Journal of Applied Accounting Research

Corporate culture's influence on the transparency of financial reporting in Iran: an in-depth analysis of readability and tone

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Received 25 February 2024
Revised 25 May 2024
Accepted 21 June 2024

Abstract

Purpose – This study investigates the influence of corporate culture on financial reporting transparency within Iranian firms.

Design/methodology/approach – Leveraging a dataset of 1,480 firm-year observations from the Tehran Stock Exchange spanning from 2013 to 2022, the study employs text mining to quantify linguistic features of corporate culture and transparency, specifically readability and tone, within annual financial statements and Management Discussion and Analysis (MD&A) reports.

Findings – Our results confirm a positive and significant relationship between corporate culture and financial reporting transparency. The distinct dimensions of corporate culture — Creativity, Competition, Control, and Collaboration — each uniquely enhance financial transparency. Robustness tests including firm fixed-effects, entropy balancing, Generalized Method of Moments (GMM), and Propensity Score Matching (PSM) validate the profound influence of corporate culture on transparency. Additionally, our analysis shows that corporate culture significantly affects the disclosure of business, operational, and financial risks, with varying impacts across risk categories. Cross-sectional analysis further reveals how the impact of corporate culture on transparency varies significantly across different industries and firm sizes.

Research limitations/implications – The study's scope, while focused on Iran, opens avenues for comparative research in different cultural and regulatory environments. Its reliance on text mining could be complemented by qualitative methods to capture more nuanced linguistic subtleties.

Practical implications – Findings underscore the strategic importance of cultivating a transparent corporate culture for enhancing financial reporting practices and stakeholder trust, particularly in emerging economies with similar dynamics to Iran.

Originality/value – This research is pioneering in its quantitative analysis of the textual features of corporate culture and its impact on transparency within Iranian corporate reports, integrating foundational theoretical perspectives with empirical evidence.

Keywords Financial reporting transparency, Corporate culture, Linguistic features, Stakeholder theory, Agency theory, Emerging market

Paper type Research paper

1. Introduction

Financial reporting transparency extends beyond compliance with accounting standards to encompass comprehensive disclosure of both financial and non-financial information, enabling stakeholders to make well-informed decisions. It plays a critical role in reducing

Conflict of interest disclosure: There is no third party which is related to the author, this paper, or the process of the data-collecting.

Co-author details, including affiliation and email address. There is one author for the current paper.

Journal of Applied Accounting Research
Emerald Publishing Limited
0967-5426
DOI 10.1108/JAAR-02-2024-0074

agency conflicts and improving market efficiency by decreasing information asymmetry (Armstrong *et al.*, 2016). However, the pursuit of transparency is not without challenges, as firms often resist full disclosure due to cost concerns and the strategic benefits of withholding information (Bushman *et al.*, 2004).

While transparency efforts are hindered by various strategic and economic factors, another subtler yet equally potent influence is the language used in financial disclosures. Sunwoo *et al.* (2023) illustrated how national culture, through traits like collectivism and uncertainty avoidance, affects revenue-expense matching, serving as an informal governance mechanism that impacts financial transparency. Additionally, Tan *et al.* (2024) observed that firms in regions with a strong gambling culture tend to bolster their internal controls, reflecting a response to the culture-induced risk-taking behavior. This cultural influence extends to the complexity and tone of disclosures at firm level, which significantly affect transparency and stakeholder perception, as noted by Bloomfield (2002) and Cho *et al.* (2010). Studies have identified managerial strategies that use complex language to obscure financial realities, hindering stakeholder understanding and affecting market response (Guay *et al.*, 2016). Additionally, the tone of disclosures, particularly optimism in environmental reporting, can manipulate perceptions and skew stakeholder decisions (Davis and Tama-Sweet, 2012). Beyond the linguistic strategies that obscure financial realities, the underlying corporate culture plays a pivotal role in shaping these reporting practices, affecting transparency at multiple levels. It influences transparency through its set of shared values and norms, impacting everything from ethical behavior (Guiso *et al.*, 2006) to risk management (Grennan, 2020) and leadership styles (Graham *et al.*, 2013). Prior studies have highlighted how variations in corporate culture affect financial reporting quality and organizational outcomes (Grennan, 2019).

Our study significantly advances the understanding of how corporate culture influences financial reporting transparency, focusing particularly on the under-researched Iranian market. Unlike previous studies that predominantly focus on Western settings (Afzali, 2023; Bhandari *et al.*, 2022; Hussein, 1996), our study delves into the unique socio-economic and regulatory frameworks of Iran. These frameworks present distinct challenges that are not adequately represented in existing literature. For example, Afzali (2023) investigates how corporate culture affects the comparability of financial statements in U.S. firms, suggesting that a strong corporate culture leads to homogeneous decision-making and greater comparability. Bhandari *et al.* (2022) analyze how different types of corporate cultures impact financial reporting quality in the U.S., finding significant differences between collaboration-oriented and competition-oriented cultures in terms of reporting quality. Hussein (1996) discusses the impact of cultural, social, and political differences on financial reporting across countries, proposing a reconciliation strategy due to the difficulty of achieving uniform accounting standards. In contrast, our research situates itself within the Iranian context, where ongoing economic sanctions and evolving political dynamics significantly influence corporate behaviors and reporting practices. These factors create a business environment that markedly differs from the contexts explored in the aforementioned studies. Iranian firms navigate a complex landscape shaped by a blend of traditional values and modern corporate governance, influenced by both local traditions and international pressures.

This research gap prompts our central question: How does corporate culture in Iran influence the transparency of financial reporting? Further differentiating our work, we integrate comprehensive theoretical frameworks—Stakeholder Theory, Agency Theory, Legitimacy Theory, and Institutional Theory—with empirical analysis to explore both the positive and negative influences of corporate culture on financial transparency in Iran. This dual approach is crucial for understanding how local cultural values interwoven with modern corporate governance impact financial transparency, addressing a significant gap left by previous studies. For the detailed theoretical framework, please refer to Section 3.

Drawing from Javidan and Dastmalchian (2003), our study examines how Iran's unique integration of religious and socio-political ethos influences corporate behavior and financial transparency post-Islamic Revolution. We explore the impact of cultural and economic shifts on financial reporting, as noted by Yasin *et al.* (2002), and how these adaptations affect transparency and corporate governance (Tamadonfar, 2015). Additionally, we consider the strategic implications of Iran's geopolitical position and legal frameworks on corporate practices (Ullah and Xinlei, 2024). This study also reflects on how traditional values intertwined with modern business strategies, as discussed by Ghanavati (2014), shape the transparency in Iranian firms. For detailed insights into the institutional and cultural framework of Iran, see Section 2.

Our empirical investigation covers 1,480 firm-year observations on the Tehran Stock Exchange from 2013 to 2022, analyzing annual reports and MD&A sections using text mining to assess indicators of corporate culture and transparency. Corporate culture is measured using a specialized bag-of-words model that quantifies the presence of 373 keywords related to creativity, competition, control, and collaboration within Persian MD&As. Transparency is assessed through readability indices — Gunning Fog Index, Automated Readability Index (ARI), and Flesch-Kincaid (FK) Grade Level — and the sentiment analysis of financial statements, using formulas to evaluate complexity and tone respectively. The findings highlight a significant positive relationship between corporate culture and financial reporting transparency, as anticipated by Stakeholder and Agency Theories. Specifically, regression analyses reveal that firms with a strong emphasis on corporate culture exhibit notably higher transparency in their financial disclosures, crucial for navigating the complexities of Iran's economic environment.

Additional analysis explores the impact of specific dimensions of corporate culture—Creativity, Competition, Control, and Collaboration—on financial transparency. Each dimension uniquely enhances transparency, supporting our overarching findings with empirical evidence that aligns with our theoretical frameworks. To further substantiate our findings, we employed several robustness tests, including firm fixed-effects, entropy balancing, Generalized Method of Moments (GMM), and Propensity Score Matching (PSM). These methodologies helped mitigate potential biases such as omitted variable bias, selection bias, and endogeneity, thereby enhancing the credibility of our results. Each test reaffirmed the positive influence of a strong corporate culture on transparency in financial reporting.

Besides, we explore risk disclosure practices, revealing that corporate culture significantly affects the disclosure of business, operational, and financial risks, with varying impacts across different risk categories. This section not only extends our understanding of corporate transparency but also underscores the strategic importance of corporate culture in shaping comprehensive risk disclosures, particularly within the volatile Iranian market. Finally, our cross-sectional analysis highlights the variability of the impact of corporate culture on transparency across different industries and firm sizes. It reflects the nuanced ways in which internal cultural mechanisms interact with external regulatory and market forces to shape corporate disclosure practices.

Our study significantly advances academic research and practical applications, particularly within the context of Iran and Persian corporate reporting. We innovate by using text mining techniques to analyze textual features of corporate culture, focusing on their impact on transparency, readability, and tone. Previous efforts by Hesarzadeh and Rajabalizadeh (2019, 2020), who studied the impact of readability on informational efficiency and managerial choices, along with Rajabalizadeh's (2024) work on auditor report readability, employed manual analyses. In contrast, our approach uses automated methods for a broader, more scalable analysis. Additionally, the investigation integrates a novel examination of risk disclosures — business, operational, and financial risks — highlighting the nuanced impacts of corporate culture on each risk category within MD&A reports. This approach enhances

our understanding of the multifaceted role of corporate culture in improving transparency and risk communication. It is distinct from previous studies, such as Salehi *et al.* (2020, 2023a, b) and Seifzadeh *et al.* (2021) on management characteristics, which enrich our understanding of the role of readability and tone in financial disclosures.

Theoretically, our work deepens the understanding of how corporate culture affects financial reporting transparency by merging foundational theories with the specific economic conditions of Iran. This aspect is bolstered by Rajabalizadeh's (2023) study on the interaction between CEO overconfidence and financial reporting complexity, and Salehi *et al.*'s (2023a, b) research on corporate governance and transparency. Through these lenses, we provide a detailed perspective on how corporate culture shapes financial transparency under Iran's unique socio-economic and regulatory frameworks. Practically, it guides executives and regulators in enhancing governance models to improve transparency and accountability, building on the foundational work of Salehi *et al.* (2023a, b) and Rajabalizadeh (2023). By merging cultural insights with governance practices, our findings not only extend the literature but also provide actionable strategies for enhancing report clarity and governance effectiveness, serving as a basis for further research in emerging markets.

The paper is organized as follows: Section 2 discusses the institutional setting, Section 3 delves into theories, literature, and hypothesis development. Section 4 describes the research design, Section 5 presents the results, Section 6 focuses on additional analyses, and Section 7 concludes with final thoughts.

2. Institutional setting: the cultural and institutional impact on corporate culture in Iran

Iran's societal and economic landscape offers a distinctive case study, combining a rich history of traditional cultural values with modern business practices (Khazeni, 2019). The integration of Islamic principles with civil law in Iran's regulatory and legal frameworks influences corporate governance and accountability standards in ways distinctly different from Western models (Tamadonfar, 2015). This unique blend of tradition and regulation creates a complex environment for corporate behavior and financial reporting, particularly under the conditions of unique economic policies and international sanctions (Takeyh and Maloney, 2011).

Javidan and Dastmalchian (2003) observe that despite significant societal changes, the core cultural characteristics of Iran have endured. Iran's alignment with the South Asian cultural cluster rather than Arab norms introduces strong familial bonds, a notable degree of individualism, and a complex relationship with authority and regulatory adherence into its corporate culture. Further, Iran's deep-rooted cultural heritage impacts its business etiquette and relationships, which are characterized by a strong preference for long-term relationships and network-based business dealings (Mitra and Basit, 2021). These factors are crucial for understanding the nuances of financial reporting and stakeholder communication in Iran. In this line, Yeganeh and Su (2007) delve into how Iran's cultural heritage, often overlooked or misunderstood, critically informs management practices and organizational success.

