Ferdowsi University of Mashhad Press (FUMP)

Volume 8, Issue 1, Winter 2024

IJAAF

IRANIAN JOURNAL OF ACCOUNTING, AUDITING and FINANNCE

Volume 8, Issue 1, Winter 2024

Serial Number: 26

Print - ISSN: 2717-4131
Online - ISSN: 2588-6142

https://ijaaf.um.ac.ir

IRANIAN JOURNAL OF ACCOUNTING, AUDITING and FINANNCE

In the Name of God, the Compassionate, the Merciful

Ferdowsi University of Mashhad

Iranian Journal of Accounting, Auditing & Finance (IJAAF)

Volume 8, Number 1, Winter 2024, Serial 26

ISSN (Print): 2717-4131, ISSN (Online): 2588-6142

Editorial Office: Faculty of Economics and Administrative sciences, Ferdowsi University of Mashhad, Azadi Sq., Mashhad; IRAN; P.O. Box: 1793; Postal Code: 9177948974; Tel: +98 51 38803742; Fax: +98 51 38763852
http://ijaaf.um.ac.ir E-mail: ijaaf@um.ac.ir

Table of Contents

Editorial Board

Received articles will be published after professional referee, and being approved by the editorial board. Submission to this Journal is required to send at least two files include: an "Article cover" and an "Anonymous file of the main article", through systems, http://ijaaf.um.ac.ir/ .Submission of a manuscript implies that the paper has not been published before and it is not under consideration for publication elsewhere. Please pay attention to the following:

1-Article Cover

The file should be typed in Word software (office), and A4 sized page which include:

- Full title of the paper centered in Times New Roman 16.
- Author's name centered in Times New Roman 12 (Bold),
- Author's characteristics centered in Times New Roman 11 (italics), including the authors' name (the name of correspondence author should be marked with an asterisk), academic rank and the name of the institution or university (do not use pseudonym and nickname), complete address, telephone number and fax of correspondence author and e-mail address of all authors.

2- Anonymous file of the main article

The main article should be typed in Word software (office), A4 sized page and utmost in 7500 words (including references), and numbered pages while page margins are as follows: margin from the above 4 cm, from the below 5/6 cm, from the left 5/4 and from the right 5 cm. The line spacing should be set at 1 cm and the beginning of each paragraph indented about 0.3 cm, the entire text should be Justified and include the following:

The first page:

- Full title of the paper, centered in Times New Roman 16.
- Abstract in Times New Roman 11 and utmost 165 words, including four issues: (1) Subject and purpose of the paper, (2) methodology, (3) findings, and (4) conclusions, and Contribution (maximum).
- Utmost 5 keywords in Times New Roman
- Subject classification code in Times New Roman This coding is designed for subject classification in economic literature and how to use it in detail is available on the following website:www.aeaweb.org/journal/jel_class_system.html
- The main titles in manuscript (including abstract, introduction, literature review, methodology, findings and Conclusion) left aligned in Times New Roman 12(Bold) and sub-titles (such as Keywords, subject classification code and other necessary(important) titles) left aligned in Times New Roman 11(bold) and in the left alignment, content of main manuscript in Times New Roman
- As far as possible, do not use any image in the text and if used, it should be high- quality black and white photos.

Structure of second page until the end of manuscript is as follow:

- *Introduction* Some paragraphs contain explaining the problem, literature review, object (purpose), importance and necessity of it.
- *Literature review* a review of the literature investigates only related researches chronologically and the results exploit at the end of the section theory matrix or conceptual model that document research variables and Formulate research hypotheses.
- *Methodology* including Methods, data collection tools, population, sample size and sampling methods, analysis and model testing hypothesis, definition of study variables and operational definition of them can be in presented the same section that model testing is represented and there is no need to repeat.
- *Results* including the findings compare it with the findings of previous and interpretation of compliance or inconsistency of findings with research findings and theories.*Conclusion* includes a summary of the problem, provide a summary of the results and overall conclusion and

recommendations based on the results (policy recommendations is necessary only in applied research and, if necessary, recommendations for future research accordant with the research limitations or how development of current research;
- *References* are as Section 3-2 and
- *Endnotes* terminology and some necessary explanations provide in the endnote (no footer) and as a two-column table (contains the endnote number and content of endnote with invisible lines (No Border). Numbering the endnotes are as text and doing without the use of EndNote technique.

3- Other important points in the original file

3-1- References inside the text

- In order to reference within the text (APA) method should be used; so the author's last name with the year of publication it is presented in the text respectively. If there are two authors, last names' will be separated by "and" and if more than three people, "et al." will be used
- After the last name of the first author. If the number of resources is more than one, a semicolon (;) will be used to separate them.
- Any reference which is mentioned in the article, must be included in references part.
- If it is required to explain more about terms or words within the text, endnote can be used.

3-2- References

To set the reference list, use the (APA) method, as follows:
Books: Author, A.A. (Year of Publication). *Title of work*. Publisher City, State: Publisher.
When citing a book in APA, keep in mind:

- Capitalize the first letter of the first word of the title and any subtitles, as well as the first letter of any proper nouns.
- The full title of the book, including any subtitles, should be stated and *italicized*.
- Magazines: Author, A.A. (Year of Publication). Title of the Article. *Journal Title*, *Volume* (Issue), pp.-pp.
- When citing a magazine in APA, keep in mind:
- You can find the volume number with the other publication information of the magazine.
- You can typically find page numbers at the bottom corners of a magazine article.
- If you cannot locate an issue number, simply don't include it in the citation.
- Online magazine article: Author, A.A. (Year). Title of the Article. *Magazine Title*, *Volume* (Issue), Retrieved from http://xxxx
- When creating an online magazine citation, keep in mind:
- The volume and issue number aren't always on the same page as the article. Check out the other parts of the website before leaving it out of the citation.
- List of references should not be numbered. If there are 2 or more authors alike, in addition to alphabetical order, the publisher year also should be ordered. In order to avoid the pitfalls of the various sources listed, the beginning of each reference is 0/5 cm protrusion.
- If there are two authors, last names' will be separated by "and" and if more than three people, last names' will be separated by a comma (,) and the last one with "and".

3-3- Charts, Tables and Formulas

Charts' title should be writhen below and tables' title on the top centered in Times New Roman 11 and Bold. Charts and tables render within the text and immediately place after the explaining paragraph. The content of charts and tables in Times New Roman 10

- Tables and images number from No. (1) To refer to the content of the images and diagrams in the text, use the number and appropriate referral.
- Inserting decimal numbers, instead of using slash (/), and show negative numbers by using the minus sign.
- Tables include variables, should contain a column for the symbols used for variables.

- Formulas represent centered in Times New Roman11and render in a two column table with no border and number with figure in parentheses.

3-4- Other notes

- There is no need to spaces before dot, comma, semicolon, colon, question mark, exclamation mark and, but after these signs shall be placed a spaces.
- Use spaces before opening and after the closing parenthesis.
- Articles should not be sent to Persian/English journal or another language at home and/or abroad simultaneously.
- If the format and structure of submitted articles are not same as what mentioned in this guide, it won't be accepted.
- Journal can edit and delete some sections, without any change in its content and received journals will not bring.
- Responsibility for the accuracy of the article is the author.
- The file should be named in English. This name should include the first author's last name and sending date. Articles will be received only by Journal Website.
- In order to expedite the referee process and publishing an article, we will ask respected professors and researchers to ensure technical and literary editing and enforce this guide.

The journal is devoted to research papers. Research paper is extracted from the research project, master's dissertation or thesis.

Receiving the papers is only possible electronically.

Editor's Note

I am pleased to announce that the Ferdowsi University of Mashhad is publishing Iranian Journal of Accounting, Auditing & Finance (IJAAF). On behalf of the board of the IJAAF and my co-editors, I am glad to present the Volume 1, Issue 1 of the journal in December 2017; the journal will publish four issues in a year. The board includes experts in the fields of accounting, finance and auditing, all of whom have proven track records of achievement in their respective disciplines. Covering various fields of accounting, *IJAAF* publishes research papers, review papers and practitioner oriented articles that address significant issues as well as those that focus on Asia in particular. Coverage includes but is not limited to:

- Financial accounting
- Managerial accounting
- Auditing
- Taxation
- Accounting information systems
- Accounting education

Perspectives or viewpoints arising from regional, national or international focus, a private or public sector information need, or a market-perspective are greatly welcomed. Manuscripts that present viewpoints should address issues of wide interest among accounting scholars internationally and those in Asia in particular.

Yours faithfully,
Mahdi Moradi
Editor in Chief

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

Marketing in Auditing: Application of the 7P Model

Oktay Yamrali, Hossein Fakhari*, Meysam Shirkhodaie

Department of Accounting, Faculty of Economics and Administrative Sciences, University of Mazandaran, Babolsar, Iran

How to cite this article:
Yamrali, O., Fakhari, H., & Shirkhodaie, M. (2024). Marketing in Auditing: Application of the 7P Model. Iranian Journal of Accounting, Auditing and Finance, 8(1), 1-16. doi: 10.22067/ijaaf.2024.44012.1313
https://ijaaf.um.ac.ir/article_44012.html

ARTICLE INFO

Article History
Received: 2022-08-29
Accepted: 2023-11-25
Published online: 2024-01-01

Keywords:
Marketing Mix, Audit Profession, The Best-Worst Method

Abstract

Effective and efficient marketing is a vital tool for promoting any business. Consequently, establishing criteria for assessing marketing quality remains a contentious topic within marketing studies. Given its significance, the service sector necessitates distinct marketing criteria and dedicated research due to its unique characteristics. This study explores the feasibility of applying the 7P model in the auditing profession as a dimension of marketing quality. In this research, we adopted a mixed-method approach. Initially, we conducted semi-structured interviews with 26 professional experts in 2022 to gather data. The research goal was pursued using content analysis. After the coding stage, aimed at extracting the marketing techniques employed by auditing firms in Iran, data saturation was achieved through 21 additional interviews. Once auditing firms' marketing techniques were identified, eight auditing experts ranked them using the best-worst method. This ranking revealed that the "promotions" element, with a weighting factor of 0.277, secured the top position, while the "location" element occupied the seventh place with a weighting factor of 0.0821. These findings hold valuable implications for policymakers in the auditing profession, enabling them to formulate well-informed marketing strategies for audit firms.

https://doi.org/10.22067/ijaaf.2024.44012.1313

NUMBER OF REFERENCES
28

NUMBER OF FIGURES
3

NUMBER OF TABLES
5

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Hossein Fakhari
Email: h.fakhari@umz.ac.ir
Tel: 09111271577
ORCID: 0000-0003-4192-6582

1. Introduction

The ongoing transformation in contemporary marketing, encompassing digital marketing (Tiago and Veríssimo, 2014), relationship marketing (Esfidani et al., 2018), and social network marketing (Tiago and Veríssimo, 2014; Mudondo, 2021), within both industrial and service sectors, bearing a commercial focus, has yielded significant consequences. This transformation has profoundly impacted the auditing field, which had long lacked a defined approach to marketing, and its code of conduct did not prescribe preferred marketing methods. This emerging trend, combined with intense competition within the auditing market and the ethical constraints placed on professionals, has prompted a critical reevaluation of marketing strategies within the auditing profession. Additionally, the shift from a public interest-oriented approach to a more commercial one, driven by competition in the auditing market, has heightened the need to develop new marketing methods and thoroughly examine the auditing profession. The credibility of the auditing profession, with its core assurance function, is inherently tied to adherence to rules and codes of conduct. Consequently, it is anticipated that marketing techniques within the auditing profession must align with standards grounded in integrity, objectivity, competence, professional care, confidentiality, professional conduct, professional principles, and rules (Arbab Soleimani, 2013). These principles are established based on conventions that form the fundamental basis of professional activities. Effectively implementing marketing strategies in auditing can yield various benefits, including increased market share, enhanced revenue, and improved brand recognition (Nasution, Dirbawanto, and Siregar, 2023). Furthermore, these strategies play a crucial role in cultivating a positive reputation for auditing firms, a key element in gaining the trust and confidence of clients.

While instances of the erosion of ethical standards due to non-compliance with professional conduct norms within the auditing profession have been well-documented at the international level, including notorious cases involving auditors' involvement in the downfall of major corporations like Enron, Tico, Edfi, etc. (Hassas Yeganeh, 2013), which resulted in far-reaching consequences, such as disruptions in auditors' workflows (Ganji and Arab Mazar Yazdi, 2021), a similar situation has emerged in Iran. Following the establishment of the Iranian Association of Certified Accountants (IACPA) in 2010, the competitive landscape of the auditing market underwent significant transformation. This transformation, driven by a substantial increase in the bargaining power of clients (Mehrbanpour, Karami, and Jandaghi Ghomi, 2021), coupled with lapses in adherence to certain principles of the code of conduct within the profession, such as the use of exaggerated advertising (Shuja' Banimahd and Vakilifard, 2017), dishonesty (Maranjuri et al., 2017), the occurrence of opinion shopping (Amiri and Fakhari, 2020; Amiri and Fakhari, 2020), and a failure to commit to the quality of audit reports (Broberg, Umans, and Gerlofstig, 2013), has raised significant concerns among professional members. These concerns are centered around the potential damage to the profession's reputation.

Upon analyzing these factors, it becomes evident that the primary reason behind these violations is the failure to adhere to the code of conduct within the auditing profession, compounded by a lack of sufficient knowledge among staff. Nevertheless, marketing within the audit service industry stands apart due to the distinct characteristics of its nature (professionalism) and function (assurance). It is subject to specific factors and requirements that can yield divergent outcomes. Consequently, it is imperative that marketing within the auditing profession aligns with professional standards while also adhering to international marketing principles. Auditing practitioners should, therefore, take into account the considerations and limitations stipulated in the professional code of conduct when applying marketing concepts and techniques. Furthermore, they should familiarize themselves with the fundamental principles of marketing. Hence, applying new marketing methods tailored to the unique attributes of the auditing profession in Iran is necessary. This includes recognizing that

governmental CPAs provide a significant portion of auditing services for large listed companies. Additionally, the auditing market features specific conditions, including increased competition within the profession in recent years with the entry of professional private auditors (private CPAs), the relatively small size of audit firms, the limited presence of international audit firms (Big 4) in the audit market, and a fundamental shift like the audit function from a public interest approach to a more commercial one.

Hence, addressing this research gap, the current study aims to explore the principles and concepts of the marketing mix to assess the potential application of its components within the auditing profession. Through this examination, the profession can equip auditors to evaluate the suitability of implementing scientific marketing methods in auditing firms. This, in turn, will aid them in selecting and implementing marketing strategies that align with the established code of conduct.

The remainder of the article is dedicated to elaborating on the theoretical framework, exploring the research background, presenting the methodology, discussing the findings, and offering recommendations.

2. Theoretical Framework

Marketing within the auditing profession has garnered considerable attention in recent years. It plays a pivotal role in fostering and sustaining client relationships, setting the auditing firm apart from competitors, and positioning it as an industry leader. Consequently, it is paramount for audit firm managers to strive to adopt the most effective marketing methods. Yet, a pertinent question arises: How can these managers successfully achieve this objective? Addressing this question necessitates understanding the factors that influence marketing, a discussion of which follows.

2.1 Marketing mix and marketing triangle in the service sector

In marketing literature, the marketing mix, as proposed by Sidorkiewicz and Orfin-Tomaszewska (2023), typically encompasses a set of variables that fall within a company's sphere of control and can influence customers' purchasing decisions. Furthermore, effective management can leverage these variables to target specific market segments and formulate an appropriate marketing strategy. Under the current understanding of the marketing mix, often represented as the 7P model, the "product" is defined as the tangible service offering provided. Companies should begin by understanding their target market comprehensively, allowing them to design their offerings accordingly. This necessitates a dual emphasis on service excellence and customer-centric practices (Enerson, Mason, and Corbishley, 2016), ultimately creating customer value (Lin, 2011). Within this element, discussions encompass product diversity, quality, specifications, brand identity, size, packaging, and warranty (Hasan Qalipour and Sharifi, 2014). The "price" element encompasses factors related to the pricing of services. Prices should be set considering competitors and the prevailing economic conditions (Enerson, Mason, and Corbishley, 2016; Lin, 2011). The price reflects the value customers are willing to exchange for a valuable product (Hasan Qalipour and Sharifi, 2014). It is vital for the marketing department to genuinely understand the requirements and constraints of other departments while devising marketing campaigns. The third element, "distribution" or "place," refers to the physical location of the company and its offices (Lin, 2011), in other words, where the product is made available (Hasan Qalipour and Sharifi, 2014).

The "place" element should be strategically positioned to cultivate a positive image in the minds of business owners and be situated in an area accessible to the target market (Granfeldt and Nastasi, 2019). The "promotion" factor encompasses all facets linked to the company's promotion to the target market, involving various means of customer communication (Enerson, Mason, and Corbishley,

2016; Lin, 2011). In essence, "promotion" encapsulates the amalgamation of personal and informal relationships organizations deploy within a specific timeframe, encompassing elements such as advertising, sales promotion, public relations, personal selling, and direct marketing (Hasan Qalipour and Sharifi, 2014). Enerson, Mason, and Corbishley (2016) advocate for the comprehensive communication and implementation of a company's marketing campaigns throughout the organization. In this model, the participation of all employees in marketing programs assumes a pivotal role (Sidorkiewicz and Orfin-Tomaszewska, 2023), exemplified in the service marketing triangle (Figure 2). The term "physical evidence" pertains to all tangible and visible items, including the office design and work environment, which should project a positive image for the company (Granfeldt and Nastasi, 2019). It can be asserted that buyers' assessments and judgments regarding service quality are substantially influenced by the facilities and physical assets of the service provider (Hasan Qalipour and Sharifi, 2014). The sixth component, "People," encompasses all individuals, including customers, employees, and management, and is intertwined with their commitment to delivering honest service to customers (Lin, 2011). This particular element has been explored separately in previous research, for instance, by Ghasemi, Mehrabanpour, and Talebnia (2023).

The "Process" element encompasses all activities related to marketing policies and procedures (Enerson, Mason, and Corbishley, 2016). In essence, it pertains to the efficient organization of processes to minimize both cost and errors, ensuring the consistent and proper quality of service. This component balances services' supply and demand (Hasan Qalipour and Sharifi, 2014). Enerson, Mason, and Corbishley (2016) recommend that a company's technological system be structured to streamline the marketing process. In this context, the primary responsibility for marketing tasks should be entrusted to qualified employees (Baker and Magnini, 2016).

Figure 1. Market mix: P7 (Adapted from Granfeldt and Nastazi, 2019)

While the marketing mix can be a valuable tool for reaching the target market (Mogaji et al., 2021), it's important to acknowledge that its elements vary across different industries. For instance, in contrast to activities associated with manufacturing and selling goods, the expectations of customers at the outset of a service process are often challenging to define, as highlighted in the context of auditing, which is inherently a service-oriented profession (Grönroos, 1998). It's essential to account for these distinctions when considering marketing strategies for auditing services.

One of the fundamental distinctions in service marketing is the absence of a tangible deliverable feature when consuming a service, as noted by Granfeldt and Nastasi (2019). Consequently, a service's preparatory aspects are critical and must be addressed in advance (Grönroos, 1998). Additionally, the logic of service marketing operates from a distinct perspective concerning purpose and the exchange process, as Baker and Magnini (2016) highlighted. In service marketing, the service itself represents the core of the exchange process, and any product involved serves merely as a facilitator within that process (Baker and Magnini, 2016). It is worth noting that customer-perceived

value is predominantly shaped by a company's customer-centric approach and the effective management of resources rather than relying on predefined characteristics (Grönroos, 1998). Furthermore, as Baker and Magnini (2016) emphasized, employees should be considered essential marketing assets since the interaction between customers and employees significantly influences the success of marketing efforts in service-based companies.

