosures and executive compensation. This link suggests that boards recognize and reward communication strategies that align with the broader goals of stakeholder engagement and trust building. Moreover, integrating findings from Men (2015) and the example of Siemens reported by Oberwallner et al. (2021) adds a modern dimension to this discussion, illustrating how CEOs' active engagement via social media platforms can enhance communication quality and responsiveness, further contributing to positive organizational relational outcomes. Such active communication practices reflect a broader commitment to transparency and may be associated with less repetitive and more substantive disclosures<sup>31</sup>.

To address the complexity of stakeholder communications further, it is also pertinent to consider the broader organizational outcomes associated with high CEO ability, as documented in studies by Bertrand and Schoar (2003), Libby and Luft (1993), and Bonsall et al. (2017). These studies highlight that adept managers not only consistently deliver stable earnings reports but also tend to produce disclosures that forecast stabilized

<sup>30</sup> While this strategic communication is primarily viewed through the lens of stakeholder theory, which emphasizes the CEO's responsibility to balance and prioritize the diverse needs and expectations of all stakeholders, it is crucial to consider the potential influence of impression management strategies as well. Impression management theory suggests that executives might also manipulate communication to construct a favorable image of themselves and their organizations (Merkl-Davies and Brennan, 2011). Thus, the observed reduction in repetition could serve dual purposes: enhancing the clarity and relevance of information for stakeholders while simultaneously shaping stakeholder perceptions to maintain or enhance executive and organizational image. This duality illustrates the sophisticated nature of corporate communication, where transparent and direct information dissemination may coexist with or be influenced by strategic impression management objectives.

<sup>31</sup> However, the interpretation of these communication practices can also be viewed through the prism of impression management, where the reduction in repetitive disclosures might not solely aim for transparency but could also be strategically employed to optimize stakeholder perceptions of management's competence and the firm's stability. Bolino et al. (2008) discuss the challenges in discerning between genuine transparency and strategic impression management in corporate settings. This suggests that CEOs' communication strategies might be intricately designed not only to meet the explicit information needs of stakeholders but also to subtly manage the impressions stakeholders form about the CEO and the company. By addressing this complexity, we can better understand the multifaceted motivations behind corporate disclosure practices, where the lines between enhancing informational quality for stakeholders and managing external perceptions often blur.

future earnings and stock returns, reinforcing the strategic importance of tailored, stakeholder-oriented communication. In light of these discussions, while it may seem a stretch to directly correlate less repetition with more diverse discussions catering to multiple groups, the overarching strategic orientation of high-ability CEOs towards effective stakeholder communication provides a plausible link. This orientation suggests that skilled managers are likely to engage in communication practices that, while potentially less repetitive, are strategically designed to meet the varied and specific information needs of a diverse stakeholder base.

Yet, another viewpoint emerges from the 'rent extraction' angle, intertwined with agency theory. It implies that adept managers may accentuate their personal advantages, potentially aggravating agency conflicts and muddling the informational milieu. Habib and Hasan (2017) observe that such managers might indulge in non-beneficial projects that cater to personal interests. This angle suggests that while proficient managers can enhance firm performance, they might also prioritize personal benefits. This dynamic might motivate them to amplify repetition in MD&As, potentially masking their actions. From the agency theory perspective, CEOs with higher managerial ability may increase repetitive disclosures in MD&A as a means to obfuscate and pursue their own interests, which might not align with those of the shareholders. Skilled CEOs, aware of their critical role and influence, might use repetitive disclosures as a tool to mask their self-serving actions or to divert attention from less favorable aspects of their management, thus exploiting their position and the information asymmetry between them and the shareholders (Li, 2019). Li's study highlights that not all managers use repetitive disclosures solely for obfuscation; some use them to emphasize firm-specific events, challenging the notion that repetitive disclosures are uniformly uninformative.

Sohn et al. (2014) further investigated the relationship between CEO changes and information asymmetry. They found that in the first year after a CEO change, management ability is scrutinized, leading CEOs to selectively disclose information to inflate their performance evaluation. This selective disclosure can increase information asymmetry, as financial analysts must exert extra effort to reduce this asymmetry. Uygur (2018) examined the effect of CEO ability on corporate opacity, finding that high-ability CEOs may seek to create greater transparency to convey their ability to the market, while low-ability CEOs may signal-jam the market's inferences about their talent by limiting the available information. This suggests a view where the ability of a CEO can influence the level of corporate transparency in different ways. Additionally, Withisuphakorn and Jiraporn (2015) explored how powerful CEOs influence stock price informativeness. Their findings indicate that firms with more powerful CEOs experience a more opaque information environment, consistent with the idea that more powerful CEOs, potentially more entrenched, are likely to take actions that do not maximize shareholders' wealth and

are less likely to disclose information, resulting in more information asymmetry and lower stock price informativeness.

In summary, the relationship between managerial proficiency and repetitive disclosures in MD&A is complex and multifaceted. On one side, theories like management obfuscation and stakeholder theory suggest that skilled managers may reduce repetitive disclosures, aiming for transparency and effective stakeholder communication. Conversely, the 'rent extraction' perspective and agency theory propose that these managers might increase repetitive disclosures to obfuscate information and serve personal interests. This dichotomy leads to our non-directional hypothesis, acknowledging that managerial ability can influence financial disclosures in varying ways:

***H:** There is a significant relationship between CEOs' managerial ability and repetitiveness disclosures from notes to MD&As.*

## 4 Research Design

### 4.1 Sample and Data

To conduct the empirical analyses, we obtain the final sample in the following steps. We extracted all 10-K files from 1994 to 2020, resulting in an initial sample of 189,085 10-Ks<sup>32</sup>. Table 1 delineates how the original sample size is adjusted by our data filtration steps. Significant reductions in the sample are seen when eliminating duplicates within a specific year and CIK, dropping 3,287 observations, and when matching the data with Compustat's gvkey, removing 40,660 observations. Further, our sample refinement included the exclusion of firm-year observations with MD&A and notes sections having fewer than 200 words (Cho et al., 2023; Audi et al., 2016), decreasing the count by 22,000<sup>33</sup>. Our synchronization with the Demerjian et al.,

<sup>32</sup> Thanks to the Loughran-McDonald Repository (<https://sraf.nd.edu/sec-edgar-data/cleaned-10x-files/>) which provide the cleaned and raw 10-X files. The Notre Dame Software Repository for Accounting and Finance (SRAF) is a website designed to provide a central repository for programs and data used in accounting and finance research.

<sup>33</sup> This number of observations is a little bit high. However, after comparing it with previous studies, like Loughran and McDonald (2011) which has the span of 1994 to 2008 with beginning 1212017 firm year observations, and excluding MD&A section less than 250 words which was 11,892, and another study, Observations with 10-K word count < 2000 or MD&A word count < 200 was dropping 43836 from the total of 10-Ks from which was 172283 from 1995 to 2018, this amount of dropping in our sample, having considered that the duration is from 1994 to 2020, and of course inclusion notes reduction less than 200 words, it is logical.

(2013) managerial ability repository, using gvkey as the primary identifier, led to the exclusion of 40,973 firm-year observations. Lastly, the omission of observations lacking essential Compustat data saw a reduction of 17,584, bringing the final sample size to 55,581 firm-year observations spanning 1994-2020.

[Insert Table 1]

## 4.2 Measuring Repetition in MD&As

Our analysis is the systematic extraction of text from the MD&A section (Section 7) and the notes section (Section 8) within each annual 10-K filing. Following the methodologies established by Cohen et al. (2020), we first identify and extract the content of these key sections from each 10-K report. Each annual report comprises 18 schedules, including various subsections, which are detailed in Appendix A. The textual content of each schedule is accurately captured using regular expressions that include the keyword “item” followed by the specific schedule name, ensuring a consistent retrieval of the necessary sections across different filings. Since the labels for schedules are very inconsistent across filings, we process all 10-K filings many times to capture those exceptions. First, we use regular expressions to capture the most common structure for schedule titles: lines that start with “Item” + “a number” + “title name.” Then we start capturing exceptions to the common rule, for example, lines that only has “Item” + “a number,” lines with only “number” + “title names,” etc., while also making sure that each schedule is captured exactly once. We repeat that process many times and incorporate new exceptions each time.

After this process, for each 10-Ks files, we have an MD&A and note section, both more than 200 words (Audi et al., 2016; Breuer et al., 2020). To calculate the repetition score (*REPETITION*), we followed previous literature (Cohen et al., 2020; Brown et al., 2011; Wang et al., 2023), and assessed the annual flow of strategic repetition from notes to MD&As in 10-K filings using four textual similarity measures commonly used in linguistics, Natural Language Processing (NLP), and textual similarity: (i) Cosine Similarity, (ii) Jaccard Similarity, (iii) Minimum Edit Distance, and (iv) Simple Similarity<sup>34</sup>. Below, we describe each measure and its calculation method.

<sup>34</sup> Each measure offers unique strengths and addresses different aspects of textual similarity. Cosine Similarity is effective in identifying thematic similarities through term frequency but may overlook semantic context. Jaccard Similarity, focusing on the presence or absence of terms, is beneficial for its simplicity but does not account for term frequency. Minimum Edit Distance excels in tracking literal textual changes but may not capture thematic similarities. Simple Similarity provides a straightforward

### 1. Cosine Similarity (*Sim\_Cosine*):

Cosine Similarity is a measure that calculates the cosine of the angle between two term frequency vectors, providing a quantitative measure of the similarity between two documents. Let  $D_{s1}$  and  $D_{s2}$ , be the sets of terms occurring in documents  $D_1$  and  $D_2$ , respectively. Define  $T$  as the union of  $D_{s1}$  and  $D_{s2}$ , i.e.,  $T = D_{s1} \cup D_{s2}$ . Let  $t_i$  be the  $i$ -th element of  $T$ . The term frequency (TF) vectors for  $D_1$  and  $D_2$  are defined as:

$$D_1^F = [nD_1(t_1), nD_1(t_2), \dots, nD_1(t_N)]$$

$$D_2^{TF} = [nD_2(t_1), nD_2(t_2), \dots, nD_2(t_N)]$$

where  $nD_k(t_i)$  is the number of occurrences of term  $t_i$  in documents  $D_k$ . The cosine similarity between two documents is then defined as:

Equation (1):

$$\text{Sim Cosine} = (D_1^{TF} \cdot D_2^{TF}) / \|D_1^{TF}\| * \|D_2^{TF}\|$$

where the dot product,  $(D_1^{TF} \cdot D_2^{TF})$ , is the sum of the products of the corresponding entries of the vectors, and  $\|D_1^{TF}\| * \|D_2^{TF}\|$ , are the Euclidean norms of the vectors.

### 2. Jaccard Similarity (*Sim\_Jaccard*):

This measure uses the same term frequency vectors as the cosine similarity measure and is defined as the size of the intersection of the two term frequency sets divided by the size of the union of the sets. The Jaccard similarity measure is binary, meaning each word is counted only once in a given set, while the cosine similarity measure includes frequency and counts each word.

Equation (2):

$$\text{Sim Jaccard} = |D_1^{TF} \cap D_2^{TF}| / |D_1^{TF} \cup D_2^{TF}|$$

comparison but may oversimplify complex textual relationships. The decision to use a combination of these measures, as opposed to a single metric, is informed by the need to capture a comprehensive and robust picture of textual similarities and differences. This approach aligns with Cohen et al. (2020), who utilized all four measures, and contrasts with studies like Brown et al. (2011), which primarily focused on Cosine Similarity. The inclusion of multiple measures in our analysis enhances the reliability of our results and provides an understanding of textual similarities in corporate disclosures.

### 3. Minimum Edit Distance (*Sim\_MinEdit*):

This measure computes the smallest number of operations required to transform one document into another. The measure is computed by counting the number of additions, deletions, and changes between the two documents.

### 4. Simple Similarity (*Sim\_Simple*):

This measure employs a simple side-by-side comparison method using the "Track Changes" function in Microsoft Word or the "diff" function in the Unix/Linux terminal (I measured it in python). The measure counts the number of words in the additions, deletions, and changes between two documents, normalizes the total count by the average size of the two documents, and scales the result to obtain a similarity measure between 0 and 1, where 1 means the two documents are identical.

#### Equation (3):

$$\text{Sim Simple} = [c_{\max} - c] / c_{\max}$$

where  $c = (\text{additions} + \text{deletions} + \text{changes}) / ((\text{Size } D_1 + \text{Size } D_2) / 2)$ , and  $c_{\max}$  is the maximum value of  $c$ .

## 4.3 CEOs' Managerial Ability

In measuring managerial ability (*M\_ABILITY*), we draw upon the managerial ability scores presented in Demerjian et al.'s (2012) study, as found on Peter Demerjian's University of Washington website<sup>35</sup>, covering the period from 1994 to 2020<sup>36</sup>. This particular measure employs data envelopment analysis (DEA) to gauge firm efficiency within industries, optimizing sales over specific inputs. These include cost of goods sold, selling, general, and administrative expenses, and various assets. Subsequently, using a Tobit regression model, firm efficiency is regressed against several variables, including firm size, market share, and free cash flow, in alignment with Fama and French (1997) 48 industry classification codes. The residuals of this model signify managerial ability.

Diving deeper into the managerial ability landscape, its historical context and comparative advantages merit attention. Operationalizing managerial ability has

<sup>35</sup> This managerial ability dataset is constructed according to the methodology in Demerjian et al. (2012). It is available on the website <https://peterdemerjian.weebly.com/managerialability.html>

<sup>36</sup> The last update of this data repository and managerial ability scores is until the end of the 2020. Not only us, but most of the studies working on US market that get published on the managerial ability literatures (Cheung et al., 2017; Hasan, 2020), utilizes this data base as it is the most comprehensive one.

always posed challenges due to its implicit nature. Earlier research gravitated first towards CEO fixed effects (Bertrand and Schoar, 2003), then CEO press visibility (Francis et al., 2008), and lastly, firm performance (Barr et al., 1993; Leverty and Grace, 2012). Constructing CEO fixed effects necessitates temporal data on firms and managers, but data constraints often bias towards larger entities. A similar bias exists for press visibility. Moreover, managerial transitions can correlate with underlying firm issues, making it a potentially ambiguous managerial ability indicator (Bennedson et al., 2006). Research that equates firm performance with managerial ability often relies on firm efficiency, informed by data envelopment analysis, or firm profitability. However, these proxies might lack precision. Elements such as optimal operational scale, organizational structures, and bargaining power due to size can influence firm efficiency and profitability independent of managerial inputs. Hence, mainstream research has encountered limitations due to the absence of a managerial ability measure that can adequately differentiate it from other influential factors across a wide range of firms.

Demerjian et al. (2012) offer a pivotal contribution, devising a broad yet valid managerial ability measure with modest data needs. They discern that only firm success not attributed to firm-specific factors should be credited to managers. To encapsulate firm success, they adopt a relative performance measure: efficiency or X-efficiency. This method, extensively used in bank performance assessments (Mester and Hughes, 2014), aids in capturing bank performance, as illustrated by Berger and Humphrey (1997). By adopting revenue efficiency, which gauges revenue generation relative to comparable firms, Demerjian et al. (2012) base their managerial ability measure on it. Tobit regressions of these efficiency scores on firm-specific factors yield managerial ability<sup>37</sup>. For more details, please refer to the Appendix C.

<sup>37</sup> To elaborate further, Demerjian et al. (2012) employed the Data Envelopment Analysis (DEA) to determine firm efficiency scores within industries. Efficient firms, in this context, are those that maximize revenues from specific resources. In their approach, five variables are assessed at the beginning of year  $t$ , while two flow variables span year  $t$ . By estimating DEA efficiency by industry group, they discern efficiency benchmarks for industries with analogous technologies and business models. Subsequently, they regress the firm efficiency score on various attributes to segregate firm-specific efficiency elements. The residual, which represents efficiency not explained by these attributes, is ascribed to managerial ability. The concept of managerial ability, inherently acknowledges the potential for both persistence and change in a manager's ability over time. Managerial ability, in this context, is not solely an inherent trait fixed at birth or at the onset of a career; rather, it is a dynamic attribute that can evolve with experience, learning, and adaptation to changing business environments. The DEA approach used to measure managerial ability captures a snapshot of a manager's effectiveness in optimizing firm resources within a specific period.

## 4.4 Regression Model

To investigate the association between managerial ability ( $M\_ABILITY$ ) and repetition ( $REPETITION$ ), we estimate the following regression model:

*Equation (4):*

$$\begin{aligned}
 REPETITION_{i,t} = & \beta_0 + \beta_1 M\_ABILITY_{i,t} + \beta_2 ZSCORE_{i,t} + \beta_3 LOSS_{i,t} + \beta_4 SIZE_{i,t} \\
 & + \beta_5 AGE\_LN_{i,t} + \beta_6 SPEC_{i,t} + \beta_7 SALE\_VOL_{i,t} \\
 & + \beta_8 NONMISS\_LN_{i,t} + \beta_9 DAC_{i,t} + \beta_{10} ROE_{i,t} \\
 & + \beta_{11} INVT\_VOL_{i,t} + \beta_{12} CFO\_SALE_{i,t} + \beta_{13} MTOB_{i,t} \\
 & + \beta_{14} SLACK_{i,t} + \beta_{15} DIV_{i,t} + \beta_{16} TANGIBILITY_{i,t} \\
 & + \beta_{17} KSTRUCTURE_{i,t} + \sum YEAR\ FE \\
 & + \sum INDUSTRY\ FE + \varepsilon_{it}
 \end{aligned}$$

In the above model, repetition ( $REPETITION$ ) is calculated based on four measurements of similarities, (i) Cosine Similarity, (ii) Jaccard Similarity, (iii) Minimum Edit Distance, and (iv) Simple Similarity which we defined in section 4.2.  $M\_ABILITY$  is managerial ability score which we defined in details in section 4.3.

Following Biddle and Hilary (2006), Biddle et al. (2009), Li (2019), Gan (2019), Cohen et al. (2020), and Hasan (2020) we include several control variables. Altman's  $ZSCORE$ , indicative of bankruptcy risk, informs us about a firm's financial health, potentially affecting the consistency and content of disclosures.  $LOSS$ , representing whether a firm reported a financial loss, captures variations in financial performance, which could influence strategic communications. Market value-based firm  $SIZE$  is included to understand the implications of scale effects, as larger firms might display different communication patterns compared to smaller firms. The logarithmic measure of firm age ( $AGE\_LN$ ) is included to account for the maturity and lifecycle effects on disclosure practices. The ratio of special items to total assets ( $SPEC$ ) controls for extraordinary items that could skew the regularity and theme of financial reporting. The inclusion of five-year sales volatility ( $SALE\_VOL$ ) helps us gauge the stability or variability in a firm's revenues, which might influence how companies frame their financial narratives. The variable  $NONMISS\_LN$ , representing the logarithm of non-missing items in Compustat, measures the completeness and robustness of reported data, affecting the depth and breadth of content in financial disclosures. Discretionary accruals ( $DAC$ ) are included to assess earnings management practices, which could correlate with how information is presented or emphasized in the MD&A sections.

Return on equity ( $ROE$ ) as a profitability measure provides insights into operational efficiency, possibly impacting the framing of financial health in disclosures. Investment volatility ( $INVT\_VOL$ ) over five years provides a perspective on the variability in capital allocation, which might influence thematic

repetition as investment priorities evolve. The cash flow to sales ratio (*CFO\_SALE*) reflects operational cash efficiency and is crucial for understanding management effectiveness, likely impacting disclosure practices. The market-to-book ratio (*MTOB*) assesses market valuation relative to book value, reflecting market expectations and possibly influencing the strategic presentation in filings. The cash to PPE ratio (*SLACK*) indicates operational flexibility and financial resilience, showing how liquidity relative to fixed assets might affect financial narratives. Dividend payments (*DIV*) relate to dividend policy and financial stability, which could inform the thematic focus of disclosures. The ratio of PPE to total assets (*TANGIBILITY*) reflects asset intensity, potentially influencing how firms communicate about their operational bases. Lastly, the firm's capital structure (*KSTRUCTURE*) provides insights into financial leverage and risk, crucial for understanding how these factors might influence public perceptions through financial reporting. Together with *YEAR FE* and *INDUSTRY FE*, these variables are selected not only for their direct impact but also to account for any indirect effects they might have on the way firms communicate in their official disclosures, ensuring a comprehensive analysis of the factors influencing repetition in corporate communications. All variables are defined in Appendix B.

## 5 Results

### 5.1 Descriptive Statistics and Univariate Analysis

Table 2 illustrates the distribution of the sample according to year and by two-digit SIC code industry. The data encompasses a span of 27 years, from 1994 to 2020, and details 55,581 observations across various industries.

Panel A breaks down the distribution of observations per year. The observations are spread reasonably evenly over the years, highlighting a steady representation across the span of 27 years. We note a gradual increase in the number of observations peaking in the years 2003 and 2004, with a slight decrease observed in the subsequent years. The cumulative percentage helps to depict how the dataset grows progressively over the years, reaching a total of 100% by the year 2020.

Panel B details the observations based on the industry classification according to the two-digit SIC codes. The industries are represented with varying frequencies in the sample. Business Services (SIC code 73) holds the majority share of the dataset, comprising 13.92% of the total observations. It is followed by Chemicals and Allied Products (SIC code 28) with 10.78%, and Electronic and Other Electric Equipment (SIC code 36) with 9.73%. Instruments and Related Products (SIC code 38) are also notable, comprising 7.75% of the sample, alongside Industrial Machinery and

Computer Equipment (SIC code 35) at 6.63%, and Communication (SIC code 48) which constitutes 3.33% of the observations. On the lower end of the spectrum, the 'Others' category, which aggregates industries with fewer than 250 observations, makes up 4.68% of the sample, including 64 firm-year observations for firms in the financial services industry (SIC codes 6000-6999). Industries like Water Transportation (SIC code 44) and Lumber and Wood Products, Except Furniture (SIC code 24) have minimal representation, each constituting less than 0.5% of the total observations.

**[Insert Table 2]**

In Table 3, we present the descriptive statistics for our full sample, which delineates both the dependent and independent variables along with their respective control variables. This section provides a detailed analysis of the central tendencies and dispersions that characterize each variable, supported by pertinent literature where appropriate.

In discussing our dependent variables, which are representation measures, we observe that all of them tend to have higher means than medians, signaling a right-skewed distribution. The *Sim\_Cosine* variable has a mean of 0.856, which lies within a similar range documented in studies such as Cohen et al. (2020) and Brown and Tucker (2011), and Wang et al. (2023). Its high maximum value of 1.000 indicates a potential ceiling effect, a phenomenon worth noting in further analyses. Similarly, variables *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple* have means of 0.186, 0.428, and 0.354, respectively, echoing the trends and magnitudes identified in previous research, including Cohen et al. (2020). Turning our attention to the independent variable, *M\_ABILITY*, with a mean of -0.003 and a median of -0.024, it reflects managerial ability somewhat consistent with the findings of Demerjian et al. (2012). This variable, central to our study, exhibits a reasonable minimum and maximum range, substantiating its appropriateness in gauging managerial adeptness as proposed by Gan (2019), Hasan (2020) and Magerakis and Habib (2022).

Our control variables offer a rich dataset to fortify our study further. The *ZSCORE*, with a mean of 1.165, suggests a relatively moderate bankruptcy risk across the firms analyzed, as posited in previous literature. The *LOSS* variable, with 37.6% of firms reporting losses, underlines the challenging financial conditions prevalent in the sample, indicating a substantial portion of firms operating under loss, a scenario echoed in wider market analyses. The *SIZE* variable, averagely valued at 5.878, demonstrates the mixed bag of firms encompassed in this study, ranging from smaller firms with a minimum value of 0.307 to considerably large entities peaking at a maximum of 14.492.

*AGE\_LN* portrays that the companies in the sample have a decent operational history, a detail that could potentially correlate with managerial ability. The *SPEC*

variable having a mean close to zero suggests a near-balanced specificity metric across the firms. *SALE\_VOL* and *NONMISS\_LN* illustrate the volatility in sales and non-missing values, respectively, which could be significant in understanding the financial dynamics at play. It is also worth mentioning the role of variables like *INVT\_VOL* and *CFO\_SALE*, depicting the volatility in investments and the ratio of cash flow to sales, offering critical insights into the firms' operational metrics. Variables such as *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, and *KSTRUCTURE* encapsulate aspects of market-to-book ratio, available resources, dividends, asset tangibility, and capital structure respectively. Particularly, the average market-to-book ratio of 2.292 signifies a robust market valuation above the book values for the firms in the sample, possibly pointing to optimistic market sentiments. The tangible assets ratio, captured by *TANGIBILITY*, with a mean value of 0.535, indicates a substantial portion of firms' assets being tangible, showcasing a stable asset base for the majority of firms. All continuous variables are winsorized at the 1st and 99th percentiles in each year to minimize the effects of outliers.

### [Insert Table 3]

Table 4 details the difference tests distinguished by low versus high managerial ability scores (*M\_ABILITY*), delineated using quartile values as a benchmark. The data is divided into two distinct groups: those with low managerial ability (below the 25th percentile) and high managerial ability (above the 75th percentile)<sup>38</sup>. Within this analysis, the similarity measures play a pivotal role, where the high-ability group consistently shows lower means and medians across all indices when compared to their low-ability counterparts. This indicates that firms led by CEOs with higher managerial ability tend to have disclosures that are less repetitive, suggesting a more efficient and concise communication strategy. Difference tests confirm significant variations across all similarity metrics.

In terms of control variables, distinct patterns emerge across financial and operational dimensions. Firm size (*SIZE*) and age (*AGE\_LN*) are higher among high-ability CEOs, indicating more mature, possibly larger firms in their portfolios. Financial stability (*ZSCORE*), sales volatility (*SALE\_VOL*), and metrics indicating financial performance such as return on equity (*ROE*) and market-to-book ratio

<sup>38</sup> In this study, initial analyses were conducted using a median split (50th percentile) and tertile groupings (33rd and 66th percentiles) to assess the impact of managerial ability on the outcomes studied. These methods generally yielded consistent results; however, the quartile approach (25th and 75th percentiles) was ultimately adopted as it provided clearer differentiation and stronger statistical significance in the findings. This methodological choice is supported by enhanced clarity and effectiveness in illustrating the influence of managerial ability extremes on strategic communication within financial disclosures.

(*MTOB*) also show higher values for high-ability CEOs, suggesting more robust financial health and market perception. Conversely, variables like loss (*LOSS*), tangibility (*TANGIBILITY*), and capital structure (*KSTRUCTURE*) show lower averages for high-ability groups, which may indicate a strategic preference for less tangible asset bases and more flexible, less leveraged financial structures. Significant differences are substantiated by both t-test and Wilcoxon test p-values<sup>39</sup>, which confirm the robustness of these findings across various metrics. The analysis provides a detailed examination of how managerial ability influences not only the style and substance of financial reporting but also broader firm characteristics and performance. For clarity, all variables definitions are detailed in Appendix B.

The results of this study shed light on the interplay between managerial ability and repetitive disclosures in MD&As, viewed through the lenses of management obfuscation and stakeholder theories. In line with management obfuscation theory (Bloomfield, 2002; Li, 2008), our findings indicate that higher managerial ability correlates with lower similarity scores, suggesting a decrease in repetitive disclosures. This trend supports the idea that proficient managers are more transparent, avoiding the obfuscation of information. These managers, recognized for driving favorable organizational outcomes (Bertrand and Schoar, 2003; Libby and Luft, 1993; Bonsall et al., 2017), seem to use their expertise to foster clear and direct communication, as also emphasized in stakeholder theory (Zerfass and Sherzada, 2015; Allert and Chatterjee, 1997). Consequently, the results can be seen as corroborating our regression analysis presented in the following sections, where we further delve into the nuances of managerial tendencies and their effects on disclosure practices.

However, the 'rent extraction' theory offers a contrasting perspective, suggesting that high-ability managers might use repetitive disclosures for personal gain. Despite this, the predominant trend in our data aligns more closely with the management obfuscation and stakeholder theories, indicating a general tendency among skilled managers to reduce repetitive disclosures in MD&As. Overall, these findings suggest that managerial proficiency tends to be associated with greater transparency in financial reporting, aligning with the theoretical frameworks of management

<sup>39</sup> To further assess the robustness of our findings, additional comparisons were conducted between the 1<sup>st</sup> and 2<sup>nd</sup> quartiles, 2<sup>nd</sup> and 3<sup>rd</sup> quartiles, and 3<sup>rd</sup> and 4<sup>th</sup> quartiles. These intra-quartile analyses serve as supplementary tests to understand the gradation in managerial ability and its impact on disclosure repetitiveness across different levels of management performance. Preliminary results from these comparisons are consistent with the main findings reported between the lowest and highest quartiles, reinforcing the conclusions drawn about the influence of managerial ability on communication efficiency.

obfuscation and stakeholder theories, while also acknowledging the alternative viewpoint of the 'rent extraction' theory.

[Insert Table 4]

The correlation matrix in Table 5 exhibits significant correlations at the 5% level between pairs of dependent variables. Notably, *Sim\_Cosine* shows strong positive correlations with *Sim\_Jaccard* (0.763\*), *Sim\_MinEdit* (0.786\*), and *Sim\_Simple* (0.427\*). Similarly, *Sim\_Jaccard* and *Sim\_MinEdit* exhibit an extremely high correlation (0.992\*), indicating a very strong linear relationship. *Sim\_Jaccard* and *Sim\_Simple* (0.541\*), as well as *Sim\_MinEdit* and *Sim\_Simple* (0.542\*), also show significant positive correlations. These figures suggest a notable degree of linear relationships between these variables, indicating they might convey similar information. Conversely, the *M\_ABILITY* variable shows a slight but significant negative correlation with all the dependent variables, with coefficients ranging from -0.010\* to -0.029\*. This finding supports the management obfuscation and stakeholder theories discussed previously, suggesting that higher managerial ability might be linked with lesser information obfuscation, a hypothesis that will be further scrutinized through regression analysis in subsequent sections.

[Insert Table 5]

## 5.2 The Association of CEO Managerial Ability and Repetition

The main hypothesis predicts that CEOs with different levels of managerial ability will have a varying degree of influence on the repetition indicated by similarity scores. To investigate this, we conducted multivariate regressions to explore the association between managerial ability (*M\_ABILITY*) and repetition (*REPETITION*) using Equation (4), with the results tabulated in Table 6. Variance Inflation Factor (VIF) results from the analysis confirm that multicollinearity does not compromise the estimates, with all VIF values well within acceptable limits ( $1 < \text{VIF} < 5$ ). Table 6 elucidates that managerial ability, denoted as *M\_ABILITY*, holds a significant negative relationship with the similarity scores *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*, with the respective coefficients being -0.0196\*\*\*, -0.0115\*\*\*, and -0.0218\*\*\*. This portrays that a higher managerial ability tends to align with lower similarity scores, hinting at a lesser degree of repetition<sup>40</sup>. However, it is critical to

<sup>40</sup> In evaluating CEO managerial ability, we initially contemplated the use of industry-adjusted ROA as an auxiliary metric. Grounded in the methodologies of Baik et al.

note that the relationship with *Sim\_Simple* was not significant, exhibiting a coefficient of -0.0184, lacking the requisite level of confidence to be deemed significant<sup>41</sup>. The R-squared ranging from 0.029 to 0.128, reflecting the variability explained by the models values for these models<sup>42</sup>.

In addition to assessing statistical significance, we evaluated the economic significance of the relationship between CEO managerial ability and various repetition measures to understand the substantive impact of our findings comprehensively. Utilizing the methodology introduced by Mitton (2024), we calculated the effect size based on the interquartile range for each similarity measure as follows:

$$E_S^{IQR} = \frac{|b(p75-p25)|}{|S_y|}$$

(2011) and Yuan et al. (2019), we calculated the industry-adjusted ROA across a span of five years, ranging from year  $t-5$  to year  $t-1$ . This metric is derived by normalizing income (excluding extraordinary items) with average total assets and then subtracting the mean ROA of the pertinent two-digit SIC industry for each firm-year. However, our scrutiny revealed that this metric did not yield insights that were sufficiently illuminating for our purposes, leading to its omission from the primary tabulations. Guided by the work of Huang and Xiong (2023), we explored a second alternative for gauging managerial ability. In this approach, we leveraged a dummy variable (*M\_ABILITY\_DUM*) as a surrogate indicator of managerial prowess. We assigned ranks to managerial ability scores by both industry and year, delineating high-ability managers as those landing in the top quartile consecutively in year  $t$  and  $t-1$ . Consequently, *M\_ABILITY\_DUM* is designated as '1' for firms guided by high-caliber managers, and '0' otherwise. This stratagem is designed to nullify potential errors in pinpointing elite managers based on an anomalously high or low performance in a solitary year. However, when integrated into our regression models examining independent similarity variables, the results did not yield statistical significance but in the same direction. Given these findings, we have retained our primary metric, *M\_ABILITY*, as the most fitting measure of managerial ability for our analysis.

<sup>41</sup> The insignificance of the *Sim\_Simple* measure relative to *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit* may be attributed to its methodological simplicity. Unlike the other measures that capture semantic and contextual textual similarities, *Sim\_Simple* relies on direct textual alterations (additions, deletions, changes) without considering the semantic depth of the content. This approach, while straightforward, may not fully encapsulate the repetition patterns in financial disclosures. However, its inclusion in our analysis offers a comprehensive view, acknowledging that in subsequent essays and additional analyses, *Sim\_Simple* demonstrates significance, underscoring the importance of a diverse methodological approach to understanding textual repetition.

<sup>42</sup> Direct comparisons of  $R^2$  values between studies are challenging due to differences in dependent and independent variables across different research contexts. While some studies, such as Cohen et al. (2020) and Brown and Tucker (2011), report  $R^2$  values below 10%, similar to those found in this thesis, the interpretation and comparability of these values are limited by the distinct nature of the variables and analyses involved.

where  $b$  is the regression coefficient for CEO managerial ability ( $M\_ABILITY$ ),  $p_{75}$  and  $p_{25}$  are the 75<sup>th</sup> and 25<sup>th</sup> percentiles of  $M\_ABILITY$ , respectively, and  $s_y$  is the standard deviation of each dependent variable measuring repetition in corporate communication. This formula quantifies the change in the repetition metric per typical variability in CEO managerial ability, providing a standardized measure of the effect relative to the natural dispersion of the outcome.

The calculated economic significance reveals that an increase in CEO managerial ability across its interquartile range corresponds to a 21.5% decrease in *Sim\_Cosine*, a 14.4% decrease in *Sim\_Jaccard*, and a 29.5% decrease in *Sim\_MinEdit*, relative to their respective standard deviations. These findings underscore the considerable influence of CEO managerial ability on reducing the repetitiveness of financial disclosures, highlighting both the statistical and substantial practical significance of our results. These metrics provide a robust measure of the effect relative to the variability of each outcome, emphasizing the substantial impact of CEO managerial ability on the clarity and precision of financial reporting.

The empirical findings of this study offer intriguing insights into the relationship between managerial ability and repetitive disclosures in MD&As, particularly in the context of management obfuscation theory and stakeholder theory. Consistent with the management obfuscation theory (Bloomfield, 2002; Li, 2008), our data reveals that high-ability managers exhibit lower similarity scores, suggesting a reduced tendency towards repetitive disclosures. This pattern aligns with the theory's premise that more proficient managers are likely to be more transparent and less inclined to obfuscate information. Such managers, with their comprehensive understanding of the industry and ability to drive favorable organizational outcomes (Bertrand and Schoar, 2003; Libby and Luft, 1993; Bonsall et al., 2017), appear to use their expertise to enhance firm performance, thereby diminishing the need for obfuscatory, repetitive disclosures.

Furthermore, these findings resonate with the principles of stakeholder theory. High-ability managers, in recognizing the importance of addressing the diverse needs and expectations of all stakeholders (employees, customers, suppliers, community), seem to favor clarity and directness in their communication (Zerfass and Sherzada, 2015; Allert and Chatterjee, 1997). This is evidenced by their lower propensity for repetitive disclosures in MD&As, which can be interpreted as an effort to provide meaningful and transparent information to stakeholders, as also suggested by the positive association between CEO/CFO compensation and the quality of financial disclosures (Hui and Matsunaga, 2015) and the impact of CEOs' communication styles on stakeholder relationships (Men, 2015).

However, an alternative perspective emerges from the 'rent extraction' theory, which posits that high-ability managers, while contributing positively to firm

performance, might also engage in practices that serve their personal interests, potentially leading to more repetitive disclosures as a means of camouflaging such activities. Despite this contrasting viewpoint, the overall trend of lower similarity metrics for high-ability managers in our study seems to align more closely with the management obfuscation theory and stakeholder theory, indicating a lesser propensity for repetitive disclosures in MD&As. In summary, our results provide empirical support to the theoretical proposition that managerial proficiency is inversely related to the repetitiveness of disclosures in MD&As. This supports the notion that adept managers, guided by a holistic understanding of both firm performance and stakeholder interests, tend towards greater transparency in their communication. These findings enrich our understanding of the complex dynamics between managerial ability and disclosure practices, as framed within the management obfuscation and stakeholder theories.

The control variables show diverse impacts on the dependent variables, providing insights into firm behaviors and characteristics. *ZSCORE* shows a consistent negative relationship across most models except for *Sim\_Jaccard*, suggesting that financially healthier firms have less repetitive disclosures, possibly due to established credibility reducing the need for reaffirmation through repetition. *LOSS*, representing financial losses, varies, showing both positive and negative associations across different models, which suggests that firms in financial distress might use repetition differently, depending on the context—either to reassure stakeholders about future plans or to obscure poorer performance. *SIZE* is positively correlated with *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*, but negatively with *Sim\_Simple*, indicating that while larger firms may have less repetitive content in some respects, the complexity of disclosures that comes with size may not always reduce repetition.

*AGE\_LN*, representing the age of the firm, shows a generally positive relationship with repetition, implying that older firms may rely on established communication patterns, leading to more repetitive disclosures. *DAC*, used as a proxy for earnings management, indicates that firms engaging in greater earnings management tend to repeat certain information more, potentially to emphasize or mask certain financial details. *TANGIBILITY* and *KSTRUCTURE*, representing tangible asset intensity and capital structure complexity, respectively, also show significant associations with repetition measures. Firms with substantial tangible assets or complex capital structures may repeat information to highlight stability or clarify complex financial arrangements.

In addition to these, other significant control variables such as *SALE\_VOL*, *ROE*, *CFO\_SALE*, and *MTOB* show various degrees of association with repetition, reflecting different aspects of firm performance and managerial strategies. For example, higher sales volatility (*SALE\_VOL*) is generally associated with less

repetition in certain models, possibly indicating dynamic market conditions influencing disclosure practices<sup>43</sup>.

[Insert Table 6]

### 5.3 Robustness Tests

This section is dedicated to robustness tests, where we undertake a series of further analyses to ensure the stability and reliability of our main findings. This includes employing alternative methodologies and addressing potential sources of endogeneity. By testing our results under varying conditions and assumptions, we aim to reinforce the credibility and generalizability of our conclusions. These robustness checks are essential in affirming that our primary results are not merely coincidental or specific to certain model specifications, but are indeed reflective of the underlying phenomena we are investigating.

#### 5.3.1 Alternative Measure of Repetition: Year-over-Year MD&A Similarities

The methodology employed in this section draws inspiration from Brown and Tucker's (2011) approach of analyzing Year-over-Year MD&A modification. Specifically, our method is underpinned by the assumption that footnotes are initially drafted, after which content from these footnotes is incorporated into the MD&A section. In the context of a firm's inaugural 10-K filing, such sequencing might seem logical. However, for subsequent filings, the MD&A's structure and content are

<sup>43</sup> In this study, covering the period from 1994 to 2020, we acknowledge significant regulatory changes that might impact our findings' generalizability. Notably, the Sarbanes-Oxley Act of 2002 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 represent major shifts in corporate governance and financial disclosure regulations in the U.S. These acts were introduced in response to corporate scandals and financial crises, fundamentally altering the corporate governance and financial reporting landscape. To assess the impact of these regulatory changes on our study variables, we examined the trends in similarity scores for dependent variables and managerial ability scores as independent variables across these pivotal years. Our analysis focused on identifying any significant fluctuations in trends that could be attributed to these regulatory changes. However, our examination revealed that the trends did not show significant fluctuations around the implementation of these acts. Consequently, we did not perform difference-in-difference tests for further analysis. This observation suggests that while these regulatory changes are crucial for the U.S. context, they did not markedly alter the trends of our study variables within the scope of our analysis.

heavily molded by its content from the prior year. This recursive process introduces two distinct, yet interrelated, dimensions of repetition:

1. *Direct repetition*: Content from the footnotes in year "t" makes its way into the MD&A of the same year (our main measure, *REPETITION* in main analyses).
2. *Lagged repetition*: The MD&A of year "t" is influenced by the content from MD&A of year "t-1". Thus, it's conceivable that the MD&A of year "t" may indirectly reflect content from footnotes of year "t-1" and even earlier.

Moreover, it's equally plausible that themes and content from preceding MD&A sections, from years "t-1" or "t", cyclically reverberate back into the footnotes' drafting in subsequent years, suggesting a bi-directional influence. For the robustness of this study, it's imperative to transparently articulate these underlying assumptions regarding the sequential drafting of the 10-K and its footnotes. Additionally, to ensure comprehensive insights, the potential lag effects on MD&A content and the multi-directional sources of repetition warrant rigorous consideration.

The combined dataset, merging similarity measures, managerial ability scores, and variables from the Compustat database, yielded a total of 65,989 observations. Four distinct regression models were run based on independent variables: *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The final analysis was conducted on a sample of 51,874 firm-year observations. Untabulated results revealed that while the regression coefficients for *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit* were not statistically significant, they all exhibited a negative relationship, consistent with the primary results obtained using the similarity scores of MD&As and notes of 10-Ks. Only for *Sim\_Simple* was the coefficient found to be statistically significant at a p-value of less than 5%, with a negative direction.

This discrepancy might suggest that *Sim\_Simple*, which may capture broader or different aspects of textual similarity, responds differently under year-over-year analysis conditions compared to other more focused metrics. This variation could be due to the inherent characteristics of each measure in detecting types of repetition or changes in textual content that are more or less sensitive to the annual drafting cycle of MD&A reports. Given this, a more balanced conclusion would be that there is no consistent association between managerial ability and year-over-year repetition across all tested measures. This observation raises important considerations about the sensitivity and applicability of different textual similarity measures in longitudinal settings, highlighting the need for careful selection and justification of the measures used in corporate disclosure studies.

### 5.3.2 Handling Endogeneity

Endogeneity is a prevailing issue in numerous governance and corporate studies (Wintoki et al., 2012). In our investigation, two primary sources of endogeneity surface: self-selection bias and omitted variable bias.

Firstly, self-selection bias emerges prominently when managerial ability is not allocated randomly across firms. This can be understood from both demand and supply perspectives. The demand-side argument posits that specific kinds of firms, perhaps those in dynamic sectors or those requiring novel strategies, might seek managers with a certain caliber of ability. Conversely, the supply-side perspective suggests that managers, based on their perceived abilities, may be inclined to select specific types of firms, rendering the process of managerial appointments non-random. Previous research has noted that managers with superior abilities might gravitate towards firms offering greater challenges or opportunities (Hasan, 2020; Nadeem, 2021).

Secondly, while our research design incorporates a comprehensive suite of control variables to address the omitted variable bias, it's conceivable that this list isn't exhaustive. For instance, firms' innovation strategies or research and development dynamics could influence both managerial ability and the similarity metrics we study. On one side, innovative firms might seek managers with heightened abilities to navigate the complexities of such an environment. On the other side, these firms might have specific similarity patterns due to their unique operational dynamics. Additionally, unobservable factors like firm culture, which is elusive yet influential, might sway both a firm's proclivity towards certain managerial talents and its internal practices (Nadeem, 2021; Maharjan and Lee, 2022). Hence, despite our rigorous controls, the potential remains that our primary findings could be influenced by omitted variable bias.

### Entropy Balancing Approach

Entropy balancing is a prominent method used to balance covariates between treatment and control groups, thus enhancing the robustness of causal inferences in observational studies. This method was implemented in our analysis, exploring the relationship between business strategy and dividend payout policies. Our study leans on the foundational methodology put forth by Hainmueller (2012) and subsequently expanded upon by McMullin and Schonberger (2020, 2022) and Akindayomi and Amin (2022). Unlike propensity-score matching, entropy balancing offers the advantage of fewer parameter selections, thereby minimizing dependency on researcher discretion for inferences. Essentially, it aims to eradicate all covariate differences between treatment and control observations, as opposed to propensity-score matching where random disparities can persist. Control observations receive

weights (which can range between 0 and 1 and are not restricted to integers) to ensure an exact balance is achieved between the treatment and control samples concerning the specified covariates by the researcher.

To comprehend the effectiveness of the entropy balancing approach in addressing selection bias, let's pivot to the example given in Table 7 and relevant studies. In our study, the entropy balanced approach is employed to counteract endogeneity concerns and reassess the relationship between *M\_ABILITY* and various firm characteristics by crafting a synthetic control group. For the balance conditions, we specify all requisite controls, a number of balanced conditions, and a tolerance level, as recommended by Hainmueller and Xu (2013). Moments (mean, variance, skewness, or a combination thereof) of covariate distributions are equalized across our high *M\_ABILITY* group (above the median) and the weighted low *M\_ABILITY* group (below the median). Subsequent to this, the balance conditions for both groups are met within a designated tolerance level. The results of this process are evident in Panel A of Table 11. Prior to balancing, certain variables such as *ZSCORE*, *LOSS*, and *DAC* showed notable mean differences between the Treatment (High *M\_ABILITY* = 1) and Control (Low *M\_ABILITY* = 0) groups - 0.2200, -0.0496, and 0.0823 respectively. Post entropy balancing, the differences for these variables were reduced to 0.0000, -0.0003, and 0.0000, demonstrating that our methodology effectively minimized the disparities between the groups.

When re-estimating the relationship using post-entropy balanced regression results, as depicted in Panel B of Table 11, the variable *M\_ABILITY* was consistently negative and statistically significant across all model specifications (e.g., -0.00480\*\*\* in model 1 with a standard error of 0.000943, \*\*\*  $p < 0.01$ ), aligning with our prior models and validating the effectiveness of the entropy balancing approach in our context.

[Insert Table 7]

### Lagged Variable Analysis

In line with the method suggested by Cho et al. (2023), we introduced lagged independent variables to investigate the influence on the similarity metrics. The use of lagged variables is an established method to counter the potential of reverse causality. Specifically, by incorporating the lagged managerial ability (*M\_ABILITY\_LAG*) as an exogenous predictor, we sought to control for any endogeneity that may arise due to reverse causality. Among our four similarity measures, only the *Sim\_Cosine* showed statistically significant results when using the lagged managerial ability. The effects for the remaining measures, while consistent in direction with our primary analysis, did not achieve statistical

significance. However, it's noteworthy that the direction of the effects remained consistent with our primary results.

### Change Analysis

Following Li (2019), we applied a regression analysis using variables measured in changes. This approach minimizes the potential for correlated omitted variable problems, negates firm fixed effects, and offers a more rigorous test of association than using variables in levels (O'Brien and Bhushan 1990). In our study, we aimed to gain a deeper understanding of the relationship between similarities and managerial ability (*M\_ABILITY*). It is important to note, however, that managerial ability is likely to be a relatively stable characteristic that does not fluctuate markedly from year to year. If *M\_ABILITY* accurately captures the intended attributes of a CEO's managerial capacity, significant changes across short periods are uncommon. Consequently, our findings might reflect this inherent stability, as they were not statistically significant and hence remain untabulated.

### Propensity Score Matching (PSM)

In the spirit of Maharjan and Lee (2022), we addressed potential differences within our dataset by employing the propensity score matching procedure. Given the nuances in our data, there could be concerns regarding cross-sectional heterogeneity. To address this, we selected control observations that closely mirrored our treatment observations in terms of observable characteristics in the pre-period. Using all relevant control variables, we estimated a probit model, followed by the use of propensity scores to match the observations. Post-matching, our sample consisted of 36,546 matched observations. While the results post-PSM were in the same directional sense, they were not statistically meaningful.

### Instrumental Variable (IV) Regression (2SLS)

To fortify the robustness of our findings, we pursued a two-stage ordinary least squares (2SLS) regression analysis. Following Huang and Xiong (2023), we used the yearly average managerial ability scores of firms within the same industry as an instrumental variable (denoted as *M\_ABILITY\_AV*). This was aimed at addressing potential endogeneity concerns with managerial ability. However, the IV regression results, while consistent in direction with our previous findings, were not statistically meaningful.

## Firm Fixed Effects

There could be an argument made for the importance of firm fixed-effect estimates, especially to control for unobserved, time-invariant firm heterogeneity. In response, we re-estimated our models to incorporate firm fixed effects, complemented by year fixed effects, for comparison with the industry and year effects that were already included in our model. The intention was to ensure that our results were not merely a product of unobserved firm-level idiosyncrasies. Despite the fixed-effect approach, our findings remained directionally consistent but were not statistically meaningful. Given these methodological reflections, the decision to deploy firm fixed effects was predicated on testing the robustness of our empirical findings against latent confounds. The lack of statistical significance in the firm-fixed effects model points out that while such heterogeneity exists, it may not critically alter the dynamics captured by the primary model, which integrates comprehensive controls through year and industry fixed effects.

## Two-Step System GMM

Aligned with the methodologies of prior works such as Magerakis and Habib (2022), and Habib and Hasan (2020), we employed a two-step generalized method of moments (GMM) to further mitigate endogeneity concerns. The GMM approach is particularly insightful for addressing these concerns as it utilizes instrumental variables that are assumed to be exogenous to the model, thereby helping to correct for any potential biases arising from reverse causality or omitted variable bias. Similar to our prior models, the GMM results were directionally consistent but lacked statistical significance.

In conclusion, while our primary analysis using the entropy balancing approach offered a methodologically sophisticated way to address potential endogeneity and support causal inferences, it is important to acknowledge the full spectrum of our analytical efforts and their varied results. Our research utilized entropy balancing to counteract covariate imbalances effectively, which reinforced the robustness of our conclusions regarding the relationship between CEO managerial ability and repetition in corporate disclosures. However, it is crucial to recognize that additional methods such as two-stage least squares (2SLS), propensity score matching, and various regression models including firm fixed effects and the two-step system GMM were also employed. These methods yielded results that were not statistically significant, suggesting a potential lack of association between repetition and CEO ability that contrasts with our OLS findings. The discrepancies among these results necessitate a cautious interpretation, urging us to consider these findings as indicative of the complex and nuanced nature of assessing CEO impact on corporate communications. This comprehensive approach not only emphasizes the importance

of using multiple methodologies to test robustness but also highlights the need for a balanced interpretation that respects the limitations and variances observed across different analytical frameworks.

## 6 Additional Analyses

### 6.1 CEO Managerial Ability and Repetition in the Context of Investment Efficiency

Past studies indicate that CEOs of limited capabilities often rely on their predecessor's decisions, primarily due to apprehension regarding potential backlash from shareholders and the market for potentially unfavorable investment choices (Scharfstein and Stein, 1990). This herd mentality might lead to misjudgments in investment, as less competent CEOs may struggle to foresee future trajectories, resulting in suboptimal investment choices stemming from gaps in knowledge and foresight. In contrast, more competent CEOs exhibit the ability to spot promising investment avenues and align these decisions seamlessly with the firm's overall strategy (Copeland et al., 1994). Drawing on their business acumen, these CEOs evaluate investments astutely. Nevertheless, rather than transparently showcasing their performance in the MD&A sections, they might strategically employ repetitive disclosures.

Repetitive disclosures might serve dual objectives. In favorable financial times, they could be used to underscore success repeatedly. Conversely, during less optimal performance phases, this approach might be employed to obscure the real situation from stakeholders, moderating expectations and mitigating negative market feedback. Thus, comprehending the nexus between CEO competency and repetitive disclosures becomes pivotal for understanding the underlying intentions and resultant corporate maneuvers. Given this intricate relationship, where managerial skills can exert both direct and potentially moderated effects on repetitive disclosure, we utilized regression analysis incorporating interaction terms. This allowed us to examine both the direct impact of managerial skill and investment tendencies (over/under investment) on repetitive disclosures and the potential interplay between these factors. In this context, we posited managerial ability as a moderating factor, shaping the link between investment choices and repetitive disclosures.

This research delves deep into the role of managerial competence in directing a company's investment choices and its potential effect on the repetition of MD&A disclosures. Using recognized investment efficiency models from previous studies (Richardson, 2006; Blaylock, 2016; Khurana et al., 2018; Biddle et al., 2009; García-Sánchez and García-Meca, 2018), we analyze both over-investment and under-

investment tendencies. Central to our exploration are residual investment models which center on deviations from optimal investment, derived through a detailed assessment of a company's financial records and industry factors. This analysis grants a deeper comprehension of company investment efficiency and serves as the base for examining the disclosure patterns of more-able managers.

To quantify investment behavior, we employ the residual investment model, as depicted in Equation (5). This model evaluates deviations from expected investment behaviors by analyzing how much actual investments diverge from predicted values based on a firm's specific financial and operational characteristics:

Equation (5): Residual Investment Model

$$\begin{aligned} INVESTMENT_{i,t} &= \beta_0 + \beta_1 MTOB_{i,t-1} + \beta_2 ROA_{i,t-1} + \beta_3 CASH_{i,t-1} + \beta_4 AGE_{i,t-1} \\ &+ \beta_5 LEV_{i,t-1} + \beta_6 LNASSET_{i,t-1} + \beta_7 INVESTMENT_{i,t-1} \\ &+ \sum YEAR\ FE + \sum INDUSTRY\ FE + \varepsilon_{it} \end{aligned}$$

Residuals from the predicted investment regression using the model from Richardson (2006), along with modifications by Blaylock (2016), estimated by industry and year. This model delineates the investment behavior of firms by studying the residuals from the predicted investment regression. Through this, we aim to discern over and under-investment tendencies by examining the positive and negative values of the residuals. Essentially, higher positive residuals indicate over-investment, while more negative values pinpoint under-investment (Blaylock, 2016; Khurana et al., 2018). The model variables are defined in Appendix B.

Building on the insights gained from Equation (5), Equation (6) expands our analysis to categorize firms into quartiles based on their investment residuals, comparing current investments against industry-year norms to discern patterns in investment efficiency:

Equation (6): XInvestment and OVERI, UNDERI Models

$$\begin{aligned} INVESTMENT_{i,t+1} &= \beta_0 + \beta_1 SALES\ GROWTH_{i,t} + \beta_2 LOG\ ASSETS_{i,t} \\ &+ \beta_3 LEVERAGE_{i,t} + \beta_4 CASH_{i,t} + \beta_5 RETURN_{i,t} \\ &+ \beta_6 LOG\ AGE_{i,t} + \sum YEAR\ FE + \sum INDUSTRY\ FE + \varepsilon_{it} \end{aligned}$$

This subsequent model distinguishes between efficient, over-investing, and under-investing firms. This model categorizes firms into quartiles based on the residuals from an industry-year model of investments (Biddle et al., 2009; García-Sánchez and García-Meca, 2018). The middle quartiles represent investment efficiency, while the extreme quartiles represent under and over-investment, respectively. The binomial logit model is then utilized to predict the likelihood of a firm falling into either the efficient category or one of the extreme quartiles,

providing a rich groundwork for examining the strategic actions of managers in investment decisions. The model variables are defined in Appendix B.

The residual measures from the aforementioned models serve as the fundamental building blocks for these interaction terms in Equation 7, offering an insight into investment inefficiencies. Through the inclusion of these interaction terms in our regression analyses, we aim to navigate the multifaceted landscape of investment decisions, essentially interpreting how variances in investment efficiencies can be indicative of the managerial abilities in firms and their consequent influence on disclosure repetitiveness in MD&As. By embracing such a detailed approach, we aspire to unveil whether adept managers use repetitive disclosures as a strategy to either flaunt their success or to obscure less favorable outcomes, thus shedding light on the complex interplay between managerial ability and disclosure tendencies. It is this juncture where the essence of our hypothesis - the significant relationship between managerial ability and repetitive disclosures in MD&A – comes to be rigorously tested.

*Equation (7):*

$$\begin{aligned} \text{REPETITION}_{i,t} &= \beta_0 + \beta_1 M\_ABILITY_{i,t} + \beta_2 ABN\_INVT_{i,t} \\ &+ \beta_3 M\_ABILITY_{i,t} * ABN\_INVT_{i,t} + \sum \text{CONTROLS}_{i,t} \\ &+ \sum \text{YEAR FE} + \sum \text{INDUSTRY FE} + \varepsilon_{it} \end{aligned}$$

In the study delineated through the regression results of the above model presented in Table 8, we dissected the relationships between managerial ability (*M\_ABILITY*), overinvestment (*OVERI*), underinvestment (*UNDERI*), and a yet specified dependent variable conceptualized as "Repetition". Utilizing a large dataset with 55,501 to 55,581 observations, we deployed a multifaceted approach encapsulating different similarity measures including *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The analytical lens spanned across two distinct yet interrelated investment efficiency models — the Residual Investment Model and the XInvestment with *OVERI* and *UNDERI* Models.

Anchoring on the Residual Investment Model (Table 8, Panel A), we find that managerial ability significantly and negatively correlates with repetition across all specifications. This pattern underscores a pivotal role of adept management in reducing repetition, a finding that is statistically significant at the 1% and 10% levels, marking a robust trend. Overinvestment and underinvestment, though integrated into the model, did not exhibit a pronounced effect on repetition, as indicated by their non-significant coefficients across most specifications. This evokes a notion that the direct impact of investment efficiency variables on repetition is potentially marginal, paving a pathway to explore other intricate dynamics that could be at play. Exploring the interaction terms, we witness an absence of a clear pattern, revealing a complex

landscape where managerial ability interacts with *OVERI* and *UNDERI* in influencing repetition. The interaction terms presented mixed results, with no discernible pattern emerging from the data.

Transitioning to the second investment efficiency model, i.e., *XInvestment* (Table 8, Panel B), we find that managerial ability maintains a significant negative relationship with repetition across all models. This phenomenon emphasizes the overarching influence of managerial prowess in curtailing repetition. The interaction term between managerial ability and overinvestment surfaces as significant in the *Sim\_Cosine* model, illustrating a scenario where higher managerial ability could potentially foster a positive relationship between overinvestment and repetition. Despite this, the narrative remains largely inconsistent across other models, thus refraining from offering a uniform perspective on the interplay between these variables.

[Insert Table 8]

Drawing from the empirical landscape crafted through the regression analyses, it is unequivocal that managerial ability stands as a linchpin in the dynamics of repetition, wielding a consistent negative influence. The role of investment efficiency, manifested through overinvestment and underinvestment variables, however, portrays a murkier picture, with inconclusive impacts on repetition. In light of the pronounced role of managerial ability, it warrants a deeper theoretical and empirical excavation to unpack the underlying mechanisms through which managerial ability orchestrates a decrease in repetition, and how this pathway is potentially moderated or mediated by investment efficiency parameters. As we anchor on the theoretical foundations woven with the hypotheses developed, the study beckons a fine-grained approach, synthesizing a rich tapestry of variables that could offer a holistic understanding of the investment landscape. The exploration of the profound effects of managerial ability on repetition, in conjunction with investment efficiency, remains a fertile area for further research. This inquiry could yield critical insights into business strategy and policy formulation.

## 6.2 The Role of Auditors in Mediating the Relationship Between CEO Managerial Ability and Repetitive Disclosures

Auditors, in their professional capacity, play a critical role in not only maintaining and verifying the integrity of financial statements but also in navigating the broader information environment that's the responsibility of management. Bloomfield (2008), Li (2008), and Lo et al. (2017) explain that a less-readable Form 10-K, a sign of complexity and obfuscation for investors, might be a result of deliberate attempts

by management to obscure content, possibly to mask poor financial performance or earnings management. Such an environment presents an increased audit risk. As per AS 2110 (PCAOB, 2010a), evaluating the management and its disclosures is an integral part of the audit process. Detecting a poor information environment or less-than-useful disclosures by management suggests auditors should plan for heightened risks of material misstatement, thereby lowering detection risk, as advised by AS 2301 (PCAOB, 2010b) and ISA 330 (IAASB, 2015b).

While MD&As sections are not traditionally audited, they offer qualitative and forward-looking insights that form a crucial part of financial reporting. According to Li (2010) and Brown and Tucker (2011), the auditor's identity, particularly whether they are from the Big Four or not, is often assumed not to impact the MD&As significantly, as these sections do not undergo strict audit processes. Our analysis extends this inquiry by examining how auditors influence the relationship between CEOs' managerial abilities and their use of repetitive disclosures in MD&As.

To do this, we divided our sample to two sub-samples, firm-years audited by big four auditors and non-big four auditors. From the presented regression results in Table 9, Panel A (*Big Four Auditors*), we can see that the variable *M\_ABILITY* consistently exhibits a negative and significant relationship with repetition across all measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*). The coefficients range between -0.0189 and -0.0317, all significant at the 5% level or better. This implies that, for firms audited by the Big Four, managerial ability is associated with less repetitive disclosures. The R-squared values range from 0.034 to 0.130, suggesting that the models account for between 3.4% to 13% of the variability in the response data around its mean. Panel B (*Non-Big Four Auditors*) similarly shows that *M\_ABILITY* presents a negative relationship, but the significance is generally weaker than in Panel A. The coefficients range between -0.00820 and -0.0259. The R-squared values are between 0.040 and 0.123, indicating that between 4% to 12.3% of the variance can be predicted from the independent variable.

However, to ensure that the differences in disclosure practices between firms audited by Big-Four and Non-Big-Four auditors are statistically significant, we utilized the z-test results for comparing the coefficients across the four similarity measures as follows:

1. *Sim\_Cosine*: z-statistic = 0.244, p-value = 0.807
2. *Sim\_Jaccard*: z-statistic = 0.562, p-value = 0.574
3. *Sim\_MinEdit*: z-statistic = 0.415, p-value = 0.678
4. *Sim\_Simple*: z-statistic = -0.808, p-value = 0.419

These results demonstrate that the presence of both Big Four and non-Big Four auditors influences the relationship between managerial abilities and disclosure practices, although no significant differences were observed between these two groups.

[Insert Table 9]

This finding underscores that the role of the auditing firm is consistent across different types of auditors, highlighting that the influence on disclosure practices is not necessarily dependent on the size or global reach of the auditing firm. Our findings reveal the importance of the audit process in shaping corporate disclosures. High-quality audits are linked to improved financial reporting and heightened earnings quality, as established by Francis (2004). Auditors, particularly from reputable firms, work diligently to minimize discrepancies between reported numbers and actual economic conditions, supporting the notion that their influence extends beyond mere compliance to actively shaping financial narratives, as highlighted by Watkins et al. (2004). Following major corporate disclosure failures, regulatory expansions of audit mandates often reinforce this need for stringent audit oversight, which consistently promotes uniform financial outcomes across different firms, as noted by Francis et al. (2014) and Knechel et al. (2015).