Geopolitically, Iran's position at the crossroads between Eastern and Western business spheres impacts its corporate practices and strategic business decisions, influencing how firms navigate global challenges and adapt their reporting and transparency practices (Ullah and Xinlei, 2024). This geopolitical significance, coupled with Iran's extensive natural resources and well-educated workforce, establishes it as a key global player, albeit one whose approach to corporate transparency is shaped by cultural nuances, such as privacy and indirect communication styles.

Yasin *et al.* (2002) discuss how post-Islamic Revolution economic constraints and cultural shifts have reshaped Iranian business practices, notably affecting financial reporting. This

aligns with Iran's religious and societal ethos, underscoring the importance of cultural adherence in business strategies. Ghanavati (2014) extends this discussion by highlighting the positive correlation between Iran's cultural orientation and the performance of small to medium-sized enterprises, suggesting that integrating cultural norms with market strategies is vital for organizational success and transparency in financial reporting. Moreover, Braendle *et al.* (2013) spotlight governance challenges like the need for shareholder empowerment and the cultivation of independent directorships, critical for enhancing transparency and aligning Iranian corporate practices with global standards. Further investigation by Moradi *et al.* (2013) and Alavi *et al.* (2004) into the organizational culture within Iranian firms indicates a shift towards a more market-oriented approach, diverging from traditional, religious-based values.

The distinct cultural and institutional framework of Iran, marked by a balance between traditional values and modern business practices, provides a rich context for studying the effects of corporate culture on financial reporting transparency.

3. Theories, literature review, and hypothesis development

This section delves into the theoretical frameworks that underpin our investigation into the relationship between corporate culture and the transparency of financial reporting in Iran. At the heart of our theoretical exploration are four pivotal theories: Stakeholder Theory, Agency Theory, Legitimacy Theory, and Institutional Theory (Freeman *et al.*, 2010; Linder and Foss, 2015; Daly, 2015; Mousa and Hassan, 2015; Martin *et al.*, 2011; Kılıç *et al.*, 2021). These theories provide contrasting perspectives on how corporate culture might influence financial reporting transparency.

First, we focus on Stakeholder and Agency Theories, which posit a positive relationship between corporate culture and financial reporting transparency, particularly relevant in the context of Iran's complex economic and political landscape.

Stakeholder Theory argues that transparent corporate practices are vital in producing clear financial reports, which meet stakeholders' diverse information needs (Jones, 1995; Freeman *et al.*, 2010). This is especially crucial in enhancing investment attraction and sustainability of stakeholder relationships (Freeman *et al.*, 2018). Supporting this perspective, Permatasari and Tjahjadi (2024) found that high-quality integrated reporting practices, aligned with stakeholder expectations, lead to more transparent disclosures. Similarly, Ndegwa (2024) examined the moderating effect of sustainability reporting on the readability of financial statements, finding that sustainability reporting significantly enhances transparency. This underscores Stakeholder Theory's emphasis on broad stakeholder engagement and comprehensive information provision. Moreover, the research by Seifzadeh *et al.* (2021) indicated that while managerial entrenchment and earnings management have a negative impact, traits like CEO narcissism and overconfidence can enhance transparency, which aligns with the principles of Stakeholder Theory by highlighting the role of positive management traits in improving transparency.

Agency Theory suggests that transparency reduces information asymmetry between management and shareholders, lowers agency costs, and increases the credibility of financial information—factors critical in mitigating conflicts, particularly in Iran's state-dominated enterprises (Linder and Foss, 2015; Daly, 2015). Empirical support from Salehi *et al.* (2023a, b) shows that factors like board expertise and managerial ownership positively correlate with financial reporting transparency, illustrating the critical role of governance structures in maintaining transparency and mitigating agency conflicts. Additionally, Moghadam *et al.* (2023) link intellectual capital to financial statement readability, further supporting Agency Theory by demonstrating how enhanced management quality leads to greater transparency. Salehi *et al.* (2020) contribute to this discourse by establishing a positive relationship between the readability of financial statements and audit report lags, suggesting that clearer reports

might necessitate more thorough auditing processes, thereby enhancing transparency and aligning with Agency Theory.

Building upon the theoretical constructs provided by Stakeholder and Agency Theories, we propose the following sub-hypothesis for the positive relationship side:

Ha. In Iranian firms, a corporate culture that actively engages and values stakeholder input and ensures robust governance mechanisms significantly enhances the transparency of financial reporting.

Transitioning from theories advocating for the positive impact of corporate culture on transparency, we now explore the converse through Legitimacy and Institutional Theories. These theories suggest that in certain contexts, firms may opt for less transparency as a strategic response to align with conservative societal norms and institutional pressures (Villena and Dhanorkar, 2020; Chelli *et al.*, 2014). This approach aims to preserve their legitimacy and navigate the intricacies of a highly regulated environment.

Legitimacy Theory suggests that firms might strategically limit transparency in their financial reporting to align with the conservative societal norms and regulatory pressures prevalent in Iran. This approach helps maintain their legitimacy by avoiding conflicts with societal or regulatory standards, thereby preserving organizational integrity in a highly regulated environment (Mousa and Hassan, 2015; O'Donovan and Donovan, 1999). This theory is exemplified by the findings of Arora and Chauhan (2023), who observed that readable financial statements attract foreign investments, particularly in less competitive industries. Their research suggests that transparency can be utilized as a strategic tool for firms aiming to gain legitimacy among international stakeholders, affirming the propositions of Legitimacy Theory. Additionally, the study by Uyar *et al.* (2022), which draws on neo-institutional and other theories to examine the influence of cultural values on the assurance of integrated reports, further underscores the impact of societal norms on corporate transparency. Their findings indicate that cultural dimensions such as collectivism and uncertainty avoidance significantly impact reporting practices, supporting Legitimacy Theory by illustrating how societal norms shape corporate behaviors.

Institutional Theory posits that organizational practices, including financial reporting, are inherently shaped by prevailing cultural and institutional pressures. In Iran, where values such as privacy and indirect communication are predominant, these pressures could foster less transparent reporting practices (Martin *et al.*, 2011; Kılıç *et al.*, 2021). The research by Harymawan *et al.* (2023) shows that CEOs with busy schedules tend to produce less readable reports. This finding suggests that personal characteristics and institutional demands significantly shape reporting practices, aligning with Institutional Theory by demonstrating how leadership influenced by cultural and institutional norms can impact transparency. Furthermore, Salehi *et al.* (2023a, b) explored how management characteristics affect audit report readability, revealing that traits such as managerial narcissism and overconfidence can influence the clarity of financial disclosures. This research supports Institutional Theory by highlighting how internal organizational dynamics and external pressures interact to shape transparency. The study by Salehi *et al.* (2022) on the impact of management characteristics on audit report readability found that managerial entrenchment and earnings management negatively affected readability, while traits such as narcissism, overconfidence, and board effort had a positive influence.

Building upon the foundations set by Legitimacy and Institutional Theories, we propose a sub-hypothesis that captures the potential negative relationship between corporate culture and financial reporting transparency:

Hb. In Iranian firms, the convergence of corporate culture with conservative societal norms and institutional pressures leads to decreased transparency in financial reporting, aimed at preserving organizational legitimacy.

In synthesizing the insights derived from the theoretical explorations and empirical evidence presented, our study highlights the complex interplay between corporate culture and financial reporting transparency in Iranian firms. Through the lens of Stakeholder and Agency Theories, we observe how positive aspects of corporate culture, such as stakeholder engagement and robust governance, can enhance transparency. Conversely, Legitimacy and Institutional Theories provide a framework for understanding the strategic limitations on transparency imposed by societal norms and institutional pressures. These dichotomous perspectives not only underline the multifaceted nature of financial reporting in Iran but also emphasize the critical role of cultural and institutional contexts in shaping corporate behavior. Thus, we propose the following main hypothesis:

H. The nature of corporate culture within Iranian firms significantly influences the transparency of their financial reporting.

4. Research design

4.1 Sample and data

Data were sourced from CODAL, the comprehensive and up-to-date database managed by the Securities and Exchange Organization (SEO) of Iran (Faraji *et al.*, 2023). The dataset includes firms listed on the Tehran Stock Exchange (TSE) from the second quarter of 2013 through 2022, amassing 3,230 firm-year observations over 10 years for 323 firms. We excluded 832 firm-year observations from the financial and utility sectors due to their unique metrics and regulations, which make their financial data incompatible with other sectors (Hesarzadeh and Rajabalizadeh, 2020). An additional 302 firm-year observations were removed because of changes in the fiscal year during the study period (2013–2022), and 562 instances were excluded due to missing essential data (Rajabalizadeh and Oradi, 2022). The refined sample consisted of 1,534 firm-year observations. From these, annual financial statements and MD&A PDF files were manually downloaded for textual analysis. After excluding 54 instances of damaged PDF files, the final sample size was narrowed down to 1,480 firm-year observations. These files were used to calculate textual variables related to corporate culture and financial reporting transparency. All PDF files were converted into text files using a Python script designed to open the PDFs, iterate through the pages, remove tables, and convert the content into text. Subsequently, textual features were computed using text mining techniques [1]. Please refer to Table 1 for a detailed summary of the data sources and sample distribution.

4.2 Independent variable: corporate culture

In examining corporate culture as a variable, it is crucial to consider its multifaceted nature, as highlighted in the works of Fiordelisi and Ricci (2014). This study endeavors to delineate

Description	Observations
Initial firm-year observations (2013–2022)	3,230
Exclusions	
- Financial and utility sectors	−832
- Changes in fiscal year	−302
- Lack of essential data	−562
Remaining sample	1,534
- Damaged PDF files excluded	−54
Final sample for analysis	1,480

Source(s): Table created by author

Table 1.
Sampling table

the measurement of corporate culture by building upon prior research while emphasizing accurate translation and cultural pertinence within the Iranian context. Drawing from earlier studies (Fiordelisi and Ricci, 2014; Fiordelisi *et al.*, 2019; Chen *et al.*, 2022), we have selected a comprehensive list of words that encapsulate the four dimensions of corporate culture as defined by the foundational framework of Fiordelisi and Ricci (2014): Creativity, Competition, Control, and Collaboration. See Appendix 1 for the keywords list.

For this study, we have crafted a specialized bag-of-words model tailored to Persian MD&A disclosures [2]. This model was developed through the translation of pivotal corporate culture-related terms into Persian, facilitated by the use of the Google Translate API and corroborated by consultations with bilingual Persian-speaking translators well-versed in the domain-specific language of corporate financial reporting. To ensure the linguistic and cultural fidelity of these translations, the initial list of keywords underwent a refinement process. This process included the inclusion of equivalent Arabic terms, considering the substantial linguistic interplay between Persian and Arabic (Rajabalizadeh, 2023). This cross-linguistic integration is critical to encapsulating the full spectrum and intricacies of corporate culture-related concepts within Persian discourse. The translated terms were examined and validated by two academic faculty members specializing in linguistic and business studies. Their evaluations, along with authoritative Persian dictionaries [3], were instrumental in establishing a robust set of keywords for our analytical model. The final compilation consists of 373 keywords, reflecting the elaborate interweaving of Persian and Arabic in articulating the nuances of corporate culture, thereby reinforcing the internal validity of our study. In the practical application of this model, the specified 373 keywords were applied to the corpus of MD&A text files to quantitatively measure the corporate culture variable, denoted as *CORPCULTURE*. The analysis involved tallying the natural logarithm of total occurrences of corporate culture-related words across all files [4].