While a company may employ full-time marketing and sales personnel, it is essential to note that not all employees within the company serve as marketers and salespeople (Granfeldt and Nastasi, 2019). This is because, in most service-based companies, employees directly engage with customers and can gather valuable information individually (Baker and Magnini, 2016). Within the service marketing triangle framework, the connection between employees and customers is termed "interactive marketing." This concept illustrates that customers and employees operate as collaborative partners in the service production process, as continuous interaction occurs between employees and customers during the service delivery (Baker and Magnini, 2016).

Figure 2. The service marketing triangle (Source: Grenfelt and Nastasi, 2019, quoted by Grönroos,1998, p. 415).

Furthermore, the service triangle clarifies that in various service processes, a multitude of company employees contribute to creating value for customers. They are directly involved in cross-selling activities, delivery, customer education, service, and maintenance. Essentially, these employees function as part-time marketers, actively participating in the marketing process. It is worth noting that in service-oriented businesses, the number of part-time marketers is often several times greater than that of full-time marketers (Granfeldt and Nastasi, 2019). Full-time marketers within marketing and sales departments have limitations as they cannot maintain continuous, widespread contact with customers at all times and locations (Grönroos, 1998). Hence, it can be argued that internal marketing becomes imperative in service companies. Its role is to train, motivate, and reward employees, ensuring they can deliver high-quality services to customers. This process contributes to continually developing the company's competencies and resource structure (Baker and Magnini, 2016). Consequently, it becomes evident that the enhancement of knowledge and communication among employees of audit firms in applying marketing techniques by professional conduct codes holds significant importance.

2.2 Auditing and marketing mix

There are diverse perspectives on the marketing mix (Sidorkiewicz and Orfin-Tomaszewska,

2023) and its applicability in auditing. O'Donohoe, Diamantopoulos, and Petersen (1991) argue that promotion is just one of the seven elements in the service marketing mix, and a sole focus on it may lead auditors to overemphasize advertising while neglecting other vital marketing strategies (O'Donohoe, Diamantopoulos, and Petersen, 1991). The elements of product and price within the marketing mix offer considerable flexibility. Pricing strategies are generally open to a wide range of options, with the primary constraint being the acceptance of commissions or contingent fees (Granfeldt and Nastasi, 2019, as cited in O'Donohoe, Diamantopoulos, and Petersen, 1991). In such circumstances, auditors can provide clients with various payment terms, except in cases where this might compromise auditor independence. Additionally, essential pricing techniques within the profession include tailoring discounts based on clients' financial capacity, adopting prestige pricing, and applying influence pricing. As for other marketing mix elements (place, people, physical evidence, and processes) do not face more limitations than those encountered in other industries (Granfeldt and Nastasi, 2019).

2.3 Research background

In recent decades, the role of marketing within the auditing profession has garnered substantial attention from researchers, practitioners, and regulators alike (Sidorkiewicz and Orfin-Tomaszewska, 2023). However, a historical review of marketing within the auditing profession reveals that much of the research has predominantly focused on objective marketing methods such as advertising and the direct request approach. It's worth noting that advertising by accountants faced restrictions and bans in the 19th century, enforced by professional bodies in countries like the UK and the USA. This was due to concerns that advertising could mislead customers and harm the profession's reputation (Hay and Knechel, 2010). In the United States, mounting pressure from both the courts and the government led to the lifting the advertising ban in 1978, followed by removing the ban on direct request in 1979. An intriguing perspective in this context was provided by the International Federation of Accountants (IFAC), established in 1977 to promote international harmonization of accounting rules by offering guidance to professional bodies across different nations. Since 1981, their guidance has underscored that advertising by auditors is not desirable and that direct request contradicts fundamental principles (IFAC Guidance, section 12.1). Nevertheless, IFAC left the decision regarding marketing regulations in the audit field to the discretion of each country, taking into account their legal, social, and economic circumstances (O'Donohoe, Diamantopoulos, and Petersen, 1991), which has led to various regulatory developments among professional bodies. Consequently, Constantin and Anton (2011) delved into the relationship between audit service providers and their clients in their research. Their study revealed that unfair competition among auditors could result in price reductions, inadequate customer education, diminished focus on service quality, a lack of empathy among professional members, inadequate advocacy for the role and significance of auditing by professional organizations, reluctance to engage with customers under financial pressures, and frequent professional scrutiny as the key barriers to establishing enduring relationships between auditors and business owners. To nurture long-term business relationships with business owners, the study emphasized the importance of understanding, fairness, honesty, confidentiality, consistent and transparent communication, mutual trust, and a certain level of customer education (Granfeldt and Nastasi, 2019).

In a separate study, Traynor investigated Pennsylvania auditors' attitudes, perceptions, and practices regarding advertising. His research findings revealed a significant correlation between individuals' age and their inclination to utilize advertisements. Specifically, the study highlighted that personal contact methods and referrals held the highest significance among marketing approaches, while social activities were deemed the least influential. These results suggest that, from a customer's perspective, social activities might not be as crucial for business development as accountants might

assume (O'Donohoe, Diamantopoulos, and Petersen, 1991).

In another study by Marts et al., American-certified public accountants' advertising practices were explored. The results indicated that start-up companies tended to employ marketing and advertising methods more extensively than others, with only a few firms adopting long-term marketing plans (O'Donohoe, Diamantopoulos, and Petersen, 1991). Conversely, in the United Kingdom, Diamantopoulos, O'Donohoe, and Lane (1989) conducted a study involving 200 large auditing firms, considering revenue, salaries, and the number of chartered accountants employed. They observed that the prioritized advertising methods included referrals, brochures, seminars, and press releases. Additionally, research revealed that a substantial portion of accounting firms in the United States believed that having a public relations department contributed to their success, with social activities outweighing their use of mass media. Furthermore, companies with a national or international scope exhibited a greater propensity to employ mail advertisements compared to regional or local companies. McLaughlin & O'Kane examined the disparities in public relations practices between users and non-users of public relations agencies' services in a different UK-based study. The findings suggested that auditors who did not utilize the services of public relations agencies tended to rely on customer-oriented literature. Most auditors expected to receive consulting services related to marketing strategy from public relations agencies and allocated minimal financial resources to this endeavor (O'Donohoe, Diamantopoulos & Petersen, 1991). Upon reviewing the literature, it becomes apparent that even though these studies date back several decades, their findings remain relevant and applicable to companies offering professional services.

In Iran, there is a notable scarcity of studies concerning the marketing practices of audit institutions. The sole study in this domain is Maranjory's 2020 research titled "Identification and Ranking of Marketing Strategies in the Auditing Profession." Within this study, a range of marketing strategies were examined, with particular emphasis on price-cutting strategies, diversifying service offerings beyond traditional assurance services, providing comprehensive work resumes, attracting entrepreneurs through influence on board members, establishing connections with parent company managers and holding companies, enticing entrepreneurs through shared interests, facilitated by familiarity or intermediaries, conducting high-quality audits to foster continued collaboration, engaging in meaningful interactions with employers, and periodically rotating formal engagements. These strategies were identified as the most significant in the context of marketing for audit institutions (Maranjory, 2020).

Recognizing the significance of the subject matter and the presence of a research gap, the current research endeavors to explore the feasibility of employing the 7P marketing mix elements as an unconventional marketing model. This exploration centers around investigating the marketing strategies employed by audit firms in Iran.

3. Research Methodology

The current study is an applied research project that has employed a mixed-method approach. A semi-structured interview was utilized as the primary data collection method to initiate this research. The research goal was pursued through content analysis. To unearth the marketing techniques practiced by auditing firms in Iran, 26 professional experts were interviewed in 2022, comprising partners, managers of auditing firms, and individuals with supreme expertise (as delineated in Table 2). Information saturation was achieved through the completion of 21 interviews. Subsequently, the identified techniques were subjected to ranking using the best-worst method (Rezaee, 2015).

The rationale behind selecting these individuals is that, organizationally, the application of marketing methods within audit firms falls under the purview of partners' responsibilities. In the

subsequent phase, marketing professors were engaged to evaluate the alignment of the identified methods with the principles of the 7P marketing mix. This assessment process is elucidated in the subsequent steps of the best-worst method:

3.1 The Best-Worst Method

Following the best-worst method introduced by Rezaei in 2015, the decision maker identifies the best and worst indicators and subsequently conducts pairwise comparisons between each of these two indicators and all other relevant indicators. Subsequently, a maximum-minimum problem is formulated and resolved to ascertain the weights of various indicators. Additionally, this method incorporates a formula for calculating the inconsistency rate and validating the comparisons (Rezaee, 2015).

3.2 Steps of the Best-Worst Method

Step 1: Determine the set of decision-making indicators. In this step, the set of indicators is defined as [c1, c2, ..., cn], which is needed to make a decision;

Step 2: Determine the best and worst indicators. At this stage, the decision maker defines the best and worst indicators in general, and no comparison is made at this stage;

Step 3: Specify the preference of the best indicator over other indicators with numbers 1 to 9. The preference vector of the best index compared to other indices is displayed as AB= (aB1, aB2,..., aBn). In the mentioned vector, aBJ indicates the preference of the best index (B) over index (J), which is aBB = 1.

Step 4: Specify the preference of all indicators over the worst indicator with numbers 1 to 9. The preference vector of other indicators compared to the worst indicator is displayed as AW= (a1W, a2W, ..., anW)T. In the mentioned vector, aJW is the index (J) preference over the worst index (W); it is clear that aWW = 1.

Step 5: Find the optimal values of weights (w_1^*,w_2^*,…,w_n^*). To determine the optimal weight of each index, the pairs w_B/w_j =a_Bj and w_j/w_w =a_jw are formed; then, to satisfy these conditions in all j, a solution must be found so that the expressions |w_B/w_j -a_Bj | and |w_j/w_w - a_jw | maximize for all js that are minimized. Considering the non-negativeness of the weights and the sum of the weights, the model can be formulated as follows:

model (1)

$$\min \max\{|w\_B/w\_j - a\_Bj|, |w\_j/w\_w - a\_jw|\}$$
$$"s.t."$$
$$\sum\_j \; [\![w\_j = 1]\!]$$
$$w\_j \geq 0, "for\ all"\ j$$

The above model can also be converted into model 2:

model (2)

$$\min \xi$$
$$"s.t."$$
$$|w\_B/w\_j - a\_Bj| \leq \xi, "for\ all"\ j$$
$$|w\_j/w\_w - a\_jw| \leq \xi, "for\ all"\ j$$
$$\sum\_j \; [\![w\_j = 1]\!]$$
$$w\_j \geq 0, "for\ all"\ j$$

By solving the above model, the optimal values of [(w] _1^*,w_2^*,...,w_n^*) and ξ^* are obtained (Rezaei (2015)).

3.3 Calculation of compatibility rate in the best-worst method

The compatibility rate is calculated using ξ^*. The larger the ξ^* value, the higher the compatibility rate. Since aBj × ajw = aBW and {9, ... and 2, 1} aBW ∈, the maximum value of ξ^* can be obtained. The consistency rate can be calculated using the consistency indices in table (1) and the presented formula.

Table 1. Compatibility indices using the best-worst method

ABW	1	2	3	4	5	6	7	8	9
Compatibility Index	0.000	0.440	1.000	1.630	2.300	3.000	3.730	4.470	5.230

Compatibility Index /ξ^ ∗ = Compatibility Rate

The closer the consistency rate is to zero, the more consistent the results are (Rezaee, 2015).

4. Research Findings and Data

4.1 Demographic findings

Demographic characteristics (Table 2) show that the respondents were 2 women (about 8%) and 24 men (about 92%). 42% of the participants in the present study had a PhD degree, 50% had a master's degree, and 8% had a bachelor's degree. The average professional experience of people is about 24 years (the longest is 50 years and the shortest is 14 years), and the average age of people is about 51 years (the oldest is 70 years and the youngest is 37 years). On average, it took 30 minutes to answer the interview questions (the maximum time is 90 minutes, and the minimum is 5 minutes).

In the initial phase, participants were invited to enumerate the marketing methods employed by audit firms for both client acquisition and client retention. The outcomes of this question are presented in Table No. 3. Notably, no restrictions were imposed on the methods they had used, as this approach facilitated a comprehensive identification of these methods. In the subsequent step, we endeavored to align these methods with the 7P marketing elements, guided by the insights of marketing experts. It is imperative to emphasize that, at this stage, the primary objective was to identify the practical marketing methods employed within audit firms without focusing on their adherence to the professional code of conduct standards. It is crucial to recognize that aligning these methods with the marketing mix elements does not necessarily imply alignment with the professional code of conduct standards. Consequently, it becomes evident that numerous methods employed by audit firms do not conform to the requirements of the code of professional conduct in Iran (Sections 150 and 250). In certain instances, these practices might be considered unprofessional and unethical, not only in the context of the auditing profession but also in other business sectors.

Following the identification of marketing methods employed by audit firms, the subsequent inquiry posed to participants concerned methods aligned with the code of professional conduct suitable for use within the audit market. The outcomes of this phase are summarized in Table No. 4, presenting approved solutions compliant with the Code of Conduct. These solutions are categorized based on the elements of the marketing mix.

Table 2. The overview of the interviewees

Participant	Age/ years	Education	Professional title	Experience/ years	Interview format	Interview Length/Minutes
P1	71	Master Degree	Partner	32	Telephone	15
P2	49	Master Degree	Partner	18	Telephone	20
P3	53	Master Degree	Partner	20	Telephone	13
P4	69	Master Degree	Partner	32	Telephone	15
P5	70	Master Degree	Partner	50	In person	80
P6	37	Ph.D.	Partner	15	In person	62
P7	44	Master Degree	Partner	18	Telephone	90
P8	48	Ph.D.	Partner	15	textual	13
P9	55	Master Degree	Partner	20	Telephone	5
P10	53	Bachelor's Degree	Partner	21	textual	14
P11	39	Ph.D.	Partner	19	In person	42
P12	46	Master Degree	Partner	20	In person	35
P13	38	Ph.D.	Partner	14	In person	36
P14	53	Master Degree	Partner	22	Telephone	12
P15	51	Master Degree	Partner	25	Telephone	15
P16	52	Bachelor's Degree	Partner	31	textual	10
P17	49	Master Degree	Partner	22	textual	13
P18	50	Master Degree	Partner	21	Telephone	18
P19	42	Ph.D.	Partner	17	Telephone	13
P20	64	Master Degree	Partner	36	Telephone	13
P21	55	Ph.D.	Partner	32	In person	64
P22	55	Ph.D.	Partner	33	In person	46
P23	51	Master Degree	Partner	22	Telephone	7
P24	39	Ph.D.	Partner	17	Telephone	9
P25	38	Ph.D.	Partner	18	In person	71
P26	54	Ph.D.	Partner	16	In person	34

According to expert opinions, these findings have illuminated that promotions hold the highest potential for marketing application within audit firms. It is plausible that this preference can be attributed to the inherent nature of the profession, particularly its emphasis on upholding the principle of independence and the inherent characteristics of the promotions element. Among the key sub-components of the promotions element identified in this research, using printed and online brochures, establishing a dedicated public relations unit, public speaking engagements, and participation in scientific and professional conferences are noteworthy. The service element follows closely in significance, characterized by strategies such as expanding the range and quality of services and focusing on branding as its vital component. On the other hand, the remaining elements of the 7P marketing mix, namely processes, physical evidence, and people, were found to possess a relatively lower marketing capacity. In contrast, the elements of price and place did not elicit the endorsement of methods by the experts.

4.2 Reliability and validity

An external diagnostic technique was employed to validate this study's findings. In this approach, expert opinions were sought, and experts were tasked with reviewing the results and providing their assessments. To ensure the reliability of the test, multiple samples of the analyses conducted on the sample were selected, each of which was re-evaluated by the expert panel within a brief and defined time frame. Ultimately, Equation 1 was applied to compute the reliability:

Reliability test percentage = (number of agreements) / (total number) * 100% (1)

In this context, two random samples of the analyses conducted by the research team were selected, and their outcomes were compared with the analyses performed by the expert group (as shown in

Table 5). Consequently, by applying Equation 1, it can be determined that the reliability percentage between the analysts amounted to 78.57%. Based on this outcome, it can be asserted that since the reliability percentage among the analysts surpasses 60%, the reliability of the results can be considered confirmed.

Table 3. Description of marketing methods for attracting clients in Iran's auditing market

Subcategories	Frequency	Main Categories	Frequency	Comply With 7P
Presenting resumes to the target companies	5	Submit work experience	5	Promotion
Providing consulting services in the field of law to clients	4	Providing free complementary services	5	Product
Acquiring the competency from the Central Bank	2	Obtaining professional competency	15	Product
Obtaining the quality control rating of auditing firms	9			
Being qualified audit firms of the stock exchange	4			
Training of a good representative	1	providing a loyal force in the market	1	People
Declining quality of audit reports	4	Audit shopping	14	Processes
attention to the employer in attracting new customers	4			
Add or remove a paragraph	4			
Fake documentation	2			
Connection with organizations, institutions and other stakeholders	11	Communications	21	
Connection with the Supreme Council of Certified Public Accountants	1			
Lobbying to get a job	9			
Destruction of other audit firms	4	Offensive strategy	4	
Hidden hands	4	Influence policy	19	Price
Receiving Commission	4			
Bribery	1			
Price-cutting	14	Cost leadership strategy	14	

Table 4. Suggested methods of marketing and customer attraction within the framework of the code of professional conduct in the auditing market

Technique	Frequency	Comply With 7P
Increasing the type and variety of services	11	

Increasing the quality of services	10	
Emphasis on stakeholders	1	
Speed in work and follow-up	1	
Compliance with the principles of confidentiality and professional honesty	1	Product
Branding of auditing firms	3	
catching name for the auditing firms	1	
Auditing firms' logo design	2	
-	-	Price
-	-	Place
Word of mouth advertising	2	
Creating an active public relations unit	6	
Presenting the current issue of profession	1	
Designing the theme of the day of profession in scientific profession publications	2	
Speeches at conferences	6	
Usage of printed and online brusher	9	
Sponsorship and participation in scientific and professional conferences	5	
Attention to search engine optimization in Google	1	
Environmental advertising in stadiums	2	
Increasing activity in social networks	2	Promotion
Use of billboards	1	
Advertising on radio and general newspapers	4	
Attractive business card design for audit firms	1	
Observance of politeness in speech and behavior with the employer	3	
Responsiveness and availability	1	People
Suitable and attractive website design	5	
Providing strong management letters	3	Processes
Importance to the decoration of the building and environment	3	
Beautiful signboard design for auditing firms	2	Physical Evidence
Paintings in the office	1	

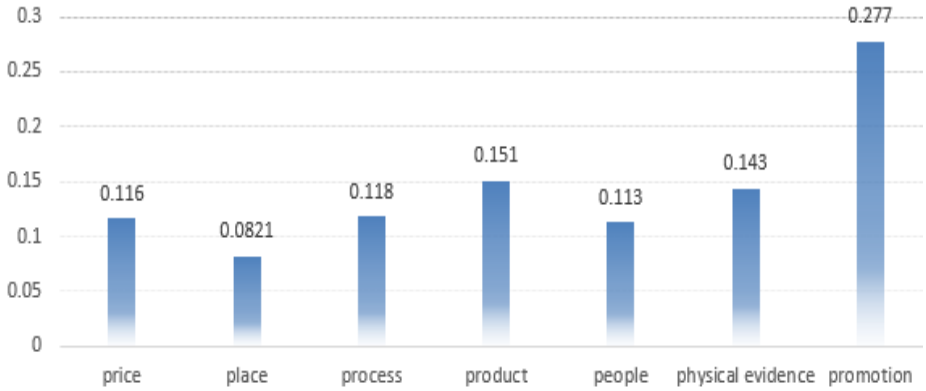

Figure 3. Ranking results using the best and worst method

Table 5. Retest reliability percentage

NO	Research Team	External Expert	Agreements	Retest Reliability Percentage
1	7	7	5	71.43%
2	7	7	6	85.71%
Total	14	14	11	78.57%

5. Conclusion

The current research findings reveal that among the elements of the 7P marketing mix, promotions, products, processes, physical evidence, and employees exhibited the highest likelihood of being employed within the auditing profession, as indicated by their frequency of use.