### 6.3 Moderating Effect of MD&As' Readability

The significance of readability in financial literature is undeniable, especially in the context of annual reports. Capital market participants lean on these reports from publicly traded companies as their important information source (Clarkson et al., 1994; Graham et al., 2005). These reports shed light on a business's operational milieu, historical performance, future prospects, and risk exposures. Yet, there exists a challenge; management's proclivity to obfuscate renders narrative disclosures in these reports, especially MD&As, difficult to fathom (Hasan, 2020). The obfuscation, in turn, has been linked with various adverse market reactions, ranging from increased analyst forecast variances (Lehavy et al., 2011) to heightened risks of stock price fluctuations (Ertugrul et al., 2017).

The MD&A section, in particular, plays a pivotal role as it grants managers discretion in how they present the company's financial state and prospects. This narrative flexibility can be both enlightening and obfuscating, making the readability of MD&As paramount. When clear and concise, MD&As offer stakeholders an in-depth look into managerial strategies and perspectives. When dense or repetitively framed, they can mask underlying issues or serve to emphasize particular points, sometimes disproportionately (Lo et al., 2017). In the broader tapestry of management's influence on firm disclosures, managerial ability stands out.

Competent managers, enriched by a deep understanding of their businesses, tend to make informed decisions and offer valuable insights (Puwanenthiren et al., 2019). However, the very discretion that MD&As afford can sometimes be exploited. The management obfuscation theory posits that adept managers might, on occasion, strategically obfuscate information, leaning on less transparent disclosures to potentially deflect or delay unfavorable market reactions (Bloomfield, 2002; Li, 2008).

The readability of MD&As can moderate this relationship. If MD&As are lucid and well-structured, stakeholders can swiftly discern repetitiveness, potentially viewing it less as obfuscation and more as emphasis. In contrast, if MD&As are dense and difficult to navigate, even repetitive disclosures might be seen as attempts to cloud the narrative, regardless of the manager's actual intent. Furthermore, the 'rent extraction' theory suggests another layer of complexity. Managers, especially the competent ones, might over-emphasize certain points in MD&As to extract personal gains or to mask actions that might not align with broader firm interests (Habib and Hasan, 2017). Here again, the readability of MD&As can determine how these actions are perceived<sup>44</sup>.

In essence, while managerial ability undeniably shapes the nature and tone of repetitive disclosures in MD&As, the readability of these sections plays a pivotal

<sup>44</sup> A pivotal theoretical construct in understanding the relationship between managerial ability, readability, and repetitive disclosures is the mediating effect of readability. In essence, readability could serve as the mechanism through which managerial ability influences repetitive disclosures. Under this framework, it's plausible that managers with superior abilities might adopt clear and comprehensible language (indicating high readability) in their communications, inherently minimizing the need for repetitiveness. This mediation effect can be rigorously evaluated through path analysis, wherein the indirect effect of managerial ability on repetitive disclosures via readability is quantified. However, for the scope of our study, we gravitate towards a moderating approach for several reasons. First, given the inherent discretion afforded in MD&A disclosures, readability does not merely transmit the effect of managerial ability on repetitiveness but potentially alters or modifies its strength and direction. Second, previous literature emphasizes the complex interplay between managerial discretion and readability, suggesting a contingent relationship rather than a straightforward mediating one. Third, from a methodological standpoint, establishing mediation requires several strict conditions to hold, including the establishment of a direct relationship between the independent variable (managerial ability) and the mediator (readability), and between the mediator and the dependent variable (repetitive disclosures). A moderation framework, on the other hand, examines how the relationship between managerial ability and repetitive disclosures changes at different levels of readability, which aligns more coherently with our theoretical premise and empirical observations. As a result, while a mediation pathway is theoretically plausible, the moderating role of readability is deemed more appropriate and robust for our investigation.

moderating role. The implications of such repetitiveness aren't just a function of its frequency or managerial intent; they are significantly influenced by the clarity and structure of the narrative. Readability, at its core, is intrinsically linked to how we measure it. Based on the foundational research of Loughran and McDonald (2014, 2016), this study employs four pivotal readability metrics. Each metric furnishes a distinct perspective on the complexities of textual content:

1. **Fog index (FOG):** Here, words exceeding two syllables are designated as complex.
2. **SMOG index:** Sharing similarities with the *Fog* index, the *SMOG* metric zeroes in on complex words and complements this with sentence counts, yielding an all-encompassing readability measurement.
3. **ARI index:** Unlike other metrics, the *ARI* index takes into account character counts, affording a detailed comprehension of textual intricacy.
4. **Flesch-Kincaid index (FK):** This metric offers a quantitative insight into textual content by amalgamating sentence length and word complexity, thereby providing an understanding of textual difficulty.

For an in-depth exposition of the calculations and nuances of these metrics, readers are directed to Appendix B.

Our regression analyses, presented in Table 10, underscore the persistent and statistically significant influence of the interplay between Managerial Ability (*M\_ABILITY*) and the selected readability indices on repetition measures like *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. This pattern remains consistent across all readability metrics. The predominance of coefficients is found to be statistically significant at the 1% level (\*\*p<0.01), vouching for the robustness of our results. Importantly, the unwavering positive sign of our interaction terms (*M\_ABILITY* × readability index) insinuates that firms with superior managerial ability tend to exhibit increased repetition as readability complexity escalates<sup>45</sup>.

[Insert Table 10]

To sum up, while managerial acumen undoubtedly moulds the nature of MD&A's repetitive disclosures, the section's readability serves as a crucial

<sup>45</sup> In our regression models, we also account for additional textual features such as the readability of notes accompanying the financial statements. Furthermore, we incorporate the natural logarithm of word counts for both MD&A and notes. Despite these additions, the results remain consistent and robust.

moderator<sup>46</sup>. The repercussions of such redundancy aren't solely dependent on its prevalence or managerial intent but are profoundly swayed by the narrative's transparency and structure<sup>47</sup>.

## 6.4 Moderating Effect of MD&As' Tone

The tone of corporate communications, especially within MD&A sections of 10-K reports, has garnered significant attention in recent literature. A company's choice of tone, whether positive or negative, in their disclosures serves as a lens through which stakeholders interpret the underlying information. Li (2010), Loughran and McDonald (2011), and Jegadeesh and Wu (2013) all underscore the idea that tone is not just an ancillary feature but can significantly shape stakeholders' perceptions and consequently influence firm outcomes. When considering the MD&A's tone, it becomes evident that the nature of repetition can be perceived differently based on the underlying sentiment. On the positive end, a repetitive yet favorable tone could

<sup>46</sup> To investigate the influence of managerial ability on the repetitiveness of disclosures within varying levels of MD&A readability, we conducted a comprehensive analysis that extends beyond our initial interaction regression results. Specifically, we segmented our sample based on readability quartiles for each readability measure (*FOG*, *SMOG*, *ARI*, *FK* indices) and analyzed repetition across high versus low readability reports. This stratification revealed that CEOs with advanced managerial abilities tend to employ less repetition in more readable reports, a finding that corroborates our regression interaction results. This pattern underscores a strategic approach by adept managers to optimize clarity in financial disclosures, particularly in MD&As characterized by higher readability. The significant mean differences observed between high and low readability quartiles across all readability measures further validate the role of readability in enhancing the transparency and effectiveness of financial reporting.

<sup>47</sup> In exploring the specific circumstances under which managers might resort to more repetitive disclosures, we conducted an analysis considering various firm-specific variables and external factors, such as financial health indicators and market orientation. This involved assessing the conditional effects of these variables on the relationship between managerial ability and disclosure repetitiveness. Notably, our findings indicate a mixed pattern of significance across different measures of repetition. Specifically, the interaction between managerial ability and losses (*M\_ABILITY\_LOSS*) showed statistical significance in influencing repetition scores for *Sim\_Jaccard* and *Sim\_MinEdit* measures, suggesting that in certain contexts, financial distress may lead managers to employ more repetitive disclosures. Similarly, the interaction with investment volatility (*M\_ABILITY\_INVOL*) was significant for the *Sim\_Simple* measure, hinting at the potential for higher volatility to impact repetition in disclosures. However, other interactions, such as those with return on equity (*M\_ABILITY\_ROE*) and market-to-book ratio (*M\_ABILITY\_MTOB*), did not yield consistently significant results across the repetition measures. Given the partial significance and the exploratory nature of this analysis, we have chosen to present these findings narratively rather than in tabulated form, to emphasize the conditional nature of these relationships.

suggest emphasis, thereby framing information in an optimistic light. Stakeholders, in this scenario, might interpret repetition not as obfuscation but as an affirmation of the company's strengths and prospects. This can create a perception that able managers are merely highlighting their accomplishments and emphasizing positive forecasts. This is in line with the findings of Loughran and McDonald (2011), who deduced that negative tone using their word list is associated with lower returns and higher volatility. On the flip side, if repetitive disclosures consistently carry a negative tone, it could signal concerns or red flags that management keeps focusing on. Such repetition can generate apprehension among stakeholders, as it may imply persistent or unresolved issues. The repeated emphasis on challenges or negative aspects can be interpreted as a sign of potential problems lurking beneath the surface, as noted by Loughran et al. (2009) in their observation about firms with frequent ethics-related terms.

Beyond mere repetition, the tone plays a pivotal role in shaping perceptions. For example, even if a disclosure is repetitive, a positive tone can mitigate its obfuscative impression, making it seem more like a strategic reiteration of key points. Conversely, a negative tone, even in repetition, can amplify concerns.

Grounded in the pioneering research of Loughran and McDonald (2011) and bolstered by subsequent studies like those of Martikainen et al. (2023) and Liu and Nguyen (2020), our analysis introduces two pivotal tone metrics<sup>48</sup>. These metrics systematically assess the sentiment by analyzing the frequency of positive and negative words within the financial narratives, utilizing word lists derived from prior research. Specifically, the classification of words into positive and negative categories leverages the "bag of words" approach as outlined in the seminal research by Loughran and McDonald (2011), ensuring our analysis is grounded in established methodologies for sentiment analysis in financial texts:

1. ***TONE1***: This measure offers a holistic yet precise view of tone. By juxtaposing the count of positive and negative words, and subsequently dividing by the total word count, we attain an unadulterated sentiment ratio that captures the emotional undertone of MD&As. According to the regression results in Table 11, Panel A, *TONE1* demonstrates significant impacts on repetitiveness metrics: *Sim\_Cosine* (-0.220,  $p > 0.05$ ), *Sim\_Jaccard* (-0.272\*,  $p < 0.05$ ), *Sim\_MinEdit* (-0.103,  $p > 0.05$ ), and *Sim\_Simple* (2.723\*\*\*,  $p < 0.01$ ). These variations suggest *TONE1*'s role in influencing the repetitiveness of

<sup>48</sup> When estimating tone (using either method), we typically also take into account "negation". For example, if there is a negation word ("no", "not", "none", "neither", "never", or "nobody") within three words preceding a positive word, we treat the positive word as negative.

financial disclosures, particularly highlighting its variable influence across different dimensions of text similarity.

2. **TONE2**: Refining our sentiment lens further, this metric leverages a balance technique. It contrasts positive with negative words and then normalizes this difference by the combined tally of both positive and negative utterances. This approach provides a balanced sentiment snapshot, ensuring neither positive nor negative dominances are overstated. In Table 11, Panel B, *TONE2* consistently shows a significant impact on repetitiveness across most models: *Sim\_Cosine* (-0.0138\*\*\*,  $p < 0.01$ ), *Sim\_Jaccard* (-0.0131\*\*\*,  $p < 0.01$ ), *Sim\_MinEdit* (-0.0135\*\*,  $p < 0.05$ ), and *Sim\_Simple* (0.00691,  $p > 0.05$ ). The consistent significance in the first three metrics underlines *TONE2*'s effectiveness in moderating the balance of sentiment in financial reporting, affecting how repetitiveness is perceived and measured.

The interplay between managerial ability (*M\_ABILITY*) and our curated tone measures exerts a discernible influence on repetition metrics, spanning *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. This influence is unwavering across both tone metrics. A substantial majority of our coefficients radiate with a statistical significance, particularly at the 1% level (\*\*\* $p < 0.01$ ), underscoring the robustness of our empirical voyage. What captivates is the directionality of our interaction terms (*M\_ABILITY*  $\times$  tone index), suggesting a subtle interplay between managerial ability and tone in influencing repetitiveness.

### [Insert Table 11]

In conclusion, our analysis from Table 11 illustrates the distinct roles that *TONE1* and *TONE2* play in shaping the repetitiveness of financial disclosures within MD&As. *TONE1*, by measuring the net sentiment ratio, reveals a complex relationship with repetitiveness across various metrics, suggesting that the emotional undertone can significantly affect how information is reiterated. Particularly, its impact varies, reducing repetitiveness in some contexts while increasing it in others, indicating that the emotional context of disclosures can either amplify or mitigate the extent of repetition based on the sentiment conveyed. On the other hand, *TONE2*, by providing a balanced sentiment measure, consistently moderates repetitiveness, particularly highlighting its capability to fine-tune the narrative's impact on perceived transparency and informativeness. The interactions between these tone measures and managerial ability underscore a dynamic where managerial competencies and the strategic use of tone together influence the clarity and effectiveness of corporate communications. These findings not only contribute to our understanding of how tone and managerial ability interact to shape financial reporting but also highlight the importance of considering both quantitative and

qualitative elements in evaluating the strategic disclosures in financial documents. This dual approach enriches the discourse on effective communication in corporate governance and financial reporting, offering valuable insights for both practitioners and regulators concerned with enhancing the integrity and utility of financial disclosures.

## 6.5 CEO Managerial Abilities and Disclosure Practices: A Strategic and Operational Analysis

Some previous studies have delineated managerial ability into two primary facets: strategic ability and operational ability (Mishra, 2020). In our study, we have primarily focused on the operational ability of managers as a proxy for CEO managerial ability (*M\_ABILITY*), which has garnered more attention in existing literature. This focus is derived from Demerjian et al. (2012), who define operational ability as management's efficiency in transforming corporate resources into revenues. Executives with higher operational ability are characterized by their capacity to generate greater revenues from a given level of corporate resources or to minimize the resources required to achieve a specified revenue level.

However, in this subsection, we aim to explore the potential influence of changes in operational practices—defined here as tactical decisions impacting day-to-day management and resource utilization—on the variability in MD&A disclosures. By examining how shifts in operational practices may affect disclosure practices, our study seeks to offer a more detailed understanding of the elements that influence disclosure transparency. This exploration acknowledges that alterations in strategic focus, investment decisions, and market positioning could lead to significant variations in the information reported in 10-K filings. Incorporating this dimension into our analysis strengthens our argument by addressing potential confounding factors and enhancing the robustness of our findings regarding the relationship between CEO managerial ability and disclosure transparency.

Operational practices will be conceptualized in terms of decisions that impact the firm's capital stock<sup>49</sup>, including investments in new projects, divestitures, acquisitions, and shifts in operational focus areas. Following Mishra (2020, 2023), we will measure the strategic ability of CEOs (*M\_STR\_ABILITY*) by the excess market value generated per unit change in the firm's capital stock. This methodology captures the impact of strategic decision-making on firm value and serves as an

<sup>49</sup> "Capital stock" in this context refers to the firm's physical assets, such as machinery, buildings, and technology, which are used in the production process. The term does not merely denote financial assets but encompasses all tangible resources that contribute to the firm's productive capacity.

indicator for shifts in operational practices over time. This approach allows us to not only quantify the strategic aspect of managerial ability but also to understand its implications for corporate disclosures. Through this lens, we can better discern how strategic and operational dimensions of CEO ability contribute to the transparency and informativeness of financial reporting, thereby providing a comprehensive view of the interplay between managerial decisions and corporate communication practices. The detailed analysis illustrating the aforementioned conceptualization is elaborated upon in Table 12.

Panel A demonstrates the effect of CEOs' strategic ability ( $M\_STR\_ABILITY$ ) on the repetitiveness of disclosures, measured through various similarity scores. The negative coefficients across all measures indicate that a higher strategic ability is associated with less repetition in disclosures. The statistical significance (\*\* for  $p < 0.05$ ) across different metrics suggests a consistent, albeit modest, effect of strategic ability on reducing repetitiveness. CEOs with greater strategic ability tend to produce more unique and less repetitive disclosures, highlighting the relevance of strategic vision in shaping corporate communication.

Panel B includes both the managerial ability ( $M\_ABILITY$  or based on Mishra (2020, 2023), operational ability) and strategic ability to show their respective impacts on disclosure repetitiveness. The coefficients for  $M\_ABILITY$  are consistently larger and more statistically significant (\*\*\* for  $p < 0.01$  and \* for  $p < 0.1$ ) than those for  $M\_STR\_ABILITY$ , indicating that managerial ability has a more pronounced effect on reducing disclosure repetitiveness. Hence, while both types of abilities influence disclosure repetitiveness, managerial ability exerts a stronger effect, suggesting that operational efficiency and broader managerial competencies play crucial roles in enhancing disclosure transparency.

Panel C examines the interaction between managerial and strategic abilities ( $M\_ABILITY \times M\_STR\_ABILITY$ ) alongside their individual effects. The regression coefficients for the interaction terms are not statistically significant, suggesting that the combined effect of managerial and strategic abilities on disclosure repetitiveness is not straightforward or uniformly significant. Therefore, the interaction analysis suggests that strategic ability's influence on reducing disclosure repetitiveness does not significantly amplify when combined with high levels of managerial ability, pointing towards the complexity of how different facets of CEO abilities interact in influencing disclosure practices.

[Insert Table 12]

In conclusion, our analysis underscores the significance of CEOs' operational ability as the primary driver behind the reduction in disclosure repetitiveness and the enhancement of transparency in financial reporting. Operational ability, characterized by efficient resource utilization to maximize revenues, emerges as a

more critical factor compared to strategic ability in influencing the quality of corporate disclosures. This finding reinforces the importance of focusing on operational efficiencies within managerial practices as a key to improving the clarity and conciseness of corporate communications. Acknowledging the complexities of asserting a causal relationship between CEO managerial abilities and disclosure practices, it is essential to continue expanding the analysis. Future research should delve deeper into the dynamics of operational practices and other potential confounding factors to provide a more comprehensive understanding of how managerial abilities impact disclosure transparency. By emphasizing operational ability, this study contributes to the ongoing dialogue on the importance of managerial competencies in shaping effective corporate disclosure, offering valuable insights for investors, regulators, and practitioners alike.

## 7 Concluding Remarks

In the intricate landscape of corporate decision-making, the role of managerial traits remains paramount. This study, deeply rooted in the foundational works of Hambrick (2007), Hambrick and Mason (1984), and subsequent researchers, sought to explore the relationship between managerial ability and narrative disclosure patterns, specifically repetition from notes to MDAs. Consistent with upper-echelons theory posited by Hambrick and Mason (1984), our research establishes that managerial characteristics, notably managerial ability, play a pivotal role in shaping a firm's disclosure tendencies. This underscores the findings of earlier studies by the likes of Bertrand and Schoar (2003), Aier et al. (2005), and Francis et al. (2008), which emphasized the profound influence of managerial features on firm decisions and outcomes.

Our inquiry unveiled a compelling narrative: CEOs endowed with superior managerial capabilities, as defined by Demerjian et al. (2012), lean towards concise and non-redundant disclosure, potentially aiming for enhanced clarity and reduced ambiguity. This revelation is congruent with the obfuscation theory, suggesting that adept CEOs prioritize transparency in communication, a phenomenon echoed in the works of Li (2008) and Bloomfield (2008). Such behavior starkly contrasts the rent extraction perspective, where repetition might serve as a strategic veil, a notion hinted at by Hasan and Habib (2017).

The interplay between managerial ability and repetition was further contextualized by exploring its relationship with investment efficiency, audit firms' stature, readability metrics, and tone of MD&A sections. Upon closer examination of our data, it becomes apparent that the correlation between higher managerial abilities and lesser repetition in disclosures does not significantly differ between

firms audited by the Big Four and those audited by Non-Big Four auditors. Our findings also echoed the sentiments of Clarkson et al. (1999) and Li (2010), highlighting the significance of MD&As as crucial qualitative disclosures. Addressing potential endogeneity, methodologies inspired by Brown and Tucker (2011) and others reaffirmed the robustness of our primary findings, albeit with some avenues necessitating deeper exploration.

Beyond the core findings elucidating the ties between CEO traits and narrative disclosure patterns, this research augments several academic realms, offering multilayered contributions. First, with the burgeoning inclination of textual analysis literature towards computational advancements, we integrate a contemporary computer linguistic tool, as endorsed by El-Haj et al. (2019), into the realm of accounting disclosure research. Second, anchoring to the foundational literature of repetitive communication – spanning Johnson and Watkins (1971), Pechmann and Stewart (1988), to Shannon and Weaver (1949) – our study enriches the knowledge pool. As repetitive communication patterns proliferate (as observed by Law, 2002; Leonardi et al., 2012), we harness the financial reporting context to the test. Third, delving into decision-making, our exhaustive exploration highlights the profound repercussions of CEO managerial ability on firms' repetitive MD&A disclosures. Aligning with Chemmanur and Paeglis (2005), Chang et al. (2010), Francis et al. (2008), Demerjian et al. (2013), and Jian and Lee (2011), we chronicle how adept CEOs can potentially reshape narrative disclosures. Fourth, our foray extends to the corporate investment literature, presenting the multidimensional effects of managerial attributes, particularly when juxtaposed against distinct agency dilemmas. Building on the pillars laid by Jensen (1986), Shleifer and Vishny (1989), Morck et al. (1990), Core and Guay (1999), Coles et al. (2006), Bebchuk et al. (2009), and Biddle et al. (2009), this research delves into the interrelation between CEO managerial ability, incentives, monitoring structures, and corporate investment protocols.

While this study is quite comprehensive, it's not without its constraints. First, our research mainly hinges on available data, potentially overlooking firms or CEOs not present in the datasets. Second, the reliance on linguistic tools and quantitative measures might not capture the qualitative nuances of CEO narratives. Third, the findings, while robust, may be more applicable to specific industries or geographies. The implications for future research are rife, first, scholars could venture into diverse datasets, spanning different sectors and regions, ensuring a more holistic perspective. Second, future studies might focus on a qualitative exploration, deciphering the thematic essence of CEO narratives. Third, by comparing industries, researchers could decipher if certain sectors are more prone to repetitive disclosures due to CEO characteristics. With the path illuminated, it's evident that the intersections of CEO traits, disclosure patterns, and corporate investments are teeming with potential, beckoning for continued academic inquiry.

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# Tables

**Table 1. Sample Creation**

Filters	Dropped	Sample Size
SEC 10-K files 1994–2020		189,085
Eliminate duplicates within year/CIK	3,287	185,798
Compustat gvkey match	40,660	145,138
MD&A and Notes sections $\geq$ 200 words	22,000	123,138
Matched with Demerjian et al., (2013) managerial ability repository (gvkey as main identifier)	40,973	73,165
Drop if required Compustat data is missing	17,584	55,581

Table 1 delineates the step-by-step filtering process utilized to refine the initial dataset of SEC 10-K filings from 1994 to 2020 into a final analytical sample. The process begins with the removal of duplicate entries and progresses through various criteria, including matching with the Compustat database, ensuring sufficient content in the MD&A and Notes sections, alignment with the Demerjian et al. (2013) managerial ability repository, and the presence of necessary financial data. Each step details the criteria applied, the number of records dropped due to each filter, and the resulting cumulative sample size, culminating in a final dataset of 55,581 records ready for analysis. This structured approach ensures that the sample is both relevant and robust for the study's objectives.

**Table 2. Sample Distribution**

Year	# of obs.	% of sample	Cumulative %
<b>Panel A. by year</b>			
1994	108	0.19	0.19
1995	777	1.40	1.59
1996	1255	2.26	3.85
1997	1713	3.08	6.93
1998	1737	3.13	10.06
1999	1638	2.95	13.00
2000	1749	3.15	16.15
2001	1812	3.26	19.41
2002	2139	3.85	23.26
2003	2872	5.17	28.43
2004	2811	5.06	33.48
2005	2705	4.87	38.35
2006	2605	4.69	43.04
2007	2553	4.59	47.63
2008	2506	4.51	52.14
2009	2666	4.80	56.94
2010	2540	4.57	61.51
2011	2410	4.34	65.84
2012	2335	4.20	70.04
2013	2269	4.08	74.13
2014	2209	3.97	78.10
2015	2128	3.83	81.93
2016	2066	3.72	85.65
2017	2054	3.70	89.34
2018	2099	3.78	93.12
2019	2030	3.65	96.77
2020	1795	3.23	100.00
Total	55,581	100.00	

	2-digit SIC	# of obs.	% of sample	Cumulative %
<b>Panel B. by industry</b>				
Oil and gas	13	2361	4.25	4.25
Heavy construction other than building construction contractors	16	314	0.57	4.81
Food, beverage	20	1564	2.81	7.63
Textile mill products	22	288	0.52	8.15
Apparel and other fabrics finished products	23	570	1.03	9.17
Lumber and wood products, except furniture	24	274	0.49	9.66
Furniture and fixtures	25	399	0.72	10.38
Paper and allied products	26	603	1.09	11.47
Printing, publishing, and allied industries	27	628	1.13	12.60

*(Continued on next page)*

**Table 2.** *Sample Distribution*

	2-digit SIC	# of obs.	% of sample	Cumulative %
<b>Panel B.</b> by industry				
<i>(Continued)</i>				
Chemicals and allied products	28	5991	10.78	23.38
Petroleum refining and related industries	29	345	0.62	24.00
Rubber	30	553	1.00	24.99
Stone, clay, glass, and concrete products	32	353	0.64	25.63
Primary metal industries	33	828	1.49	27.12
Fabricated metal products	34	917	1.65	28.77
Industrial machinery and computer equipment	35	3684	6.63	35.39
Electronic and other electric equipment	36	5406	9.73	45.12
Transportation equipment	37	1551	2.79	47.91
Instruments and related products	38	4307	7.75	55.66
Miscellaneous manufacturing	39	620	1.12	56.78
Motor freight transportation and warehousing	42	497	0.89	57.67
Water transportation	44	264	0.48	58.14
Transportation by air	45	458	0.82	58.97
Communication	48	1849	3.33	62.30
Wholesale—durable goods	50	1496	2.69	64.99
Wholesale—non-durable goods	51	778	1.40	66.39
General merchandise store	53	439	0.79	67.18
Food stores	54	371	0.67	67.84
Automotive dealers and gasoline stations	55	335	0.60	68.45
Apparel and accessory stores	56	770	1.39	69.83
Furniture and home furnishings stores	57	264	0.48	70.31
Eating and drinking	58	1007	1.81	72.12
Miscellaneous retail	59	1150	2.07	74.19
Business services	73	7736	13.92	88.11
Amusement and recreation services	79	712	1.28	89.39
Health services	80	1322	2.38	91.77
Educational services	82	293	0.53	92.29
Engineering and management services	87	1269	2.28	94.58
Non-classifiable establishments	99	415	0.75	95.32
Others	<sup>b</sup>	2600	4.68	100.00
Total		55,581	100.00	

<sup>b</sup> Industries with fewer than 250 observations have been aggregated into this category. It should be noted that there are 64 firm-year observations for firms in the financial services industry, which falls within the SIC code range of 6000 to 6999. While some previous studies have excluded these observations, others have not, contingent upon the specific demands of the study. In this research, given that the total number of observations is less than 250, they have been categorized under the "Others" category.

Table 2 presents a detailed breakdown of the sample distribution across two main dimensions: by year (**Panel A**) and by industry (**Panel B**), based on 2-digit SIC codes. **Panel A** outlines the annual distribution of observations from 1994 to 2020, indicating both the number and percentage of observations per year, along with a cumulative percentage to show the growth of the sample over time. **Panel B** categorizes the sample by industry, showing the diversity of sectors covered in the analysis.

**Table 3. Descriptive Statistics**

Variable	N	Mean	SD	Min	25 %	50 %	75 %	Max
<u>Dependent variables (<i>REPETITION</i> measures)</u>								
<i>Sim_Cosine</i>	55581	0.856	0.115	0.013	0.810	0.889	0.936	1.000
<i>Sim_Jaccard</i>	55581	0.186	0.093	0.007	0.121	0.185	0.238	0.500
<i>Sim_MinEdit</i>	55581	0.428	0.197	0.009	0.282	0.433	0.549	1.000
<i>Sim_Simple</i>	55581	0.354	0.317	0.001	0.035	0.320	0.579	1.000
<u>Independent variable</u>								
<i>M_ABILITY</i>	55581	-0.003	0.128	-0.282	-0.078	-0.024	0.039	0.697
<u>Control variables</u>								
<i>ZSCORE</i>	55581	1.165	0.867	-0.204	0.601	0.983	1.498	8.116
<i>LOSS</i>	55581	0.376	0.484	0.000	0.000	0.000	1.000	1.000
<i>SIZE</i>	55581	5.878	2.395	0.307	4.230	5.948	7.501	14.492
<i>AGE_LN</i>	55581	2.676	0.432	1.946	2.303	2.708	3.045	3.497
<i>SPEC</i>	55581	-0.021	0.129	-1.038	-0.016	-0.002	0.000	2.729
<i>SALE_VOL</i>	55581	0.308	0.396	0.001	0.112	0.206	0.373	10.154
<i>NONMISS_LN</i>	55581	5.971	0.105	5.587	5.914	6.004	6.045	6.180
<i>DAC</i>	55581	0.265	0.691	0.000	0.046	0.105	0.239	9.356
<i>ROE</i>	55581	-0.287	1.963	-30.415	-0.076	0.027	0.059	23.295
<i>INVT_VOL</i>	55581	3.589	5.063	0.000	0.320	1.955	4.760	67.777
<i>CFO_SALE</i>	55581	-0.096	0.957	-10.945	0.007	0.072	0.143	10.588
<i>MTOB</i>	55581	2.292	3.410	0.061	1.128	1.542	2.348	61.802
<i>SLACK</i>	55581	1.309	3.641	0.000	0.064	0.264	1.017	59.150
<i>DIV</i>	55581	0.304	0.460	0.000	0.000	0.000	1.000	1.000
<i>TANGIBILITY</i>	55581	0.535	0.532	0.000	0.200	0.399	0.735	10.233
<i>KSTRUCTURE</i>	55581	0.190	0.230	0.000	0.002	0.104	0.292	1.000

Table 3 provides comprehensive descriptive statistics for the variables used in our analysis, detailing the distribution of both dependent and independent variables, as well as a range of control variables. Dependent variables concerning repetition measures include *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*, showcasing the varied approaches to quantifying repetitiveness in corporate disclosures. The independent variable, managerial ability (*M\_ABILITY*), is highlighted to explore its relationship with the dependent variables. Control variables such as *ZSCORE*, *LOSS*, *SIZE*, *AGE\_LN*, *SPEC*, *SALE\_VOL*, *NONMISS\_LN*, *DAC*, *ROE*, *INVT\_VOL*, *CFO\_SALE*, *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, and *KSTRUCTURE* are included to adjust for potential confounding effects and ensure a more accurate model specification. These controls encompass financial health, company size, age, specificity of investment, sales volatility, and other pertinent firm characteristics that might influence disclosure practices. Each statistic is derived after applying winsorization to limit the influence of extreme values, thereby enhancing the robustness and reliability of our analysis. All variables are defined in Appendix B.

**Table 4.** Mean Difference Test: Similarity and Control Variables by CEO Managerial Ability (*M\_ABILITY*)

Variable	Low ability (below the 25th percentile)			High ability (above the 75th percentile)			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>Sim_Cosine</i>	13896	0.867	0.900	13895	0.852	0.884	-10.853 (0.000)	-12.908 (0.000)
<i>Sim_Jaccard</i>	13896	0.194	0.195	13895	0.186	0.184	-7.688 (0.000)	-9.159 (0.000)
<i>Sim_MinEdit</i>	13896	0.444	0.454	13895	0.426	0.430	-7.303 (0.000)	-8.303 (0.000)
<i>Sim_Simple</i>	13896	0.365	0.336	13895	0.350	0.305	-3.858 (0.000)	-4.356 (0.000)
<u>Control variables:</u>								
<i>ZSCORE</i>	13896	0.897	0.782	13895	1.233	0.962	32.487 (0.000)	29.212 (0.000)
<i>LOSS</i>	13896	0.428	0.000	13895	0.330	0.000	-16.937 (0.000)	-14.161 (0.000)
<i>SIZE</i>	13896	6.147	6.273	13895	6.457	6.560	10.615 (0.000)	10.365 (0.000)
<i>AGE_LN</i>	13896	2.645	2.639	13895	2.690	2.708	8.680 (0.000)	8.643 (0.000)
<i>SPEC</i>	13896	-0.022	-0.003	13895	-0.019	-0.001	2.144 (0.032)	6.032 (0.000)
<i>SALE_VOL</i>	13896	0.236	0.161	13895	0.343	0.219	22.233 (0.000)	28.401 (0.000)
<i>NONMISS_LN</i>	13896	5.976	6.009	13895	5.976	6.006	-0.005 (0.996)	-1.621 (0.105)
<i>DAC</i>	13896	0.252	0.122	13895	0.427	0.114	16.398 (0.000)	-0.105 (0.916)
<i>ROE</i>	13896	-0.453	0.021	13895	-0.154	0.030	12.286 (0.000)	12.853 (0.000)
<i>INVT_VOL</i>	13896	2.627	1.266	13895	3.468	1.653	14.635 (0.000)	8.042 (0.000)
<i>CFO_SALE</i>	13896	-0.282	0.075	13895	-0.031	0.087	18.404 (0.000)	16.680 (0.000)
<i>MTOB</i>	13896	2.029	1.417	13895	2.896	1.893	19.681 (0.000)	38.653 (0.000)
<i>SLACK</i>	13896	1.133	0.142	13895	1.990	0.561	16.966 (0.000)	46.592 (0.000)
<i>DIV</i>	13896	0.320	0.000	13895	0.318	0.000	-0.399 (0.690)	-0.322 (0.747)
<i>TANGIBILITY</i>	13896	0.640	0.540	13895	0.462	0.293	-25.559 (0.000)	-41.887 (0.000)

*(Continued on next page)*

**Table 4.** Mean Difference Test: Similarity and Control Variables by CEO Managerial Ability (*M\_ABILITY*)

Variable	Low ability (below the 25th percentile)			High ability (above the 75th percentile)			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>(Continued)</i>								
<i>KSTRUCTURE</i>	13896	0.267	0.202	13895	0.136	0.052	-48.572 (0.000)	-50.405 (0.000)

Table 4 outlines the results of mean difference tests for similarity measures and control variables, categorized by CEO managerial ability (*M\_ABILITY*). The analysis compares two groups: CEOs with low ability (below the 25th percentile) and those with high ability (above the 75th percentile). For each group, the table presents the number of observations (N), mean, and median values for each variable. Additionally, the table reports the results of t-tests and Wilcoxon tests (with p-values) to assess the statistical significance of the differences between the low and high ability groups. The dependent variables, including *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*, serve as measures of repetition in corporate disclosures. The analysis extends to a wide range of control variables which capture various aspects of firm characteristics and financial performance. This division into low and high CEO managerial ability groups allows for an insightful comparison, highlighting how CEOs' abilities might influence the repetition in corporate disclosures and the impact on other firm-level variables. Significant differences across the two groups are evident in both similarity measures and control variables, pointing to the effects of CEO managerial ability on firm behavior and reporting practices. The p-values indicate the statistical significance of these differences, providing a robust basis for further analysis and discussion on the role of managerial ability in shaping corporate disclosures. All variables and their operational definitions are detailed in Appendix B, ensuring transparency and replicability of the analysis.

**Table 5. Correlation Matrix: CEO Managerial Ability, Repetition, and Controls (n = 55581)**

<b>Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
(1) <i>Sim_Cosine</i>	1						
(2) <i>Sim_Jaccard</i>	0.763*	1					
(3) <i>Sim_MinEdit</i>	0.786*	0.992*	1				
(4) <i>Sim_Simple</i>	0.427*	0.541*	0.542*	1			
(5) <i>M_ABILITY</i>	-0.029*	-0.012*	-0.011*	-0.010*	1		
(6) <i>ZSCORE</i>	-0.057*	-0.051*	-0.050*	-0.001	0.101*	1	
(7) <i>LOSS</i>	-0.007	-0.029*	-0.026*	-0.021*	-0.070*	-0.134*	1
(8) <i>SIZE</i>	0.113*	0.163*	0.157*	0.012*	0.136*	-0.156*	-0.407*
(9) <i>AGE_LN</i>	0.210*	0.203*	0.213*	0.061*	0.040*	-0.013*	-0.149*
(10) <i>SPEC</i>	-0.004	0.002	0.002	0.009*	0.008	-0.013*	-0.225*
(11) <i>SALE_VOL</i>	-0.066*	-0.078*	-0.079*	-0.007	0.080*	0.472*	0.024*
(12) <i>NONMISS_LN</i>	0.275*	0.305*	0.319*	0.001	0.032*	-0.117*	-0.047*
(13) <i>DAC</i>	0.072*	0.074*	0.074*	0.043*	0.166*	-0.077*	-0.059*
(14) <i>ROE</i>	-0.009*	0.005	0.007	0	0.055*	-0.002	-0.260*
(15) <i>INVT_VOL</i>	-0.078*	-0.096*	-0.097*	0.009*	0.012*	0.232*	0.037*
(16) <i>CFO_SALE</i>	0.012*	0.028*	0.025*	-0.011*	0.069*	0.183*	-0.293*
(17) <i>MTOB</i>	-0.021*	-0.035*	-0.031*	0.017*	0.103*	-0.029*	0.089*
(18) <i>SLACK</i>	-0.030*	-0.021*	-0.017*	-0.028*	0.135*	-0.150*	0.103*
(19) <i>DIV</i>	0.064*	0.077*	0.076*	0.062*	0.020*	0.059*	-0.344*
(20) <i>TANGIBILITY</i>	0.045*	0.020*	0.021*	0.032*	-0.117*	0.011*	0.046*
(21) <i>KSTRUCTURE</i>	0.062*	0.038*	0.030*	0.020*	-0.181*	-0.036*	0.133*
<b>Variables</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>	<b>(13)</b>	<b>(14)</b>
(8) <i>SIZE</i>	1						
(9) <i>AGE_LN</i>	0.251*	1					
(10) <i>SPEC</i>	0.065*	0.044*	1				
(11) <i>SALE_VOL</i>	-0.183*	-0.170*	0.010*	1			
(12) <i>NONMISS_LN</i>	0.329*	0.555*	-0.002	-0.177*	1		
(13) <i>DAC</i>	0.334*	0.164*	0.009*	-0.063*	0.103*	1	
(14) <i>ROE</i>	0.262*	0.048*	0.280*	-0.024*	0.043*	0.005	1
(15) <i>INVT_VOL</i>	-0.225*	-0.118*	0.013*	0.379*	-0.206*	-0.084*	-0.022*
(16) <i>CFO_SALE</i>	0.184*	0.089*	0.045*	0.007	0.029*	0.050*	0.060*
(17) <i>MTOB</i>	0.009*	-0.039*	0.038*	0.125*	0.005	-0.015*	-0.007
(18) <i>SLACK</i>	-0.031*	-0.082*	0.011*	0.027*	0.061*	-0.045*	0.026*
(19) <i>DIV</i>	0.426*	0.286*	0.046*	-0.127*	0.128*	0.181*	0.097*
(20) <i>TANGIBILITY</i>	-0.102*	0.085*	0.046*	-0.082*	-0.065*	0.079*	-0.116*
(21) <i>KSTRUCTURE</i>	-0.115*	-0.001	-0.027*	-0.064*	-0.076*	0.067*	-0.189*
<b>Variables</b>	<b>(15)</b>	<b>(16)</b>	<b>(17)</b>	<b>(18)</b>	<b>(19)</b>	<b>(20)</b>	<b>(21)</b>
(15) <i>INVT_VOL</i>	1						
(16) <i>CFO_SALE</i>	-0.026*	1					
(17) <i>MTOB</i>	0.049*	-0.265*	1				
(18) <i>SLACK</i>	-0.047*	-0.217*	0.102*	1			
(19) <i>DIV</i>	-0.109*	0.152*	-0.070*	-0.142*	1		
(20) <i>TANGIBILITY</i>	-0.094*	0.058*	0.046*	-0.262*	0.079*	1	
(21) <i>KSTRUCTURE</i>	-0.036*	0.080*	-0.182*	-0.185*	-0.017*	0.213*	1

(Continued on next page)

**Table 5. Correlation Matrix: CEO Managerial Ability, Repetition, and Controls (n = 55581)**

*(Continued)*

Table 5 displays a correlation matrix for a comprehensive set of variables involved in our study. This matrix includes both the dependent variables related to repetitiveness measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) and a series of control variables that capture various aspects of firm characteristics, financial health, and performance. Each cell in the matrix shows the Pearson correlation coefficient between two variables, allowing us to examine the degree and direction of association between them. Significance indicators (\*) are used to denote correlation coefficients with a p-value less than 0.05, highlighting statistically significant relationships. This detailed presentation aids in identifying potential multicollinearity issues and provides initial insights into the variables' interrelationships before conducting more complex analyses. This preliminary investigation is crucial for guiding further empirical work and interpreting the results within a coherent framework of existing relationships among the variables. Definitions and further details about each variable are provided in Appendix B, ensuring thorough transparency and accessibility of the data for replication and further analysis.

**Table 6.** Regression Results of Managerial Ability on Repetition (Similarity Scores)

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0196*** (0.00396)	-0.0115*** (0.00367)	-0.0218*** (0.00669)	-0.0184 (0.0114)
<i>ZSCORE</i>	-0.00206*** (0.000751)	-0.000012 (0.000695)	-0.000159 (0.00127)	-0.00223 (0.00215)
<i>LOSS</i>	0.00285** (0.00119)	0.00315*** (0.00110)	0.00633*** (0.00200)	-0.00966*** (0.00340)
<i>SIZE</i>	0.00228*** (0.000290)	0.00396*** (0.000268)	0.00731*** (0.000489)	-0.00475*** (0.000831)
<i>AGE_LN</i>	0.0127*** (0.00147)	0.00306** (0.00136)	0.00643*** (0.00248)	0.0411*** (0.00422)
<i>SPEC</i>	-0.00600 (0.00386)	0.00200 (0.00357)	0.00124 (0.00651)	0.00687 (0.0111)
<i>SALE_VOL</i>	0.00410*** (0.00150)	0.00117 (0.00139)	-0.000782 (0.00253)	0.00911** (0.00429)
<i>NONMISS_LN</i>	0.100*** (0.0133)	0.103*** (0.0123)	0.205*** (0.0224)	0.0283 (0.0380)
<i>DAC</i>	0.00307*** (0.000786)	0.00153** (0.000728)	0.00263** (0.00133)	0.0191*** (0.00225)
<i>ROE</i>	-0.000681*** (0.000262)	-0.000901*** (0.000242)	-0.00135*** (0.000441)	7.93e-05 (0.000750)
<i>INVT_VOL</i>	-0.000287** (0.000114)	-0.000285*** (0.000106)	-0.000528*** (0.000193)	-0.000599* (0.000327)
<i>CFO_SALE</i>	-0.00143** (0.000562)	-0.00124** (0.000520)	-0.00174* (0.000948)	-0.00553*** (0.00161)
<i>MTOB</i>	-0.000459*** (0.000150)	-0.000794*** (0.000138)	-0.00162*** (0.000252)	0.00260*** (0.000429)
<i>SLACK</i>	-0.000727*** (0.000142)	-0.000415*** (0.000132)	-0.000859*** (0.000240)	-0.00118*** (0.000408)
<i>DIV</i>	0.000108 (0.00123)	0.000908 (0.00114)	0.00137 (0.00207)	0.0253*** (0.00352)
<i>TANGIBILITY</i>	0.00359*** (0.00110)	0.00263*** (0.00101)	0.00525*** (0.00185)	-0.000549 (0.00314)
<i>KSTRUCTURE</i>	0.0333*** (0.00235)	0.0209*** (0.00218)	0.0394*** (0.00397)	0.0177*** (0.00675)
<i>Constant</i>	0.173** (0.0766)	-0.482*** (0.0709)	-0.902*** (0.129)	0.311 (0.220)
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.107	0.094	0.128	0.029

Table 6 presents the regression results exploring the impact of managerial ability (*M\_ABILITY*) on the repetitiveness of corporate disclosures, measured through various similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). This analysis includes a comprehensive set of control variables to account for firm-specific characteristics and financial indicators. Each regression model is specified with both year fixed effects and industry fixed effects to control for temporal and sectoral variations. The table reports coefficients for each variable across four columns corresponding to the different similarity measures, with standard errors provided in parentheses. Significance levels are denoted with asterisks, indicating p-values (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). Standard errors are provided in parentheses to indicate the estimation accuracy. All variables used in the analysis are meticulously defined in Appendix B, ensuring clarity and facilitating further research and discussion on the topic.

**Table 7. Addressing Selection Bias Using Entropy Balancing Approach**

**Panel A. Pre Vs. Post-balancing Entropy Balanced Approach**  
 [Treatment (High *M\_ABILITY* = 1) Vs. Control (Low *M\_ABILITY* = 0)]

	Pre-balancing Entropy Balanced			Post-balancing Entropy Balanced		
	(1)	(2)	(3)	(5)	(6)	(7)
	Treatment	Control	Diff [1-2]	Treatment	Control	Diff [5-6]
	Mean	Mean		Mean	Mean	
ZSCORE	1.2720	1.0520	0.2200	1.2720	1.2720	0.0000
LOSS	0.3517	0.4013	-0.0496	0.3517	0.3520	-0.0003
SIZE	5.8780	5.8780	0.0000	5.8780	5.8760	0.0020
AGE_LN	2.6840	2.6680	0.0160	2.6840	2.6840	0.0000
SPEC	-0.0191	-0.0225	0.0034	-0.0191	-0.0192	0.0000
SALE_VOL	0.3437	0.2712	0.0725	0.3437	0.3436	0.0001
NONMISS_LN	5.9690	5.9740	-0.0050	5.9690	5.9690	0.0000
DAC	0.3052	0.2229	0.0823	0.3052	0.3052	0.0000
ROE	-0.1964	-0.3819	0.1855	-0.1964	-0.1984	0.0020
INVT_VOL	3.9340	3.2270	0.7070	3.9340	3.9330	0.0010
CFO_SALE	-0.0276	-0.1670	0.1394	-0.0276	-0.0277	0.0001
MTOB	2.5390	2.0320	0.5070	2.5390	2.5390	0.0000
SLACK	1.5690	1.0360	0.5330	1.5690	1.5680	0.0010
DIV	0.2940	0.3141	-0.0201	0.2940	0.2939	0.0001
TANGIBILITY	0.4733	0.6004	-0.1271	0.4733	0.4739	-0.0006
KSTRUCTURE	0.1468	0.2350	-0.0882	0.1468	0.1472	-0.0004

**Panel B. Post Entropy Balanced Regression Results**

Variables	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.00480*** (0.000943)	-0.00343*** (0.000863)	-0.00619*** (0.00157)	-0.00612** (0.00267)
ZSCORE	-0.00211*** (0.000585)	0.000790 (0.000536)	0.00158 (0.000976)	-0.00537*** (0.00166)
LOSS	0.00388*** (0.00120)	0.00452*** (0.00110)	0.00798*** (0.00200)	-0.00601* (0.00339)
SIZE	0.00122*** (0.000269)	0.00299*** (0.000246)	0.00520*** (0.000449)	-0.00410*** (0.000761)
AGE_LN	0.0203*** (0.00142)	0.00772*** (0.00130)	0.0185*** (0.00236)	0.0548*** (0.00401)
SPEC	-0.000303 (0.00375)	0.00817** (0.00343)	0.0127** (0.00626)	0.0223** (0.0106)
SALE_VOL	0.00422*** (0.00126)	0.00214* (0.00116)	0.00185 (0.00210)	0.00888** (0.00357)
NONMISS_LN	0.256*** (0.00586)	0.241*** (0.00537)	0.528*** (0.00978)	-0.112*** (0.0166)
DAC	0.00331*** (0.000586)	0.00253*** (0.000536)	0.00432*** (0.000978)	0.0159*** (0.00166)

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**Table 7. Addressing Selection Bias Using Entropy Balancing Approach**

<b>Panel B. Post Entropy Balanced Regression Results</b>				
Variables	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>ROE</i>	-0.000600* (0.000321)	-0.000753** (0.000294)	-0.00113** (0.000535)	-0.000799 (0.000908)
<i>INVT_VOL</i>	-0.000272*** (9.55e-05)	-0.000351*** (8.74e-05)	-0.000704*** (0.000159)	0.000369 (0.000270)
<i>CFO_SALE</i>	-0.00113* (0.000604)	-0.000947* (0.000553)	-0.000959 (0.00101)	-0.00175 (0.00171)
<i>MTOB</i>	-0.000329*** (0.000116)	-0.000815*** (0.000106)	-0.00158*** (0.000193)	0.00148*** (0.000327)
<i>SLACK</i>	-0.000688*** (0.000117)	-0.000337*** (0.000107)	-0.000697*** (0.000195)	-0.000177 (0.000331)
<i>DIV</i>	-0.000365 (0.00122)	0.000227 (0.00112)	0.000265 (0.00204)	0.0365*** (0.00346)
<i>TANGIBILITY</i>	0.00777*** (0.00113)	0.00527*** (0.00104)	0.0103*** (0.00189)	0.00784** (0.00321)
<i>KSTRUCTURE</i>	0.0354*** (0.00253)	0.0190*** (0.00232)	0.0360*** (0.00422)	0.0262*** (0.00716)
<i>Intercept</i>	-0.742*** (0.0328)	-1.295*** (0.0300)	-2.813*** (0.0547)	0.878*** (0.0929)
<i>YEAR_FE</i>	Yes	Yes	Yes	Yes
<i>INDUSTRY_FE</i>	Yes	Yes	Yes	Yes
Observations	55,581	55,581	55,581	55,581
R-squared	0.091	0.086	0.038	0.011

Table 7 showcases the utilization of the entropy balancing approach to address selection bias in analyzing the effect of managerial ability (*M\_ABILITY*) on the repetitiveness of corporate disclosures, measured through similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). **Panel A** contrasts the pre- and post-balancing characteristics of treatment (high managerial ability) and control (low managerial ability) groups across several firm-specific characteristics and financial indicators. It displays the mean values for each variable in the pre-balanced and post-balanced scenarios, along with the differences between the treatment and control groups before and after applying entropy balancing. This method ensures that the two groups are comparable on observed covariates, mitigating the influence of selection bias. **Panel B** presents post-entropy balanced regression results, indicating the impact of managerial ability on disclosure repetitiveness after adjusting for selection bias. The table reports coefficients for *M\_ABILITY* and control variables across four models, corresponding to different measures of repetitiveness. It includes fixed effects for year and industry to control for temporal and sectoral effects, enhancing the robustness of the findings. Significance levels are denoted with asterisks (\*\*\*)  $p < 0.01$ , (\*\*)  $p < 0.05$ , (\*)  $p < 0.1$ ), highlighting the precision of the estimated effects. Standard errors are provided in parentheses to indicate the estimation accuracy. Definitions of all variables and additional methodological details are thoroughly documented in Appendix B, ensuring transparency and facilitating further research exploration.

**Table 8.** Regression Results of Managerial Ability and Investment Efficiency Interactions on Repetition

<b>Panel A. Residual Investment Model</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0198*** (0.00400)	-0.0114*** (0.00370)	-0.0219*** (0.00675)	-0.0191* (0.0115)
<i>OVERI</i>	-0.000351 (0.000372)	-0.000379 (0.000344)	-0.000775 (0.000628)	1.96e-05 (0.00107)
<i>M_ABILITY</i> × <i>OVERI</i>	0.000972 (0.00400)	0.000903 (0.00370)	0.000942 (0.00675)	0.00318 (0.0115)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,501	55,501	55,501	55,501
R-squared	0.107	0.094	0.128	0.029

  

Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0197*** (0.00414)	-0.0113*** (0.00383)	-0.0221*** (0.00698)	-0.0221* (0.0119)
<i>UNDERI</i>	-0.00145 (0.000924)	-0.000237 (0.000855)	-0.000821 (0.00156)	-0.00168 (0.00265)
<i>M_ABILITY</i> × <i>UNDERI</i>	-0.00259 (0.0146)	0.000549 (0.0135)	-0.00535 (0.0246)	-0.0422 (0.0418)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,501	55,501	55,501	55,501
R-squared	0.107	0.094	0.128	0.029

  

<b>Panel B. XInvestment and OVERI, UNDERI Models</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0271*** (0.00479)	-0.0142*** (0.00444)	-0.0278*** (0.00809)	-0.0205 (0.0137)
<i>OVERI</i>	-0.00195 (0.00119)	-0.000732 (0.00110)	-0.00275 (0.00201)	-0.00117 (0.00342)
<i>M_ABILITY</i> × <i>OVERI</i>	0.0229*** (0.00768)	0.00815 (0.00710)	0.0190 (0.0130)	0.00677 (0.0220)

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**Table 8.** Regression Results of Managerial Ability and Investment Efficiency Interactions on Repetition

<b>Panel B. XInvestment and OVERI, UNDERI Models</b>				
<i>(Continued)</i>				
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.107	0.095	0.128	0.029
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0157*** (0.00497)	-0.0108** (0.00460)	-0.0204** (0.00839)	-0.00879 (0.0142)
<i>UNDERI</i>	0.00114 (0.00115)	-0.00108 (0.00106)	-0.000938 (0.00193)	0.000430 (0.00328)
<i>M_ABILITY</i> × <i>UNDERI</i>	-0.00892 (0.00755)	-0.00234 (0.00698)	-0.00417 (0.0127)	-0.0238 (0.0216)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.107	0.095	0.128	0.029

Table 8 details the regression results exploring the interplay between managerial ability (*M\_ABILITY*), investment efficiency (represented by *OVERI* for overinvestment and *UNDERI* for underinvestment), and their interactions on the repetitiveness of corporate disclosures, quantified through similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). **Panel A**, Residual Investment Model, explores the direct impacts of overinvestment (*OVERI*) and underinvestment (*UNDERI*) and their interactions with managerial ability on disclosure repetitiveness. Each regression includes intercept and control variables (*C & CONTROLS*) to account for other factors influencing repetitiveness, along with year fixed effects and industry fixed effects to mitigate temporal and sector-specific biases. **Panel B**, XInvestment and *OVERI*, *UNDERI* Models, delves into how investment decisions, categorized by efficiency and moderated by managerial ability, influence corporate disclosure patterns. This panel's focus is on the strategic implications of investment efficiency on repetitiveness in MD&A disclosures. The results are presented with standard errors in parentheses to highlight estimation precision, and significance levels are marked accordingly (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ), offering insights into the statistical relevance of each variable. Definitions for all variables and further methodological details are systematically outlined in Appendix B, facilitating transparency and aiding in the replication and extension of the research findings.

**Table 9.** Regression Results of Managerial Ability on Repetition (Big Four vs. Non-Big Four Auditors)

<b>Panel A. Big-Four Auditors</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0189*** (0.00439)	-0.00994** (0.00410)	-0.0189** (0.00752)	-0.0317** (0.0126)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	39,578	39,578	39,578	39,578
R-squared	0.115	0.097	0.130	0.034
<b>Panel B. Non-Big Four Auditors</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0214** (0.00926)	-0.0152* (0.00841)	-0.0259* (0.0151)	-0.00820 (0.0262)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	16,003	16,003	16,003	16,003
R-squared	0.101	0.089	0.123	0.040

Table 9 reports the differential effects of managerial ability on the repetitiveness of corporate disclosures, segmented by the auditing oversight of either Big-Four or Non-Big Four auditors. This bifurcation allows for an assessment of whether the auditing firm's stature influences the relationship between managerial ability and disclosure practices, as measured by similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). **Panel A** focuses on firms audited by Big Four auditors, presenting the regression results that quantify the impact of managerial ability (*M\_ABILITY*) on the repetitiveness of disclosures. The analysis controls for other influencing factors (*C & CONTROLS*), incorporates year fixed effects, and industry fixed effects to control for temporal and sector-specific variations. **Panel B** shifts the focus to firms audited by Non-Big Four auditors, providing a comparative analysis to ascertain any differences in the managerial ability's impact on disclosure repetitiveness across different auditor oversight contexts. Similar to Panel A, this section includes control variables, fixed effects, and provides information on observations count and the model's fit. The regression coefficients are accompanied by standard errors in parentheses, highlighting the statistical significance of managerial ability's impact on disclosure repetitiveness under different auditing conditions. Significance levels are marked with asterisks, indicating p-values (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1), elucidating the robustness of the findings. Definitions and additional details regarding the variables and methodology employed are comprehensively outlined in Appendix B, ensuring clarity and facilitating future research endeavors.

**Table 10. Regression Results of Managerial Ability and Readability Interactions on Repetition**

<b>Panel A. FOG Index</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0427*** (0.00808)	-0.0325*** (0.00747)	-0.0557*** (0.0136)	-0.0853*** (0.0231)
<i>FOG</i>	-0.00153*** (0.000232)	-0.00155*** (0.000214)	-0.00408*** (0.000390)	0.00467*** (0.000663)
<i>M_ABILITY</i> × <i>FOG</i>	0.00197*** (0.00400)	0.00180*** (0.00370)	0.00295*** (0.00675)	0.00540*** (0.0115)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.108	0.096	0.131	0.034
<b>Panel B. SMOG Index</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0556*** (0.00955)	-0.0530*** (0.00885)	-0.0930*** (0.0161)	-0.0946*** (0.0274)
<i>SMOG</i>	0.00246*** (0.000288)	0.000728*** (0.000267)	-0.000435 (0.000487)	0.00386*** (0.000827)
<i>M_ABILITY</i> × <i>SMOG</i>	0.00217*** (0.000536)	0.00253*** (0.000496)	0.00437*** (0.000905)	0.00462*** (0.00154)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.110	0.096	0.128	0.030
<b>Panel C. ARI Index</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0484*** (0.00835)	-0.0412*** (0.00773)	-0.0698*** (0.0141)	-0.107*** (0.0239)
<i>ARI</i>	-0.000917*** (0.000172)	-0.000454*** (0.000159)	-0.00169*** (0.000290)	0.00133*** (0.000492)
<i>M_ABILITY</i> × <i>ARI</i>	0.00170*** (0.000431)	0.00174*** (0.000399)	0.00284*** (0.000728)	0.00512*** (0.00124)

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**Table 10.** Regression Results of Managerial Ability and Readability Interactions on Repetition

<b>Panel C. ARI Index</b>				
<i>(Continued)</i>				
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.108	0.095	0.129	0.031

  

<b>Panel D. FK Index</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0483*** (0.00861)	-0.0380*** (0.00797)	-0.0664*** (0.0145)	-0.0927*** (0.0247)
<i>FK</i>	-0.000236 (0.000216)	-0.000492** (0.000200)	-0.00200*** (0.000364)	0.000965 (0.000618)
<i>M_ABILITY × FK</i>	0.00196*** (0.000524)	0.00182*** (0.000485)	0.00308*** (0.000884)	0.00505*** (0.00150)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.107	0.095	0.128	0.030

Table 10 examines the influence of managerial ability on the repetitiveness of corporate disclosures, with a special focus on the interaction between managerial ability and the readability of financial texts. The analysis is differentiated by readability indexes including the *FOG* Index, *SMOG* Index, *ARI* Index, and *FK* Index, offering a view of how textual complexity might mediate the relationship between managerial qualities and disclosure practices. **Panel A** presents the regression results using the *FOG* Index, a commonly used readability metric that assesses the complexity of texts based on word and sentence length. The interaction term between managerial ability (*M\_ABILITY*) and the *FOG* Index (*M\_ABILITY × FOG*) highlights how readability influences the association between managerial ability and repetitiveness across different similarity measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). **Panel B** shifts the focus to the *SMOG* Index, another readability measure that estimates the years of education needed to understand a piece of writing. Similar to Panel A, this section explores how the *SMOG* Index interacts with managerial ability to affect disclosure repetitiveness. **Panel C** employs the *ARI* Index, which uses characters per word and words per sentence to gauge text complexity, to further dissect the relationship between managerial ability, text readability, and repetitiveness in financial disclosures. **Panel D** uses the *FK* Index, a readability test focusing on word and sentence length to determine the reading level of text, to complete the exploration of how various readability metrics interact with managerial ability to influence the nature of corporate disclosures. Across all panels, regression models include a set of control variables (*C & CONTROLS*) alongside year fixed effects and industry fixed effects to account for potential confounding factors. The regression coefficients are accompanied by standard errors in parentheses, highlighting the statistical significance of managerial ability's impact on disclosure repetitiveness under different auditing conditions. Significance levels are marked with asterisks, indicating p-values (\*\*\*)  $p < 0.01$ , (\*\*)  $p < 0.05$ , (\*)  $p < 0.1$ ). Definitions for all the variables are systematically outlined in Appendix B, facilitating transparency and aiding in further academic exploration.

**Table 11.** Regression Results of Managerial Ability and Tone Interactions on Repetition

<b>Panel A. TONE1</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0259*** (0.00475)	-0.0195*** (0.00440)	-0.0374*** (0.00802)	-0.0523*** (0.0136)
<i>TONE1</i>	-0.220 (0.170)	-0.272* (0.158)	-0.103 (0.287)	2.723*** (0.488)
<i>M_ABILITY</i> × <i>TONE1</i>	-1.102** (0.458)	-1.415*** (0.424)	-2.744*** (0.774)	-5.918*** (1.314)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.108	0.096	0.129	0.030
<b>Panel B. TONE2</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0256*** (0.00511)	-0.0223*** (0.00473)	-0.0416*** (0.00862)	-0.0425*** (0.0147)
<i>TONE2</i>	-0.0138*** (0.00375)	-0.0131*** (0.00347)	-0.0135** (0.00633)	0.00691 (0.0108)
<i>M_ABILITY</i> × <i>TONE2</i>	-0.0198* (0.0104)	-0.0354*** (0.00960)	-0.0644*** (0.0175)	-0.0777*** (0.0298)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	55,581	55,581	55,581	55,581
R-squared	0.109	0.098	0.130	0.029

Table 11 delves into the interplay between managerial ability and the emotional tone of corporate disclosures, as measured through two distinct tone indicators (*TONE1* and *TONE2*), and their effects on the repetitiveness of these disclosures. This analysis aims to shed light on how the sentiment conveyed in financial reporting interacts with managerial quality to influence disclosure patterns, using various similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) as measures of repetitiveness. **Panel A** focuses on *TONE1*, exploring its direct impact and its interaction with managerial ability (*M\_ABILITY* × *TONE1*) on the repetitiveness of disclosures. The regression models incorporate a comprehensive set of control variables (*C & CONTROLS*) along with year fixed effects and industry fixed effects to control for potential external influences. The analysis demonstrates significant interactions between managerial ability and *TONE1* across all measures of repetitiveness, highlighting the relationship between the sentiment of disclosures and the effectiveness of managerial communication strategies. **Panel B** examines *TONE2*, providing a parallel analysis to assess whether different aspects of emotional tone have distinct effects on disclosure repetitiveness.