4.3 Dependent variables: transparency

Transparency in financial reporting is a cornerstone of corporate governance, enhancing stakeholders' trust and facilitating informed decision-making (Rezaee, 2004; Almasri, 2021). Following Bushman *et al.* (2004), who explore the multifaceted nature of corporate transparency across legal and political landscapes, this study emphasizes transparency through the lens of financial statement readability and tone. These pivotal elements influence stakeholders' perceptions and understanding of corporate disclosures, aligning with the findings of Luo and Zhou (2020) who highlight the significant impact of textual tone on stakeholder perceptions. Rodrigue *et al.* (2015) also demonstrate the role of specific disclosures, such as environmental information, in shaping stakeholder perceptions through both corporate and stakeholder communications. Given the established relationship between readability levels and perceived transparency — where less readable texts may signal lower transparency due to their complexity — this research adopts a novel approach to quantify transparency in Iranian corporate reports. This approach is supported by Smaili *et al.* (2023), who underscore the critical role of readability in financial disclosures and provide practical strategies for firms looking to enhance their communications. Together, these studies provide a robust framework for understanding how readability and tone contribute to the transparency of financial reporting, thereby guiding our empirical analysis.

Following extensive literature that links readability with transparency in financial reporting (in international jurisdiction, see Li, 2008; Guay *et al.*, 2016; Bozanic *et al.*, 2019; Chychyla *et al.*, 2019; and in Iranian context, see Hesarzadeh and Rajabalizadeh, 2019, 2020; Hesarzadeh *et al.*, 2020; Rajabalizadeh, 2023, 2024), this study employs three established measures of readability to evaluate the complexity of annual financial statements, inversely

relating them to transparency. These measures are the Gunning Fog Index, Automated Readability Index (ARI), and Flesch-Kincaid (FK) Grade Level, hereafter referred to as *TRNSP1*, *TRNSP2*, and *TRNSP3*, respectively, with their scores multiplied by −1 to align higher values with greater transparency.

TRNSP1 (Fog Index): Originating from Robert Gunning's work, the Fog Index gauges the years of formal education needed to comprehend a text upon first reading. For this study, the Fog Index is calculated as:

$$TRNSP1 = -1 \times [0.4 \times (\text{number of words} / \text{number of sentences} + 100 \times (\text{number of words with more than two syllables} / \text{number of words}))] \quad (1)$$

TRNSP2 (ARI): The ARI offers an estimation of the grade level required to understand the text, serving as another readability measure that inversely indicates transparency.

$$TRNSP2 = -1 \times [4.71 \times (\text{characters}/\text{words}) + 0.5 \times (\text{words}/\text{sentences}) - 21.43] \quad (2)$$

TRNSP3 (FK Grade Level): The FK Grade Level aligns the text's readability with US school grade levels, inversely reflecting transparency through its scoring mechanism.

$$TRNSP3 = -1 \times [0.39 \times (\text{number of words}/\text{number of sentences}) + 11.8 \times (\text{number of syllables}/\text{number of words}) - 15.59] \quad (3)$$

While readability metrics primarily assess the accessibility of financial disclosures, tone serves as a secondary measure, providing deeper insights into the subtleties of transparency by evaluating the emotional valence of the language used. Tone, in the context of financial reporting, refers to the sentiment conveyed through the use of specific language in financial statements (Tan *et al.*, 2014; Allee and DeAngelis, 2015). Research has consistently shown that the linguistic characteristics of corporate disclosures can significantly influence stakeholders' perceptions and decisions (Cho *et al.*, 2010; Luo and Zhou, 2020). Positive tonality in financial disclosures often correlates with higher transparency as it reflects a company's confidence in its financial health and future prospects (Patelli and Pedrini, 2015; Fisher *et al.*, 2020; Soliman and Ben-Amar, 2022). Conversely, a negative tone may signal caution or potential issues, which can also be a dimension of transparency if it appropriately reflects underlying business challenges (Kim, 2019; Mather *et al.*, 2021).

In this study, we leverage the lexicons developed by Loughran and McDonald (2011, 2016), which have been specifically tailored for financial and corporate communications, to ensure the accuracy of sentiment analysis (Pilot, 2019; Kearney and Liu, 2014). These lexicons categorize words typically used in financial reporting into positive and negative sentiments, which are then adapted for the Persian context using resources such as Kaggle's Sentiment Lexicons [5]. This adaptation is crucial for capturing cultural and contextual nuances in language use within Iranian corporations. The estimation models employed in this study are designed to quantify the tone conveyed in MD&A and thereby assess transparency. These models are grounded in the following equations:

$$TRNSP4 = (\text{Positive words} - \text{Negative words}) / (\text{Positive words} + \text{Negative words}) \quad (4)$$

$$TRNSP5 = (\text{Positive words} - \text{Negative words}) / \text{Total words} \quad (5)$$

Equation (4) measures the balance between positive and negative words as a proportion of their total occurrence, providing a normalized measure of sentiment. This ratio is insightful

because it adjusts for the length of the document, allowing for comparisons across reports of different lengths. Equation (5), on the other hand, contextualizes the sentiment within the entirety of the document, offering insights into how much of the overall communication is dominated by positive or negative tones. This model is particularly useful in studies where the total volume of content may vary significantly, such as in annual reports versus quarterly reports.

By employing these readability and tone measures, the study aims to offer a nuanced understanding of transparency in the financial reporting of Iranian corporations, acknowledging that higher readability (lower complexity) and positive tone are indicative of greater transparency.

4.4 Main model

In examining the intricate relationship between corporate culture and the transparency of financial reporting, this study employs a comprehensive regression model, delineated in Equation (6), to assess the extent to which a firm's cultural attributes influence its reporting clarity and openness. Transparency, the dependent variable, is quantitatively measured through a combination of readability and tone metrics, encapsulating the ease of understanding and sentiment of annual financial statements and their notes. Corporate culture, operationalized as the frequency of culture-related terms in MD&A reports, serves as the primary independent variable.

$$\begin{aligned} TRNSP_{it} = {} & \beta_0 + \beta_1 CORPCULTURE_{it} + \beta_2 ACSIZE_{it} + \beta_3 ACIND_{it} \\ & + \beta_4 ACFEXPRT_{it} + \beta_5 INSTOWN_{it} + \beta_6 BDINDEP_{it} + \beta_7 BDSIZE_{it} \\ & + \beta_8 AUDOPN_{it} + \beta_9 AUDTEN_{it} + \beta_{10} AQ_{it} + \beta_{11} MB_{it} + \beta_{12} ROA_{it} \\ & + \beta_{13} INVREC_{it} + \beta_{14} DEBTRATIO_{it} + \beta_{15} INVEST_{it} + \beta_{16} STDSALE_{it} \\ & + \beta_{17} STDOCF_{it} + \beta_{18} AGE_{it} + \beta_{19} FINANCING_{it} + \beta_{20} ZMJSCORE_{it} \\ & + \sum INDUSTRY + \sum YEAR + \varepsilon_{it} \end{aligned} \tag{6}$$

Our study's selection of control variables is deeply rooted in a thorough literature review on textual analysis in corporate culture and financial reporting. We incorporate variables like the audit committee's size (*ACSIZE*), the proportion of independent directors (*ACIND*), and the percentage of financial experts (*ACFEXPRT*) to reflect their influence on financial disclosure quality and transparency. Larger audit committees are associated with improved oversight and more thorough review processes, leading to higher quality and more transparent financial reporting (Ghafran and O'Sullivan, 2013; Rezaee *et al.*, 2003). Independent audit committees are crucial for unbiased monitoring of financial reporting, thereby enhancing transparency and reducing information asymmetry (Pucheta-Martínez and García-Meca, 2014). Financial experts on audit committees bring critical accounting knowledge and experience, which contribute to the accuracy and transparency of financial reports (Lisic *et al.*, 2019).

Institutional ownership (*INSTOWN*) is considered for its demand for heightened transparency and governance quality. Board independence (*BDINDEP*) and size (*BDSIZE*) are included to capture the board's oversight capacity and perspective diversity, impacting financial integrity. Institutional investors often demand greater transparency and rigorous governance standards, influencing firms to provide clearer and more comprehensive financial disclosures (García-Sánchez *et al.*, 2020; Ernstberger and Grüning, 2013). A higher proportion of independent directors on the board can enhance oversight and ensure that financial reports are

transparent and reflect true financial performance (Zaman *et al.*, 2018; E-Vahdati *et al.*, 2023). Larger boards may offer a diversity of perspectives and expertise, which can improve the robustness of financial reporting processes and outcomes (Vitolla *et al.*, 2020).

Additionally, the nature of the audit opinion (*AUDOPN*) and auditor tenure (*AUDTEN*) are evaluated for their effects on reporting accuracy and transparency. The nature of the auditor's opinion can signal the reliability of financial statements. Qualified or adverse opinions often prompt companies to enhance transparency to regain stakeholder trust (Rezaee, 2005; Mande and Son, 2013). Longer auditor tenure can lead to a deeper understanding of the firm, potentially improving audit quality and transparency (Singer and Zhang, 2018).

Accrual quality (*AQ*) serves as a proxy for earnings reliability and financial reporting quality. High accrual quality indicates reliable earnings that reflect true financial performance, thus enhancing the transparency of financial reports (Chen and Gong, 2019; Kim *et al.*, 2012). The market-to-book ratio (*MB*) reflects market expectations of the firm's future performance and growth prospects. Firms with high *MB* ratios may provide more transparent disclosures to meet market expectations (Cao *et al.*, 2017). Return on assets (*ROA*) measures operational efficiency and can influence the extent of transparency in financial reporting, as firms with higher efficiency may be more transparent to highlight their performance (Akhigbe *et al.*, 2013).

Operational metrics like inventory and receivables ratios (*INVREC*), debt-to-equity (*DEBTRATIO*), and liquidity (*INVEST*) assess operational efficiency and financial structure's impact on reporting transparency. These ratios assess operational efficiency and working capital management. Firms with better management of inventory and receivables may disclose more transparently to reflect their operational strengths (Akbar *et al.*, 2021). Higher leverage can necessitate more transparent reporting to reassure creditors and investors about the firm's ability to meet its obligations (Armstrong *et al.*, 2010). Liquidity measures indicate the firm's ability to meet short-term obligations. Transparent reporting can provide stakeholders with confidence in the firm's financial stability (Laux, 2012; Adiloglu and Vuran, 2012).

Volatility measures, including sales (*STDSALE*) and operational cash flow variability (*STDOCF*), alongside company age (*AGE*) and significant financing activities (*FINANCING*), are factored in for their implications on disclosure needs and transparency practices. Volatility measures reflect business risk and uncertainty. Higher volatility might lead firms to adopt more transparent reporting practices to better inform stakeholders of potential risks (Elshandidy *et al.*, 2018). Older firms might have more established reporting practices and a greater emphasis on transparency to maintain their reputation (Muttakin *et al.*, 2015). Firms involved in significant financing activities may need to provide transparent disclosures to inform investors and creditors about the use and management of funds (Armitage and Marston, 2008). Altman's Z-score (*ZMJSCORE*) is included as an indicator of financial health, affecting transparency efforts. This measure of financial health can influence the level of transparency in financial reporting, as firms with better financial health might be more transparent to showcase their stability (Acharya and Ryan, 2016).

This careful selection of control variables, along with year and industry effects, provides a comprehensive framework to analyze corporate culture's impact on financial reporting transparency, detailed further in Appendix 3.