Price and distribution elements occupy lower categories in terms of frequency of use. It is important to highlight that while all the methods in practice align with one of the elements of the 7P marketing mix, this alignment does not necessarily validate their compliance with the professional code of conduct stipulations.

The findings indicate that auditing firms employ various marketing methods, as presented in Table 2. These methods include sending work experience, price-cutting, and exerting influence while offering commissions. It is worth noting that these findings align with the results of Maranjori's research conducted in 2020, which suggested similar approaches. Furthermore, the results concerning adherence to confidentiality and professional integrity principles concord with the research conducted by Constantin and Anton in 2011. Moreover, establishing a dedicated marketing unit and utilizing marketing specialists correlate with the research findings by Diamantopoulos, O'Donohoe, and Lane (1989) and Maranjuri (2020). Additionally, the emphasis on branding and using a brand name in marketing strategies aligns with the research conducted by O'Donohoe, Diamantopoulos, and Petersen (1991).

The research findings indicate that marketing has not yet emerged as a top priority for auditing firms, largely owing to the mandatory nature of auditing in Iran. However, with the growing number of audit firms and professionals in the field, marketing is anticipated to assume greater importance in the profession shortly. This shift in focus is especially likely when considering the evolving approach of the profession towards commercialism.

The elucidation of the techniques employed in this study highlights that a majority of the marketing methods adopted by auditing firms in Iran are not aligned with the code of professional conduct. This observation suggests that the precarious economic environment faced by auditing firms, stemming

from factors such as economic sanctions and government-mandated pricing of auditing fees, coupled with the absence of significant international audit firms, contributes to the proliferation and endorsement of "inappropriate marketing practices" within Iranian auditing firms.

6. Implications

Based on the current research findings and the significance of elements such as promotions and products, it is recommended that future research endeavors consider conducting partial studies to delve deeper into their subcomponents. For instance, within the subset of the promotions element, a specific focus could be placed on exploring the role and development of a public relations department. This research could aim to establish a model within the context of the auditing profession while adhering to the code of professional conduct. In conclusion, to advance and implement the outcomes of the present research, the following suggestions are put forth for consideration in future research:

• Developing a marketing model in alignment with the professional code of conduct in audit firms

• Exploring effective marketing practices for attracting business owners to select a particular audit firm

• Establishing quantitative metrics for identifying novel marketing strategies tailored to the auditing profession

In this context, a recommendation is extended to practitioners within the auditing profession to:

• In the realm of client relationship management, formulate and put into practice the necessary standards.

• Acknowledging that economic factors influence many methods utilized by auditors, it is imperative for professional practitioners to work towards mitigating these underlying factors by establishing a practical model for fee structures across all categories of audit services, with a particular focus on assurance services.

7. Special thanks and appreciation

I thank all the partners and managing directors of auditing firms for participating in this research.

References

1. Amiri, E. and Fakhari, H. (2020). A Composite Index for Audit Opinion Shopping Based on Discriminant Analysis Technique. *Accounting and Auditing Review*, 27(1), pp. 1-31. https://doi.org/10.22059/acctgrev.2020.290386.1008287
2. Amiri, E. and Fakhari, H. (2020). Audit Opinion Shopping and the quality of financial reporting: with the simultaneous equations model approach. *Audit knowledge*, 27(1), pp. 1-31. https://doi.org/10.22059/acctgrev.2020.290386.1008287
3. Arbab Soleimani, A. (2013). Professional Code of Conduct for Professional Accountants. *Shahr Yas Publication*, p. 2.
4. Baker, M. A. and Magnini, V. P. (2016). The evolution of services marketing, hospitality marketing and building the constituency model for hospitality marketing. *International Journal of Contemporary Hospitality Management*, 28(8), pp. 1510-1534. https://doi.org/10.1108/IJCHM-01-2015-0015.
5. Broberg, P., Umans, T. and Gerlofstig, C. (2013). Balance between auditing and marketing: An explorative Study. *Journal of International Accounting, Auditing and Taxation*, 22(1), pp. 57-70. https://doi.org/10.1016/j.intaccaudtax.2013.02.001
6. Constantin C. and Anton, C. (2011). Implications of Relationship Marketing on the Financial Accounting Services Providers Mathematics And Computers In Biology, Conference Paper,

Business And Acoustics, pp. 122-127.

7. Diamantopoulos, A., O'Donohoe, S. and Lane, J. (1989). Advertising by accountants: An empirical study. *Managerial Auditing Journal*, 4(1), pp. 3–10. https://doi.org/10.1108/EUM0000000001740
8. Enerson, M., Mason, B. R., and Corbishley, K. M. (2016). Factors that influence the marketing of professional services. *Investment Management and Financial Innovations*, 13(3), pp. 118-130. http://doi:196.21.61.18/handle/10321/2409.
9. Esfidani, M. R., Nazari, M., aghaei, M. and Abdolali, H. (2018). Designing a Model for B2B Relationship Marketing in the Parsian Tourism Business Network. *New Marketing Research Journal*, 7(4), pp. 23-40. https://doi.org/10.22108/nmrj.2017.102899.1171.
10. Ganji, K., and Arabmazar Yazdi, M. (2021). Identifying the Factors Affecting Professional Turnover Intention among the Auditors. *Iranian Journal of Accounting, Auditing and Finance*, 5(3), pp. 83-106. https://doi.org/10.22067/ijaaf.2021.40754
11. Ghasemi, S., Mehrabanpour, M. and Talebnia, G. (2023). Modeling the Consequences of the Auditors' Leaving the Public Accounting Profession: Is There a Brain Drain in Auditing? *Iranian Journal of Accounting, Auditing and Finance*, 7(1), pp. 69-91. https://doi.org/10.22067/ijaaf.2023.42678.1168
12. Granfeldt, S., and Nastasi, I. (2019). Relationship marketing for auditors: A qualitative study on how SME auditing firms practice relationship marketing. Thesis, Halmstad University, Halmstad, Sweden
13. Grönroos, C. (1998). Marketing services: the case of a missing product. *Journal of Business &Industrial Marketing*, 13(4/5), pp. 322-338. https://doi.org/10.1108/08858629810226645
14. Hasanqolipour, T and Sharifi, K. (2014). Insurance Services Marketing. *Kyomarth Publications*, 1(1), pp. 39-42.
15. Hasaqolipour, T & Sharifi, Q. (2014). Marketing insurance services. SAMT Publications, 1(1), p. 40.
16. Hassas Yeganeh, Y. (2013). The fall of professional ethics and the collapse of Enron. *Auditor*, 27(1) , pp. 47-42.
17. Hay, D., and Knechel, W. R. (2010). The effects of advertising and solicitation on audit fees. *Journal of Accounting and Public Policy*, 29(1), pp. 60-81. https://doi.org/10.1016/j.jaccpubpol.2009.10.001.
18. Lin, S. M. (2011). Marketing mix (7P) and performance assessment of western fast food industry in Taiwan: An application by associating DEMATEL and ANP. *African Journal of Business Management, 5(26)*, pp. 10634-10644. https://doi.org/10.5897/AJBM11.894
19. Maranjory, M. (2020). Identifying and Ranking the Marketing Strategies in Auditing Profession. *Accounting and Auditing Review*, 27(1), pp. 114-131. https://doi.org/10.22059/acctgrev.2020.276175.1008129
20. Mehrbanpour, M., Karami, G., and Jandaghi Ghomi, M. (2021). SWOT Analysis of the Independent Audit Profession in Iran. *Accounting and Auditing Review*, 28(2), pp. 359-397. https://doi.org/10.22059/acctgrev.2020.290832.1008290
21. Mogaji, E., Adeola, O., Hinson, R. E., Nguyen, N. P., Nwoba, A. C. and Soetan, T. O. (2021). Marketing bank services to financially vulnerable customers: evidence from an emerging economy. *International Journal of Bank Marketing*, 39(3), pp. 402-428. https://doi.org/10.1108/IJBM-07-2020-0379
22. Mudondo, C. D. (2021). Social media marketing and bank customers' behaviour: conceptualizing a relationship model. *Turkish Journal of Computer and Mathematics*

Education (TURCOMAT), 12(2), pp. 1955-1972. https://doi.org/10.17762/turcomat.v12i2.1792

23. Nasution, M. M., Dirbawanto, N. D. and Siregar, O. M. (2023). Analysis of service business growth and marketing strategies used in the digital technology ERA during the COVID-19 pandemic: (Case Study on PT. Sucofindo Medan). *Journal of Humanities, Social Sciences and Business*, 2(2), pp. 525–534. https://doi.org/10.55047/jhssb.v2i2.569
24. O'Donohoe, A. Diamantopoulos N. and Petersen. (1991). Marketing Principles and Practice in the Accounting Profession: A Review. *European Journal of Marketing*, 25(6), pp. 37 – 54. https://doi.org/10.1108/03090569110145402
25. Rezaee, J. (2015). Best-worst multi-criteria decision-making method, *Omega*, 53(2), pp. 49-57. https://doi.org/10.1016/j.omega.2014.11.009
26. Shuja, N., Banimahd, B and Vakilifard, H. (2018). Examining auditors' views on marketing activities. *Financial Accounting and Auditing Research*, 10(38), pp. 31-46.
27. Sidorkiewicz, M., and Orfin-Tomaszewska, K. (2023). Kształtowanie instrumentarium marketingowego obiektów hotelarskich w świetle pandemii COVID-19. Rozważania teoretyczno-analityczne. *Studia Periegetica*, 39(3), pp. 73–94. https://journals.wsb.poznan.pl/index.php/sp/article/view/359
28. Tiago, M and Verıssimo, J. (2014). Digital marketing and social media: Why bother? *Business Horizons*, 57(6), pp. 703-708. https://doi.org/10.1016/j.bushor.2014.07.002.

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

The Role of Technocracy Instrumental Rationale in Dialogic Accounting Model with Green Accounting Consequences

Ensie Hosseinpooran, Hasan Valiyan*, Mohammadreza Abdoli

Department of Accounting, Shahrood Branch, Islamic Azad University, Shahrood, Iran

How to cite this article:
Hosseinpooran, E., Valiyan, H., & Abdoli, M. (2024). Dialogic Accounting Model and Green Accounting Consequences: Empirical Evidence from Iran. Iranian Journal of Accounting, Auditing and Finance, 8(1), 17-37. doi: 10.22067/ijaaf.2024.42793.1137
https://ijaaf.um.ac.ir/article_42793.html

ARTICLE INFO

Article History
Received: 2023-08-20
Accepted: 2023-11-16
Published online: 2024-01-01

Keywords:
Dialogic Accounting, Green Accounting Consequence, Technocracy Instrumental Rational

Abstract

Changes in any field of science will lead to greater dynamics of the functions of that field. Accounting is one of the areas based on social processes. Accounting, as one of the areas based on social processes, is no exception to these changes. To enhance interactivity with stakeholder needs, one can expect to achieve a coherent and interactive understanding of the elements of the accounting profession with social dimensions through such changes. Dialogic accounting, as changes resulting from perceptual and social contexts, can have pervasive values, such as the positive consequences of green accounting socially and competitively. This study examines the role of technocracy instrumental rationale in the dialogic accounting model with green accounting consequences. In this research, which is considered methodologically in terms of the nature of the problem and the purpose, the data collection method was survey correlation, and the research tool was a questionnaire. In this study, 195 financial managers and heads of accounting of capital market companies participated. Partial Least Squares Analysis (PLS) was also used to fit the model. The results showed that dialogic accounting impacts the green accounting implications of capital market companies. The results showed that dialogic accounting has a positive and significant effect on the green accounting consequences of capital market companies. It was also found that using technocratic instrumental rationality intensifies the positive impact of dialogic accounting on the consequences of green accounting. The results show the development of the dialogic accounting model as a basis of the system in the social context, and by transferring the level of capital market expectations as the input of the system and combining it with accounting knowledge as a system process occurs, it can lead to green accounting consequences as a system output. On the other hand, the result shows that the technocracy instrumental rationale by changing the attitude in corporate decision-making can cause dialogic accounting is one of the capacities of technical and technological knowledge, which is the most prominent layer of rationality in modern thought on the base strengthen dialogic accounting for green implications for financial reporting, based on ethical norms based on ethics.

https://doi.org/10.22067/ijaaf.2024.42793.1137

NUMBER OF REFERENCES
48

NUMBER OF FIGURES
7

NUMBER OF TABLES
12

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Hasan Valiyan
Email: Hasan.valiyan@yahoo.com
Tel: 09122735989
ORCID: 0000-0001-5852-4198

1. Introduction

There has been an increased appreciation of accounting's discursive significance in recent years. Accountants do not merely "convey" information; their representations play an active role in (re)constructing social worlds (Nicholls, 2018). Accounting is one of the social practices through which individual and group subjectivities are shaped and a means by which power is exercised (Uvaneswaran et al., 2019). An interest in reconfiguring calculative technologies has accompanied an appreciation of the power of accounting in shaping social realities. There is widespread recognition in and outside the accounting discipline of the need for "new accountings" that facilitate more participatory decision-making and accountability (Hussain et al., 2020). Much concerns dissatisfaction with technocratic decision-making tools rooted in positivism and neo-classical economics, as exemplified by debates surrounding cost-benefit analysis and similar techniques. Philosophically, appeals for new methods are embedded in the democratic rather than capitalist traditions of Western societies (Brown, 2009). This is particularly evident in the sustainable development and social and environmental accounting literature, with calls for approaches that recognize the plurality inherent in liberal democracies and promote more critically reflective dialogue (Pärl et al., 2022). Over the years, various social accounting tools have been proposed as a means of promoting democratic interaction (see, e.g., Medawar, 1976 on social audits; Morgan, 1988 on redesigning accounting to facilitate "better conversations"; Dey, 2003 and Gray, 1997 on silent/shadow accounts; Boyce, 2000 on creating environmental and social visibilities; Gray and Bebbington, 2001 reporting on a variety of environmental accounting initiatives). Most recently, these have included attempts to promote explicitly dialogic accounting technologies and forms of engagement. The social accounting community is learning that "doing" is not enough, no matter how well-intentioned. Social and environmental accounting has been under-theorized and insufficiently politicized, hampered practice (Gunarathne et al., 2023). In particular, it is argued that the field has been inadequately theorized to cope with difference and diversity despite its claimed pluralist underpinnings. Technocracy results from a positivist attitude that depends on human society and management. This approach oversees economic growth, planning, project evaluation, and technology and emphasizes a rational and technocratic approach to problem-solving. Rationality here does not necessarily mean rationality; rather, it refers only to rationality based on the originality of tools and technology, which is rooted in instrumental rationality (Fremeaux et al., 2020). Instrumental rationality is, of course, a necessity for every society and civilization. Still, it becomes original when it is formed based on a series of tools and methods aimed at developing and advancing goals such as ethics, social and cultural responsibilities, etc., and causes society to move in the direction of the set goals (Van der Meer-Kooistra and Vosselman, 2012). Such an attitude, while taking a neutral and purely scientific approach to problems and their solutions, is based on the values that epistemological teachings draw on liberal/positivist approaches and moral assumptions based on social responsibilities such as dialogic accounting and the development of greenery is focused on society (Budding and Van Helden, 2022).

Dialogic accounting is considered one of the dimensions of accounting development; by combining behavioral and ethical perceptions and scientism, it seeks to develop practical green accounting implications for preventing environmental degradation (Millar and Searcy, 2020). Accounting dialogic expresses the critical nature of accounting knowledge through the use of similarities and themes related to the facts of accounting that affect it (Sami et al., 2021). Because accounting has today become a language for interaction and dialogue in a competitive market on the one hand, and the development of ethical behaviors such as environmental protection on the other, and its development in the form of dialogic can be reflected. More thought-provoking information to help inform users. An essential part of the impact of capital market accounting is that, due to the

conflict of interest between stakeholders, dialogic accounting can help balance the market and facts based on decision-making. In other words, developing accounting themes is a superficial dialogic representation or knowledge-based identity of specialized interactions between companies and external stakeholders. In the form of voluntary reports, such as the disclosure of corporate environmental performance information, companies help to create synergies in market decisions. Although this concept can have a semantic scope, in the form of a professional basis, it creates reciprocal language structures between the company and external stakeholders, which can have positive consequences for both the economy and society. Researchers such as Melissa Walters-York (1996), Mcgoun et al. (2007) and Amernic and Craig (2009) proposed different but similar patterns of information equality and symmetry for dialogic accounting. The common denominator of all these patterns is the focus on a process of accounting practices such as financial reporting, adjustment of financial statements, etc. For example, Corrigan's (2018) definition of dialogic accounting interprets it as knowledge based on linguistics in areas such as sociology, philosophy, and psychology, including management and economics; on the other hand, Bordt (2018) defines dialogic accounting as a critical linguistics that, based on the thematic information and tone hidden in the accounting procedures of a financial report, helps analysts to use the techniques and arrangements in investing knowledge to give an outline of corporate performance convert an argument able language than what is behind the words; make the hidden sentences and text of the financial reporting language an understandable decision to generate more revenue for the stakeholders. Therefore, as it is clear, dialogic accounting is a concept based on developing a common language with institutionalized values in the background of financial reporting, which can help increase the effectiveness of accounting in reflecting information facts. Therefore, conducting this research can be considered important from two perspectives.

First, because this research contains a new concept in the accounting field, it can develop theoretical and research literature. This is a basis that, due to the lack of applied research related to dialogic accounting, can contribute to the development of theoretical literature in terms of its importance for increasing the quality of reporting language and green accounting knowledge. A review of previous research such as Brown (2009) examining "technologies related to Dialogic accounting in the development of sustainability"; Godowski et al. (2020) examine "Future Perspectives on dialogic accounting in Assisting Public Accounting"; Bellucci et al. (2019) to examine the "role of dialogic accounting in the development of stakeholder participation"; Grossi et al. (2021) who studied "dialogic accounting on IT platforms" and Dillard and Vinnari (2019) who examined the "dialogic accounting framework in environmental accounting information systems". It confirms the claim that although issues similar to those of dialogic accounting have been explored, it can enhance the quality of the environment, both in terms of its structure of analysis and in terms of its semantics, while being innovative in its relationship to green accounting can help to increase the quality of information between stakeholders. This study develops a framework connecting interested stakeholders to accounting systems development. As it turned out, previous studies have not taken action to examine the role of technocracy in dialogic accounting and evaluate the consequences of green accounting. This research can cover the theoretical and practical gap in this part of accounting research and contribute to the link between knowledge and information systems in accounting so that the consequences of green accounting are more effective.