(Continued on next page)

**Table 11.** *Regression Results of Managerial Ability and Tone Interactions on Repetition*

*(Continued)*

Like Panel A, this section reports the impacts of managerial ability, *TONE2*, and their interaction on the four similarity measures. The findings reveal that both the tone of disclosures and the interaction between tone and managerial ability significantly affect the nature of corporate communications, with variations in significance and effect sizes across different measures of repetitiveness. Each regression model's coefficients are presented with standard errors in parentheses, indicating the precision of the estimates, and significance levels are denoted with asterisks (\*\* $p < 0.01$ , \* $p < 0.05$ , \* $p < 0.1$ ), underscoring the robustness of the findings. Definitions for all variables used in the analysis and further methodological details are comprehensively outlined in Appendix B.

**Table 12. Comparative Analysis of CEO Abilities on Disclosure Repetitiveness**

<b>Panel A. The Impact of Strategic Ability on Disclosure Repetitiveness</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_STR_ABILITY</i>	-0.00483** (0.00245)	-0.00591** (0.00235)	-0.0108** (0.00433)	-0.00307 (0.00732)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	45,360	45,360	45,360	45,360
R-squared	0.087	0.080	0.106	0.031
<b>Panel B. Comparing the Effects of Managerial and Strategic Abilities</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0187*** (0.00407)	-0.0117*** (0.00391)	-0.0212*** (0.00721)	-0.0218* (0.0122)
<i>M_STR_ABILITY</i>	-0.00478* (0.00245)	-0.00588** (0.00235)	-0.0107** (0.00433)	-0.00301 (0.00732)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	45,360	45,360	45,360	45,360
R-squared	0.088	0.080	0.106	0.031
<b>Panel C. Interaction Effects Between Managerial and Strategic Abilities</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>M_ABILITY</i>	-0.0187*** (0.00407)	-0.0117*** (0.00391)	-0.0212*** (0.00721)	-0.0220* (0.0122)
<i>M_STR_ABILITY</i>	-0.00363 (0.00325)	-0.00666** (0.00312)	-0.00941 (0.00575)	0.00264 (0.00971)
<i>M_ABILITY</i> × <i>M_STR_ABILITY</i>	-0.0112 (0.0208)	0.00759 (0.0199)	-0.0125 (0.0368)	-0.0550 (0.0621)
<i>C &amp; CONTROLS</i>	YES	YES	YES	YES
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	45,360	45,360	45,360	45,360
R-squared	0.088	0.080	0.106	0.031

(Continued on next page)

**Table 12.** *Comparative Analysis of CEO Abilities on Disclosure Repetitiveness*

*(Continued)*

Table 12 conducts an examination of the effects of CEOs' abilities on the repetitiveness of corporate disclosures, differentiating between managerial and strategic abilities. The analysis is structured into three panels to dissect the impact of strategic ability, compare the effects of managerial and strategic abilities, and explore their interaction effects on disclosure repetitiveness. **Panel A** centers on the influence of strategic ability (*M\_STR\_ABILITY*) on disclosure repetitiveness, using similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) as the measures. The results indicate a significant impact of strategic ability on some aspects of disclosure repetitiveness, with coefficients suggesting varying levels of influence across different similarity measures. Control variables (*C & CONTROLS*), year fixed effects, and industry fixed effects are included to account for external factors, ensuring a robust analysis. **Panel B** advances the discussion by comparing the effects of managerial ability (*M\_ABILITY*) and strategic ability (*M\_STR\_ABILITY*) on disclosure repetitiveness. This comparative analysis reveals how each type of ability distinctly influences the repetitiveness of financial reporting, providing insight into the specific attributes of CEO capabilities that affect disclosure practices. **Panel C** delves into the interaction effects between managerial and strategic abilities, examining how the combination of these abilities influences disclosure repetitiveness. This analysis aims to uncover synergies or tensions between different types of CEO abilities and their collective impact on financial reporting practices. Across all panels, the regression coefficients are presented with standard errors in parentheses to denote estimation precision, and significance levels are denoted with asterisks (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ), indicating the statistical significance of the findings. Definitions and additional details about the variables used in the analysis are thoroughly documented in Appendix B, facilitating transparency and further academic inquiry.

# Appendices

## **Appendix A. Section Definitions in 10-Ks**

Items	Definition
Item 1	Business
Item 1A	Risk Factors
Item 2	Properties
Item 3	Legal Proceedings
Item 4	Mine Safety Disclosures
Item 5	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities
Item 6	Selected Financial Data
Item 7	Management's Discussion and Analysis of Financial Condition and Results of Operations
Item 7A	Quantitative and Qualitative Disclosures About Market Risk
Item 8	Financial Statements and Supplementary Data
Item 9	Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
Item 9A	Controls and Procedures
Item 9B	Other Information
Item 10	Directors, Executive Officers and Corporate Governance
Item 11	Executive Compensation
Item 12	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters
Item 13	Certain Relationships and Related Transactions, and Director Independence
Item 14	Principal Accounting Fees and Services

**Source:** Cohen et al. (2020)

Appendix A provides detailed definitions for various sections within the Form 10-K, a comprehensive report filed annually by publicly traded companies to the U.S. Securities and Exchange Commission (SEC). This mandatory filing offers a thorough overview of the company's business, financial condition, and operational results over the past fiscal year. While the structure and content of the 10-K are largely prescribed by SEC regulations, companies do have some discretion in the extent and detail of the information provided. This flexibility allows for voluntary disclosures that companies may include to enhance transparency, provide additional context, or address specific investor concerns beyond the regulatory requirements. Each item listed in the 10-K, as outlined in Appendix A, contributes to a comprehensive understanding of these mandatory and voluntary aspects of corporate reporting.

**Appendix B. Variable Definition**

Variables	Definition	Authors
<b>Dependent Variable</b>		
<i>REPETITION</i>	= <b>Sim_Cosine (Cosine Similarity):</b> Measures the cosine angle between two term frequency vectors from documents, capturing the closeness in textual content. <b>Sim_Jaccard (Jaccard Similarity):</b> Computes similarity by evaluating the intersection over the union of terms in two documents. <b>Sim_MinEdit (Minimum Edit Distance):</b> Represents the fewest operations needed to transform one document into another. <b>Sim_Simple (Simple Similarity):</b> Measures the fraction of identical content between two documents based on word changes.	Cohen et al. (2020), Brown et al. (2011), Brown et al. (2018)
<b>Independent Variable</b>		
<i>M_ABILITY</i>	= CEO managerial ability scores developed by Demerjian et al. (2012)	Hasan (2020), Lin et al. (2021), Gan (2019)
<b>Control Variables</b>		
<i>ZSCORE</i>	= $0.033 \times \text{earnings before extraordinary item (ib)} / \text{total assets (at)} + \text{sales (sale)} / \text{total assets (at)} + 0.014 \times \text{retained earnings (re)} / \text{total assets (at)} + 0.012 \times \text{working capital (wcap)} / \text{total assets (at)} + 0.006 \times (\text{market value of common stock (MV)} / \text{total liabilities (lt)})$ ;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>LOSS</i>	= An indicator variable equal to 1 if net income (ni) is negative, and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>SIZE</i>	= Natural log of market value of equity (csho * prcc_f).	Hasan (2020), Lin et al. (2021)
<i>AGE_LN</i>	= Age is measured as the number of years since the firm was first covered by the Center for Research in Securities Prices (CRSP). We measure AGE_LN as the natural log of (1+ age of the firm).	Hasan (2020)
<i>SPEC</i>	= Special items, measures as the amount of special items (spi) divided by total assets.	Hasan (2020)
<i>SALE_VOL</i>	= standard deviation of sales (sale), scaled by average total assets (at) over the previous 5 years;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>NONMISS_LN</i>	= Natural log of the number of items in Compustat with non-missing values.	Hasan (2020)
<i>DAC</i>	= Absolute discretionary accruals calculated using the performance-adjusted Modified Jones model.	Hasan (2020), Gan (2019)
<i>ROE</i>	= Profitability of the firm, measured as net income scaled by common equity.	Hasan (2020)

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**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>INVT_VOL</i>	= The standard deviation of total investments (invt), scaled by the average total assets over the previous 5 years	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>CFO_SALE</i>	= Operating cash flows divided by sales;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>MTOB</i>	= The ratio of the market value of total assets to book value of total assets	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>SLACK</i>	= The ratio of cash (che) to PPE (ppegt);	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>DIV</i>	= An indicator variable equal to 1 if the firm paid dividends (dvc), and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>TANGIBILITY</i>	= PPE divided by total assets;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>KSTRUCTURE</i>	= Long-term debt (dltt) divided by the sum of long-term debt and the market value of equity	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>INDUSTRY FE</i>	= Industry dummy to control for industry fixed effect.	Hasan (2020)
<i>YEAR FE</i>	= Dummy variables to control for fiscal year effect.	Hasan (2020)
<b>Additional Variables</b>		
<i>CAP_INT</i>	= Capital intensity measured as the net property, plant and equipment (ppent) scaled by total assets.	Hasan (2020)
<i>Industry-adjusted ROA</i>	= A measure spanning five years, from year t-5 to year t-1, calculated by normalizing income (excluding extraordinary items) with average total assets, then subtracting the mean ROA of the corresponding two-digit SIC industry for each firm-year.	Baik et al. (2011), Yuan et al. (2019)
<i>M_ABILITY_DUM</i>	= A dummy variable used to indicate managerial ability. Managers are ranked based on ability scores by both industry and year, with those in the top quartile for consecutive years t and t-1 identified as high-ability. <i>MA_DUM</i> is assigned a value of '1' for firms led by these high-ability managers and '0' otherwise.	Huang and Xiong (2023)

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**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>ResidualInvest</i>	<p>= Residuals from predicted investment regression using the model from Richardson (2006) along with Blaylock (2016) and estimated by industry and year.</p> $INVESTMENT_{i,t} = \beta_0 + \beta_1 MTOB_{i,t-1} + \beta_2 ROA_{i,t-1} + \beta_3 CASH_{i,t-1} + \beta_4 AGE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 LNASSET_{i,t-1} + \beta_7 INVESTMENT_{i,t-1} + YEAR\ FE + INDUSTRY\ FE + \varepsilon_{it}$ <ul style="list-style-type: none"> <li>○ <i>INVESTMENT</i> = Capital Expenditures (capx) + Acquisitions (aqc) + Research and Development Expenditures (xrd) – Cash Proceeds from the Sale of Property Plant and Equipment (sppe) + Depreciation (dpc). This value is scaled by the book value of assets in year <math>t - 1</math>. Missing values for capx, aqc, xrd, sppe, or dpc are set equal to 0.</li> <li>○ <i>ResidualInvest</i> is calculated as the error term from this regression equation. In this equation, Investment is the firm’s investment in the current year (see definition above).</li> <li>○ <i>MTOB</i> is the firm’s prior year market-to-book ratio (mkvalt to ceq).</li> <li>○ <i>ROA</i> is return on assets (ni to at OR oiadp to at).</li> <li>○ <i>CASH</i> is cash and cash equivalents, scaled by book value of assets from two years ago (check to L2.at).</li> <li>○ <i>AGE</i> is the number of years the firm has reported data in Compustat.</li> <li>○ <i>LEV</i> is long-term debt scaled by book value of assets (dltt to at).</li> <li>○ <i>LOGASSET</i> is log of book value of assets.</li> <li>○ Year Fixed Effect is an indicator variable for the year of the observation.</li> <li>○ Industry Fixed Effect is an indicator variable for the industry of the observation based on 2-digit SIC codes.</li> </ul>	Richardson (2006), Blaylock (2016), Khurana et al. (2018)
<i>ResidualInvest_Positive</i>	<p>= The positive value from the error term in the <i>ResidualInvest</i> equation. Higher positive values indicate the firm is undertaking greater levels of over-investment. Negative values of <i>ResidualInvest_Positive</i> are eliminated.</p>	Richardson (2006), Blaylock (2016), Khurana et al. (2018)
<i>ResidualInvest_Negative</i>	<p>= The negative value from the error term in the <i>ResidualInvest</i> equation. More negative values (values further from 0) indicate that the firm is undertaking greater levels of under-investment. Positive values of <i>ResidualInvest_Negative</i> are eliminated.</p>	Richardson (2006), Blaylock (2016), Khurana et al. (2018)

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**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>XInvestment</i>	= Residuals from predicted levels of investment, estimated using an industry-year benchmark model based on firm fundamentals. These residuals reflect the firm-specific deviation from optimal investment. A value close to zero suggests efficient investment behavior, while larger positive or negative residuals indicate potential over- or underinvestment. For analysis, these residuals are later classified into quartiles to construct <i>UNDERI</i> , <i>OVERI</i> , and a binary measure of investment efficiency.	Richardson (2006), Blaylock (2016), Khurana et al. (2018)
<i>UNDERI, OVERI</i>	<p>= First, we determine the residuals of a firm-specific deviation from optimal investment. The model is described as:</p> $INVESTMENT_{i,t+1} = \beta_0 + \beta_1 SALES\text{GROWTH}_{i,t} + \beta_2 LOG\text{ASSETS}_{i,t} + \beta_3 LEVERAGE_{i,t} + \beta_4 CASH_{i,t} + \beta_5 RETURN_{i,t} + \beta_6 LOGAGE_{i,t} + \text{YEAR FE} + \text{INDUSTRY FE} + \varepsilon_{it}$ <ul style="list-style-type: none"> <li>○ <i>INVESTMENT</i> is calculated by estimating an industry-year model of investments (defined as capital expenditures plus research and development plus acquisition expenditures less cash receipts from sales of property, plant, and equipment, multiplied by 100 and scaled by the average total assets) as a function of growth opportunities (as measured by sales growth, the percentage change in sales from year t-1 to t), the log of total assets, the ratio of financial leverage (total long term debt (dltt) + total debt in current liabilities (dlc) / total assets (at)), the ratio of cash to total asset, the stock return, and the log of the age of the firm in years.</li> <li>○ <i>SALES</i>GROWTH is defined as the percentage change in sales from year t-1 to t, capturing the firm's growth trajectory.</li> <li>○ <i>LN</i>ASSETS is the natural logarithm of the total book value of assets, providing a normalized measure of firm size.</li> <li>○ <i>LEVERAGE</i> is calculated as the sum of long-term debt (dltt) and current liabilities (dlc), divided by total assets (at), representing the firm's financial leverage.</li> <li>○ <i>CASH</i> is the ratio of cash and cash equivalents to total assets, reflecting liquidity.</li> <li>○ <i>RETURN</i> is the annual stock return, indicating the market's performance perception of the firm.</li> <li>○ <i>LOGAGE</i> (previously referred to as <i>AGE_LN</i> on page 135) is the natural</li> </ul>	Biddle et al. (2009), García-Sánchez and García-Meca (2018)

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**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>	<p>logarithm of the number of years the firm has reported data in Compustat, providing a measure of firm maturity.</p> <ul style="list-style-type: none"> <li>○ YEAR <i>FE</i> are fixed effects for the year of observation, controlling for temporal macroeconomic factors.</li> <li>○ INDUSTRY <i>FE</i> are fixed effects based on the firm's 2-digit SIC code, controlling for industry-specific dynamics.</li> </ul> <p>However, it could not be considered as a dependent variable due to these residuals identifying different deviations (negative and positive) from the optimal investment, so we rank this measure into quartiles and rescale the quartile rankings from 1 to 4. Firm-year observations in the middle two quartiles are classified as Investment_efficiency (<i>XInvestment</i>). Firm-year observations in the bottom quartile (i.e., the most negative residuals) are classified as Underinvestment (<i>UNDERI</i>), and observations in the top quartile (i.e., the most positive residuals) are classified as overinvestment (<i>OVERI</i>).</p> <p>In order to explain Investment_efficiency, we estimate a binomial logit model that tests the likelihood that a firm is in the middle two quartiles as opposed to the extreme quartiles. In order to predict under- and overinvestment decisions, we use the middle two quartiles classified as the benchmark group as opposed to one of the extreme quartiles. In this sense, for the overinvestment model, the bottom quartile (those that represent underinvestment companies) is omitted, while in the underinvestment equation, the top quartile (those that represent overinvestment companies) is not considered.</p>	
<i>BIGFOUR</i>	= Indicator variable that equals 1 if firm i's auditor is a Big N auditor, 0 otherwise. Big N auditors include Ernst & Young, Deloitte & Touche, KPMG, and PricewaterhouseCoopers.	De Franco et al. (2020)
<i>MD&amp;A_RPETITION</i>	= All similarity measures for consecutive MD&As (This suggests that MD&A content in year "t" echo content from MD&As of year "t-1").	Brown and Tucker (2011)
<i>FOG</i>	= The Gunning-Fog Index, calculated as: (words per sentence + percent of complex words) × 0.4.	Li (2019), De Franco et al. (2020), Dyer et al. (2017), Loughran and McDonald (2014, 2016)
<i>SMOG</i>	= $1.043 \times \sqrt{[30 \times \text{number of words with more than two syllables} / \text{number of sentences}] + 3.1291}$	Loughran and McDonald (2014, 2016)

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**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>ARI</i>	$= 4.71 \times (\text{characters/words}) + 0.5 \times (\text{words/sentences}) - 21.43$	Loughran and McDonald (2014, 2016)
<i>FK</i>	$= 0.39 \times [\text{number of words/number of sentences}] + 11.8 \times [\text{number of syllables/number of words}] - 15.59$	Loughran and McDonald (2014, 2016)
<i>TONE1</i>	$= (\text{positive word count} - \text{negative word count}) / \text{total word count}$	Marquez-Illescas et al. (2019), Loughran and McDonald (2011), Martikainen et al. (2023), Liu and Nguyen (2020)
<i>TONE2</i>	$= (\text{positive words} - \text{negative words}) / (\text{positive words} + \text{negative words})$	Marquez-Illescas et al. (2019), Loughran and McDonald (2011), Martikainen et al. (2023), Liu and Nguyen (2020)
<i>M_ABILITY_LAG</i>	= The lagged managerial ability	Cho et al. (2023)
<i>M_ABILITYA_AV</i>	= The yearly average managerial ability scores of firms within the same industry as an instrumental variable (denoted as).	Huang and Xiong (2023)
<i>M_STR_ABILITY</i>	= Strategic ability is quantified as the excess market value generated by the firm for each unit of change in capital stock. This measure is derived from a regression analysis where the firm's asset returns are regressed against changes in its capital stock, capturing the CEO's impact on strategic decision-making and value creation.	Mishra (2020, 2023)

**Appendix C. Detailed Methodology of CEO Managerial Ability as Proposed by Demerjian et al. (2012)**

Demerjian et al. (2012) developed an approach to quantify managerial ability, focusing on a CEO's talent in optimizing resource efficiency to enhance firm profitability. This methodology involves a two-step process:

1. **Data Envelopment Analysis (DEA):** The first step involves employing DEA to assess corporate efficiency. This analysis uses seven key inputs, differentiated by industry and year, to calculate a firm's output efficiency. The DEA model treats each firm as a unique decision-making unit, formulated as follows:

$$MAX_{\lambda} \frac{SALES}{V1 COGS + V2 SG\&A + V3 PPE + V4 OPLEASE + V5 R\&D + V6 GOODWILL + V7 OTHERINTAN}$$

Here,  $\lambda$  represents the firm's efficiency score, ranging between 0 and 1, where 1 indicates high efficiency and 0 indicates inefficiency in converting inputs into sales. The inputs include Cost of Goods Sold (COGS), Selling, General and Administrative Expenses (SG&A), Property, Plant, and Equipment (PPE), Operating Lease Expenses (OPLEASE), Research and Development Expenditures (R&D), GOODWILL, and other Intangible Assets (OTHERINTAN).

2. **Tobit Regression Model:** The second step involves regressing the firm efficiency scores obtained from DEA on six firm-specific variables within each industry. The model, incorporating both industry-fixed and year-fixed effects, is as follows:

$$\begin{aligned} Firm\ Efficiency = & \beta_0 + \beta_1 \ln(Total\ Assets) + \beta_2 Market\ Share + \beta_3 Positive\ FCF \\ & + \beta_4 \ln(Age) + \beta_5 Business\ Segment\ Concentration \\ & + \beta_6 Foreign\ Currency + YEAR\ FE \end{aligned}$$

In this model, Firm Efficiency is the efficiency score for a fiscal year. The explanatory variables include the natural logarithm of total assets ( $\ln(Total\ Assets)$ ), the firm's market share in its industry (*Market Share*), an indicator for positive free cash flow (*Positive FCF*), the natural logarithm of company age ( $\ln(Age)$ ), business segment concentration (measured as the sum of squares of the sales ratio per division to total firm sales), and a binary variable for foreign currency adjustments (*Foreign Currency*). The residuals from this regression model provide a continuous score of managerial ability. In our study, we utilize this managerial ability score (*MA\_ABILITY*) as a key variable. A higher score indicates superior managerial ability.

Essay 2 CEO Overconfidence and  
Strategic Repetition in 10-K  
Reports from Notes to MD&A

# CEO Overconfidence and Strategic Repetition in 10-K Reports from Notes to MD&A

## ABSTRACT

Recent interdisciplinary studies, particularly within the realms of accounting, have underscored the pivotal role of CEO characteristics, including overconfidence, in influencing firm performance and corporate decision-making. Drawing on upper echelons theory, this investigation delves into how CEO overconfidence dictates the strategic repetition in 10-K reports from the notes section to the Management Discussion and Analysis (MD&A). CEO overconfidence, a multifaceted concept traditionally associated with negative organizational outcomes, is reevaluated for its potential to foster varied communication styles in financial disclosures. Employing a comprehensive dataset of 23,132 firm-year observations from 1999 to 2022, we analyze repetition through four textual similarity measures: Cosine Similarity, Jaccard Similarity, Minimum Edit Distance, and Simple Similarity, aiming to unveil the strategic communication choices underpinned by CEO overconfidence. The definition of CEO overconfidence is based on the delay in stock option exercises, which reflects a CEO's expectation of higher future stock values and indicates overconfidence. Our findings reveal a significant negative relationship between CEO overconfidence and the extent of repetition in MD&As. This indicates that overconfident CEOs are likely to utilize less repetitive language, challenging traditional perceptions of overconfidence as exclusively detrimental. The study further explores the influence of CEO personal characteristics—age, tenure, and gender—on disclosure styles, uncovering that younger or less tenured CEOs tend towards less repetitive disclosures. Additionally, the influence of female gender in leadership further adds repetition in the communication styles of CEOs. To enhance the robustness of our findings, we conducted several tests using alternative measures for repetition and CEO overconfidence. Addressing the critical issue of endogeneity, we applied Propensity Score Matching (PSM) and the entropy balancing method, which further corroborated the significant negative link between CEO overconfidence and repetition. In additional analyses, this relationship persisted even when integrating other textual features into our framework, such as readability, sentiment analysis, and metrics like file size and length of MD&As. Our findings not only contribute to the literature on CEO overconfidence and corporate communication but also highlight the complex interplay between overconfidence and transparency in financial reporting. By illustrating how CEO overconfidence can lead to more transparent and efficient corporate disclosures, this research challenges the conventional narrative surrounding overconfidence and offers new insights into its potential benefits.

**Keywords:** CEO Overconfidence, Repetition, Upper Echelon Theory, Behavioral Decision Theory, Textual Analysis, 10-Ks.

# 1 Introduction

Recent interdisciplinary studies have highlighted the significant influence of CEO overconfidence on firm performance, merging insights from psychology, management, and finance. Central to this exploration in the field of management is the upper echelons theory<sup>50</sup>, which posits that the traits of CEOs, particularly overconfidence, play a crucial role in shaping organizational outcomes (Hambrick and Mason, 1984; Hambrick, 2007). Overconfidence<sup>51</sup>, defined as a CEO's exaggeratedly positive view of their own skills and knowledge (Anderson et al., 2012), has been identified as a pivotal characteristic affecting strategic decisions and thereby influencing firm performance across various sectors (Heavey et al., 2022). Psychological studies break down overconfidence into three main dimensions: overestimation (exaggerated self-view<sup>52</sup>), overplacement (belief in one's superiority), and overprecision (excessive confidence in one's knowledge), which collectively impact decision-making and risk-taking in corporate settings (Moore and Healy, 2008; Moore and Schatz, 2017). These facets of overconfidence integrate to form a broader understanding of how this trait influences a CEO's behavior and organizational strategies (Chen et al., 2015; Chung and Hribar, 2021; Lee et al., 2017; Pavićević and Keil, 2021).

<sup>50</sup> The upper echelons theory (Hambrick and Mason, 1984) posits that behavioral elements play a pivotal role in complex corporate decisions. In broader terms, CEOs' managerial traits can, to some extent, forecast strategic choices and organizational results (Hambrick and Mason, 1984).

<sup>51</sup> Our study concentrates on the concept of overconfidence, which refers to the tendency of people to overestimate their abilities, judgment, or likelihood of achieving successful life outcomes, often termed as “optimism” in this context. The existence of overconfidence has been explored in theoretical research by scholars like Benabou and Tirole (2002) and Van den Steen (2004). Furthermore, empirical studies in psychology and related fields have consistently shown that people, including experts, often exhibit overconfidence across various dimensions. However, it's also noted that there's a significant and enduring variation in the level of overconfidence among individuals. This has been documented in studies such as those by Oskamp (1985), Weinstein (1980), Brenner et al. (1996), and Puri and Robinson (2007).

<sup>52</sup> Overconfidence and narcissism are related yet distinct psychological constructs. Overconfidence encompasses overestimation (an exaggerated view of oneself), overplacement (the belief in one's superiority over others), and overprecision (excessive certainty in one's knowledge) (Duttie, 2016; Grezo, 2021). These dimensions focus on an individual's perception of their abilities and knowledge, not necessarily involving the self-aggrandizement or entitlement typical of narcissism (Lakey et al., 2008). Narcissism, while it may involve some level of exaggerated self-view, primarily centers on a grandiose self-image and a constant need for admiration and attention (Kaufman et al., 2020), which are not core aspects of overconfidence.

Beyond its broad impact on corporate strategies, CEO overconfidence has also been scrutinized within the accounting field for its influence on managerial practices and financial reporting. Studies have shown that overconfident CEOs are likely to engage in less than optimal investment choices, unprofitable acquisitions, and may even reduce corporate social responsibility efforts, thereby influencing overall organizational performance negatively (Malmendier and Tate, 2005; 2008; Tang et al., 2018; Park et al., 2018). Further research has delved into the impact of overconfidence on earnings forecasts and the incidence of financial misreporting or fraud, revealing that overconfident managers tend to give more importance to internal factors when predicting good performance, which leads to a higher likelihood of issuing optimistic forecasts and potentially manipulative reporting (Hilary and Hsu, 2011; Hribar and Yang, 2011; Libby and Rennekamp, 2012; Schrand and Zechman, 2012; Ahmed and Duellman, 2013).

Building on the earlier discussions, it becomes evident that CEO overconfidence not only shapes strategic decisions but also distinctly affects how CEOs communicate through corporate disclosures. This consolidated view incorporates the findings from behavioral decision theory, which have highlighted both the pitfalls and potential positive impacts of overconfidence on corporate actions. For example, while overconfident CEOs may lead their companies into risky investments and optimistic earnings forecasts, they also drive innovation and bold strategic moves that can enhance firm performance (Galasso and Simcoe, 2011; Reyes et al., 2022). The complex effects of overconfidence extend into financial reporting, where it influences not just the content but also the presentation and clarity of financial disclosures, affecting stakeholders' perceptions and actions (Libby and Rennekamp, 2012; Ahmed and Duellman, 2013).

Focusing on the understudied area of repetition<sup>53</sup> in financial disclosures, this study examines how CEO overconfidence affects the clarity and transparency of narrative reports. Narrative disclosures, as integral components of corporate financial disclosure, play a critical role in mitigating information asymmetry and agency conflicts between managers and external stakeholders (Li, 2010; Lo et al.,

<sup>53</sup> Repetition is a significant linguistic feature commonly used in corporate reports, often seen both within individual company filings and across various filings over time (Brown et al., 2022). It is not uncommon for companies to duplicate information across different sections of their filings, such as in the MD&A section, financial statement footnotes, and other parts of their documents. While repetition can assist in drawing investor attention to important information (Li, 2019), the Securities and Exchange Commission (SEC) has raised concerns that it might also conceal critical information, potentially impacting investor decisions (SEC, 2018a, 2019, 2020). This issue is especially significant regarding non-repeated information, which forms the bulk of content in company filings (FASB, 2001, 2012; Higgins, 2014; KPMG, 2011; PwC, 2014; Bloomfield, 2008; Cazier and Pfeiffer, 2017; Li, 2019).

2017). The textual component of financial disclosures, notably within 10-K reports, plays a pivotal role in communicating a company's performance and future prospects. While previous research has extensively explored the implications of overconfidence on decision-making and investment, less attention has been given to how it influences the repetitive use of information within corporate reports. Aiming to bridge a research gap, this study focuses on the strategic use of repetition, analyzing how content from the notes is selectively reiterated in MD&As<sup>54</sup> within the same 10-K<sup>55</sup> reports, influenced by CEO overconfidence<sup>56</sup>.

<sup>54</sup> In 10-K filings, the Management Discussion and Analysis (MD&A) section is often regarded as a crucial qualitative disclosure (Clarkson et al., 1999; Li, 2008; Tavcar, 1998). This segment allows managers to narratively describe the firm's performance. While there are certain mandated topics in MD&As, managers have the freedom to decide how extensively they discuss these topics and the language they use. As a result, much of the content in MD&As is effectively voluntary (Liu and Nguyen, 2020). From a behavioral perspective, the linguistic choices made in these corporate disclosures can unintentionally reveal managerial biases (Merkl-Davies and Brennan, 2011). Within this framework, disclosure repetition in MD&As emerges as a critical consideration, presenting a cost-benefit dilemma for regulators. Much repeated information is value-relevant, often highlighting key details (Cazier and Pfeiffer, 2017; Li, 2019). Nelson and Pritchard (2007) found MD&A disclosures to be 'sticky' in their cautionary language, with firms repeating risks even with marginal added benefit. Brown and Tucker (2011) observed an increase in boilerplate disclosures and a related decrease in market reaction, noting that firms with declining earnings often modify their MD&As more, suggesting a need for more explanation in the face of bad news. These insights underscore MD&As' complex role in corporate reporting, where linguistic choices, especially repetition, reflect managerial intent and impact market and regulatory perceptions.

<sup>55</sup> It's essential to acknowledge that a certain level of boilerplate content is indispensable for financial disclosures to maintain consistency and clarity over time. This standardization aids stakeholders in navigating the reports and tracking organizational changes with ease. However, the critique that overconfident CEOs might drive unnecessary changes to the narrative structure, prioritizing innovation over informational quality, raises a valid concern. This study posits that while innovative disclosures can reflect a firm's dynamic approach to communication, the value of such innovations must be balanced against the need for coherence and relevance to stakeholders.

<sup>56</sup> In addressing the distinction between repetition and boilerplate text within financial disclosures, it's pertinent to clarify that repetition, as investigated in this study, focuses primarily on the within-report repetition of text, particularly comparing the MD&A section to the notes within the same 10-K report for a given year. Additionally, as an extended metric, we consider the comparison of MD&As between consecutive reports (e.g., 10-Ks for 2022 and 2023) to assess year-over-year changes. This approach allows us to dissect the nuances of disclosure practices, distinguishing between necessary boilerplate content, which provides structure and consistency to reports, and innovative narrative elements that reflect significant business developments or strategic shifts.

This study draws from diverse theoretical backgrounds. Initially, upper echelons theory (Hambrick and Mason, 1984) provides the overarching framework, positing that CEO characteristics significantly influence corporate strategies and disclosures. For the potential positive relationship in terms of strategic management, obfuscation theory (Li, 2008; Bens et al., 2011) and agency theory (Smith and Taffler, 1992) posit that overconfident CEOs may prefer using repetitive language to strategically conceal underperformance. This deliberate use of repetition serves to emphasize selected achievements or projections, thereby manipulating the narrative to reflect favorably on their leadership and aligning corporate communications more closely with their personal ambitions. Adding to this, signaling theory (Merkl-Davies and Brennan, 2007; Bae et al., 2018) posits that such CEOs use repetition not merely for obfuscation but also to assertively communicate their confidence in the firm's prospects, enhancing perceived credibility and investor confidence.

Conversely, exploring the negative relationship, behavioral decision theory (Kahneman et al., 1982; Tversky and Kahneman, 1982) offers a counterpoint. This theory proposes that overconfident CEOs may lean towards less repetition and greater transparency, using their confidence to guide clear and efficient decision-making. This viewpoint is reinforced by insights from information asymmetry theory, which posits that detailed, concise disclosures can reduce market inefficiencies by better informing investors (Clarkson et al., 2007). Furthermore, cognitive dissonance theory (Abdulfatah, 2019) explains how overconfident CEOs might avoid repetitive content that conflicts with their self-image as innovative leaders, opting instead for fresh and insightful disclosures to maintain a narrative of progress and dynamism. This consideration adds complexity to understanding the impact of CEO overconfidence, suggesting it could either obscure or clarify critical information (for a detailed discussion, refer to Section 2). Hence, this research acknowledges the dual possibilities in the relationship between CEO overconfidence and repetition in MD&A disclosures, framing it as an open question warranting empirical exploration.

For this analysis, repetition (*REPETITION*) is understood as the degree to which information from the notes<sup>57</sup> (Section 8) is strategically echoed in the MD&A section

<sup>57</sup> The notes section in 10-K filings includes both mandatory and voluntary disclosures. Mandatory disclosures are required by regulatory standards and provide essential information such as accounting policies, financial statement details, and compliance data. Voluntary disclosures, however, are at the discretion of the company and may include additional data that management deems relevant for providing greater transparency or enhancing shareholder understanding. This mix influences the content's depth and breadth, affecting the overall transparency and information asymmetry in financial reporting.

(Section 7) of 10-K reports<sup>58</sup>. Drawing on methodologies from previous research (Cohen et al., 2020; Brown et al., 2011; Wang et al., 2023), we assess the annual content similarities between these sections using four textual similarity measures: Cosine Similarity, Jaccard Similarity, Minimum Edit Distance, and Simple Similarity. Furthermore, our main metric for assessing CEO overconfidence (*HOLDER67*) is derived from the approach regarding the timing of CEO option exercises<sup>59</sup>, as outlined by Malmendier and Tate (2005, 2008), Campbell et al. (2011), Hirshleifer et al. (2012), and Ahmed and Duellman (2013). Additional foundational data is obtained from the Compustat, BoardEx, and ExecuComp databases. Our comprehensive matched sample, which includes similarity metrics, CEO overconfidence, and other characteristics, along with board of directors and audit committee details, as well as other fundamental firm data from Compustat, covers the period from 1999 to 2022. This span encompasses a total of 23,132 firm-year observations.

In our analysis, we categorized CEOs as either cautious or overconfident<sup>60</sup> using the *HOLDER67* measure, focusing on the impact of CEO overconfidence on repetition in corporate disclosures. Our findings reveal a distinctive communication style among overconfident CEOs, characterized by lower similarity scores across several measures. This indicates a tendency for overconfident CEOs to adopt more varied communication styles in their MD&As, diverging from standard norms and templates. The main regression analysis corroborates this, showing a significant

<sup>58</sup> The importance of analyzing repetitive disclosures stems from several factors: (1) the MD&A section is a key reference in annual reports (Li, 2010); (2) regulatory bodies like the SEC, Financial Accounting Standard Board (FASB), and International Accounting Standards Board (IASB) are actively working to reduce redundant disclosures between the MD&A and notes; and (3) repetition between the MD&A and notes significantly surpasses the repetition found between the MD&A and other parts of 10-K reports (Li, 2019).

<sup>59</sup> Typically, CEOs, who often lack diversification in their investments, are expected to exercise their options and sell the acquired shares to reduce their vulnerability to company-specific risks. Nonetheless, an overconfident CEO may hold a belief in the continuous appreciation of the firm's value, leading to a postponement in exercising options, particularly when these options are significantly above the strike price (Ahmed and Duellman, 2013). In our methodology, a CEO is deemed overconfident if, on at least two occasions during our study period, the average intrinsic value of their exercisable yet unexercised options is over 67% of the average exercise price (Ahmed and Duellman, 2013). CEOs who do not satisfy this condition are considered not to be overconfident.

<sup>60</sup> For clarity, CEOs are categorized as either cautious (non-overconfident) or overconfident based on the *HOLDER67* measure, specifically using the 1st and 4th quartiles for differentiation. This classification employs a dummy variable, indicating exclusivity between states, precluding simultaneous classification as both overconfident and cautious in our analysis.

negative relationship between CEO overconfidence (*HOLDER67*) and repetition (similarity scores). This suggests that heightened overconfidence is linked to decreased repetitive communication, resonating with behavioral decision theory. This theory posits that inherent human biases like overconfidence, while typically diverging from traditional models of rational decision-making, can sometimes lead CEOs towards more transparent and less repetitive communication strategies. Additionally, the principles of information asymmetry theory imply that such communication practices may effectively reduce information gaps, aligning market perceptions more closely with strategic intentions. Furthermore, cognitive dissonance theory suggests that reducing repetition in disclosures may help overconfident CEOs align their communications with their self-perceived innovative and dynamic leadership style, thereby maintaining both internal consistency and external credibility. These insights enrich our understanding of the impact of CEO psychological traits on corporate communication strategies. Contrary to assumptions that overconfidence solely leads to obfuscation (as suggested by obfuscation and agency theories), this perspective, grounded in the works of Kahneman et al. (1982) and Tversky and Kahneman (1982), alongside subsequent studies (Chen et al., 2015; Picone et al., 2014; Reyes et al., 2022), underscores how overconfidence can enhance decision-making efficiency in uncertain contexts.

In additional analyses, this relationship persisted even when integrating other textual features into our framework, such as readability, sentiment analysis, and metrics like file size and length of MD&As. Moreover, we expanded our investigation to include CEO personal characteristics; age, tenure, and gender, as control variables. Drawing from the principles of upper echelon theory, this approach provided a comprehensive perspective on how these traits intersect with strategic communication in corporate settings. We observed that younger CEOs or those earlier in their tenure tend to engage in less repetitive and more diverse disclosure practices. In contrast, older, longer-tenured CEOs may favor more conservative and repetitive disclosures. The influence of more females in leadership further adds repetition in the communication styles of CEOs. Overall, our study contributes significantly to understanding how CEO overconfidence shape corporate communication strategies. It elucidates the impact of CEO overconfidence on corporate disclosures, challenging traditional perceptions of overconfidence and unveiling its potential to foster efficient and transparent communication. This insight, considered alongside existing theories on the impact of CEO traits on corporate behavior and stakeholder relationships, offers a novel perspective on the role of CEO psychological characteristics in shaping corporate communication strategies.

Our study further conducted a series of robustness tests, including alternative measures of repetition and CEO overconfidence. These tests, examining year-over-year MD&A similarities and stock purchase behaviors of CEOs (*PURCHASE*),

validated the consistency of our primary findings. To address endogeneity, a pivotal concern in our research, we employed Propensity Score Matching (PSM) and the Entropy Balancing approach. Results from these methodologies affirmed the significant negative relationship between CEO overconfidence and communication similarity measures, underscoring the distinct communication styles of overconfident CEOs.

This study enriches the existing body of literature in several ways. First, it extends the understanding of how individual traits, particularly CEO overconfidence, influences corporate disclosure decisions. While previous studies have established that CEO overconfidence impacts various corporate behaviors (Hirshleifer et al., 2012; Malmendier and Tate, 2005, 2008; Malmendier et al., 2011), as well as corporate accounting choices (Ahmed and Duellman, 2013; Schrand and Zechman, 2012) and management forecasts (Hribar and Yang, 2016), this paper contributes by exploring how CEO overconfidence affects a significant textual feature in corporate disclosures: repetition in the MD&A sections<sup>61</sup> of 10-K filings. In this context, this study uniquely investigates the relationship between CEO overconfidence and the usage of repetition within MD&As, expanding our understanding of how overconfidence manifests in different forms of corporate communication. This approach not only complements prior research that primarily examined earnings information and press releases but also provides novel insights into the subtler aspects of corporate disclosure influenced by CEO personal trait.

Second, this study adds a significant dimension to the understanding of the factors influencing corporate disclosures, specifically focusing on repetition in MD&A sections of 10-K reports. While previous research has predominantly concentrated on the tone of press releases and their use in achieving personal benefits or misleading the market about firm fundamentals (Arslan-Ayaydin et al., 2016; Huang et al., 2014), there has been limited examination of large samples of disclosures related to firms' actual activities. Notable exceptions include Merkley (2014), who highlighted how managers adjust R&D disclosures in 10-K reports based on earnings performance, and Ma (2019), who found that investor reactions to

<sup>61</sup> The focus on MD&As in 10-Ks is pivotal because, unlike press releases which are used to publicize management's opinions on a variety of topics including future prospects and firm profitability, MD&As offer a more structured and comprehensive overview of the company's financial health, strategies, and performance. While press releases allow management full control over content and presentation and often contain softer, more flexible information, MD&As in 10-K filings provide a more formal, regulated, and detailed account of a company's operational and financial aspects. This difference in the nature of disclosures makes MD&As an intriguing subject for studying the impact of CEO overconfidence, especially in terms of repetition, which can indicate a range of managerial attitudes and strategic focuses.

operations-related disclosures are more significant than their reactions to 10-K/Q reports and 8-K filings. This highlights the distinct impact of specific operations disclosures on investor decisions. Building on this, our research uniquely addresses the gap by examining how CEO overconfidence impacts the use of repetition in MD&As. Unlike Gong (2023), who demonstrated that CEO overconfidence enhances the positive tone in investment-related press releases but does not affect earnings-related releases, this study reveals that CEO overconfidence decreases repetition in MD&As. This finding is significant as it suggests a move towards greater transparency in corporate disclosures.

Third, our findings suggest that CEO overconfidence, rather than prompting risk-taking behavior, leads to more direct and clear communication in financial reporting. This characteristic of overconfident CEOs contributes to enhanced firm transparency, marking a departure from the traditional association of overconfidence with strategic risk-taking. This insight is crucial as it provides robust empirical support for upper echelons theory's proposition that CEO impacts are realized through strategic decisions, especially in contexts allowing for more executive freedom. Our study responds to the recent calls for more detailed exploration into the mechanisms through which CEO overconfidence affects firm outcomes (Heavey et al., 2022). By demonstrating that CEO overconfidence can lead to more transparent and less formulaic disclosures within the same report—specifically by avoiding the repetition of the same information in both the MD&A and the notes—our work paves the way for future investigations. This new understanding can further refine and expand the academic discourse on CEO psychological traits and their impact on financial reporting transparency.

Fourth, incorporating insights from Dyer et al. (2016), we propose that beyond adherence to disclosure regulations, an important determinant of repetition in MD&As is managerial discretion. This discretion often serves to either enhance or impair the transparency of disclosures. Supporting this, studies by Li (2008) and Loughran and McDonald (2014) show that worse-performing firms are linked with longer 10-K reports, indicating that managers may use length as a mechanism to address poor earnings. This aligns with findings that narrative disclosures tend to be less readable and include additional explanations when performance is poor (Jones and Shoemaker, 1994; Li, 2010; Merkley, 2014; Guay et al., 2016; Bushee et al., 2018). In essence, our study contributes a novel perspective by highlighting how CEO overconfidence can lead to a decrease in repetition within MD&As, thereby potentially enhancing the clarity and transparency of corporate financial reporting. This provides a new understanding of the complex interplay between CEO psychological traits and disclosure practices in the corporate world.

This paper is structured as follows: Section 2 delves into the theoretical background, while Section 3 covers the literature review and hypothesis

development. Section 4 describes our research methodology. Section 5 presents the empirical results and sensitivity checks. Additional analyses are provided in Section 6. The paper concludes with Section 7.

## 2 Theoretical Background

This section outlines the theoretical backdrop of our study, beginning with the upper echelons theory. This framework posits that the characteristics of top executives, particularly their cognitive backgrounds and values, critically shape their strategic choices and the firm's performance outcomes. We then focus on the attribute of CEO overconfidence, exploring its implications for corporate decision-making, and especially financial reporting. The discussion extends to contrasting theoretical perspectives on CEO overconfidence's impact on corporate disclosures. First, we examine the positive relationship between CEO overconfidence and increased repetition, as suggested by obfuscation and agency theories, indicating a tendency toward less transparent disclosures. Conversely, we explore behavioral decision theory's suggestion of a negative relationship, where CEO overconfidence may lead to decreased repetition and enhanced transparency. These viewpoints collectively offer an understanding of how CEO overconfidence could influence the style and content of corporate communication.

### 2.1 Upper Echelons Theory, CEO Overconfidence and Decision-Making

Upper echelons theory posits that the attributes of top executives—such as their cognitive backgrounds, values, and perceptions—directly shape their strategic choices and, by extension, firm performance (Hambrick and Mason, 1984). These executives' perceptions of situations, influenced by their personal characteristics, dictate their attention, interpretation of information, and strategic decisions (Hambrick, 2007). This theory underscores the behavioral underpinnings of strategic management, highlighting how top managers' inherent traits influence company outcomes.

Incorporating the principles of upper echelons theory, this study posits that the personal characteristics of CEOs can significantly influence the textual features of corporate disclosures. The theory suggests that the cognitive backgrounds, values, and perceptions shaped by a CEO's personality traits and experiences directly impact their strategic choices, including how they communicate in corporate disclosures. These personal attributes, therefore, not only guide their strategic decisions but also manifest in the way information is presented and articulated in documents like 10-K reports. Observable traits of CEOs, such as their demographic characteristics (Kish-Gephart

and Campbell, 2015), personality profiles (Harrison et al., 2020), and behavioral patterns (Simsek et al., 2010; Cragun et al., 2020; Wowak et al., 2016; Ou et al., 2018), are indicative of their cognitive frameworks. These frameworks are critical in determining how CEOs perceive, interpret, and subsequently report company information, influencing the structure, tone, and content of financial disclosures.

The evolving scope of upper echelons theory, especially its process-oriented approach, also suggests a deeper exploration of how these CEO traits mediate the relationship between strategic decisions and firm performance (Liu et al., 2018; Neely et al., 2020). In this context, the manner in which CEOs articulate and repeat information in disclosures such as MD&As can be seen as a strategic choice influenced by their personal characteristics, reflecting a deeper link between CEO psychology and the textual features of corporate disclosures. This perspective aligns with recent empirical studies (Jeong and Harrison, 2017; Ou et al., 2018) and offers an understanding of how CEO attributes shape the narrative style and content in corporate communication.

Narrowing down the general implications of upper echelons theory to the specific context of CEO overconfidence, this concept is rooted in the social psychology 'better-than-average' effect, where individuals, including CEOs, generally view themselves more supercilious compared to others (Larwood and Whittaker, 1977; Svenson, 1981). This overconfidence impacts their self-assessment and risk perception, leading to a tendency to credit successes to personal actions and attribute failures to external factors (Miller and Ross, 1975). This study aims to explore how CEO overconfidence affects the repetitive disclosures in MD&A sections of 10-K reports<sup>62, 63</sup>. It aims to uncover new dimensions of how CEO

<sup>62</sup> Repetitive disclosures serve as an effective method for conveying information to recipients, with the MD&A and notes in 10-K reports acting as distinct information channels (Stephens, 2008). This approach is informative as it accounts for the possibility that users might overlook information in one section but catch it in another. Contrary to overloading the user's processing capacity, repeating information across different channels, like in both the MD&A and notes, actually reinforces it (Dahle, 1954). In the context of financial disclosures, significant events, often unforeseen operational occurrences affecting a firm's financial performance, can be highlighted through this method. Managers, with their direct knowledge, may opt for repetitive disclosures to communicate crucial events, ensuring that all investors, regardless of whether they read only the MD&A or the notes, receive essential information. This strategy is particularly relevant for ensuring widespread awareness of important matters among all readers of the 10-K.

<sup>63</sup> While the SEC requires specific topics be discussed in the MD&A, managers exercise discretion with respect to the extent of detail provided and the language used in these disclosures. Thus, while firms may be required to provide MD&As, the content of these disclosures is voluntary in nature and managers may choose to disclose information relating to a given firm. Given the potential for a larger market response, we argue that managers will be strategic in their choice of language used in MD&As.

psychology, particularly overconfidence, shapes the textual features of corporate financial reporting. Prior research demonstrates that market participants respond not only to the content, but also to the form and language used in different financial disclosures (e.g., Kothari et al., 2009; Loughran et al., 2009; Li, 2010; Loughran and McDonald, 2011; Jegadeesh and Wu, 2013; Audi et al., 2016). Given that firms communicate their performance through diverse channels, including MD&As as explored in this study, it prompts an examination of the distinct roles and objectives behind various disclosure types that ostensibly present similar information.

## 2.2 Positive Aspects of CEO Overconfidence and Repetition: Insights from Obfuscation and Agency Theories

To comprehensively explore the relationship between CEO overconfidence and increased repetition in corporate disclosures, we integrate the principles of obfuscation, agency, and signaling theories. This approach examines how overconfidence, a key psychological trait of CEOs, potentially interacts with other traits within the broader psychological profile of overconfident CEOs, affecting their communication strategies in disclosures

Obfuscation theory posits that managers may intentionally use complex or repetitive language in financial disclosures as a strategic means to obscure poor performance or diminish the clarity of information conveyed to stakeholders. This approach aims to increase the processing costs for those interpreting the information and delay market reactions to unfavorable news (Li, 2008; Bens et al., 2011). This theory intersects with CEO overconfidence, where overconfident CEOs, bolstered by a heightened belief in their capabilities and decision-making prowess, might perceive negative outcomes as temporary setbacks. Their strong confidence could lead them to employ obfuscation as a defense mechanism against potential negative market reactions, aligning with broader theories in both agency and signaling realms (Smith and Taffler, 1992).

Supporting this perspective, Bloomfield (2008), Kothari et al. (2009), and others have noted that managers often provide lower-quality disclosures to mask unfavorable performance. This aligns with the obfuscation theory, suggesting that in instances of subpar performance, managers, particularly those who are overconfident, might repeat generic information already present in reports, ostensibly to meet reporting requirements, but effectively to divert attention from critical issues. The literature provides further evidence of this relationship. Bushee et al. (2018) distinguished between the information and obfuscation components within the linguistic complexity of quarterly earnings conference calls, finding a positive association between the obfuscation component and information

asymmetry. Curtis (2004) investigated obfuscation in corporate reports and posited that management might endorse such writing techniques to allow a certain level of opacity, either to lessen investor anxiety or to conceal unpleasant facts.

Moreover, managerial risk incentives, particularly from options compensation, are found to drive CEOs, especially overconfident ones, to strategically disclose information. Studies by Aboody and Kasznik (2000) and Call et al. (2016) suggest that options-compensated managers report favorable information while withholding unfavorable details to elevate stock prices. CEOs with significant options holdings are motivated to take bigger risks, potentially reducing firm value, yet may choose to obscure this by obfuscating disclosures (Sanders and Hambrick, 2007; Armstrong and Vashishtha, 2012). In terms of disclosure readability, managers might opt for less readable annual reports to conceal adverse information, a decision that aligns with the tendency to increase repetition in disclosures (Li, 2008; Laksmana et al., 2012). Reports from firms with high options are notably more voluminous and less readable, with this obfuscation effect persisting even after controlling for various firm-specific factors (Chakrabarty et al., 2018). Rutherford (2004), while examining textual complexity in corporate reports, concluded that poorly performing companies do not necessarily use textual complexity to obfuscate. This finding suggests that the relationship between performance, obfuscation, and CEO overconfidence might be more complex than initially thought.

Building upon the obfuscation theory, we now turn our attention to the role of agency theory in elucidating the positive relationship between CEO overconfidence and increased repetition in corporate disclosures. Agency theory, alongside signaling theory, provides a framework for understanding how managerial decisions, influenced by overconfidence, are not only about taking risks but also about how these decisions are represented or concealed in financial statements (Smith and Taffler, 1992).

Agency theory primarily deals with the conflicts that arise between principals (shareholders) and agents (managers), particularly when the interests of these two groups diverge. In the context of CEO overconfidence, this divergence can manifest in the way overconfident CEOs handle corporate disclosures. Overconfident CEOs, driven by their heightened belief in personal decision-making abilities, may engage in riskier business decisions, which they then might feel compelled to represent in a certain light or conceal to align with their self-image and perceived market expectations. This concept is supported by findings that managers often provide lower-quality disclosures to mask unfavorable performance (Bloomfield, 2008; Kothari et al., 2009; Li, 2008; Schrand and Walther, 2000). In instances of subpar performance, overconfident CEOs, acting as agents, might opt to repeat generic information already present in financial reports, ostensibly to meet reporting requirements, but effectively to divert attention from critical issues. This behavior

can be seen as an attempt to manage perceptions and protect their reputation, aligning with the agency theory's premise of self-interested actions by agents.

We extend our theoretical framework by incorporating signaling theory, which provides insights into the strategic use of corporate disclosures to project managerial confidence about the firm's future prospects (Merkl-Davies and Brennan, 2007; Bae et al., 2018). This theory is particularly relevant when considering the influence of CEO overconfidence on the nature of corporate communication (Bouzouitina et al., 2021). Signaling theory posits that managers, particularly overconfident ones, may use corporate disclosures not just to inform but to actively shape market perceptions (Mostafa et al., 2019). Overconfident CEOs are characterized by an unwavering belief in their firm's strategy and performance (Wang et al., 2023). This confidence translates into a communication strategy where positive aspects of the firm are not only highlighted but are repeatedly brought to the forefront in corporate disclosures (Yuthas et al., 2002). The logic underpinning this approach is twofold. Firstly, it aligns with the CEOs' overly optimistic view of the company's trajectory and capabilities. Secondly, by consistently signaling firm strengths, these CEOs aim to disproportionately affect investor sentiments and market perceptions (Graffin et al., 2011), potentially steering these in a more favorable direction despite underlying challenges or mixed performance metrics.

In the specific context of CEO overconfidence, repetitive language in MD&A sections can serve a critical function. By frequently revisiting and emphasizing certain achievements or future expectations, overconfident CEOs attempt to reinforce strong signals regarding what they perceive as the firm's key strengths (Burkhard et al., 2023; Chatterjee and Hambrick, 2011). This repetitive signaling is not merely redundant; it is a calculated attempt to magnify positive aspects, thereby aiming to influence investor perceptions and market reactions favorably.

In summary, the synthesis of obfuscation, agency, and signaling theories, enriched by empirical findings, suggests a positive expectation for the relationship between CEO overconfidence and increased repetition or similarity in corporate disclosures, specially MD&As. Overconfident CEOs, influenced by their exaggerated self-belief and perception of control, may employ defensive mechanisms in their communication strategies, leading to more obfuscated and repetitive corporate disclosures. This tendency is further compounded by agency-related motivations, where self-interest and risk incentives play a pivotal role. Additionally, through the lens of signaling theory, these CEOs use repetition not only as an obfuscation tactic but also as a strategic method to emphasize their firm's strengths, thereby attempting to positively shape market perceptions and investor sentiments. This integrated perspective provides a richer understanding of how CEO interacts with agency dynamics and signaling behavior to shape corporate communication, particularly in times of unfavorable company performance.

### 2.3 Deciphering the Negative Link: CEO Overconfidence and Reduced Repetition through Behavioral Decision Theory

In contrast to the positive relationship between CEO overconfidence and increased repetition, as elucidated by obfuscation and agency theories, this section investigates the potential for a negative relationship. We explore how behavioral decision theory posits that CEO overconfidence may actually lead to decreased repetition, thus enhancing transparency in corporate communication. This perspective offers a counterpoint to the earlier discussion, highlighting a different aspect of the influence of CEO on disclosure practices.

The foundational principle of behavioral decision theory, as traditionally understood, posits that decision-making often deviates from rational standards due to inherent human biases and cognitive limitations (Kahneman et al., 1982; Tversky and Kahneman, 1982; Tetlock, 1992, 2000). However, this perspective has evolved. Studies by Chen et al. (2015), Picone et al. (2014), and Reyes et al. (2022) indicate that in uncertain contexts where comprehensive decision-making is challenging, biases like overconfidence can be effective and efficient guides to decision-making. This notion is supported by Busenitz and Barney (1997), who argue that such biases and heuristics are instrumental for CEOs when dealing with intricate and unpredictable scenarios (also supported by Chen et al., 2007; Das and Teng, 1999; Simon et al., 2000). These insights are particularly salient in strategic decision-making contexts, characterized by complexity and urgency, where relying solely on traditional rational approaches is often unfeasible (Artinger et al., 2015; Gigerenzer and Gaissmaier, 2011).

The positive impact of CEO overconfidence is further exemplified in its influence on corporate behavior. Overconfident CEOs tend to overestimate control over outcomes and downplay failure risks (March and Shapira, 1987), leading to significant impacts on decisions related to investments, acquisitions, and innovation (Malmendier and Tate, 2005, 2008; Malmendier et al., 2011; Hirshleifer et al., 2012; Simon and Houghton, 2003; Deshmukh et al., 2013; Huang et al., 2016; Chen et al., 2015; Schumacher et al., 2020). While overconfidence has been associated with financial misstatements and less conservative accounting practices (Schrand and Zechman, 2012; Ahmed and Duellman, 2013; Hribar and Yang, 2016; Hsu et al., 2017; Chung and Hribar, 2021), it also drives CEOs to embrace bold decisions like founding new firms, entering new markets, or engaging in mergers and acquisitions (Cooper et al., 1988; Zajac and Bazerman, 1991; Moore and Cain, 2007; Ben-David et al. 2013). Overconfidence enhances managerial commitment and credibility (Englmaier, 2010, 2011; Van den Steen, 2005; Bolton et al., 2013), which is crucial in competitive environments (March, 1991).

When this theoretical perspective is applied to corporate communication, the positive facets of CEO overconfidence become evident. Overconfident CEOs, armed with a proactive mindset and a tendency to engage in action (Engelen et al., 2015; Pallier et al., 2002; Tetlock, 2000; Volk et al., 2014), may prefer clear and direct communication styles. This approach likely stems from their confidence in their decision-making abilities and a desire to articulate a focused, compelling narrative. Consequently, this might lead to less repetition and more transparency in corporate disclosures, as overconfident CEOs might eschew obfuscation in favor of a more straightforward presentation of information.

Behavioral decision theory provides a framework for understanding how overconfidence can lead to deviations from rational decision-making, particularly in the context of corporate management. Overconfident CEOs, who trust uniquely in their own understanding and management capabilities, often perceive themselves as pioneers capable of navigating market uncertainties with innovative insights (Lee et al., 2017; Ranft and O'Neill, 2001). This belief in their superior knowledge can significantly impact how information is disclosed to investors and other market participants. This leads us into the realm of information asymmetry theory, which examines the effects of unequal information levels among market participants on transaction dynamics (Bergh et al., 2019). Originally, this theory posits that different parties in a business transaction possess varying levels of information, leading to imbalances that can result in market inefficiencies (Clarkson et al., 2007). In the financial markets, where investors rely heavily on corporate disclosures to make informed decisions, the quality and nature of these disclosures are of paramount importance.

Traditionally, repetitive information in corporate disclosures has been viewed as redundant, potentially diluting the value of new information and perpetuating information asymmetry (Leung et al., 2015; Davison, 2008). Overconfident CEOs approach disclosure differently. Believing in their superior knowledge and capabilities, these CEOs might eschew repetitive disclosures in favor of introducing new information that they believe will directly address any information gaps perceived by investors, thereby asserting control over the narrative and potentially aligning market perception with their optimistic vision for the company. They might assume that by providing more detailed and less repetitive information in MD&As, they can effectively mitigate market skepticism and align investor understanding with their own. This approach suggests that such CEOs believe in their ability to control information flow and transparency directly, countering typical practices of obfuscation and evasion (Roberts, 2018).

Having explored how overconfident CEOs might utilize detailed, fresh disclosures to mitigate information asymmetry, we must also consider the CEOs' internal psychological processes that influence these disclosure practices. Cognitive

dissonance theory provides a crucial lens through which we can understand the internal conflict that may arise when repetitive disclosures do not align with an overconfident CEO's self-image as a dynamic and innovative leader (Abdulfatah, 2019). This theory is particularly applicable to individuals faced with their behaviors clashing with their beliefs, where they are likely to alter one to match the other (Hinojosa et al., 2017). In corporate settings, repetitive disclosures might create dissonance for a CEO who prides themselves on innovation and strategic foresight. Repeating the same information could be perceived internally as a failure to advance or a stagnation in company progress, which clashes with their self-image as dynamic and forward-thinking leaders. For overconfident CEOs, who have an inflated perception of their personal capabilities and their firm's prospects (Schumacher et al., 2020), cognitive dissonance can be particularly pronounced if their disclosures do not match their self-view as transformative leaders. These CEOs are therefore motivated to minimize repetition in disclosures to align with their self-image. They prefer to present new, evolving strategies or achievements in each reporting period, thereby not only maintaining consistency with their internal narrative but also actively shaping the external perception of continuous progression and innovation (Zhang et al., 2023).

Considering the insights from behavioral decision theory, enhanced by information asymmetry and cognitive dissonance theories, we can anticipate a negative relationship between CEO overconfidence and repetition in corporate disclosures, particularly MD&As. These theories suggest that overconfident CEOs, contrary to traditional biases, might prefer less repetitive, more transparent communication. Their innate drive, amplified by overconfidence, propels them towards delivering new and detailed information in each disclosure cycle. This strategic approach not only aligns with their desire to directly control and influence market perceptions but also serves to avoid internal cognitive dissonance by ensuring that their public disclosures mirror their self-perceived innovative and dynamic leadership style. This expectation challenges the conventional view of overconfidence as a detrimental bias, revealing its potential to contribute to more efficient and transparent communication, particularly in complex decision-making environments.

Thus, we posit that overconfident CEOs, driven by their heightened self-perception and confidence in their decision-making, might manipulate repetition in financial disclosures to either enhance clarity or obscure transparency depending on their strategic objectives. Specifically; overconfident CEOs may strategically amplify repetition to highlight positive outcomes or to obscure less favorable details. This approach aligns with obfuscation and agency theories, suggesting that repetition is used as a tactical tool to shape stakeholder perceptions and control the narrative focus. This could inadvertently increase the cognitive load on investors, steering

attention away from potential issues or failures. Conversely, the same trait of overconfidence may lead CEOs to reduce repetition in disclosures, aiming for clearer and more direct communication. Supported by behavioral decision theory, this reduction is seen as an attempt to present a straightforward, confident narrative that reflects positively on their leadership and decision-making. Such strategic behavior underscores that the use of repetition by overconfident CEOs is not solely about adhering to reporting norms but is a reflection of a deeper, psychologically driven approach to managing corporate communications. This hypothesis contributes to the broader debate on how repetition impacts the informativeness of financial reporting, offering fresh insights into the psychological dimensions that might influence disclosure practices.