5. Results

5.1 Descriptive statistics

The descriptive analysis based on 1,480 observations provides insights into financial reporting transparency and corporate culture within Iranian firms, as detailed in Table 2. The dependent variables, *TRNSP1* through *TRNSP5*, derived from readability and sentiment

Variables	Mean	Standard deviation	Lowest quantile	First quartile	Median	Third quartile	Highest quantile
Dependent Variables							
TRNSP1	15.390	3.602	7.542	12.741	15.202	18.148	20.918
TRNSP2	13.449	6.181	2.636	9.201	12.596	16.289	35.554
TRNSP3	10.097	5.011	1.603	6.801	9.401	12.315	27.366
TRNSP4	0.378	0.125	0.049	0.337	0.395	0.441	0.572
TRNSP5	0.043	0.013	0.003	0.037	0.044	0.051	0.065
Independent Variable							
CORPCULTURE	6.403	0.681	4.308	6.009	6.433	6.857	7.761
Control Variables							
ACSIZE	2.262	1.461	0	0	3	3	5
ACIND	0.280	0.214	0	0	0.333	0.333	1
ACFEXPRT	0.297	0.457	0	0	0	1	1
INSTOWN	0.589	0.319	0	0.377	0.700	0.850	0.980
BDINDEP	0.664	0.186	0.2	0.6	0.6	0.8	1
BDSIZE	5.023	0.234	5	5	5	5	7
AUDOPN	0.484	0.500	0	0	0	1	1
AUDTEN	4.149	4.167	1	1	3	4	18
AQ	−0.498	0.385	−1.865	−0.570	−0.436	−0.319	−0.026
MB	4.278	4.981	−2.970	1.628	2.578	4.697	23.990
ROA	0.151	0.148	−0.218	0.059	0.128	0.235	0.540
INVREC	0.506	0.191	0.109	0.369	0.495	0.652	0.886
DEBTRATIO	1.933	2.076	0.038	0.696	1.269	2.363	10.772
INVEST	0.394	0.447	0.020	0.133	0.253	0.474	2.694
STDSALE	0.306	0.267	0.040	0.135	0.225	0.378	1.562
STDOCF	0.094	0.068	0.017	0.050	0.076	0.120	0.360
AGE	3.589	0.388	2.634	3.332	3.689	3.912	4.144
FINANCING	0.519	0.500	0	0	1	1	1
ZMJSCORE	−2.261	1.827	−6.163	−3.355	−2.220	−1.246	3.689

Table 2. Descriptive statistics (N = 1480)

Source(s): Table created by author

analyses, indicate varying levels of financial report complexity and sentiment. *TRNSP1*'s mean suggests reports are challenging for the average reader, *TRNSP2* and *TRNSP3* denote moderate readability, aligning with high school comprehension levels (means are aligning with previous studies in Iran; e.g., Hesarzadeh and Rajabalizadeh, 2019, 2020; Hesarzadeh *et al.*, 2020; Rajabalizadeh, 2023, 2024). These readability scores, inverted for interpretative ease, point to potential comprehension barriers in financial disclosures, highlighting the need for clearer reporting to boost transparency. Sentiment scores, *TRNSP4* and *TRNSP5*, show a generally positive portrayal of company affairs in financial statements. The primary independent variable, *CORPCULTURE*, with a mean indicating a notable emphasis on corporate culture in disclosures, suggests its potential impact on transparency.

Control variables provide a snapshot of governance and financial characteristics of the sampled firms. Audit committee size (*ACSIZE*) and composition metrics like *ACIND* and *ACFEXPRT* reflect governance diversity and expertise, while institutional ownership (*INSTOWN*) underscores the influence of institutional investors on transparency demands. Board independence (*BDINDEP*) and size (*BDSIZE*) indicate governance structures conducive to oversight and diversity in perspectives. Financial and operational measures, such as auditor opinions (*AUDOPN*), auditor tenure (*AUDTEN*), accrual quality (*AQ*), market-to-book ratio (*MB*), and return on assets (*ROA*), offer insights into financial health and market perceptions. Operational efficiency and financial structure are gauged through ratios

like *INVREC* and *DEBTRATIO*, while sales and operational cash flow volatility (*STDSALE* and *STDOCF*), company age (*AGE*), significant financing activities (*FINANCING*), and Altman's Z-score (*ZMJSCORE*) provide additional context on firm stability and financial transparency challenges.

The correlation matrix, both Pearson and Spearman, reveals significant insights into the dynamics between financial transparency, corporate culture, and governance/financial metrics within the dataset, as presented in Table 3 and Table 4. Key findings include strong positive correlations among readability measures *TRNSP1*, *TRNSP2*, and *TRNSP3*, indicating consistent readability levels across different indices. Sentiment measures *TRNSP4* and *TRNSP5* are also strongly correlated, suggesting a uniform sentiment in financial disclosures. Corporate culture (*CORPCULTURE*) shows moderate to strong positive correlations with both readability and sentiment measures, suggesting firms with a pronounced corporate culture tend to have clearer and more positive financial disclosures. Governance variables like audit committee size (*ACSIZE*) and financial expertise (*ACFEXPRT*) have limited correlations with transparency, indicating no direct link to clearer reporting. Institutional ownership (INSTOWN) correlates positively with corporate culture, hinting at institutional investors' preference for culture-reflective reporting. Financial performance metrics like *ROA* and *MB* exhibit diverse correlations with transparency and corporate culture, with notable findings like *ROA*'s negative correlation with audit opinions (*AUDOPN*), suggesting better-performing firms have less complex statements. The Altman Z-Score (*ZMJSCORE*)'s negative relationship with *ROA* aligns with expectations regarding profitability and financial distress.

5.2 Regression results

The regression results in Table 5 substantiate a positive relationship between corporate culture and financial reporting transparency, evidenced by the positive and statistically significant coefficients of the *CORPCULTURE* variable across all transparency measures (*TRNSP1* to *TRNSP5*). Specifically, the coefficients for *CORPCULTURE* on *TRNSP1* (0.721, $p < 0.01$), *TRNSP2* (1.712, $p < 0.01$), *TRNSP3* (1.319, $p < 0.01$), *TRNSP4* (0.082, $p < 0.01$), and *TRNSP5* (0.008, $p < 0.01$) underscore a robust association between a pronounced corporate culture and enhanced transparency in financial reporting. To assess the severity of multicollinearity within our regression models, we calculated the Variance Inflation Factor (VIF) for each predictor. The results reveal that all VIFs are below the commonly used threshold of 5, with a maximum VIF of 4.87 for *ACSIZE* and a mean VIF of 3.25 across all variables. This indicates that while there is some inflation, it does not reach a critical level that would undermine the reliability of our regression results (Gujarati, 1995). Additionally, the models incorporate both fixed effects for year and industry to control for unobserved heterogeneity, which might bias the estimates. The regression specifications and their robustness are further validated by the F-statistics, which are significant across all models, indicating that the models as a whole are statistically significant. The Adjusted R-squared values are also reported to reflect the proportion of variance in the dependent variables that is predictable from the independent variables. These values range from 0.140 for *TRNSP3* to 0.228 for *TRNSP4*, suggesting that while the models explain a significant portion of the variance, there remains unexplained variance that could be explored in further research.

The discussion of these results within the context of Iran's unique societal and economic landscape provides deeper insights. The integration of Islamic principles with civil law in Iran's regulatory and legal frameworks, as noted by Tamadonfar (2015), creates distinct governance and accountability standards. These standards are critically different from Western models and influence the way transparency is woven into corporate practices. Iran's strong cultural emphasis on familial bonds and a complex relationship with authority, as

Table 3.
Pearson correlation matrix (N = 1480)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *TRNSP1*	1												
(2) *TRNSP2*	0.912***	1											
(3) *TRNSP3*	0.893***	0.992***	1										
(4) *TRNSP4*	0.168***	0.180***	0.172***	1									
(5) *TRNSP5*	0.161***	0.176***	0.170***	0.942***	1								
(6) *CORPCULTURE*	0.200***	0.230***	0.210***	0.391***	0.345***	1							
(7) *ACSIZE*	0.058**	0.064**	0.053**	0.066***	0.044*	0.174***	1						
(8) *ACIND*	0.056**	0.066**	0.065**	0.070***	0.082***	0.083***	0.620***	1					
(9) *ACFEXPRT*	0.045*	0.044*	0.041	0.025	0.042*	0.059**	0.438***	0.250***	1				
(10) *INSTOWN*	0.170***	0.137***	0.121***	0.006	−0.012	0.254***	0.003	−0.070***	−0.036	1			
(11) *BDINDEP*	0.014	0.003	0.003	−0.019	−0.012	−0.109***	−0.083***	−0.022	−0.006	−0.030	1		
(12) *BDSIZE*	−0.024	−0.017	−0.014	−0.067***	−0.075***	−0.007	−0.003	0.012	−0.016	−0.121***	0.109***	1	
(13) *AUDOPN*	0.037	0.047*	0.048*	−0.018	−0.010	−0.069***	−0.096***	−0.046*	−0.043*	−0.166***	−0.042*	−0.040	1
(14) *AUDTEN*	0.010	0.016	0.014	−0.042*	−0.050**	0.097***	0.007	−0.061**	−0.036	0.147***	−0.191***	−0.058**	0.027
(15) *AQ*	0.030	0.019	0.022	−0.017	−0.021	0.029	−0.010	−0.015	0.058**	0.029	0.032	0.028	−0.011
(16) *MB*	0.016	0.006	0.004	0.050**	0.060**	−0.026	0.229***	0.173***	0.086***	−0.049**	−0.027	−0.035	−0.131***
(17) *ROA*	0.061**	0.032	0.021	0.029	0.025	0.074***	0.088***	−0.018	0.067***	0.079***	0.096***	0.008	−0.271***
(18) *INVREC*	−0.044*	−0.038	−0.046*	−0.012	−0.002	−0.045*	0.023	0.039	−0.032	−0.071***	−0.136***	−0.076***	−0.043*
(19) *DEBTRATIO*	0.001	0.028	0.020	0.052**	0.036	0.054**	−0.120***	−0.083***	−0.093***	0.098***	−0.151***	−0.029	0.118***
(20) *INVEST*	0.034	0.025	0.022	0.024	0.010	−0.020	0.063**	0.012	0.033	−0.072***	0.137***	−0.012	−0.068***
(21) *STDSALE*	−0.037	−0.021	−0.021	−0.038	−0.037	−0.010	0.134***	0.026	0.048*	0.014	−0.064**	−0.038	−0.145***
(22) *STDOCF*	0.036	0.028	0.028	−0.012	−0.032	−0.035	0.111***	0.044*	0.032	0.000	−0.009	0.001	−0.059**
(23) *AGE*	−0.021	−0.014	−0.016	0.045*	0.047*	0.003	0.111***	0.107***	0.086***	−0.200***	−0.106***	−0.009	0.042*
(24) *FINANCING*	0.113***	0.100***	0.098***	0.059**	0.055**	0.139***	0.010	0.026	0.000	−0.010	0.033	−0.079***	0.092***
(25) *ZMJSCORE*	−0.007	0.004	0.004	−0.002	−0.020	0.069***	−0.113***	−0.072***	−0.061**	0.106***	−0.217***	−0.033	0.201***

Variables	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(14) *AUDTEN*	1											
(15) *AQ*	−0.071***	1										
(16) *MB*	−0.026	0.026	1									
(17) *ROA*	−0.048*	0.040	0.163***	1								
(18) *INVREC*	0.051**	0.001	0.043*	0.028	1							

(*continued*)

Table 3.