Second, the results of this study can help higher institutions in the Iranian accounting profession, such as scientific associations and accounting professions in the private sector and committees to develop accounting standards in the public sector to gain a more coherent understanding of the importance of dialogic accounting and its role in green accounting development, and accordingly help to normalize and develop a culture of interaction and discourse in accounting. The effectiveness of

dialogic accounting in terms of application, as well as to other capital markets stakeholders such as investors, shareholders, and market analysts, also helps to make more controlled risk decisions than the environmental practices disclosed by the existence of dialogic accounting functions. Therefore, this research seeks to develop realistic and practical functions in the capital market at the mentioned theoretical and experimental support level by referring to the research concept development research to fill the gap in standards and structural requirements related to the research topic. Dialogic accounting and its role in green accounting consist of perceptual themes that may not necessarily fit within the tangible framework of the information disclosed in financial reporting and require a comprehensive understanding of linguistic critique in the accounting profession. Therefore, in the first step, this study aims to present the dimensions of dialogic accounting based on measurable dimensions through meta-synthesis. In the second step, the paper seeks to determine its impact on green accounting. It also examines the role of technocratic instrumental rationality in the impact of dialogic accounting on the consequences of green accounting.

2. Literature Review

The stream of realism (positivism) as a philosophical school, as opposed to the school of subjectivism (criticisms) in the humanities, focuses on facts objectively and emphasizes quantities versus qualities independently of mental stimuli. The foundation of classical accounting knowledge is based on the approaches of the school of realism (positivism) due to the nature of this profession, and the founders of this school described the general concepts as a rearrangement of measurable facts and largely denied the existence of quality and meaning in this field. However, the school of subjectivism (criticisms) believes that the humanities are more concerned with human perceptions of what is happening. Even accounting knowledge is considered to require interactive functions based on human cognition, but the early foundations of this knowledge emphasized facts for decision-making. The confrontation of the approaches of these two schools of demand, like other humanities fields, gradually created the grounds for changing the accounting philosophy. Melissa Walters-York (1996), as a pioneer in changing the mere quantitative approaches to subjective approaches in accounting knowledge, provided the existence of information demand and supply by the accounting profession as a basis for moving towards modern accounting knowledge. Describing "dialogic accounting", this researcher tried to build a new paradigm of accounting language in financial reporting by moving away from merely quantitative functions in accounting to interactive functions and strengthening the mechanisms of absorbing and sharing external accounting knowledge in this field. The consequences of this change over time and with the development of the knowledge of researchers such as Rutherford (2002), Jones and Willis (2003), Malthus and Fowler (2009), Yen et al. (2017); and Aly et al. (2018) to create new scientific trends such as accounting narrative; financial reporting language; perception of accounting and the tone of financial reporting led. Dialogic accounting encompasses a set of new approaches to accounting knowledge that aim to increase interaction in developing accounting knowledge. Littlejohn and Foss (2011) introduced the accounting metaphor as a system-based concept and presented this field of accounting knowledge cycle as a systematic model.

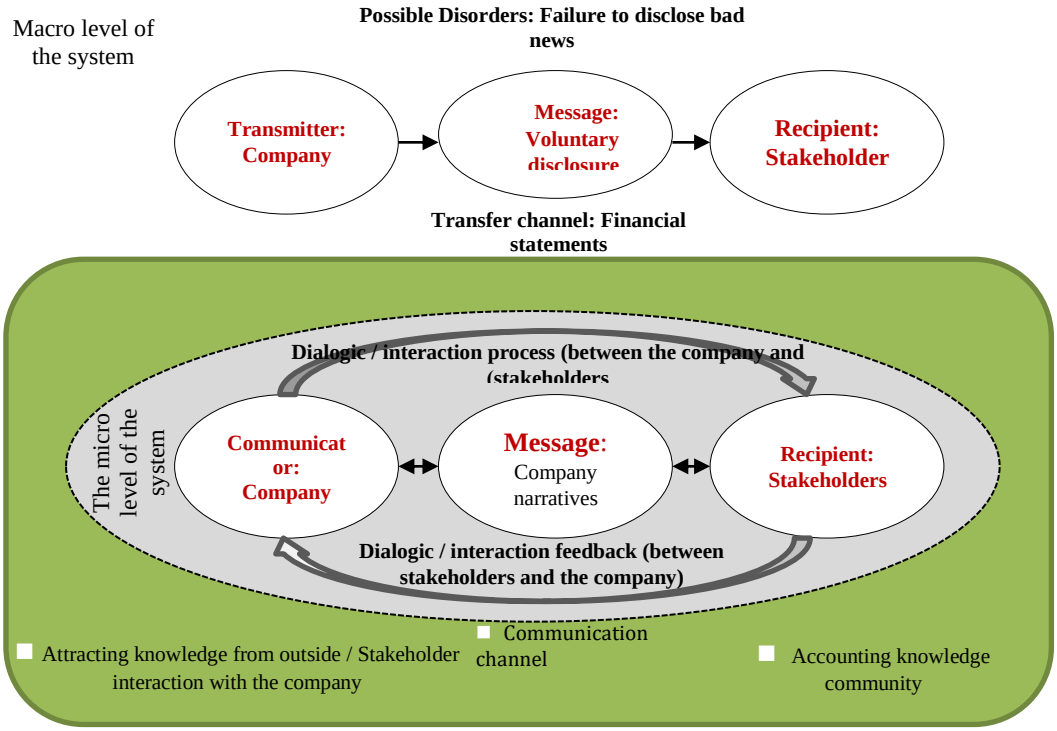

Figure 1. Dialogic accounting system model

In this context, dialogic accounting is based on a system cycle at both macro and micro levels, ranging from the company's functions in transmitting information to absorbing knowledge from stakeholders. At the macro level, corporate engagement functions shape dynamic communications into a system that transmits the company message through accounting communication channels such as financial statements and other accompanying reports to recipients, i.e., external stakeholders (Merkl-Davies and Brennan, 2017). Like any communication process, disruption of message transmission in this system, which is based on the structural approach of communication, i.e. managers, can reduce communication effectiveness. At the micro level, however, the process takes on a more dynamic form, as the context of discourse as a process and the flow of information through feedback constantly evaluate and ultimately modify the system. In other words, the company communicates with external stakeholders. Then, it communicates its realistic narratives based on the quality and quantity of the company's financial operations to them, and the stakeholders return their expectations to the system by receiving information. In these circumstances, the form of communication occurs bilaterally and provides the basis for the knowledge community in accounting that is the result of knowledge absorption; the expectations and information needs of stakeholders are met, and in this case, dialogic accounting as a social norm will strengthen the relationship between the company and stakeholders (Grossi et al., 2021). Craig (1999), on the other hand, sought to develop interactive accounting knowledge strategies by presenting a matrix of strategic reference points.

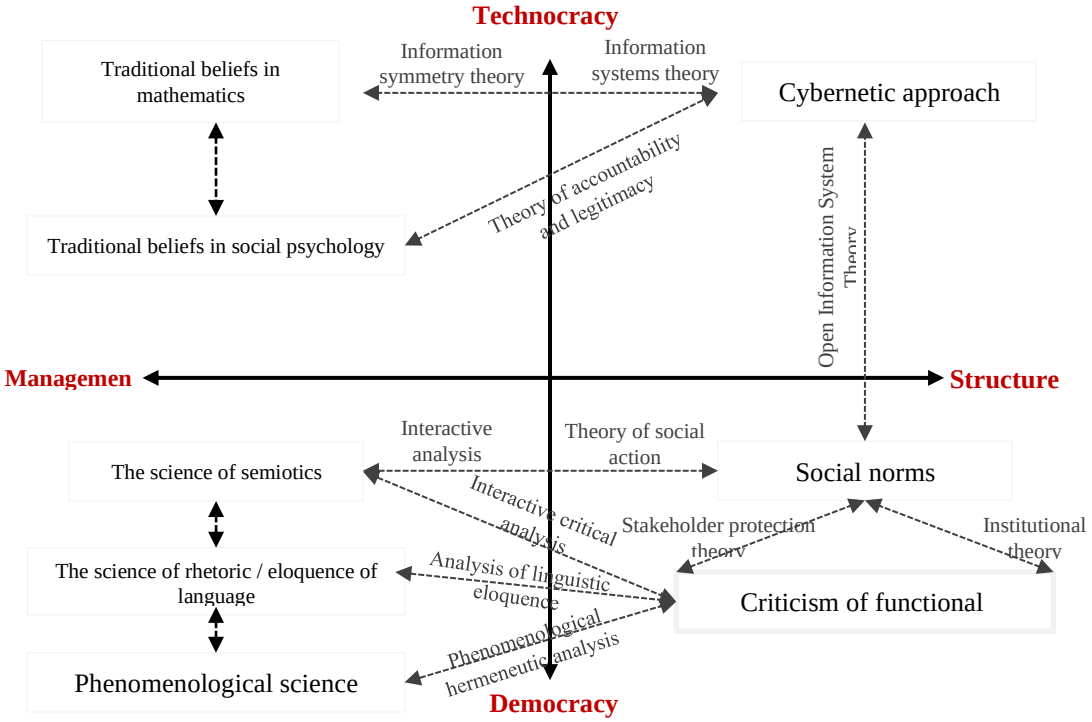

Figure 2. Strategic reference framework for dialogic accounting

Like any strategic reference matrix, this matrix is based on two vertical/horizontal axes; the four dimensions of management and structure are on the horizontal axis, and technocracy and democracy are on the vertical axis. In general, the two left quadrants of this matrix focus on management approaches, and the right two quarters focus on the structural functions of companies in accounting functions. Management is the sum of decision-making processes based on traditional beliefs instead of phenomenological and perceptual beliefs. It interprets the structure of the set of information systems processes against social norms. Technocracy also interprets the originality of specialized and analytical techniques in accounting, and democracy refers to a worldview beyond technology and reliance on the development of concepts and equality (Craig, 2008). Therefore, according to this matrix, the management attitude in relying on quantitative techniques and areas increases the technocracy in the role of accounting, which, by applying mathematics to accounting, considers quantitative analysis to legitimize accounting and pave the way for cybernetic development in accounting. In contrast, the management approach in phenomenology science realizes the fields of dialectical development in accounting. It promotes social understanding of accounting knowledge by developing semiotic techniques and linguistic rhetoric. It also provides a democracy-based structure for the development of social norms through a water-critique approach, according to which the protection of stakeholder interests makes institutional structures more dynamic. According to this framework, dialogic accounting can be considered as a level of need for perception to align the interaction and dialogue between the company and environmental stakeholders, which will lead to creating a common language based on the quality of the information environment (Webber, 2006). Relying on the presented theoretical foundations, in line with the methodological nature of the research, the questions of the qualitative part and then the research hypothesis are raised:

2.1 Qualitative research question

Due to the inconsistency and reliability of dialogic accounting tools, in this study, first, the meta-synthesis dimensions of dialogic accounting are determined and based on Delphi analysis, the theoretical adequacy limit is determined. Therefore, the questions in this section are:
What are the dimensions of dialogic accounting?

2.2 Research hypothesis

After determining the dimensions of dialogic accounting and determining the level of reliability of this variable by using the Shahri et al. (2021) questionnaire, the research hypothesis is presented in the following order:

H1: Dialogic accounting impacts the green accounting implications of capital market companies.

2.3 Research background

Gunarathne et al. (2023) use a web-based survey designed and administered to publicly listed companies and members of three industry chambers in Sri Lanka. This study finds that implementing environmental management accounting (EMA) differs significantly among organizations at varying EMM stages. Further, it is observed that organizations at higher stages of EMM use significantly greater domain-based EMA tools and EMA for functional purposes. Therefore, the results show that when organizations progress from reactive to proactive environmental strategies, the EMA evolves to encapsulate and diversify to deal with more sophisticated environmental management activities. Brown and Dillard (2021), by using Jasanoff's four proposed focal points for developing new analytical instruments for accounting for non-financial matters and promoting participatory governance framing, vulnerability, distribution and learning, argued to be useful in conceptualizing possible critical dialogic accounting and accountability (CDAA) technologies. These aspects are ignored or downplayed in conventional approaches to accounting for non-financial matters, limiting accounting's ability to promote more socially just and ecologically sustainable societies. Manetti et al. (2021) aimed to identify the accounting dimensions of discourse through meta-synthesis. The study examined more than 186 sources from international databases between 2004 and 2019. The development of a dialogic accounting framework accompanied the results of the study and showed that the development of theoretical literature in social and environmental contexts could lead to raising the level of culture of voluntary disclosure of corporate information and provide a basis for environmental protection as a competitive basis. Godowski et al. (2020) showed that the focus on dialogic accounting functions, especially in the public sector, includes cultural and social norms requiring academic awareness. This study addresses some of the values of the accounting profession for which there is not necessarily a specific standard. It requires conceptual understanding to recognize the links between social issues and corporate financial reporting to enhance stakeholder interaction capabilities. According to the research results, the tool of this section is the use of dialogue-oriented methods in focus groups, which will create the ground for more perceptual coherence as a consequence of this theoretical approach. Shahri et al. (2021) included two levels of CEO and deputy CEO and less than 100 participants, which is one of the census criteria used to select research participants. The results showed that, according to the Anthropocene theory paradigm, changing companies' environmental behaviours increases the strategic consequences of green accounting. The results of this study show that to realize the Anthropocene paradigm at the performance level of companies, change the attitude, behavior and practical ethics of individuals as helmsmen of the company, to increase effective decisions to reduce environmental pollution, introduce a structure of the underlying causes of the effectiveness of environmental accounting mechanisms with the aim of sustainable development, in which the two dimensions of micro-mechanisms and macro mechanisms were analyzed. Three sub-dimensions were determined in the

micro mechanism dimension: value accounting, development, and financial accounting. In the macro mechanism dimension, two dimensions of legal mechanism and cultural mechanism were explained. The results of this research will help improve the quality of sustainable development of companies by using effective environmental accounting and lead to the competitive advantage of companies and greater success in competitive areas.

A review of the empirical background of the research shows that the study of the effect of dialogic accounting on the consequences of green accounting has not been done by previous research, and this research can help the development of theoretical literature in this field.

3. Methodology

The required data were collected based on a survey (Dianati Deilami, 2014). Accordingly, a questionnaire was used to collect research data because, following previous research, it is an effective method of collecting data from a large sample (Mael and Ashforth, 1992; Chen et al., 2009). Also, to collect the theoretical foundations, the library method was used and the theoretical foundations of similar research were studied. The subjects' questioning period is 6 months, from August 2020 to February 2020.

3.1 Research instrument

The tool for collecting research data, according to the nature of the operational measurement of research variables, in the qualitative phase to identify the accounting dimensions of discourse was the critical evaluation list. In the quantitative phase of the research, it was a questionnaire. In collecting research data in the qualitative section, based on the nature of content screening, attempts were made first to identify relevant research and then measurable dimensions of dialogic accounting. Then, based on the Delphi analysis process, during the development of Likert 7-item checklists, an attempt was made to determine the reliability of dialogic accounting subscales based on the mean and agreement coefficient. Then, in the quantitative phase, a questionnaire was distributed among the participants as a data collection tool in the quantitative section to test the research hypothesis. The results can be theoretically argued based on partial least squares (PLS) analysis. The questions of all the questionnaires in the quantitative methodology section were arranged through a 5 Likert scale from strongly agree to strongly disagree. All questionnaires were again provided to experts in terms of validity, and the concept of questions and alignment with the research objectives were reviewed and modified in several stages so that all questions were approved and distributed among the community. The purpose of the research was.

3.2 The statistical population

The statistical population of this study, in the qualitative section, were 13 accounting experts at the university level who had a good understanding of dialogic accounting in terms of knowledge acquisition and conducting similar scientific research. A distinctive feature of all these participants is having a PhD in accounting, experience teaching accounting / financial theories and conducting at least 5 studies in accounting science during the past years. The adoption of this filter helped to select people appropriate to the purpose of the research.

The statistical population of this research is the quantitative section, financial managers and heads of accounting units of Tehran Stock Exchange companies. Since there are no exact statistics about the statistical population, to determine the sample size, Cochran's Alpha was used assuming the statistical population is unknown and as follows:

$$n = \frac{Z_{\alpha/2}{}^{2}.\sigma^{2}}{e^{2}} = \frac{1/96\,^{2} * 0/683^{2}}{0/1\,^{2}} = 179$$

n: indicates the sample size; $z_{\alpha/2}$: standard normal value is 1.96; σ^2: indicates the variance of the population, which, because it is not clear, was obtained using a pre-test and a standard deviation of a sample of 30; e: The accuracy of the research, which is usually considered equal to 0.1. Due to the above relationship, a sample size of 179 participants was obtained to increase the validity of the research, 250 questionnaires were randomly distributed among the participants, and 195 questionnaires were received and used as a basis for statistical analysis.

3.3 Research variables

3.3.1 Dependent variable

A researcher-made questionnaire was used to measure the variables of green accounting consequences. According to the analytical process based on Delphi analysis and meta-synthesis, this questionnaire includes three subscales of competitive functions, value functions and legal functions of accounting are green, which are measured based on 15 questions in a 5-point Likert comparison. Considering that experts reviewed the concepts of the questionnaire based on the CVR validity index, it was confirmed. This questionnaire asks questions such as: Does increasing tax incentives help strengthen the application of green accounting in the capital market? Or to what extent do you consider the application of green accounting as a basis for the sustainability of social responsibility values at the market level? Is coordination between the organization's bylaws and environmental regulators a stimulus to strengthen companies' commitment to green accounting? The content of the questions is based on strategic consequences in green accounting, which strengthens competitive criteria, value and legal or regulations among capital market companies. The reliability of this questionnaire was estimated based on Cronbach's alpha coefficient of 0.86, which was approved since it was more than 0.7.

3.3.2 Moderating variable

The moderating variable of research is technocracy instrumental rationale. This study used Simon's (1997) questionnaire, which includes 12 questions based on the 5-point Likert scale. Instrumental rationality in technocracy defines reason as a means to achieve a specific goal, the output of which is behavioral optimization to achieve specific goals on an all-encompassing and pluralistic basis. This questionnaire includes 3 dimensions of comprehensive technical knowledge: Inclusive values and inclusive evaluation, whose validity has been confirmed by experts. This questionnaire asks questions such as whether the tenure of managers with specialized knowledge can help create inclusive values. Is believing in the creation of inclusive values a responsible process in the field of social accounting development? The content of the questions is based on the extent of knowledge. Values and practical evaluation of managers as decision-makers at the top of companies can help develop the field of social accounting and provide a context for the emergence of expected behaviors towards society. The reliability of this questionnaire was also confirmed based on Cronbach's alpha coefficient and was estimated by Bolan (1999) to be about 0.84. It was evaluated again due to adjusting the content of the questions and was calculated to be 0.88.