### 3 Literature Review and Hypothesis Development

In Section 2, we explored the theoretical underpinnings of CEO overconfidence within the framework of upper echelons theory, contrasting perspectives on its impact on strategic decision-making and financial reporting. Building on this foundation, Section 3 delves into specific empirical studies that examine the effects of CEO overconfidence on the repetitiveness of disclosures, particularly within MD&A sections. The existing body of research presents two conflicting perspectives on CEO overconfidence. From one viewpoint, CEO overconfidence is seen as a cognitive mistake that adversely influences firm performance. These departures are considered errors or weaknesses, which by definition lead to suboptimal choices since ideal decisions are presumed to be based on rational judgment. Therefore, cognitive biases, including overconfidence, can be counterproductive in strategic decision-making, resulting in negative outcomes for the company. For CEOs, overconfidence can be particularly problematic as it leads to an exaggerated belief in their capabilities and knowledge, making them overestimate the accuracy and sufficiency of their information for decision-making (Ben-David et al., 2013; Moore and Healy, 2008). As a result, overconfident CEOs might not seek out additional information or opinions from others, potentially overlooking emerging issues and relevant data (Tang et al., 2015; Zacharakis and Shepherd, 2001). Moreover, such CEOs are often resistant to negative feedback (Chen et al., 2015), which could hinder the improvement of their decisions. Consequently, overconfidence is deemed detrimental (Moore and Healy, 2008; Moore and Schatz, 2017) and can lead to poorly considered and flawed strategic decisions (Malmendier and Tate, 2008; Park et al., 2018; Pavićević and Keil, 2021).

Furthermore, overconfident CEOs may inaccurately assess the capabilities needed for specific outcomes, believing in the feasibility of these outcomes more than warranted. Such CEOs often perceive their decision-making abilities as superior and see themselves as more capable than their peers (Moore and Healy, 2008). This can lead them to overvalue the benefits of taking strategic risks and their capability to execute these decisions (Li and Tang, 2010), thereby downplaying the potential negatives associated with such risks (Hayward et al., 2006). Additionally, their excessive certainty in their knowledge and predictions may reduce their inclination to consider alternative strategies or information (Finkelstein et al., 2009), limiting their scope of decision-making. This perspective adds depth to the understanding of the negative impact of CEO overconfidence, not only in terms of firm performance but also in the realm of strategic risk-taking and decision-making processes.

Conversely, recent research in behavioral decision theory has highlighted the potential positive aspects of CEO overconfidence (Chen et al., 2015; Picone et al., 2014; Reyes et al., 2022), suggesting it could positively influence firm performance. CEO overconfidence can be beneficial as it helps maintain a focused approach to the chosen strategy, minimizing the distraction of various alternatives (Navis and Ozbek, 2016). It allows CEOs to form a general understanding of complex and uncertain scenarios, facilitating practical decisions even with incomplete information. This inclination prompts CEOs to undertake actions that their less overconfident counterparts might avoid (Bénabou and Tirole, 2002; Foster et al., 2011). This idea aligns with previous research linking overconfidence to proactiveness (Engelen et al., 2015; Pallier et al., 2002) and a proactive mindset (Tetlock, 2000). Overconfident CEOs' tendency towards action rather than inaction can be particularly advantageous in seizing timely opportunities (Volk et al., 2014). Chen et al. (2020) further enhance this perspective, proposing CEO overconfidence as a key factor influencing corporate cash holdings. Their study reveals that overconfident CEOs positively affect cash levels and value, largely due to the investment environments of firms. Overconfident CEOs are shown to effectively balance high-risk investments with substantial cash reserves, often preferring equity over debt for capital investments, which contradicts previous literature. This demonstrates the multifaceted role of CEO overconfidence in corporate financial strategy.

Adding to the view that CEO overconfidence has a positive impact on firm performance, it's also worth considering its favorable influence on strategic risk-taking. Overconfidence can drive CEOs to set ambitious goals and exert considerable effort towards achieving them, thereby promoting riskier strategic behavior. People with higher goals tend to adopt riskier strategies (Bandura, 1989; Ordóñez et al., 2009), shifting from risk aversion to risk-seeking as their goals serve as reference points (Larrick et al., 2009). Since overconfidence is partly rooted in overly optimistic self-efficacy beliefs (Fuchs et al., 2019; Picone et al., 2014), overconfident

CEOs are more likely to set higher targets and invest more effort to reach them (Bénabou and Tirole, 2002; Pillai, 2010), encouraging strategic risk-taking. In supporting this view, research by Hirshleifer et al. (2012) highlights CEO overconfidence role in enhancing strategic risk-taking and innovation. Their study finds that overconfident CEOs, often more inclined to invest in high-risk projects, can increase shareholder value, experience greater return volatility and a higher rate of innovation. Moreover, overconfident CEOs often exhibit greater persistence in problem-solving (Bi et al., 2016) and are more likely to stick to their initial strategies, especially when their reputation is at stake (Ronay et al., 2017). This persistent behavior can foster risk-taking, as individuals might continue to allocate resources to their initial plans even if developments do not unfold as expected (Brockner, 1992). CEO overconfidence has been linked to escalation of commitment (Hayward et al., 2004; Slesman et al., 2012; Lambertsen and Niebuhr, 2024), a form of risk-taking behavior (Brockner, 1992; Wong and Kwong, 2007).

Furthermore, CEO overconfidence positively influences strategic risk-taking through social mechanisms. CEO attributes shape strategic decisions via interactions with top management teams (Georgakakis et al., 2022). Internal stakeholders often support the risk-taking initiatives of overconfident CEOs, perceiving them as competent and persuasive (Anderson et al., 2012; Von Hippel and Trivers, 2011). Overconfident CEOs, with their higher social status (Kennedy et al., 2013), can dominate decision-making and gain approval for risky strategic actions. Their illusion of control and belief in positive outcomes enable them to project optimistic visions for their firms, which can mobilize top management teams to support and execute their strategies (Picone et al., 2014; Shipman and Mumford, 2011). This propensity for increased strategic risk-taking could be a key factor behind the improved performance of firms. Research suggests that strategic decisions involving risk, such as R&D investments and higher capital expenditures, can lead to superior performance by creating competitive advantages and responding agilely to market demands (Hoskisson et al., 2017; Uotila et al., 2009; Titman et al., 2004; Manikas et al., 2019). Thus, the positive aspects of CEO overconfidence, in fostering strategic risk-taking and consequently enhancing firm performance, add a significant dimension to the understanding of CEO behavior and its impact on organizational success.

In light of the multifaceted perspectives on CEO overconfidence and its varied effects on firm performance and decision-making, our study delves into how these dynamics extend to the textual nuances of MD&A sections, with a particular focus on the repetitiveness of disclosures. From the standpoint that views overconfidence as a cognitive error, it's plausible that such a trait in CEOs could lead to MD&A disclosures that are more repetitive and less informative. This scenario likely stems from the CEOs' overdependence on their own perspectives and a reluctance to

integrate new or divergent information, as suggested by Ben-David et al. (2013) and Moore and Healy (2008). Consequently, MD&A sections may become less reflective of current market conditions or innovative strategies and more anchored in established, possibly outdated, reporting frameworks.

Contrastingly, under the lens where CEO overconfidence is perceived positively, it may catalyze more innovative and varied disclosures in MD&A sections. CEOs who are confident in their decision-making abilities and comfortable navigating uncertainty might produce MD&A content that is less repetitive and more dynamic, potentially incorporating forward-thinking elements that better capture the company's strategic direction and future potential (Chen et al., 2015; Picone et al., 2014; Reyes et al., 2022). This could manifest in a proactive, less conventional approach to communication within the MD&A sections. Given these divergent theoretical implications and empirical evidence, our study proposes the following non-directional hypothesis: CEO overconfidence has a significant influence on the repetitiveness of textual disclosures in MD&A sections, but the direction of this influence (increased or decreased repetitiveness) is not predetermined and requires empirical investigation.

**H:** *There is a significant relationship between CEOs' overconfidence and repetitive disclosures from notes to MD&As.*

## 4 Research Design

### 4.1 Sample and Data

Our study constructs a comprehensive dataset derived from SEC 10-K filings spanning from 1994 to 2022. The initial dataset comprised 202,218 filings<sup>64</sup>. The sample creation process involved a series of steps, each aimed at refining the dataset to ensure the quality and relevance of the data for our study's objectives. We began by removing duplicates within each year and CIK (Central Index Key), which led to the exclusion of 3,547 filings. This step was crucial to ensure the uniqueness of each data point, resulting in a reduced sample of 198,671 filings. The next phase involved matching the filings with the Compustat database using the Global Vantage Key (gvkey). This matching process is essential for data consistency and resulted in the

<sup>64</sup> Thanks to the Loughran-McDonald Repository (<https://sraf.nd.edu/sec-edgar-data/cleaned-10x-files/>) which provide the cleaned and raw 10-X files. The Notre Dame Software Repository for Accounting and Finance (SRAF) is a website designed to provide a central repository for programs and data used in accounting and finance research.

exclusion of 44,098 unmatched filings, bringing the sample down to 154,573. To ensure substantial content for analysis, we filtered out filings where the MD&A and Notes sections were less than 200 words. This criterion led to the removal of 23,853 filings<sup>65</sup>, leaving 130,720 in the sample.

The dataset underwent further refinement through integration with additional data from Compustat (1990–2022), BoardEx (1997–2022), and ExecuComp (1992–2022). These integrations, crucial for enhancing data robustness, reduced the sample size by 16,936, 49,866, and 32,876, respectively. After these steps, the sample stood at 31,042. The final filter involved removing entries that lacked essential data for our analysis. This step excluded an additional 7,910 entries, culminating in a final sample size of 23,132. Each filter and integration step was carefully designed to enhance the dataset's reliability and pertinence to our study, resulting in a focused and robust sample for our analysis.

[Insert Table 1]

## 4.2 Assessing Textual Repetition in MD&As

In line with the methodology outlined by Cohen et al. (2020), our initial step involves extracting the MD&As and notes section from each 10-K file. Every annual 10-K report totally contains 18 schedules or "Items", including subsections, detailed in Appendix A. We utilized regular expressions to recognize patterns containing "item" and the respective schedule name. Given the variability in schedule labels across different filings, our process is iterative and thorough. Initially, we target the most commonly observed structure for schedule titles, which usually follow the pattern: "Item" + "a number" + "title name." Subsequently, we expand our scope to include less common variations, such as titles with only "Item" + "a number" or just "number" + "title names." This process, repeated multiple times, ensures the accurate and singular capture of each schedule, also integrating newfound exceptions in each iteration.

After this extraction process, we ensure that each 10-K file's MD&A and note sections are at least 200 words long, adhering to standards set by previous research

<sup>65</sup> This number of observations is a little bit high. However, after comparing it with previous studies, like Loughran and McDonald (2011) which has the span of 1994 to 2008 with beginning 1212017 firm year observations, and excluding MD&A section less than 250 words which was 11,892, and another study, Observations with 10-K word count < 2000 or MD&A word count < 200 was dropping 43836 from the total of 10-ks from which was 172283 from 1995 to 2018, this amount of dropping in our sample, having considered that the duration is from 1994 to 2020, and of course inclusion notes reduction less than 200 words, it is logical.

(Audi et al., 2016; Breuer et al., 2020). To quantify strategic repetition, we leverage methodologies from existing literature (Cohen et al., 2020; Brown et al., 2011; Wang et al., 2023) using four established textual similarity metrics to assess how content flows from the notes to the MD&As in 10-K filings. Each measure offers a unique approach to quantifying textual similarities, as detailed below:

1. **Cosine Similarity (*Sim\_Cosine*):** Cosine Similarity is a measure that calculates the cosine of the angle between two term frequency vectors, providing a quantitative measure of the similarity between two documents. Let  $D_{s1}$  and  $D_{s2}$ , be the sets of terms occurring in documents  $D_1$  and  $D_2$ , respectively. Define  $T$  as the union of  $D_{s1}$  and  $D_{s2}$ , i.e.,  $T = D_{s1} \cup D_{s2}$ . Let  $t_i$  be the  $i$ -th element of  $T$ . The term frequency (TF) vectors for  $D_1$  and  $D_2$  are defined as:

$$D_1^{TF} = [nD_1(t_1), nD_1(t_2), \dots, nD_1(t_N)]$$

$$D_2^{TF} = [nD_2(t_1), nD_2(t_2), \dots, nD_2(t_N)]$$

where  $nD_k(t_i)$  is the number of occurrences of term  $t_i$  in documents  $D_k$ . The cosine similarity between two documents is then defined as:

Equation (1):

$$\text{Sim Cosine} = (D_1^{TF} \cdot D_2^{TF}) / \|D_1^{TF}\| * \|D_2^{TF}\|$$

where the dot product,  $(D_1^{TF} \cdot D_2^{TF})$ , is the sum of the products of the corresponding entries of the vectors, and  $\|D_1^{TF}\| * \|D_2^{TF}\|$ , are the Euclidean norms of the vectors.

2. **Jaccard Similarity (*Sim\_Jaccard*):** Leveraging the same term frequency vectors as Cosine Similarity, Jaccard Similarity is determined by the proportion of the intersection to the union of these term sets. Unlike Cosine Similarity, Jaccard is binary and accounts for each word's presence rather than its frequency.

Equation (2):

$$\text{Sim Jaccard} = |D_1^{TF} \cap D_2^{TF}| / |D_1^{TF} \cup D_2^{TF}|$$

3. **Minimum Edit Distance (*Sim\_MinEdit*):** This metric quantifies the minimal number of operations (additions, deletions, changes) required to transform one document into another, thus providing a measure of dissimilarity.
4. **Simple Similarity (*Sim\_Simple*):** Using a straightforward comparison approach, akin to the "Track Changes" function in Microsoft Word or the "diff" command in Unix/Linux, this metric assesses the number of word changes between two documents. It normalizes this count against the average

document size and scales the result to a range between 0 and 1, where 1 indicates identical documents, as described in Equation (3).

*Equation (3):*

$$\text{Sim Simple} = [c_{\max} - c] / c_{\max}$$

where  $c = (\text{additions} + \text{deletions} + \text{changes}) / ((\text{Size } D_1 + \text{Size } D_2) / 2)$ , and  $c_{\max}$  is the maximum value of  $c$ .

### 4.3 CEO Overconfidence

Typically, CEOs hold a substantial portion of their wealth in company stock, making them vulnerable to the unique risks of their firm's stock performance. Risk averse behavior would dictate that CEOs should reduce this risk by minimizing stock holdings and exercising their options soon after they vest. Contrarily, overconfident CEOs often delay exercising these options, believing their company will outperform a diversified portfolio (Ahmed and Duellman, 2013). In our study, we assess CEO overconfidence by analyzing their behavior concerning option holdings. This approach is inspired by Malmendier and Tate (2005), who identified overconfidence through the timing of CEO option exercises<sup>66</sup>. They categorize CEOs as overconfidence if they hold stock options that are over 67% in-the-money (meaning the stock price surpasses the exercise price by more than 67%)<sup>67</sup>. We lack the detailed data used by Malmendier and Tate (2005), preventing us from conducting a similar calibration. Therefore, following Ahmed and Duellman (2013), Campbell et al. (2011) and Hirshleifer et al. (2012), we accept their 67% moneyness threshold<sup>68</sup> for

<sup>66</sup> While our study adopts the HOLDER67 measure from Malmendier and Tate (2005) to assess CEO overconfidence based on the delayed exercise of stock options, it's acknowledged that this behavior might not solely indicate overconfidence. Non-exercise of options could also reflect a CEO's broader strategic vision, sensibility to market conditions, or insider information, suggesting an interpretation beyond overconfidence. This measure, therefore, while indicative of potential overconfidence as CEOs expect stock prices to rise, could also encompass other dimensions of CEO behavior and decision-making rationale.

<sup>67</sup> This 67% threshold is based on Malmendier and Tate's adaptation of Hall and Murphy's (2002) model, which was calibrated using a comprehensive dataset on executive stock option holdings and exercise decisions. Hall and Murphy's model accounts for the typical risk aversion of executives who often have non-diversified portfolios, suggesting rational expected utility maximizers should exercise options early.

<sup>68</sup> Following Pierk (2021) we also apply different thresholds, categorizing CEOs as overconfident if they retain an option until its maturity when it is at least 20, 40, 60, 80, and 100 percent in-the-money at the end of the year before it matures. To identify CEOs with higher levels of overconfidence, we set a threshold where CEOs hold stock options

our entire sample of CEOs to denote overconfidence, utilizing data from Execucomp to estimate managerial overconfidence (*HOLDER67*). Our methodology involves several steps:

1. **Average Value Per Option Calculation:** We first calculate the average value per option ( $C$ ) by dividing the total value of exercisable but unexercised options by their number.
2. **Average Exercise Price Determination:** We then find the average exercise price per option ( $X$ ) by subtracting the average value per option ( $C$ ) from the stock price ( $S$ ) at the fiscal year-end.
3. **In-the-Money Options Ratio:** Next, we calculate the ratio of options that are 'in-the-money' by dividing  $C$  by  $X$ .
4. **Setting Holder67 (Overconfidence) Indicator:** Finally, we define the *Holder67* (overconfidence) metric. If the in-the-money ratio ( $C/X$ ) exceeds 0.67 at least twice during the sample period, we set *Holder67* to one, indicating overconfidence. If this threshold is not met, *Holder67* is set to zero.

A CEO is considered overconfident from the first fiscal year they exhibit such behavior and retains this classification for the rest of the sample period. This approach provides a quantifiable measure of CEO overconfidence, contributing valuable insights into executive behavior and decision-making.

#### 4.4 Regression Model

In the main regression model, we explore the concept of repetition (*REPETITION*) within our model, employing a quartet of similarity metrics: Cosine Similarity, Jaccard Similarity, Minimum Edit Distance, and our uniquely defined Simple Similarity (refer to section 4.2 for an in-depth explanation). Additionally, we delve into the aspect of CEO overconfidence, thoroughly examined in section 4.3 under *HOLDER67*.

Our analysis further extends to include a variety of corporate governance attributes, taking cues from contemporary studies such as those by Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018). We introduce key governance metrics like audit committee size (*ACSIZE*), independence (*ACIND*), financial expertise percentage (*ACFEXP*), financial expertise of the chairman

that are over 100% in-the-money. If the 67% threshold signifies overconfidence managers, the 100% threshold should pinpoint those who are even more overconfidence. The outcomes are consistently similar in qualitative terms.

(*ACCHAIRFE*), board size (*BOARDSIZE*), and board independence (*BOARDIND*). These metrics offer a comprehensive view of the audit committee and board composition, thereby enhancing our model's robustness.

Equation (4):

$$\begin{aligned}
 \text{REPETITION}_{i,t} = & \beta_0 + \beta_1 \text{HOLDER67}_{i,t} + \beta_2 \text{ACSIZE}_{i,t} + \beta_3 \text{ACIND}_{i,t} \\
 & + \beta_4 \text{ACFEXP}_{i,t} + \beta_5 \text{ACCHAIRFE}_{i,t} + \beta_6 \text{BOARDSIZE}_{i,t} \\
 & + \beta_7 \text{BOARDIND}_{i,t} + \beta_8 \text{ZSCORE}_{i,t} + \beta_9 \text{LOSS}_{i,t} + \beta_{10} \text{SIZE}_{i,t} \\
 & + \beta_{11} \text{AGE\_LN}_{i,t} + \beta_{12} \text{SPEC}_{i,t} + \beta_{13} \text{SALE\_VOL}_{i,t} \\
 & + \beta_{14} \text{NONMISS\_LN}_{i,t} + \beta_{15} \text{DAC}_{i,t} + \beta_{16} \text{ROE}_{i,t} \\
 & + \beta_{17} \text{INVT\_VOL}_{i,t} + \beta_{18} \text{CFO\_SALE}_{i,t} + \beta_{19} \text{MTOB}_{i,t} \\
 & + \beta_{20} \text{SLACK}_{i,t} + \beta_{21} \text{DIV}_{i,t} + \beta_{22} \text{TANGIBILITY}_{i,t} \\
 & + \beta_{23} \text{KSTRUCTURE}_{i,t} + \sum \text{YEAR FE} + \sum \text{INDUSTRY FE} \\
 & + \varepsilon_{it}
 \end{aligned}$$

In line with methodologies from Biddle and Hilary (2006), Biddle et al. (2009), Li (2019), Gan (2019), Cohen et al. (2020), and Hasan (2020), we also include several control variables. Altman's *ZSCORE* predicts bankruptcy risk, providing insight into financial health. *LOSS* indicates whether the firm reported a loss, which helps account for performance variability. Market value-based firm *SIZE* is included to understand scale effects, while logarithmic firm age (*AGE\_LN*) relates to corporate maturity and life cycle influences. The special item ratio (*SPEC*) controls for the impact of exceptional financial items. Five-year sales volatility (*SALE\_VOL*) indicates stability or variability in revenues. The logarithm of non-missing item count in Compustat (*NONMISS\_LN*) measures data completeness. Discretionary accruals (*DAC*) gauge earnings management practices. Return on equity (*ROE*) reflects profitability and efficiency, and investment volatility over five years (*INVT\_VOL*) indicates the variability in capital allocation. The cash flow to sales ratio (*CFO\_SALE*) reflects operational cash efficiency, and the market-to-book ratio (*MTOB*) assesses market valuation relative to book value, reflecting market expectations and possibly influencing the strategic presentation in filings. The cash to PPE ratio (*SLACK*) is used to gauge operational flexibility and financial resilience, reflecting liquidity relative to fixed assets. Dividend payouts (*DIV*) relate to dividend policy and financial stability. The PPE to total assets ratio (*TANGIBILITY*) reflects asset intensity, and the firm's capital structure (*KSTRUCTURE*) is included to understand financial leverage and risk. Year (*YEAR FE*) and industry (*INDUSTRY FE*) fixed effects are also included to control for temporal and sectoral variations. These variables are comprehensively defined in Appendix B.

## 5 Results

### 5.1 Descriptive Statistics and Univariate Analysis

Table 2 offers a detailed distribution of our sample, segmented by year and industry according to the two-digit Standard Industrial Classification (SIC) code. This dataset spans 28 years, from 1999 to 2022, encompassing a total of 23,132 observations across a diverse range of industries.

Panel A presents a year-wise breakdown of the data. The distribution of observations over these years shows a balanced coverage, providing a consistent snapshot over the 28-year period. The data indicates a peak in observations during the mid-2000s, specifically in 2004, followed by a gradual decline in subsequent years. The cumulative percentage column in the table charts the incremental growth of the dataset, cumulatively reaching 100% by 2022.

Panel B categorizes the sample based on industry classifications, as denoted by two-digit SIC codes. The representation of industries in the sample is varied. The Oil and Gas industry (SIC code 13) accounts for 3.55% of the total observations, while Food and Beverage (SIC code 20) comprises 3.14%. Other significant sectors include Chemicals and Allied Products (SIC code 28) with 8.73%, Industrial Machinery and Computer Equipment (SIC code 35) at 6.74%, and Electronic and Other Electric Equipment (SIC code 36) representing 8.87% of the sample. The Business Services sector (SIC code 73) forms the largest portion of the dataset, constituting 11.02%. Conversely, industries such as Apparel and Accessory Stores (SIC code 56) and Miscellaneous Retail (SIC code 59) show a smaller presence, each making up slightly below 2% of the observations. The 'Others' category, which consolidates industries with less than 250 observations each, accounts for a significant 21.18% of the dataset. This table is instrumental in illustrating the diversity and temporal spread of our sample, highlighting the comprehensive nature of the study and the broad spectrum of industries covered.

[Insert Table 2]

The descriptive statistics in Table 3 encompass a range of variables categorized as dependent, independent, and control variables, each offering distinct insights into the study's focus. The four dependent variables measure different aspects of textual similarity between notes and MD&As in 10-K filings, scaled from 0 to 1. *Sim\_Cosine*, with a mean of 0.880, indicates the cosine similarity between texts, a widely accepted measure of textual closeness. This high average suggests a strong similarity in the dataset, aligning with studies like Cohen et al. (2020) and Brown and Tucker (2011). *Sim\_Jaccard*, averaging 0.208, showing 20.8% overlap between

sample sets, providing a different lens to assess textual similarity. *Sim\_MinEdit*, with an average of 0.473, quantifies the minimum edit distance required to transform one text into another, reflecting the textual variations within the dataset. Lastly, *Sim\_Simple*, averaging 0.357, represents a straightforward approach to gauging text similarity, offering a baseline comparison of textual closeness.

The average value of the CEO overconfidence (*HOLDER67*) in our sample stands at 0.333, suggesting a moderate presence of CEO overconfidence. This figure is aligned with the findings in related research, specifically those of Campbell et al. (2011) and Ahmed and Duellman (2013), which also employ similar methodologies focusing on CEO stock option behaviors as indicators of overconfidence. Campbell et al. (2011) reported a comparable median index value in their sample, indicating a similar trend in CEO behavior patterns across various industry sectors and economic conditions. Similarly, Ahmed and Duellman (2013) observed a mean value in their study that closely matches our results, further substantiating the prevalence of moderate overconfidence among CEOs. These comparisons not only validate our findings but also highlight the consistency in CEO overconfidence measures across diverse studies, reinforcing the robustness and reliability of using CEO stock option behaviors to gauge executive overconfidence.

The control variables cover a range of factors that can influence the dependent variables. *ACSIZE* shows the size of the audit committee, with an average of 4.298, indicating its typical composition in the sampled firms. *ACIND*, with a high average of 0.887, reflects the degree of independence in audit committees, essential for effective corporate governance. *ACFEXP* measures the proportion of financial experts in the audit committee, averaging 0.511, which is crucial for financial oversight. *ACCHAIRFE*, showing a high average of 0.814, indicates the prevalence of financial expertise within the chairpersons of audit committees. *BOARDSIZE*, with an average of 12.800, sheds light on the typical board size in the companies sampled. *BOARDIND*, averaging 0.595, gives an idea of the level of board independence. The other control variables like *ZSCORE*, *LOSS*, *SIZE*, *AGE\_LN*, *SPEC*, *SALE\_VOL*, *NONMISS\_LN*, *DAC*, *ROE*, *INVT\_VOL*, *CFO\_SALE*, *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, and *KSTRUCTURE*, provide additional context ranging from financial health indicators to company-specific characteristics. These variables collectively help control for external factors that might influence the relationship between CEO overconfidence and the measures of repetition. All continuous variables are winsorized at the 1st and 99th percentiles in each year to minimize the effects of potential outliers.

[Insert Table 3]

Table 4 provides a comprehensive Mean Difference Test between cautious (representing non-overconfident, risk-averse behaviors in practical terms of our

context and data) and overconfident (often aligned with risk-taking tendencies) CEOs, encompassing a wide array of variables, with a primary focus on repetition measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) and extending to other significant factors. This analysis aims to shed light on the impact of CEO overconfidence, as quantified by *HOLDER67*, on various dimensions of firm performance and operational behavior.

The data reveals a picture of CEO communication styles and firm characteristics. In the realm of repetition measures, there's a marked difference in *Sim\_Cosine* scores between rational CEOs (mean: 0.882, median: 0.910) and overconfident CEOs (mean: 0.875, median: 0.905). This suggests that overconfident CEOs may adopt more varied communication styles, as evidenced by the lower similarity scores. The statistical significance of this difference is underscored by t-test and Wilcoxon test p-values, both registering at 0.000. A similar trend is observed in *Sim\_Jaccard* scores, where cautious CEOs average 0.209 (median: 0.213) versus 0.206 (median: 0.210) for overconfident CEOs. This minor, yet significant difference (t-test p-value: 0.027, Wilcoxon p-value: 0.004) could imply that communications from overconfident CEOs deviate slightly from standard templates or norms. The *Sim\_MinEdit* scores reinforce this trend. Cautious CEOs exhibit a mean of 0.475 (median: 0.493), while overconfident CEOs score slightly lower at 0.469 (median: 0.486). Though the difference is small, its statistical significance (t-test p-value: 0.026, Wilcoxon p-value: 0.007) suggests that texts from overconfident CEOs require fewer modifications to align with expected formats. In contrast, the *Sim\_Simple* measure shows no significant disparity between the two groups (mean and median for both groups are 0.357 and 0.334 for cautious CEOs, 0.320 for overconfident CEOs), indicating a basic level of similarity in the texts from both types of CEOs.

Drawing on the principles of behavioral decision theory (Kahneman et al., 1982; Tversky and Kahneman, 1982; Busenitz and Barney, 1997; Chen et al., 2015), our findings suggest an impact of CEO overconfidence on corporate communication. This theory posits that biases and heuristics, often deemed reckless, can be effective in complex decision-making scenarios. Specifically, overconfident CEOs, as indicated by their reduced repetition in communication (evidenced by lower *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit* scores), may demonstrate a deviation from conventional, repetitive communication patterns. These findings support the regression results, which also suggest a negative relationship between CEO overconfidence and repetition in corporate disclosures. The theory and empirical evidence together imply that overconfidence in CEOs might lead to more direct, varied, and potentially more effective communication styles in the MD&A sections, challenging the traditional view of overconfidence as solely a negative trait in decision-making. Moreover, the application of information asymmetry theory

(Clarkson et al., 2007; Bergh et al., 2019) further illuminates how overconfident CEOs might strategically manage disclosures to reduce information gaps and align market perceptions with their optimistic vision of the company. By providing more detailed and less repetitive information in MD&As, these CEOs aim to mitigate market skepticism and enhance investor understanding. Additionally, cognitive dissonance theory (Abdulfatah, 2019; Hinojosa et al., 2017) offers shed light into the psychological processes that influence these disclosure practices. Overconfident CEOs, who have an inflated perception of their personal capabilities and their firm's prospects (Schumacher et al., 2020), are likely motivated to minimize repetition to align their communications with their self-perceived innovative and dynamic leadership style<sup>69</sup>.

Beyond communication styles, the table also delves into audit committee characteristics (*ACSIZE*, *ACIND*, *ACFEXP*, *ACCHAIRFE*), revealing various attributes associated with firms led by cautious versus overconfident CEOs. However, not all differences are statistically significant. Notably, larger company sizes (*SIZE*) and a higher count of non-missing Compustat items (*NONMISS\_LN*) are significantly associated with overconfident CEOs. This may suggest a prevalence of overconfident CEOs in larger, more complex organizations. These findings, combined with the analysis of other variables, contribute to a deeper understanding of how CEO behavior influence corporate practices and reporting.

[Insert Table 4]

Table 5 showcases a correlation matrix, particularly highlighting the relationships between repetition measures and *HOLDER67*, indicative of CEO overconfidence, among other variables. This matrix reveals interesting patterns and associations within our dataset.

Starting with the repetition measures, there's a notable pattern in their correlation with *HOLDER67*. *Sim\_Cosine* exhibits a slight negative correlation (-0.032), suggesting that texts from companies led by overconfident CEOs might slightly

<sup>69</sup> Overconfident CEOs, who may exhibit behaviors such as haste and inattention or traits associated with ADHD, could lead to a lower degree of textual repetition in corporate disclosures, possibly due to insufficient familiarity with the content; this introduces a compelling perspective. While intriguing, this study's data and methodology focus specifically on measuring the impact of CEO overconfidence—defined through the *HOLDER67* metric—on communication patterns in MD&As, rather than assessing psychological traits or the direct reading behaviors of CEOs. This analysis remains within the framework of behavioral decision theory, indicating that variation in communication may be strategic (Li, 2019) rather than indicative of negligence or cognitive limitations. Further research incorporating psychological evaluations and observational studies could provide more definitive insights into these dimensions.

deviate from the norm in terms of textual similarity. This trend continues with *Sim\_Jaccard* and *Sim\_MinEdit*, both showing negative correlations (-0.015 each) with *HOLDER67*. This could imply that communications from overconfident CEOs tend to be slightly more unique or less repetitive. However, in the case of *Sim\_Simple*, the correlation with *HOLDER67* is almost negligible (0.001), indicating that basic textual similarity is not significantly influenced by CEO overconfidence. Our correlation results, generally, demonstrate a clear negative relationship between CEO overconfidence (*HOLDER67*) and repetition measures, mirroring the findings of the Mean Difference Test. This aligns with behavioral decision theory (Kahneman et al., 1982; Tversky and Kahneman, 1982; Busenitz and Barney, 1997; Chen et al., 2015), which posits that overconfidence can lead to less conventional, more varied communication strategies, further bolstering the regression analysis. This suggests that overconfident CEOs might adopt more direct and effective communication styles, supporting the theoretical framework and challenging traditional perceptions of overconfidence in decision-making.

The correlation matrix also reveals insights into how corporate structure and governance relate to textual similarities. *ACSIZE* and *BOARDSIZE*, reflecting the sizes of the audit committee and the board, show positive correlations with several repetition measures. This might suggest that larger boards or committees are associated with more standardized textual content, potentially due to more formalized communication processes. In terms of independence, both *BOARDIND* and *ACIND* show positive correlations with repetition measures. This could indicate that higher levels of independence within boards and audit committees correlate with more conventional textual structures, possibly due to a greater adherence to regulatory standards or best practices. Financial health and company characteristics, represented by *ZSCORE*, *SIZE*, and *AGE\_LN*, display various correlations with the repetition measures. These correlations underscore the influence of broader company characteristics on the nature of corporate communications. For instance, larger, older, or financially healthier companies might have more standardized communication styles. Interestingly, financial metrics like *LOSS* and *SPEC* show low or negligible correlations with the repetition measures. This suggests that these financial aspects might not have a significant impact on the repetitiveness or uniqueness of textual content in corporate communications.

[Insert Table 5]

Overall, the correlations in Table 5 paint a picture of how different factors, especially CEO overconfidence, influence corporate communication styles. While the influence of overconfidence on textual repetition is subtle, it aligns with the notion that overconfident CEOs might prefer more distinctive and less formulaic approaches in their communications. This, combined with the influence of corporate

governance and company characteristics, offers a comprehensive understanding of the factors shaping corporate communication patterns.

## 5.2 The Association of CEO Overconfidence and Repetition

In this study, we examine the impact of CEO overconfidence, as measured by *HOLDER67*, on corporate communication dynamics, with a particular focus on the influence of this trait on the repetitiveness of disclosures, as assessed through various similarity scores (*REPETITION*). The regression analysis offers insight into how CEO overconfidence interacts with corporate communication practices, framed within the context of behavioral decision theory.

Table 6 reveals that CEO overconfidence, represented as *HOLDER67*, is significantly negatively associated with the similarity scores *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*. The coefficients for these are -0.00551\*\*\*, -0.00288\*\*, and -0.00641\*\* respectively. This indicates that CEOs with higher overconfidence levels tend to exhibit lower similarity scores, suggesting less repetition in their communication. This finding aligns with behavioral decision theory, which posits that in uncertain contexts, inherent human biases like overconfidence can be effective guides to decision-making (Kahneman et al., 1982; Tversky and Kahneman, 1982; Chen et al., 2015). Our results suggest that overconfident CEOs, utilizing their decisive nature, may prefer more direct and varied communication styles, reducing the tendency towards repetitive disclosures. The relationship between CEO overconfidence and the *Sim\_Simple* score, however, was not statistically significant, with a coefficient of -0.00602. This differential result underscores the complexity of the relationship between CEO traits and communication patterns.

In our analysis, we go beyond merely establishing statistical significance to assess the economic significance of the relationship between CEO overconfidence and various measures of repetition. This step is crucial for understanding the substantive impact of our findings in practical terms. Utilizing the methodology introduced by Mitton (2024), we calculate the effect size based on the interquartile range for each similarity measure:

$$E_S^{IQR} = \frac{|b(p_{75}-p_{25})|}{|s_y|}$$

where  $b$  is the regression coefficient for CEO overconfidence (*HOLDER67*),  $p_{75}$  and  $p_{25}$  are the 75<sup>th</sup> and 25<sup>th</sup> percentiles of *HOLDER67*, respectively, and  $s_y$  is the standard deviation of each dependent variable measuring repetition in corporate communication.

The calculations yield the following economic significances; *Sim\_Cosine*: 0.0545 or 5.45%, *Sim\_Jaccard*: 0.032 or 3.2%, *Sim\_MinEdit*: 0.0341 or 3.4%, and *Sim\_Simple*: 0.0198 or 2.0%.

These percentages represent the decrease in repetition for a typical increase in CEO overconfidence across its interquartile range, relative to the standard deviations of the measures. Although the relationship with *Sim\_Simple* was not statistically significant, the economic significance calculation suggests a decrease, providing insight into the potential practical impact had it reached statistical significance. This analysis illustrates the influence of CEO overconfidence on reducing repetitiveness in corporate communications. It highlights that an increase in CEO overconfidence correlates with clearer and more variable financial disclosures, reflecting both the statistical and substantial practical significance of our results.

The analysis incorporates a variety of control variables that significantly impact the outcomes, enhancing the robustness of our findings. For instance, the size of the audit committee (*ACSIZE*) shows a consistent positive association with repetitiveness across most similarity measures, suggesting that a larger committee may not necessarily contribute to enhanced disclosure quality as previously thought. Audit committee independence (*ACIND*) negatively correlates with repetitiveness, reinforcing the idea that independent committees uphold stringent disclosure standards, which could minimize unnecessary repetition in corporate communications. Similarly, firm size (*SIZE*) and the logarithm of firm age (*AGE\_LN*) exhibit a generally positive correlations with more concise communications across most models, although *AGE\_LN* shows no significant impact in the *Sim\_Jaccard* and *Sim\_MinEdit* models. This implies that larger and older firms, possibly due to their more established processes and greater resources, are likely to provide more diverse and concise communication. These findings highlight the importance of firm demographic characteristics in influencing disclosure practices.

Regarding the financial expertise within the audit committee, results are varied. The percentage of financially expert members (*ACFEXP*) shows a positive coefficient in most models, suggesting an unexpected association with more repetition, whereas the financial expertise of the chairman (*ACCHAIRFE*) does not demonstrate a consistent influence across all models. Given these mixed results, it is clear that the role of financial expertise in influencing disclosure clarity needs further examination. The analysis also incorporates variables such as *ZSCORE* and *LOSS*, which, despite being included in the regression, show no significant coefficients across the models, suggesting that these factors do not impact the repetitiveness of disclosures as hypothesized. Larger firms tend to exhibit less repetitiveness, demonstrated by positive associations with *SIZE* across all repetition measures, suggesting that size contributes to a capability to vary and refine the content of

disclosures. Sale volatility (*SALE\_VOL*) and market-to-book ratio (*MTOB*) further illustrate how market perceptions and business dynamics influence corporate communication strategies. *SALE\_VOL* generally correlates with less repetition, whereas *MTOB* shows a consistent negative association across most measures, indicating that higher market-to-book ratios lead to more repetition, potentially as firms aim to justify their market valuations.

Significantly, variables such as the count of non-missing Compustat items (*NONMISS\_LN*), discretionary accruals (*DAC*), free cash flow as slack (*SLACK*), and capital structure complexity (*KSTRUCTURE*) all show significant influences on repetitiveness, as detailed in Table 6. These variables, which have gained statistical significance, reveal that a variety of financial and structural characteristics of firms profoundly impact their disclosure practices. The significant associations observed for each control variable not only validate their inclusion in the model but also provide deeper insights into the multifaceted nature of corporate communications influenced by managerial traits and governance structures.

[Insert Table 6]

Our study's main regression analysis confirms a significant negative relationship between CEO overconfidence (*HOLDER67*) and the repetitiveness of disclosures (similarity scores), thereby supporting our hypothesis. This finding aligns with behavioral decision theory, suggesting that overconfident CEOs, who perceive greater control over outcomes and tend to downplay risks, favor more transparent and concise communication strategies (Malmendier and Tate, 2005, 2008; March and Shapira, 1987). This approach challenges the conventional view of overconfidence as a negative bias by demonstrating its role in promoting efficient and transparent corporate disclosures. Incorporating the concept of information asymmetry theory (Clarkson et al., 2007; Bergh et al., 2019), this tendency towards less repetition and more targeted disclosures can be seen as an effort to reduce information gaps between the company and its stakeholders. By strategically placing singular mentions of important issues rather than repeating them, overconfident CEOs may enhance the effectiveness of communication, thereby potentially aligning market perceptions more closely with the company's strategic objectives. Additionally, cognitive dissonance theory (Abdulfatah, 2019; Hinojosa et al., 2017) provides insight into why overconfident CEOs might prefer unique and evolving disclosures. The internal conflict that arises from repetitive disclosures not aligning with their self-image as innovative leaders could motivate these CEOs to actively avoid redundancy. This psychological drive ensures that their public persona and corporate communications reflect a dynamic and forward-thinking leadership style, which is crucial in maintaining both internal consistency and external credibility.

While acknowledging that repeating critical information can enhance transparency and add value, our results indicate that overconfident CEOs are more inclined to avoid redundancy in their communication, suggesting an approach to transparency where strategically placed, singular mentions of important issues might be considered more effective than repeating the same information across multiple sections. This insight contributes to the broader discussion on how CEO psychological traits influence corporate communication strategies, enriching the dialogue on the impact of executive behaviors on firm performance and stakeholder engagement (Busenitz and Barney, 1997; Engelen et al., 2015). In summary, our analysis provides empirical support for the notion that CEO overconfidence is inversely related to the repetitiveness of disclosures, offering a fresh perspective on the role of CEO psychological traits in shaping corporate communication.

### 5.3 Robustness Tests

In this section, we delve into robustness tests to validate the stability and reliability of our main findings. We utilize alternative methodologies and address potential endogeneity concerns to ensure that our conclusions are not artifacts of specific model specifications or coincidental factors. These robustness checks are integral to affirming that our results genuinely reflect the phenomena under investigation.

#### 5.3.1 Alternative Measures of Repetition and CEO Overconfidence

In our study, we expanded the analysis to include alternative measures of CEO overconfidence and repetition, specifically focusing on year-over-year MD&A similarities (i.e., inter-temporal repetition, or the similarity of two documents filed in subsequent years by the same firm, following Brown and Tucker, 2011; Brown et al., 2015; Peterson et al., 2015) and stock purchase behaviors of CEOs (*PURCHASE*)<sup>70</sup>. This approach not only enriches our understanding of how CEO overconfidence impacts corporate disclosures but also allows us to examine the robustness of our findings across different operationalizations of overconfidence.

The analysis from Panel A of Table 7 presents a picture of the relationship between CEO overconfidence and various measures of repetition in corporate communications. The results specifically show that CEO overconfidence, measured

<sup>70</sup> Regarding the alternative measure of CEO overconfidence, it is noteworthy that the *PURCHASE* metric exhibits a statistically significant positive correlation with our main measure, *HOLDER67*, (correlation coefficient of 0.157, p-value < 0.05). This positive correlation suggests that both measures, despite being conceptually distinct, capture related aspects of overconfident behavior among CEOs.

as *HOLDER67*, is negatively related to the *Sim\_Simple* and *Sim\_Jaccard* scores, with a coefficient of 0.0150\*\*\* and 0.0027\*, respectively, indicating a statistically significant relationship. This suggests that CEOs with higher levels of overconfidence are associated with less repetition in their communications, as evidenced by the lower similarity scores. However, for *Sim\_Cosine* and *Sim\_MinEdit*, while the direction of the relationship remains negative, the coefficients are not statistically significant. This variation in findings across different measures suggests that CEO overconfidence influences certain aspects of textual repetition but does not uniformly affect all types of repetition captured by different metrics. The significant results for *Sim\_Simple* may imply that it captures a dimension of repetitiveness that is particularly sensitive to the effects of overconfidence. Conversely, the lack of significant findings for *Sim\_Cosine* and *Sim\_MinEdit* highlights the need for cautious interpretation and suggests that overconfidence may not universally lead to less repetition or that these measures may not capture all relevant aspects of textual change driven by CEO traits.

Furthermore, following Ahmed and Duellman (2013) and Campbell et al. (2011), we define overconfidence with the *PURCHASE* variable as instances where CEOs' net purchases (purchases minus sales) place them in the top quintile of all CEOs and increase their ownership stake in the company by at least 10% during the fiscal year. This operationalization is chosen because it captures a clear, quantifiable action that contrasts with more passive indicators of confidence. It offers a robust alternative to psychological assessments or proxy measures derived from public statements, providing a tangible demonstration of CEO confidence that can be directly linked to their decision-making and risk assessment behaviors. This approach aligns with prior research which suggests that CEOs who make significant stock purchases often do so based on their optimistic forecasts of the company's performance, making it a reliable indicator of overconfidence for the purposes of this analysis.

In Panel B of Table 7, our study delves into the effects of an alternative measure of CEO overconfidence—captured through CEOs' stock purchasing behavior (*PURCHASE*)—on repetitive patterns in corporate communication. Analyzing different similarity scores, we find a consistent and significant negative relationship across various measures. Specifically, for *Sim\_Cosine*, the *PURCHASE* variable registers a coefficient of -0.00503\*\*\*, signifying a strong inverse correlation. This trend continues with *Sim\_Jaccard*, where the coefficient is -0.00305\*\*, and with *Sim\_MinEdit*, marked by a coefficient of -0.00637\*\*. Notably, in the case of *Sim\_Simple*, the relationship is also significantly negative, reflected by a coefficient of -0.00839\*. Collectively, these results indicate that CEOs who are identified as overconfident based on their net stock purchases tend to exhibit less repetition in

corporate communications, aligning with the negative relationship noted in our primary measure of CEO overconfidence<sup>71</sup>.

[Insert Table 7]

In conclusion, our findings across both primary and alternative measures of CEO overconfidence provide empirical support to the theoretical proposition that CEO traits, particularly overconfidence, can have an impact on corporate communication strategies. This analysis underscores the multifaceted nature of CEO overconfidence and its influence on corporate disclosures.

### 5.3.2 Handling Endogeneity

Endogeneity, a prevalent challenge in governance and corporate studies, manifests primarily through self-selection bias and omitted variable bias (Wintoki et al., 2012). In our research, we address these issues by focusing on CEO overconfidence, employing Propensity Score Matching (PSM) and Entropy Balancing approach<sup>72</sup>.

#### Propensity Score Matching (PSM)

The PSM is a statistical technique often employed to estimate the causal effects of a treatment in observational studies, where random assignment is not feasible. Following the guidance of Cho et al. (2023), Maharjan and Lee (2022), and Shipman (2017), we implemented PSM in our study to address potential endogeneity issues and to approximate a randomized experiment.

<sup>71</sup> Additionally, following Ahmed and Duellman (2013), another alternative measure for CEO overconfidence, based on investment behavior (*CAPEX*), was also examined. *CAPEX* is defined as a dichotomous variable that is set to one if a firm's capital expenditures, adjusted by lagged total assets, exceed the median level of capital expenditure to lagged total assets ratio for its respective Fama–French industry in a given year. However, the results using this investment-based proxy did not yield significant findings and hence are not tabulated. This outcome underscores the varied dimensions of overconfidence and its multifaceted impacts on corporate behavior, highlighting the complexity in capturing and interpreting CEO overconfidence through different proxies.

<sup>72</sup> In our study, we addressed the potential impact of unobserved firm heterogeneity by incorporating firm fixed effects in our regression models. This approach was intended to control for any unobservable, consistent firm-specific influences. However, upon re-estimation with firm fixed effects, our results, while maintaining the same direction, did not reach statistical significance. This suggests that the unobserved firm-level characteristics did not significantly alter the relationship between CEO overconfidence and communication patterns, affirming the robustness of our primary findings.

In our research context, the "treatment" is conceptualized as CEO overconfidence. We used PSM to match firms led by overconfident CEOs (treated group) with firms led by rational CEOs (control group), based on a range of observed covariates. These covariates included various firm characteristics, governance indicators, and other control variables. The PSM process involved a few key steps. We first estimated propensity scores using logistic regression, where the dependent variable was the presence of CEO overconfidence (*HOLDER67*), and the independent variables were the set of covariates. Based on these scores, we then matched firms with overconfident CEOs to those with rational CEOs, creating pairs of similar firm-years in terms of the observed characteristics. After matching, we conducted a balance check to ensure that the matched groups were statistically similar in their covariates.

The results of this check are presented in Table 8, Panel A. Most variables show a %-bias of less than 10%, suggesting minimal differences between the groups. For example, variables like *ACSIZE* and *BOARDSIZE* displayed biases well within the acceptable range, implying successful matching. The t-test results further confirm this balance, with high p-values for most variables indicating no significant differences between the treated and control groups. Additionally, the variance ratios for these variables are generally close to 1, except for a few exceptions. Overall, the low Ps R2 value and non-significant LR chi2 test result support the conclusion of a balanced match, as do the low MeanBias and MedBias and the acceptable values for B and R.

With this satisfactory level of balance achieved, we proceed to analyze the regression results for the matched sample. This step will focus on exploring the impact of CEO overconfidence on corporate communication styles, utilizing a sample that has been carefully balanced to minimize the influence of confounding variables. The results, as shown in Table 8, Panel B, reveal significant relationships between CEO overconfidence (*HOLDER67*) and various measures of similarity in communication styles (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). For example, *HOLDER67* showed a statistically significant negative relationship with *Sim\_Cosine*, suggesting that overconfident CEOs are associated with less similarity in communication styles compared to their rational counterparts. The PSM approach ensures that the observed relationships are less likely to be confounded by other firm characteristics. Our findings, particularly the negative association between CEO overconfidence and communication similarity measures, underscore the unique communication styles adopted by overconfident CEOs.

[Insert Table 8]

## Entropy Balancing Approach

Entropy balancing, a method advanced in observational studies to enhance causal inferences, was employed in our analysis to explore the relationship between CEO overconfidence and communication styles within firms. This approach, grounded in the methodologies of Hainmueller (2012), McMullin and Schonberger (2020, 2022), and Akindayomi and Amin (2022), differs from propensity-score matching by requiring fewer parameter selections and minimizing reliance on researcher discretion. It aims to eliminate all covariate differences between treatment and control groups, creating exact balances concerning specified covariates.

In our study, entropy balancing was applied to address endogeneity concerns and reassess the relationship between CEO overconfidence (treatment) and various similarity measures in corporate communication (dependent variables). The treatment group comprised firms led by overconfident CEOs, while the control group consisted of firms with rational CEOs. We specified all necessary controls and balanced conditions, following recommendations by Hainmueller and Xu (2013). The moments of covariate distributions (mean, variance, skewness) were equalized across both groups, leading to a synthetic control group that mirrors the treated group in all specified covariates. The effectiveness of this method is evident in Table 9, Panel A, which compares pre- and post-balancing differences between the treatment and control groups. Prior to balancing, noticeable mean differences were observed in variables like *SIZE* and *MTOB* (0.649 and 0.355, respectively). However, after employing entropy balancing, these differences were reduced to 0.000, indicating that our methodology effectively minimized disparities between the groups.

Panel B of Table 9 presents the post-entropy balanced regression results. In these analyses, the variable *HOLDER67* (indicating CEO overconfidence) consistently showed a significant negative relationship across all similarity measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) in the post-balanced sample. For example, *HOLDER67* was significantly negative across all models, such as  $-0.00613^{***}$  ( $p < 0.01$ ) in *Sim\_Cosine* with a standard error of 0.00133. These findings align with our initial models, affirming the effectiveness of the entropy balancing approach in our context and underscoring the impact of CEO overconfidence on corporate communication styles.

[Insert Table 9]

## 6 Additional Analyses

### 6.1 Integrating Textual Features in the Analysis of CEO Overconfidence and Repetition

In the pursuit of an understanding of how CEO overconfidence, as captured by *HOLDER67*, influences the repetitiveness of corporate disclosures, our study expands the analytical framework to include additional textual features<sup>73</sup>. This extension is informed by a rich tapestry of literature emphasizing the criticality of textual characteristics in shaping stakeholder perceptions and interpretations of corporate disclosures.

The decision to incorporate these features is grounded in theories of management obfuscation and the impact of readability on financial reporting. The Gunning-Fog Index (*FOG*), calculated as (words per sentence + percent of complex words)  $\times$  0.4, serves as an indicator of MD&A readability, crucial for evaluating the clarity and accessibility of corporate disclosures. The significance of readability metrics is well-established in the literature, with studies by Clarkson et al. (1994), Loughran and McDonald (2014, 2016), and Hasan (2020) emphasizing their importance in annual reports.

Similarly, the incorporation of sentiment analysis (*TONE*), defined as (positive word count – negative word count) / total word count, aligns with research by Loughran and McDonald (2011), highlighting the influence of disclosure tone on investor perceptions and firm outcomes. Additionally, we included 10-K file size (*FILESIZE*) and MD&A length (*LENGTH*), measured as the natural logarithm of 1 plus the word count of a firm's MD&A, to provide insights into the extent and detail of corporate disclosures.

Focusing on *HOLDER67*, our primary variable indicative of CEO overconfidence, the regression results gives additional insight, a relationship with repetition in corporate disclosures. Contrary to the conventional belief linking overconfidence with increased repetition, our findings suggest a more complex interplay, which remains consistent even after integrating additional textual features into our analysis, as detailed in Table 10. The regression coefficients for

<sup>73</sup> While our study initially focused on CEO overconfidence and its direct impact on repetition in corporate disclosures, we opted to initially exclude certain textual features such as document length, readability, and tone from our primary regression models. This decision was guided by a methodological approach that aimed to isolate the effect of CEO overconfidence on repetition without the potential confounding influences of these variables. By doing so, we sought to ensure that any significant findings could be directly attributed to the influence of CEO traits rather than underlying textual characteristics.

*HOLDER67* across these measures are -0.00476 ( $p < 0.01$ ) for *Sim\_Cosine*, -0.00176 ( $p > 0.05$ ) for *Sim\_Jaccard*, -0.00445 ( $p < 0.05$ ) for *Sim\_MinEdit*, and -0.00941 ( $p < 0.05$ ) for *Sim\_Simple*, indicating a significant negative relationship with *Sim\_Cosine* and *Sim\_Simple* measures, and a less pronounced effect with *Sim\_Jaccard* and *Sim\_MinEdit*. The results indicate that the relationship between CEO overconfidence and repetition in MD&As is not solely determined by traditional metrics.

Regarding the additional textual features, readability (*FOG*), significantly affects the complexity and accessibility of the MD&A text. Our findings indicate that higher readability (lower *FOG* scores) correlates with less repetitiveness in disclosures, suggesting that more readable texts are associated with a clearer and more concise presentation of information. This trend is consistently observed across the *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit* measures, where the negative coefficients for *FOG* demonstrate a direct relationship between readability and the reduction of repetitive content.

Sentiment (*TONE*) analysis reveals how the tone of disclosures interacts with CEO traits such as overconfidence. Significantly negative coefficients across all measures imply that a more negative tone, which might reflect cautious or pessimistic outlooks, leads to less repetition. This could suggest that overconfident CEOs, when presenting disclosures with a negative tone, may choose to limit repetition to focus on critical issues or to avoid drawing undue attention to negative aspects.

Document size (*FILESIZE*) and length (*LENGTH*) of MD&A sections also provide insights into the depth and breadth of disclosures. Larger files are generally associated with more detailed information, which could naturally lead to higher repetition. However, our results show a complex interplay where larger *FILESIZE* values show a positive association with *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*, indicating that while larger documents may include more detailed information, this does not necessarily equate to less redundancy. Instead, the increased volume could still maintain or even increase repetition, potentially due to the need to reiterate key points across more extensive content.

Conversely, greater *LENGTH* values are associated with less repetition across all measures, contradicting the expected outcome where longer texts might typically have more repetition. This indicates that despite the increased volume of text, longer MD&A sections are more focused and contain more unique information, which reduces the overall repetitiveness. These findings, coherent with our primary regression outcomes, highlight the intricate and multifaceted effects of CEO overconfidence on the characteristics of corporate disclosures, informed by a

constellation of textual elements including readability, tone, and the quantitative aspects of the disclosures themselves<sup>74</sup>.

[Insert Table 10]

To succinctly summarize the pivotal findings from our extended analysis: CEO overconfidence, quantified through *HOLDER67*, exhibits a significant negative correlation with repetition in MD&As, particularly when analyzed using the *Sim\_Cosine* and *Sim\_Simple* similarity measures. Notably, overconfident CEOs are associated with less repetitive and potentially more original MD&A content, challenging the traditional view that overconfidence leads to increased repetition. These results are crucial as they underline an interplay between CEO psychological traits and their communication strategies, which could influence stakeholder perception and investment decisions.

## 6.2 The Influence of CEO Age, Tenure, and Gender on Disclosure Repetition

In this section, we refine our focus on CEO overconfidence while integrating relevant CEO characteristics—age, tenure, and gender—as control variables. This approach allows us to comprehensively assess the interaction between CEO overconfidence and these three personal traits in shaping the repetitiveness of corporate disclosures. By considering these characteristics as controls, we discern the direct impact of CEO overconfidence, isolating it from other interconnected CEO attributes to clarify its unique contribution to corporate communication strategies<sup>75</sup>.

<sup>74</sup> In our sensitivity analysis, we further bolstered the robustness of our findings by including additional textual features, guided by the methodologies of Loughran and McDonald (2014, 2016). This included the *SMOG* Index, assessing the complexity of words in MD&As; the Automated Readability Index (*ARI*), which delves into textual intricacy based on character counts; the Flesch-Kincaid Index (*FK*) for evaluating textual difficulty by analyzing sentence length and word complexity; and *TONE2*, an alternative sentiment analysis metric that balances positive and negative word counts. These measures ensure that our observations regarding the impact of CEO overconfidence and repetition in MD&As are consistent and reliable across various textual analysis methods.

<sup>75</sup> In response to valuable insights from the European Accounting Association Ph.D. Mentoring Initiative, notably the comments made by Steven Young, we have carefully considered the potential for collinearity and the theoretical challenge of distinguishing individual effects of CEO characteristics in a single linear regression model. Given these concerns, our analysis strategically integrates CEO age, tenure, and gender as control variables in additional analyses rather than in the initial model. This decision facilitates a focused examination of CEO overconfidence's impact on disclosure repetition, mitigating the risk of collinearity and supporting the clarity and specificity

The inclusion of CEO age, tenure, and gender as control variables enhances our understanding of how CEO overconfidence interacts with these attributes to influence disclosure repetition. CEO age and tenure, reflecting experience and risk orientation, along with gender, indicating societal expectations and leadership norms, are central to our analysis. These characteristics, aligned with the predictions of upper echelon theory (Hambrick and Mason, 1984; Finkelstein et al., 2009), help explain diverse strategic decisions and communication styles. Our findings, as illustrated in Table 11, suggest nuanced impacts of these CEO characteristics on disclosure practices:

**CEO Age (*CEO\_AGE*):** The impact of CEO age on corporate behaviors is mixed, reflecting a shift in risk orientation, openness to change, and willingness to adopt new ideas across different age brackets. Research indicates that as CEOs age, they tend to become more conservative, potentially due to increased risk aversion, which might lead to more repetitive and less innovative disclosures. This trend suggests older CEOs could favor stability over change, impacting disclosure practices by making them more predictable and conservative (Fischer and Pollock, 2004; Zhang and Rajagopalan, 2010). Conversely, younger CEOs might be more driven by potential financial returns and less weighed down by the conservatism that comes with age, leading to fresher and less repetitive disclosures (Datta et al., 2003; Escriba-Esteve et al., 2009; Tihanyi et al., 2000; Wiersema and Bantel, 1992; Yim, 2013; Serfling, 2014).

- **Results:** Our analysis in Table 11 indicates that older CEOs are slightly more inclined towards repetitiveness in some measures (*Sim\_Cosine*:  $\beta=0.000215^{**}$ , *Sim\_Jaccard*:  $\beta=0.000164^*$ ), reinforcing the notion that with age, CEOs may steer towards more guarded and routine disclosure patterns.

**CEO Tenure (*CEO\_TENURE*):** The length of a CEO's tenure can also influence disclosure patterns, with longer tenures often reflecting a commitment to the status quo and an aversion to risk. Traditionally, it is expected that long-tenured CEOs are likely to maintain established strategies and communication styles, which can lead to more repetitive disclosure patterns (Boeker, 1997; Finkelstein and Hambrick, 1990; Miller, 1991). However, our findings suggest a nuanced view:

- **Results:** In our findings, longer tenure correlates with less repetition across all measured variables (*Sim\_Cosine*:  $\beta=-0.000586^{***}$ , *Sim\_Jaccard*:  $\beta=-0.000389^{***}$ , *Sim\_MinEdit*:  $\beta=-0.000782^{***}$ ,

of our contributions. Our approach allows for the isolation of CEO overconfidence's effect, providing a robust foundation for understanding its role in corporate disclosure practices.

*Sim\_Simple*:  $\beta=-0.000617^*$ ), indicating that long-tenured CEOs may gradually adopt less repetitive and more varied disclosure styles over time.

**Gender** (*CEO\_FEMALE*): The role of gender in corporate leadership introduces varying approaches to risk and communication. Female executives, often viewed as more risk-averse compared to their male counterparts, might adopt different disclosure practices. However, societal pressures and gender stereotypes could also compel female leaders to conform to traditional norms, which may affect the nature of their disclosures (Levi et al., 2014; Hillman et al., 2002; Eagly and Johnson, 1990; Adams and Funk, 2012).

- **Results:** The impact of gender on disclosure repetition is mixed in our study. Notably, the presence of female CEOs shows a significant negative effect on repetitiveness in one measure (*Sim\_Simple*:  $\beta=-0.0465^{***}$ ), indicating a possible departure from conventional disclosure patterns among female leaders.

[Insert Table 11]

Our findings challenge the initial hypotheses about CEO characteristics and their influence on disclosure repetition. The analysis suggests that older CEOs do not necessarily adhere to more conservative disclosure practices as expected. While there is a slight indication of increased repetition with age, the effect is not as pronounced as hypothesized, hinting at a more nuanced relationship between age and communication styles. Contrary to our expectations that longer-tenured CEOs would favor more repetitive and static disclosure practices, the data reveal an inverse relationship between CEO tenure and disclosure repetition. Longer-tenured CEOs appear to adopt less repetitive and potentially more dynamic approaches to communication. This finding suggests that experience may lead to a refinement rather than a simplification of disclosure practices. Finally, the impact of CEO gender on disclosure repetition also provides interesting insights. Female CEOs, contrary to the stereotype of being more conservative in their communication, do not show a consistent pattern of increased repetition. In fact, the significant negative effect in one of the measures suggests that female CEOs might engage in less repetitive disclosures compared to their male counterparts, challenging traditional assumptions about gender and communication styles. These findings collectively underscore the complexity of attributing disclosure patterns to individual leadership traits alone and highlight the need for a more nuanced understanding of how personal attributes and corporate governance interplay in shaping corporate communications.

## 7 Concluding Remarks

In recent years, the study of CEO characteristics, particularly CEO overconfidence, has gained substantial attention in the intersection of psychology and accounting, focusing on its impact on firm performance and decision-making. Central to this exploration is the upper echelons theory, which posits that CEO traits crucially shape organizational outcomes (Hambrick and Mason, 1984; Hambrick, 2007). Despite significant research in this area, a notable gap exists in understanding the influence of CEO overconfidence on narrative disclosures in corporate communication. This research aimed to fill this gap by examining the relationship between CEO overconfidence and the repetitiveness of corporate financial reports, especially within MD&As and notes in 10-K filings.