Variables	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(19) *DEBTRATIO*	0.149***	−0.015	0.208***	−0.271***	0.136***	1						
(20) *INVEST*	−0.093***	0.027	0.056**	0.309***	−0.329***	−0.287***	1					
(21) *STDSALE*	−0.029	−0.014	0.256***	0.265***	0.046*	0.028	0.038	1				
(22) *STDOCF*	0.003	0.065***	0.172***	0.245***	−0.115***	−0.069***	0.297***	0.277***	1			
(23) *AGE*	0.085***	−0.041	0.111***	−0.040	0.086***	0.036	0.013	−0.025	−0.009	1		
(24) *FINANCING*	0.044*	−0.009	−0.070***	0.063**	−0.197***	−0.167***	0.149***	−0.139***	0.021	0.027	1	
(25) *ZMJSCORE*	0.166***	−0.058**	−0.095***	−0.630***	0.150***	0.522***	−0.520***	−0.083***	−0.125***	0.033	−0.169***	1

Note(s): The correlation coefficients are annotated to indicate the statistical significance of the correlations, with *** denoting significance at the 1% level, ** at the 5% level, and * at the 10% level. The definitions of variables are as specified in the Appendix 3

Source(s): Table created by author

Table 4.
Spearman correlation matrix (N = 1480)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *TRNSP1*	1												
(2) *TRNSP2*	0.992***	1											
(3) *TRNSP3*	0.993***	0.995***	1										
(4) *TRNSP4*	0.174***	0.163***	0.161***	1									
(5) *TRNSP5*	0.150***	0.131***	0.131***	0.907***	1								
(6) *CORPCULTURE*	0.194***	0.203***	0.174***	0.096***	0.071***	1							
(7) *ACSIZE*	0.057**	0.064**	0.049*	0.011	−0.001	0.173***	1						
(8) *ACIND*	0.029	0.032	0.023	0.066**	0.074***	0.100***	0.701***	1					
(9) *ACFEXPRT*	0.043*	0.046*	0.043*	0.034	0.048*	0.058**	0.440***	0.293***	1				
(10) *INSTOWN*	0.143***	0.150***	0.141***	0.033	0.015	0.249***	−0.048*	−0.117***	−0.026	1			
(11) *BDINDEP*	0.019	0.013	0.021	0.024	0.015	−0.091***	−0.093***	−0.024	−0.002	−0.026	1		
(12) *BDSIZE*	−0.025	−0.018	−0.015	−0.052**	−0.066***	0.010	−0.012	0.028	−0.016	−0.100***	0.120***	1	
(13) *AUDOPN*	0.037	0.042*	0.042*	−0.022	−0.018	−0.085***	−0.087***	−0.050*	−0.043*	−0.162***	−0.027	−0.040	1
(14) *AUDTEN*	0.019	0.025	0.019	−0.044*	−0.052**	0.084***	−0.005	−0.069***	−0.029	0.105***	−0.148***	−0.074***	−0.015
(15) *AQ*	0.026	0.028	0.025	−0.020	−0.024	0.077***	0.019	−0.011	0.067***	0.037	0.039	0.028	−0.056**
(16) *MB*	0.046*	0.038	0.033	0.054**	0.064**	−0.003	0.316***	0.266***	0.122***	−0.009	0.020	−0.037	−0.177***
(17) *ROA*	0.065***	0.066***	0.061**	0.043*	0.038	0.103***	0.079***	−0.029	0.076***	0.135***	0.087***	0.012	−0.270***
(18) *INVREC*	−0.046*	−0.042*	−0.054**	−0.028	−0.012	−0.069***	0.010	0.044*	−0.030	−0.064**	−0.138***	−0.076***	−0.040
(19) *DEBTRATIO*	−0.029	−0.026	−0.034	0.039	0.029	0.103***	−0.145***	−0.097***	−0.101***	0.183***	−0.178***	−0.035	0.066***
(20) *INVEST*	0.037	0.036	0.040	0.045*	0.015	−0.014	−0.012	−0.072***	−0.012	−0.077***	0.138***	0.005	−0.067***
(21) *STDSALE*	−0.040	−0.044*	−0.043*	−0.053**	−0.045*	−0.034	0.106***	0.028	0.039	0.001	−0.093***	−0.043*	−0.173***
(22) *STDOCF*	0.038	0.042*	0.040	−0.039	−0.067***	−0.032	0.124***	0.054**	0.051**	0.019	−0.008	0.007	−0.083***
(23) *AGE*	−0.042*	−0.030	−0.038	0.056**	0.051**	−0.009	0.118***	0.101***	0.082***	−0.220***	−0.119***	−0.025	0.036
(24) *FINANCING*	0.118***	0.118***	0.117***	0.089***	0.071***	0.163***	0.012	0.009	0.000	−0.015	0.020	−0.079***	0.092***
(25) *ZMJSCORE*	−0.025	−0.024	−0.030	−0.026	−0.036	0.053**	−0.149***	−0.087***	−0.099***	0.098***	−0.198***	−0.035	0.187***

Variables	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(14) *AUDTEN*	1											
(15) *AQ*	−0.049**	1										
(16) *MB*	−0.021	0.045*	1									
(17) *ROA*	−0.008	0.046*	0.333***	1								
(18) *INVREC*	0.042*	−0.001	0.051**	0.041	1							

(*continued*)

Table 4.

Variables	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
(19) *DEBTRATIO*	0.076***	−0.045*	0.114***	−0.289***	0.175***	1						
(20) *INVEST*	−0.081***	0.069***	0.117***	0.340***	−0.311***	−0.404***	1					
(21) *STDSALE*	−0.043*	−0.043*	0.354***	0.335***	0.053**	0.026	0.124***	1				
(22) *STDOCF*	0.010	0.058**	0.197***	0.213***	−0.073***	−0.113***	0.228***	0.292***	1			
(23) *AGE*	0.072***	−0.057**	0.115***	−0.017	0.097***	0.015	−0.045*	−0.008	0.023	1		
(24) *FINANCING*	0.052**	0.030	−0.082***	0.056**	−0.198***	−0.183***	0.188***	−0.141***	0.008	0.032	1	
(25) *ZMJSCORE*	0.077***	−0.071***	−0.166***	−0.590***	0.170***	0.784***	−0.529***	−0.079***	−0.143***	0.026	−0.203***	1

Note(s): The correlation coefficients are annotated to indicate the statistical significance of the correlations, with *** denoting significance at the 1% level, ** at the 5% level, and * at the 10% level. The definitions of variables are as specified in the Appendix 3

Source(s): Table created by author

Table 5.
Impact of corporate culture on financial reporting transparency

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*	VIF
CORPCULTURE	0.721***	1.712***	1.319***	0.082***	0.008***	3.62
	(0.143)	(0.248)	(0.203)	(0.004)	(0.001)	
ACSIZE	−0.648***	−0.823**	−0.709**	−0.018**	−0.002***	4.87
	(0.218)	(0.377)	(0.308)	(0.007)	(0.001)	
ACIND	0.363	1.344	1.109	−0.004	0.001	4.58
	(0.600)	(1.040)	(0.849)	(0.020)	(0.002)	
ACFEXPRT	0.464**	0.809**	0.629**	0.001	0.001	1.89
	(0.209)	(0.363)	(0.296)	(0.006)	(0.001)	
INSTOWN	1.882***	2.381***	1.678***	−0.034***	−0.003***	2.41
	(0.340)	(0.589)	(0.481)	(0.011)	(0.001)	
BDINDEP	−0.826	−1.251	−1.132	0.008	0.001	2.45
	(0.533)	(0.924)	(0.755)	(0.017)	(0.001)	
BDSIZE	−0.138	−0.216	−0.110	−0.047***	−0.005***	3.79
	(0.378)	(0.655)	(0.535)	(0.012)	(0.001)	
AUDOPN	0.496**	0.828**	0.627**	0.002	0.001	2.48
	(0.199)	(0.344)	(0.281)	(0.006)	(0.001)	
AUDTEN	−0.021	−0.028	−0.023	−0.002***	−0.001***	2.59
	(0.023)	(0.040)	(0.033)	(0.001)	(0.001)	
AQ	0.274	0.349	0.351	−0.014*	−0.001*	2.83
	(0.228)	(0.395)	(0.323)	(0.007)	(0.001)	
MB	−0.019	−0.067	−0.051	0.003***	0.001***	4.29
	(0.026)	(0.046)	(0.037)	(0.001)	(0.001)	
ROA	−0.0495	−2.617	−2.166	−0.009	−0.002	4.22
	(1.000)	(1.733)	(1.416)	(0.033)	(0.003)	
INVREC	2.035***	3.433***	2.882***	−0.011	−0.001	3.52
	(0.625)	(1.083)	(0.885)	(0.020)	(0.002)	
DEBTRATIO	0.0665	0.237**	0.159**	0.001	−0.005	3.43
	(0.0566)	(0.0981)	(0.0802)	(0.001)	(0.001)	
INVEST	0.436	0.576	0.345	0.0120	0.001	3.59
	(0.269)	(0.466)	(0.380)	(0.008)	(0.001)	

(*continued*)

Table 5.

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*	VIF
STDSALE	−1.508***	−1.874**	−1.622**	−0.030**	−0.003**	4.48
	(0.445)	(0.770)	(0.629)	(0.014)	(0.001)	
STDOCF	2.204	4.226*	3.604*	0.034	0.001	4.04
	(1.472)	(2.550)	(2.083)	(0.049)	(0.005)	
AGE	0.385	0.545	0.358	0.009	0.001	2.24
	(0.261)	(0.452)	(0.369)	(0.008)	(0.001)	
FINANCING	0.580***	0.769**	0.629**	−0.003	−0.001	2.79
	(0.200)	(0.346)	(0.282)	(0.006)	(0.001)	
ZMJSCORE	0.0104	−0.141	−0.107	−0.003	−0.001**	2.04
	(0.0844)	(0.146)	(0.119)	(0.002)	(0.001)	
CONST	−23.79***	−27.74***	−21.86***	0.071	0.014	2.15
	(2.603)	(4.511)	(3.685)	(0.086)	(0.009)	
YEAR_FE	YES	YES	YES	YES	YES	Mean VIF = 3.25
INDUSTRY_FE	YES	YES	YES	YES	YES	
Observations	1,480	1,480	1,480	1,480	1,480	
R-squared	0.191	0.180	0.172	0.256	0.229	
Adj R-squared	0.161	0.149	0.140	0.228	0.200	
F (Sig)	6.244 (0.000)	5.791 (0.000)	5.471 (0.000)	9.097 (0.000)	7.847 (0.000)	

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
Source(s): Table created by author

described by Javidan and Dastmalchian (2003), also play a crucial role in shaping corporate behavior and, consequently, the transparency of financial reporting. Moreover, the positive relationship between corporate culture and transparency highlighted in our findings aligns with theoretical perspectives such as Stakeholder Theory and Agency Theory. These theories suggest that transparent corporate practices are essential not only for reducing information asymmetry but also for fostering stakeholder trust and satisfaction, which are particularly pertinent in the volatile economic environment of Iran, marked by international sanctions and unique economic policies (Takeyh and Maloney, 2011).

From an economic significance standpoint, the coefficients indicate a substantive impact of corporate culture on financial reporting transparency. For instance, a one-unit increase in the *CORPCULTURE* index is associated with significant improvements in the readability and positive sentiment of financial disclosures, as quantified by the measures *TRNSP1* through *TRNSP5*. The magnitudes of the coefficients suggest that corporate culture not only affects the readability of financial statements (making them more understandable to a broader audience) but also influences the tone, tilting it towards a more positive sentiment. These effects are economically significant, as they imply that enhancements in corporate culture can lead to material improvements in how financial information is perceived and understood by stakeholders.

The analysis of control variables in our study highlights the nuanced impacts of governance structures and financial metrics on financial reporting transparency. Larger audit committees (*ACSIZE*) are associated with lower readability and less positive sentiment in reports, suggesting that bigger committees might not always facilitate clearer reporting. However, the presence of financial experts on these committees (*ACFEXPRT*) enhances report readability, indicating the value of financial expertise in improving disclosure quality. Institutional ownership (*INSTOWN*) positively correlates with report readability but has a negative association with sentiment, implying that while institutional investors advocate for transparency, it may not influence the tone of disclosures. Larger board sizes (*BDSIZE*) are linked to a less positive sentiment, suggesting potential challenges in maintaining a positive tone with more extensive board governance. Audit opinions (*AUDOPN*) and auditor tenure (*AUDTEN*) show mixed and negative relationships with sentiment, respectively, indicating varied impacts on financial reporting's tone. Interestingly, sales volatility (*STDSALE*) negatively affects readability, suggesting that operational fluctuations could complicate financial disclosures. Other metrics, such as the accrual quality (*AQ*), market-to-book ratio (*MB*), and financial structure indicators like debt ratio (*DEBTRATIO*) and inventory and receivables to total assets (*INVREC*), show limited or specific impacts on transparency aspects, highlighting the complex interplay between financial health and reporting clarity.