3.3.3 Independent variable

Because there is no tool for measuring this study's exogenous variable (independent), i.e., the accounting model of discourse at the capital market level, meta-combination analysis is used to compile a questionnaire. This analysis provides the basis for formulating effective components aligned with capital market dialogic accounting. For this purpose, relying on the process of meta-analysis and Delphi analysis, this study seeks to develop a tool to measure this variable at the capital market level. Therefore, to focus on similar studies worldwide, only studies conducted from 2018 to

2021 to the research dependent variable were selected as a sample. It should be noted that the 13 initial types of research should be analyzed in the third step in terms of the critical appraisal process with the participation of research experts. This process includes the following 10 criteria, which are examined based on a minimum score of (1) and a maximum of (5). The total score based on 10 criteria can be 50, and if the research scores 30 or more, it enters the fourth step. Based on a better understanding of the analysis process in this step, with the participation of research experts, 13 initial approved types of research will be analyzed for points based on critical evaluation analysis. In this section, after analyzing the basics of the approved components of the above research, the themes for measuring the accounting components of discourse are determined separately.

Table 1. The process of determining the themes of dialogic accounting assessment

		7-point rating scale								
		7	6	5	4	3	2	1		
Dialogic Accounting Components	Development of voluntary								Reduce the proprietary cost of disclosing information. Reduce the cost of litigation risk. Reduce the cost of credit risk. Reduce agency costs Increasing the information disclosure threshold Reduce the cost of default risk.	Dialogic Accounting Assessment Statements
	Development of future accounting								Development of the knowledge field of accounting science based on philosophical theories Establishing the general theory of society to promote theoretical and practical knowledge Strengthen scripting functions to explain accounting perspectives. The dialectical accounting paradigm Strengthening the positive approach of accounting knowledge based on reality	
	Development of accounting cybernetics								Establishing an active information network between the company and stakeholders Increasing the level of financial knowledge through a variety of strategic alternatives Upgrading Financial Decision Support Systems (DSS) Upgrading Financial Management Information Systems (FMIS) Upgrading Strategic Financial Information Systems (FIS) Upgrading Financial Information Operating Systems (FTPS)	

In the next step, Delphi analysis based on two criteria of mean and coefficient of agreement is used to determine the consensus of experts for the appropriateness of research propositions with the main components. Therefore, to perform this section, according to the scale of 7 evaluation options, according to Table (2), the results of Delphi analysis are presented.

After two rounds of analysis in the Delphi step, the results showed that 5 propositions were removed because they had an agreement coefficient below 0.5 and mean below 5. The two propositions were merged in pairs. Therefore, according to the obtained results, the dialogic accounting questionnaire is presented in the following order:

Table 2. Delphi analysis process to determine the consensus of experts

		The first round of Delphi		The second round of Delphi		Result		
		Mean	Coefficient of agreement	Mean	Coefficient of agreement			
Dialogic Accounting Components	Development of voluntary disclosure	4.000	0.350		*Delete*		Reduce the cost of credit risk	Dialogic Accounting Assessment Statements
		5.200	0.600	5.300	0.650	Confirm	Reduce the proprietary cost of disclosing information.	
		3.000	0.200		*Delete*		Reduce the cost of default risk.	
		5.30	0.650	5.500	0.750	Confirm	Reduce agency costs	
		5.000	0.500	5.100	0.550	Confirm	Increasing the information disclosure threshold	
		5.300	0.650	5.500	0.750	Confirm	Reduce the cost of default risk.	
	Development of future accounting values	4.000	0.350		*Delete*		Development of the epistemological field of accounting science based on philosophical theories	
		6.000	0.800	6.200	0.850	Confirm	Strengthening the positive approach of accounting knowledge based on real nature	
		5.200	0.600	5.300	0.650	Confirm	The dialectical accounting paradigm	
		5.300	0.650	5.500	0.750	Confirm	Strengthen scripting functions to explain accounting perspectives	
		2.000	0.150		*Delete*		Establishing the theory of society to promote theoretical and practical knowledge	
	Development of accounting cybernetics	6.000	0.800	6.200	0.850	Confirm	Establishing an active information network between the company and stakeholders	
		4.800	0.470	5.000	0.500	Merge	Upgrading Financial Management Information Systems (FMIS)	
		5.000	0.500	5.150	0.580		Upgrading Financial Information Operating Systems (FTPS)	
		5.300	0.650	5.500	0.750	Confirm	Upgrading Financial Decision Support Systems (DSS)	
		5.300	0.650	5.500	0.750	Confirm	Upgrading Strategic Financial Information Systems (FIS)	

As can be seen, this questionnaire includes 11 questions and 3 sub-components of voluntary disclosure development, development of future accounting values and cybernetic development of accounting. The questionnaire scoring was based on a five-point Likert scale (strongly agree = 5, agree = 4, have no opinion = 3, disagree = 2 and strongly disagree = 1). Thus, the ratio of the total score of each questionnaire to the total achievable score (55) is considered an indicator of dialogic accounting. Therefore, the research model is presented to determine the dimensions of the research.

4. Findings

In this section, first, the findings of descriptive statistics and then the findings of inferential statistics are presented. Based on the results of Table (6), the descriptive statistics of the tested variables, which include some central indicators and dispersion, should be expressed; the highest mean is related to the competitive impact subscale (4.271), which indicates that the competitive outcome of green accounting will reduce the company's financial costs. At the same time, it will give the company a competitive advantage over other companies, increasing its market share by creating

more trust and confidence in stakeholders. On the other hand, it was found that the highest rate of standard deviation is related to the subscale for the development of future accounting values (1.13).

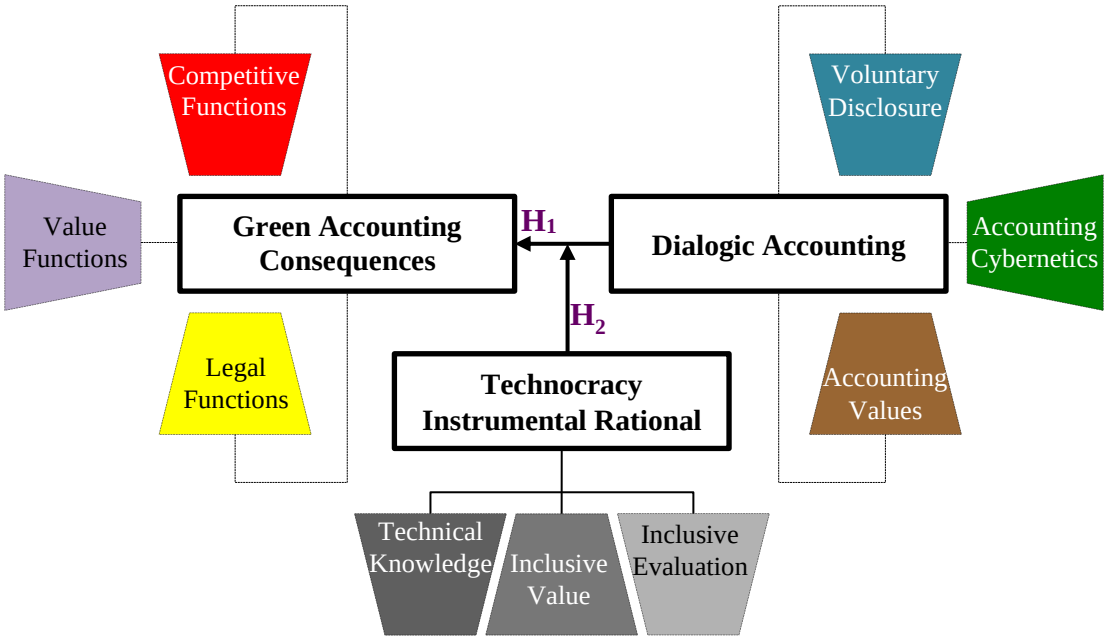

Figure 5. Theoretical model of research

Table 3. Dialogic accounting questionnaire

The main components	Research Questions	5	4	3	2	1
Development of voluntary disclosure	Can the basis of discretionary disclosure as an accounting dimension of dialogic be considered a factor in reducing the proprietary cost of disclosing information? Can dialogic accounting reduce agency costs by developing voluntary disclosure? Can dialogic accounting based on the function of voluntary disclosure provide the basis for increasing the disclosure threshold? Can the basis of discretionary dialogic as an accounting dimension of discourse be considered a factor in reducing the costs of default risk?					
Development of future accounting values	Does dialogic accounting reinforce the positive approach of accounting knowledge based on real nature? Can dialogic accounting be the basis for developing the dialectical accounting paradigm? Can dialogic accounting develop scripting functions to explain accounting perspectives?					
Development of accounting cybernetics	Does dialogic accounting provide the basis for an active information network between the company and stakeholders? Does dialogic accounting improve financial management operational information systems through its systematic approach? Does dialogic accounting promote financial decision support systems (DSS) through its systemic approach? Does dialogic accounting promote strategic financial information systems (FEIS) through its systematic approach?					

This suggests that participants in research on the Likert spectrum have different approaches to

changing the level of future accounting values. In other words, the form of dialogic accounting failed to create a coherent perception in the participants' minds, and this was the basis for the dispersion of the response to the Likert spectrum. Regarding the basis of values, they are perceptually diverse and different in individuals' beliefs, which can justify the standard deviation result.

Table 4. Descriptive statistics related to research variables

Variable	Subscales	Variable symbol	Mean	Mean	Minimum	Maximum	Standard deviation
Dialogic accounting	Development of optional disclosure	Voluntary Disclosure	4.053	4.100	2.250	5.000	0.770
	Development of accounting cybernetics	Cybernetic	3.726	4.000	2.250	5.000	1.030
Implications of green accounting	Development of accounting values	Values	4.112	4.500	2.500	5.000	1.130
	Competitive implications	CC	4.271	4.415	3.200	5.000	0.570
	Value implications	CV	4.011	4.000	2.800	5.000	0.800
	Legal implications	CL	4.119	4.300	2.600	5.000	0.870
Technocracy instrumental rational	Technical Knowledge	Knowledge	4.006	4.211	2.250	5.000	0.770
	Inclusive Value	Value	3.925	4.375	2.250	5.000	1.030
	Inclusive Evaluation	Evaluation	4.156	4.500	2.500	5.000	0.830

After expressing the descriptive statistics in this section, the fitting of the measurement models is presented in the first step. Three reliability criteria, convergent validity and divergent validity, are used in fitting measurement models. In order to evaluate the reliability of the research measurement model, factor load coefficients, Cronbach's alpha coefficients and combined reliability are used.

Table 5. Factor load coefficients

Factor	Indicator	Factor load	Factor	Indicator	Factor load
0.871	Cybernetic		0.682	CC	
0.715	Values	Dialogic Accounting	0.833	CL	Green Accounting Consequences
0.701	Voluntary Disclosure		0.864	CV	
0.879	Cybernetic1		0.751	CC1	
0.862	Cybernetic2	Cybernetic	0.717	CC2	
0.856	Cybernetic3		0.758	CC3	CC
0.878	Cybernetic4		0.794	CC4	
0.713	Values1		0.809	CC5	
0.936	Values2	Values	0.650	CL1	
0.886	Values3		0.827	CL2	
0.789	VoluntaryDisclosure1		0.685	CL3	CL
0.709	VoluntaryDisclosure2	Voluntary Disclosure	0.850	CL4	
0.700	VoluntaryDisclosure3		0.818	CL5	
0.657	VoluntaryDisclosure4		0.872	CV1	
			0.949	CV2	
			0.868	CV3	CV
			0.881	CV4	
			0.881	CV5	

The criterion for the suitability of factor load coefficients is 0.4 (Hulland, 1999). According to Table (5), all numbers of factor load coefficients in the questions are greater than 0.4, indicating this criterion's appropriateness. According to the data analysis algorithm in PLS, after measuring the

factor loads of the questions, it is time to calculate and report Cronbach's alpha coefficients and combined reliability; the results are shown in Table (6).

Table 6. Cronbach's alpha standard results and combined reliability

Concealed Variables	Abbreviation	Cronbach's alpha coefficients (Alpha>0.7)	The combined reliability (CR>0.7) coefficient
(Dialogic Accounting)	Voluntary Disclosure	0.807	0.781
	Cybernetic	0.925	0.892
(Green Accounting Consequences)	Values	0.886	0.800
	CC	0.877	0.824
	CV	0.950	0.935
	CL	0.878	0.825

Considering that the appropriate value for Cronbach's alpha and combined reliability is 0.7 and according to the findings of the table above, these criteria have adopted a suitable value for latent variables, so it can be confirmed that the reliability of research measurement models is appropriate. The second criterion for examining the fit of measurement models is convergent validity, which examines the degree of correlation of each construct with its questions (indicators).

Table 7. Convergent validity results of latent research variables

Concealed Variables	Abbreviation	Mean extraction variance (AVE>0.5)
(Dialogic Accounting)	Voluntary Disclosure	0.512
	Cybernetic	0.755
(Green Accounting Consequences)	Values	0.724
	CC	0.587
	CV	0.793
	CL	0.593

Given that the appropriate value for AVE is 0.5 (Fornell and Larker, 1981) and by the findings of Table (7), this criterion adopts an appropriate value for latent variables, thus confirming the appropriateness of convergent validity of the research. Divergent validity is the third criterion for examining the fit of measurement models. The acceptable divergence validity of a model indicates that one structure interacts more with its characteristics than other structures. Divergent validity is acceptable when the AVE for each construct is greater than the common variance between that structure and the other structures in the model (Fornell and Larker, 1981). According to Table (8), the root value of the mean of the common values of the hidden variables in the present study, which are located in the cells located in the main diameter of the matrix, is greater than the correlation value between those located in the lower and right cells of the main diameter. This means that each structure in the research model interacts more with its own characteristics than other structures. This shows the appropriate divergent validity and proper fit of the research measurement models.

Table 8. Fornell and Larker matrices for divergent validity

	Voluntary Disclosure	Cybernetic	Values	CC	CV	CL
Voluntary Disclosure	0.715					
Cybernetic	0.477	0.869				
Values	0.237	0.428	0.851			
CC	0.251	0.516	0.507	0.766		
CV	0.891	0.445	0.367	0.404		
CL	0.415	0.379	0.428	0.312	0.627	0.770

According to the results of reliability, convergent validity and divergent validity, it is observed

that the measurement models of the structural equation model of the research have the ability to measure the hidden variables of the research optimally. Therefore, the fit of the structural model of the research is examined. After measuring the validity and reliability of the measurement model, the structural model was evaluated through the relationships between latent variables. The present study used two coefficient of determination (R2) and predictive power coefficient (Q2) criteria. R^2 is a criterion that indicates the effect of an exogenous variable on an endogenous variable. According to the table below, the value of R^2 has been calculated for the endogenous structures of the research, which can confirm the suitability of the structural model. In addition, a criterion called Q^2 was used to evaluate the model's predictive power. According to the results of this criterion in Table (9), it can be concluded that the model has strong predictive power.

Table 9. The values of the coefficient of determination (R^2) and coefficient of predictive power (Q^2)

	R^2	Q^2
Voluntary Disclosure	0.500	0.247
Cybernetic	0.760	0.564
Values	0.497	0.345
CC	0.464	0.264
CV	0.755	0.592
CL	0.689	0.395

After checking the fit of the measurement models and the structural model, the general model of the structural equations of the research should be checked using the good of fitness (GOF), which has three values of 0.01, 0.25 and 0.36 as weak, medium and strong values for GOF. Has been introduced. This criterion is calculated using the following formula:

$$GOF = \sqrt{\overline{Communalities} \times \overline{R^2}}$$

Where in: $\overline{Communalities}$ The mean of the common values of the hidden variables and $\overline{R^2}$: the mean values of the coefficient of determination of the model's endogenous variables.

Table 10. The communication rate and R^2 of research variables

Concealed Variables	Abbreviation symbols	Communality	R^2
Development of optional disclosure	Voluntary Disclosure	0.378	0.464
Development of accounting cybernetics	Cybernetic	0.390	0.689
Development of accounting values	Values	0.681	0.755
Dialogic Accounting	Dialogic Accounting	0.577	0.760
Competitive Consequences	CC	0.200	--
Value Consequences	CV	0.286	0.486
Legal consequences	CL	0.442	0.497
Accounting Green Consequences	Accounting Green Consequences	0.199	0.500

Table 11. The results of the general model fit

$\overline{Communality}$	$\overline{R2}$	GOF
0.394	0.593	0.483

Given the value obtained for GOF of 0.483, a very good fit of the overall model is confirmed. After examining the fit of the measurement models and the structural model and having a suitable fit of the general model and according to Figures (5) and (6), the test results of the research hypotheses

are examined, and the results are presented in Table (12).

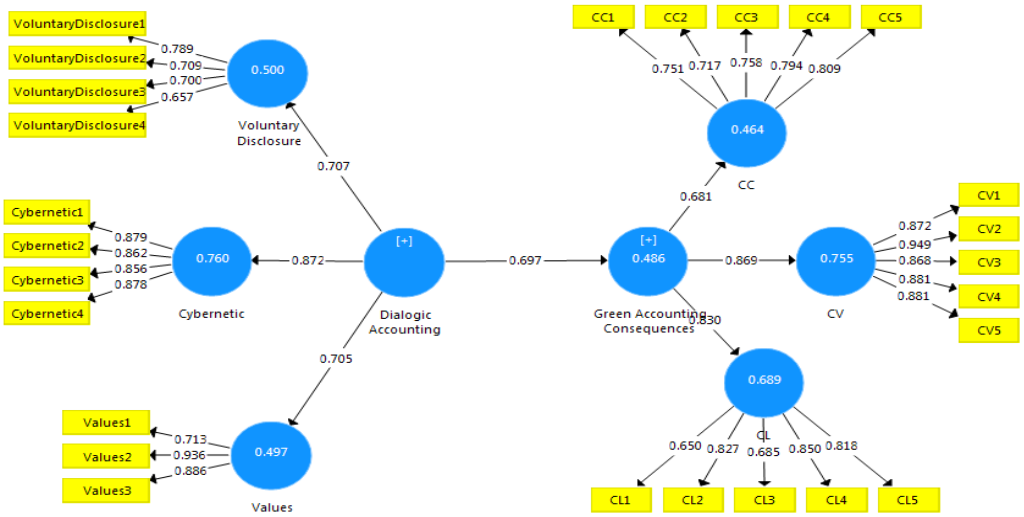

Figure 6. Structural model of research hypothesis with factor load coefficients

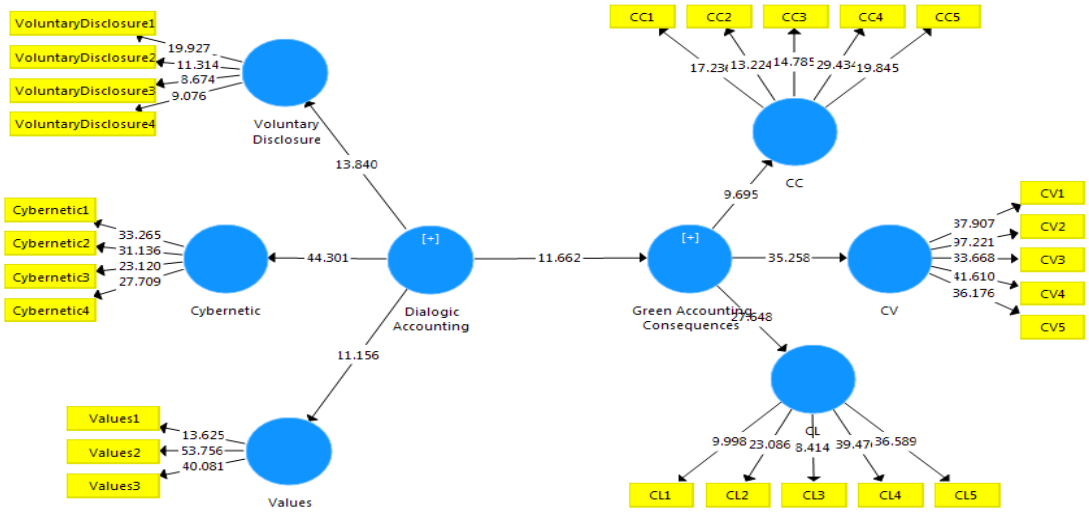

Figure 7. Structural model of research hypothesis with significant coefficients

Table 12. The results of the hypothesis test

Hypothesis	Causal Relationships between Research Variables	Route coefficient (β)	Meaningful (T-Value)	Test Result
The First Research Hypothesis	Dialogic accounting affects the green accounting implications of capital market companies.	0.690	11.660	proving a theory

According to Figures (5) and (6), the standardized coefficient (path coefficient) between the two variables (dialogic accounting and green accounting implications) is positive (0.99), and the t-statistic between these two variables (11.66) is greater than the value is 1.96. Therefore, it can be concluded that dialogic accounting has a positive and significant effect on the green accounting consequences of capital market companies, and therefore, the research hypothesis is accepted. On the other hand, was confirmed the second hypothesis of the research.