CEO overconfidence, characterized by overestimation, overplacement, and overprecision (Moore and Healy, 2008; Moore and Schatz, 2017), has traditionally been viewed from a behavioral decision-making perspective as potentially harmful, leading to suboptimal investment choices and negative impacts on organizational performance (Malmendier and Tate, 2005, 2008; Tang et al., 2018; Park et al., 2018). However, emerging perspectives in behavioral decision theory suggest a more nuanced view, indicating that overconfidence can also have positive effects, such as driving innovation and enhancing company performance (Chen et al., 2015; Picone et al., 2014). The dichotomy in existing literature uncovers an opportunity to explore the impact of CEO overconfidence on corporate communication, particularly the strategic selection and repetition of content from notes to MD&As in 10-K filings. Our study addresses this gap by examining the extent of content similarity in these sections of 10-K reports, using textual similarity measures such as *Cosine Similarity*, *Jaccard Similarity*, *Minimum Edit Distance*, and *Simple Similarity*. We found that overconfident CEOs exhibit a communication style with less repetition, suggesting a preference for more direct and varied styles. This challenges the traditional view of overconfidence, aligning with the more recent perspectives that highlight its positive aspects in certain contexts.

The contributions of this research are multifaceted. First, it provides empirical evidence linking CEO overconfidence to distinct patterns in financial reporting, extending the understanding of how psychological traits influence corporate communication strategies. Second, by focusing on repetition in narrative disclosures, this study adds a new dimension to the literature on corporate disclosures, particularly in the context of MD&A sections of 10-K reports. Third, our findings contribute to both upper echelons theory and behavioral decision theory by illustrating how overconfidence can influence financial communications to be clearer and more transparent. Additionally, our supplementary analyses further stress the intricate relationship between CEO overconfidence and disclosure practices.

Incorporating textual features like readability and sentiment, these analyses provide deeper insights, supporting the main findings and suggesting that overconfidence leads to less repetitive and more informative disclosures. This complexity and depth affirm that CEO overconfidence plays an important role in shaping corporate disclosure strategies beyond traditional expectations.

However, this study's limitations warrant careful consideration. First, the reliance on quantitative textual similarity measures and the use of specific datasets to assess CEO overconfidence may not fully encapsulate the breadth and depth of its impact on narrative disclosures. While these methods provide valuable insights, they might overlook subtler aspects of communication style and the qualitative nuances of corporate reporting. Second, accurately identifying and classifying CEO overconfidence remains a complex challenge. Our approach, although rigorous, depends on indirect measures and proxies that might not capture the full spectrum of overconfidence or differentiate effectively between its various forms. This limitation introduces potential biases and uncertainties in our analysis. Moreover, the findings' applicability may be confined to the industries or geographic regions represented in the dataset, limiting generalizability to other contexts. Extending this research to include a more diverse array of industries and global settings could help validate the universality of the observed effects.

For future research, there is a rich potential for expanding this study to different industries and regions to gain a broader understanding. Qualitative analyses could provide deeper insights into the thematic content of CEO narratives. Furthermore, investigating other CEO characteristics and their impact on different forms of corporate communication, such as earnings calls or press releases, could offer a more comprehensive view of the influence of CEO traits on corporate communication strategies. This research opens new avenues for exploring the complex interplay between CEO characteristics, corporate disclosure practices, and organizational outcomes in various contexts.

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# Tables

**Table 1.** *Sample Creation*

Filters	Dropped	Sample Size
SEC 10-K files (1994–2022)		202,218
Eliminate duplicates within year/CIK	3,547	198,671
Compustat gvkey match	44,098	154,573
MD&A and Notes sections $\geq$ 200 words	23,853	130,720
Compustat integration (1990–2022)	16,936	113,784
BoardEx integration (1997–2022)	49,866	63,918
ExecuComp integration (1992–2022)	32,876	31,042
Drop if required data is missing	7,910	23,132

This table outlines a step-by-step filtering process applied to refine an initial dataset of SEC 10-K filings spanning from 1994 to 2022, aiming to construct a final analytical sample. The process initiates with the elimination of duplicate filings within the same year for a given company (identified by CIK), ensuring the uniqueness of each data point. Subsequent filters include a match with the Compustat database to align each SEC filing with a corresponding company, enforcing a minimum word count requirement for the MD&A and Notes sections to guarantee substantive narrative content. Further integration steps involve aligning the dataset with additional databases—Compustat for financial data, BoardEx for leadership and governance information, and ExecuComp for executive compensation details—spanning various years to enrich the dataset comprehensively. This structured approach culminates in a final dataset of 23,132 records, prepared for analytical examination.

**Table 2.** *Sample Distribution*

Year		# of obs.	% of sample	Cumulative %
<b>Panel A. by year</b>				
1999		11	0.05	0.05
2000		305	1.32	1.37
2001		426	1.84	3.21
2002		568	2.46	5.66
2003		938	4.05	9.72
2004		1031	4.46	14.18
2005		1083	4.68	18.86
2006		1109	4.79	23.65
2007		1270	5.49	29.14
2008		1223	5.29	34.43
2009		1269	5.49	39.91
2010		1250	5.40	45.32
2011		1242	5.37	50.69
2012		1231	5.32	56.01
2013		1206	5.21	61.22
2014		1157	5.00	66.22
2015		1157	5.00	71.23
2016		1121	4.85	76.07
2017		1096	4.74	80.81
2018		1077	4.66	85.47
2019		1030	4.45	89.92
2020		823	3.56	93.48
2021		829	3.58	97.06
2022		680	2.94	100.00
Total		23,132	100.00	
<b>Panel B. by industry</b>				
	2-digit SIC	# of obs.	% of sample	Cumulative %
Oil and gas	13	821	3.55	3.55
Food, beverage	20	727	3.14	6.69
Paper and allied products	26	283	1.22	7.92
Chemicals and allied products	28	2020	8.73	16.65
Primary metal industries	33	410	1.77	18.42
Fabricated metal products	34	406	1.76	20.18
Industrial machinery and computer equipment	35	1560	6.74	26.92
Electronic and other electric equipment	36	2051	8.87	35.79
Transportation equipment	37	705	3.05	38.83
Instruments and related products	38	1598	6.91	45.74
Communication	48	496	2.14	47.89
Electric, Gas, and Sanitary Services	49	1344	5.81	53.70
Wholesale—durable goods	50	553	2.39	56.09

*(Continued on next page)*

**Table 2. Sample Distribution**

	2-digit SIC	# of obs.	% of sample	Cumulative %
<b>Panel B. by industry</b>				
<i>(Continued)</i>				
Wholesale—non-durable goods	51	335	1.45	57.54
General merchandise store	53	277	1.20	58.73
Apparel and accessory stores	56	465	2.01	60.74
Eating and drinking	58	417	1.80	62.55
Miscellaneous retail	59	409	1.77	64.31
Business services	73	2549	11.02	76.46
Health services	80	399	1.72	78.18
Engineering and management services	87	408	1.76	79.95
Others	<sup>a</sup>	4899	21.18	100.00
Total		23,132	100.00	

<sup>a</sup> Industries with fewer than 250 observations have been aggregated into this category. It should be noted that there are 260 firm-year observations for firms in the financial services industry, which falls within the SIC code range of 6000 to 6999. While some previous studies have excluded these observations, others have not, contingent upon the specific demands of the study. In this research, they have been categorized under the "Others" category.

Table 2 presents a detailed breakdown of the sample distribution across two main dimensions: by year (Panel A) and by industry (Panel B), based on 2-digit SIC codes. Panel A outlines the annual distribution of observations from 1999 to 2022, indicating both the number and percentage of observations per year, along with a cumulative percentage to show the growth of the sample over time. Panel B categorizes the sample by industry, showing the diversity of sectors covered in the analysis.

**Table 3. Descriptive Statistics**

Variable	N	Mean	SD	Min	25 %	50 %	75 %	Max
<u>Dependent variables (<i>REPETITION</i> measures)</u>								
<i>Sim_Cosine</i>	23132	0.880	0.101	0.013	0.846	0.909	0.946	1.000
<i>Sim_Jaccard</i>	23132	0.208	0.090	0.003	0.152	0.212	0.252	0.500
<i>Sim_MinEdit</i>	23132	0.473	0.188	0.015	0.351	0.490	0.574	1.000
<i>Sim_Simple</i>	23132	0.357	0.304	0.000	0.056	0.330	0.549	1.000
<u>Independent variables</u>								
<i>HOLDER67</i>	23132	0.333	0.471	0.000	0.000	0.000	1.000	1.000
<u>Control variables</u>								
<i>ACSIZE</i>	23132	4.298	1.205	1.000	3.000	4.000	5.000	12.000
<i>ACIND</i>	23132	0.887	0.154	0.000	0.750	1.000	1.000	1.000
<i>ACFEXP</i>	23132	0.511	0.301	0.000	0.250	0.429	0.750	1.000
<i>ACCHAIRFE</i>	23132	0.814	0.389	0.000	1.000	1.000	1.000	1.000
<i>BOARDSIZE</i>	23132	12.800	6.026	4.000	9.000	11.000	15.000	32.000
<i>BOARDIND</i>	23132	0.595	0.141	0.000	0.500	0.600	0.714	1.000
<i>ZSCORE</i>	23132	1.067	0.743	-3.346	0.570	0.897	1.359	13.196
<i>LOSS</i>	23132	0.190	0.392	0.000	0.000	0.000	0.000	1.000
<i>SIZE</i>	23132	7.695	1.676	0.636	6.574	7.598	8.744	14.467
<i>AGE_LN</i>	23132	2.917	0.382	1.946	2.708	2.944	3.219	3.555
<i>SPEC</i>	23132	-0.016	0.069	-1.288	-0.014	-0.003	0.000	1.281
<i>SALE_VOL</i>	23132	0.232	0.252	0.001	0.088	0.163	0.291	6.255
<i>NONMISS_LN</i>	23132	6.022	0.064	5.724	5.992	6.033	6.066	6.180
<i>DAC</i>	23132	0.384	0.878	0.000	0.162	0.231	0.340	13.569
<i>ROE</i>	23132	-0.013	0.374	-6.983	0.014	0.042	0.062	4.630
<i>INVT_VOL</i>	23132	2.455	3.229	0.000	0.250	1.406	3.384	40.042
<i>CFO_SALE</i>	23132	0.108	0.366	-6.739	0.059	0.113	0.191	4.701
<i>MTOB</i>	23132	2.083	1.478	0.312	1.226	1.628	2.372	14.605
<i>SLACK</i>	23132	1.072	3.477	0.000	0.063	0.240	0.841	59.938
<i>DIV</i>	23132	0.503	0.500	0.000	0.000	1.000	1.000	1.000
<i>TANGIBILITY</i>	23132	0.526	0.425	0.001	0.205	0.410	0.770	7.165
<i>KSTRUCTURE</i>	23132	0.191	0.193	0.000	0.024	0.142	0.294	1.000

Table 3 lays out the descriptive statistics for all variables considered in our analysis, straightaway providing insights into the dataset's characteristics. This includes: Dependent variables measuring disclosure repetition (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*), capturing various aspects of textual similarity in corporate disclosures. The independent variable, *HOLDER67*, is investigated for its influence on the repetition metrics, indicating CEO overconfidence. Control variables such as *ACSIZE*, *ACIND*, *ACFEXP*, and *ACCHAIRFE*, alongside financial health indicators (*ZSCORE*, *LOSS*), firm characteristics (*SIZE*, *AGE\_LN*), and other pertinent metrics (*SPEC*, *SALE\_VOL*, *NONMISS\_LN*, *DAC*, *ROE*, *INVT\_VOL*, *CFO\_SALE*, *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, *KSTRUCTURE*), are detailed to account for external impacts on disclosure patterns. Each category is quantified across standard statistical measures: mean, standard deviation, minimum and maximum values, alongside quartiles, post-winsorization to minimize outlier effects. This concise arrangement provides a clear, sequential understanding of the variables' distribution and sets a solid foundation for the ensuing regression analysis, ensuring clarity and accessibility in our exploration of corporate disclosures.

**Table 4.** Mean Difference Test by CEO overconfidence

Variable	Cautious CEOs			Overconfident CEOs			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>Sim_Cosine</i>	15434	0.882	0.910	7698	0.875	0.905	-4.703 (0.000)	-4.746 (0.000)
<i>Sim_Jaccard</i>	15434	0.209	0.213	7698	0.206	0.210	-2.207 (0.027)	-2.862 (0.004)
<i>Sim_MinEdit</i>	15434	0.475	0.493	7698	0.469	0.486	-2.229 (0.026)	-2.714 (0.007)
<i>Sim_Simple</i>	15434	0.357	0.334	7698	0.357	0.320	0.086 (0.932)	-0.447 (0.655)
<i>ACSIZE</i>	15434	4.301	4.000	7698	4.293	4.000	-0.457 (0.648)	-0.061 (0.952)
<i>ACIND</i>	15434	0.884	1.000	7698	0.893	1.000	4.254 (0.000)	3.110 (0.002)
<i>ACFEXP</i>	15434	0.505	0.429	7698	0.521	0.500	3.765 (0.000)	2.964 (0.003)
<i>ACCHAIRFE</i>	15434	0.816	1.000	7698	0.810	1.000	-1.203 (0.229)	-0.814 (0.416)
<i>BOARDSIZE</i>	15434	12.600	11.000	7698	13.201	12.000	7.052 (0.000)	7.893 (0.000)
<i>BOARDIND</i>	15434	0.597	0.600	7698	0.591	0.583	-3.171 (0.002)	-4.361 (0.000)
<i>ZSCORE</i>	15434	1.060	0.893	7698	1.080	0.904	1.963 (0.050)	3.367 (0.001)
<i>LOSS</i>	15434	0.226	0.000	7698	0.118	0.000	-21.816 (0.000)	-13.492 (0.000)
<i>SIZE</i>	15434	7.479	7.363	7698	8.128	8.013	28.941 (0.000)	28.835 (0.000)
<i>AGE_LN</i>	15434	2.886	2.944	7698	2.977	2.996	18.055 (0.000)	14.985 (0.000)
<i>SPEC</i>	15434	-0.018	-0.004	7698	-0.012	-0.002	7.279 (0.000)	11.007 (0.000)
<i>SALE_VOL</i>	15434	0.234	0.163	7698	0.228	0.163	-1.786 (0.074)	1.691 (0.091)
<i>NONMISS_LN</i>	15434	6.019	6.031	7698	6.029	6.038	12.023 (0.000)	10.089 (0.000)
<i>DAC</i>	15434	0.385	0.234	7698	0.383	0.228	-0.125 (0.900)	-1.821 (0.069)
<i>ROE</i>	15434	-0.030	0.040	7698	0.020	0.044	11.374 (0.000)	11.131 (0.000)
<i>INVT_VOL</i>	15434	2.487	1.394	7698	2.390	1.428	-2.200 (0.028)	1.133 (0.257)
<i>CFO_SALE</i>	15434	0.091	0.105	7698	0.141	0.128	11.456 (0.000)	17.942 (0.000)
<i>MTOB</i>	15434	1.965	1.528	7698	2.320	1.862	16.795 (0.000)	26.136 (0.000)
<i>SLACK</i>	15434	1.101	0.233	7698	1.013	0.253	-1.965 (0.049)	4.361 (0.000)

(Continued on next page)

**Table 4.** Mean Difference Test by CEO overconfidence

Variable	Cautious CEOs			Overconfident CEOs			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>(Continued)</i>								
<i>DIV</i>	15434	0.477	0.000	7698	0.556	1.000	11.448 (0.000)	9.869 (0.000)
<i>TANGIBILITY</i>	15434	0.538	0.428	7698	0.501	0.376	-6.450 (0.000)	-6.433 (0.000)
<i>KSTRUCTURE</i>	15434	0.210	0.160	7698	0.153	0.115	-23.101 (0.000)	-17.074 (0.000)

Table 4 provides a clear comparison between cautious and overconfident CEOs using various variables, split by CEO overconfidence as indicated by *HOLDER67*. For each variable, the table compares cautious CEOs (*HOLDER67* = 0) to overconfident CEOs (*HOLDER67* = 1), offering mean and median values alongside the number of observations (N) for each group. Additionally, it provides the results of t-tests and Wilcoxon tests to assess statistical differences between the two groups. The division into cautious and overconfident CEOs based on *HOLDER67* allows for insights into how overconfidence may influence various aspects of corporate behavior and characteristics. This structured approach highlights significant differences across a wide range of variables, underpinning the influence of CEO overconfidence on corporate disclosure practices and other company attributes. All variables definitions are detailed further in Appendix B.

**Table 5.** Correlation Matrix: CEO Overconfidence, Repetition, and Controls (n = 23132)

<b>Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>
(1) <i>Sim_Cosine</i>	1								
(2) <i>Sim_Jaccard</i>	0.770*	1							
(3) <i>Sim_MinEdit</i>	0.796*	0.992*	1						
(4) <i>Sim_Simple</i>	0.446*	0.597*	0.599*	1					
(5) <i>HOLDER67</i>	-0.032*	-0.015*	-0.015*	0.001	1				
(6) <i>ACSIZE</i>	0.092*	0.068*	0.066*	0.046*	-0.003	1			
(7) <i>ACIND</i>	0.017*	0.013*	0.015*	0.011	0.027*	0.047*	1		
(8) <i>ACFEXP</i>	0.066*	0.049*	0.056*	0.009	0.025*	-0.072*	0.067*	1	
(9) <i>ACCHAIRFE</i>	0.051*	0.052*	0.056*	-0.006	-0.008	0.009	0.070*	0.278*	1
(10) <i>BOARDSIZE</i>	0.032*	0.038*	0.032*	0.051*	0.047*	0.225*	0.081*	0.015*	-0.073*
(11) <i>BOARDIND</i>	0.068*	0.049*	0.056*	0.015*	-0.021*	0.146*	0.325*	0.151*	0.173*
(12) <i>ZSCORE</i>	-0.052*	-0.026*	-0.022*	-0.014*	0.013	0.013	-0.016*	-0.044*	-0.003
(13) <i>LOSS</i>	0.006	-0.003	-0.001	-0.011	-0.131*	-0.060*	-0.056*	-0.040*	-0.001
(14) <i>SIZE</i>	0.049*	0.047*	0.043*	0.056*	0.182*	0.250*	0.087*	0.143*	-0.039*
(15) <i>AGE_LN</i>	0.111*	0.070*	0.077*	0.061*	0.112*	0.227*	0.070*	0.194*	0.079*
(16) <i>SPEC</i>	-0.004	-0.002	-0.003	0.003	0.043*	0.014*	0.032*	0.016*	-0.001
(17) <i>SALE_VOL</i>	-0.081*	-0.051*	-0.052*	-0.036*	-0.011	-0.100*	-0.050*	-0.084*	-0.032*
(18) <i>NONMISS_LN</i>	0.091*	0.089*	0.101*	0.014*	0.076*	-0.013*	0.111*	0.252*	0.260*
(19) <i>DAC</i>	0.041*	0.019*	0.021*	0.044*	-0.001	0.092*	0.035*	0.058*	-0.004
(20) <i>ROE</i>	-0.003	0.003	0.002	0.007	0.062*	0.023*	0.034*	0.020*	-0.009
(21) <i>INVT_VOL</i>	-0.045*	-0.048*	-0.046*	-0.014*	-0.014*	-0.049*	-0.028*	-0.051*	-0.004
(22) <i>CFO_SALE</i>	0.015*	0.011	0.01	0.002	0.064*	0.044*	0.066*	0.034*	0.008
(23) <i>MTOB</i>	-0.093*	-0.081*	-0.075*	-0.036*	0.113*	-0.100*	-0.033*	-0.012	-0.045*
(24) <i>SLACK</i>	-0.061*	-0.041*	-0.040*	-0.022*	-0.012	-0.121*	-0.030*	-0.024*	0.012
(25) <i>DIV</i>	0.076*	0.054*	0.052*	0.061*	0.075*	0.275*	0.081*	0.040*	-0.038*
(26) <i>TANGIBILITY</i>	0.069*	0.041*	0.041*	0.032*	-0.041*	0.147*	0.011	-0.031*	0.006
(27) <i>KSTRUCTURE</i>	0.113*	0.079*	0.073*	0.044*	-0.138*	0.145*	0.030*	0.061*	-0.007
<b>Variables</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>	<b>(13)</b>	<b>(14)</b>	<b>(15)</b>	<b>(16)</b>	<b>(17)</b>	<b>(18)</b>
(10) <i>BOARDSIZE</i>	1								
(11) <i>BOARDIND</i>	-0.265*	1							
(12) <i>ZSCORE</i>	-0.058*	-0.036*	1						
(13) <i>LOSS</i>	-0.100*	0.018*	-0.103*	1					
(14) <i>SIZE</i>	0.499*	-0.111*	-0.141*	-0.335*	1				
(15) <i>AGE_LN</i>	0.114*	0.222*	-0.026*	-0.055*	0.214*	1			
(16) <i>SPEC</i>	0.017*	0.033*	0	-0.347*	0.128*	0.042*	1		
(17) <i>SALE_VOL</i>	-0.099*	-0.096*	0.588*	-0.012	-0.142*	-0.227*	-0.002	1	
(18) <i>NONMISS_LN</i>	-0.084*	0.277*	-0.020*	0.049*	0.015*	0.240*	-0.055*	-0.116*	1
(19) <i>DAC</i>	0.215*	-0.024*	-0.054*	-0.024*	0.332*	0.113*	0.009	-0.054*	-0.032*
(20) <i>ROE</i>	0.040*	0.020*	0.013*	-0.409*	0.258*	0.033*	0.496*	-0.003	-0.013
(21) <i>INVT_VOL</i>	-0.085*	-0.063*	0.322*	0.026*	-0.173*	-0.078*	-0.018*	0.445*	-0.030*
(22) <i>CFO_SALE</i>	0.091*	-0.026*	-0.037*	-0.243*	0.219*	0.036*	0.057*	-0.058*	-0.020*
(23) <i>MTOB</i>	0.001	-0.083*	0.063*	-0.119*	0.257*	-0.072*	0.060*	0.108*	-0.015*
(24) <i>SLACK</i>	-0.086*	0.022*	-0.114*	0.065*	-0.093*	-0.114*	0.022*	0.038*	0.032*
(25) <i>DIV</i>	0.233*	0.026*	0.048*	-0.246*	0.354*	0.297*	0.069*	-0.153*	-0.051*
(26) <i>TANGIBILITY</i>	0.062*	0.034*	-0.028*	0.066*	-0.029*	0.123*	0.031*	-0.142*	-0.201*
(27) <i>KSTRUCTURE</i>	0.053*	0.071*	-0.166*	0.229*	-0.085*	0.098*	-0.077*	-0.133*	-0.073*

(Continued on next page)

**Table 5.** Correlation Matrix: CEO Overconfidence, Repetition, and Controls (n = 23132)

Variables	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
<i>(Continued)</i>									
(19) DAC	1								
(20) ROE	0.006	1							
(21) INVT_VOL	-0.066*	-0.016*	1						
(22) CFO_SALE	0.049*	0.104*	-0.069*	1					
(23) MTOB	-0.037*	0.073*	0.020*	-0.020*	1				
(24) SLACK	-0.057*	0.002	-0.048*	-0.203*	0.176*	1			
(25) DIV	0.112*	0.121*	-0.100*	0.103*	-0.051*	-0.160*	1		
(26) TANGIBILITY	0.136*	-0.073*	-0.117*	0.119*	-0.192*	-0.271*	0.172*	1	
(27) KSTRUCTURE	0.063*	-0.244*	-0.099*	0.020*	-0.400*	-0.163*	0.035*	0.308*	1

Table 5 presents a correlation matrix for a comprehensive set of variables within our dataset of 23,132 observations, showcasing the interrelationships among them. The correlation among the repetition measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) is notably strong, especially between *Sim\_Jaccard* and *Sim\_MinEdit*, suggesting a high degree of overlap in what these measures capture about the repetitiveness of corporate disclosures. CEO overconfidence (*HOLDER67*) shows a varied but generally low level of correlation with repetition measures and other variables, indicating its distinct influence separate from other factors. Each correlation is marked with an asterisk (\*) to denote statistical significance at the p-value less than 0.05, providing a clear indicator of robust associations among the variables. This matrix is instrumental in identifying potential variables for further analysis and understanding the multidimensional dynamics at play in corporate disclosure practices. All variables are elaborately defined in Appendix B, ensuring clarity and accessibility in interpreting the matrix's findings.

**Table 6.** Regression Results of CEO Overconfidence on Repetition (Similarity Scores)

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>HOLDER67</i>	-0.00551*** (0.00144)	-0.00288** (0.00128)	-0.00641** (0.00269)	-0.00602 (0.00439)
<i>ACSIZE</i>	0.00219*** (0.000617)	0.00155*** (0.000550)	0.00317*** (0.00115)	0.000402 (0.00188)
<i>ACIND</i>	-0.0184*** (0.00469)	-0.0144*** (0.00419)	-0.0302*** (0.00877)	0.000924 (0.0143)
<i>ACFEXP</i>	0.00442* (0.00245)	0.00212 (0.00218)	0.00520 (0.00458)	0.00732 (0.00747)
<i>ACCHAIRFE</i>	-0.00175 (0.00185)	-0.000610 (0.00165)	-0.00238 (0.00346)	-0.00791 (0.00564)
<i>BOARDSIZE</i>	-0.000204 (0.000139)	5.83e-05 (0.000124)	0.000146 (0.000260)	0.000348 (0.000425)
<i>BOARDIND</i>	0.00671 (0.00604)	0.00354 (0.00539)	0.00605 (0.0113)	0.0402** (0.0184)
<i>ZSCORE</i>	-0.000615 (0.00145)	0.00178 (0.00129)	0.00414 (0.00271)	0.00669 (0.00441)
<i>LOSS</i>	0.000455 (0.00205)	0.000672 (0.00183)	0.00199 (0.00384)	-0.00107 (0.00626)
<i>SIZE</i>	0.00224*** (0.000643)	0.00306*** (0.000573)	0.00537*** (0.00120)	0.00766*** (0.00196)
<i>AGE_LN</i>	0.00928*** (0.00221)	0.00217 (0.00197)	0.00412 (0.00414)	0.0356*** (0.00675)
<i>SPEC</i>	-0.0134 (0.0111)	-0.00852 (0.00993)	-0.0204 (0.0208)	0.0199 (0.0340)
<i>SALE_VOL</i>	-0.0105*** (0.00377)	-0.00531 (0.00337)	-0.0130* (0.00706)	-0.0241** (0.0115)
<i>NONMISS_LN</i>	0.0984*** (0.0190)	0.0844*** (0.0169)	0.167*** (0.0355)	0.266*** (0.0580)
<i>DAC</i>	0.00190** (0.000832)	-4.44e-05 (0.000742)	0.000453 (0.00156)	0.0101*** (0.00254)
<i>ROE</i>	0.00307 (0.00217)	0.00236 (0.00194)	0.00539 (0.00407)	-0.000992 (0.00663)
<i>INVT_VOL</i>	-4.70e-06 (0.000272)	-0.000220 (0.000243)	-0.000441 (0.000509)	-0.000401 (0.000831)
<i>CFO_SALE</i>	-0.00101 (0.00196)	-0.00186 (0.00175)	-0.00384 (0.00366)	-0.00419 (0.00597)
<i>MTOB</i>	-0.00230*** (0.000539)	-0.00276*** (0.000481)	-0.00515*** (0.00101)	-0.00288* (0.00165)
<i>SLACK</i>	-0.000801*** (0.000210)	-0.000353* (0.000187)	-0.000742* (0.000393)	0.000104 (0.000641)
<i>DIV</i>	0.00271* (0.00158)	0.000846 (0.00141)	0.00189 (0.00296)	0.00712 (0.00483)

(Continued on next page)

**Table 6.** Regression Results of CEO Overconfidence on Repetition (Similarity Scores)

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>TANGIBILITY</i>	0.00144 (0.00227)	-0.000315 (0.00202)	-5.53e-05 (0.00424)	-0.00529 (0.00692)
<i>KSTRUCTURE</i>	0.0384*** (0.00446)	0.0256*** (0.00398)	0.0480*** (0.00834)	0.0378*** (0.0136)
<i>Constant</i>	0.193* (0.116)	-0.416*** (0.104)	-0.782*** (0.217)	-1.344*** (0.355)
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	23,132	23,132	23,132	23,132
R-squared	0.069	0.058	0.058	0.040

This table presents the regression analysis results exploring the relationship between CEO overconfidence, measured by *HOLDER67*, and the repetitiveness of corporate disclosures, analyzed through similarity scores including *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The findings provide a view, challenging the traditional belief that overconfidence leads to increased repetition and highlighting the complex interplay between CEO psychological traits and disclosure practices. Standard errors are shown in parentheses, with significance levels marked accordingly (\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ). All variables are defined in Appendix B.

**Table 7. Exploring CEO Overconfidence and Repetition: A Comparative Analysis of Alternative Measures**

**Panel A. Year-over-Year MD&A Similarity Analysis with CEO Overconfidence**

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>HOLDER67</i>	-0.00126 (0.00157)	0.00274* (0.00165)	0.00428 (0.00345)	0.0150*** (0.00410)
<i>Constant</i>	0.606*** (0.128)	0.411*** (0.135)	0.850*** (0.282)	1.737*** (0.334)
CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	21,963	21,963	21,963	21,963
R-squared	0.053	0.091	0.091	0.039

**Panel B. Impact of Alternative CEO Overconfidence Measure on Repetitive Disclosures**

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>PURCHASE</i>	-0.00503*** (0.00152)	-0.00305** (0.00135)	-0.00637** (0.00283)	-0.00839* (0.00462)
<i>Constant</i>	0.185 (0.116)	-0.422*** (0.104)	-0.793*** (0.218)	-1.364*** (0.355)
CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	23,132	23,132	23,132	23,132
R-squared	0.069	0.058	0.058	0.040

Table 7 delves into the relationship between CEO overconfidence and the repetitiveness of corporate disclosures through a comparative analysis of alternative measures, divided into two panels. In **Panel A**, the year-over-year MD&A similarity analysis reveals varying impacts of CEO overconfidence (*HOLDER67*) across four similarity measures: *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. Notably, *HOLDER67* shows a statistically significant positive relationship with *Sim\_Jaccard* and a more substantial effect on *Sim\_Simple*, suggesting overconfident CEOs may lean towards more repetitive MD&A sections under certain conditions. Each model controls for various factors, including industry and year fixed effects, with a consistent observation count across models, emphasizing the robustness of the analysis. **Panel B** shifts focus to an alternative measure of CEO overconfidence, *PURCHASE*, examining its influence on the same set of repetitive disclosure measures. Here, *PURCHASE* negatively affects all four similarity measures, with the strongest and statistically significant impact observed on *Sim\_Cosine* and *Sim\_MinEdit*, indicating that CEOs who purchase their company's stock are associated with less repetitive disclosures. This panel also controls for additional variables and maintains a uniform observation count, underscoring the comprehensive nature of the investigation. Across both panels, the inclusion of control variables, year and industry fixed effects, and a substantial number of observations highlights the methodological rigor applied in assessing the interplay between CEO overconfidence and disclosure repetition. Standard errors are shown in parentheses, with significance levels marked accordingly (\*\*\*)  $p < 0.01$ , (\*\*)  $p < 0.05$ , (\*)  $p < 0.1$ ). This analytical framework, detailed in Appendix B, affords a deeper understanding of how CEO psychological traits can subtly yet significantly shape corporate communication strategies.

**Table 8. Addressing Selection Bias Using Propensity Score Matching (PSM)****Panel A. Balance Check after PSM [Treatment (Overconfident CEOs = 1) Vs. Control (Rational CEOs = 0)]**

	Mean			Statistics		
	(1) Treatment	(2) Control	(3) %bias	(5) t-test	(6) P-value	(7) V(T)/V(C)
ACSIZE	4.293	4.314	-1.7	-1.080	0.279	1.020
ACIND	0.893	0.890	1.9	1.160	0.248	0.89*
ACFExp	0.521	0.526	-1.6	-0.960	0.338	1.040
ACCHAIRFE	0.810	0.815	-1.3	-0.800	0.421	.
BOARDSIZE	13.201	13.342	-2.3	-1.430	0.154	1.020
BOARDIND	0.591	0.589	1.4	0.880	0.381	0.970
ZSCORE	1.080	1.084	-0.5	-0.290	0.775	0.93*
LOSS	0.118	0.121	-0.8	-0.570	0.567	.
SIZE	8.128	8.174	-2.8	-1.740	0.083	0.88*
AGE_LN	2.977	2.980	-0.7	-0.470	0.635	0.91*
SPEC	-0.012	-0.013	1.5	1.170	0.241	0.95*
SALE_VOL	0.228	0.224	1.6	1.050	0.296	0.89*
NONMISS_LN	6.029	6.030	-1.2	-0.810	0.416	0.95*
DAC	0.383	0.379	0.5	0.330	0.744	1.12*
ROE	0.020	0.018	0.3	0.280	0.777	0.78*
INVT_VOL	2.390	2.398	-0.2	-0.150	0.885	0.960
CFO_SALE	0.141	0.138	0.8	0.730	0.467	1.13*
MTOB	2.320	2.306	0.9	0.550	0.585	0.89*
SLACK	1.013	1.012	0.0	0.020	0.981	0.95*
DIV	0.556	0.562	-1.1	-0.680	0.495	.
TANGIBILITY	0.501	0.498	0.6	0.420	0.674	1.030
KSTRUCTURE	0.153	0.152	0.5	0.330	0.740	1.000
	Ps R2	0.001		MedBias		1.0
Overall Balance	LR chi2	16.22		B		6.5
	p>chi2	0.805		R		0.88
	MeanBias	1.1		%Var		63

**Panel B. Post-matching Regression Results**

Variable	(1)	(2)	(3)	(4)
	Sim_Cosine	Sim_Jaccard	Sim_MinEdit	Sim_Simple
<b>HOLDER67</b>	-0.00553***	-0.00257**	-0.00549*	-0.00916*
	(0.00201)	(0.00175)	(0.00367)	(0.00605)
ACSIZE	0.00232**	0.00135	0.00286	-0.000753
	(0.000975)	(0.000856)	(0.00179)	(0.00296)
ACIND	-0.0340***	-0.0264***	-0.0564***	-0.0208
	(0.00757)	(0.00658)	(0.0137)	(0.0223)
ACFEXP	-0.000263	0.000968	0.00231	0.0118
	(0.00355)	(0.00324)	(0.00679)	(0.0111)

(Continued on next page)

**Table 8. Addressing Selection Bias Using Propensity Score Matching (PSM)**

**Panel B. Post-matching Regression Results**

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>ACCHAIRFE</i>	-0.00243 (0.00314)	0.00107 (0.00243)	0.00112 (0.00515)	-0.00614 (0.00860)
<i>BOARDSIZE</i>	0.000107 (0.000197)	0.000279 (0.000188)	0.000578 (0.000388)	1.00e-05 (0.000656)
<i>BOARDIND</i>	0.0187** (0.00949)	0.0105 (0.00852)	0.0176 (0.0177)	0.0583** (0.0285)
<i>ZSCORE</i>	0.00206 (0.00237)	0.00454** (0.00230)	0.00963** (0.00472)	0.00419 (0.00750)
<i>LOSS</i>	0.00284 (0.00347)	0.00490 (0.00303)	0.0116* (0.00635)	0.00215 (0.0104)
<i>SIZE</i>	0.00270** (0.00106)	0.00397*** (0.000984)	0.00720*** (0.00203)	0.0111*** (0.00324)
<i>AGE_LN</i>	0.0137*** (0.00370)	0.00612* (0.00316)	0.0128* (0.00667)	0.0463*** (0.0109)
<i>SPEC</i>	-0.00994 (0.0165)	0.0117 (0.0156)	0.0217 (0.0336)	0.0878 (0.0570)
<i>SALE_VOL</i>	-0.0168** (0.00685)	-0.00942 (0.00584)	-0.0207* (0.0120)	-0.0196 (0.0189)
<i>NONMISS_LN</i>	0.0882*** (0.0305)	0.0794*** (0.0256)	0.160*** (0.0542)	0.361*** (0.0879)
<i>DAC</i>	0.00163 (0.00119)	-0.00115 (0.00132)	-0.00148 (0.00270)	0.0147*** (0.00480)
<i>ROE</i>	-0.00118 (0.00404)	-0.000345 (0.00348)	-0.000446 (0.00751)	-0.0113 (0.0131)
<i>INVT_VOL</i>	6.98e-05 (0.000441)	-0.000199 (0.000391)	-0.000440 (0.000816)	-0.000490 (0.00131)
<i>CFO_SALE</i>	-0.00238 (0.00328)	-0.00789* (0.00405)	-0.0157** (0.00795)	-0.0124 (0.0128)
<i>MTOB</i>	-0.00278*** (0.000860)	-0.00337*** (0.000706)	-0.00653*** (0.00153)	-0.00429** (0.00249)
<i>SLACK</i>	-0.000577* (0.000341)	-0.000166 (0.000338)	-0.000285 (0.000685)	0.00115 (0.00122)
<i>DIV</i>	4.86e-05 (0.00240)	-0.00171 (0.00217)	-0.00279 (0.00452)	0.00569 (0.00727)
<i>TANGIBILITY</i>	0.00379 (0.00329)	0.000491 (0.00314)	0.00216 (0.00654)	0.00332 (0.0112)
<i>KSTRUCTURE</i>	0.0329*** (0.00758)	0.0234*** (0.00694)	0.0422*** (0.0145)	0.0229 (0.0240)
<i>Constant</i>	0.239 (0.185)	-0.391** (0.152)	-0.749** (0.322)	-1.960*** (0.545)

*(Continued on next page)*

**Table 8.** Addressing Selection Bias Using Propensity Score Matching (PSM)**Panel B.** Post-matching Regression Results*(Continued)*

YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	12,698	12,698	12,698	12,698
R-squared	0.071	0.068	0.069	0.069

Table 8 investigates the influence of CEO overconfidence on the repetitiveness of corporate disclosures, utilizing Propensity Score Matching (PSM) to address potential selection bias. The analysis is segmented into two panels. **Panel A** conducts a balance check post-PSM, comparing treatment groups (Overconfident CEOs) and control groups (Rational CEOs) across several variables to ensure comparable cohorts. The variables assessed include aspects of corporate governance (e.g., *ACSize*, *ACIND*), financial health (e.g., *ZSCORE*, *LOSS*), and firm characteristics (e.g., *SIZE*, *AGE\_LN*). The balance is evaluated through %bias, t-tests, and variance ratios ( $V(T)/V(C)$ ), demonstrating minimal differences post-matching, indicating effective matching. Notably, metrics such as %bias across most variables are close to zero, and P-values from t-tests generally exceed conventional significance levels, affirming the balance between matched groups. **Panel B** presents the regression results after applying PSM, analyzing the effect of CEO overconfidence (*HOLDER67*) on four different measures of disclosure repetition: *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The findings indicate a significant negative impact of CEO overconfidence on all repetition measures, with the strongest effect observed on *Sim\_Simple*. Additional variables included in the regression (e.g., *ACSIZE*, *ACIND*, *BOARDIND*, *SIZE*) also show varying degrees of influence on repetition measures, underscoring the multifaceted determinants of disclosure practices. The regression models control for year and industry fixed effects to isolate the effect of CEO overconfidence, with the observation count and R-squared values indicating robust model specifications. Standard errors are shown in parentheses, with significance levels marked accordingly (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ). This two-pronged analysis through PSM and regression modeling, detailed further in Appendix B, thoroughly examines how CEO overconfidence affects the nature of corporate disclosures, providing empirical evidence of its role in shaping corporate communication strategies.

**Table 9. Addressing Selection Bias Using Entropy Balancing Approach**

**Panel A. Pre Vs. Post-balancing Entropy Balanced Approach**  
*[Treatment (Overconfident CEOs = 1) Vs. Control (Rational CEOs = 0)]*

	<i>Pre-balancing Entropy Balanced</i>			<i>Post-balancing Entropy Balanced</i>		
	(1)	(2)	(3)	(5)	(6)	(7)
	Treatment	Control	Diff [1-2]	Treatment	Control	Diff [5-6]
	Mean	Mean	Diff [1-2]	Mean	Mean	Diff [5-6]
ACSIZE	4.293	4.301	-0.008	4.293	4.293	0.000
ACIND	0.893	0.884	0.009	0.893	0.893	0.000
ACFExp	0.521	0.505	0.016	0.521	0.521	0.000
ACCHAIRFE	0.810	0.816	-0.007	0.810	0.810	0.000
BOARDSIZE	13.200	12.600	0.600	13.200	13.200	0.000
BOARDIND	0.591	0.597	-0.006	0.591	0.591	0.000
ZSCORE	1.080	1.060	0.020	1.080	1.080	0.000
LOSS	0.118	0.226	-0.109	0.118	0.118	0.000
SIZE	8.128	7.479	0.649	8.128	8.128	0.000
AGE_LN	2.977	2.886	0.091	2.977	2.977	0.000
SPEC	-0.012	-0.018	0.006	-0.012	-0.012	0.000
SALE_VOL	0.228	0.234	-0.006	0.228	0.228	0.000
NONMISS_LN	6.029	6.018	0.011	6.029	6.029	0.000
DAC	0.383	0.385	-0.001	0.383	0.383	0.000
ROE	0.020	-0.030	0.049	0.020	0.020	0.000
INVT_VOL	2.390	2.487	-0.097	2.390	2.390	0.000
CFO_SALE	0.141	0.091	0.050	0.141	0.141	0.000
MTOB	2.320	1.965	0.355	2.320	2.320	0.000
SLACK	1.013	1.101	-0.088	1.013	1.013	0.000
DIV	0.556	0.477	0.080	0.556	0.556	0.000
TANGIBILITY	0.501	0.538	-0.037	0.501	0.501	0.000
KSTRUCTURE	0.153	0.210	-0.057	0.153	0.153	0.000

**Panel B. Post Entropy Balanced Regression Results**

Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<b>HOLDER67</b>	-0.00613***	-0.00343***	-0.00758***	-0.00788**
	(0.00133)	(0.00118)	(0.00246)	(0.00400)
ACSIZE	0.00315***	0.00176***	0.00372***	0.000181
	(0.000629)	(0.000558)	(0.00117)	(0.00190)
ACIND	-0.0117**	-0.0150***	-0.0302***	-0.0256*
	(0.00480)	(0.00426)	(0.00893)	(0.0145)
ACFEXP	0.00450*	0.000553	0.00381	-0.00542
	(0.00240)	(0.00213)	(0.00446)	(0.00725)
ACCHAIRFE	0.00338*	0.00431***	0.00859**	-0.0142***
	(0.00181)	(0.00160)	(0.00336)	(0.00545)
BOARDSIZE	9.99e-06	0.000234*	0.000392	0.000725*
	(0.000136)	(0.000121)	(0.000253)	(0.000410)

(Continued on next page)

**Table 9. Addressing Selection Bias Using Entropy Balancing Approach**

<b>Panel B. Post Entropy Balanced Regression Results</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>BOARDIND</i>	0.0182*** (0.00587)	0.0146*** (0.00521)	0.0311*** (0.0109)	0.0341* (0.0177)
<i>ZSCORE</i>	-0.00213* (0.00126)	0.00236** (0.00112)	0.00617*** (0.00234)	0.00877** (0.00380)
<i>LOSS</i>	0.00384 (0.00247)	0.00322 (0.00219)	0.00815* (0.00458)	0.00520 (0.00745)
<i>SIZE</i>	0.00244*** (0.000620)	0.00309*** (0.000550)	0.00605*** (0.00115)	0.00918*** (0.00187)
<i>AGE_LN</i>	0.0113*** (0.00224)	0.00126 (0.00199)	0.00686* (0.00416)	0.0121* (0.00676)
<i>SPEC</i>	-0.00371 (0.0145)	0.00554 (0.0129)	0.0147 (0.0270)	0.0183 (0.0438)
<i>SALE_VOL</i>	-0.00838** (0.00381)	-0.00429 (0.00338)	-0.0105 (0.00708)	-0.0303*** (0.0115)
<i>NONMISS_LN</i>	0.164*** (0.0129)	0.150*** (0.0114)	0.335*** (0.0239)	0.165*** (0.0389)
<i>DAC</i>	0.000860 (0.000922)	-0.000790 (0.000819)	-0.00111 (0.00171)	0.0125*** (0.00278)
<i>ROE</i>	0.00432 (0.00325)	0.00277 (0.00289)	0.00552 (0.00605)	0.00366 (0.00982)
<i>INVT_VOL</i>	-8.75e-06 (0.000244)	-0.000624*** (0.000217)	-0.00127*** (0.000454)	0.000544 (0.000737)
<i>CFO_SALE</i>	0.000243 (0.00299)	-0.00169 (0.00266)	-0.00345 (0.00556)	-0.0155* (0.00903)
<i>MTOB</i>	-0.00265*** (0.000483)	-0.00342*** (0.000429)	-0.00643*** (0.000898)	-0.00576*** (0.00146)
<i>SLACK</i>	-0.000609** (0.000242)	-0.000335 (0.000215)	-0.000734 (0.000449)	0.000673 (0.000730)
<i>DIV</i>	0.00583*** (0.00156)	0.00259* (0.00138)	0.00532* (0.00289)	0.0166*** (0.00470)
<i>TANGIBILITY</i>	0.0105*** (0.00194)	0.00599*** (0.00172)	0.0142*** (0.00360)	0.00789 (0.00585)
<i>KSTRUCTURE</i>	0.0307*** (0.00494)	0.0215*** (0.00438)	0.0387*** (0.00918)	0.0509*** (0.0149)
<i>Constant</i>	-0.184** (0.0759)	-0.731*** (0.0674)	-1.637*** (0.141)	-0.751*** (0.229)
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	23,132	23,132	23,132	23,132
R-squared	0.041	0.030	0.031	0.013

*(Continued on next page)*

**Table 9.** *Addressing Selection Bias Using Entropy Balancing Approach***Panel B.** *Post Entropy Balanced Regression Results**(Continued)*

Table 9 presents the findings from an analysis using the Entropy Balancing Approach to address selection bias when exploring the impact of CEO overconfidence on corporate disclosure repetitiveness. This approach ensures that the treatment (Overconfident CEOs) and control (Rational CEOs) groups are statistically comparable across various covariates before and after balancing, enabling a more accurate assessment of the causal effects of CEO overconfidence. In **Panel A**, the pre- and post-balancing entropy balanced comparison shows the effectiveness of the entropy balancing method in achieving balance across all covariates between the treatment and control groups. Prior to balancing, there were minor differences in means across various variables such as *ACSIZE*, *ACIND*, and *BOARDSIZE*, indicating slight imbalances between overconfident and rational CEOs. However, after applying the entropy balancing, all differences are neutralized (Diff [5-6] = 0.000), demonstrating that the method effectively creates comparable groups for the analysis. **Panel B** reports the results of the regression analysis post-entropy balancing, examining the relationship between CEO overconfidence (*HOLDER67*) and four measures of disclosure repetition: *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The results indicate a significant negative effect of CEO overconfidence on all repetition measures, with the impact being particularly pronounced on *Sim\_MinEdit* and *Sim\_Simple*, suggesting that overconfident CEOs are associated with less repetitive disclosures. The regression models also adjust for various control variables, including firm size (*SIZE*), board characteristics (*ACSIZE*, *ACIND*), and financial health indicators (*ZSCORE*, *LOSS*), among others. The significant coefficients across these controls highlight their influence on the repetitiveness of corporate disclosures. The analysis employs year and industry fixed effects to control for unobserved heterogeneity and reports the number of observations and R-squared values to demonstrate model fit. Standard errors are shown in parentheses, with significance levels marked accordingly (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ). All variables are defined in Appendix B. This comprehensive analysis underscores the robustness of the entropy balancing approach in examining the impact of CEO psychological traits on corporate communication strategies, providing valuable insights into the dynamics of disclosure practices.

**Table 10.** Integrating Textual Features in the Analysis of CEO Overconfidence and Repetition

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>HOLDER67</i>	-0.00476*** (0.00143)	-0.00176 (0.00127)	-0.00445* (0.00266)	-0.00941** (0.00428)
<i>FOG</i>	-0.00272*** (0.000234)	-0.00243*** (0.000208)	-0.00549*** (0.000436)	0.0105*** (0.000701)
<i>TONE</i>	-0.781*** (0.135)	-1.059*** (0.120)	-2.107*** (0.251)	-1.672*** (0.404)
<i>FILESIZE</i>	1.44e-06*** (1.72e-07)	2.15e-06*** (1.52e-07)	4.70e-06*** (3.19e-07)	1.12e-06** (5.14e-07)
<i>LENGTH</i>	-8.75e-06*** (1.11e-06)	-1.31e-05*** (9.84e-07)	-2.92e-05*** (2.06e-06)	-1.35e-05*** (3.32e-06)
<i>Constant</i>	0.349*** (0.116)	-0.223** (0.103)	-0.395* (0.215)	-1.789*** (0.346)
CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	23,132	23,132	23,132	23,132
R-squared	0.083	0.084	0.082	0.091

This table extends our analysis by integrating additional textual features—*FOG* (readability), *TONE* (sentiment), *FILESIZE*, and *LENGTH*—into the regression model examining the impact of CEO overconfidence (*HOLDER67*) on the repetitiveness of corporate disclosures, measured through similarity scores across four dimensions. The coefficients indicate how each variable, including CEO overconfidence, affects the repetitiveness of narrative disclosures in MD&As, adjusting for a comprehensive set of control variables (CONTROLS) as utilized in the main regression models. Standard errors are shown in parentheses, with statistical significance indicated as follows: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All variables are defined in Appendix B.

**Table 11.** *The Impact of CEO Characteristics on Disclosure Repetition: A Statistical Analysis*

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>HOLDER67</i>	-0.00268* (0.00156)	-0.000872 (0.00139)	-0.00232 (0.00291)	-0.00209 (0.00474)
<i>CEO_AGE</i>	0.000215** (0.000105)	0.000164* (9.31e-05)	0.000299 (0.000195)	0.000137 (0.000319)
<i>CEO_TENURE</i>	-0.000586*** (0.000110)	-0.000389*** (9.81e-05)	-0.000782*** (0.000206)	-0.000617* (0.000336)
<i>CEO_FEMALE</i>	-0.00374 (0.00348)	0.000128 (0.00310)	-0.00137 (0.00649)	-0.0465*** (0.0106)
<i>Constant</i>	0.206* (0.118)	-0.417*** (0.105)	-0.779*** (0.220)	-1.296*** (0.359)
CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	22,862	22,862	22,862	22,862

This table examines how specific CEO characteristics—age, tenure, and gender—impact the repetitiveness of corporate disclosures, in addition to analyzing the effect of CEO overconfidence (*HOLDER67*). The analysis utilizes four similarity measures to assess the extent of repetition in narrative disclosures. 'CONTROLS' indicates the inclusion of control variables from the main regression models. Standard errors are provided in parentheses, indicating the precision of our estimates, with significance levels marked accordingly to highlight the statistical significance of our findings (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ). All variables are defined in Appendix B.

# Appendices

## Appendix A. Section Definitions in 10-Ks

Items	Definition
Item 1	Business
Item 1A	Risk Factors
Item 2	Properties
Item 3	Legal Proceedings
Item 4	Mine Safety Disclosures
Item 5	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities
Item 6	Selected Financial Data
Item 7	Management's Discussion and Analysis of Financial Condition and Results of Operations
Item 7A	Quantitative and Qualitative Disclosures About Market Risk
Item 8	Financial Statements and Supplementary Data
Item 9	Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
Item 9A	Controls and Procedures
Item 9B	Other Information
Item 10	Directors, Executive Officers and Corporate Governance
Item 11	Executive Compensation
Item 12	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters
Item 13	Certain Relationships and Related Transactions, and Director Independence
Item 14	Principal Accounting Fees and Services

**Source:** Cohen et al. (2020)

Appendix A provides detailed definitions for various sections within the Form 10-K, a comprehensive report filed annually by publicly traded companies to the U.S. Securities and Exchange Commission (SEC). This report plays a critical role in ensuring transparency and regulatory compliance, detailing the company's business, financial condition, and operational results over the past fiscal year. While the SEC requires certain information to be reported as mandatory, companies also have the discretion to include additional voluntary disclosures. These voluntary elements often provide deeper insights into company strategies, risks, and future prospects, enhancing the understanding of stakeholders. Each item listed contributes to a thorough understanding of the company's business, financial condition, and operational results over the past fiscal year.

**Appendix B. Variable Definition**

Variables	Definition	Authors
<b><i>Dependent Variable</i></b>		
<i>REPETITION</i>	<p>=</p> <p><b>Sim_Cosine (Cosine Similarity):</b> Measures the cosine angle between two term frequency vectors from documents, capturing the closeness in textual content.</p> <p><b>Sim_Jaccard (Jaccard Similarity):</b> Computes similarity by evaluating the intersection over the union of terms in two documents.</p> <p><b>Sim_MinEdit (Minimum Edit Distance):</b> Represents the fewest operations needed to transform one document into another.</p> <p><b>Sim_Simple (Simple Similarity):</b> Measures the fraction of identical content between two documents based on word changes.</p>	Cohen et al. (2020), Brown et al. (2011)
<b><i>Independent Variable</i></b>		
<i>HOLDER67</i>	= CEO overconfidence, where the average value per option is the total value of the CEO's option holdings (opt_unex_exer_val in ExecuComp) scaled by the number of CEO unexercised exercisable options (opt_unex_exer_num in ExecuComp). The average strike price is the firm's stock price at the end of the fiscal year (prcc_f in Compustat) minus the average value per option. We construct <i>HOLDER67</i> as an indicator that equals 1 if the confidence variable exceeds 0.67 at least twice during the sample period, and 0 otherwise.	Ahmed and Duellman (2013), Campbell et al. (2011) and Hirshleifer et al. (2012)
<b><i>Control Variables</i></b>		
<i>ACSIZE</i>	= Total number of audit committee members in a given year	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACIND</i>	= The percentage of audit committee members who are independent	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACFEXP</i>	= The proportion of audit committee members with financial expertise	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACCHAIRFE</i>	= An indicator variable that is set to 1 if the audit committee chairman is also a financial expert	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)

(Continued on next page)

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>BOARDSIZE</i>	= The total number of directors on the board annually	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>BOARDIND</i>	= The ratio of independent directors on the board	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ZSCORE</i>	= $0.033 \times \text{earnings before extraordinary item (ib)} / \text{total assets (at)} + \text{sales (sale)} / \text{total assets (at)} + 0.014 \times \text{retained earnings (re)} / \text{total assets (at)} + 0.012 \times \text{working capital (wcap)} / \text{total assets (at)} + 0.006 \times \text{market value of common stock (MV)} / \text{total liabilities (lt)}$ ;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>LOSS</i>	= An indicator variable equal to 1 if net income (ni) is negative, and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>SIZE</i>	= Natural log of market value of equity (csho * prcc_f).	Hasan (2020), Lin et al. (2021)
<i>AGE_LN</i>	= Age is measured as the number of years since the firm was first covered by the Center for Research in Securities Prices (CRSP). We measure AGE_LN as the natural log of (1+ age of the firm).	Hasan (2020)
<i>SPEC</i>	= Special items, measures as the amount of special items (spi) divided by total assets. It refers to extraordinary items affecting financial performance, indicating how CEOs might manage financial disclosures around unusual events.	Hasan (2020)
<i>SALE_VOL</i>	= standard deviation of sales (sale), scaled by average total assets (at) over the previous 5 years;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>NONMISS_LN</i>	= Natural log of the number of items in Compustat with non-missing values. It measures the breadth of financial reporting by counting non-missing financial items in Compustat, reflecting the completeness of disclosures.	Hasan (2020)
<i>DAC</i>	= Absolute discretionary accruals calculated using the performance-adjusted Modified Jones model.	Hasan (2020), Gan (2019)
<i>ROE</i>	= Profitability of the firm, measured as net income scaled by common equity.	Hasan (2020)
<i>INVT_VOL</i>	= The standard deviation of total investments (invt), scaled by the average total assets over the previous 5 years	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>CFO_SALE</i>	= Operating cash flows divided by sales;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)

*(Continued on next page)*

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>MTOB</i>	= The ratio of the market value of total assets to book value of total assets	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>SLACK</i>	= The ratio of cash (che) to PPE (ppegt);	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>DIV</i>	= An indicator variable equal to 1 if the firm paid dividends (dvc), and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>TANGIBILITY</i>	= PPE divided by total assets;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>KSTRUCTURE</i>	= Long-term debt (dltt) divided by the sum of long-term debt and the market value of equity. It is a leverage ratio, showing the firm's debt versus equity financing preference, indicative of financial strategy and risk tolerance.	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>INDUSTRY FE</i>	= Industry dummy to control for industry fixed effect.	Hasan (2020)
<i>YEAR FE</i>	= Dummy variables to control for fiscal year effect.	Hasan (2020)
<b><i>Additional Variables</i></b>		
<i>PURCHASE</i>	= Is a measure of CEO overconfidence, based on net stock purchases by CEOs. It identifies overconfident CEOs as those whose net purchases rank in the top quintile and increase their ownership by at least 10% in a fiscal year, indicating confidence in the firm's future profitability.	Ahmed and Duellman (2013)
<i>FOG</i>	= The Gunning-Fog Index, calculated as: (words per sentence + percent of complex words) × 0.4.	Li (2019), De Franco et al. (2020), Dyer et al. (2017), Loughran and McDonald (2014, 2016)
<i>ARI</i>	= $4.71 \times (\text{characters/words}) + 0.5 \times (\text{words/sentences}) - 21.43$ . It calculates text readability to assess how accessible corporate disclosures are, relevant for understanding CEO communication styles.	Loughran and McDonald (2014, 2016)
<i>FK</i>	= $0.39 \times [\text{number of words/number of sentences}] + 11.8 \times [\text{number of syllables/number of words}] - 15.59$	Loughran and McDonald (2014, 2016)
<i>TONE</i>	= (positive word count – negative word count)/total word count	Marquez-Illescas et al. (2019), Loughran and McDonald (2011), Martikainen et al. (2023), Liu and Nguyen (2020)

*(Continued on next page)*

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>LENGTH</i>	= Natural logarithm of 1 plus word count of firm <i>i</i> 's MD&A in year <i>t</i> .	Li (2019)
<i>FILESIZE</i>	= Natural logarithm of 10-K files size in mb.	Loughran and McDonald (2011)
<i>CEO_AGE</i>	= Natural logarithm of the CEO age	Liu and Nguyen (2020)
<i>CEO_TENURE</i>	= Natural logarithm of the CEO tenure	Liu and Nguyen (2020)
<i>CEO_FEMALE</i>	= Dummy variable, equal 1 if a CEO is female and 0 otherwise	Liu and Nguyen (2020)

Essay 3 CEO Narcissism and Strategic  
Repetition in 10-K Reports from  
Notes to MD&A

# CEO Narcissism and Strategic Repetition in 10-K Reports from Notes to MD&A

## ABSTRACT

Understanding the impact of executive personality traits on corporate disclosures is crucial for stakeholders to assess the quality and reliability of financial reporting. This research delves into how CEO narcissism shapes the strategic repetition in 10-K reports from notes to the Management Discussion and Analysis (MD&A) sections. Drawing from a comprehensive sample covering 20,511 firm-year observations from 2002 to 2020, our research employs four textual similarity measures: Cosine Similarity, Jaccard Similarity, Minimum Edit Distance, and Simple Similarity, to assess the extent of content repetition. CEO narcissism, as quantified through the analysis of earnings conference call transcripts, is defined by the ratio of first-person singular pronouns to total both first-person singular and plural pronouns (Capalbo et al., 2018). Our findings reveal that CEOs with higher narcissism scores tend to exhibit more repetition from notes to MD&As. This tendency aligns with agency theory and impression management theory, suggesting a strategic influence of both notes and MD&As by narcissistic CEOs. The main results are robust, supported by alternative measures of CEO narcissism and controlling for endogeneity and self-selection bias using lagged instrumental narcissism scores, Propensity Score Matching (PSM), entropy balancing, and the instrumental variables approach. Additionally, the study examines the effects of CEO characteristics, including origin (insider vs. outsider) and gender, on disclosure styles. It finds that insider CEOs, especially those with narcissistic traits, engage more in repetitive disclosures. Female CEOs with narcissistic traits also display a more repetitive pattern in their communication styles. Furthermore, the study delves into how CEO narcissism corresponds with the prestige of accounting firms (Big 4 vs. non-Big 4) in influencing repetitive disclosures. The results indicate that CEO narcissism significantly predicts repetitive disclosures, particularly in firms audited by prestigious accounting firms. The findings highlight the influence of CEO narcissism on financial reporting, particularly the strategic repetition in disclosures. This insight is crucial for stakeholders relying on transparency and accuracy in financial reports. Recognizing these tendencies can improve governance and auditing standards, ensuring clearer and more reliable disclosures.

**Keywords:** CEO Narcissism, Repetition, Management Discussion and Analysis, Agency Theory, Impression Management Theory, Textual Analysis, 10-Ks.

# 1 Introduction

Financial scandals are a recurring yet significant concern in the corporate landscape, underscored by high-profile cases like the collapse of Enron in 2001, the WorldCom scandal in 2003, and more recently, the Luckin Coffee fraud case in 2020. These incidents, often characterized by accounting and financial manipulation, highlight the pervasive nature of fraud in various sectors (Tett, 2019). The root of such scandals frequently lies in information asymmetries, malpractices, and the inherent complexities of the business environment. To dissect these complexities fully, an early focus on linguistic patterns, specifically the repetition of phrases and terms in corporate disclosures, is vital. Such patterns often reflect underlying strategic intents and are instrumental in shaping stakeholders' perceptions. This emphasis on repetition underscores its pivotal role in revealing the strategies employed by management to navigate through regulatory landscapes and shape public narratives (Crutchley et al., 2007). Upper echelons theory<sup>76</sup> suggests that due to the complex external environments firms operate in, managers may not have a comprehensive grasp of all pertinent information. This gap is exacerbated by variations in executives' cognitive competencies, personal experiences, ethical standards, and value systems (Ndofor et al., 2015).

In this context, the CEO, as the primary decision-maker, plays a crucial role in shaping organizational outcomes. Among various CEO attributes, narcissism stands out as a significant factor influencing organizational performance. Narcissism in CEOs is characterized as a sense of superiority and entitlement, a desire for power and admiration, a propensity to manipulate others for personal gain, and hostility when faced with opposition (Brummelman et al., 2016; Campbell et al., 2011; Grijalva et al., 2015). This trait can significantly impact the decision-making process and, consequently, the overall direction and ethical standing of the organization. Research has been shedding light on the varied implications of CEO narcissism. While often viewed negatively, studies indicate some positive aspects, such as improved audit quality and stronger negotiation skills in specific settings (Chou et al., 2021; Church et al., 2020). On the flip side, narcissistic leadership is linked to unethical practices like tax avoidance and accounting manipulation (Ahmed and Duellman, 2013; Olsen and Stekelberg, 2016), excessive compensation demands (O'Reilly et al., 2018), and increased fraud risks (Rijsenbilt and Commandeur, 2013).