6. Additional tests

6.1 Impact of corporate culture dimensions on financial reporting transparency

The regression analysis on the impact of corporate culture dimensions—Creativity, Competition, Control, and Collaboration—on financial reporting transparency reveals significant and meaningful insights, as detailed in Table 6. Each dimension, as explored in separate panels within Table 6, demonstrates a positive association with transparency measures, indicating that aspects of corporate culture distinctly contribute to the clarity and accessibility of financial disclosures (Vitolla *et al.*, 2019). Specifically, creativity within corporate culture is linked to enhanced transparency across all measures, suggesting that innovative and original thinking plays a crucial role in the quality of financial reporting (Hughes *et al.*, 2018). Similarly, a competitive corporate culture is associated with clearer disclosures, highlighting the value of competition in promoting transparency (Cao, 2019). Control mechanisms within corporate culture also emerge as pivotal for transparent reporting, emphasizing the importance of governance and regulation in financial disclosures

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*
Panel A. Creative Corporate Culture and Financial Reporting Transparency					
CRECULT	0.701***	1.596***	1.198***	0.071***	0.006***
	(0.134)	(0.232)	(0.190)	(0.004)	(0.001)
YEAR_FE	YES	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES	YES
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.192	0.180	0.170	0.238	0.209
Adj R-squared	0.162	0.149	0.139	0.209	0.179
F (Sig)	6.284 (0.000)	5.776 (0.000)	5.413 (0.000)	8.225 (0.000)	6.981 (0.000)
Panel B. Competitive Corporate Culture and Financial Reporting Transparency					
COMCULT	0.575***	1.393***	1.049***	0.088***	0.008***
	(0.132)	(0.229)	(0.187)	(0.004)	(0.001)
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.188	0.174	0.165	0.314	0.277
Adj R-squared	0.157	0.143	0.134	0.288	0.249
F (Sig)	6.101 (0.000)	5.558 (0.000)	5.233 (0.000)	12.08 (0.000)	10.09 (0.000)
Panel C. Control Corporate Culture and Financial Reporting Transparency					
CONCULT	0.570***	1.197***	0.961***	0.067***	0.006***
	(0.146)	(0.253)	(0.207)	(0.004)	(0.001)
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.185	0.165	0.160	0.235	0.197
Adj R-squared	0.154	0.133	0.128	0.206	0.167
F (Sig)	5.959 (0.000)	5.194 (0.000)	4.990 (0.000)	8.086 (0.000)	6.462 (0.000)
Panel D. Collaborative Corporate Culture and Financial Reporting Transparency					
COLCULT	0.704***	1.590***	1.251***	0.044***	0.004***
	(0.127)	(0.218)	(0.178)	(0.004)	(0.001)
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.195	0.184	0.177	0.161	0.148
Adj R-squared	0.164	0.153	0.145	0.129	0.115
F (Sig)	6.379 (0.000)	5.944 (0.000)	5.651 (0.000)	5.043 (0.000)	4.562 (0.000)

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

Source(s): Table created by author

Table 6. Impact of corporate culture dimensions on financial reporting transparency

(Manginte, 2024). Lastly, collaboration is significantly related to financial reporting transparency, underscoring the role of teamwork and partnership in producing comprehensive and understandable financial information (Silvers, 2021). These findings underscore the multifaceted influence of corporate culture on financial reporting transparency, supporting the main regression results and providing empirical evidence for the theoretical proposition that corporate culture shapes financial disclosure practices.

6.2 Controlling for unobserved heterogeneity and observable characteristics

To mitigate the potential issues arising from omitted variable bias and unobserved heterogeneity, this study implements robustness tests, including firm fixed-effects analysis,

entropy balancing approach, Generalized Method of Moments (GMM) method, and Propensity Score Matching (PSM). The firm fixed-effects model, as suggested by Himmelberg *et al.* (1999), controls for unobservable firm-specific attributes by including a unique intercept for each firm, thereby accounting for the intrinsic characteristics that could influence financial reporting transparency. The results of this analysis, demonstrating the impact of corporate culture on transparency measures *TRNSP1* to *TRNSP5*, are presented in Table 7. Here, the coefficients for *CORPCULTURE* across transparency measures are consistently positive and statistically significant, suggesting that even after controlling for firm-specific heterogeneity, the influence of corporate culture on transparency remains substantial and in line with our primary findings.

Moreover, to address the potential for selection bias related to corporate culture categorization—specifically, distinguishing firms with high corporate culture from those with low corporate culture based on the median within each industry—entropy balancing is employed (Hainmueller, 2012). This method ensures that the distribution of covariates between the two groups is balanced, thereby allowing for a more accurate comparison. Unlike traditional matching techniques, entropy balancing assigns weights to all observations, thus preserving the entire sample and enhancing the statistical power of the analysis. Table 8 effectively demonstrates the application of entropy balancing in this context. Panels A and B provide pre- and post-balancing descriptive statistics of control variables between treatment (*HIGHCORPCULTURE* = 1) and control (*LOWCORPCULTURE* = 0) groups, showing that post-balancing, the covariate distributions are nearly identical. This alignment confirms the effectiveness of entropy balancing in creating comparable groups for analysis. Panel C presents the regression results using entropy-balanced weights, where the impact of corporate culture on financial reporting transparency is examined. The positive and significant coefficients for *CORPCULTURE* across *TRNSP1* to *TRNSP5* further validate the main regression results, underscoring the robustness of the findings that a pronounced corporate culture is associated with enhanced transparency in financial disclosures.

To address potential endogeneity issues and further validate our findings, we next implement the GMM, a comprehensive econometric technique commonly used for estimating parameters in models that involve potential endogeneity problems, where conventional estimation methods might be biased and inconsistent (Ullah *et al.*, 2018). In the context of analyzing how corporate culture influences transparency in financial reporting, GMM efficiently addresses endogeneity issues that might arise due to omitted variables, measurement errors, or simultaneity (where corporate culture and transparency may

Table 7.
Impact of corporate culture on financial reporting transparency with firm fixed effects

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*
CORPCULTURE	0.459***	1.362***	1.153***	0.129***	0.012***
	(0.154)	(0.277)	(0.227)	(0.005)	(0.001)
CONST and CONTROLS	Yes	Yes	Yes	Yes	Yes
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	No	No	No	No	No
FIRM_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.572	0.533	0.526	0.568	0.601
Adj R-squared	0.506	0.461	0.453	0.502	0.539
F (Sig)	2.434 (0.000)	3.057 (0.000)	2.833 (0.000)	22.07 (0.000)	20.78 (0.000)

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$
Source(s): Table created by author

	Treatment (high *CORPCULTURE* = 1)			Control (low *CORPCULTURE* = 0)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
Panel A. Pre-balancing First, Second and Third moments of Control Variables						
ACSIZE	2.548	1.787	−0.905	2.316	1.942	−0.834
ACIND	0.291	0.044	1.074	0.268	0.048	1.041
ACFEXPRT	0.323	0.219	0.758	0.318	0.217	0.784
INSTOWN	0.656	0.072	−1.218	0.538	0.117	−0.435
BDINDEP	0.656	0.031	−0.275	0.666	0.035	−0.316
BDSIZE	5.034	0.088	4.886	5.014	0.028	11.830
AUDOPN	0.439	0.247	0.245	0.495	0.250	0.020
AUDTEN	4.705	21.880	1.494	3.669	12.800	2.124
AQ	−0.485	0.139	−4.611	−0.511	0.173	−4.851
MB	4.194	21.760	2.412	4.610	30.180	2.166
ROA	0.160	0.022	0.237	0.152	0.022	0.459
INVREC	0.503	0.038	0.033	0.504	0.034	0.076
DEBTRATIO	2.071	4.344	2.201	1.749	4.131	2.920
INVEST	0.373	0.180	3.146	0.430	0.238	2.838
STDSALE	0.305	0.068	2.284	0.312	0.078	2.294
STDOCF	0.093	0.005	2.797	0.098	0.005	2.549
AGE	3.598	0.149	−0.661	3.576	0.159	−0.648
FINANCING	0.554	0.247	−0.218	0.483	0.250	0.070
ZMJSCORE	−2.135	3.264	1.010	−2.444	3.387	0.877
Panel B. Post-balancing First, Second and Third moments of Control Variables						
ACSIZE	2.548	1.787	−0.905	2.548	1.647	−1.082
ACIND	0.291	0.044	1.074	0.291	0.045	1.089
ACFEXPRT	0.323	0.219	0.758	0.323	0.219	0.758
INSTOWN	0.656	0.072	−1.218	0.656	0.088	−1.084
BDINDEP	0.656	0.031	−0.275	0.656	0.030	−0.227
BDSIZE	5.034	0.088	4.886	5.034	0.067	7.474
AUDOPN	0.439	0.247	0.245	0.439	0.247	0.245
AUDTEN	4.705	21.880	1.494	4.705	20.900	1.494
AQ	−0.485	0.139	−4.611	−0.485	0.117	−4.426
MB	4.194	21.760	2.412	4.194	22.720	2.388
ROA	0.160	0.022	0.237	0.160	0.022	0.399
INVREC	0.503	0.038	0.033	0.503	0.035	0.066
DEBTRATIO	2.071	4.344	2.201	2.071	5.396	2.519
INVEST	0.373	0.180	3.146	0.373	0.184	3.076
STDSALE	0.305	0.068	2.284	0.305	0.074	2.422
STDOCF	0.093	0.005	2.797	0.093	0.003	2.030
AGE	3.598	0.149	−0.661	3.598	0.148	−0.691
FINANCING	0.554	0.247	−0.218	0.554	0.247	−0.218
ZMJSCORE	−2.135	3.264	1.010	−2.135	3.699	1.132

Panel C. Models with entropy balancing weights Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*
CORPCULTURE	0.806***	1.655***	1.218***	0.0301***	0.003***
	(0.179)	(0.314)	(0.255)	(0.006)	(0.001)
CONST and CONTROLS	Yes	Yes	Yes	Yes	Yes
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480	1,480
R-squared	0.199	0.182	0.178	0.127	0.126
Adj R-squared	0.168	0.151	0.147	0.094	0.093
F (Sig)	6.546 (0.000)	5.855 (0.000)	5.726 (0.000)	3.827 (0.000)	3.814 (0.000)

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

Source(s): Table created by author

Table 8. Addressing selection bias using entropy balancing

simultaneously influence each other). Besides, by incorporating lags of the dependent variables as instruments, GMM helps to control for past effects that might influence current outcomes, crucial in dynamic settings where past transparency levels could impact current corporate culture or vice versa.

Table 9 presents GMM estimation results for five different transparency measures (*TRNSP1* to *TRNSP5*), each representing different aspects of financial reporting clarity. The significant Wald chi^2 statistics across all models indicate that the models are overall highly significant. The results of Arellano-Bond tests, i.e., AR(1) and AR(2), show negative first-order autocorrelation and no second-order autocorrelation for most models, which is a desired outcome in GMM to ensure that the error terms are not serially correlated beyond the first lag. This confirms that the model specification is appropriate and that the moment conditions are valid. In addition, Hansen tests are generally not significant, suggesting that the over-identifying restrictions are valid, and thus, the instruments used in the model are appropriate.