5. Conclusion

This study examines the role of technocracy instrumental rationale in dialogic accounting models with green accounting consequences. The results showed that developing the dialogic accounting model as a system basis in social contexts transfers capital market expectations as a system input. Combining it with accounting knowledge as a system process can create green accounting consequences, leading to system output. In other words, dialogic accounting can make the consequences of green accounting more dynamic, thereby reducing the capacity to protect the environment and reduce environmental pollution. Dialogic accounting seeks to develop information transparency through information infrastructures in the form of responsible stakeholder behaviors, develop voluntary disclosure of information, and through it, inclusive implications for accounting values such as the positive implications of green accounting from different perspectives such as competitive; achieve legal and social values. Dialogic accounting stimulates the context through the system cycle for voluntary disclosure and cybernetic development in accounting functions. It develops a level of future accounting ideals as pervasive values for stakeholders. Under these circumstances, green accounting will have more positive consequences in effectiveness as a systemic output in the accounting cycle of discourse. Consequences of green accounting in the form of competitive capital market functions due to cost control; the ability to manage waste under Dialogic accounting can more consistently enable companies to take full advantage of social potential in proportion to their capacity level. On the other hand, by creating a sequence in the accounting dialogic, laws are more tangibly integrated with the realities of the functional context in the market and its social situations and can strengthen and develop effective oversight of corporate operations. Ultimately, these are value implications that, based on the normative form of dialogic accounting, can lead to ethics and adherence to the responsible and voluntary disclosure of companies' environmental practices to stakeholders and gradually create an environmental identity for companies. Therefore, the effectiveness of dialogic accounting at the level of capital market companies can reduce the environmental and process pollution of capital market companies as a positive consequence of green accounting and help to create ethical values in accounting. Results obtained by Manetti et al. (2021) corresponded to Godowski et al. (2020) and Shahri et al. (2021) results.

On the other hand, it was determined technocracy instrumental rationale reinforces the positive effect of dialogic accounting on the green accounting consequences. Using instrumental rationality as the basis of technocracy can change the attitude, behavior and practical ethics of managers as helmsmen of the company to increase the level of social performance of companies, and this will strengthen the green accounting functions in the performance of companies. It should also be noted that if we focus on the instrumental rationality of technocracy, managers' decision-making procedures regarding managerial characteristics, either through standards and requirements or through media education and culture, cause more dynamic interaction between industries and companies by reducing ideas and solutions. Environmental pollution. This change in behavior and ethical decision-making practices created by the instrumental level of rationality of technocracy will be able to develop scenarios for the future impact of capital markets and industries on the environment and lead to actions based on technological capacity to control environmental degradation. At the same time, it helps increase the attractiveness of competitive advantage for companies to stimulate the continuous and sustainable use of green accounting. Results of Manetti et al. (2021) corresponding to Godowski et al. (2020) and Shahri et al. (2021).

Based on the obtained results, it is first suggested that as the development of any field of humanities knowledge, accounting should also be based on recognizing the current and future needs of users of financial statements to develop scenarios to strengthen the metaphorical perspectives of

dialogic accounting by holding scientific conferences with participation. Market and accounting analysts contribute to the greater integration of this paradigm in accounting and provide the basis for raising awareness and institutionalizing the social values of this field in managerial structures and attitudes. Second, the knowledge of accounting itself must distance itself from purely deductive approaches in the philosophy of the accounting profession by focusing on committees and, based on critical theories in the context of social phenomenology, strive to understand expectations of accounting knowledge and enhance effective interaction with stakeholders. In this way, cultivating and strengthening the functional values of accounting through mass media and social media tools can promote the profession in business management, gain more legitimacy for themselves and specialize in accounting knowledge with the help of ethics, preventing distortion or manipulation; earnings to convey more precise information to stakeholders. It is a kind of knowledge-based self-leadership based on reinforced beliefs in the accounting profession in which the themes of discourse can play a significant role.

References

1. Aly, D., El-Halaby, S. and Hussainey, K. (2018). Tone disclosure and financial performance: evidence from Egypt. *Accounting Research Journal*, 31(1), pp. 63-74. https://doi.org/10.1108/ARJ-09-2016-0123
2. Amernic, J. and Craig, R. (2009). Understanding accounting through conceptual metaphor: accounting is an instrument? *Critical Perspectives on Accounting*, 20(8), pp. 875-883. https://doi.org/10.1016/j.cpa.2009.06.004
3. Bellucci, M., Simoni, L., Acuti, D. and Manetti, G. (2019). Stakeholder engagement and dialogic accounting: Empirical evidence in sustainability reporting. *Accounting, Auditing & Accountability Journal*, 32(5), pp. 1467-1499. https://doi.org/10.1108/AAAJ-09-2017-3158
4. Bolan, R.S. (1999). Rationality revisited: An alternative perspective on reason in management and planning, *Journal of Management History*, 5(2), pp. 68-86. https://doi.org/10.1108/13552529910260082
5. Bordt, M. (2018). Discourses in ecosystem accounting: a survey of the expert community. *Ecological Economics*, 144(2), pp. 82-99. https://doi.org/10.1016/j.ecolecon.2017.06.032
6. Boyce, G. (2000). Valuing customers and loyalty: The rhetoric of customer focus versus the reality of alienation and exclusion of (de-valued) customers, *Critical Perspectives on Accounting*, 11(6), pp. 649-689 https://doi.org/10.1006/cpac.2000.0408
7. Boyce, M.C. and Arruda, E.M. (2000) Constitutive Models of Rubber Elasticity: A Review. *Rubber Chemistry and Technology*, 73, pp. 504-523. http://dx.doi.org/10.5254/1.3547602
8. Brown, J. (2009). Democracy, sustainability and dialogic accounting technologies: Taking pluralism seriously. *Critical Perspectives on Accounting*, 20(3), pp. 313-342. https://doi.org/10.1016/j.cpa.2008.08.002
9. Brown, J. and Dillard, J. (2021). Accounting for non-financial matters: technologies of humility as a means for developing critical dialogic accounting and accountability. *Meditari Accountancy Research*, 29(2), pp. 197-218. https://doi.org/10.1108/MEDAR-01-2020-0692
10. Budding, T. and Helden, J. V. (2022). Theme: Politicians' use of accounting informationEditorial: Unraveling politicians' use and non-use of accounting information. *Public Money & Management*, 42(3), pp. 137-139. https://doi.org/10.1080/09540962.2022.2028467
11. Chen, H., Tian, Y. and Daugherty, P. J. (2009). Measuring process orientation. *The International Journal of Logistics Management*, 20(2), pp. 213-227.

https://doi.org/10.1108/09574090910981305
12. Corrigan, L. T. (2018). Budget making: the theatrical presentation of accounting discourse. *Critical Perspectives on Accounting*, 55(1), pp. 12-32. https://doi.org/10.1016/j.cpa.2017.12.001
13. Craig, R. T. (1999). Communication theory as a field. *Communication Theory*, 9(2), pp. 119-161. https://doi.org/10.1111/j.1468-2885.1999.tb00355.x
14. Craig, R. T. (2008). Communication as a field and discipline. *The International Encyclopedia of Communication*, 2(2), pp. 675-688.
15. Dey, C. (2003). Corporate 'silent and 'shadow social accounting. *Social and Environmental Accountability Journal*, 23(2), pp. 6-9. https://doi.org/10.1080/0969160X.2003.9651696
16. Dianati Deilami. Z. (2014). Research Method in Accounting: A Practical Guide for Writing Dissertations and Articles, Iranian Management Accounting Association, Second Edition. Tehran, Iran. (In Persian)
17. Dillard, J. and Vinnari, E. (2019). Critical dialogical accountability: From accounting-based accountability to accountability-based accounting. *Critical Perspectives on Accounting*, 62(1), pp. 16-38. https://doi.org/10.1016/j.cpa.2018.10.003
18. Fornell, C. and Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), pp. 39-50.
19. Fremeaux, S., Puyou, F. R. and Michelson, G. (2020). Beyond accountants as technocrats: A common good perspective. *Critical Perspectives on Accounting*, 67, A. 102054. https://doi.org/10.1016/j.cpa.2018.07.003
20. Ghanbari, V., Abdoli, M., Valiyan, H. (2021). The Design of Effectiveness of Environmental Accounting Mechanisms Model Aimed at Sustainable Development of Stock Exchanges Companies by Grounded Theory Approach. *Environmental Researches*, 11(22), pp. 57-72. (In Persian)
21. Godowski, C., Nègre, E. and Verdier, M. A. (2020). Toward dialogic accounting? Public accountants' assistance to works councils− A tool between hope and illusion. *Critical Perspectives on Accounting*, 69(3), A. 102095. https://doi.org/10.1016/j.cpa.2019.102095
22. Gray, R. and Bebbington, J. (2001). *Accounting for The Environment*. 2nd ed. London: Sage. London, England
23. Gray, R., Dey, C., Owen, D., Evans, R. and Zadek, S. (1997). Struggling with the praxis of social accounting: Stakeholders, accountability, audits and procedures. *Accounting, Auditing & Accountability Journal*, 10(3), pp. 325-364. https://doi.org/10.1108/09513579710178106
24. Grossi, G., Biancone, P. P., Secinaro, S. and Brescia, V. (2021). Dialogic accounting through popular reporting and digital platforms. *Meditari Accountancy Research*, 29(7), pp. 75-93. https://doi.org/10.1108/MEDAR-01-2021-1163
25. Gunarathne, N., Lee, K. H. and Hitigala Kaluarachchilage, P. K. (2023). Tackling the integration challenge between environmental strategy and environmental management accounting. *Accounting, Auditing & Accountability Journal*, 36(1), pp. 63-95. https://doi.org/10.1108/AAAJ-03-2020-4452
26. Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), pp. 195-204.
27. Hussain, S., Liu, L. Y. J. and Miller, A. D. (2020). Accounting as a dichotomized discipline: An analysis of the source materials used in the construction of accounting articles. *Critical Perspectives on Accounting*, 66(2), A. 102086. https://doi.org/10.1016/j.cpa.2019.04.007
28. Jones, A. and Willis, M. (2003). The challenge of XBRL: business reporting for the investor. *Balance sheet*, 11(3), pp. 29-37. https://doi.org/10.1108/09657960310491172

29. Littlejohn, S. W. and Foss, K. A. (2011). Theories of Human Communication. Tenth Edition, Waveland Press, Long Grove, Illinois
30. Mael, F. and Ashforth, B. E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior*, 13(2), pp. 103-123.
31. Malthus, S. and Fowler, C. (2009). Perceptions of accounting: a qualitative New Zealand study. *Pacific Accounting Review*, 21(1), pp. 26-47. https://doi.org/10.1108/01140580910956849
32. Manetti, G., Bellucci, M. and Oliva, S. (2021). Unpacking dialogic accounting: a systematic literature review and research agenda. *Accounting, Auditing & Accountability Journal*, 34(9), pp. 250-283. https://doi.org/10.1108/AAAJ-08-2020-4736
33. McGoun, E. G., Bettner, M. S. and Coyne, M. P. (2007). Pedagogic metaphors and the nature of accounting signification. *Critical Perspectives on Accounting*, 18(2), pp. 213-230. https://doi.org/10.1016/j.cpa.2005.12.003
34. Medawar, C. (1976). The social audit: a political view. *Accounting, Organizations and Society*, 1(4), pp. 389-394. https://doi.org/10.1016/0361-3682(76)90041-6
35. Melissa Walters-York, L. (1996). Metaphor in accounting discourse. *Accounting, Auditing & Accountability Journal*, 9(5), pp. 45-70. https://doi.org/10.1108/09513579610367242
36. Merkl-Davies, D. M. and Brennan, N. M. (2017). A theoretical framework of external accounting communication: Research perspectives, traditions, and theories. *Accounting, Auditing & Accountability Journal*, 30(2), pp. 433-469. http://dx.doi.org/10.1108/AAAJ-04-2015-2039
37. Millar, E. and Searcy, C. (2020). The presence of citizen science in sustainability reporting. *Sustainability Accounting, Management and Policy Journal*, 11(1), pp. 31-64. https://doi.org/10.1108/SAMPJ-01-2019-0006
38. Morgan, G. (1988). Accounting as reality construction: towards a new epistemology for accounting practice. *Accounting, Organizations and Society*, 13(5), pp. 477-485. https://doi.org/10.1016/0361-3682(88)90018-9
39. Nicholls, A. (2018). A general theory of social impact accounting: Materiality, uncertainty and empowerment. *Journal of Social Entrepreneurship*, 9(2), pp. 132-153. https://doi.org/10.1080/19420676.2018.1452785
40. Pärl, Ü., Paemurru, E., Paemurru, K. and Kivisoo, H. (2022). Dialogical turn of accounting and accountability integrated reporting in non-profit and public-sector organizations. *Journal of Public Budgeting, Accounting & Financial Management*, 34(1), pp. 27-51. https://doi.org/10.1108/JPBAFM-11-2019-0178
41. Rutherford, B. A. (2002). The production of narrative accounting statements: An exploratory study of the operating and financial review. *Journal of Applied Accounting Research*, 6(3), pp. 25-56. https://doi.org/10.1108/96754260280001031
42. Sami, S., khosravipour, N., lashgari, Z. (2021). Effect of Dialectical Metaphor of Auditors' Negotiation Maturity Process. *Journal of Accounting Knowledge*, 2(2), pp. 1-24. (In Persian)
43. Shahri, M., Fazeli, N., Abdoli, M. (2021). Expanding of Anthropocene Theory Paradigm in Examining Corporate Environmental Behaviors on Green Accounting Strategic Consequences. *Management Accounting*, 14(48), pp. 193-214. (In Persian)
44. Simon, H. A. (1997). Models of Bounded Rationality. Vol. 3: Empirically Grounded Economic Reason. *Cambridge, MA: The MIT Press*. 2(2), pp. 1-93. https://doi.org/10.7551/mitpress/4711.001.0001
45. Uvaneswaran, S. M., Tsega, Z. and Seid, M. (2019). Efficacy of Social Accounting Practices on the Financial Performance: Evidence from Ethiopia. *Journal of Innovation in Business and*

Economics, 3(1), pp. 11-22. https://doi.org/10.22219/jibe.v3i01.7192
46. van der Meer-Kooistra, J. and Vosselman, E. (2012). Research paradigms, theoretical pluralism and the practical relevance of management accounting knowledge. *Qualitative Research in Accounting & Management*, 9(3), pp. 245-264. https://doi.org/10.1108/11766091211257452
47. Webber, B. (2006). Accounting for discourse relations: Constituency and dependency. *Intelligent linguistic Architectures*, 1(1), pp. 339-360.
48. Yen, A. C., Riley, T. J. and Liao, P. (2017). Chinese vs US investors' reactions to accounting narratives: An experiment. *Asian Review of Accounting*, 25(4), pp. 526-548. https://doi.org/10.1108/ARA-12-2016-0144

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Iranian Journal of
Accounting, Auditing & Finance

Ferdowsi University of Mashhad

Quarterly

RESEARCH ARTICLE

Collaboration Network Analysis of Papers Published in English Language Accounting and Finance Journals in Iran

Mostafa Ghannad*, Mohammad Arabmazar Yazdi, Mohammad Hossein Safarzadeh Bandari
Faculty of Management and Accounting, Shahid Beheshti University, Tehran, Iran
Reza Hesarzadeh
Faculty of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

How to cite this article:
Ghannad, M., Arabmazar Yazdi, M., Safarzadeh Bandari, M. H., & HesarZadeh, R. (2024). Collaboration Network Analysis of Papers Published in English language Accounting and Finance Journals in Iran. Iranian Journal of Accounting, Auditing and Finance, 8(1), 39-65. doi: 10.22067/ijaaf.2024.43946.131
https://ijaaf.um.ac.ir/article_43946.html

ARTICLE INFO

Article History
Received: 2023-09-10
Accepted: 2023-10-25
Published online: 2024-01-01

Abstract

Between 2016 and 2017, the Ministry of Science, Research, and Technology's Scholarly Journals Commission authorized the publication of four English-language journals in accounting and finance. By the end of 2022, these journals collectively produced 853 papers. This study explores and analyses the network of scholarly collaboration among authors contributing to papers published in English-language accounting and finance journals endorsed by the Ministry of Science from their inaugural issues to the latest one in 2022. This investigation delves into research output volume authorship patterns and identifies prolific contributors, shedding light on the collaborative networks within accounting and finance studies in Iran. Employing scientometric indexes and social network analytics, this research takes a pragmatic approach and utilizes network analysis software such as UCINet and VOSviewer for visualization and analysis. The findings of this study disclose that 2,438 authors contributed to a total of 853 papers. Among these authors, only 53 papers (6%) were authored by international professors. Examining authorship patterns reveals that a mere 8% of the papers (72 items) were individually authored, while the remainder involved collaboration: 25% (213 papers) were co-authored by pairs, 42% (354 papers) were the result of collaborative efforts among three scholars, and the remaining 25% were produced by groups involving more than three scholars. The most prolific monograph authors, credited with three monographs each, are Mohammad Izadikhah and Reza Jamei. The most productive authors are Fraydoon Rahnamay Roodposhti, Hashem Nikoomaram, and Mirfeiz Fallah Shams, with 28, 24, and 19 papers, respectively. Notably, these authors have published over 80% of their works in the journal they manage, specifically the International Journal of Finance and Managerial Accounting. The analysis of the scholarly collaboration network reveals a collaboration encompassing 1,406 scholars, of which 1,002 (71%) have contributed to only one paper. The network, with a compression index 0.018, demonstrates low coherence and includes numerous isolated nodes. However, the International Journal of Finance and Managerial Accounting stands out with a compression index of 0.051, indicating the highest level of coherence among journals. Regarding co-authorship, the most central scholars in the network are Fraydoon Rahmany Roodposhti, Hashem Nikoomaram, and Hamidreza Vakilifard. Notably, Fraydoon Rahmany Roodposhti and Hashem Nikoomaram have the highest number of collaborations in the network, with ten joint efforts. Visualizing the scholarly collaboration network yields valuable insights for policymakers within English-language accounting and finance journals. It aids in strategic planning by offering a comprehensive view of collaborations, contributing to a deeper understanding of this overlooked aspect of research partnerships.