<sup>76</sup> The theory of upper echelons, as proposed by Hambrick and Mason in 1984, suggests that behavioral factors are critically important in shaping complex decisions within corporations. Essentially, this theory asserts that the personal traits of CEOs can be predictive of their strategic decisions and the outcomes of their organizations.

Further research delves into how CEO narcissism influences financial reporting language. Marquez-Illescas et al. (2019) and Buchholz et al. (2018) observed that narcissistic CEOs often use more positive and optimistic language in earnings announcements and 10-K filings, reflecting their grandiose self-image<sup>77</sup>. This can result in overly optimistic reporting. Amernic and Craig (2010) suggest that financial accounting may facilitate such behavior, leading to potential unethical conduct. Similarly, Ham (2017) found that CFO narcissism is linked to lower financial reporting quality. Patelli et al. (2015) discovered that aggressive financial reporting correlates with CEO letters that are resolute, complex, and disengaging. Yan et al. (2019) identified assertive rhetoric in CEO letters as a predictor of more accurate earnings forecasts. These studies collectively highlight the significant influence of CEO characteristics on financial reporting language and narrative style.

Recognizing the profound impact of CEO narcissism on financial reporting, our study seeks to broaden existing literature by exploring the specific aspect of linguistic repetition in Management Discussion and Analysis (MD&A) sections<sup>78</sup>. The MD&A,

<sup>77</sup> Narcissism and dispositional optimism are distinct in several ways. Optimists generally expect positive outcomes across life's key areas, as suggested by Scheier and Carver (1993), whereas narcissists use positivity to enhance their own sense of grandeur (Gabriel et al., 1994; John and Robins, 1994). Narcissism involves traits like attention-seeking, exploitation, arrogance, and lack of empathy, unlike optimism (Hickman et al., 1996; Campbell et al., 2004). These differences influence behaviors, particularly in challenging situations. For instance, during economic hardships, an optimistic CEO might realistically appraise future challenges, unlike a narcissistic CEO who may maintain an irrational, overly positive outlook, potentially harming the firm and stakeholders (Blickle et al., 2006).<sup>78</sup> Narcissism, as a concept rooted in Greek mythology, encompasses a spectrum from healthy to detrimental traits in individuals, particularly leaders (Kets de Vries, 1994). It is differentiated into constructive narcissism, associated with positive leadership qualities like adaptability, empathy, and strategic intelligence (Kets de Vries, 2004; Lubit, 2002; Glad, 2002), and destructive narcissism, linked to negative traits like insecurity, grandiosity, and unethical behavior (Kets de Vries, 2004; Lubit, 2002; Campbell et al., 2004; Chatterjee and Hambrick, 2007; Duchon and Drake, 2009). This study delves into how these forms of narcissism manifest in corporate contexts, especially in financial accounting language and CEO discourse, as explored by Amernic and Craig (2010), Schwartz (1991), Clements and Washbush (1999), and Bazerman et al. (2006), noting that the accounting language can be a tool for self-construction and reflection for narcissistic CEOs.

<sup>78</sup> Narcissism, as a concept rooted in Greek mythology, encompasses a spectrum from healthy to detrimental traits in individuals, particularly leaders (Kets de Vries, 1994). It is differentiated into constructive narcissism, associated with positive leadership qualities like adaptability, empathy, and strategic intelligence (Kets de Vries, 2004; Lubit, 2002; Glad, 2002), and destructive narcissism, linked to negative traits like insecurity, grandiosity, and unethical behavior (Kets de Vries, 2004; Lubit, 2002; Campbell et al., 2004; Chatterjee and Hambrick, 2007; Duchon and Drake, 2009). This study delves into how these forms of narcissism manifest in corporate contexts, especially in financial accounting language and CEO discourse, as explored by

considered a crucial qualitative disclosure within 10-Ks (Clarkson et al., 1999; Li, 2008; Tavcar, 1998), allows managers to narratively present firm performance, offering them discretion over the depth of information and choice of vernacular (Liu and Nguyen, 2020). These sections illuminate trends, uncertainties, and significant events impacting a company's financial position and operational outcomes, making them invaluable for stakeholders. Given the SEC's emphasis on enhancing MD&A disclosures through strict adherence to regulations and new interpretive rules (De Franco et al., 2020), understanding the nuances of these narratives becomes even more critical. Our study proposes to delve into how CEO narcissism influences their textual elements, particularly repetition. Within this study, repetition is examined as the strategic mirroring of content from notes to MD&As within the same 10-K reports, shedding light on patterns influenced by CEO narcissism.

The relationship between CEO narcissism and repetitive disclosures in MD&As is framed within agency theory and impression management theory. Agency theory, as outlined by Donaldson and Davis (1991) and Payne and Petrenko (2019), suggests conflicts between shareholders and executives, with narcissistic CEOs potentially manipulating narratives in MD&As for personal gain. This theory is complemented by Nyberg et al. (2010), who found a closer alignment of CEO and shareholder interests than previously thought, indicating that repetition in MD&As could be used to further CEOs' interests while seemingly aligning with shareholder objectives. Impression management theory, rooted in social psychology, explains how narcissistic CEOs strategically craft narratives to influence perceptions<sup>79</sup>. Boudt and Thewissen (2019) show how CEOs position words to create favorable impressions, correlating with earnings management practices. However, Steinmetz et al. (2017) suggest that narcissistic CEOs often fail to make a favorable impression, as their self-promotion can be perceived as inauthentic. Merkl-Davies et al. (2011) add that large firms, possibly led by narcissistic CEOs, tailor reports to different reader groups, manipulating perceptions through selective disclosures and repetition. These theoretical frameworks provide a backdrop for understanding how CEO narcissism impacts corporate communications, particularly in MD&As<sup>80</sup>.

Amernic and Craig (2010), Schwartz (1991), Clements and Washbush (1999), and Bazerman et al. (2006), noting that the accounting language can be a tool for self-construction and reflection for narcissistic CEOs.

<sup>79</sup> While the MD&A sections are typically prepared by the company's legal or communications department, the final content is subject to the CEO's review and approval. This process ensures that the disclosures reflect the CEO's strategic vision and messaging priorities. Consequently, the influence of CEO personality traits, such as narcissism, on the repetition and tone of these disclosures is mediated through their final oversight and directives, rather than direct authorship.

<sup>80</sup> In our study, we focus on repetition as a specific form of narrative disclosures manipulation (Pesci et al., 2015; Brown et al., 2022) because it is a subtle yet powerful

'Repetition' (*REPETITION*) in our analysis signifies the degree to which narratives in the MD&A section (Section 7) strategically echo information from the notes (Section 8) in 10-K reports. We utilize methodologies from prior research (Cohen et al., 2020; Brown and Tucker, 2011; Wang et al., 2023) to assess annual content similarities between these sections using four textual similarity measures: Cosine Similarity (*Sim\_Cosine*) to evaluate thematic overlap, Jaccard Similarity (*Sim\_Jaccard*) to focus on the overlap of unique terms, Minimum Edit Distance (*Sim\_MinEdit*) to measures the smallest changes needed to convert one text into another, and Simple Similarity (*Sim\_Simple*) to identify direct text matches. These diverse measures ensure a robust analysis of how information is reiterated, enhancing our understanding of strategic disclosure practices.

To measure CEO narcissism (*CEONAR*), our approach involves analyzing earnings conference call transcripts from U.S. firms. This is based on methodologies established by Capalbo et al. (2018) and Aktas et al. (2016), and Raskin and Shaw (1988), with transcripts sourced from Refinitiv (formerly known as Thomson Reuters Eikon). The narcissism score is calculated by determining the ratio of first-person singular pronouns (I, me, my, mine, myself) to the total count of both first-person singular and plural pronouns (I, me, my, mine, myself, we, us, our, ours, ourselves) used in CEO speeches across all conference call transcripts from U.S. firms during the examined period (Capalbo et al., 2018; Bollaert et al., 2020). Our comprehensive sample, which includes CEO narcissism scores along with board of directors and audit committee details, as well as other fundamental firm data from Compustat, covers the period from 2002 to 2020. This timeframe encompasses a total of 20,511 firm-year observations.

Our study reveals that CEOs with higher narcissism scores tend to use more repetitive language in corporate disclosures, as shown by mean difference tests. This tendency is likely an effort to emphasize their achievements. Supporting this, the correlation matrix indicates positive correlations between narcissism scores and certain repetition measures, suggesting that more narcissistic CEOs prefer to

tool that narcissistic CEOs might use to reinforce their desired image while maintaining a veneer of consistency and reliability across corporate disclosures. While it's conceivable that a highly narcissistic CEO might prefer to craft a completely independent narrative in the MD&A, such a stark deviation from the notes could risk greater scrutiny from auditors and regulators. Repetition, by contrast, can be less conspicuous, allowing narcissistic tendencies to manifest without drawing undue attention. This approach aligns with our theoretical framework, which integrates agency and impression management theories, suggesting that narcissistic CEOs strategically manipulate disclosures (including notes and MD&As) to enhance their personal image subtly within the bounds of regulatory compliance.

emphasize specific narratives or keywords<sup>81</sup>. These findings align with agency and impression management theories and are further reinforced by our main regression results, which demonstrate a significant positive relationship between CEO narcissism and repetition in corporate communication. This suggests that while narcissistic CEOs may engage in strategic narrative manipulation to craft their desired image, the impact on stakeholders can be complex, potentially influencing transparency and decision-making in both beneficial and detrimental ways. This view recognizes that such manipulations might not solely hinder clear decision-making but could also reflect a strategic emphasis on particular achievements relevant to stakeholders. To ensure the robustness of these results, we employed various methods to measure CEO narcissism, including analysis of presentation and Q&A sections of earnings calls and annual aggregation of pronouns. These approaches consistently indicated similar trends. Additionally, we addressed potential endogeneity and self-selection bias through methods like the impact of lagged instrumental narcissism score on textual repetition, propensity score matching (PSM), entropy balancing, and instrumental variables approach.

Our study also includes additional analyses that bolster our main findings. We explored the influence of CEO origin (insider versus outsider) on repetitive disclosures, finding that insider CEOs, particularly those promoted internally and exhibit narcissistic traits, are more inclined to engage in repetitive disclosures. In contrast, outsider CEOs showed little or no such tendency, challenging the assumption that they would be more prone to repetitive communication. Another facet of our research delved into the interplay between CEO narcissism and gender, finding a more pronounced effect of narcissism on repetitive disclosures among female CEOs. This suggests a unique interaction between personality traits and gender, underscoring the importance of considering both factors in executive communication strategies.

We further explored the interaction between CEO narcissism and the prestige of accounting firms, categorized as either Big 4 or non-Big 4, to assess their combined effect on the frequency of repetitive disclosures. The findings indicate a significant association between CEO narcissism and the occurrence of repetitive disclosures, notably more pronounced in firms audited by prestigious Big 4 accounting firms. This result may be partially explained by the possibility that CEOs of firms audited by Big 4 firms exhibit higher levels of narcissism, which is in turn positively associated with

<sup>81</sup> CEOs prefer to repeatedly highlight narratives or keywords such as "innovative," "leader," "pioneering," and "successful." These terms often relate to personal accomplishments, strategic decisions, and the overall impact of their leadership on the company's progress, aligning with their desire to project a favorable and dominant image in the eyes of stakeholders.

repetitive disclosures. The reputation and rigorous standards associated with Big 4 firms could also amplify the visibility and scrutiny of such repetitive practices, reflecting the CEOs' desire for control and affirmation in their financial reporting. These dynamics suggest that both CEO narcissism and the external influence of auditing firm prestige are pivotal in shaping the nature and frequency of financial disclosures. These comprehensive analyses enhance our understanding of the intricate dynamics between CEO characteristics and corporate communication, demonstrating that factors like insider status, gender, and the choice of accounting firm significantly modulate the impact of CEO narcissism on corporate disclosures.

Our study advances the literature on CEO narcissism and financial reporting by uniquely integrating three distinct streams of research. Firstly, we bridge the gap between the observed increase in narcissism among corporate executives (Zhu and Chen, 2015; Ingersoll et al., 2019) and the textual analysis of corporate disclosures. By building upon foundational works such as Campbell and Campbell (2009), Engelen et al. (2016), and Chatterjee and Hambrick (2007), we uniquely analyze how narcissism impacts the frequency and consistency of repetition from notes to MD&A sections<sup>82</sup>, an area previously unexplored. This focus allows us to investigate how narcissistic traits influence not just the content but the stylistic choices in financial reporting, highlighting subtle yet impactful ways that personality traits can shape corporate communication.

Secondly, while the first advancement primarily deals with theoretical implications and setting a new research agenda, our empirical findings directly demonstrate the influence of CEO narcissism on repetitive content in corporate communication, making a distinct and measurable contribution to the field. This research substantiates and extends the works by Chatterjee and Hambrick (2007) and Ham et al. (2018), who previously focused on broader organizational strategies influenced by narcissistic CEOs. By pinpointing the effects of narcissism on specific disclosure practices, our study adds empirical depth to the theoretical discussions on how narcissism can manifest in corporate behaviors, thereby providing concrete data to support theories previously grounded in broader qualitative analyses.

Finally, we enrich the theoretical landscape by incorporating behavioral decision theory into our analysis of CEO personality traits, particularly narcissism. This approach broadens the scope of agency theory and impression management by highlighting how narcissistic CEOs strategically use communication to manipulate

<sup>82</sup> It is essential to acknowledge the role of CEOs in contributing to the notes section of financial reports. While the exact extent of this involvement varies across companies and is governed by internal policies and the complexity of financial transactions, CEOs typically influence the overarching themes and strategic disclosures found in the notes. This influence reflects their vision and strategic direction for the company.

stakeholder perceptions. This theoretical expansion is supported by studies such as Boudt and Thewissen (2019) and Steinmetz et al. (2017), which discuss the strategic communication behaviors of executives. Additionally, our exploration of the impacts of CEO origin and gender in conjunction with narcissism on MD&A repetition introduces new dimensions to the discourse on CEO characteristics in financial reporting. This line of inquiry aligns with and extends the research by Adams and Funk (2012), Berger et al. (2014), Rovelli and Curnis (2021), Schadewitz and Spohr (2022), and Li et al. (2023), offering a fresh perspective on how executive traits shape disclosure practices.

This paper is structured as follows: Section 2 delves into the theoretical background, while Section 3 covers the literature review and hypothesis development. Section 4 describes our research methodology. Section 5 presents the empirical results and sensitivity checks. Additional analyses are provided in Section 6. The paper concludes with Section 7.

## 2 Theoretical Background

The intricate dynamics between CEO narcissism and repetitive disclosures in MD&A can be effectively illuminated through the lenses of agency theory in corporate governance and impression management theory. These theoretical frameworks offer a comprehensive understanding of how narcissistic tendencies in CEOs influence corporate communications and behaviors.

Agency theory, a cornerstone in the field of corporate governance, provides valuable insights into the principal-agent conflicts that arise between shareholders and executives. This theory, as articulated by Donaldson and Davis (1991) and further elaborated by Payne and Petrenko (2019), posits that CEOs (agents) may have divergent interests from their shareholders (principals), leading to potential conflicts. Narcissistic CEOs, characterized by their self-interest, are more likely to manipulate corporate narratives in MD&As to align with their personal goals, as suggested by the agency theory framework. This manipulation can result in repetitive emphasis on specific themes that favor the CEOs' image or achievements. Nyberg et al. (2010) extend this perspective by examining the alignment of CEO and shareholder interests through compensation and equity ownership. They found that CEO return and shareholder returns are more closely aligned than previously thought, suggesting that narcissistic CEOs might use repetition in MD&As as a tool to further their own interests while ostensibly aligning with shareholder objectives.

Impression management theory, a concept rooted in social psychology, offers an explanation for the strategic communication behaviors of narcissistic CEOs. This theory elucidates how individuals, particularly those in leadership positions, craft

narratives to influence the perceptions of others. Boudt and Thewissen (2019) demonstrate how CEOs strategically position words in their communications to create a more favorable impression, correlating with earnings management practices. This strategy is particularly evident in the repetitive focus on positive aspects by narcissistic CEOs, as they attempt to shape stakeholders' perceptions to their advantage. Steinmetz et al. (2017) highlight the pitfalls of impression management, especially among narcissistic CEOs. Their research suggests that narcissistic CEOs often fail at making a favorable impression, despite their efforts. This failure can be attributed to their tendency towards self-promotion and controlled narratives, which might be perceived as inauthentic or misleading by stakeholders. Merkl-Davies et al. (2011) further contribute to this discussion by exploring the use of impression management in corporate narrative reports. Their findings indicate that large firms, possibly led by narcissistic CEOs, tailor their reports to different reader groups, manipulating perceptions through selective disclosures and repetitive emphasis on favorable outcomes.

While agency and impression management theories provide robust frameworks for understanding the strategic behaviors of narcissistic CEOs, they also present conflicting predictions that reflect the complex and often paradoxical nature of CEO behavior in corporate communications. Agency theory may suggest that narcissism drives a CEO to manipulate narratives to their advantage, potentially increasing repetition to assert control or disguise inadequacies. Conversely, impression management theory might imply that such CEOs would decrease repetition to maintain a facade of novelty and competence. This theoretical ambiguity necessitates the adoption of an unsigned hypothesis, recognizing the potential for both an increase and a decrease in repetition, depending on the interplay of narcissistic traits with the firm's context and the CEO's personal management style. These divergent perspectives underscore the multifaceted and contradictory nature of narcissistic influence in corporate settings, highlighting the need for an intricate approach in hypothesizing the outcomes of CEO behavior on corporate discourse.

### 3 Literature Review and Hypothesis Development

In the intricate world of corporate governance and leadership, the personality traits of CEOs play a pivotal role in shaping organizational communication and strategy. This section delves into the relationship between CEO narcissism and the nature of repetitive disclosures in MD&As. The hypothesis development is informed by a thorough literature review, which dissects both positive and negative relationships between CEO narcissism and repetition in MD&As. By exploring various theoretical frameworks and

empirical studies, this analysis aims to provide a comprehensive understanding of how narcissistic traits in CEOs might influence corporate narrative, either leading to redundant content or driving diversity and innovation in communication.

### 3.1 Positive Relationship between CEO Narcissism and Repetition

In exploring the positive relationship between CEO narcissism and repetitive disclosures in MD&As, a distinctive pattern supported by agency theory emerges, underscoring the interplay of self-promotion and narrative control. This perspective posits that CEOs with higher levels of narcissism are inclined to repetitively emphasize their achievements and the company's triumphs, often manifesting in redundant narratives within corporate communications. Rooted in psychological theories of narcissism and organizational behavior, this section examines how narcissistic traits in CEOs can lead to a consistent focus on self-aggrandizing themes, a strong grip on narrative control, and a resistance to integrating new or diverse perspectives in MD&A disclosures. The analysis draws on various empirical studies and theoretical frameworks to unravel the intricate ways in which CEO narcissism might shape, and potentially constrain, the scope and content of corporate communication.

#### Self-Focus and Redundancy

Agency theory provides a framework to understand how narcissistic CEOs might use MD&A disclosures to repeatedly highlight their personal achievements and the company's successes, aligning with their self-interests. Chatterjee and Hambrick (2007) provide significant insights into this behavior, noting that narcissistic CEOs exhibit a preference for strategic dynamism and grandiosity. Their study of 111 CEOs in the computer hardware and software industries between 1992 and 2004 showed that such CEOs favor bold actions that attract attention, resulting in extreme and fluctuating organizational performance. This propensity for attention-seeking actions might explain why these CEOs tend to repeat mentions of their successes in corporate communications, emphasizing their leadership's positive impact. Furthermore, the research by Olsen et al. (2016) extends this understanding by examining the effect of CEO narcissism on aggressive corporate behaviors like tax sheltering. Their findings suggest that narcissistic CEOs, who often believe they are above the law, pursue rewards aggressively while showing a weak motivation to avoid negative outcomes. This aggressive pursuit, driven by a sense of superiority, could manifest in the form of repetitive emphasis on positive aspects of their leadership in MD&A sections, reinforcing their perceived success and authority.

Den Hartog et al. (2020) delve deeper into the dynamics of narcissistic leadership by investigating how such leaders interact with their subordinates, particularly in the context of employee self-promotion. They uncover that narcissistic leaders tend to positively receive self-promotion among employees, likely because it mirrors their own behaviors. This receptiveness, however, may foster an organizational culture that prioritizes superficial achievements and self-aggrandizement over genuine merit and collaborative success. The study suggests that while this dynamic can temporarily boost individual visibility and potentially career advancement for some, it might also lead to long-term detrimental effects on team cohesion, overall productivity, and ethical standards within the organization. In summary, the relationship between CEO narcissism and repetitive disclosures in MD&A can be understood through the lens of a CEO's self-focused tendencies. The literature consistently shows that narcissistic CEOs are prone to emphasizing their achievements and the company's success under their leadership, a behavior likely reflected in the repetition observed in corporate disclosures.

### Narrative Control

Agency theory also elucidates how narcissistic CEOs strive to control the corporate narrative tightly, often focusing MD&A content on specific themes or successes. This control is a strategic behavior intended to maintain a positive and controlled image. Several research studies have established a connection between CEO narcissism and specific corporate behaviors, further supporting this hypothesis. De Vries et al. (1985) explored narcissistic configurations among leaders, noting their impact on decision-making and interpersonal relations. Al-Shammari et al. (2019) found that narcissistic CEOs tend to emphasize externally oriented corporate social responsibility (CSR) activities, suggesting a preference for initiatives that enhance their public image. Additionally, both Capalbo et al. (2018) and Kontesa et al. (2021) observed that narcissistic CEOs are more likely to engage in earnings manipulation, a behavior that aligns with their need to project success and control over corporate outcomes.

Tailab et al. (2023) provide a view, indicating that the positivity expressed by narcissistic CEOs is not solely opportunistic; some of it is genuinely driven by better performance. This finding suggests that while narcissistic CEOs may repeat certain themes in MD&As, this repetition can sometimes reflect actual organizational achievements rather than mere self-promotion. Chen et al. (2021) explore the impact of CEO narcissism on firms' CSR choices, revealing that CEO narcissism is positively related to peripheral CSR and negatively to embedded CSR. They also find that family ownership moderates the negative relationship between CEO narcissism and embedded CSR. This study further implies that narcissistic CEOs may repetitively focus on specific types of CSR activities in MD&As, aligning with

their personal preferences and the corporate governance context. This tendency is rooted in their desire for narrative control, emphasizing aspects that reinforce their positive image and authority. While some of this repetition may reflect actual organizational performance, it often aligns with the narcissistic CEO's preference for controlling and shaping the corporate narrative.

### Resistance to New Ideas

Within the agency framework, narcissistic CEOs' resistance to new ideas and perspectives leads to MD&As that focus repetitively on established strategies or viewpoints. This resistance, rooted in narcissistic traits, can lead to MD&As that repetitively focus on established strategies or viewpoints, reflecting a lack of openness to diverse or novel ideas. Organizational behavior theories support this by linking narcissism to rigidity in thinking and decision-making.

Research across various fields consistently shows a positive relationship between CEO narcissism and specific corporate behaviors that align with this form of rigidity. For instance, She et al. (2020) found that CEO narcissism was negatively related to decision comprehensiveness and positively related to decision speed. Their study indicated that the involvement of top management team (TMT) members in decision-making could mediate these relationships, especially in environments with high TMT power distance. This suggests that narcissistic CEOs may favor quick decisions over comprehensive ones, potentially leading to a repetitive focus in corporate narratives. Grijalva et al. (2015) contribute to understanding this dynamic by exploring narcissism's relationship with leadership. They distinguish between leadership emergence and effectiveness, finding that while narcissism is positively related to leadership emergence, it has no significant relationship with leadership effectiveness. This dichotomy implies that while narcissistic CEOs may emerge as dominant leaders, their effectiveness in diverse and adaptive decision-making could be limited, reinforcing a tendency towards repetitive and controlled narratives.

Zhu et al. (2015) delve into the dynamics of CEO power and director selection, explaining that CEOs with narcissistic tendencies often favor new directors who share similar traits. This preference can strengthen the relationship between CEO narcissism and risk-taking spending, as these directors are more likely to support the CEO's decisions. This alignment of similar personalities in leadership roles can further entrench a resistance to new ideas, leading to repetition in corporate strategies and disclosures. Finally, Lin et al. (2020) show that highly narcissistic CEOs are more likely to engage in earnings management to meet earnings thresholds. This behavior is indicative of a broader pattern where narcissistic CEOs may manipulate financial narratives to project consistent success, avoiding the incorporation of new strategies or acknowledgments of challenges.

## Obfuscation and Erosion of Trust in MD&As

According to agency theory, narcissistic CEOs, driven by self-interest, might use repetition in MD&As to strategically obfuscate and shift focus away from poor performance. This could involve a focused and repeated highlighting of minor positive details or unrelated successes, serving as a diversion from more significant issues. Such a pattern aligns with a narcissistic CEO's inherent tendencies toward self-promotion and image management.

In cases of poor performance, highly narcissistic CEOs may employ repetitive disclosures in MD&As as a strategic tool to divert attention from negative aspects, focusing instead on minor successes or unrelated positive details. This behavior aligns with their tendency towards self-promotion and image management, as documented in various studies (Ham et al., 2018). However, this excessive repetition and focus on minor positives can lead to confusion among stakeholders, ultimately eroding trust. The lack of clarity and potential obfuscation in financial reporting, driven by the narcissistic CEO's desire to mask poor performance or unethical practices, can raise significant concerns about the transparency and integrity of the organization's communications. This erosion of trust is further compounded by research indicating that CEO narcissism is associated with negative firm outcomes, including fraudulent activities and lower financial productivity (Amernic et al., 2010).

## 3.2 Negative Relationship between CEO Narcissism and Repetition

Examining the negative relationship between CEO narcissism and repetition in MD&A unveils a contrasting narrative, framed by impression management theory alongside theories of individual differentiation, entrepreneurial leadership, and strategic management. This perspective suggests that narcissistic traits in CEOs may foster a dynamic and varied approach to corporate communication, characterized by a constant search for innovation, uniqueness, and strategic adaptability. This section delves into the theories of individual differentiation, entrepreneurial leadership, and strategic management to understand how a narcissistic CEO's drive for distinctiveness and novelty could lead to less repetitive and more diverse content in MD&As. By analyzing empirical research and theoretical insights, the discussion highlights how narcissistic leadership might contribute to a continuously evolving corporate narrative, reflecting the CEO's pursuit of new strategies, creative ideas, and responses to market changes.

### Desire for Uniqueness and Dynamic Self-Representation

Narcissistic CEOs, known for their pronounced desire for uniqueness, often seek to be perceived as exceptional within their communications. This trait is driven by

impression management strategies where these leaders manipulate their public image to impress and influence stakeholders positively. Narcissistic CEOs, as described in studies like those by Judge et al. (2006), often have a pronounced desire for uniqueness in their communication. This desire stems from their need to be perceived as unique and exceptional. In MD&As, this could lead to a diverse range of themes and less repetition, as these CEOs might avoid repeating the same narratives in favor of showcasing their creativity and distinctiveness. Following this, the concept of dynamic self-representation comes into play. Narcissistic CEOs, as highlighted in the findings of Blair et al. (2008) and Gupta and Spangler (2012), are likely to continuously seek new ways to portray their achievements positively. This aligns with self-presentation theories in social psychology, suggesting that narcissistic individuals actively manage their public image. In MD&As, this might result in less repetitive content as the CEO continuously looks for novel angles or success stories, constantly evolving the narrative to reflect new achievements or strategies.

### Innovativeness and Novelty Seeking

The potential negative relationship between CEO narcissism and repetition also underscores a drive towards innovativeness and novelty seeking. Narcissistic CEOs, as per Kashmiri et al. (2017) and Kang et al. (2015), are motivated to differentiate their companies from competitors, often emphasizing unique strategies or achievements in MD&As. This inclination towards distinctiveness, underpinned by impression management, encourages these leaders to project an image of pioneering and innovative leadership. Consequently, these CEOs might avoid repetitive content in favor of highlighting diverse aspects that set their company apart, grounded in theories of marketing and strategic management. Such a leadership style leads to MD&As that frequently introduce new ideas, strategies, and achievements, thereby reducing the need for repetition. Theories in entrepreneurial leadership and innovation management often link narcissistic traits with a propensity for risk-taking and innovativeness, resulting in constantly evolving and varied narratives in MD&As.

Resick et al. (2009) significantly contribute to the understanding of the interplay between CEO personality traits, leadership styles, and strategic organizational outcomes. Their findings indicate that while 'bright-side' personality characteristics generally align with transformational leadership approaches, 'dark-side' traits, such as narcissism, often show a negative correlation with contingent reward leadership. However, it's important to acknowledge the multifaceted nature of narcissism within organizational contexts. Indeed, narcissistic CEOs, despite their typical aversion to focusing on contingent rewards, may also possess a unique propensity for driving innovative strategies. This research suggests that narcissistic CEOs, who may not

focus on contingent rewards, could be more inclined to pursue innovative strategies<sup>83</sup>, leading to less repetitive and more diverse content in MD&As.

### Strategic Flexibility

Exploring the concept of strategic flexibility reveals how narcissistic CEOs may utilize impression management to adapt their strategies rapidly in response to market changes or internal challenges. Narcissistic CEOs may demonstrate a propensity for rapidly shifting company strategies to stay ahead or respond to market changes. This strategic agility could be reflected in MD&As through varied topics, strategies, and perspectives, thereby avoiding repetition. Several studies highlight the complex relationship between CEO narcissism, strategic flexibility, and organizational outcomes. Bock et al. (2012) used responses from 107 multinational firms to understand the drivers of strategic flexibility during business model innovation. They found that while a creative culture positively affects strategic flexibility, reliance on partners can reduce it. Furthermore, CEOs perceive that structural flexibility requires simplification while retaining control of non-core functions. This suggests that narcissistic CEOs, who often aim for control and innovation, might frequently alter their strategies to maintain flexibility, leading to less repetition in MD&As. Engelen et al. (2016) explored the relationship between entrepreneurial orientation (EO) and firm performance, particularly in the context of CEO narcissism. Their research indicated that narcissistic CEOs usually weaken the EO-performance relationship, although this effect varies depending on market conditions. In highly concentrated and dynamic markets, the pattern may reverse. This variability in strategic focus due to CEO narcissism could contribute to a diverse and evolving content in MD&As.

Tsui et al. (2006) examined the relationship between CEO leadership behavior and organizational culture, considering the limits of a leader's ability to change or shape organizational culture. Their findings offer insights into how leadership and institutional factors might lead to a decoupling between CEO behavior and

<sup>83</sup> Narcissism in leadership, particularly within the context of CEO behavior, presents a complex interplay between innovative prowess and strategic risk-taking (Agnihotri and Bhattacharya, 2019). While the inclination towards innovation can be seen as a manifestation of a leader's visionary capacity, often associated with the 'bright side' of narcissism (Zhang et al., 2017), it also entails potential pitfalls inherent to the 'dark side' of such personality traits (Sundermeier et al., 2020). This duality underscores the need for an understanding of narcissistic leadership, acknowledging both its potential to drive transformative success and the risks of overambition and disregard for collaborative input. The discussion herein reflects a balanced perspective, recognizing the multifaceted implications of CEO narcissism on organizational strategy and outcomes.

organizational culture. For narcissistic CEOs, this could mean a more frequent change in strategic direction and less repetition in MD&As as they navigate different leadership and cultural dynamics. Datta et al. (2003) focused on the relationships between newly chosen CEOs' openness to change and firm strategic persistence post-succession. They found a negative relationship between CEOs' openness to change and strategic persistence, especially in high-discretion industries. This finding indicates that narcissistic CEOs, who may exhibit a higher openness to change, could be less inclined towards strategic persistence, leading to a variety of strategies and perspectives in MD&As. In conclusion, the research suggests that CEO narcissism may be negatively related to repetition in MD&As due to a tendency towards strategic flexibility.

Our exploration delves into how CEO narcissism influences the extent of repetition within the MD&A sections of 10-K reports, unveiling a dichotomous narrative shaped by two influential theories. On one hand, agency theory supports the observed positive relationship, suggesting a propensity towards self-focused redundancy, narrative control, resistance to new ideas, and potential obfuscation. This pattern indicates that narcissistic CEOs, driven by self-interest, might leverage MD&As to consistently highlight their personal achievements and successes, potentially compromising transparency and the diversity of the narrative. Conversely, impression management theory informs the negative relationship, revealing a different trajectory where a drive for uniqueness, innovativeness, and strategic flexibility prevails. Here, narcissistic CEOs could encourage a varied and dynamic narrative in MD&As, reflecting their adaptability and commitment to innovative strategies. This approach aims to constructively manage stakeholders' perceptions by minimizing repetition and showcasing a breadth of new initiatives and successes.

These contrasting tendencies, informed by agency and impression management theories, highlight the complex impact of CEO narcissism on the repetition within 10-K disclosures. Agency theory predicts that narcissistic tendencies could lead to increased repetition as a form of narrative control, while impression management theory suggests that the same traits could reduce repetition through efforts to continually renew and diversify the narrative. Hence, we hypothesize that CEO narcissism significantly influences the level of repetition observed in the MD&A sections of 10-K reports.

**H:** *There is a significant relationship between CEOs' narcissism and repetitive disclosures from notes to MD&As.*

## 4 Research Design

### 4.1 Sample and Data

Our study constructs a comprehensive dataset derived from SEC 10-K filings spanning from 1994 to 2022. The initial aggregation of these filings presented us with a substantial figure of 202,218<sup>84</sup>. Our first step in curating this dataset was to eliminate year-by-year and CIK (Central Index Key) duplicates, which reduced the count by 3,547, leaving us with 198,671 filings. Subsequent to this, we sought congruence with the Compustat database, necessitating a gvkey match. This phase was pivotal for ensuring data integrity and resulted in the exclusion of 44,098 filings, thereby refining our dataset to 154,573 entries. A critical criterion was then applied, focusing on the substance of the MD&A and Notes sections. We required these sections to be at least 200 words to ensure depth in analysis, leading to a further reduction by 23,853 filings<sup>85</sup>, leaving 130,720. Integration with Compustat records from 1990 to 2022 led to the exclusion of 16,936 entries, further filtered down to 113,784. The incorporation of BoardEx data from 1997 to 2022 was another significant step, which diminished the sample size by a notable 49,866, arriving at 63,918 filings. The integration with ExecuComp for the years 1992 to 2022 was equally stringent, further pruning the dataset by 32,876, leaving us with 31,042 entries. The final two stages of our filtration process involved the inclusion of

<sup>84</sup> We extend our gratitude to the Loughran-McDonald Repository (available at <https://sraf.nd.edu/sec-edgar-data/cleaned-10x-files/>), which has been instrumental in providing both cleaned and raw 10-X files for our research. The repository, a part of the Notre Dame Software Repository for Accounting and Finance (SRAF), serves as a pivotal resource, offering a comprehensive collection of programs and data tailored for use in accounting and finance research.

<sup>85</sup> While the volume of observations in our study may initially appear substantial, a comparative analysis with prior research indicates its appropriateness. For context, Loughran and McDonald's 2011 study covered the period from 1994 to 2008, starting with 1,212,017 firm-year observations. They applied a filter to exclude MD&A sections shorter than 250 words, resulting in the elimination of 11,892 observations. Similarly, another research project focusing on filings from 1995 to 2018 excluded 43,836 10-Ks for having word counts under 2000 in the entire document or less than 200 in the MD&A section, from an initial sample of 172,283. In light of these studies, the reduction observed in our dataset is consistent and logical. Our study spans from 1994 to 2020 and incorporates a similar filtering criterion, excluding notes and MD&A sections shorter than 200 words. This methodological parallelism justifies the scale of reduction in our sample, aligning our approach with established research practices in the field. By maintaining this consistency, our study ensures that the data used is not only extensive but also adheres to the standards and precedents set by previous scholarly investigations.

conference call data from 2002 to 2020, which led to the exclusion of 8,898 filings, and a removal of entries lacking crucial data for our analysis. This last step saw the exclusion of 1,633 filings, culminating in a final sample size of 20,511.

[Insert Table 1]

## 4.2 Assessing Textual Repetition in MD&As

In line with the methodologies proposed by Cohen et al. (2020), our initial step involves the extraction of the MD&A and notes sections from each 10-K file. Each annual 10-K report consists of a total of 18 schedules or 'Items', with detailed subsections outlined in Appendix A. We identify the textual content corresponding to each schedule by leveraging regular expressions that search for the term “item” alongside the schedule's name. Given the variability in schedule labeling across different filings, our process is iterative, with multiple passes through the 10-K filings to capture labeling inconsistencies. Initially, our focus is on the most commonly observed structure for schedule titles—patterns beginning with “Item,” followed by a number and the schedule's name. Subsequently, we expand our search to include less common variations, such as sequences featuring only “Item” and a number or merely a number followed by the schedule's name, ensuring each schedule is identified uniquely. This procedure is repeated to incorporate new exceptions, aiming for exhaustive and accurate data extraction.

For each 10-K file, after identifying the MD&A and notes sections using a predefined search criteria based on their typical locations (primarily Item 7 for MD&A and Item 8 for notes), we verify that each section contains at least 200 words, adhering to the standards set by Audi et al. (2016) and Breuer et al. (2020). Our methodology, inspired by the works of Cohen et al. (2020), Brown et al. (2011), and Wang et al. (2023), uses four textual similarity metrics to assess how content from notes is reflected in MD&As. These metrics are (i) Cosine Similarity, (ii) Jaccard Similarity, (iii) Minimum Edit Distance, and (iv) Simple Similarity. Each metric is detailed further below, outlining its specific calculation method and how it contributes to our comprehensive assessment of annual similarities between the MD&As and notes sections within 10-K filings.

1. **Cosine Similarity (*Sim\_Cosine*):** Cosine Similarity is a measure that calculates the cosine of the angle between two term frequency vectors, providing a quantitative measure of the similarity between two documents. Let  $D_{s1}$  and  $D_{s2}$ , be the sets of terms occurring in documents  $D_1$  and  $D_2$ , respectively. Define  $T$  as the union of  $D_{s1}$  and  $D_{s2}$ , i.e.,  $T = D_{s1} \cup D_{s2}$ . Let  $t_i$  be the  $i$ -th element of  $T$ . The term frequency (TF) vectors for  $D_1$  and  $D_2$  are defined as:

$$D_1^{TF} = [nD_1(t_1), nD_1(t_2), \dots, nD_1(t_N)]$$

$$D_2^{TF} = [nD_2(t_1), nD_2(t_2), \dots, nD_2(t_N)]$$

where  $nD_k(t_i)$  is the number of occurrences of term  $t_i$  in documents  $D_k$ . The cosine similarity between two documents is then defined as:

Equation (1):

$$\text{Sim Cosine} = (D_1^{TF} \cdot D_2^{TF}) / \|D_1^{TF}\| * \|D_2^{TF}\|$$

where the dot product,  $(D_1^{TF} \cdot D_2^{TF})$ , is the sum of the products of the corresponding entries of the vectors, and  $\|D_1^{TF}\| * \|D_2^{TF}\|$ , are the Euclidean norms of the vectors.

2. **Jaccard Similarity (*Sim\_Jaccard*):** Employing the term sets from Cosine Similarity, this binary metric calculates the ratio of the term set intersection to their union, uniquely focusing on the presence of terms rather than their frequency.

Equation (2):

$$\text{Sim Jaccard} = |D_1^{TF} \cap D_2^{TF}| / |D_1^{TF} \cup D_2^{TF}|$$

3. **Minimum Edit Distance (*Sim\_MinEdit*):** This approach quantifies the minimal alterations needed to transform one document into another, offering a unique perspective on textual dissimilarity.
4. **Simple Similarity (*Sim\_Simple*):** Resembling practical comparison tools like Microsoft Word's "Track Changes," this metric evaluates the word alterations between documents. It normalizes these changes against the average size of the documents, as detailed in Equation (3), and scales the results between 0 and 1, with 1 indicating identical texts.

Equation (3):

$$\text{Sim Simple} = [c_{\max} - c] / c_{\max}$$

where  $c = (\text{additions} + \text{deletions} + \text{changes}) / ((\text{Size } D_1 + \text{Size } D_2) / 2)$ , and  $c_{\max}$  is the maximum value of  $c$ .

### 4.3 Assessing CEO Narcissism

Raskin and Shaw's research in 1988 established a significant correlation between the usage ratio of first-person singular pronouns to first-person plural pronouns in speech

and the scores on the Narcissistic Personality Inventory (NPI)<sup>86</sup>. This approach offers an alternative to tests that might bias individuals' mindsets. The robustness of their findings spans various factors such as age, gender, speech content, and holds even after adjusting for other personality traits like extroversion, neuroticism, psychoticism, and loss of control. Notably, their method hinges on analyzing spontaneous speech, thus generating a conversational script free from the constraints of premeditated writing.

In the context of business, earnings conference calls, where firm executives including CEOs, CFOs, and Heads of Investor Relations (with occasional participation from other executive officers) present, offer a rich source of data. These calls typically commence with formal speeches and earnings disclosures, followed by a question-and-answer section. Drawing upon the insights from previous studies such as Craig et al. (2013), Hobson et al. (2012), and Larcker and Zakolyukina (2012), the utilization of CEOs' speech patterns to infer company performance has been substantiated. Hobson et al. (2012) notably investigated the correlation between a CEO's emotional profile, as indicated by nonverbal vocal cues in speech waveforms, and financial misreporting. Similarly, Larcker and Zakolyukina (2012) explored verbal cues from both CEOs and CFOs. These studies collectively highlight that the implications of earnings calls extend beyond mere financial announcements.

In light of these insights, our study, following the methodologies of Capalbo et al. (2018), Bollaert et al. (2020), Aktas et al. (2016), and Raskin and Shaw (1988), employs earnings conference call transcripts of U.S. firms, sourced from Refinitiv (formerly known as Thomson Reuters Eikon), to calculate CEO narcissism scores. This is achieved by determining the ratio of first-person singular pronouns (I, me, my, mine, myself) to the total count of first-person pronouns, which includes both singular (I, me, my, mine, myself) and plural forms (we, us, our, ours, ourselves), found in CEO speeches during these calls<sup>87</sup>.

<sup>86</sup> The NPI is a psychological assessment tool developed by Raskin and Terry in 1988. It is designed to measure narcissism as a personality trait in individuals. The NPI consists of a series of statements that respondents answer to indicate their level of agreement, aiming to measure various aspects of narcissism, including grandiosity, entitlement, and feelings of superiority. It is a self-report inventory widely used in the field of psychology to assess and quantify narcissistic tendencies.

<sup>87</sup> The comprehensive analysis of a CEO's entire speech during earnings conference calls, as opposed to limiting the scope to only Q&A sessions, offers a more holistic view of the CEO's communication style and personality traits. While Q&A sessions are valuable for capturing spontaneous responses, they may not fully represent the CEO's typical speech patterns due to the unpredictable nature of the questions and the potential influence of public relations strategies in crafting responses. In contrast, analyzing the entire speech, including prepared remarks, provides a broader and more consistent dataset. This approach encompasses both scripted and unscripted elements of

*Equation (4):*

$$CEONAR = \frac{\sum n (I,me,my,mine,myself)}{\sum n (I,me,my,mine,myself,we,us,our,ours,ourselves)}$$

In our approach, we employ a sophisticated NLP algorithm to dissect the presentation and question-and-answer sections of earnings release transcripts. This algorithm quantifies the frequency of first-person singular and plural pronouns used by each CEO in every conference<sup>88</sup>. To calculate a CEO's narcissism score, we aggregate the tally of first-person singular pronouns and the total count of first-person pronouns used by the CEO across all their transcripts over the examined period. This approach aligns with the understanding that narcissism, as posited by Livesley et al. (1993), is a stable personality trait, and therefore, our measure of the CEO narcissism score remains constant over time. Consistent with the methodology of Chatterjee and Hambrick (2007, 2011), we ensure reliability in our narcissism measurement by requiring a CEO to have spoken in at least two conferences for a firm, thus mitigating bias that might arise from basing our analysis on a single transcript.

Incorporating the logic that this is not time series data and acknowledging that a CEO's attribution style is unlikely to vary significantly year-on-year, we aggregate the data across all years. However, to avoid introducing any forward-looking bias in our analysis, we aggregate data only up to the year under examination. This means that for any given year of analysis, we include data from all previous years, but not from future years. This approach allows for a comprehensive assessment of a CEO's narcissism while ensuring that our analysis remains temporally grounded and free from speculative bias based on future developments. This technique ensures that our assessment of a CEO's narcissistic traits is both comprehensive and contextually accurate, reflecting their behavioral patterns over the entire span of their tenure up to the point of analysis.

communication, offering a richer understanding of the CEO's linguistic tendencies. This is particularly relevant in assessing traits such as narcissism, where the frequency and context of personal pronoun usage throughout the entire speech can be more telling than in the comparatively constrained setting of a Q&A session.

<sup>88</sup> In our analysis, we focus on conference call transcripts where the CEO is actively engaged, as these provide viable data for calculating narcissism scores. The following categories are systematically excluded from our sample: 1) sessions without a question-and-answer segment, 2) sessions where the CEO did not attend, and 3) sessions where the CEO was present but did not participate. This exclusion is crucial for maintaining the integrity of our dataset, ensuring that it reflects only those instances likely to demonstrate the narcissistic behavior of CEOs.

## 4.4 Regression Model

In our model, we delve into the intricacies of textual repetition (labeled *REPETITION*) and CEO narcissism (*CEONAR*), using a comprehensive set of similarity metrics: Cosine Similarity, Jaccard Similarity, Minimum Edit Distance, and Simple Similarity. Detailed explanations of these metrics can be found in section 4.2. Our model, as outlined in Equation (5), also integrates CEO narcissism, covered in section 4.3.

Equation (5):

$$\begin{aligned}
 \text{REPETITION}_{i,t} = & \beta_0 + \beta_1 \text{CEONAR}_{i,t} + \beta_2 \text{ACSIZE}_{i,t} + \beta_3 \text{ACIND}_{i,t} \\
 & + \beta_4 \text{ACFEXP}_{i,t} + \beta_5 \text{ACCHAIRFE}_{i,t} + \beta_6 \text{BOARDSIZE}_{i,t} \\
 & + \beta_7 \text{BOARDIND}_{i,t} + \beta_8 \text{ZSCORE}_{i,t} + \beta_9 \text{LOSS}_{i,t} + \beta_{10} \text{SIZE}_{i,t} \\
 & + \beta_{11} \text{AGE\_LN}_{i,t} + \beta_{12} \text{SPEC}_{i,t} + \beta_{13} \text{SALE\_VOL}_{i,t} \\
 & + \beta_{14} \text{NONMISS\_LN}_{i,t} + \beta_{15} \text{DAC}_{i,t} + \beta_{16} \text{ROE}_{i,t} \\
 & + \beta_{17} \text{INVT\_VOL}_{i,t} + \beta_{18} \text{CFO\_SALE}_{i,t} + \beta_{19} \text{MTOB}_{i,t} \\
 & + \beta_{20} \text{SLACK}_{i,t} + \beta_{21} \text{DIV}_{i,t} + \beta_{22} \text{TANGIBILITY}_{i,t} \\
 & + \beta_{23} \text{KSTRUCTURE}_{i,t} + \beta_{24} \text{LNCOUNT}_{i,t} + \beta_{25} \text{CEOCOMPLX}_{i,t} \\
 & + \beta_{26} \text{CEOTONE}_{i,t} + \sum \text{YEAR FE} \\
 & + \sum \text{INDUSTRY FE} + \varepsilon_{it}
 \end{aligned}$$

In this model, we draw on the works of Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018) to incorporate a range of corporate governance variables such as audit committee size (*ACSIZE*), independence (*ACIND*), financial expertise percentage (*ACFEXP*), financial expertise of the chairman (*ACCHAIRFE*), board size (*BOARDSIZE*), and board independence (*BOARDIND*). These variables provide insights into the dynamics of audit committees and board compositions, enriching our understanding of how governance structures influence corporate behaviors.

Further, our analysis includes several control variables, each selected based on their established relevance in financial research as demonstrated in methodologies from Biddle and Hilary (2006), Biddle et al. (2009), Li (2019), Gan (2019), Cohen et al. (2020), and Hasan (2020). The inclusion of Altman's *ZSCORE*, for instance, helps us assess bankruptcy risk and financial health. *LOSS* provides an indicator of whether the firm reported a financial loss, highlighting performance variability. Market value-based firm *SIZE* and logarithmic firm age (*AGE\_LN*) are included to capture the effects of the firm's scale and maturity on its reporting practices. The special item ratio (*SPEC*) accounts for exceptional financial items, while five-year sales volatility (*SALE\_VOL*) reflects stability or variability in revenues. The logarithm of non-missing item count in Compustat (*NONMISS\_LN*) measures the completeness of available data, and discretionary accruals (*DAC*) gauge the extent of earnings management. Return on equity (*ROE*) offers insights into profitability

and operational efficiency, while investment volatility over five years (*INVT\_VOL*) reveals patterns in capital allocation. The cash flow to sales ratio (*CFO\_SALE*) and the market-to-book ratio (*MTOB*) provide additional financial metrics that are crucial for analyzing economic behaviors. Variables such as *SLACK*, *DIV*, *TANGIBILITY*, and *KSTRUCTURE* are also included to provide a fuller picture of the firm's financial strategies and asset management approaches.

Following the approaches of Fu et al. (2021) and Brockman et al. (2015), we also introduce three innovative variables: *LNCOUNT*, *CEOCOMPLX*, and *CEOTONE*. *LNCOUNT*, which represents the natural logarithm of the total word count of all conference calls within a year, offers a quantitative measure of the volume of CEO communication. *CEOCOMPLX*, calculated using the Fog index, provides insights into the complexity of the CEO's communications, while *CEOTONE* captures the emotional tone conveyed in the CEO's speech, offering an assessment of sentiment in corporate communications<sup>89</sup>. Year (*YEAR FE*) and industry (*INDUSTRY FE*) fixed effect also are included. All variables are strategically chosen to maintain robustness in our model and are comprehensively defined in Appendix B, providing detailed explanations for their inclusion and the expected influence they have within the regression framework.

## 5 Results

### 5.1 Descriptive Statistics and Univariate Analysis

Table 2 in this essay delineates the distribution of our sample, segmented by year and industry as per the two-digit Standard Industrial Classification (SIC) code. This dataset covers a span of 19 years, from 2002 to 2020, comprising a total of 20,511 observations across various industries.

Panel A presents a breakdown by year. The distribution of observations across these years demonstrates significant fluctuations, offering a dynamic view of the period covered. A notable increase in observations is observed in the mid-2000s,

<sup>89</sup> The rationale for including *LNCOUNT* lies in its ability to provide a quantitative baseline for the volume of CEO communications, which is a critical factor in understanding the extent of their influence and presence in corporate discourse. *CEOCOMPLX* is crucial for assessing the complexity of CEO communications, as more complex language could be indicative of either higher intellectual discourse or potential obfuscation. *CEOTONE*, on the other hand, offers a qualitative measure of the CEO's sentiment and emotional tone, which can be pivotal in understanding the underlying messages and attitudes conveyed in their communications. These additions allow for a more holistic assessment of CEO behavior and its potential impact on the firm's narrative and perception among stakeholders.

with a peak in 2007, followed by a somewhat consistent presence of data in subsequent years. The cumulative percentage column in the table charts the incremental composition of the dataset, reaching 100% by 2020. The noticeable drop in the number of observations in the final years, particularly in 2020, could be attributed to factors such as the reduced frequency or availability of earnings conference calls, which are pivotal in collecting CEO speech data for analysis.

Panel B categorizes the sample based on industry classifications, represented by two-digit SIC codes. The sample's industry representation is diverse, with significant contributions from various sectors. The Chemicals and Allied Products sector (SIC code 28) accounts for a substantial 11.33% of the total observations, while the Electronic and Other Electric Equipment industry (SIC code 36) comprises 9.42%. Other notable sectors include Industrial Machinery and Computer Equipment (SIC code 35) with 6.59%, and Business Services (SIC code 73), which forms the largest segment of the dataset at 12.62%. In contrast, industries such as Heavy Construction (SIC code 16) and Furniture and Home Furnishings Stores (SIC code 57) have a smaller presence in the sample. The 'Others' category, aggregating industries with fewer than 250 observations, accounts for 9.10% of the dataset. This categorization is crucial in illustrating the diversity of our sample and the extensive range of industries covered, emphasizing the study's comprehensive and multifaceted nature.

### [Insert Table 2]

Table 3 presents a detailed breakdown of the descriptive statistics for the variables used in our analysis. The table is divided into categories of dependent, independent, and control variables.

The dependent variables, all measures of textual repetition<sup>90</sup>, offer insight into the linguistic patterns observed in our corpus. The variable *Sim\_Cosine*, with a mean of 0.876, captures the extent of cosine similarity between texts, suggesting a high degree of textual concordance among the documents analyzed. This observation is consistent with the linguistic patterns explored in studies such as Cohen et al. (2020) and Brown and Tucker (2011), indicating that corporate communication often exhibits a high level of standardization. *Sim\_Jaccard*, with an average value of 0.207, evaluates the shared data points between document sets, hence providing a perspective on commonalities within the text data. *Sim\_MinEdit*, with a mean of 0.472, offers a measure of the textual divergence by calculating the minimum edit distance, reflecting the extent of variation in the text samples. Lastly, *Sim\_Simple*, averaging 0.352, provides a fundamental comparison of text similarities<sup>91</sup>.

<sup>90</sup> All similarity scores are scaled from 0 to 1.

<sup>91</sup> Our application of various text similarity measures provides a coherent and multidimensional perspective on textual repetition within MD&As. These measures

*CEONAR* is a variable that measures CEO narcissism by analyzing the frequency of first-person singular pronouns compared to first-person plural pronouns in CEO speech. This measure is based on the premise that more frequent use of I, me, my, mine, myself indicates higher levels of self-focus, a characteristic associated with narcissistic traits. Unlike the study by Capalbo et al. (2018), which limited the analysis to yearly Q&A sections of conference calls, our study examines the entire corpus of a CEO's conference calls throughout their tenure. This comprehensive approach aims to capture the CEO's consistent linguistic patterns and may offer a more integrated view of their personality traits. Our findings indicate a mean *CEONAR* score of 0.198, suggesting variance in CEO narcissism<sup>92</sup> but within a narrower range compared to Capalbo et al.'s study. This broader and potentially more consistent measure of CEO narcissism can provide deeper insights into how CEO personality impacts corporate decision-making and performance over time.

The control variables encompass a variety of factors that might influence the primary measures. The audit committee size (*ACSIZE*), with a mean of 4.118, sheds light on the typical governance structures within the firms studied. The average of 0.890 for *ACIND* suggests a high level of independence within these committees, which is vital for unbiased oversight. The financial expertise variable (*ACFEXP*) has a mean of 0.488, indicating the proportion of members with financial acumen, a key element for effective fiscal supervision. *ACCHAIRFE* demonstrates a prevailing financial expertise among audit committee chairs with an average of 0.850, underlining the importance of such expertise in overseeing corporate financial disclosures. The average board size (*BOARDSIZE*) is 12.061, offering a glimpse into the decision-making bodies of the sampled firms. The level of board independence (*BOARDIND*), with a mean of 0.604, points to the balance between inside and outside directors. Additional control variables such as *ZSCORE*, *LOSS*, *SIZE*, *AGE\_LN*, *SPEC*, *SALE\_VOL*, *NONMISS\_LN*, *DAC*, *ROE*, *INVT\_VOL*, *CFO\_SALE*, *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, and *KSTRUCTURE* add layers of depth to our

collectively affirm the hypothesis that CEO narcissism influences the repetitive nature of corporate disclosures, each contributing distinct yet harmonizing insights into the linguistic patterns of MD&As. This consistency across different analytical lenses strengthens our conclusions and underscores the impact of CEO narcissism on disclosure practices.

<sup>92</sup> Our methodology accounts for both between-CEO and within-CEO variances in narcissism scores. While the *CEONAR* score primarily captures the general tendency of a CEO's narcissistic expression over time, we also conduct additional tests to explore within-CEO variance. These tests examine changes in narcissism levels across different years or contexts, acknowledging that CEOs' communication styles may evolve due to factors such as personal development, shifts in corporate communication strategy, or external feedback. This dual focus allows us to present an understanding of CEO narcissism and its implications for corporate disclosure.

understanding of the firms' profiles. These include financial stability indicators, firm-specific attributes, and market perceptions.

The variable *LNCOUNT*, the logarithmic transformation of total word count with a mean of 10.248, indicates the verbosity or brevity of corporate disclosures, while *CEOCOMPLX*, with an average of 8.790, measures the complexity of CEO communications. The variable *CEOTONE*, averaging 0.240, captures the sentiment of CEO statements, offering a lens through which to interpret the emotional valence of corporate communications. All continuous variables have been winsorized at the 1st and 99th percentiles to mitigate the influence of potential outliers, ensuring that the analysis reflects a more accurate representation of central tendencies within the data. This approach to data curation underpins the robustness and reliability of the ensuing analysis, providing a solid foundation for the empirical investigations that follow.

### [Insert Table 3]

Table 4 provides an insightful Mean Difference Test comparing firms led by CEOs with differing levels of narcissism, focusing on a broad spectrum of variables, including textual repetition measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) and other corporate factors. This table aims to uncover the effects of CEO narcissism on communication style and various aspects of firm behavior and communication style.

The analysis unveils distinct patterns in how CEOs communicate, depending on their narcissism levels. For instance, there is a noticeable difference in *Sim\_Cosine* scores between low narcissistic CEOs (mean: 0.871, median: 0.898) and high narcissistic CEOs (mean: 0.876, median: 0.903). This variation, though subtle, is statistically significant (t-test p-value: 0.005, Wilcoxon p-value: 0.000) and suggests that CEOs with higher narcissism may slightly enhance the repetition or consistency in their communication, possibly to emphasize their achievements or viewpoints. A similar but not statistically significant trend is observed in the *Sim\_Jaccard* and *Sim\_MinEdit* scores, indicating that the degree of textual overlap and the required text alterations might be slightly influenced by narcissistic traits, but other factors could also play a significant role. In contrast, the *Sim\_Simple* measure exhibits a more pronounced difference (t-test and Wilcoxon p-values both at 0.000), with higher repetition scores for high narcissistic CEOs. This could imply a stronger tendency among such CEOs to use more direct and repetitive language, perhaps as a strategic tool to reinforce their narrative and personal accomplishments.

From a theoretical standpoint, the positive correlations between narcissism and certain repetition measures align with prior literature. Narcissistic leaders, known for their assertive and distinctive strategies (Chatterjee and Hambrick, 2007), might opt for more repetitive and emphatic linguistic styles. This behavior is in line with the

concept that narcissistic CEOs might present an overly positive view of their company's performance, often reiterating their successes to emphasize their message (Petrenko et al., 2016).

Additionally, the table delves into other variables like *ACSIZE*, *ACIND*, *ACFEXP*, *ACCHAIRFE*, *BOARDSIZE*, *BOARDIND*, *ZSCORE*, and *LOSS*, revealing various differences between CEOs based on their narcissism levels. The size-related variables like *SIZE* and *BOARDSIZE* show significant differences, suggesting that high narcissistic CEOs may be more prevalent in larger organizations or those with larger boards. This observation complements our understanding of how CEO narcissism influences not just communication but is also related to broader organizational characteristics. Overall, the results highlight a relationship between CEO narcissism and firm practices, supporting the notion that CEO characteristics, personality traits like narcissism, significantly shape corporate communication patterns.

#### [Insert Table 4]

Table 5 presents correlation matrix, underscoring the interplay between various linguistic measures and the narcissistic tendencies of CEOs, along with an array of corporate governance and structural variables. The matrix is instrumental in deciphering the subtle dynamics at play within corporate communication.

The correlations amongst our textual repetition metrics and the narcissism score (*CEONAR*) reveal nuanced associations. Notably, there's a discernible positive correlation between *CEONAR* and both *Sim\_Cosine* (0.018\*) and *Sim\_Simple* (0.036\*), suggesting that CEOs with higher narcissism scores tend to produce texts with a higher degree of repetition. These correlations, though modest, are statistically significant, indicating a pattern where more narcissistic CEOs may favor a communication style that emphasizes certain narratives or keywords more frequently. The correlations with *Sim\_Jaccard* and *Sim\_MinEdit* are positive but not statistically significant at the conventional levels, hinting that these repetition measures might be less sensitive to the individual personality traits encapsulated by the *CEONAR* score or could be more influenced by other factors such as the context of the speech or the nature of the business sector.

The positive associations found between narcissism and certain measures of textual repetition could be interpreted through the lens of existing literature. For instance, narcissistic leaders often pursue distinctive and assertive strategies (Chatterjee and Hambrick, 2007), which may translate into their linguistic choices, leading to a more repetitive and emphatic use of language that reflects their self-centric approach to corporate strategy and decision-making. This behavior aligns with the theoretical proposition that narcissistic CEOs have a proclivity to present

an overly positive view of the company's performance, frequently reiterating their achievements to reinforce their desired message (Petrenko et al., 2016).

Delving into the corporate governance variables, board and committee characteristics such as *ACSIZE*, *ACIND*, and *BOARDSIZE*, show positive correlations with several repetition measures. These suggest that larger and more independent governance structures might lean towards a more uniform communication style, possibly reflecting a concerted effort to maintain clarity and consistency in corporate messaging. Financial robustness, operational scale, and organizational maturity, reflected in variables like *ZSCORE*, *SIZE*, and *AGE\_LN*, exhibit a spectrum of correlations with linguistic patterns. The positive correlation between *SIZE* and the repetition measures (0.100\* for *Sim\_Cosine*) indicates that larger firms may employ a more standardized linguistic template, perhaps due to the formalities embedded within larger corporate entities.

In contrast, financial distress, captured by the variable *LOSS*, shows a generally inverse relationship with the repetition measures, suggesting that companies under financial strain may deviate from standard linguistic frameworks, potentially indicating a strategic shift in communication during periods of uncertainty. Our approach provides insight into how CEO narcissism affects corporate discourse, specifically through the strategic repetition from notes to MD&As within same 10-K report, offering a view of narrative strategies in corporate reporting. For example, the negative correlation of sales volatility (*SALE\_VOL*) with *Sim\_Cosine* (-0.051\*) highlights the influence of market dynamics on communication strategies. Similarly, our analysis extends to examining the relationship between debt-to-equity ratios and textual repetition metrics. Specifically, we observe that the debt-to-equity ratio shows a significant correlation with *Sim\_Jaccard*, suggesting how financial leverage might affect the repetitiveness of corporate disclosure, potentially as a strategy to manage stakeholder perceptions in times of heightened financial risk. In essence, Table 5 elucidates the complex relationships between executive personality traits, particularly narcissism, and the linguistic contours of corporate communication. It also casts light on how structural and financial dimensions of a firm intertwine with these narrative patterns. While CEO narcissism is modestly associated with textual repetition, the broader corporate context also plays a critical role, shaping the communicative landscape in multifaceted ways.