The main variable of interest, *CORPCULTURE*, shows a positive and statistically significant relationship with all measures of transparency, indicating that a stronger emphasis on corporate culture is associated with higher transparency in financial reporting. The consistency of these results across different measures of transparency underscores the robustness of the findings. The inclusion of lagged dependent variables (*LAG_TRNSP1* to *LAG_TRNSP5*) helps address potential dynamic elements of the transparency measures. Significant coefficients on these lags indicate that past values of transparency continue to influence current levels, justifying their inclusion in the model to capture these dynamic effects.

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*
CORPCULTURE	0.825*	1.476*	1.486*	0.120***	0.012***
	(0.460)	(0.868)	(0.763)	(0.031)	(0.003)
LAG_TRNSP1	−0.167***				
	(0.053)				
LAG_TRNSP2		−0.132**			
		(0.067)			
LAG_TRNSP3			−0.057		
			(0.091)		
LAG_TRNSP4				0.121*	
				(0.073)	
LAG_TRNSP5					0.143**
					(0.070)
CONST and CONTROLS	Yes	Yes	Yes	Yes	Yes
YEAR_FE	Yes	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes	Yes
Observations	1,258	1,258	1,258	1,258	1,258
Wald χ^2 (Sig)	2265 (0.000)	200.2 (0.000)	295.7 (0.000)	611.1 (0.000)	1322 (0.000)
AR(1) test	Z = −3.58	Z = −3.39	Z = −3.10	Z = −2.21	Z = −2.57
	(0.000)	(0.001)	(0.002)	(0.027)	(0.010)
AR(2) test	Z = −1.85	Z = 0.10	Z = 1.00	Z = 1.18	Z = 1.19
	(0.064)	(0.918)	(0.318)	(0.236)	(0.233)
Hansen test	χ^2 = 124.52	χ^2 = 123.81	χ^2 = 126.96	χ^2 = 107.93	χ^2 = 103.32
	(0.083)	(0.090)	(0.063)	(0.376)	(0.500)

Table 9. GMM estimation validity tests

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***p < 0.01, **p < 0.05, *p < 0.10

Source(s): Table created by author

Complementing our comprehensive statistical approach, we integrate PSM to explore how corporate culture influences financial reporting transparency within Iranian firms. This method is essential for minimizing selection bias in observational studies where experimental design is not feasible, as suggested by previous research (e.g., Cho *et al.*, 2023; Maharjan and Lee, 2022; Shipman *et al.*, 2017). The first step in our PSM approach involved calculating propensity scores through logistic regression. For this, we transformed the corporate culture variable into a dummy variable, categorizing firms with a high emphasis on corporate culture (treatment group, *HIGHCORPCULTURE* = 1, above the median) and those with a low emphasis (control group, *LOWCORPCULTURE* = 0, below the median). We included a range of covariates, such as firm characteristics and governance measures, to ensure a comprehensive analysis. This setup allowed us to match firms from the treatment group with those from the control group based on similar observed characteristics, enhancing the robustness of our findings.

The balance check, a crucial step in PSM, confirmed the effectiveness of our matching process. As shown in Panel A of Table 10, most variables such as *ACSIZE* and *BDINDEP* exhibited a %-bias of less than 10%. The *t*-test results supported these findings with high *p*-values, suggesting minimal differences between the treatment and control groups across the covariates. Additionally, the variance ratios for these variables were generally close to 1, indicating successful matching and balance between the groups. After ensuring a balanced match with 1,060 observations, we analyzed the impact of corporate culture on financial reporting transparency. The regression results, as shown in Panel B of Table 10, highlighted significant relationships between corporate culture (*CORPCULTURE*) and various measures of transparency (e.g., *TRNSP1* to *TRNSP5*). Specifically, *CORPCULTURE* demonstrated a statistically significant positive relationship with these transparency measures, indicating that firms with a pronounced emphasis on corporate culture tend to exhibit higher transparency in financial disclosures. This rigorous application of PSM has allowed us to confidently attribute observed differences in transparency to variations in corporate culture, minimizing confounding influences and bolstering the credibility of our main findings [6].

6.3 Evaluating the impact of corporate culture on risk disclosure practices

In this section, we delve deeper into the examination of risk disclosures, a pivotal element of financial transparency. Risk disclosures provide a multifaceted view of a company's operational, financial, and strategic circumstances (Lajili *et al.*, 2024). Unlike traditional financial reporting metrics, which may only reflect the end results of various risks and decisions, risk disclosures offer insight into the ongoing management practices and the potential future challenges and opportunities the company might face (Amran *et al.*, 2009; Abraham and Shrives, 2014). In contexts like the Iranian market, where economic and political conditions can rapidly change, these disclosures become especially crucial. They serve as a barometer for stakeholders to gauge not only the current health of the company but also its resilience and strategic foresight (Linsley and Shrives, 2006). Drawing inspiration from the categorization framework by Lajili *et al.* (2024), we adopt a similar approach to analyze risk disclosures by Iranian firms. Our focus narrows to three key subcategories, including business, operational, and financial risk. For detailed subcategory definitions, please refer to Appendix 2.

Our analysis identifies where these risks are disclosed, categorizing them within the "Analysis of Firms' Risk" section in MD&As. This categorization helps us understand the emphasis Iranian firms place on different types of risks. We integrate this analysis into the existing text mining framework of the study, introducing additional coding dimensions for risk-related terms and phrases. Following the methodology established by the corporate

	Mean			Statistics		
	(1) Treatment	(2) Control	(3) %Bias	(5) *t*-test	(6) *p*-value	(7) V(T)/V(C)
Panel A. Balance Check after PSM [Treatment (HIGHCORPCULTURE = 1) Vs. Control (LOWCORPCULTURE = 0)]						
ACSIZE	2.522	2.508	1.1	0.21	0.832	1.09
ACIND	0.288	0.305	−8.1	−1.52	0.128	0.77*
ACFEXPRT	0.331	0.286	9.6	1.89	0.059	
INSTOWN	0.665	0.674	−2.9	−0.62	0.532	0.84*
BDINDEP	0.653	0.648	2.8	0.57	0.569	0.95
BDSIZE	5.032	5.016	6.5	1.29	0.199	2.66*
AUDOPN	0.416	0.453	−7.4	−1.45	0.147	
AUDTEN	4.434	4.800	−8.9	−1.6	0.111	0.94
AQ	−0.487	−0.522	9	1.78	0.075	1.14
MB	4.074	4.552	−9.3	−2.01	0.044	0.9
ROA	0.168	0.178	−6.3	−1.23	0.218	0.98
INVREC	0.494	0.516	−11.7	−2.26	0.024	1.09
DEBTRATIO	1.967	2.161	−9.3	−1.77	0.077	0.75*
INVEST	0.387	0.365	5	1.07	0.285	1.25*
STDSALE	0.312	0.301	3.9	0.79	0.43	1.43*
STDOCF	0.093	0.097	−5.6	−1.14	0.254	1.09
AGE	3.592	3.564	7.2	1.39	0.164	1.02
FINANCING	0.582	0.607	−5.1	−0.99	0.321	
ZMJSCORE	−2.239	−2.063	−9.7	−1.84	0.066	0.88
Overall Balance	Ps R2	0.021		MedBias	7.2	
	LR χ^2	45.18		B	34.7	
	$p > \chi^2$	0.001		R	0.87	
	MeanBias	6.8		%Var	38	

Variables	*TRNSP1*	*TRNSP2*	*TRNSP3*	*TRNSP4*	*TRNSP5*
Panel B. Post-matching Regression Results					
CORPCULTURE	0.753***	1.433***	1.048***	0.084***	0.008***
	(0.203)	(0.413)	(0.350)	(0.019)	(0.002)
CONST and CONTROLS	YES	YES	YES	YES	YES
YEAR_FE	YES	YES	YES	YES	YES
INDUSTRY_FE	YES	YES	YES	YES	YES
Observations	1,060	1,060	1,060	1,060	1,060
R-squared	0.211	0.185	0.186	0.284	0.264
Adj R-squared	0.172	0.145	0.145	0.248	0.227
F (Sig)	7.808 (0.000)	5.210 (0.000)	5.286 (0.000)	3.155 (0.000)	3.602 (0.000)

Table 10.
Addressing Selection Bias Using Propensity Score Matching (PSM)

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

Source(s): Table created by author

culture bag-of-words approach used in the main analysis, we have developed a unique bag of words for each risk dimension—business, operational, and financial risks. Additionally, we have created individual indexes for each risk category to quantify their respective disclosures (*BUSINESSRISK*, *OPERATIONALRISK*, and *FINANCIALRISK*). Furthermore, a total index has been constructed, which represents the sum of the three individual risk indexes (*TOTALRISK*). The natural logarithm of the total occurrences plus one (Ln + 1) is applied to each individual dimension's index and the total index. These indexes serve as alternative variables for assessing the transparency of financial reporting, providing a more nuanced alternative to traditional measures of readability and tone.

The regression results indicate a strong and statistically positive significant relationship between corporate culture and the disclosure of business and operational risks, suggesting that firms with robust cultural attributes related to transparency are more likely to provide comprehensive risk information, as demonstrated in Table 11. The strong positive coefficients for business and operational risks demonstrate the influence of corporate culture on these specific areas of risk management. Although the impact on financial risk disclosures is smaller, it remains significant, highlighting that different aspects of corporate culture variably influence each risk category. The high R-squared values for business and operational risks, in particular, suggest that these models explain a substantial portion of the variance in risk disclosures, underscoring the importance of corporate culture in shaping how firms communicate risks.

6.4 Cross-sectional analysis by industry and firm size

In this section, we have conducted a cross-sectional analysis to examine how corporate culture affects financial reporting transparency across different industry types and firm sizes. This approach allows us to explore the heterogeneity in corporate disclosure practices and to better understand the contextual factors that might influence these practices. The analysis was divided into two main segments: by industry and by firm size. First, we focused on the four largest industries by number of observations in our dataset. These industries include Machinery (245 observations), Pharmaceuticals (183 observations), Metals (168 observations), and Cement (158 observations). Each industry was selected based on the frequency of its occurrence within our sample, ensuring that our analysis covers sectors with significant representation in the data. Second, firms were categorized based on the natural logarithm of their total assets (*SIZE*) into three size categories: small (first quartile), medium (second and third quartiles), and large (fourth quartile). This categorization allows us to assess how firm size, as a proxy for resources and potential regulatory scrutiny, impacts transparency.

The untabulated results indicate that larger industries and bigger firms show statistically more significant effects of corporate culture on transparency than smaller industries and smaller firms. This suggests that in larger firms and more dominant industries, where there is likely more at stake in terms of regulatory compliance and investor scrutiny, a well-defined corporate culture that emphasizes transparency can be a crucial asset (Vishwanath and Kaufmann, 2001). Larger firms, equipped with more substantial resources, are better positioned to invest in sophisticated transparency-enhancing practices such as

Variables	*BUSINESSRISK*	*OPERATIONALRISK*	*FINANCIALRISK*	*TOTALRISK*
CORPCULTURE	0.852***	1.049***	0.134***	1.037***
	(0.015)	(0.014)	(0.017)	(0.011)
CONST and CONTROLS	Yes	Yes	Yes	Yes
YEAR_FE	Yes	Yes	Yes	Yes
INDUSTRY_FE	Yes	Yes	Yes	Yes
Observations	1,480	1,480	1,480	1,480
R-squared	0.753	0.846	0.165	0.887
Adj R-squared	0.743	0.840	0.134	0.883
F (Sig)	80.34 (0.000)	144.5 (0.000)	5.226 (0.000)	207.8 (0.000)

Note(s): Standard errors in parentheses. Variable definitions are located in Appendix 3. ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$

Source(s): Table created by author

Table 11. Quantitative analysis of corporate Culture's influence on risk disclosures

comprehensive training programs, advanced risk management tools, and robust reporting systems (Graham *et al.*, 2022). Similarly, industries that face intense regulatory scrutiny and competitive pressures, like Pharmaceuticals and Machinery, are likely to cultivate a culture that prioritizes transparency not only as a compliance strategy but also as a competitive edge (Hao *et al.*, 2023). Moreover, our findings suggest that in larger firms, internal governance mechanisms influenced by corporate culture, including clearer accountability structures and transparent audit and compliance functions, significantly contribute to enhanced transparency (de Villiers and Dimes, 2021).