Keywords:
Co-authorship, Iranian English Journals, Journals of Accounting and Finance, Scholarly Collaborations, Scientometrics, Social Network Analytics (SNA)

https://doi.org/10.22067/ijaaf.2024.43946.1315

NUMBER OF REFERENCES
47

NUMBER OF FIGURES
10

NUMBER OF TABLES
13

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Mostafa Ghannad
Email: M_ghanad@sbu.ac.ir
Tel: 09153755075
ORCID: 0000-0003-0906-6121

1. Introduction

Scientific journals play a pivotal role in disseminating study findings, serving as cornerstones for scholarly communities. A symbiotic relationship exists between scientific knowledge production and scientific journals' expansive nature, offering researchers a foundation to stay abreast of studies and the latest advancements in their fields. This collaboration prevents redundant efforts, conserves resources, and accelerates the pace of scientific progress (Behroozfar and Davarpanah, 2009). Evaluating and measuring scholarly works are crucial drivers of scientific advancement. Scientometrics, a means of measuring and assessing scholarly works, informs science policies. The initial steps in quality research involve problem identification, selecting appropriate methodologies, and effectively reporting findings (e.g., Hesarzadeh, 2018, 2020; Mastechaman et al., 2021). However, the subsequent phase, publication, and visibility of papers are equally vital.

Publishing in international forums broadens the research audience, aligning with Iran's emphasis, as seen in its sixth development plan and the Ministry of Science, Research, and Technology's support for English-language academic publications. By 2022, the country has published 282 English-language journals, including those in accounting and finance—a field known for its impact on development and economy (Aghdam et al., 2019). Notably, four English-language journals were authorized by the Ministry in 2016 and 2017, attracting contributions from Iranian researchers in accounting and finance.

Advancing research in this field requires diverse resources and expertise. Collaboration emerges as a strategic approach, enhancing research effectiveness (Collins, Oler, and Skousen, 2018). In recent years, scholarly collaborations have gained prominence, necessitating intellectual and social interactions among collaborators. These interactions are visualized through co-authorship networks, a focus of social network analytics (Erfanmanesh and Arshadi, 2015). Co-authorship signifies the formal collaboration among authors, leading to higher-quality outputs compared to individual efforts (Hudson, 1996).

Scholarly collaboration network analyses have been conducted across various fields, including accounting and finance (Andrikopoulos and Kostaris, 2017; Kılıç et al., 2019). However, none have specifically explored Iran's domestic accounting and finance journals. This study pioneers the analysis of collaboration networks in English-language journals within this field. Unlike previous studies focusing on different aspects, this research aims to uncover previously unexplored evidence. While studies proposing scholarly collaboration relations have been conducted (e.g., Taghizadeh et al., 2021; Faraji et al., 2022), this study differs in methodology and focus. The present study, focusing on English-language journals, holds strategic importance in promoting internationalization, aligning with Iran's development plan objectives (Law on the Fifth Five-Year Development Plan, 2010; Regulations of Scientific Publications, 2019; Supreme Council of the Cultural Revolution, 2010).

This quantitative approach uses VOS Viewer software to assess accounting and finance literature in Iranian English-language journals, unveiling patterns and insights (Singh, 2021). The innovative aspect lies in utilizing software like VOS Viewer and NetDraw extension in Ucinet. Analyses at both overall and individual journal levels offer comprehensive insights.

Given the recent growth of English-language journals in accounting and finance and the importance of scholarly collaboration networks, especially international collaborations, this study aims to analyze such networks within English-language accounting journals. This analysis spans the publication process from 2016 to 2022, evaluating cross-border collaborations, authorship patterns, and collaboration methods, identifying leading researchers, and analyzing scholarly collaboration networks using macro- and micro-indicators in the published papers.

2. Theoretical Framework

2.1 Importance of publishing international journals in Iran

In line with Section 3 of Article 1 within the Code of Scientific Journal Practices (2019), a key aim of the Scholarly Journals Commission under the Ministry of Science, Research, and Technology is to facilitate the integration of domestic scientific journals into international indexes. Table 13 of the Sixth Development Plan establishes targets for the number of indexed Iranian journals in global science databases. Commencing with the inception of the development program in 2017, the plan aimed for 45 indexed journals, with an annual programmed increase of five, ultimately reaching 70 international journals by 2021. Aligned with overarching documents such as Article 20 of the Law on the Fifth Plan (2010), Table 13 of Article 66 of the Law on the Sixth Economic, Social, and Cultural Development Plan of the Islamic Republic of Iran (2017), Section 4 of the National Actions of Macro Strategy 4, and Section 25 of the National Actions of Macro Strategy 9 within the Comprehensive Scientific Map of the Country (2010), a primary strategic goal involves bolstering scientific journals and domestic scientific products. This endeavor seeks to augment research and study contributions to the country's gross domestic product while enhancing the quality and global visibility. Hence, the highest priority among the Office of Policy Making and Planning Research Affairs initiatives under the Ministry of Science, Research, and Technology revolves around indexing scientific journals in reputable international science databases (Nejadebrahimi et al., 2023).

To actualize this objective, the Ministry of Science, Research, and Technology has actively advocated for the internationalization of journals. This support includes providing guidelines, establishing planning workgroups, incentivizing directives, and organizing seven professional workshops in 2021 and 2022. One of these workshops, the webinar titled "Indexing Scientific Journals: Familiarization with International Standards for Journal Inclusion in Credible Indexes," was specifically tailored for editors and directors of scientific journals held on Wednesday, June 8, 2022. Through these collective endeavors, the Ministry identified 97 journals in 2021 that met the stipulated conditions for indexing (Portal of Scientific Journals Evaluation, 2023). However, it's notable that despite accounting for 2% of the country's scientific journals (31 out of 1441), the fields of accounting and finance have not significantly contributed to journal internationalization, impeding the fulfillment of objectives outlined in the Sixth Development Plan.

In 2021, the Journal Evaluation Commission of the Ministry of Science, Research, and Technology assessed and categorized the scholarly ranks of 1,441 journals internationally, ranging from A to D. Among these journals, 282 (20%) are published in languages other than Persian, and their data is detailed in Table 1.

2.2 Scholarly collaboration network

Scholarly collaboration stands as a multifaceted practice that amalgamates diverse skills and cultivates the generation of novel scientific knowledge. As the knowledge landscape grows increasingly intricate, the demand for specialized and interdisciplinary expertise in research papers has amplified, underscoring the significance of collaborative approaches (De Stefano et al., 2011). Within the realm of accounting, research endeavors necessitate a breadth of resources and specialized skills that often exceed an individual researcher's capacity, considering limitations in both resources and time (Collins, Oler, and Skousen, 2018). Hence, collaborative efforts with other researchers emerge as the most effective strategy in this domain. An illuminating lens into the landscape of authorship and the number of authors in accounting papers within major international journals reveals a diminishing prevalence of single-authored papers. This decline is coupled with a proportional rise in papers authored by multiple individuals (e.g., Urbancic, 1992; Ettredge & Wong-On-Wing, 1991;

Mohammad Rezaei et al., 2016, as cited by Faraji et al., 2022). This trend mirrors the shift observed in domestic accounting research, where group research has gained traction. Pursuing collaborative research and disseminating collective findings necessitate mental and social interactions among collaborators, visualized through co-authorship networks. In scientometrics, co-authorship and co-writing networks have garnered substantial attention for their ability to quantify scholarly collaborations (Chong, Ooi, and Sohal, 2009). Moreover, collaborative research brings forth numerous advantages, as Hart (2000) emphasized, encompassing enhancements in paper quality, the utilization of co-authors' expertise and skills, the inception of innovative ideas, amplified scientific publications, and mutual learning. Li et al. (2013) accentuate that collaborative research allows researchers to complement each other's knowledge, expertise, and experiences, enabling effective performance and the publication of successful papers.

Table 1. Statistics of Persian and Non-Persian journals authorized by the Ministry of Science, Research, and Technology across all disciplines and knowledge fields, specifically accounting and finance

Language Journals	Field Journals	Number of Journals in Iran country	International ranking	Rank A	Rank B	Ranked lower than B
Persian Journals	At the level of all journals	1159	13 (1%)	196 (17%)	863 (74%)	87 (8%)
	In the level of accounting and finance disciplines	27	-	11 (41%)	15 (55%)	1 (4%)
Non-Persian Journals	At the level of all journals	282	97 (34%)	41 (15%)	126 (45%)	18 (6%)
	In the level of accounting and finance disciplines	4	-	1 (25%)	3 (75%)	-
Total (Persian and non-Persian Journals)	At the level of all journals	1441	110 (8%)	237 (16%)	989 (69%)	105 (7%)
	In the level of accounting and finance disciplines	31	-	12 (39%)	18 (58%)	1 (3%)

Source: researcher's findings based on the data inserted in the portal of scientific journals (2023)

Collins, Oler, and Skousen (2018) delineate fundamental roles crucial in scholarly collaboration, underscoring their significance within collaborative endeavors. These roles highlight the importance of collaborative dynamics, encompassing leadership (even in two-author papers), responsibility for writing and editing, data management, overseeing the paper's draft, responding to editors and reviewers, presenting findings in conferences or workshops, and facilitating the use of subject-method experts, especially in rapidly evolving technological landscapes or complex research designs.

Co-authorship networks are intricate webs comprising nodes representing authors, universities, and regions, interconnected through collaborative authorships. These networks link authors collaborating on at least one research paper, forming the network's foundation. The application of social network analysis indicators to explore scholarly collaboration networks through co-authorship was pioneered by Newman (2001) across domains like computer science, physics, and biomedicine. Subsequently, this methodology found application in diverse fields, including tourism, medicine, public health, energy, sociology, information science, and scientometrics (Erfanmanesh and Arshadi, 2016).

The analysis of co-authorship social networks employs macro-level and micro-level indicators to dissect their development and structure. Macro-indicators delve into the network's overall configuration and characteristics, encompassing metrics such as density, fragmentation, clustering

coefficient, centralization, components, connectedness, diameter, and the average of the shortest distances (Sadatmoosavi et al., 2018). Density, a pivotal factor in macro-indicators, quantifies the extent of connections within a network. Higher density implies increased interactions among network elements, while lower density suggests fewer connections, indicating weaker interrelations (Soheili and Osareh, 2013).

Expressed as a fraction ranging from zero to one, network density represents the ratio of actual connections to potential connections. Closer to one signifies higher density, indicating robust interconnections among nodes, fostering cohesion and collaboration (Han and Park, 2006). Centrality indices within social networks serve as vital metrics, elucidating an individual's significance, influence, and connectivity within the network. Individuals with higher centrality possess stronger ties and are pivotal players influencing the network's dynamics and scientific impact (Liu et al., 2005).

Table 2. Summary of Findings from Ghane and Rahimi (2011)

Investigated journal	Number of investigated papers	Number of researchers	Average of authorship	Degree of collaboration	Percentage of authorship pattern				International collaboration
					1	2	3	4 and more	
International Journal of Engineering	124	323	2.6	91%	19%	42%	35%	13%	19 papers (15%)
Asian Journal of Civil Engineering	93	232	2.5	92%	7%	46%	36%	11%	62 items (67%)
Iranian Journal of Biotechnology	59	245	4.15	95%	5%	9%	27%	59%	6 items (10%)
Iranian Journal of Materials Science & Engineering	42	116	2.8	95%	5%	33%	48%	14%	5 items (12%)
Iranian Journal of Electrical & Electronic Engineering (IEEE)	28	74	2.6	96%	3%	43%	43%	11%	2 items (7%)
International Journal of Iron & Steel Society of Iran	21	62	3	95%	5%	33%	43%	19%	1 item (5%)
total	367	1052	2.9	93%	7%	36%	37%	20%	95 papers (26%)

2.3 Literature review

Numerous studies have delved into collaboration networks, underscoring their significance. These investigations encompass works by Ghane and Rahimi (2011), Thavamani (2014), Erfanmanesh and Hosseini (2015), Erfanmanesh and Morovati (2016), Hajipour et al. (2019), Khalili and Mohammadi (2021), and Marefat and Marefat (2022). For instance, Ghane and Rahimi (2011) scrutinized collaboration patterns among authors in six Iranian English-language journals within the technical and engineering domain using the Islamic World Science Citation Database (ISC). A comprehensive

outline of their discoveries is detailed in Table 2:

Thavamani (2014) delved into the research contributions within the Malaysian Journal of Library and Information Science from 1996 to 2012, revealing that dual-authorship patterns dominated, accounting for 39% of 279 published papers. Single-authorship followed at 36%, while two-, three-, four-, and five-author patterns comprised 17%, 5%, 3%, and 3%, respectively. The collaboration level stood at 0.645, involving 560 authors across an average of 2 contributors per paper.

Erfanmanesh and Hosseini (2015) examined the performance of the International Journal of Information Science and Management from 2003 to 2012, uncovering an average of 2 authors per paper among 173 publications. Single-authorship constituted 31%, followed by two-author (46%), three-author (14%), four-author (8%), and a solitary five-author paper (1%). The network comprised 265 unique authors and 463 co-authorship ties, with a network density of 0.006. Collaboration indices were 2, the Degree of Collaboration at 0.69, and the Collaboration Coefficient at 0.4. Professor Mehrad emerged as a top contributor across multiple metrics.

Erfanmanesh and Morovati (2016) scrutinized the Quarterly Journal of Interdisciplinary Studies in Human Studies, involving 185 papers and 272 contributors. Single-authored papers accounted for 49%, followed by two-author (32%), three-author (11%), four-author (7%), and five-author (1%) compositions. International collaboration was scarce, appearing in only one paper. Pourezzat and Mousapour were the most prolific, each contributing to 5 papers. Mousapour, also the journal's editor, held significant centrality scores in the network.

Hajipour et al. (2019) analyzed 332 papers from 2012 to 2016, involving 686 researchers across various authorship patterns. Threesome authorship dominated at 40%, followed by twosome (35%), foursome (17%), and single-authorship (8%). Hamidizadeh led with 15 papers and held substantial centrality scores in the network.

Khalili and Mohammadi (2021) conducted a scientometric analysis of two Iranian journals: the International Journal of Information Science and Management and the Journal of Webology. These journals published 242 and 187 papers, respectively. Collaboration percentages with foreign journals were 24% and 76%. The most productive authors contributed 11 and 21 papers, respectively, with network ties and densities calculated for each.

Marefat and Marefat (2022) investigated collaboration rates in the Journal of Advanced Periodontology & Implant Dentistry from 2009 to 2020, involving 1076 authors and 376 papers. Authorship patterns varied from single to multiple authors, with 27% single-author, 22% two-author, 19% three-author, and 16% four-author papers.

In accounting research, scholars such as Fleischman and Schuele (2009), Andrikopoulos and Kostaris (2017), Collins, Oler, and Skousen (2018), and Kılıç et al. (2019) have explored collaborative scholarly cooperation, emphasizing benefits such as skill integration, intellectual stimulation, and enhanced research quality.

Andrikopoulos and Kostaris (2017) explored scholarly collaboration networks within accounting, examining 4738 papers published from 1985 to 2014 across five reputable accounting journals:

1. The Accounting Review
2. Accounting, Organizations and Society
3. Journal of Accounting and Economics
4. Journal of Accounting Research
5. Contemporary Accounting Research

Their findings unveiled a small-world collaboration network with 3,609 unique authors represented as nodes. The distribution revealed 30% of single-authored papers, 36% with two authors, and 34% with three authors. David Larcker emerged as the most prolific author with 43 papers, while Dan Dhaliwal held the highest degree of centrality at 41. The average degree centrality was calculated

at 3.195. A significant 69% of the total network size comprised the giant component, and its average distance measured at 6.274.

Collins, Oler, and Skousen (2018) observed a significant shift in authorship patterns in leading accounting journals. In 1960, around 90% of The Accounting Review papers were single-authored. However, by 2015, this dropped to 20%, with 29% two-author papers and 51% featuring more than two authors, indicating a growing trend towards collaborative efforts.

Kılıç et al. (2019) analyzed co-authorship networks across 22 accounting journals, noting a rising trend in multi-authored papers among 10,863 publications. They found that 26% were single-authored, 36% were two-authored, three authors contributed to 30%, and 8% involved four or more authors. Lee D. Parker was highlighted as the most prolific author with 48 papers. Their study involved key network indicators like 31,836 ties, 8,700 nodes, an average degree centrality of 3.557, a network concentration of 0.006, a network density of 836 components, with the largest component representing 70% of the total network and an average distance of 7.120.

Faraji et al. (2022) conducted a pioneering study on scholarly collaborations within Iran's accounting sphere. They analyzed papers from the top five accounting journals between 2016 and 2018. Their findings highlighted collaborative dynamics, predominantly among professors and students, often stemming from thesis-related papers. Professors in international scholarly accounting papers tend to collaborate more frequently, minimizing student involvement.

Given the significance of scholarly collaboration networks and the research gap in accounting and finance, this study analyzes such networks in English-language accounting and finance journals. The anticipated findings are poised to guide journal policies and mark a significant contribution in this area of research.

2.4 Research questions

This study endeavors to provide a comprehensive overview of scholarly publications within English-language accounting and finance journals in Iran. Our objectives encompass identifying key contributors facilitating knowledge dissemination, unraveling prevalent connections among these individuals, and delineating influential entities within this scholarly network. To accomplish these objectives, this paper will address several critical questions:

First Question*:* What is the trend in paper publications, and to what extent is there cross-border collaboration with foreign scholars?

Second Question*:* How do authorship patterns and degrees of collaboration among scholars manifest, and which scholars have contributed significantly as sole authors?

Third Question*:* Who are the most prolific individuals in terms of published papers?

Fourth Question: What macro-indicators define the scholarly collaboration network among scholars in these published papers?

Fifth Question: How do micro-indicators of scholarly collaboration networks among scholars (such as the Degree Centrality Index, Closeness Centrality Index, Betweenness Centrality Index, and Eigenvector Index) manifest in these published papers?

Sixth Question: Which collaborative groups feature most prominently as dual collaborative entities in these published papers?

3. Research Methodology

The current research adopts a scientometrics and social network analytics approach. The study encompasses papers published across all four English-language accounting and finance journals in Iran from their inception until the conclusion of 2022. Data necessary for analysis was gathered

directly from the official websites of these journals. Information regarding the authors of the papers was collated into an Excel file, addressing variances in author names through the Fuzzy Lookup Add-in for Excel. Each author's data underwent cross-referencing, and the dataset was structured into a co-authorship matrix using Bibexcel. Following this, separate co-authorship matrices were formulated for each journal and subsequently imported into software applications ucinet and VOSviewer. We conducted comprehensive co-authorship network analyses encompassing all journals collectively and for each individual journal. All four English-language accounting and finance journals follow a quarterly publication schedule. Presented below is a summary outlining the key statistical data pertinent to the research's population across these journals:

Table 3. Research Statistical Population

Code	Journal Title	Start	Print Circulation	Number of Published Papers	Publisher	Website
1	International Journal of Finance and Managerial Accounting	2016 (winter)	28	311	Iranian Financial Engineering Associations	ijfma.srbiau.ac.ir
2	Advances in Mathematical Finance and Applications	2016 (summer)	26	264	Islamic Azad University of Arak	amfa.arak.iau.ir
3	Iranian Journal of Finance	2017 (summer)	22	131	Iran Finance Association	ijfifsa.ir
4	Iranian Journal of Accounting, Auditing and Finance	2017 (Autumn)	21	147	Ferdowsi University of Mashhad, Iran	ijaaf.um.ac.ir
Sum			97	853	9 papers are published in each number on average	

4. Research Findings

This section presents findings derived from analyzing the scholarly collaboration network across four English-language accounting and finance institutions, considering various indicators.