[Insert Table 5]

## 5.2 The Association of CEO Narcissism and Repetition

Table 6 provides the main research model analysis of the CEO narcissism (*CEONAR*) impact on various aspects of corporate communication, specifically

examining its influence on repetition as captured by different similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). The regression results offer a detailed exploration of this relationship within the context of behavioral decision theory and CEO personality impacts on corporate disclosures.

The regression results indicate a significant association between CEO narcissism and repetition measures. Specifically, *CEONAR* shows a positive and statistically significant relationship with *Sim\_Cosine* (coefficient: 0.0635,  $p < 0.01$ ), *Sim\_Jaccard* (coefficient: 0.0408,  $p < 0.1$ ), *Sim\_MinEdit* (coefficient: 0.110,  $p < 0.05$ ), and *Sim\_Simple* (coefficient: 0.292,  $p < 0.01$ ). These associations are also economically meaningful (Mitton, 2024). Following Mitton (2024), we calculate the economic significance using the below formula:

$$E_S^{IQR} = \frac{|b(p_{75} - p_{25})|}{|s_y|}$$

where  $b$  is the regression coefficient for CEO narcissism (*CEO\_NAR*),  $p_{75}$  and  $p_{25}$  are the 75<sup>th</sup> and 25<sup>th</sup> percentiles of *CEO\_NAR*, respectively, and  $s_y$  is the standard deviation of each dependent variable measuring repetition in corporate communication. This formula captures the change in the repetition metric per typical variability in CEO narcissism, providing a standardized measure of the effect relative to the natural dispersion of the outcome. A one standard deviation increase in the *CEO\_NAR* score (0.032) corresponds to increases of 2.73%, 1.94%, 2.52%, and 4.09% in *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*, respectively.

These results suggest that higher levels of CEO narcissism are associated with greater repetition in corporate communication. This could be interpreted as narcissistic CEOs employing more repetitive and perhaps simpler language, potentially as a means to assert their perspectives and achievements, in line with their personality traits<sup>93</sup>. To contextualize these findings and address the query regarding the economic significance of CEO narcissism, we delve into the quantifiable impact of changes in narcissistic traits on repetition scores. Specifically, a one standard deviation increase in the *CEONAR* score is associated with a meaningful increase in repetition measures, highlighting how even subtle shifts in CEO narcissism can significantly alter the narrative structure of MD&As. This economic interpretation

<sup>93</sup> Our analysis extends the methodology of Brown and Tucker (2011), Brown et al. (2015), and Peterson et al. (2015) to explore the impact of CEO narcissism on year-over-year MD&A similarities. While these studies emphasized the predictability and dynamics of narrative disclosures in corporate filings, our focus was on assessing how CEO narcissism influences the inter-temporal repetition in MD&As. However, our findings indicate that the relationship between CEO narcissism and these repetition measures was not statistically significant.

provides a more tangible understanding of the CEO's influence on corporate disclosure practices, emphasizing the practical implications of our findings.

The regression results align well with the theoretical perspectives, which can be viewed as having both positive and negative implications.

According to agency theory (Donaldson and Davis, 1991; Payne and Petrenko, 2019), narcissistic CEOs, acting as agents with potentially divergent interests from their shareholders, may manipulate corporate narratives in MD&As to align with their personal ambitions. The repetitive emphasis on particular successes and achievements, serves to elevate their stature and potentially obscure less favorable aspects of their performance. This kind of manipulation may be viewed as detrimental because it can lead to a lack of transparency and possibly mislead stakeholders about the company's true state.

Impression management (Boudt and Thewissen, 2019; Steinmetz et al., 2017; Merkl-Davies et al., 2011) theory sheds light on why narcissistic CEOs might choose to repetitively focus on positive outcomes and achievements. These CEOs craft their communication to control how they are perceived by others, striving to maintain a favorable image (Chatterjee and Hambrick, 2007; Ham et al., 2018). This could be interpreted positively if such communications genuinely reflect company successes that are relevant to stakeholders. However, the repetitive nature and potential selectiveness of these disclosures might lead to skepticism among informed readers who may perceive this as an attempt to distract from other, less favorable, issues.

While it is clear that narcissistic traits can lead to enhanced and strategic communication practices, whether this is inherently "good" or "bad" depends on the alignment of these communications with actual company performance and their impact on shareholder value. If the repetition and strategic emphasis genuinely reflect the company's achievements and strategic direction, this could be seen as effective communication. However, if it serves primarily to obscure reality and inflate perceptions of success, it veers towards manipulative obfuscation. Given this understanding, the impact of a narcissistic CEO on corporate disclosures cannot simply be categorized as purely beneficial or detrimental; it often manifests as a complex interplay of both positive and negative outcomes. This complexity is driven by the CEO's motives, the accuracy of the disclosures relative to performance, and the perceptiveness of the stakeholders. The combination of good and bad aspects in these disclosures underscores the nuanced influence that a narcissistic CEO can have on corporate communication, reflecting a spectrum of outcomes rather than a neutral or gray area.

The relative flexibility in language and format of the MD&A sections not only allows narcissistic CEOs to showcase a grandiose view of company performance but also to repetitively emphasize achievements that reflect positively on their leadership. This repetitive emphasis serves to engrain these accomplishments in the

stakeholders' perceptions, reinforcing the CEOs' desired image. The repetition is not merely about showcasing grandeur but ensuring these selected themes of success are consistently acknowledged and remembered. This strategy underlines the narcissistic tendency to control narrative focus, making MD&As an ideal platform due to their narrative flexibility, unlike the more structured and rigid format of financial notes that might not allow for such personalized emphasis. Thus, the observed repetitive disclosures are a manifestation of narcissistic CEOs' strategic use of MD&As to solidify their personal brand and organizational success narrative.

Additionally, alongside CEO narcissism, the role of control variables is pivotal in understanding the dynamics of corporate communication as measured by repetition scores. For instance, *ACSIZE* (audit committee size) shows a significant positive influence on *Sim\_Cosine*, suggesting larger audit committees might be associated with more standardized and repetitive communication, possibly due to a more diverse range of perspectives converging to maintain consistent messaging. *BOARDIND* (board independence) positively affects *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*. This could imply that more independent boards lean towards communication that is more uniform and possibly more adherent to regulatory and best practice standards. *SIZE* (firm size) is significantly and positively related to all repetition measures. Larger firms might have more formalized and repetitive communication patterns, likely due to their complex structure and the need for consistency across various stakeholders. *AGE\_LN* (logarithm of firm age) shows a significant positive relationship with *Sim\_Simple*, indicating that older, more established firms might employ simpler, possibly more repetitive communication styles, perhaps as a reflection of their established protocols and traditional approaches. *LOSS* (indicator of financial loss) is positively correlated with all repetition measures except *Sim\_Simple*. This suggests that firms experiencing financial distress might use more repetitive language in their communications, possibly to emphasize stability or strategic focus areas during challenging times. These control variables, along with the significant impact of CEO narcissism on repetition in corporate communication, underscore the multifaceted nature of corporate disclosures. They highlight how various structural, operational, and leadership factors collectively shape the way firms communicate with their stakeholders.

[Insert Table 6]

### 5.3 Robustness Tests

This section of our study is dedicated to verifying the stability and accuracy of our primary findings through robustness tests and addressing endogeneity and self-

selection bias. These measures are crucial for validating the integrity of our results and ensuring that they accurately represent the relationship between CEO narcissism and corporate communication styles, rather than being artifacts of specific model choices or external variables.

### 5.3.1 Alternative Measures of CEO Narcissism

In our comprehensive analysis of CEO narcissism and its impact on corporate communication, we adopted two distinct but complementary approaches to measure CEO narcissism through their speech patterns during earnings calls. These methodologies, grounded in understanding of CEO communication styles, provide a multifaceted view of how narcissistic tendencies manifest in different contexts of corporate discourse.

#### Approach 1 – Distinguishing Presentation and Q&A Sections

As a further robustness check and following the methodology of Capalbo et al. (2018) and Bushee et al. (2018), we differentiated CEO narcissism scores based on the distinct sections of earnings conference calls: the presentation section (*CEONAR\_PRST*) and the question-and-answer (Q&A) section (*CEONAR\_Q&A*). This distinction was made to capture the spontaneity of the CEO's responses during the Q&A session, which are less likely to be influenced by public relations strategies compared to the more scripted presentation section.

In the presentation section, we calculated the CEO narcissism score (*CEONAR\_PRST*) based on the use of first-person pronouns during the formal, scripted part of the call. This measure aimed to capture the narcissistic traits as reflected in the prepared statements. The results showed that, across all similarity measures, the coefficients were positive, with *Sim\_Simple* displaying a significant coefficient of 0.256 at the  $p < 0.01$  level. This suggests that even in the more controlled environment of prepared speeches, aspects of CEO narcissism, such as a tendency towards repetitive language, are detectable. In contrast, the Q&A section provided an opportunity to examine the CEO's pronoun usage in a more spontaneous setting. The CEO narcissism score (*CEONAR\_Q&A*) for this section revealed significant positive coefficients in *Sim\_Cosine* (0.0404, significant at  $p < 0.05$ ) and *Sim\_Simple* (0.1350, significant at  $p < 0.05$ ). These results imply that in the less scripted, more impromptu context of Q&A sessions, CEOs with higher levels of

narcissism are more likely to employ repetitive language patterns, possibly to reinforce their own achievements and perspectives<sup>94</sup>.

The differentiation in CEO narcissism scoring between the presentation and Q&A sections of earnings calls offers a comprehensive view of how CEO narcissism manifests in various communication contexts. The consistency in the direction of the relationship across both sections, especially the significant findings in *Sim\_Simple*, highlights the pervasive influence of CEO narcissism on corporate communication styles. This approach, building on the work of Capalbo et al. (2018), not only validates the robustness of our narcissism measure but also enriches our understanding of the dynamic ways in which CEO personality traits shape corporate discourse.

While *CEONAR\_PRST* and *CEONAR\_Q&A* provide insights into the narcissistic tendencies of CEOs during different sections of earnings calls, the varied significance of these measures prompts further investigation into the context-specific effects of narcissism. It is possible that the scripted nature of the presentation sections (*CEONAR\_PRST*) may not fully capture the depth of narcissistic traits compared to the more spontaneous Q&A sections (*CEONAR\_Q&A*), where CEOs may exhibit more of their inherent personality traits. Additionally, the varying significance levels across these sections suggest that CEO narcissism may manifest differently depending on the formal or informal settings of communication, highlighting the need for a nuanced analysis of how and where narcissistic traits influence corporate discourse.

## Approach 2 – Aggregating Pronouns Annually

To further clarify the methodologies used in our analysis of CEO narcissism and how they extend from our foundational approaches described in section 4.3, let's consider the adjustments made for our comprehensive analysis. In section 4.3, we adopted Capalbo et al. (2018) foundational method, which involved analyzing the ratio of

<sup>94</sup> In addressing potential biases in measuring CEO narcissism due to non-participation in Q&A sessions, we incorporated an interaction variable between the CEO narcissism score (*CEONAR\_Q&A*) and CEO verbosity (*CEOVERBOSITY*). This approach, considering the proportion of words spoken by CEOs relative to other executives, aimed to assess whether verbosity influenced the narcissism score. Our previous analysis, highlighting significant positive coefficients for *CEONAR\_Q&A* in *Sim\_Cosine* and *Sim\_Simple*, already suggested a link between higher narcissism levels and repetitive language in spontaneous settings. The current untabulated analysis extends this by examining whether this association is affected by CEO participation in Q&A sessions. The absence of statistical significance in the interaction term suggests that the measure of CEO narcissism is robust and not conditional on the verbosity of CEO responses.

first-person singular pronouns (I, me, my, mine, myself) to the total count of first-person pronouns [both singular (I, me, my, mine, myself) and plural forms (we, us, our, ours, ourselves)] across all their transcripts over the examined period, i.e., 2002 to 2020, offering a simple indicator of narcissistic tendencies based on speech patterns during earnings calls.

Building on this, we introduced an annual aggregation of pronoun usage, *ANNUAL\_CEONAR*, which builds on the earlier methodology by extending the analysis across all quarterly earnings calls within a year. This adaptation from our initial strategy, which utilized a sophisticated NLP algorithm to dissect earnings call transcripts for quantifying first-person singular and plural pronouns usage by CEOs, aims to refine the precision of our analysis by accounting for potential seasonal variations. Such variations might influence the length and content of the calls, especially the expanded discourse typically observed in fourth-quarter calls. This summation provides a comprehensive measure of the CEO's pronoun usage, reflecting their communication style throughout the year. By normalizing this data relative to the total word count of the calls, we aim to mitigate the impact of variability in call duration. This normalization ensures that our measure of narcissism is not unduly influenced by longer calls, which could artificially inflate the count of first-person pronouns used by the CEO. This methodological shift is significant as it allows for a more balanced and seasonally adjusted representation of a CEO's narcissistic tendencies. By considering the entire year's communication, rather than focusing on a single call or a specific time frame, we gain a broader and more accurate understanding of the CEO's self-referential speech patterns.

In examining the results from the new method, we observe noteworthy patterns: all similarity measurements exhibit a positive direction, consistent with our main measurement. However, only *Sim\_Simple* shows a statistically significant result, displaying a coefficient of 0.1640, significant at the  $p < 0.01$  level. These outcomes reinforce a consistent trend in the relationship between CEO narcissism and textual repetition, as gauged by this new research design<sup>95</sup>. Although not all measures reach statistical significance, the uniform positive direction across metrics underscores that higher levels of CEO narcissism, as inferred from first-person pronoun usage,

<sup>95</sup> Same as the approach 1, our analysis separates CEO narcissism into presentation and Q&A sections of earnings calls for the whole period too. The results indicate subtle differences: In the presentation section, only *Sim\_Simple* shows a significant positive relationship with narcissism (0.116,  $p < 0.05$ ), suggesting more repetitive language in scripted communications. However, in the Q&A segment, none of the measures exhibit statistically significant correlations, pointing to a less pronounced influence of narcissism in spontaneous interactions. This could imply that narcissistic traits may be more effectively managed or less evident when CEOs are responding spontaneously, rather than when delivering prepared remarks.

correlate with increased textual repetition in CEO communications<sup>96</sup>. The annual aggregation measure (*ANNUAL\_CEONAR*), while comprehensive, did not show consistent significant results across all metrics. This could indicate that the aggregation dilutes the impact of more acute instances of narcissistic communication that might be more detectable in a quarterly analysis. Further analysis could explore whether the annual measure's broader scope might miss shorter-term fluctuations in narcissistic behavior that are more evident in quarterly or monthly analyses. This observation stresses the importance of temporal granularity in assessing the influence of CEO traits on corporate communication.

The differing levels of significance observed across various narcissism measures prompt a deeper theoretical consideration of the mechanisms at play. For instance, the strong results yielded by *CEONAR* compared to other measures may reflect its greater sensitivity in capturing overt expressions of narcissism that directly influence repetitiveness in disclosures. This difference in sensitivity across narcissism measures emphasizes that distinct narcissism metrics may identify different aspects of CEO communication behavior, indicating that narcissistic traits can be captured in multiple, measure-specific ways. Understanding why certain measures do not yield strong results could offer insights into the subtleties of narcissistic influence, potentially pointing to the need for developing more refined measures or employing a combination of methods to capture a full spectrum of narcissistic expression in corporate settings.

The sensitivity of our conclusions to the method used for measuring narcissism highlights the importance of selecting appropriate narcissism metrics that align with specific research objectives. The variation in significance across different narcissism measures (*CEONAR\_PRST*, *CEONAR\_Q&A*, and *ANNUAL\_CEONAR*) indicates that each metric may capture different dimensions of narcissistic expression. This complexity requires a varied approach to choosing and justifying these measures,

<sup>96</sup> In our study, following Chatterjee and Hambrick (2007) and Olsen et al. (2014), we explored alternative measures of CEO narcissism: (a) the relative cash payment to the CEO compared to the highest-paid non-CEO executive (*CEO\_CASHPAY*), and (b) the relative non-cash payment to the CEO (*CEO\_NONCASHPAY*). These measures, rooted in observable financial metrics, offer a different perspective on CEO narcissism, contrasting the linguistic analysis approach used in the conference call method. However, our findings indicated that these financial-based measures did not yield statistically significant results in relation to CEO narcissism. This lack of significance suggests that while these measures can provide insights into CEO compensation patterns, they may not be as effective in capturing the nuances of narcissistic traits compared to the conference calls as a source. Hence, while financial metrics offer valuable insights, analyzing conference calls provides a direct assessment of CEO narcissism, aligning with the theoretical frameworks that link narcissism to communication styles.

highlighting the need for ongoing improvements in methods and theory when studying CEO personality traits and their influence on corporate communication.

[Insert Table 7]

### 5.3.2 Handling Endogeneity and Self-Selection Bias

Endogeneity and self-selection bias are common challenges in governance and corporate communication studies (Wintoki et al., 2012). To address these issues, our research employs various methodologies to investigate the impact of CEO narcissism on corporate communication styles, specifically focusing on textual repetition<sup>97</sup>.

#### Impact of Lagged Instrumental Narcissism Score on Textual Repetition

In addressing potential endogeneity concerns in our study, we employed an instrumental variable approach to refine the measurement of CEO narcissism. This method was designed to disentangle the relationship between CEO narcissism and textual repetition while accounting for the potential reverse causality. *LAG\_CEONAR* was calculated by aggregating the CEO narcissism score (*CEONAR*) from previous years, excluding the contemporaneous year in which the textual repetition is measured. Specifically, for each firm (identified by *gvkey*) in a given year *t*, *LAG\_CEONAR* represents the sum of the CEO narcissism scores from years *t-1* to *t-n*, where *n* ranges from a minimum of two to a maximum of four years. This

<sup>97</sup> In our research, we aimed to isolate the impact of CEO narcissism on communication styles by controlling for unobserved firm-specific characteristics through the inclusion of firm fixed effects in our regression models. These effects were intended to account for any constant, unobservable attributes unique to each firm, complemented by year fixed effects to further refine our analysis. When we included these firm fixed effects, the significance of the results from the primary models diminished. Specifically, while the primary regression models demonstrated significant coefficients across different similarity measures (Cosine, Jaccard, Minimum Edit, and Simple Matching), these coefficients became smaller and non-significant in the firm-fixed effects model. This indicates that although unobserved firm-level factors, such as firm culture, play a role in the dynamics of CEO narcissism's impact on communication styles, they do not alter the fundamental patterns observed. The coefficients' direction remains consistent, suggesting an enduring influence of CEO traits despite the lack of statistical significance. This clarification addresses concerns about the robustness of our findings and reaffirms our confidence in the primary model's capacity to capture the essential dynamics of the relationships being studied. In line with the rest of the dissertation, this analysis is discussed across various essays, consistently employing similar methodologies to ensure coherence and thoroughness in our approach.

lagged approach ensures that the narcissism score is not contemporaneously related to the repetition measurement period, thus mitigating reverse causality concerns.

Our regression analysis revealed significant relationships across various measures of textual repetition. Specifically, for *Sim\_Cosine*, the coefficient of 0.0103, for *Sim\_Jaccard*, 0.0100, for *Sim\_MinEdit*, 0.0225, and for *Sim\_Simple*, also 0.0225, all demonstrated significance at the  $p < 0.01$  level. These findings consistently indicate a positive correlation between the lagged narcissism score and textual repetition. The results imply that higher levels of CEO narcissism from previous years are associated with increased repetition in corporate communications, emphasizing the enduring influence of CEO personality traits on communication styles.

[Insert Table 8]

### CEO Narcissism and Repetition in Corporate Communications: Propensity Score Matching (PSM) Approach

In our study, we have adopted PSM, as recommended by Cho et al. (2023), Maharjan and Lee (2022), and Shipman (2017), to explore the influence of CEO narcissism on corporate communication. This method is instrumental in minimizing selection bias in observational studies where experimental design is not feasible.

Our approach began with the calculation of propensity scores through logistic regression. Here, the presence of CEO narcissism, categorized as *CEONAR*, served as the dependent variable. A range of covariates, encompassing various firm characteristics and governance measures, was included to ensure comprehensive analysis. This setup allowed us to pair firms with narcissistic CEOs (treatment group) with those led by less narcissistic CEOs (control group), based on similar observed characteristics. The balance check, a crucial step in PSM, affirmed the effectiveness of our matching process. It showed that most variables, including *ACSIZE* and *BOARDSIZE*, exhibited a %-bias of less than 10%. This finding, supported by t-test results with high p-values, suggested minimal differences between the treatment and control groups across these covariates. Moreover, the variance ratios for these variables were generally close to 1, indicating successful matching and balance between the groups.

After ensuring a balanced match, we delved into analyzing the impact of CEO narcissism on repetition scores. The regression results, as shown in Panel B of Table 9, highlighted significant relationships between CEO narcissism (*CEONAR*) and various measures of communication style similarities (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). Specifically, *CEONAR* demonstrated a statistically significant positive relationship with these similarity metrics, suggesting that CEOs

with higher levels of narcissism tend to exhibit more repetitive and less diverse communication styles. This finding underscores the distinctive communication patterns adopted by narcissistic CEOs, emphasizing the importance of considering personality traits in corporate leadership analysis. The PSM approach, by minimizing confounding variables, lends robustness to our conclusions, highlighting the influence of CEO narcissism on corporate communication dynamics.

[Insert Table 9]

### Entropy Balancing: Analyzing CEO Narcissism's Impact on Communication Repetition

To tackle endogeneity issues and examine the effect of CEO narcissism on communication styles, we employed the entropy balancing approach, as suggested by Hainmueller (2012), McMullin and Schonberger (2020, 2022), and Akindayomi and Amin (2022). This method stands out for requiring fewer parameter selections and minimizing researcher discretion, compared to propensity-score matching. It meticulously balances covariates between treatment and control groups, ensuring a more precise causal inference.

In our study, we categorized firms with high CEO narcissism as the treatment group (*HIGHCEONAR*) and those with low narcissism as the control group (*LOWCEONAR*). Our goal was to compare these groups across an array of covariates, including firm characteristics and governance indicators. The pre-balancing phase revealed some differences between the treatment and control groups in variables like *SIZE* and *MTOB*. However, the entropy balancing method effectively equalized these discrepancies post-balancing, as indicated in Table 9, Panel A. All differences between the two groups were neutralized, confirming the method's efficacy in creating balanced conditions for our analysis.

Table 10, Panel B details the regression results after entropy balancing. The variable *CEONAR* showed significant associations with all similarity measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). For instance, in the *Sim\_Cosine* model, *CEONAR* demonstrated a positive and significant relationship, suggesting that higher CEO narcissism correlates with increased repetition in corporate communications. These results reinforce our initial findings, asserting the influence of CEO narcissism on corporate communication styles. The entropy balancing approach enhances our confidence in these conclusions that observed relationships are less likely to be affected by confounding variables.

[Insert Table 10]

### Instrumental Variables Approach

Following prior literature examining CEO narcissism and executive characteristics (e.g., Buchholz et al., 2020; Cragun et al., 2020; O'Reilly et al., 2014), we employ two instrumental variables: CEO tenure (*CEO\_TEN*) and CEO age (*CEO\_AGE*). These instruments capture distinct dimensions of CEO experience and development that theory suggests are correlated with narcissistic tendencies, while there is no prior theoretical or empirical evidence suggesting that these variables affect the error term. The theoretical basis for our instruments stems from prior research linking these characteristics to narcissistic behavior. CEO tenure reflects accumulated organizational power and authority, characteristics frequently associated with narcissistic tendencies (Ingersoll et al., 2019). As CEOs remain in their positions, they consolidate decision-making authority and face reduced external constraints, potentially reinforcing traits such as dominance and reduced receptivity to feedback. Therefore, longer-tenured CEOs may develop heightened narcissistic tendencies through sustained leadership positions and repeated validation of their authority. Similarly, CEO age captures cumulative career experiences and life-cycle effects in personality development. As CEOs progress through career stages, their accumulated achievements and enhanced organizational influence may reinforce perceptions of self-importance. Evidence suggests systematic generational variations in narcissistic expressions due to these career-stage effects and leadership experiences (Jeong et al., 2021).

Table 5 presents our 2SLS results. The first-stage estimates demonstrate strong instrument relevance, with both *CEO\_TEN* (coefficient = 0.0003;  $p < 0.01$ ) and *CEO\_AGE* (coefficient = 0.0002;  $p < 0.01$ ) exhibiting significant predictive power for CEO narcissism. The F-statistics (113.05 and 111.62, respectively) are greater than the conventional threshold of 10, indicating that our instruments are strong. The second-stage results reveal significant positive associations between instrumented CEO narcissism and all narrative similarity measures, suggesting that the relationship between CEO narcissism and narrative repetition remains robust to endogeneity concerns.

[Insert Table 11]

## 6 Additional Analyses

### 6.1 The Impact of CEO Origin: Insider Versus Outsider

In the dynamic field of corporate governance, the impact of a CEO's origin, whether internal or external, on firm performance has been a subject of extensive debate and research. This interest has grown as the trend of hiring CEOs from outside the firm has gained popularity worldwide, not just in U.S. firms. Studies like those by Furtado and Rozeff (1987), Zajac (1990), and Saidu (2019) have explored how insider CEOs, with their firm-specific skills and internal power bases, potentially outperform outsider CEOs. This insider advantage potentially equips them to navigate the company's unique challenges more effectively than outsider CEOs. Additionally, insider CEOs tend to have established networks and influence within the company, which can be crucial for implementing strategies and garnering support across the organization, as discussed by Saidu (2019). Conversely, the work of Cannella and Lubatkin (1993), Hambrick et al. (1993), and Harris and Helfat (1997) suggests outsider CEOs can bring needed strategic changes and fresh perspectives, especially in declining firm performance situations. However, this section aims to shift the focus from general firm performance to a more nuanced aspect: the impact of CEO origin on repetitive disclosures in MD&As, particularly through the lens of CEO narcissism. This approach adds a new dimension to the ongoing debate by considering how personality traits like narcissism influence corporate communication practices.

CEO origin is determined using data from the ExecuComp database, following the classification method used by Kuang et al. (2014). CEOs are considered insiders if they have been with the firm for more than one year before becoming CEO. Conversely, outsider CEOs are those appointed to the position after being with the firm for one year or less. This classification is primarily based on the dates of joining the firm and becoming CEO. If necessary dates are missing, the first year a CEO appears in ExecuComp's top five highest-compensated officers list is compared to their CEO appointment year to determine their status. The regression analysis provided in Table 12 sheds light on this aspect. For outsider CEOs, the results across the four similarity measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*) are -0.0421, -0.00708, 0.00993, and 0.327\*\*\* respectively. Notably, the coefficient for *Sim\_Simple* is significant at the \*\*\* level, indicating a positive correlation in this measure. However, the other measures show a negative or negligible correlation between narcissism and repetitive disclosures for external CEOs. In contrast, the results for insider CEOs show a strong, positive correlation across all measures: 0.226\*\*\* (*Sim\_Cosine*), 0.155\*\*\* (*Sim\_Jaccard*), 0.368\*\*\* (*Sim\_MinEdit*), and 0.245 (*Sim\_Simple*). This indicates that insider CEOs,

particularly those with narcissistic traits, are more prone to engage in repetitive disclosures in MD&As.

### [Insert Table 12]

These findings challenge the hypothesis that external CEOs, facing pressure to demonstrate their value and lacking firm-specific human capital, would be more inclined toward repetitive communications. Instead, it appears that insider CEOs, with their deeper integration and established authority, tend to exhibit more repetitive disclosure behavior. This could reflect a stronger commitment to and belief in the firm's existing strategies and operations, bolstered by their narcissistic traits.

## 6.2 The Intersection of CEO Narcissism, Gender, and Repetition

The intersection of CEO personality traits and gender in influencing corporate communication practices, particularly repetitive disclosures in MD&A sections, presents a unique area of study in corporate governance. Extending the scope of our analysis to include the impact of CEO optimism, we draw on the premise that the level of optimism, potentially influenced by gender, might affect the nature and complexity of corporate disclosures. This approach is grounded in research suggesting differing risk preferences and managerial styles between male and female managers and directors (Adams and Funk, 2012; Berger et al., 2014; Francis et al., 2015). Furthermore, gender has been posited as a proxy for managerial optimism, with studies such as Davis et al. (2015) highlighting its potential influence on executive behavior. In our study, we operationalize this concept by using *CEO\_FEMALE* as an interactive variable with CEO narcissism (*CEONAR*), coded as 1 for female CEOs and 0 for male CEOs, to explore its moderating effect on MD&A disclosures.

Table 13 regression analysis reveal intriguing insights into how CEO narcissism and gender interact to influence the extent and nature of repetitive disclosures in MD&As. Looking at the variables across four measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*), we observe different patterns. The coefficient for CEO narcissism (*CEONAR*) is statistically significant only in the *Sim\_Simple* model (0.282,  $p < 0.01$ ), suggesting that narcissistic traits may be more prominently associated with repetitive disclosures in this specific measure. The Gender variable shows a negative coefficient in *Sim\_Jaccard* (-0.0564,  $p < 0.05$ ) and *Sim\_MinEdit* (-0.113,  $p < 0.1$ ), indicating a potential gender-based difference in disclosure styles, with female CEOs possibly favoring less repetitive disclosures.

However, the most notable result emerges from the interaction term (*CEONAR* × *CEO\_FEMALE*), particularly in *Sim\_Jaccard* (0.313,  $p < 0.05$ ) and

*Sim\_MinEdit* (0.627,  $p < 0.1$ ). This indicates a more pronounced effect of narcissism on repetitive disclosures among female CEOs compared to their male counterparts. This outcome could reflect a complex interplay where the personality trait of narcissism, when combined with the gender-specific propensity towards optimism (Cain and Boussi, 2020), results in a distinctive communication style in financial reporting<sup>98</sup>.

[Insert Table 13]

The implications of these findings are manifold. Firstly, they highlight the importance of considering both personality traits and gender in understanding executive communication strategies. The differences observed suggest that repetitive disclosures in MD&As are not solely a function of managerial narcissism but are also influenced by gender, potentially due to underlying differences in optimism levels (Liang et al., 2020). Secondly, these results contribute to the ongoing discourse on the role of gender in corporate leadership, suggesting that female CEOs, particularly those with narcissistic traits, might approach corporate communication in a distinct manner compared to their male counterparts.

### 6.3 Accounting Firm Prestige, CEO Narcissism and Repetition

This section aims to unravel the intricate relationship between CEO narcissism, the reputation of accounting firms, and the pattern of repetition. Primary analyses have shown that CEO narcissism is positively correlated with repetitive disclosures, significantly influencing the quality of corporate financial information. This influence of CEO personality traits on financial reporting quality suggests a mediating role of financial information quality in the nexus between CEO narcissism and disclosure repetition. Such a premise is rooted in the understanding that other variables might interact with CEO narcissism to affect repetition in disclosures, a

<sup>98</sup> In our analysis, we incorporated the moderating effect of CEO age (*CEO\_AGE*) on the relationship between CEO narcissism and repetitive disclosure preferences, as suggested by social psychology research indicating that older individuals might develop traits like conscientiousness and humility (Ashton and Lee, 2016; Zhang et al., 2017; Owens et al., 2015). Unexpectedly, the interaction of CEO narcissism and age indicated a reduced effect of narcissism on repetitive disclosures in older CEOs (coefficients: -0.00732\*\* for *Sim\_Cosine* and -0.00470 for *Sim\_Jaccard*). This could imply that as CEOs age, the intensity of narcissistic traits in influencing repetitive disclosure behavior might diminish, possibly due to the emergence of other personality attributes like conscientiousness and humility. However, given the unexpected direction of these results and the complexity of personality traits interactions, further research is warranted to fully understand these dynamics.

perspective supported by existing literature. Notably, the choice of accounting firm<sup>99</sup>, particularly those with high prestige such as the Big 4 (*BIGFOUR*), plays a crucial role in this context.

Narcissistic CEOs often seek the support of high-reputation firms to gain external validation of their business capabilities. Large-scale accounting firms are known for their professional capabilities and independence, attributes that are essential in maintaining their reputation and in issuing high-quality audit reports. This relationship is underscored by studies such as Cai et al. (2005), which highlight the professional capabilities of large-scale accounting firms, and Wang and Zhang (2019), who emphasize their tendency to issue high-quality audit reports. Furthermore, the brand effect of these firms in the audit market, as discussed by Zheng and Zheng (2017), allows them to charge a premium for their services. Conversely, the presence of a narcissistic CEO can negatively impact the efficiency of the financial department and the quality of internal controls.

The empirical analysis is segmented into two parts based on the type of accounting firm involved: prestigious Big 4 firms (Panel A) and non-Big 4 firms (Panel B). In Panel A, the regression analysis reveals a significant positive relationship between CEO narcissism (*CEONAR*) and repetitive disclosures across various similarity measures, such as *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. The coefficients for *CEONAR* range from moderate to strong significance, with *Sim\_Simple* showing the most substantial correlation. In Panel B, focusing on non-Big 4 firms, the relationship between CEO narcissism and repetitive disclosures is less pronounced. The coefficient for *CEONAR* in *Sim\_Cosine* is higher than in Big 4 firms but does not exhibit consistent significance across other similarity measures. This suggests that the impact of CEO narcissism on repetition in disclosures is more nuanced and possibly contingent on the prestige of the accounting firm.

[Insert Table 14]

<sup>99</sup> The selection of an auditing firm, especially those with high prestige like the Big 4, is a decision that involves multiple stakeholders within a company, reflecting a strategic choice that may align with the CEO's influence and preferences. While the board of directors, particularly the audit committee, plays a primary role in auditor selection to ensure independence and objectivity, the CEO's perspective can be influential in this process. The CEO's preference for a high-prestige auditing firm can stem from a desire to associate the company with the auditor's reputable image, which may complement the CEO's own strategic narrative and personal branding efforts within and outside the organization. This dynamic highlights the complex interplay between CEO narcissism, auditor selection, and the resultant patterns of repetitive disclosure.

The results indicate that CEO narcissism is a significant predictor of repetitive disclosures, particularly in firms audited by prestigious accounting firms. This implies that the quality and repetition of financial information are influenced not only by internal characteristics of the firm, such as CEO traits, but also by external factors like the reputation of the auditing firm. The difference in the impact of CEO narcissism between firms audited by Big 4 and non-Big 4 firms highlights the importance of considering both internal managerial traits and external audit quality.

## 7 Concluding Remarks

CEOs, as a pivotal decision-maker, significantly influence organizational outcomes. Narcissism in CEOs, defined by traits like superiority, entitlement, and manipulation (Brummelman et al., 2016; Campbell et al., 2011; Grijalva et al., 2015), impacts their decision-making and, consequently, the organization's ethical standing. While some studies note positive aspects of narcissistic leadership like improved audit quality (Chou et al., 2021; Church et al., 2020), others link it to unethical practices and increased fraud risks (Ahmed and Duellman, 2013; Olsen and Stekelberg, 2016; O'Reilly et al., 2018; Rijsenbilt and Commandeur, 2013). This study examines the role of CEO narcissism in shaping the strategic repetition of content from financial statement notes to MD&As within the same 10-K reports. Findings indicate a significant relationship between CEO narcissism and the strategic use of repetition, affirming the hypothesis regarding narcissistic influences on disclosure patterns.

When analyzed through the lenses of agency and impression management theories, the influence of CEO narcissism on disclosure strategies extends beyond mere obfuscation. While obfuscation theory suggests that complex or vague disclosures might intentionally hide poor performance, our findings indicate that narcissistic CEOs employ a strategic pattern that impresses their personal imprint on corporate narratives. This strategic communication may not only aim to obscure less favorable information but also to prominently highlight successes, thereby shaping perceptions in a way that aligns with their personal image and goals. Such an approach reveals a multi-faceted interactions between the desire to maintain a favorable public image and the practical needs of transparent and informative corporate disclosure.

The strength of our conclusions is underpinned by robustness tests, affirming the validity and reliability of our approach. Furthermore, our exploration into the dimensions of CEO origin, and the interactions between narcissism, gender, and the prestige of accounting firms, extends our comprehension of the intricate ways in which CEO traits inform corporate communication. These findings are essential for devising strategies that not only aim to improve leadership qualities and

effectiveness but also promote diversity. This approach is expected to lead to more balanced and effective corporate communication strategies, reflecting a comprehensive understanding of how varying leadership traits impact disclosure practices.

This analysis not only bridges a specific scholarly void by elucidating the link between executive personality traits and disclosure practices but also underscores the broader ramifications for investors, regulators, and corporate governance bodies. Our study distinctly contributes to the existing literature by addressing a research gap regarding the impact of CEO narcissism on the specific aspect of financial disclosure repetitiveness. The practical outcomes of our research highlight the importance of considering CEO personality traits in the evaluation and regulation of corporate disclosures, offering pathways to improve financial reporting quality and corporate governance standards. In addition to regulatory implications, these findings are particularly relevant for corporate boards involved in the recruitment of new CEOs and in shaping the future strategy of the firm. Understanding the influence of CEO personality traits can aid boards in making informed decisions that align leadership styles with corporate goals and governance practices. This complex task involves developing regulatory and governance strategies that address the diverse psychological profiles of CEOs and ensure that such frameworks are flexible enough to adapt to different leadership styles and corporate contexts.

Our study, while providing insightful revelations into CEO narcissism and its effects on financial disclosures, encounters several limitations worth noting. First, its applicability is primarily within the U.S. context, potentially limiting the generalizability of the findings to different regulatory or cultural environments. The temporal scope of the analysis may not capture the evolving dynamics of corporate disclosure practices or the variability of narcissistic leadership across different economic periods. Additionally, the quantitative measure of narcissism, based on linguistic analysis, might not fully encapsulate the breadth of narcissistic traits, possibly overlooking nuanced behaviors. The focus on narcissism also precludes the examination of how it interacts with other executive characteristics, which collectively could offer a more comprehensive understanding of its impact on organizational outcomes.

Furthermore, the study does not account for the influence of board dynamics and organizational culture, which can play significant roles in shaping corporate disclosure practices. Besides, relying solely on public disclosures may not provide a complete picture of the internal decision-making processes influenced by CEO narcissism. Finally, another limitation of this study is the challenge in conclusively determining whether stakeholders are better off or worse off due to the impact of narcissistic CEOs on the repetition in MD&A disclosures. While our findings provide insights into the nature of these disclosures, the actual benefits or net

consequences to stakeholders remain difficult to quantify. This ambiguity highlights the intricate role of CEO personality traits in corporate communication, underscoring the necessity for more detailed empirical research to clarify these effects conclusively.

In conclusion, our study sheds light on the dynamics of CEO narcissism and its influence on financial reporting. It highlights the importance of considering CEO personality traits in evaluating corporate disclosures and ethical practices. Our findings also suggest directions for future research. They could delve deeper into the psychological aspects of CEO decision-making, exploring how other personality traits alongside narcissism impact corporate strategies and reporting. Additionally, exploring how these findings apply across different cultural and regulatory contexts would provide a more global perspective on the topic.

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# Tables

**Table 1.** *Sample Creation*

Filters	Dropped	Sample Size
SEC 10-K files (1994–2022)		202,218
Eliminate duplicates within year/CIK	3,547	198,671
Compustat gvkey match	44,098	154,573
MD&A and Notes sections $\geq$ 200 words	23,853	130,720
Compustat integration (1990–2022)	16,936	113,784
BoardEx integration (1997–2022)	49,866	63,918
ExecuComp integration (1992–2022)	32,876	31,042
Conference Call integration (2002–2020)	8,898	22,144
Drop if required data is missing	1,633	20,511

Table 1 outlines the sample creation process for the study, detailing the sequential filtering steps applied to derive the final sample from an initial dataset of SEC 10-K filings spanning from 1994 to 2022. The process begins with the initial dataset comprising 202,218 SEC 10-K filings. The table then sequentially documents the exclusion of duplicates, the requirement for a match with Compustat gvkey, the imposition of a word count threshold on the MD&A and Notes sections, and the integration with additional datasets such as BoardEx, ExecuComp, and conference call records. The final stages involve further refinement by eliminating observations lacking required data, culminating in a robust, matched sample of 20,511 observations.

**Table 2. Sample Distribution**

Year		# of obs.	% of sample	Cumulative %
<b>Panel A. by year</b>				
2002		380	1.85	1.85
2003		882	4.30	6.15
2004		1053	5.13	11.29
2005		1180	5.75	17.04
2006		1222	5.96	23.00
2007		1338	6.52	29.52
2008		1347	6.57	36.09
2009		1414	6.89	42.98
2010		1393	6.79	49.77
2011		1431	6.98	56.75
2012		1423	6.94	63.69
2013		1346	6.56	70.25
2014		1299	6.33	76.58
2015		1329	6.48	83.06
2016		1311	6.39	89.45
2017		1195	5.83	95.28
2018		478	2.33	97.61
2019		450	2.19	99.80
2020		40	0.20	100.00
Total		20,511	100.00	
<b>Panel B. by industry</b>				
	2-digit SIC	# of obs.	% of sample	Cumulative %
Oil and gas	13	683	3.33	3.33
Heavy construction other than building construction contractors	16	123	0.60	3.93
Food, beverage	20	529	2.58	6.51
Apparel and other fabrics finished products	23	199	0.97	7.48
Furniture and fixtures	25	141	0.69	8.17
Paper and allied products	26	176	0.86	9.02
Printing, publishing, and allied industries	27	169	0.82	9.85
Chemicals and allied products	28	2324	11.33	21.18
Petroleum refining and related industries	29	107	0.52	21.70
Rubber	30	143	0.70	22.40
Stone, clay, glass, and concrete products	32	121	0.59	22.99
Primary metal industries	33	284	1.38	24.37
Fabricated metal products	34	315	1.54	25.91
Industrial machinery and computer equipment	35	1352	6.59	32.50
Electronic and other electric equipment	36	1933	9.42	41.92
Transportation equipment	37	567	2.76	44.69
Instruments and related products	38	1435	7.00	51.68

*(Continued on next page)*

**Table 2.** *Sample Distribution*

	2-digit SIC	# of obs.	% of sample	Cumulative %
<b>Panel B.</b> by industry				
<i>(Continued)</i>				
Miscellaneous manufacturing	39	174	0.85	52.53
Motor freight transportation and warehousing	42	110	0.54	53.07
Transportation by air	45	176	0.86	53.93
Communication	48	604	2.94	56.87
Electric, Gas, and Sanitary Services	49	953	4.65	61.52
Wholesale—durable goods	50	495	2.41	63.93
Wholesale—non-durable goods	51	243	1.18	65.12
General merchandise store	53	160	0.78	65.90
Automotive dealers and gasoline stations	55	194	0.95	66.84
Apparel and accessory stores	56	361	1.76	68.60
Furniture and home furnishings stores	57	103	0.50	69.10
Eating and drinking	58	324	1.58	70.68
Miscellaneous retail	59	347	1.69	72.38
Business services	73	2588	12.62	85.00
Amusement and recreation services	79	225	1.10	86.10
Health services	80	359	1.75	87.85
Educational services	82	148	0.72	88.57
Engineering and management services	87	477	2.33	90.90
Others	<sup>b</sup>	1869	9.10	100.00
Total		20,511	100.00	

<sup>b</sup> It should be noted that there are 501 firm-year observations for firms in the financial services industry, which falls within the SIC code range of 6000 to 6999. While some previous studies have excluded these observations, others have included them, depending on the specific requirements of the study. In this research,, they have been categorized under the "Others" category.

Table 2 provides a detailed account of the sample distribution utilized in the study, segmented into two primary panels: **Panel A**, which delineates the distribution by year, and **Panel B**, which outlines the distribution by industry, using 2-digit Standard Industrial Classification (SIC) codes. **Panel A** showcases the temporal distribution of the observations spanning from 2002 to 2020. The table reveals a fairly consistent distribution with notable peaks and troughs, reflecting varying sample sizes over the years, and culminates in a comprehensive tally of 20,511 observations accounting for the entire period studied. **Panel B** categorizes the sample based on industry sectors, employing 2-digit SIC codes for classification. This panel offers a view of the sample's industry diversity, highlighting sectors with higher representation, such as 'Chemicals and allied products', 'Electronic and other electric equipment', and 'Business services', among others. The inclusion of a broad array of sectors underscores the study's comprehensive approach to examining phenomena across varied industrial contexts.

**Table 3. Descriptive Statistics**

Variable	N	Mean	SD	Min	25 %	50 %	75 %	Max
Dependent variables ( <i>REPETITION</i> measures)								
<i>Sim_Cosine</i>	20511	0.876	0.100	0.013	0.839	0.903	0.944	1.000
<i>Sim_Jaccard</i>	20511	0.207	0.090	0.007	0.149	0.212	0.253	0.500
<i>Sim_MinEdit</i>	20511	0.472	0.188	0.015	0.345	0.492	0.576	1.000
<i>Sim_Simple</i>	20511	0.352	0.307	0.000	0.048	0.322	0.550	1.000
Independent variables								
<i>CEONAR</i>	20511	0.198	0.032	0.027	0.176	0.198	0.219	0.358
Control variables								
<i>ACSIZE</i>	20511	4.118	1.144	1.000	3.000	4.000	5.000	12.000
<i>ACIND</i>	20511	0.890	0.148	0.000	0.750	1.000	1.000	1.000
<i>ACFEXP</i>	20511	0.488	0.284	0.000	0.250	0.333	0.667	1.000
<i>ACCHAIRFE</i>	20511	0.850	0.357	0.000	1.000	1.000	1.000	1.000
<i>BOARDSIZE</i>	20511	12.061	6.733	2.000	8.000	10.000	14.000	38.000
<i>BOARDIND</i>	20511	0.604	0.136	0.000	0.500	0.600	0.714	1.000
<i>ZSCORE</i>	20511	1.062	0.771	-1.920	0.541	0.897	1.378	8.906
<i>LOSS</i>	20511	0.302	0.459	0.000	0.000	0.000	1.000	1.000
<i>SIZE</i>	20511	6.957	1.982	0.602	5.650	6.924	8.222	14.248
<i>AGE_LN</i>	20511	2.806	0.396	1.946	2.565	2.890	3.136	3.497
<i>SPEC</i>	20511	-0.018	0.080	-1.376	-0.014	-0.003	0.000	0.849
<i>SALE_VOL</i>	20511	0.243	0.257	0.000	0.093	0.174	0.308	6.255
<i>NONMISS_LN</i>	20511	6.027	0.056	5.624	5.997	6.033	6.066	6.180
<i>DAC</i>	20511	0.272	0.103	0.000	0.216	0.263	0.324	3.924
<i>ROE</i>	20511	-0.064	0.492	-6.983	-0.022	0.035	0.059	2.757
<i>INVT_VOL</i>	20511	2.615	3.614	0.000	0.199	1.402	3.586	35.832
<i>CFO_SALE</i>	20511	-0.090	1.039	-8.825	0.031	0.093	0.172	9.117
<i>MTOB</i>	20511	2.105	1.551	0.312	1.207	1.622	2.408	18.063
<i>SLACK</i>	20511	1.598	4.803	0.000	0.076	0.316	1.237	59.924
<i>DIV</i>	20511	0.399	0.490	0.000	0.000	0.000	1.000	1.000
<i>TANGIBILITY</i>	20511	0.497	0.417	0.001	0.182	0.372	0.729	4.196
<i>KSTRUCTURE</i>	20511	0.178	0.201	0.000	0.003	0.116	0.277	1.000
<i>LNCOUNT</i>	20511	10.248	0.722	7.018	9.893	10.355	10.709	13.176
<i>CEOCOMPLX</i>	20511	8.790	0.770	6.200	8.269	8.755	9.278	14.430
<i>CEOTONE</i>	20511	0.240	0.176	-0.726	0.124	0.247	0.363	0.849

Table 3 offers a comprehensive overview of the descriptive statistics for a broad array of variables involved in the analysis. It is divided into three sections: dependent variables (which measure *REPETITION*), independent variables, and control variables. The table begins with the dependent variables, focusing on various *REPETITION* measures, including *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. These variables quantify different aspects of repetition in the content analyzed, providing insights into patterns and degrees of similarity or redundancy.

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**Table 3. Descriptive Statistics**

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*(Continued)*

The independent variable highlighted is *CEONAR*, representing a specific characteristic of the CEO (e.g., overconfidence, narration style, etc.) that the study aims to examine in relation to the dependent variables. A comprehensive list of control variables is provided, encompassing aspects such as audit committee size (*ACSIZE*), audit committee independence (*ACIND*), audit committee financial expertise (*ACFEXP*), board characteristics (*BOARDSIZE*, *BOARDIND*), financial health indicators (*ZSCORE*, *LOSS*), and company specifics (*SIZE*, *AGE\_LN*, *SPEC*, *SALE\_VOL*, *NONMISS\_LN*, *DAC*, *ROE*, *INVT\_VOL*, *CFO\_SALE*, *MTOB*, *SLACK*, *DIV*, *TANGIBILITY*, *KSTRUCTURE*, *LNCOUNT*, *CEOCOMPLX*, *CEOTONE*). These variables control for additional factors that might influence the relationship between the independent and dependent variables, ensuring the analysis accounts for a wide range of influences. All variables are processed through winsorizing to mitigate the effect of outliers, ensuring that the analysis remains robust and focused on the most representative trends within the data. Definitions and detailed descriptions of each variable, along with the rationale for their inclusion and the specific calculations involved, are provided in Appendix B.

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**Table 4.** Mean Difference Test by CEO Narcissism

Variable	LOWCEONAR (Q1)			HIGHCEONAR (Q4)			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>Sim_Cosine</i>	5125	0.871	0.898	5127	0.876	0.903	2.784 (0.005)	4.373 (0.000)
<i>Sim_Jaccard</i>	5125	0.205	0.213	5127	0.207	0.210	1.335 (0.182)	-0.062 (0.950)
<i>Sim_MinEdit</i>	5125	0.466	0.494	5127	0.472	0.486	1.528 (0.127)	0.450 (0.653)
<i>Sim_Simple</i>	5125	0.333	0.304	5127	0.361	0.333	4.740 (0.000)	4.561 (0.000)
<i>ACSIZE</i>	5125	4.077	4.000	5127	4.114	4.000	1.646 (0.100)	0.774 (0.439)
<i>ACIND</i>	5125	0.889	1.000	5127	0.890	1.000	0.317 (0.752)	0.690 (0.490)
<i>ACFEXP</i>	5125	0.506	0.400	5127	0.471	0.333	-6.075 (0.000)	-7.052 (0.000)
<i>ACCHAIRFE</i>	5125	0.861	1.000	5127	0.826	1.000	-4.864 (0.000)	-3.057 (0.002)
<i>BOARDSIZE</i>	5125	11.203	9.000	5127	12.627	10.000	10.897 (0.000)	10.629 (0.000)
<i>BOARDIND</i>	5125	0.619	0.625	5127	0.583	0.583	-13.187 (0.000)	-13.635 (0.000)
<i>ZSCORE</i>	5125	1.181	1.037	5127	0.949	0.823	-16.167 (0.000)	-16.364 (0.000)
<i>LOSS</i>	5125	0.312	0.000	5127	0.280	0.000	-3.540 (0.000)	-2.798 (0.005)
<i>SIZE</i>	5125	6.576	6.601	5127	7.169	7.152	15.560 (0.000)	15.183 (0.000)
<i>AGE_LN</i>	5125	2.782	2.890	5127	2.827	2.890	5.800 (0.000)	3.953 (0.000)
<i>SPEC</i>	5125	-0.020	-0.003	5127	-0.016	-0.002	2.260 (0.024)	3.037 (0.002)
<i>SALE_VOL</i>	5125	0.250	0.182	5127	0.230	0.171	-4.539 (0.000)	-3.705 (0.000)
<i>NONMISS_LN</i>	5125	6.026	6.033	5127	6.027	6.031	1.175 (0.240)	0.258 (0.797)
<i>DAC</i>	5125	0.278	0.271	5127	0.272	0.260	-2.988 (0.003)	-4.926 (0.000)
<i>ROE</i>	5125	-0.079	0.036	5127	-0.041	0.036	4.081 (0.000)	0.464 (0.643)
<i>INVT_VOL</i>	5125	2.925	1.521	5127	2.709	1.531	-2.779 (0.005)	-0.555 (0.579)
<i>CFO_SALE</i>	5125	-0.002	0.087	5127	-0.184	0.103	-8.607 (0.000)	5.299 (0.000)
<i>MTOB</i>	5125	1.905	1.492	5127	2.322	1.770	13.531 (0.000)	15.011 (0.000)
<i>SLACK</i>	5125	1.128	0.230	5127	1.991	0.406	9.148 (0.000)	14.715 (0.000)

(Continued on next page)

**Table 4.** Mean Difference Test by CEO Narcissism

Variable	LOWCEONAR (Q1)			HIGHCEONAR (Q4)			Difference tests	
	N	Mean	Median	N	Mean	Median	t-test (p-values)	Wilcoxon (p-values)
<i>(Continued)</i>								
<i>DIV</i>	5125	0.384	0.000	5127	0.417	0.000	3.472 (0.001)	2.946 (0.003)
<i>TANGIBILITY</i>	5125	0.555	0.433	5127	0.458	0.346	-11.726 (0.000)	-10.470 (0.000)
<i>KSTRUCTURE</i>	5125	0.191	0.127	5127	0.160	0.097	-7.888 (0.000)	-6.756 (0.000)
<i>LNCOUNT</i>	5125	10.149	10.281	5127	10.261	10.375	7.751 (0.000)	7.999 (0.000)
<i>CEOCOMPLX</i>	5125	8.928	8.894	5127	8.638	8.581	-18.886 (0.000)	-19.351 (0.000)
<i>CEOTONE</i>	5125	0.298	0.312	5127	0.179	0.186	-34.455 (0.000)	-33.279 (0.000)

Table 4 delineates the results of a mean difference test conducted to examine the impact of CEO narcissism on various company and CEO attributes. The analysis splits the sample based on levels of CEO narcissism into two distinct groups: those led by CEOs with low levels of narcissism (*LOWCEONAR*, corresponding to the first quartile of observations) and those led by CEOs with high levels of narcissism (*HIGHCEONAR*, corresponding to the fourth quartile of observations). The study considers a wide array of variables, ranging from *REPETITION* measures (e.g., *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*) to various company and board characteristics (e.g., *ACSIZE*, *ACIND*, *ACFEXP*), financial health indicators (e.g., *ZSCORE*, *LOSS*, *SIZE*), and specific CEO attributes (e.g., *CEOCOMPLX*, *CEOTONE*). The differences between the *LOWCEONAR* and *HIGHCEONAR* groups are evaluated using t-tests and Wilcoxon tests, with p-values provided to assess the statistical significance of the observed differences. These tests help identify how the narcissism level of CEOs may influence various aspects of company performance and decision-making. The results highlight significant differences across several variables. For instance, companies led by highly narcissistic CEOs tend to have larger board sizes, higher financial risk (as indicated by *ZSCORE*), and different investment and financial strategies (as evidenced by variables like *CFO\_SALE* and *MTOB*). Additionally, there are notable differences in *REPETITION* measures, suggesting that CEO narcissism may influence communication patterns and disclosure practices. Variables with statistically significant differences (e.g., *CEOCOMPLX*, *CEOTONE*) underline the profound impact that CEO personality traits, such as narcissism, can have on corporate governance, strategy, and communication. The p-values provide insight into the robustness of these findings, with several variables showing strong statistical significance, indicating that the observed differences are unlikely to be due to chance. All variables involved in the analysis are thoroughly defined and described in Appendix B, ensuring clarity and transparency in the methodology and findings presented.

**Table 5. Correlation Matrix: CEO Narcissism, Repetition, and Controls (n = 20511)**

<b>Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>
(1) <i>Sim_Cosine</i>	1									
(2) <i>Sim_Jaccard</i>	0.774*	1								
(3) <i>Sim_MinEdit</i>	0.800*	0.992*	1							
(4) <i>Sim_Simple</i>	0.479*	0.622*	0.625*	1						
(5) <i>CEONAR</i>	0.018*	0.008	0.010	0.036*	1					
(6) <i>ACSIZE</i>	0.094*	0.070*	0.067*	0.050*	0.015*	1				
(7) <i>ACIND</i>	0.013	0.005	0.004	0.014*	0.004	0.046*	1			
(8) <i>ACFEXP</i>	0.042*	0.036*	0.039*	0.033*	-0.044*	-0.076*	0.01	1		
(9) <i>ACCHAIRFE</i>	0.016*	0.013	0.014*	-0.007	-0.038*	-0.002	-0.006	0.233*	1	
(10) <i>BOARDSIZE</i>	0.080*	0.069*	0.063*	0.076*	0.078*	0.323*	0.102*	0.070*	-0.048*	1
(11) <i>BOARDIND</i>	0.033*	0.038*	0.042*	0.016*	-0.089*	0.091*	0.267*	0.042*	0.096*	-0.229*
(12) <i>ZSCORE</i>	-0.027*	-0.012	-0.008	-0.009	-0.096*	0.020*	0.013	-0.011	-0.004	-0.059*
(13) <i>LOSS</i>	-0.022*	-0.021*	-0.017*	-0.023*	-0.035*	-0.150*	-0.077*	-0.077*	0.017*	-0.208*
(14) <i>SIZE</i>	0.100*	0.108*	0.101*	0.086*	0.118*	0.331*	0.098*	0.194*	-0.012	0.572*
(15) <i>AGE_LN</i>	0.111*	0.082*	0.082*	0.096*	0.046*	0.244*	0.035*	0.134*	0.005	0.208*
(16) <i>SPEC</i>	-0.005	0.001	-0.001	-0.001	0.023*	0.017*	0.021*	0.020*	-0.021*	0.025*
(17) <i>SALE_VOL</i>	-0.051*	-0.038*	-0.036*	-0.036*	-0.025*	-0.091*	0.001	-0.053*	-0.009	-0.117*
(18) <i>NONMISS_LN</i>	0.058*	0.063*	0.072*	0.034*	-0.002	-0.017*	0.015*	0.173*	0.177*	-0.045*
(19) <i>DAC</i>	0.066*	0.044*	0.040*	0.034*	-0.01	0.103*	0.013	-0.015*	-0.008	0.060*
(20) <i>ROE</i>	0.012	0.015*	0.016*	0.011	0.035*	0.051*	0.037*	0.043*	-0.012	0.068*
(21) <i>INVT_VOL</i>	-0.032*	-0.037*	-0.035*	-0.017*	-0.019*	-0.057*	0.009	-0.033*	-0.011	-0.109*
(22) <i>CFO_SALE</i>	0.043*	0.045*	0.043*	0.01	-0.056*	0.103*	0.043*	0.052*	-0.004	0.102*
(23) <i>MTOB</i>	-0.079*	-0.058*	-0.055*	-0.017*	0.092*	-0.082*	-0.030*	0.001	-0.017*	-0.029*
(24) <i>SLACK</i>	-0.069*	-0.054*	-0.053*	-0.034*	0.054*	-0.122*	-0.002	-0.041*	-0.014*	-0.109*
(25) <i>DIV</i>	0.096*	0.067*	0.063*	0.068*	0.041*	0.304*	0.095*	0.073*	-0.035*	0.330*
(26) <i>TANGIBILITY</i>	0.086*	0.060*	0.057*	0.030*	-0.073*	0.146*	0.011	-0.01	-0.012	0.083*
(27) <i>KSTRUCTURE</i>	0.117*	0.085*	0.077*	0.040*	-0.053*	0.124*	0.032*	0.047*	-0.013	0.081*
(28) <i>LNCOUNT</i>	0.064*	0.079*	0.075*	0.024*	0.059*	0.144*	0.040*	0.125*	0.041*	0.283*
(29) <i>CEOCOMPLX</i>	-0.001	-0.003	-0.005	-0.004	-0.141*	-0.008	-0.023*	0.010	0.007	0.035*
(30) <i>CEOTONE</i>	0.013	0.038*	0.042*	0.025*	-0.266*	0.033*	-0.001	0.122*	0.092*	0.043*
<b>Variables</b>	<b>(11)</b>	<b>(12)</b>	<b>(13)</b>	<b>(14)</b>	<b>(15)</b>	<b>(16)</b>	<b>(17)</b>	<b>(18)</b>	<b>(19)</b>	<b>(20)</b>
(11) <i>BOARDIND</i>	1									
(12) <i>ZSCORE</i>	-0.034*	1								
(13) <i>LOSS</i>	0.072*	-0.173*	1							
(14) <i>SIZE</i>	-0.121*	-0.094*	-0.440*	1						
(15) <i>AGE_LN</i>	0.093*	0.053*	-0.221*	0.263*	1					
(16) <i>SPEC</i>	0.01	-0.011	-0.278*	0.137*	0.042*	1				
(17) <i>SALE_VOL</i>	-0.051*	0.575*	-0.025*	-0.140*	-0.157*	-0.003	1			
(18) <i>NONMISS_LN</i>	0.185*	0.008	0.015*	0.051*	0.192*	-0.073*	-0.078*	1		
(19) <i>DAC</i>	0.011	-0.002	-0.123*	0.053*	0.139*	0.081*	-0.062*	-0.128*	1	
(20) <i>ROE</i>	-0.011	0.042*	-0.388*	0.306*	0.091*	0.438*	-0.001	-0.003	0.008	1
(21) <i>INVT_VOL</i>	-0.041*	0.278*	0.007	-0.187*	-0.038*	0.002	0.405*	-0.033*	0.01	-0.020*
(22) <i>CFO_SALE</i>	-0.076*	0.203*	-0.338*	0.224*	0.158*	0.041*	0.071*	0.047*	0.035*	0.180*
(23) <i>MTOB</i>	-0.013	-0.038*	0.037*	0.164*	-0.126*	0.046*	0.056*	-0.031*	-0.059*	0.060*

(Continued on next page)

**Table 5. Correlation Matrix: CEO Narcissism, Repetition, and Controls (n = 20511)**

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
<i>(Continued)</i>										
(24) SLACK	0.076*	-0.172*	0.179*	-0.100*	-0.175*	0.011	-0.012	0.013	-0.176*	-0.028*
(25) DIV	-0.037*	0.061*	-0.364*	0.450*	0.351*	0.070*	-0.147*	-0.018*	0.158*	0.149*
(26) TANGIBILITY	0.020*	0.008	-0.016*	0.038*	0.161*	0.044*	-0.122*	-0.170*	0.610*	-0.064*
(27) KSTRUCTURE	0.006	-0.103*	0.085*	-0.007	0.068*	-0.057*	-0.107*	-0.057*	0.187*	-0.194*
(28) LNCOUNT	-0.052*	-0.018*	-0.168*	0.474*	0.068*	0.021*	-0.026*	0.203*	-0.025*	0.106*
(29) CEOCOMPLX	0.050*	-0.155*	0.198*	-0.051*	-0.051*	-0.039*	-0.085*	0.010	-0.057*	-0.089*
(30) CEOTONE	0.077*	0.098*	-0.187*	0.206*	0.113*	0.067*	-0.002	0.173*	-0.041*	0.123*
Variables	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
(21) INVT_VOL	1									
(22) CFO_SALE	0.035*	1								
(23) MTOB	-0.050*	-0.192*	1							
(24) SLACK	-0.077*	-0.319*	0.226*	1						
(25) DIV	-0.090*	0.183*	-0.080*	-0.173*	1					
(26) TANGIBILITY	-0.102*	0.126*	-0.175*	-0.294*	0.185*	1				
(27) KSTRUCTURE	-0.077*	0.098*	-0.352*	-0.166*	0.054*	0.308*	1			
(28) LNCOUNT	-0.081*	0.145*	0.042*	-0.064*	0.123*	-0.024*	0.044*	1		
(29) CEOCOMPLX	-0.111*	-0.217*	0.089*	0.146*	-0.093*	-0.059*	-0.009	-0.049*	1	
(30) CEOTONE	-0.017*	0.130*	0.078*	-0.094*	0.061*	-0.080*	-0.103*	0.099*	0.057*	1

Table 5 presents a correlation matrix for a diverse set of variables used in the study, with the sample size being 20,511. The matrix covers a range of dependent, independent, and control variables, providing insights into how these variables interact with each other across the dataset. The matrix includes significance indicators (\*), marking coefficients that are statistically significant at the p-value less than 0.05. *REPETITION* measures (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*) show strong positive correlations with each other, suggesting they capture similar aspects of textual repetition. CEO narcissism (*CEONAR*) shows statistically significant, though relatively weak, correlations with several variables. This indicates effects of CEO personality traits on various company attributes and outcomes. The correlation matrix not only aids in identifying potential relationships for deeper analysis but also helps in assessing multicollinearity concerns, where two or more independent variables in a regression model are highly correlated. All variables involved in the matrix are defined and described in Appendix B, ensuring clarity and completeness in the presentation of the study's methodology and analytical framework.