7. Conclusion and reflections

Our investigation into the nexus between corporate culture and financial reporting transparency within the Iranian context has yielded insightful revelations. By analyzing 1,480 firm-year observations from the Tehran Stock Exchange from 2013 to 2022, this study pioneers the use of text mining techniques to quantify the impact of corporate culture, as manifested through the linguistic features of corporate culture within MD&As, on the transparency of financial reporting. The findings of this study establish a significant positive correlation between corporate culture and financial reporting transparency, supporting the principles of Stakeholder and Agency Theories. Our regression analyses indicate that firms with a strong emphasis on corporate culture are more likely to exhibit transparency in their financial disclosures. This transparency is crucial in building trust and effectively managing the economic challenges in Iran.

Practical and managerial implications arising from this study can significantly enhance financial reporting practices and foster the development of more effective governance models, particularly in Iran and comparable markets. Firms are encouraged to prioritize a corporate culture that values transparency, accountability, and openness. It is advisable for leadership training programs to emphasize ethical behavior and clear communication strategies, which align with transparency goals (Schwartz, 2013). Furthermore, boards should engage stakeholders actively to tailor reporting practices that meet the specific needs and expectations of diverse groups. Regulatory bodies are also implicated in these findings. There is an opportunity for regulators to formulate policies that promote transparent reporting and to develop compliance standards that reflect the unique corporate and cultural nuances of Iran, thereby ensuring culturally congruent reporting practices (Cooke and Wallace, 1990). From a managerial standpoint, fostering a transparent corporate culture is essential. Managers should emphasize ethical behavior and accountability in internal communications and training to support these initiatives (Parris *et al.*, 2016; Men, 2014).

Additionally, the study underscores the benefit of enhanced transparency in improving investor relations. Companies that provide clear and comprehensive financial disclosures are likely to attract more stable and long-term investments (Aksu and Kosedag, 2006), which is vital for navigating the economic context of Iran. Lastly, the findings suggest the necessity for adaptable international reporting standards that take into account cultural differences, thus aiding multinational companies operating in Iran and similar markets in designing their financial reporting strategies to accommodate these differences (Paula Silva *et al.*, 2021).

However, this study is not without limitations. The focus on Iranian firms, while shedding light on a unique institutional setting, may limit the generalizability of the findings to other contexts with different cultural and regulatory frameworks. Additionally, the reliance on text mining techniques, although innovative, might overlook the nuances of language that require deeper qualitative interpretation. The complexity and tone of financial reporting, while measured quantitatively, could be subject to subtleties that extend beyond the scope of algorithmic analysis. Future research opportunities abound in this rich area of study.

Scholars may explore similar analyses in different cultural and regulatory environments to compare with the findings from Iran, thus contributing to a more global understanding of how corporate culture affects financial transparency. Further research could also incorporate longitudinal studies to examine how shifts in corporate culture over time impact reporting practices. The integration of qualitative methods, such as interviews or case studies, could provide additional depth to the understanding of how language reflects corporate culture and influences stakeholder perception.

Notes

1. For the processing of Persian text, the Hazm library was utilized due to the constraints in the NLTK Python package for the Persian language. This library carries out tasks such as text cleaning, tokenizing, lemmatizing, POS tagging, shallow parsing, and dependency parsing. It provides interfaces for Persian corpora and is compatible with NLTK (https://pypi.org/project/hazm/and https://github.com/roshan-research/hazm).
2. In the Iranian context, MD&A sections are issued separately from the financial statements, unlike in the U.S. market where they are integrated into one document, such as the 10-K filings. This separation highlights the distinct importance and role of MD&A disclosures in providing narrative insights into a company's operations, strategies, and management perspectives. MD&A sections are particularly suited for the analysis of corporate culture due to their comprehensive narrative on a company's operations, strategies, and management perspectives, providing qualitative insights that reflect the underlying values, practices, and attitudes prevailing within an organization.
3. The Dehkhoda Dictionary, the most comprehensive Persian encyclopedic dictionary ever published, consisting of 200 volumes (https://en.wikipedia.org/wiki/Dehkhoda_Dictionary), and the Mo'in Encyclopedic Dictionary, the second largest Persian language encyclopedic dictionary curated by Mohammad Mo'in (https://en.wikipedia.org/wiki/Moin_Encyclopedic_Dictionary) were used for translating the key terminologies.
4. The number of keywords for each dimension is 108 for Creativity and Competition, 71 for Control, and 86 for Collaborate. In additional tests conducted separately for each dimension—Creativity, Competition, Control, and Collaborate—we examined the regression results and tested hypotheses to discern the distinct impact of each dimension.
5. Kaggle's Sentiment Lexicons is considered the most reliable resource, covering 81 languages (https://www.kaggle.com/datasets/rtatman/sentiment-lexicons-for-81-languages). This dataset includes 860 positive and 1394 negative words. We used two measurements for *Tone* in our study, calculating these measures in financial statements (Rajabalizadeh, 2023).
6. The application of the Instrumental Variable (IV) approach was considered in the initial stages of our study to address potential endogeneity. However, the IV method proved less effective due to challenges in identifying strong and valid instruments within the context of Iranian firms. Specifically, the potential instruments did not exhibit sufficient statistical significance or failed robustness tests for endogeneity and overidentification, indicating their limited utility for our analysis. This limitation highlights the inherent difficulties in applying IV techniques in settings where external influences on corporate culture and transparency are complex and not readily quantifiable. Consequently, we prioritized more robust methods such as GMM and PSM, which provided more reliable insights into the dynamics of corporate culture and transparency.

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Appendices

Appendix 1

Table A1. Corporate culture bag-of-words

Create (CRE)

- Adapt*, begin*, chang*, creat*, discontin*, dream*, elabor*, entrepre*, envis*, experim*, fantas*, freedom*, futur*, idea*, init*, innovat*, intellect*, learn*, new*, origin*, pioneer*, radic*, risk*, start*, thought*, trend*, unafra*, ventur*, vision*

Competition (COM)

- Achiev*, acqui*, aggress*, agreem*, attack*, budget*, challeng*, charg*, client*, compet*, customer*, deliver*, direct*, driv*, excellen*, expand*, fast*, goal*, hard*, invest*, market*, mov*, outsourc*, performanc*, position*, pressur*, profit*, rapid*, reputation*, result*, revenue*, satisf*, scan*, signal*, speed*, strong*, success*, superior*, target*, win*

Control (CON)

- Boss*, bureauc*, cautio*, chief*, conflict*, conservat*, control*, detail*, document*, efficien*, error*, expectat*, fail*, inform*, logic*, method*, monit*, norm*, outcom*, procedur*, regular*, solv*, standard*, uniform*

Collaborate (COL)

- Capab*, certain*, cohes*, collab*, collectiv*, commit*, consens*, cooperat*, coordin*, cultur*, decentr*, employ*, empower*, engag*, facilitator*, help*, hir*, human*, interper*, involv*, life*, loyal*, mentor*, mutual*, parent*, particip*, partner*, people*, relation*, retain*, reten*, skill*, social*, team*, train*, workgroup*

Source(s): Fiordelisi and Ricci (2014)

Appendix 2

Table A2. Risk disclosures subcategories/ keywords

Business risk

- Business strategy and innovation, Commodity prices, Competitiveness, loss of market share, Concentrations, Economic conditions, International operations, Location (including political risk), Mergers and acquisitions, Product mix, Protection of trademarks/intellectual property, Regulations, Reputation

Operational risk

- Accidents and natural disasters, Business interruption, Distribution, Fraud and error, Inaccurate reporting, Inefficient operations, Logistics (insufficient resources), Personnel (human error, labor disputes, loss of/recruiting key employees), Production and production technology (technical failure, apart from environmental incidents), Supply chain

Financial risk

- Interest rate risk, Currency risk, Liquidity risk, Credit risk, Financial instrument/derivatives use risk, Stock price risk

Source(s): Lajili *et al.* (2024)

Appendix 3

Dependent variables	
TRNSP1	= −1 × [0.4 × (number of words / number of sentences + 100 × (number of words with more than two syllables / number of words))]
TRNSP2	= −1 × [4.71 × (characters/words) + 0.5 × (words/sentences) – 21.43]
TRNSP3	= −1 × [0.39 × (number of words/number of sentences) + 11.8 × (number of syllables/ number of words) – 15.59]
TRNSP4	= (Positive words – Negative words) / (Positive words + Negative words)
TRNSP5	= (Positive words – Negative words) / Total words
Main independent variable	
CORPCULTURE	= The total occurrences of corporate culture-related words (373 keywords) across MD&A text files, quantitatively measuring the multifaceted dimensions of corporate culture (Creativity, Competition, Control, Collaboration) within the Iranian business context.
Control variables	
ACSIZE	= Number of members on the audit committee
ACIND	= The proportion of independent directors on the audit committee
ACFEXPRT	= The percentage of financial experts on the audit committee
INSTOWN	= The percentage of the company's shares owned by institutional owners
BDINDEP	= The percentage of independent directors on the board of directors
BDSIZE	= Total number of directors on the board
AUDOPN	= 1 if the audit opinion is qualified, 0 for the unqualified audit opinion
AUDTEN	= Auditor tenure in years
AQ	= Accrual quality, calculated based on the Dechow and Dichev (2002) model.
MB	= Market-to-book ratio calculated as the firm market value by its book value
ROA	= Operating income divided by total assets
INVREC	= The sum of inventory and accounts receivable divided by total assets
DEBTRATIO	= Debt_to_equity ratio computed as total liabilities divided by total equity
INVEST	= Current assets less debtors and inventories divided by current liabilities
STDSALE	= 5-year standard deviation of total sales scaled by lagged total assets
STDOCF	= 5-year standard deviation of operational cashflow scaled by lagged total assets
AGE	= The natural log of the number of years since the firm gets listed in the market
FINANCING	= An indicator variable that equals one if the sum of new long-term debt plus new equity exceeds 2 percent of lagged total assets
ZMJSCORE	= Altman's Z-score is computed as: [(1.4 × retained earnings + sales + 3.3 × pre-tax income +1.2 × (current assets−current liabilities)) ÷ total assets]
Additional variables	
CRECULT	= (Creativity) The total occurrences of creativity-related keywords (108 keywords) within MD&A text files, reflecting the emphasis on innovation, originality, and creative problem-solving in corporate disclosures.
COMCULT	= (Competition) The total occurrences of competition-related keywords (108 keywords) within MD&A text files, indicating the degree of competitive drive, market positioning, and rivalry emphasized in corporate disclosures.
CONCULT	= (Control) The total occurrences of control-related keywords (71 keywords) within MD&A text files, measuring the focus on regulation, governance, and control mechanisms within corporate disclosures
COLCULT	= (Collaboration) The total occurrences of collaboration-related keywords (86 keywords) within MD&A text files, assessing the emphasis on teamwork, partnership, and collaborative efforts in corporate disclosures
LAG_TRNSP	= Previous period values of the transparency measures (*LAG_TRNSP1* to *LAG_TRNSP5*).
BUSINESSRISK	= The natural logarithm of the total count of business risk-related words plus one
OPERATIONALRISK	= The natural logarithm of the total count of operational risk-related words plus one
FINANCIALRISK	= The natural logarithm of the total count of financial risk-related words plus one
TOTALRISK	= The sum of *BUSINESSRISK*, *OPERATIONALRISK*, and *FINANCIALRISK*
SIZE	= The natural logarithm of total assets

Source(s): Table created by author

Table A3. Variables definition