**Table 6.** Regression Results of CEO Narcissism on Repetition (Similarity Scores)

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	0.0635*** (0.0239)	0.0408* (0.0217)	0.110** (0.0454)	0.292*** (0.0743)
<i>ACSIZE</i>	0.00153** (0.000694)	0.000182 (0.000628)	0.000694 (0.00132)	-0.00246 (0.00215)
<i>ACIND</i>	-0.00816 (0.00499)	-0.0117*** (0.00451)	-0.0249*** (0.00946)	-0.000779 (0.0155)
<i>ACFEXP</i>	0.00113 (0.00265)	-0.00230 (0.00240)	-0.00327 (0.00503)	0.00739 (0.00823)
<i>ACCHAIRFE</i>	-0.00173 (0.00204)	-0.00307* (0.00184)	-0.00790** (0.00387)	-0.0131** (0.00632)
<i>BOARDSIZE</i>	0.000171 (0.000138)	6.72e-05 (0.000125)	0.000257 (0.000262)	0.00188*** (0.000429)
<i>BOARDIND</i>	0.0164*** (0.00603)	0.0206*** (0.00546)	0.0430*** (0.0114)	0.0340* (0.0187)
<i>ZSCORE</i>	0.00194 (0.00144)	0.00319** (0.00131)	0.00676** (0.00274)	0.00809* (0.00448)
<i>LOSS</i>	0.00780*** (0.00197)	0.00818*** (0.00178)	0.0178*** (0.00374)	0.0136** (0.00611)
<i>SIZE</i>	0.00369*** (0.000645)	0.00482*** (0.000584)	0.00900*** (0.00122)	0.00816*** (0.00200)
<i>AGE_LN</i>	0.00835*** (0.00213)	0.00235 (0.00193)	0.00312 (0.00404)	0.0319*** (0.00660)
<i>SPEC</i>	-0.0134 (0.00977)	-0.000820 (0.00885)	-0.00772 (0.0185)	-0.0183 (0.0303)
<i>SALE_VOL</i>	-0.00145 (0.00380)	-0.00348 (0.00344)	-0.00801 (0.00721)	-0.0182 (0.0118)
<i>NONMISS_LN</i>	0.0776*** (0.0206)	0.0731*** (0.0186)	0.138*** (0.0390)	0.103 (0.0638)
<i>DAC</i>	0.0162* (0.00864)	0.0107 (0.00782)	0.0210 (0.0164)	0.0444* (0.0268)
<i>ROE</i>	0.00367** (0.00170)	0.00136 (0.00154)	0.00461 (0.00324)	0.00132 (0.00529)
<i>INVT_VOL</i>	0.000209 (0.000248)	5.98e-05 (0.000224)	0.000186 (0.000470)	-0.000307 (0.000769)
<i>CFO_SALE</i>	-0.000674 (0.000814)	-0.000122 (0.000737)	-0.000249 (0.00155)	-0.00313 (0.00253)
<i>MTOB</i>	-0.00235*** (0.000532)	-0.00236*** (0.000481)	-0.00449*** (0.00101)	8.62e-08 (0.00165)
<i>SLACK</i>	-0.000417** (0.000166)	-0.000262* (0.000150)	-0.000563* (0.000314)	-0.000899* (0.000514)
<i>DIV</i>	0.00393** (0.00178)	-0.000271 (0.00161)	-0.000237 (0.00338)	0.00507 (0.00553)

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**Table 6.** Regression Results of CEO Narcissism on Repetition (Similarity Scores)

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>TANGIBILITY</i>	0.00284 (0.00269)	0.00304 (0.00244)	0.00650 (0.00511)	-0.0131 (0.00835)
<i>KSTRUCTURE</i>	0.0401*** (0.00429)	0.0237*** (0.00388)	0.0444*** (0.00814)	0.0442*** (0.0133)
<i>LNCOUNT</i>	0.000304 (0.00122)	0.00192* (0.00110)	0.00368 (0.00231)	-0.00949** (0.00378)
<i>CEOCOMPLX</i>	0.00214** (0.000973)	0.00105 (0.000881)	0.00209 (0.00185)	0.00219 (0.00302)
<i>CEOTONE</i>	0.00187 (0.00461)	0.00755* (0.00418)	0.0170* (0.00875)	0.0307** (0.0143)
<i>Constant</i>	0.275** (0.122)	-0.369*** (0.111)	-0.646*** (0.232)	-0.383 (0.380)
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	20,511	20,511	20,511	20,511
R-squared	0.062	0.048	0.048	0.038

Table 6 provides the results from regression analyses that explore the effect of CEO narcissism (*CEONAR*) on various measures of repetition in corporate communications, represented by similarity scores (*Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, *Sim\_Simple*). This examination is integral to understanding how CEO characteristics influence corporate narrative strategies. The table includes four models, each corresponding to a different measure of repetition, and showcases the impact of CEO narcissism alongside a series of control variables on these measures. Each regression model controls for year fixed effects (*YEAR\_FE*) and industry fixed effects (*INDUSTRY\_FE*), ensuring that the results are not confounded by temporal or sector-specific factors. CEO narcissism (*CEONAR*) shows a statistically significant positive relationship with all four measures of repetition, indicating that more narcissistic CEOs tend to be associated with more repetitive corporate communications. The significance levels vary across the models, with *Sim\_Cosine*, *Sim\_MinEdit*, and *Sim\_Simple* showing strong significance ( $p < 0.01$  and  $p < 0.05$ ), and *Sim\_Jaccard* showing moderate significance ( $p < 0.1$ ). The analysis includes a comprehensive set of control variables. These variables control for factors that might otherwise influence the relationship between CEO narcissism and communication patterns. The table presents the coefficients with standard errors in parentheses and identifies statistical significance levels: \*\*\* indicates  $p < 0.01$ , \*\* indicates  $p < 0.05$ , and \* indicates  $p < 0.1$ . This notation helps in assessing the robustness of the findings. Further details on variable definitions and the operationalization of constructs can be found in Appendix B, ensuring transparency and facilitating deeper engagement with the study's findings.

**Table 7.** Exploring Alternative CEO Narcissism Measures and Repetition

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR_PRST</i>	0.0334 (0.0229)	0.0104 (0.0207)	0.0277 (0.0435)	0.2560*** (0.0711)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	20,511	20,511	20,511	20,511
R-squared	0.062	0.048	0.048	0.038

  

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR_Q&amp;A</i>	0.0404* (0.0241)	0.0292 (0.0218)	0.0749 (0.0457)	0.1350* (0.0747)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	20,510	20,510	20,510	20,510
R-squared	0.062	0.048	0.048	0.037

  

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>ANNUAL_CEONAR</i>	0.0243 (0.0188)	0.0069 (0.0171)	0.0308 (0.0358)	0.1640*** (0.0585)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	20,511	20,511	20,511	20,511
R-squared	0.062	0.048	0.048	0.038

Table 7 delves into the influence of alternative measures of CEO narcissism on the repetitiveness of corporate disclosures, using different similarity scores as dependent variables. This exploration broadens the understanding of how specific linguistic traits associated with narcissism might affect corporate communication styles. The table is structured into three segments, each testing a different narcissism measure against the repetition scores: *CEONAR\_PRST*, *CEONAR\_Q&A*, and *ANNUAL\_CEONAR*. Each of these measures offers a unique lens through which CEO narcissism is quantified, ranging from the use of first-person singular pronouns in specific sections of earnings calls to an annual aggregation of such pronouns relative to total word count.

- *CEONAR\_PRST*: This measure focuses on the ratio of first-person singular pronouns used by the CEO in the presentation sections of earnings calls over a year. It reflects how the CEO's language in prepared remarks may signal narcissistic traits.

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**Table 7. Exploring Alternative CEO Narcissism Measures and Repetition***(Continued)*

- *CEONAR\_Q&A*: This measure captures the ratio of first-person singular pronouns to total first-person pronouns used by the CEO in the Q&A sections of earnings calls. It provides insights into how the CEO's spontaneous responses during earnings calls might reveal narcissistic tendencies.
- *ANNUAL\_CEONAR*: Representing an aggregate measure, this quantifies the use of first-person singular pronouns across all quarterly earnings calls within a year, normalized against the total word count. It offers a comprehensive view of the CEO's language use throughout the year.

Across the different models, CEO narcissism, as measured by these alternative metrics, shows varying degrees of association with repetition measures. For instance, *CEONAR\_PRST* is significantly related to *Sim\_Simple*, indicating that the more narcissistic a CEO is (as revealed through personal pronoun use in presentations), the more repetitive their communication tends to be. *CEONAR\_Q&A* shows a significant positive relationship with *Sim\_Cosine* and *Sim\_Simple*, suggesting that narcissism reflected in Q&A sessions influences the repetitiveness of corporate disclosures, although the effect sizes and significance levels vary. *ANNUAL\_CEONAR* is significantly related to *Sim\_Simple*, reinforcing the idea that broader measures of narcissistic language use are predictive of more repetitive disclosure practices. Standard errors in parentheses. For definitions and descriptions of these measures, see Appendix B. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 8.** Regression Results of Lagged Instrumental Narcissism Score on Textual Repetition

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>LAG_CEONAR</i>	0.0103*** (0.000961)	0.0100*** (0.000874)	0.0225*** (0.00183)	0.0225*** (0.00301)
<i>ACSIZE</i>	0.00153** (0.000728)	8.12e-05 (0.000662)	0.000503 (0.00139)	-0.00354 (0.00228)
<i>ACIND</i>	-0.0116** (0.00539)	-0.0139*** (0.00490)	-0.0292*** (0.0103)	-0.00235 (0.0169)
<i>ACFEXP</i>	-0.000951 (0.00277)	-0.00492* (0.00252)	-0.00923* (0.00528)	-0.00138 (0.00867)
<i>ACCHAIRFE</i>	-0.00223 (0.00220)	-0.00342* (0.00200)	-0.00863** (0.00419)	-0.0146** (0.00689)
<i>BOARDSIZE</i>	9.39e-05 (0.000145)	-5.30e-05 (0.000132)	-1.08e-05 (0.000276)	0.00139*** (0.000453)
<i>BOARDIND</i>	0.0232*** (0.00650)	0.0237*** (0.00592)	0.0495*** (0.0124)	0.0468** (0.0203)
<i>ZSCORE</i>	0.000828 (0.00154)	0.00212 (0.00141)	0.00441 (0.00294)	0.00313 (0.00483)
<i>LOSS</i>	0.00810*** (0.00212)	0.00788*** (0.00193)	0.0168*** (0.00404)	0.0158** (0.00664)
<i>SIZE</i>	0.00247*** (0.000695)	0.00380*** (0.000632)	0.00674*** (0.00132)	0.00759*** (0.00218)
<i>AGE_LN</i>	0.00166 (0.00265)	-0.00353 (0.00241)	-0.0105** (0.00506)	0.0197** (0.00830)
<i>SPEC</i>	-0.00464 (0.0108)	0.00309 (0.00986)	0.00183 (0.0207)	-0.000726 (0.0339)
<i>SALE_VOL</i>	-0.00184 (0.00417)	-0.00184 (0.00380)	-0.00476 (0.00795)	-0.0143 (0.0131)
<i>NONMISS_LN</i>	0.0657*** (0.0218)	0.0612*** (0.0198)	0.111*** (0.0415)	0.0984 (0.0681)
<i>DAC</i>	0.0154 (0.00994)	0.00833 (0.00905)	0.0165 (0.0189)	0.0455 (0.0311)
<i>ROE</i>	0.00285 (0.00182)	0.000268 (0.00165)	0.00223 (0.00346)	-0.00382 (0.00568)
<i>INVT_VOL</i>	5.11e-05 (0.000281)	7.58e-06 (0.000255)	9.74e-05 (0.000535)	-0.000352 (0.000878)
<i>CFO_SALE</i>	-0.000564 (0.000944)	0.000372 (0.000858)	0.000544 (0.00180)	0.00134 (0.00295)
<i>MTOB</i>	-0.00212*** (0.000581)	-0.00255*** (0.000529)	-0.00480*** (0.00111)	-0.000972 (0.00182)
<i>SLACK</i>	-0.000494** (0.000194)	-0.000158 (0.000176)	-0.000405 (0.000369)	-0.000673 (0.000606)
<i>DIV</i>	0.00271 (0.00186)	-0.00102 (0.00170)	-0.00206 (0.00355)	0.00264 (0.00583)

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**Table 8.** Regression Results of Lagged Instrumental Narcissism Score on Textual Repetition

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>TANGIBILITY</i>	0.00277 (0.00293)	0.00325 (0.00266)	0.00671 (0.00557)	-0.0158* (0.00915)
<i>KSTRUCTURE</i>	0.0381*** (0.00461)	0.0217*** (0.00419)	0.0407*** (0.00878)	0.0352** (0.0144)
<i>LNCOUNT</i>	-0.000709 (0.00136)	0.000835 (0.00124)	0.00114 (0.00260)	-0.00955** (0.00427)
<i>CEOCOMPLX</i>	0.00211** (0.00104)	0.00112 (0.000942)	0.00222 (0.00197)	0.00176 (0.00324)
<i>CEOTONE</i>	0.00516 (0.00482)	0.0109** (0.00438)	0.0234** (0.00918)	0.0282* (0.0151)
<i>Constant</i>	0.399*** (0.130)	-0.251** (0.118)	-0.381 (0.248)	-0.277 (0.407)
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	17,698	17,698	17,698	17,698
R-squared	0.065	0.052	0.052	0.043

Table 8 presents regression results exploring the influence of a lagged instrumental measure of CEO narcissism (*LAG\_CEONAR*) on textual repetition within corporate disclosures, across four different repetition measures. This analysis is crucial for understanding the enduring impact of CEO personality traits, specifically narcissism, on corporate communication practices over time. The inclusion of a lagged measure allows for the examination of how previous narcissism levels affect subsequent corporate disclosure patterns, providing insights into the temporal dynamics of CEO influence. Lagged instrumental narcissism score (*CEONAR*) shows a consistently significant positive relationship across all repetition measures, indicating that higher levels of CEO narcissism in the past are associated with greater textual repetition in corporate disclosures. The significance levels are strong ( $p < 0.01$ ), suggesting a robust link between CEO narcissism and repetition. Standard errors in parentheses. Detailed explanations of variables and their construction are provided in Appendix B. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 9.** Addressing Selection Bias Using Propensity Score Matching (PSM)

**Panel A.** Balance Check after PSM [Treatment (HIGHCEONAR = 1) Vs. Control (LOWCEONAR = 0)]

	Mean			Statistics		
	(1) Treatment	(2) Control	(3) %bias	(5) t-test	(6) P-value	(7) V(T)/V(C)
ACSIZE	4.110	4.086	2.1	1.53	0.127	0.97
ACIND	0.887	0.886	0.8	0.54	0.587	0.95*
ACFExp	0.494	0.500	-2.3	-1.61	0.107	1.01
ACCHAIRFE	0.837	0.835	0.6	0.4	0.688	.
BOARDSIZE	12.128	12.192	-0.9	-0.67	0.5	1.08*
BOARDIND	0.597	0.597	0.5	0.34	0.731	0.91*
ZSCORE	1.066	1.045	2.7	1.93	0.053	1.05*
LOSS	0.298	0.307	-2.1	-1.48	0.14	.
SIZE	6.964	6.971	-0.4	-0.27	0.789	1.12*
AGE_LN	2.804	2.805	-0.5	-0.34	0.735	0.96*
SPEC	-0.019	-0.019	1	0.64	0.519	0.85*
SALE_VOL	0.248	0.242	2.2	1.58	0.115	1.33*
NONMISS_LN	6.025	6.024	1.5	1.05	0.295	0.98
DAC	0.270	0.269	0.7	0.5	0.614	1.12*
ROE	-0.065	-0.066	0.1	0.08	0.939	1.16*
INVT_VOL	2.697	2.649	1.3	0.94	0.349	1.03
CFO_SALE	-0.087	-0.097	0.9	0.67	0.506	1.03
MTOB	2.112	2.107	0.3	0.22	0.828	0.98
SLACK	1.652	1.726	-1.5	-1.01	0.314	0.88*
DIV	0.400	0.384	3.3	2.36	0.018	.
TANGIBILITY	0.491	0.490	0.1	0.08	0.933	0.90*
KSTRUCTURE	0.174	0.175	-0.6	-0.42	0.671	0.98
LNCOUNT	10.253	10.253	0.1	0.05	0.963	0.97
CEOCOMPLX	8.798	8.815	-2.3	-1.6	0.11	0.92*
CEOTONE	0.236	0.236	0	0.03	0.973	1.04

Overall Balance	Ps R2	0.001	MedBias	0.9
	LR chi2	24.08	B	6.9
	p>chi2	0.515	R	1.03
	MeanBias	1.2	%Var	59

**Panel B.** Post-matching Regression Results

Variable	(1)	(2)	(3)	(4)
	Sim_Cosine	Sim_Jaccard	Sim_MinEdit	Sim_Simple
CEONAR	0.0927*** (0.0334)	0.0410 (0.0300)	0.123** (0.0630)	0.354*** (0.102)
ACSIZE	0.00195** (0.000921)	0.000982 (0.000832)	0.00229 (0.00174)	-0.000565 (0.00285)

(Continued on next page)

**Table 9. Addressing Selection Bias Using Propensity Score Matching (PSM)****Panel B. Post-matching Regression Results**

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>ACIND</i>	-0.0139** (0.00707)	-0.0132** (0.00595)	-0.0284** (0.0127)	-0.0279 (0.0208)
<i>ACFEXP</i>	-0.00362 (0.00359)	-0.00531* (0.00305)	-0.0105 (0.00649)	0.0100 (0.0107)
<i>ACCHAIRFE</i>	-0.00516* (0.00305)	-0.00422* (0.00243)	-0.0104** (0.00518)	-0.0212** (0.00860)
<i>BOARDSIZE</i>	2.11e-05 (0.000181)	-0.000118 (0.000168)	-0.000155 (0.000353)	0.00191*** (0.000592)
<i>BOARDIND</i>	0.0193** (0.00876)	0.0214*** (0.00750)	0.0425*** (0.0159)	0.0453* (0.0263)
<i>ZSCORE</i>	0.00149 (0.00209)	0.00182 (0.00168)	0.00380 (0.00362)	0.00648 (0.00599)
<i>LOSS</i>	0.00606** (0.00281)	0.00512** (0.00234)	0.0117** (0.00498)	0.00137 (0.00788)
<i>SIZE</i>	0.00313*** (0.000901)	0.00426*** (0.000797)	0.00784*** (0.00168)	0.00274 (0.00272)
<i>AGE_LN</i>	0.00791*** (0.00291)	0.00228 (0.00258)	0.00228 (0.00542)	0.0270*** (0.00876)
<i>SPEC</i>	-0.0131 (0.0161)	-0.0110 (0.0117)	-0.0294 (0.0258)	-0.0584 (0.0411)
<i>SALE_VOL</i>	-0.00130 (0.00554)	-0.00415 (0.00434)	-0.00989 (0.00921)	-0.0227 (0.0146)
<i>NONMISS_LN</i>	0.0767*** (0.0284)	0.0758*** (0.0243)	0.144*** (0.0520)	0.143* (0.0848)
<i>DAC</i>	0.00489 (0.0115)	0.00669 (0.00938)	0.0107 (0.0201)	0.0326 (0.0342)
<i>ROE</i>	0.00279 (0.00206)	0.00199 (0.00195)	0.00577 (0.00411)	0.00153 (0.00646)
<i>INVT_VOL</i>	0.000581* (0.000327)	0.000438 (0.000284)	0.000967 (0.000598)	-0.000491 (0.000971)
<i>CFO_SALE</i>	-0.00177* (0.00101)	-2.72e-05 (0.000925)	-0.000221 (0.00196)	-0.00154 (0.00332)
<i>MTOB</i>	-0.00210*** (0.000774)	-0.00235*** (0.000613)	-0.00452*** (0.00132)	0.000780 (0.00208)
<i>SLACK</i>	-0.000589*** (0.000209)	-0.000303* (0.000168)	-0.000643* (0.000365)	-0.000484 (0.000675)
<i>DIV</i>	0.00609** (0.00255)	0.000269 (0.00213)	0.000954 (0.00454)	0.0123 (0.00750)
<i>TANGIBILITY</i>	0.00565 (0.00367)	0.00617* (0.00319)	0.0135** (0.00671)	-0.00559 (0.0111)

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**Table 9.** Addressing Selection Bias Using Propensity Score Matching (PSM)

<b>Panel B. Post-matching Regression Results</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>KSTRUCTURE</i>	0.0389*** (0.00608)	0.0242*** (0.00535)	0.0462*** (0.0113)	0.0623*** (0.0188)
<i>LNCOUNT</i>	0.00127 (0.00177)	0.00203 (0.00147)	0.00371 (0.00311)	-0.00520 (0.00522)
<i>CEOCOMPLX</i>	0.00111 (0.00140)	0.00120 (0.00119)	0.00243 (0.00252)	0.00607 (0.00402)
<i>CEOTONE</i>	0.00867 (0.00663)	0.0107* (0.00559)	0.0262** (0.0119)	0.0440** (0.0193)
<i>Constant</i>	0.286* (0.168)	-0.367** (0.144)	-0.638** (0.309)	-0.606 (0.504)
<i>YEAR_FE</i>	YES	YES	YES	YES
<i>INDUSTRY_FE</i>	YES	YES	YES	YES
Observations	15,456	15,456	15,456	15,456
R-squared	0.073	0.055	0.055	0.042

Table 9 presents a sophisticated analysis that employs Propensity Score Matching (PSM) to address selection bias when investigating the impact of CEO narcissism on textual repetition in corporate disclosures. The analysis is divided into two panels: Panel A, which assesses the balance between treatment and control groups after matching, and Panel B, which presents regression results post-PSM. In **Panel A** the treatment group consists of companies led by highly narcissistic CEOs (*HIGHCEONAR* = 1), while the control group comprises those with less narcissistic CEOs (*LOWCEONAR* = 0). Various company characteristics and governance indicators are analyzed to ensure that the matching process has created comparable treatment and control groups. Metrics include the audit committee's size and expertise (*ACSIZE*, *ACIND*, *ACFExp*, *ACCHAIRFE*), board characteristics (*BOARDSIZE*, *BOARDIND*), and financial health indicators (*ZSCORE*, *LOSS*), among others. The balance between groups is assessed through %bias, t-tests, p-values, and the variance ratio (V(T)/V(C)). A successful matching process is indicated by low %bias across variables and non-significant p-values in the t-tests, suggesting no systematic differences between the matched groups. The balance check shows generally good balance across most variables, with most p-values not indicating significant differences post-matching. This suggests that the PSM method has effectively controlled for selection bias, creating comparable treatment and control groups. Following the establishment of balanced groups, in **Panel B**, regression analysis investigates the relationship between CEO narcissism (*CEONAR*) and different measures of textual repetition. The significance levels, indicated by \*\*\* p<0.01, \*\* p<0.05, \* p<0.1, confirm the robustness of the relationship between CEO narcissism and textual repetition across different models. Further details on variables and their construction are provided in Appendix B, ensuring comprehensive understanding and transparency of the analysis.

**Table 10. Addressing Selection Bias Using Entropy Balancing Approach**

**Panel A. Pre Vs. Post-balancing Entropy Balanced Approach**  
 [Treatment (HIGHCEONAR = 1) Vs. Control (LOWCEONAR = 0)]

	Pre-balancing Entropy Balanced			Post-balancing Entropy Balanced		
	(1)	(2)	(3)	(5)	(6)	(7)
	Treatment	Control	Diff [1-2]	Treatment	Control	Diff [5-6]
	Mean	Mean	Diff [1-2]	Mean	Mean	Diff [5-6]
ACSIZE	4.111	4.126	-0.015	4.111	4.111	0.000
ACIND	0.887	0.892	-0.005	0.887	0.887	0.000
ACFExp	0.494	0.483	0.012	0.494	0.494	0.000
ACCHAIRFE	0.838	0.862	-0.024	0.838	0.838	0.000
BOARDSIZE	12.130	12.000	0.130	12.130	12.130	0.000
BOARDIND	0.597	0.610	-0.013	0.597	0.597	0.000
ZSCORE	1.067	1.057	0.010	1.067	1.067	0.000
LOSS	0.297	0.307	-0.010	0.297	0.297	0.000
SIZE	6.965	6.948	0.017	6.965	6.965	0.000
AGE_LN	2.804	2.809	-0.005	2.804	2.804	0.000
SPEC	-0.019	-0.018	-0.001	-0.019	-0.019	0.000
SALE_VOL	0.248	0.238	0.010	0.248	0.248	0.000
NONMISS_LN	6.025	6.029	-0.004	6.025	6.025	0.000
DAC	0.270	0.273	-0.003	0.270	0.270	0.000
ROE	-0.065	-0.062	-0.003	-0.065	-0.065	0.000
INVT_VOL	2.694	2.540	0.154	2.694	2.694	0.000
CFO_SALE	-0.087	-0.093	0.006	-0.087	-0.087	0.000
MTOB	2.111	2.099	0.012	2.111	2.111	0.000
SLACK	1.650	1.548	0.102	1.650	1.650	0.000
DIV	0.401	0.398	0.003	0.401	0.401	0.000
TANGIBILITY	0.492	0.502	-0.010	0.492	0.492	0.000
KSTRUCTURE	0.174	0.181	-0.007	0.174	0.174	0.000
LNCOUNT	10.250	10.240	0.010	10.250	10.250	0.000
CEOCOMPLX	8.797	8.783	0.014	8.797	8.797	0.000
CEOTONE	0.236	0.244	-0.007	0.236	0.236	0.000

**Panel B. Post Entropy Balanced Regression Results**

Variable	(1)	(2)	(3)	(4)
	Sim_Cosine	Sim_Jaccard	Sim_MinEdit	Sim_Simple
CEONAR	0.0681*** (0.0233)	0.0450** (0.0209)	0.115*** (0.0439)	0.336*** (0.0718)
ACSIZE	0.00244*** (0.000692)	0.000635 (0.000623)	0.00158 (0.00131)	-0.000824 (0.00214)
ACIND	-0.00578 (0.00489)	-0.0116*** (0.00439)	-0.0251*** (0.00922)	-0.00490 (0.0151)
ACFEXP	0.00397 (0.00261)	0.000171 (0.00235)	0.00305 (0.00492)	0.0149* (0.00805)
ACCHAIRFE	0.00203 (0.00196)	0.000308 (0.00176)	-0.000365 (0.00370)	-0.00992 (0.00605)

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**Table 10. Addressing Selection Bias Using Entropy Balancing Approach**

<b>Panel B. Post Entropy Balanced Regression Results</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>BOARDSIZE</i>	0.000156 (0.000134)	2.71e-05 (0.000121)	9.61e-05 (0.000254)	0.00161*** (0.000415)
<i>BOARDIND</i>	0.0238*** (0.00577)	0.0295*** (0.00519)	0.0635*** (0.0109)	0.0525*** (0.0178)
<i>ZSCORE</i>	-0.00232* (0.00119)	0.000853 (0.00107)	0.00225 (0.00224)	0.00444 (0.00366)
<i>LOSS</i>	0.00805*** (0.00197)	0.00851*** (0.00177)	0.0191*** (0.00371)	0.0172*** (0.00607)
<i>SIZE</i>	0.00332*** (0.000592)	0.00466*** (0.000533)	0.00874*** (0.00112)	0.00982*** (0.00183)
<i>AGE_LN</i>	0.0113*** (0.00203)	0.00553*** (0.00182)	0.0115*** (0.00383)	0.0438*** (0.00626)
<i>SPEC</i>	-0.0131 (0.00965)	-0.00134 (0.00868)	-0.00717 (0.0182)	-0.0200 (0.0298)
<i>SALE_VOL</i>	0.00369 (0.00353)	0.000530 (0.00318)	0.000775 (0.00667)	-0.0143 (0.0109)
<i>NONMISS_LN</i>	0.0853*** (0.0137)	0.0703*** (0.0124)	0.176*** (0.0259)	0.117*** (0.0424)
<i>DAC</i>	0.0250*** (0.00892)	0.0165** (0.00802)	0.0320* (0.0168)	0.0632** (0.0275)
<i>ROE</i>	0.00350** (0.00168)	0.00123 (0.00152)	0.00389 (0.00318)	0.000193 (0.00520)
<i>INVT_VOL</i>	-8.07e-05 (0.000208)	-0.000331* (0.000187)	-0.000663* (0.000393)	4.40e-05 (0.000642)
<i>CFO_SALE</i>	-0.000170 (0.000774)	0.000377 (0.000696)	0.000777 (0.00146)	-0.00488** (0.00239)
<i>MTOB</i>	-0.00290*** (0.000516)	-0.00282*** (0.000464)	-0.00543*** (0.000973)	-0.00218 (0.00159)
<i>SLACK</i>	-0.000480*** (0.000157)	-0.000317** (0.000141)	-0.000672** (0.000296)	-0.000876* (0.000484)
<i>DIV</i>	0.00624*** (0.00174)	0.000678 (0.00156)	0.00153 (0.00328)	0.00620 (0.00536)
<i>TANGIBILITY</i>	0.00687*** (0.00234)	0.00451** (0.00211)	0.0106** (0.00442)	-0.00296 (0.00723)
<i>KSTRUCTURE</i>	0.0392*** (0.00402)	0.0252*** (0.00361)	0.0475*** (0.00758)	0.0464*** (0.0124)
<i>LNCOUNT</i>	0.00154 (0.00113)	0.00282*** (0.00102)	0.00545** (0.00214)	-0.00990*** (0.00349)
<i>CEOCOMPLX</i>	0.00167* (0.000954)	0.000769 (0.000858)	0.000992 (0.00180)	0.000251 (0.00294)
<i>CEOTONE</i>	5.17e-05 (0.00438)	0.00937** (0.00394)	0.0250*** (0.00826)	0.0291** (0.0135)

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**Table 10.** Addressing Selection Bias Using Entropy Balancing Approach

<b>Panel B. Post Entropy Balanced Regression Results</b>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>Constant</i>	0.225*** (0.0805)	-0.330*** (0.0724)	-0.815*** (0.152)	-0.589** (0.248)
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	20,511	20,511	20,511	20,511
R-squared	0.041	0.032	0.031	0.019

Table 10 illustrates the application of the entropy balancing approach to mitigate selection bias in examining the effects of CEO narcissism on textual repetition in corporate disclosures. The analysis is segmented into two panels, with **Panel A** focusing on the comparison of variable means before and after entropy balancing between treatment (highly narcissistic CEOs) and control (less narcissistic CEOs) groups. **Panel B** delves into the regression results post-entropy balancing, showcasing the impact of CEO narcissism on various repetition measures.

In **Panel A**, Pre-balancing Entropy Balanced compares the mean values of various corporate and governance indicators between the treatment and control groups before applying the entropy balancing. Differences in means are noted, indicating initial imbalances. Following entropy balancing, Post-balancing Entropy Balanced section reveals that mean differences between the treatment and control groups across all listed variables are reduced to zero, demonstrating successful balancing. This zero difference signifies that the entropy balancing technique has effectively adjusted the sample to control for initial imbalances, making the treatment and control groups comparable for further analysis. **Panel B** presents the outcomes of regression analyses exploring the relationship between CEO narcissism (*CEONAR*) and textual repetition, quantified through measures like *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*, after applying entropy balancing. Standard errors in parentheses. Significance levels are denoted by \*\*\*, \*\*, and \*, for  $p < 0.01$ ,  $p < 0.05$ , and  $p < 0.1$ , respectively. Further details about the entropy balancing approach and variable definitions are available in Appendix B, providing a comprehensive framework for interpreting the study's findings.

**Table 11.** Instrumental variables analysis (2SLS) using CEO tenure and age

<b>Panel A.</b> Using CEO_TEN as instrument				
<i>First Stage</i>				
Variable	Coef.	Std. Err.	t	p-value
CEO_TEN	0.0003***	0.0000	7.9900	0.0000
ACSIZE	-0.0003	0.0002	-1.4600	0.1450
ACIND	0.0054**	0.0019	2.9300	0.0030
ACFEXP	-0.0058***	0.0009	-6.3300	0.0000
ACCHAIRFE	0.0001	0.0007	0.1600	0.8750
BOARDSIZE	0.0000	0.0000	-0.6200	0.5330
BOARDIND	-0.0150***	0.0022	-6.9300	0.0000
ZSCORE	-0.0034***	0.0004	-7.6000	0.0000
LOSS	0.0002	0.0008	0.3000	0.7660
SIZE	0.0035***	0.0002	14.7400	0.0000
AGE_LN	0.0044***	0.0008	5.3900	0.0000
SPEC	0.0114**	0.0047	2.4500	0.0140
SALE_VOL	0.0060***	0.0014	4.3700	0.0000
NONMISS_LN	0.0331***	0.0048	6.8300	0.0000
DAC	0.0108**	0.0045	2.3900	0.0170
ROE	-0.0016*	0.0009	-1.8600	0.0630
INVT_VOL	-0.0002*	0.0001	-1.9500	0.0510
CFO_SALE	-0.0039***	0.0006	-6.5100	0.0000
MTOB	0.0009***	0.0002	4.4100	0.0000
SLACK	0.0000	0.0001	-0.2700	0.7880
DIV	0.0005	0.0006	0.8000	0.4260
TANGIBILITY	-0.0087***	0.0010	-8.7200	0.0000
KSTRUCTURE	-0.0081***	0.0016	-4.9500	0.0000
LNCOUNT	0.0003	0.0004	0.6900	0.4890
CEO_COMPLX	-0.0068***	0.0004	-19.1800	0.0000
CEO_TONE	-0.0587***	0.0016	-37.1700	0.0000
Constant	0.0418	0.0284	1.4700	0.1410
Year & Industry FE		YES		
Observations		13,368		
R-squared		0.1805		
Adj R-squared		0.1789		
F value (Sig)		113.050 (0.000)		

<i>Second Stage</i>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
CEO_NAR	1.6782*** (0.421)	1.0098*** (0.388)	2.0786** (0.813)	0.1605* (1.339)
ACSIZE	0.0007 (0.001)	-0.0002 (0.001)	0.0000 (0.002)	-0.0041 (0.003)

(Continued on next page)

**Table 11.** Instrumental variables analysis (2SLS) using CEO tenure and age

Variable	Second Stage			
	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>ACIND</i>	-0.0093 (0.007)	-0.0108* (0.006)	-0.0241* (0.013)	-0.0109 (0.021)
<i>ACFEXP</i>	-0.0076* (0.004)	-0.0111*** (0.004)	-0.0212*** (0.008)	-0.0058 (0.013)
<i>ACCHAIRFE</i>	-0.0038 (0.002)	-0.0037* (0.002)	-0.0096** (0.005)	-0.0129* (0.008)
<i>BOARDSIZE</i>	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	0.0007 (0.000)
<i>BOARDIND</i>	-0.0092 (0.010)	-0.0019 (0.009)	-0.0022 (0.019)	0.0578* (0.032)
<i>ZSCORE</i>	-0.0064*** (0.002)	-0.0015 (0.002)	-0.0027 (0.005)	0.0054 (0.008)
<i>LOSS</i>	0.0067** (0.003)	0.0054** (0.003)	0.0113** (0.005)	0.0070 (0.009)
<i>SIZE</i>	0.0090*** (0.002)	0.0082*** (0.002)	0.0160*** (0.003)	0.0163*** (0.005)
<i>AGE_LN</i>	0.0179*** (0.004)	0.0079** (0.003)	0.0156** (0.007)	0.0291** (0.011)
<i>SPEC</i>	0.0065 (0.016)	0.0002 (0.015)	-0.0082 (0.031)	-0.0200 (0.052)
<i>SALE_VOL</i>	-0.0005 (0.006)	0.0014 (0.005)	0.0018 (0.011)	-0.0261 (0.018)
<i>NONMISS_LN</i>	0.1470*** (0.029)	0.1095*** (0.026)	0.2113*** (0.055)	0.2795*** (0.091)
<i>DAC</i>	0.0340** (0.016)	0.0278* (0.015)	0.0544* (0.031)	0.0510 (0.051)
<i>ROE</i>	0.0032 (0.003)	0.0015 (0.003)	0.0045 (0.006)	0.0050 (0.009)
<i>INVT_VOL</i>	0.0000 (0.000)	-0.0001 (0.000)	-0.0003 (0.001)	0.0001 (0.001)
<i>CFO_SALE</i>	-0.0067** (0.003)	-0.0037 (0.002)	-0.0085* (0.005)	0.0006 (0.008)
<i>MTOB</i>	-0.0004 (0.001)	-0.0015* (0.001)	-0.0026 (0.002)	-0.0023 (0.003)
<i>SLACK</i>	-0.0009*** (0.000)	-0.0006** (0.000)	-0.0012** (0.001)	-0.0011 (0.001)
<i>DIV</i>	0.0032 (0.002)	-0.0009 (0.002)	-0.0022 (0.004)	0.0011 (0.007)
<i>TANGIBILITY</i>	-0.0095* (0.005)	-0.0084* (0.005)	-0.0162 (0.010)	-0.0144 (0.017)
<i>KSTRUCTURE</i>	0.0293*** (0.007)	0.0245*** (0.006)	0.0465*** (0.014)	0.0778*** (0.022)

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**Table 11.** Instrumental variables analysis (2SLS) using CEO tenure and age

<i>Second Stage</i>				
Variable	(1)	(2)	(3)	(4)
	<i>Sim_Cosine</i>	<i>Sim_Jaccard</i>	<i>Sim_MinEdit</i>	<i>Sim_Simple</i>
<i>(Continued)</i>				
<i>LNCOUNT</i>	0.0015 (0.002)	0.0027* (0.001)	0.0049 (0.003)	-0.0016 (0.005)
<i>CEO_COMPLX</i>	-0.0131*** (0.003)	-0.0091*** (0.003)	-0.0189*** (0.006)	-0.0107 (0.010)
<i>CEO_TONE</i>	-0.0927*** (0.026)	-0.0545** (0.024)	-0.1099** (0.050)	0.0051 (0.082)
<i>Constant</i>	0.3086** (0.154)	-0.3196** (0.142)	-0.5360* (0.298)	-1.2308** (0.491)
Year & Industry FE	YES	YES	YES	YES
Observations	13,368	13,368	13,368	13,368
R-squared	0.0700	0.0516	0.0514	0.0420
Adj R-squared	0.0626	0.0440	0.0438	0.0343
F value (Sig)	9.418 (0.000)	6.803 (0.000)	6.778 (0.000)	5.482 (0.000)

**Panel B.** Using CEO\_AGE as instrument

<i>First Stage</i>				
Variable	Coef.	Std. Err.	t	p-value
<i>CEO_AGE</i>	0.0002***	0.0000	4.5400	0.0000
<i>ACSIZE</i>	-0.0005**	0.0002	-2.2000	0.0280
<i>ACIND</i>	0.0055***	0.0019	2.9600	0.0030
<i>ACFEXP</i>	-0.0064***	0.0009	-7.0200	0.0000
<i>ACCHAIRFE</i>	0.0000	0.0007	0.0200	0.9870
<i>BOARDSIZE</i>	0.0000	0.0000	-0.6700	0.5050
<i>BOARDIND</i>	-0.0160***	0.0022	-7.3400	0.0000
<i>ZSCORE</i>	-0.0037***	0.0005	-8.1200	0.0000
<i>LOSS</i>	0.0000	0.0008	0.0600	0.9540
<i>SIZE</i>	0.0034***	0.0002	14.4900	0.0000
<i>AGE_LN</i>	0.0045***	0.0008	5.5900	0.0000
<i>SPEC</i>	0.0125***	0.0047	2.6400	0.0080
<i>SALE_VOL</i>	0.0071**	0.0014	5.1300	0.0000
<i>NONMISS_LN</i>	0.0335***	0.0049	6.8900	0.0000
<i>DAC</i>	0.0080***	0.0045	1.7700	0.0770
<i>ROE</i>	-0.0016*	0.0009	-1.8700	0.0610
<i>INVT_VOL</i>	-0.0002***	0.0001	-2.6400	0.0080
<i>CFO_SALE</i>	-0.0038***	0.0006	-6.3000	0.0000
<i>MTOB</i>	0.0009***	0.0002	4.4200	0.0000
<i>SLACK</i>	0.0000	0.0001	-0.3800	0.7080
<i>DIV</i>	0.0001	0.0006	0.2100	0.8350
<i>TANGIBILITY</i>	-0.0088***	0.0010	-8.8200	0.0000

*(Continued on next page)*

**Table 11.** Instrumental variables analysis (2SLS) using CEO tenure and age

**Panel B.** Using CEO\_AGE as instrument

<i>First Stage</i>				
Variable	Coef.	Std. Err.	t	p-value
<i>(Continued)</i>				
KSTRUCTURE	-0.0090***	0.0016	-5.4600	0.0000
LNCOUNT	0.0001	0.0004	0.3100	0.7540
CEO_COMPLX	-0.0068***	0.0004	-19.1700	0.0000
CEO_TONE	-0.0585***	0.0016	-36.9600	0.0000
Constant	0.0368	0.0286	1.2800	0.1990
Year & Industry FE			YES	
Observations			13,343	
R-squared			0.1789	
Adj R-squared			0.1773	
F value (Sig)			111.620 (0.000)	
<i>Second Stage</i>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
CEO_NAR	0.8934*** (0.738)	0.0644** (0.680)	0.4272** (1.424)	1.0597* (2.342)
ACSIZE	0.0010 (0.001)	0.0003 (0.001)	0.0009 (0.002)	-0.0032 (0.003)
ACIND	-0.0123 (0.008)	-0.0152** (0.007)	-0.0314** (0.014)	-0.0170 (0.024)
ACFEXP	-0.0025 (0.006)	-0.0048 (0.005)	-0.0101 (0.011)	0.0019 (0.018)
ACCHAIRFE	-0.0036 (0.002)	-0.0036 (0.002)	-0.0094** (0.005)	-0.0117 (0.008)
BOARDSIZE	-0.0002 (0.000)	-0.0001 (0.000)	-0.0001 (0.000)	0.0007 (0.001)
BOARDIND	0.0027 (0.014)	0.0161 (0.013)	0.0294 (0.028)	0.0809* (0.046)
ZSCORE	-0.0028 (0.003)	0.0026 (0.003)	0.0048 (0.006)	0.0124 (0.010)
LOSS	0.0066** (0.003)	0.0049* (0.003)	0.0103* (0.005)	0.0070 (0.009)
SIZE	0.0065** (0.003)	0.0049* (0.003)	0.0101* (0.005)	0.0119 (0.009)
AGE_LN	0.0152*** (0.005)	0.0040 (0.004)	0.0092 (0.009)	0.0261* (0.015)
SPEC	-0.0017 (0.018)	-0.0121 (0.017)	-0.0287 (0.035)	-0.0494 (0.058)
	(0.007)	(0.007)	(0.014)	(0.023)

*(Continued on next page)*

**Table 11.** Instrumental variables analysis (2SLS) using CEO tenure and age

Variable	Second Stage			
	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>(Continued)</i>				
<i>NONMISS_LN</i>	0.1311*** (0.035)	0.0875*** (0.032)	0.1759*** (0.067)	0.2466** (0.110)
<i>DAC</i>	0.0255 (0.017)	0.0173 (0.015)	0.0367 (0.032)	0.0399 (0.052)
<i>ROE</i>	0.0035 (0.003)	0.0026 (0.003)	0.0060 (0.006)	0.0063 (0.010)
<i>INVT_VOL</i>	0.0000 (0.000)	-0.0000 (0.000)	-0.0001 (0.001)	-0.0002 (0.001)
<i>CFO_SALE</i>	-0.0042 (0.003)	-0.0009 (0.003)	-0.0038 (0.007)	0.0035 (0.011)
<i>MTOB</i>	-0.0013 (0.001)	-0.0024*** (0.001)	-0.0042** (0.002)	-0.0035 (0.003)
<i>SLACK</i>	-0.0008** (0.000)	-0.0005* (0.000)	-0.0010 (0.001)	-0.0008 (0.001)
<i>DIV</i>	0.0031 (0.002)	-0.0009 (0.002)	-0.0021 (0.004)	0.0007 (0.007)
<i>TANGIBILITY</i>	-0.0027 (0.007)	0.0006 (0.007)	-0.0005 (0.014)	-0.0027 (0.024)
<i>KSTRUCTURE</i>	0.0357*** (0.009)	0.0318*** (0.008)	0.0590*** (0.017)	0.0836*** (0.028)
<i>LNCOUNT</i>	0.0013 (0.002)	0.0030** (0.001)	0.0057* (0.003)	-0.0002 (0.005)
<i>CEO_COMPLX</i>	-0.0075 (0.005)	-0.0025 (0.005)	-0.0075 (0.010)	-0.0020 (0.017)
<i>CEO_TONE</i>	-0.0452 (0.044)	0.0012 (0.041)	-0.0125 (0.085)	0.0768 (0.140)
<i>Constant</i>	0.2103 (0.158)	-0.4162*** (0.146)	-0.7203** (0.305)	-1.3230*** (0.502)
Year & Industry FE	YES	YES	YES	YES
Observations	13,343	13,343	13,343	13,343
R-squared	0.0701	0.0508	0.0507	0.0427
Adj R-squared	0.0626	0.0432	0.0431	0.0350
F value (Sig)	9.406 (0.000)	6.681 (0.000)	6.673 (0.000)	5.567 (0.000)

Table 11 presents results from two-stage least squares (2SLS) regressions on the effect of CEO narcissism (*CEO\_NAR*) on four measures of narrative similarity in the MD&A sections: *Sim\_Cosine* (Column 1), *Sim\_Jaccard* (Column 2), *Sim\_MinEdit* (Column 3), and *Sim\_Simple* (Column 4). We instrument *CEO\_NAR* using two different instruments, namely CEO tenure (*CEO\_TEN* in Panel A), and CEO age (*CEO\_AGE* in Panel B). All continuous variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. Firm-level clustered standard errors are in parentheses. The asterisks indicate a 1% (\*\*\*), 5% (\*\*), and 10% (\*) level of significance. All variables are defined in the Appendix of the paper.

**Table 12.** Exploring the Impact of CEO Origin, Narcissism and Repetition

<b>Panel A. Outsider CEO</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	-0.0421 (0.0345)	-0.00708 (0.0319)	0.00993 (0.0669)	0.327*** (0.109)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	10,128	10,128	10,128	10,128
R-squared	0.077	0.054	0.054	0.051
<b>Panel B. Insider CEO</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	0.226*** (0.0629)	0.155*** (0.0579)	0.368*** (0.121)	0.245 (0.201)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	3,366	3,366	3,366	3,366
R-squared	0.100	0.086	0.088	0.083

Table 12 delves into the relationship between CEO origin (insider vs. outsider), their level of narcissism (*CEONAR*), and the extent of repetition in corporate disclosures. The analysis is neatly divided into two panels: Panel A, which concentrates on outsider CEOs, and Panel B, which focuses on insider CEOs. Each panel evaluates the impact of CEO narcissism on four different measures of textual repetition: *Sim\_Cosine*, *Sim\_Jaccard*, *Sim\_MinEdit*, and *Sim\_Simple*. **Panel A (Outsider CEO):** For outsider CEOs, CEO narcissism presents a complex relationship with repetition measures. It shows a significant positive effect only on *Sim\_Simple*, indicating that higher narcissism levels in outsider CEOs are associated with more repetition in this specific measure. The other repetition metrics do not show significant relationships, suggesting that the influence of narcissism may be context-dependent or manifest differently across various aspects of corporate disclosures. **Panel B (Insider CEO):** For insider CEOs, narcissism exhibits a notably stronger relationship with all repetition measures, showing significant positive effects across *Sim\_Cosine*, *Sim\_Jaccard*, and *Sim\_MinEdit*. This suggests that insider CEOs with higher narcissism levels are associated with more repetitive textual content in corporate disclosures across various dimensions. The relationship with *Sim\_Simple* is positive but not statistically significant, hinting at potential nuances in how narcissism influences different aspects of repetition. The exploration reveals distinct patterns in how the origin of the CEO interacts with their level of narcissism to impact corporate disclosure repetition. Insider CEOs' narcissism is more consistently associated with increased repetition across various metrics, possibly reflecting their deeper organizational entrenchment and influence over corporate narratives. In contrast, outsider CEOs' narcissism shows a significant impact mainly on *Sim\_Simple*, suggesting different mechanisms or areas of influence. Variable definitions and measurement methods are detailed in Appendix B. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 13.** Exploring the Intersection of CEO Narcissism, Gender, and Repetition

Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	0.00802 (0.0300)	0.0276 (0.0277)	0.0862 (0.0579)	0.282*** (0.0953)
<i>CEO_FEMALE</i>	-0.0495 (0.0324)	-0.0564* (0.0299)	-0.113* (0.0626)	-0.127 (0.103)
<i>CEONAR</i> × <i>CEO_FEMALE</i>	0.267 (0.168)	0.313** (0.155)	0.627* (0.325)	0.470 (0.534)
<i>Constant</i>	0.191 (0.152)	-0.404*** (0.140)	-0.715** (0.294)	-1.266*** (0.483)
CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	13,494	13,494	13,494	13,494
R-squared	0.069	0.051	0.051	0.043

Table 13 undertakes a nuanced analysis to explore how the interaction between CEO narcissism and gender affects the level of repetition in corporate disclosures, using four different measures of textual repetition. *CEO\_FEMALE* indicates whether the CEO is female. The analysis reveals that female CEOs are associated with less repetition, as indicated by the negative coefficients for *CEO\_FEMALE*, which are significant for *Sim\_Jaccard* and *Sim\_MinEdit*. This suggests that female CEOs may employ less repetitive textual content in certain aspects of corporate disclosures. *CEONAR*×*CEO\_FEMALE* is interaction term explores how the effect of narcissism on repetition varies with the CEO's gender. Significant positive coefficients for the interaction term across *Sim\_Jaccard*, *Sim\_MinEdit*, and a positive trend in *Sim\_Simple* suggest that the influence of narcissism on repetition is more pronounced for female CEOs in these aspects of corporate disclosures, though the interaction is not significant for *Sim\_Simple*. The findings suggest that gender plays a significant role in modulating the impact of CEO narcissism on the repetitiveness of corporate disclosures. Specifically, female CEOs who are also characterized by higher levels of narcissism tend to be associated with more repetitive disclosure practices in certain respects than their male counterparts. For a comprehensive understanding of each variable, please consult Appendix B. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 14.** Exploring the Impact of Big4s on CEO Narcissism and Repetition

<b>Panel A. BIGFOUR</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	0.0578** (0.0264)	0.0440* (0.0241)	0.118** (0.0505)	0.342*** (0.0827)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	17,175	17,175	17,175	17,175
R-squared	0.071	0.050	0.051	0.042
<b>Panel B. NONBIGFOUR</b>				
Variable	(1) <i>Sim_Cosine</i>	(2) <i>Sim_Jaccard</i>	(3) <i>Sim_MinEdit</i>	(4) <i>Sim_Simple</i>
<i>CEONAR</i>	0.118** (0.0585)	0.0425 (0.0518)	0.107 (0.108)	0.109 (0.174)
C & CONTROLS	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES
Observations	3,336	3,336	3,336	3,336
R-squared	0.084	0.078	0.081	0.085

Table 14 investigates the influence of the prestige of accounting firms (Big4 vs. non-Big4) on the relationship between CEO narcissism and the level of repetition in corporate disclosures. The analysis is stratified into two panels, with **Panel A** focusing on companies audited by Big4 accounting firms and **Panel B** examining those audited by non-Big4 firms. Each panel explores the impact across four measures of textual repetition. In companies audited by Big4 firms, CEO narcissism is positively associated with all measures of textual repetition, indicating that higher narcissism levels lead to more repetitive content in corporate disclosures. For companies audited by non-Big4 firms, CEO narcissism shows a significant positive relationship with *Sim\_Cosine*, implying that narcissism influences repetition in this context as well, although the effects are not uniformly significant across all repetition measures as seen in Panel A. The findings suggest that the influence of CEO narcissism on the repetitiveness of corporate disclosures might be more pronounced in companies audited by Big4 firms, possibly reflecting the higher scrutiny and expectations associated with such auditors. This indicates that the relationship between executive personality traits and disclosure practices is complex and can be influenced by external governance and oversight mechanisms. Detailed variable descriptions are provided in Appendix B. Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# Appendices

## **Appendix A. Section Definitions in 10-Ks**

Items	Definition
Item 1	Business
Item 1A	Risk Factors
Item 2	Properties
Item 3	Legal Proceedings
Item 4	Mine Safety Disclosures
Item 5	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities
Item 6	Selected Financial Data
Item 7	Management's Discussion and Analysis of Financial Condition and Results of Operations
Item 7A	Quantitative and Qualitative Disclosures About Market Risk
Item 8	Financial Statements and Supplementary Data
Item 9	Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
Item 9A	Controls and Procedures
Item 9B	Other Information
Item 10	Directors, Executive Officers and Corporate Governance
Item 11	Executive Compensation
Item 12	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters
Item 13	Certain Relationships and Related Transactions, and Director Independence
Item 14	Principal Accounting Fees and Services

**Source:** Cohen et al. (2020)

Appendix A offers a comprehensive outline of the various sections typically found in 10-K filings, reflecting the definitions provided in the study by Cohen et al. (2020). These sections form the backbone of 10-K reports, which are mandatory annual filings made by publicly traded companies to the U.S. Securities and Exchange Commission (SEC). Each item within a 10-K filing is crucial for conveying specific aspects of a company's financial health, operational performance, governance, and risk factors, among other key information. While these reports are required to include certain regulatory elements, companies also have the discretion to provide additional voluntary disclosures that offer deeper insights into their operations and future outlooks. This blend of mandatory and voluntary information ensures a thorough understanding of a company's comprehensive annual performance.

**Appendix B. Variable Definition**

Variables	Definition	Authors
<b><i>Dependent Variable</i></b>		
<i>REPETITION</i>	<p>=</p> <p><b><i>Sim_Cosine (Cosine Similarity)</i></b>: Measures the cosine angle between two term frequency vectors from documents, capturing the closeness in textual content.</p> <p><b><i>Sim_Jaccard (Jaccard Similarity)</i></b>: Computes similarity by evaluating the intersection over the union of terms in two documents.</p> <p><b><i>Sim_MinEdit (Minimum Edit Distance)</i></b>: Represents the fewest operations needed to transform one document into another.</p> <p><b><i>Sim_Simple (Simple Similarity)</i></b>: Measures the fraction of identical content between two documents based on word changes.</p>	Cohen et al. (2020), Brown et al. (2011)
<b><i>Independent Variable</i></b>		
<i>CEONAR</i>	= The narcissism score for each CEO is measured by obtaining the ratio of first person singular pronouns (I, me, my, mine, myself) to total first person pronouns, which includes both singular (I, me, my, mine, myself) and plural forms (we, us, our, ours, ourselves), in CEO speech in the entire period.	Capalbo et al. (2018); Aktas et al. (2016); Raskin and Shaw (1988)
<b><i>Control Variables</i></b>		
<i>ACSIZE</i>	= Total number of audit committee members in a given year	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACIND</i>	= The percentage of audit committee members who are independent	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACFEXP</i>	= The proportion of audit committee members with financial expertise	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ACCHAIRFE</i>	= An indicator variable that is set to 1 if the audit committee chairman is also a financial expert	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>BOARDSIZE</i>	= The total number of directors on the board annually	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)

*(Continued on next page)*

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>BOARDIND</i>	= The ratio of independent directors on the board	Burkhard et al. (2023), Chen et al. (2019), and Chakrabarty et al. (2018)
<i>ZSCORE</i>	= $0.033 \times \text{earnings before extraordinary item (ib)} / \text{total assets (at)} + \text{sales (sale)} / \text{total assets (at)} + 0.014 \times \text{retained earnings (re)} / \text{total assets (at)} + 0.012 \times (\text{working capital (wcap)} / \text{total assets (at)}) + 0.006 \times (\text{market value of common stock (MV)} / \text{total liabilities (lt)})$ ;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>LOSS</i>	= An indicator variable equal to 1 if net income (ni) is negative, and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>SIZE</i>	= Natural log of market value of equity (csho * prcc_f).	Hasan (2020), Lin et al. (2021)
<i>AGE_LN</i>	= Age is measured as the number of years since the firm was first covered by the Center for Research in Securities Prices (CRSP). We measure <i>AGE_LN</i> as the natural log of (1+ age of the firm).	Hasan (2020)
<i>SPEC</i>	= Special items, measures as the amount of special items (spi) divided by total assets.	Hasan (2020)
<i>SALE_VOL</i>	= standard deviation of sales (sale), scaled by average total assets (at) over the previous 5 years;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>NONMISS_LN</i>	= Natural log of the number of items in Compustat with non-missing values.	Hasan (2020)
<i>DAC</i>	= Absolute discretionary accruals calculated using the performance-adjusted Modified Jones model.	Hasan (2020), Gan (2019)
<i>ROE</i>	= Profitability of the firm, measured as net income scaled by common equity.	Hasan (2020)
<i>INVT_VOL</i>	= The standard deviation of total investments (invt), scaled by the average total assets over the previous 5 years	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>CFO_SALE</i>	= Operating cash flows divided by sales;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>MTOB</i>	= The ratio of the market value of total assets to book value of total assets	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)

*(Continued on next page)*

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>SLACK</i>	= The ratio of cash (che) to PPE (ppeg);	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>DIV</i>	= An indicator variable equal to 1 if the firm paid dividends (dvc), and 0 otherwise;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>TANGIBILITY</i>	= PPE divided by total assets;	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>KSTRUCTURE</i>	= Long-term debt (dltt) divided by the sum of long-term debt and the market value of equity	Gan (2019), Biddle and Hilary (2006), Biddle et al. (2009)
<i>LNCOUNT</i>	= Natural logarithm of the total word count of all conference call transcripts in a year.	Fu et al. (2021), Brockman et al. (2015)
<i>CEOCOMPLX</i>	= Readability measure calculated using the Fog index for the CEO's speech in all conference calls within a year. The Fog index, calculated as: (words per sentence + percent of complex words) × 0.4.	Fu et al. (2021), Brockman et al. (2015)
<i>CEOTONE</i>	= Sentiment analysis measure of the CEO's speech in all conference calls over a year. Tone is (positive word count – negative word count)/ (positive word count + negative word count)	Fu et al. (2021), Brockman et al. (2015)
<i>INDUSTRY FE</i>	= Industry dummy to control for industry fixed effect.	Hasan (2020)
<i>YEAR FE</i>	= Dummy variables to control for fiscal year effect.	Hasan (2020)
<b><i>Additional Variables</i></b>		
<i>CEONAR_PRST</i>	= Ratio of first-person singular pronouns to total first-person pronouns used by the CEO in the presentation section of earnings calls over a year.	Raskin and Shaw (1988), Capalbo et al. (2018)
<i>CEONAR_Q&amp;A</i>	= Ratio of first-person singular pronouns to total first-person pronouns used by the CEO in the Q&A section of earnings calls over a year.	Raskin and Shaw (1988), Capalbo et al. (2018)
<i>ANNUAL_CEONAR</i>	= Aggregate of first-person singular pronouns used by the CEO across all quarterly earnings calls within a year, normalized against the total word count of these calls.	Raskin and Shaw (1988), Capalbo et al. (2018)

*(Continued on next page)*

**Appendix B. Variable Definition**

Variables	Definition	Authors
<i>(Continued)</i>		
<i>CEO_CASHPAY</i>	= Relative cash compensation of the CEO compared to the highest-paid non-CEO executive in the firm.	Chatterjee and Hambrick (2007), Olsen et al. (2016)
<i>CEO_NONCASHPAY</i>	= Relative non-cash compensation of the CEO compared to the non-CEO executive with the highest non-cash compensation in the firm.	Chatterjee and Hambrick (2007), Olsen et al. (2016)
<i>LAG_CEONAR</i>	= Calculated by aggregating the CEO narcissism score ( <i>CEONAR</i> ) from previous years, excluding the contemporaneous year in which the textual repetition is measured.	
<i>CEO_TEN</i>	= The number of years the CEO has been in their current position.	Ingersoll et al. (2019), Jeong et al. (2021)
<i>CEO_AGE</i>	= Natural logarithm of the CEO's age.	Ingersoll et al. (2019), Jeong et al. (2021)
<i>CEOORIGIN</i>	= An indicator equal to 1 if the CEO was recruited from outside the company, and 0 if the CEO was promoted from inside.	Kuang et al. (2014); Huson et al. (2004); Murphy and Za'bojnik (2007)
<i>CEO_AGE</i>	= Natural logarithm of the CEO age	Liu and Nguyen (2020)
<i>CEO_FEMALE</i>	= Dummy variable, equal 1 if a CEO is female and 0 otherwise	Liu and Nguyen (2020)
<i>CEO_VERBOSITY</i>	= The proportion of words spoken by the CEO relative to total words spoken by all executives during company conference calls, particularly in Q&A sessions.	Capalbo et al. (2018)
<i>BIGFOUR</i>	= Indicator variable that equals 1 if firm i's auditor is a Big N auditor, 0 otherwise. Big N auditors include Ernst & Young, Deloitte & Touche, KPMG, and PricewaterhouseCoopers.	De Franco et al. (2020)





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