4.1 Answering the first research question

" What is the trend in paper publications, and to what extent is cross-border collaboration with foreign scholars?" Journals 1, 2, 3, and 4 have been consistently publishing papers since the commencement of 2016. Specifically, two publications were made in July 2016, followed by two in July 2017 and one in February 2017 for Journal 4. By the conclusion of 2022, a total of 853 papers had been published across 97 English journals focusing on accounting and finance in Iran, averaging 8.8 papers per issue. The publication trend demonstrates an upward trajectory, detailed in Table 4. Notably, Journals 3 and 4 have maintained a consistent publication routine, with Journal 3 showcasing a consistent publication of 6 papers in all issues except for Issue 4 in October 2018, where 5 papers were published. Conversely, Journal 4 has displayed a lower publication rate, with only 7 papers across all its issues. It's crucial to highlight that among these publications, only 53 papers have featured affiliations with foreign universities, including Iranian individuals. Despite the anticipation of an increasing trend, the level of collaboration has not risen significantly. Journal 4 records the highest rate of international collaboration at 21%, involving 17 papers featuring international contributors.

Table 4. Examination of international collaboration and publication trends in English journals focusing on accounting and finance in Iran from 2016 to 2022

Journals	Total		Journal 1		Journal 2		Journal 3		Journal 4	
Number of:	papers	IC*	papers	IC*	papers	IC*	papers	IC*	papers	IC*
2016	44	6	28	6	16	-	-	-	-	-
2017	83	5	32	4	32	-	12	-	7	1
2018	114	9	31	3	32	1	23	-	28	5
2019	124	8	40	3	32	3	24	-	28	2
2020	137	11	49	4	36	4	24	1	28	2
2021	167	6	63	3	52	1	24	-	28	2
2022	184	8	68	1	64	1	24	1	28	5
sum	853	53	311	24	264	10	131	2	147	17
Percentage of Collaboration	6%		8%		4%		2%		12%	
Issue	97		28		26		22		21	
The average number of papers in each number	8.8		11		10		5.95		7	

*IC: Number of international collaborations

4.2 Answering the second question

How do authorship patterns and degrees of collaboration among scholars manifest, and which scholars have contributed significantly as sole authors?

An analysis of authorship patterns within papers published in English-language accounting and finance journals in Iran indicates that the three-authorship pattern is the most prevalent, representing 354 papers (42%). Following this, co-authorship and four-authorship patterns constitute 213 papers (25%) and 193 papers (23%). Single authorship accounts for 72 papers (8%), while five and six-authorship patterns are the least common, appearing in 20 and 1 paper, respectively. The distribution of papers and their corresponding percentages for each journal is detailed in Table 4. Across all journals, except Journal 4, more than 88% of papers have been authored and published by two to four authors, aligning with prevalent practices in standard journal publication norms. However, Journal 4 stands out due to a notable number of monographs, resulting in variations in prevailing authorship patterns. These monographs contribute to the lowest degree of collaboration, accounting for 78% in Journal 4.

Quantifying the degree of author collaboration involved utilizing the formula introduced by Subramanyam (1983):

$$\text{Degree of collaboration} = \frac{\text{Number of multi-authored papers}}{\text{Number of multi-authored papers} + \text{Number of single-authored papers}}$$

Table 5. Authorship patterns in English journals of accounting and finance of Iran

Number of Authors	Sum of Journals		Journal 1		Journal 2		Journal 3		Journal 4	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
One Author	72	8%	14	5%	21	8%	5	4%	32	22%
Two Author	213	25%	60	19%	74	28%	33	25%	46	31%
Three Author	354	42%	147	47%	108	41%	54	41%	45	31%
Four Author	193	23%	83	27%	51	19%	38	29%	21	14%
Five Author	20	2%	7	2%	9	3%	1	1%	3	2%
Six Author	1	0%	-	-	1	0%	-	-	-	-
Sum of Papers	853		311		264		131		147	
Degree of collaboration	92%		96%		92%		96%		78%	

By examining the monographs, we found that the following authors have had the most monographs in English-language journals of accounting and finance of Iran during the investigated seven-year period. Therefore, Mohammad Izadikhah (journal 3: Editor-in-Chief) and Reza Jamei have had the most monographs, having published three. Table 6 includes all the authors with multiple monographs during the study period.

Table 6. Information of authors with more than one monograph sorted by English journals of accounting and finance

Name	Number of Monographs	Journal 1	Journal 2	Journal 3	Journal 4
Mohammad Izadikhah	3	-	3	-	-
Reza Jamei	3	1	-	1	1
Hassan Rashidi	2	-	-	-	-
Reza Hesarzadeh	2	-	-	-	2
Arash Arianpoor	2	-	-	-	2
Ali Daemigah	2	-	-	-	2

4.3 Answering the third question

Who are the most prolific individuals in terms of published papers?

The most prolific authors in English-language accounting and finance journals in Iran are detailed in the following table. Collectively, Fraydoon Rahnamay Roodposhti, Hashem Nikoomaram, and Mirfeiz Fallah Shams have demonstrated the highest productivity, having published 28 (3.3%), 24 (2.8%), and 19 (2.2%) papers, respectively. The names of these highly productive authors, sorted by the journals they have contributed to, are also presented in Table 7.

Authors who have contributed more than 7 papers to Journal 1, more than 3 papers to Journal 2, and more than 2 papers to Journals 3 and 4 are listed, following the Bradford principle to encompass the productive authors of these journals. Consequently, the most substantial share of publications in journals exceeding the collaboration limit of 3.3% (across all journals) is attributed to the following authors:

Fraydoon Rahnamay Roodposhti (1 journal: 8%)
Hashem Nikoomaram (1 journal: 5.7%)
Mohammadreza Abdoli (3 journals: 5.3%)
Mirfeiz Fallah Shams (1 journal: 5.1%)
Zahra Pourzamani (1 journal: 4.2%)
Reza Tehrani (3 journals: 3.8%)
Hamidreza Vakilifard (1 journal: 3.5%)

Journal 1, with 5 items, and Journal 3, with 2 items, hold the record for publishing the highest number of papers by a specific author. In contrast, Journals 2 and 4 have not surpassed the average.

To visualize the network's density and highlight concentrated areas on the map, we utilized the VOSViewer software (see Figure 1-5). In this visualization, each vertex is color-coded based on multiple factors, including its weight within the network, the number of neighboring vertices, and the significance of these adjacent vertices. Colors ranging from orange to dark yellow (tending towards red) signify vertices surrounded by numerous and heavily weighted neighboring vertices. Conversely, when a point has fewer nearby vertices with lower weights, its color shifts towards blue; the colors indicate vertex density, ranging from blue (indicating low density) to red (indicating high density). Authors positioned within denser areas appear in red, highlighting their pivotal roles in the journal co-authorship network (Erfanmanesh and Hosseini, 2015).

Table 7. The most productive authors in English journals of accounting and finance of Iran

rank	In universal level		Journal 1		Journal 2		Journal 3		Journal 4	
	Names of individuals with more than 10 papers	number	Names of individuals with more than 6 papers	number	Names of individuals with more than 4 papers	Number	Names of individuals with more than 3 papers	number	Names of individuals with more than 3 papers	number
1	Fraydoon Rahnamay Roodposhti	28	Fraydoon Rahnamay Roodposhti	25	Ahmad Sarlak	8	Mohammadreza Abdoli	7	Mahdi Faghani	4
2	Hashem Nikoomaram	24	Hashem Nikoomaram	18	Mohsen Hamidian	7	Reza Tehrani	5	Zohreh Hajiha	4
3	Mirfeiz Fallah Shams	19	Mirfeiz fallah shams	16	Reza Gholami Jamkarani	6	Ghodratollah Emamverdi	4	Mahdi Moradi	3
4	Roya Darabi	16	Zahra Pourzamani	13	Allah Karam Salehi	6	Farhad Dehdar	4	Heydar Mohammadzadeh Salteh	3
5	Mohammad Hamed Khanmohammadi	16	Hamidreza Vakilifard	11	Ali Lalbar	6	Ebrahim Abbasi	4	Masood Fooladi	3
6	HAMIDREZA KORDLOUIE	15	Hassan Yazdifar	9	Roya Darabi	5	Hassan Ghalibaf Asl	4	Maryam Farhadi	3
7	Hamidreza Vakilifard	15	HAMIDREZA KORDLOUIE	9	Mohammad Hamed Khan Mohammadi	4	Ali Namaki	4	Mahmoud Mousavi Shiri	3
8	Mohsen Hamidian	14	Bahman Banimahd	9	Ali Asghar Anvary Rostamy	4	Ali Khozain	3	Amir Ghafourian Shagerdi	3
9	Bahman Banimahd	14	Mohammad Hamed Khanmohammadi	8	Gholamreza Farsad Amanollahi	4	Ali Hosseini	3	Arash Arianpour	3
10	Zahra Pourzamani	14	Keyhan Azadi	8	Mohsen Rostamy Malkhalifeh	4	Babak Jamshidinavid	3	Arezoo Aghaei Chadegani	3
11	Ghodratallah Talebnia	14	MohammadReza Vatanparast	8	Reza Tehrani	4	Hamidreza Kordlouie	3	Hamzeh Didar	3
12	Hassan Yazdifar	12	Roya Darabi	8	Mohammad Gholamrezapour	4	Mohammad Esmaeil Fadaeinezad	3	Hamid Zarei	3
13	Mohammadreza Abdoli	12	Taghi Torabi	7	Majid Zanjirdar	4	Mehrdad Ghanbari	3	Farzaneh Nasirzadeh	3
14	Mahdi Safari Gerayli	11	Ghodratallah Talebnia	7	Hashem Nikoomaram	4	Mohsen Seighali	3	Mohsen Dastgir	3
15	Nader Rezaei	11	sina kheradyar	7	Mitra Mohammadtalebi	4	Fatemeh Sarraf	3	Roya Darabi	3
16	Mohsen Dastgir	11	Asgar Pakmaram	7	Abbas Aflatooni	4				
17	Hossein Panahian	11	Sahar Sepasi	6	Hossein Panahian	4				
18	sina kheradyar	10	Mahdi Meshki	6	Parviz Saeidi	4				
19	Gholamreza Zomorodian	10	Rasoul Abdi	6	Rahmatollah Mohammadipour	4	Ghodratallah Talebnia	3	Reza Hesarzadeh	3
20	Reza Gholami Jamkarani	10	Nader Rezaei	6	Bahareh Mohammadtalebi	4				
21	Asgar Pakmaram	10			Ghodratallah Talebnia	4				
					Mahdi Safari Gerayli	4				

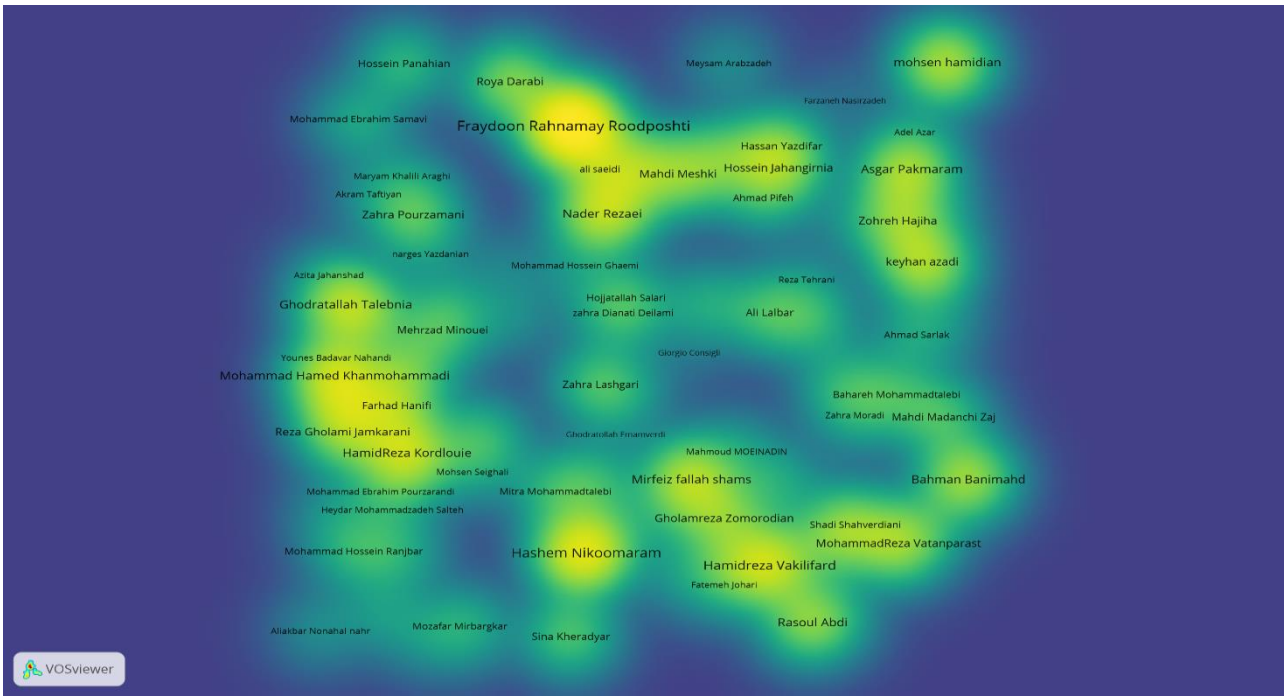

Figure1. Visualization of network density across all journals

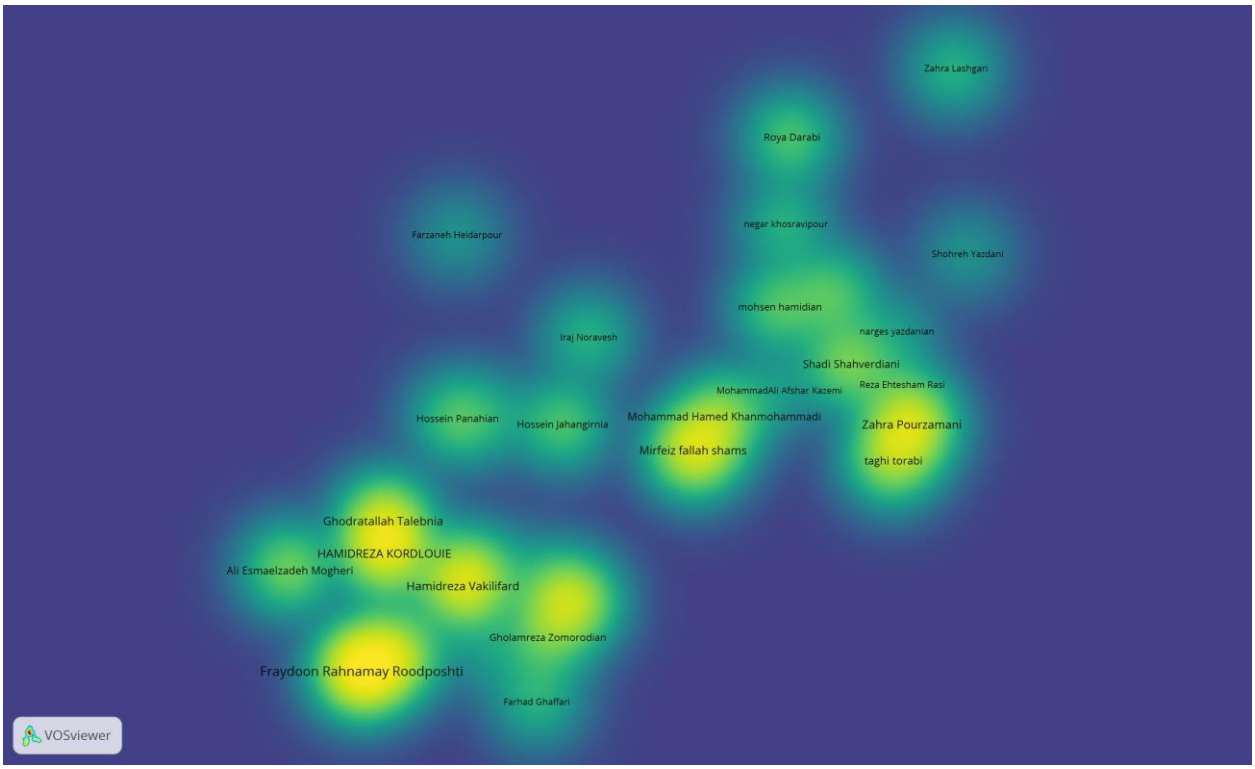

Figure 2. Density visualization of the network in Journal 1

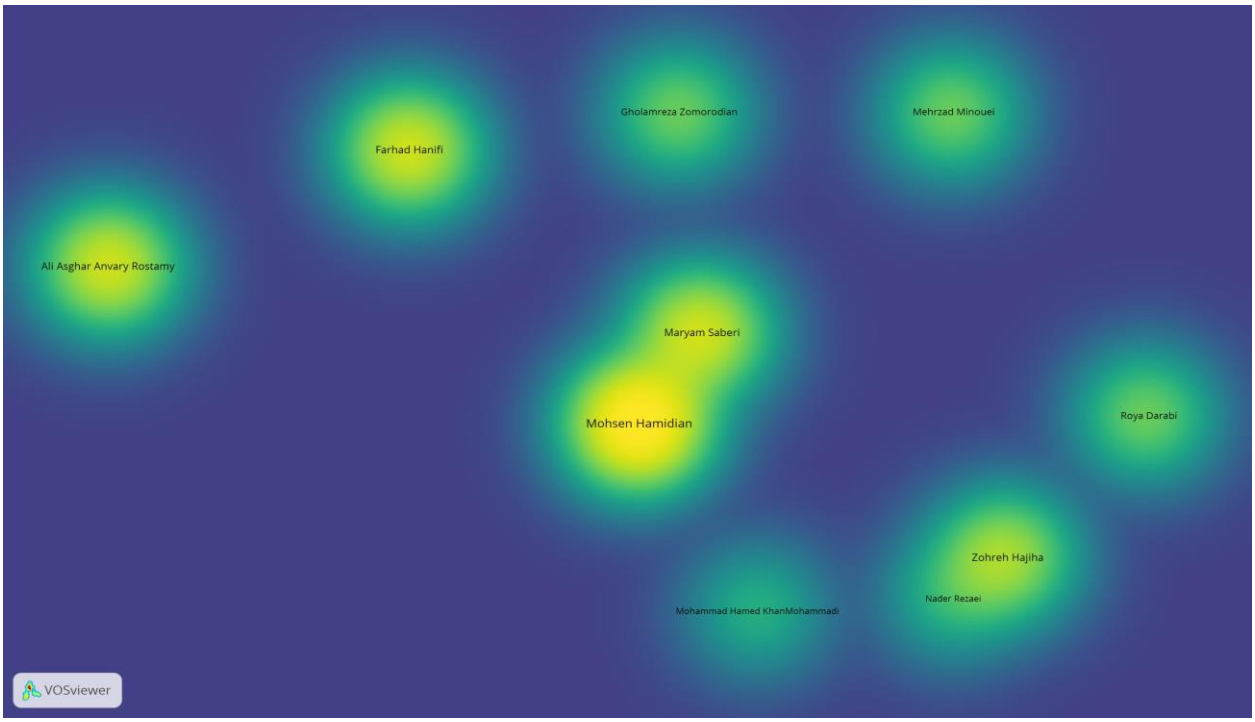

Figure 3. Density visualization of the network in Journal 2

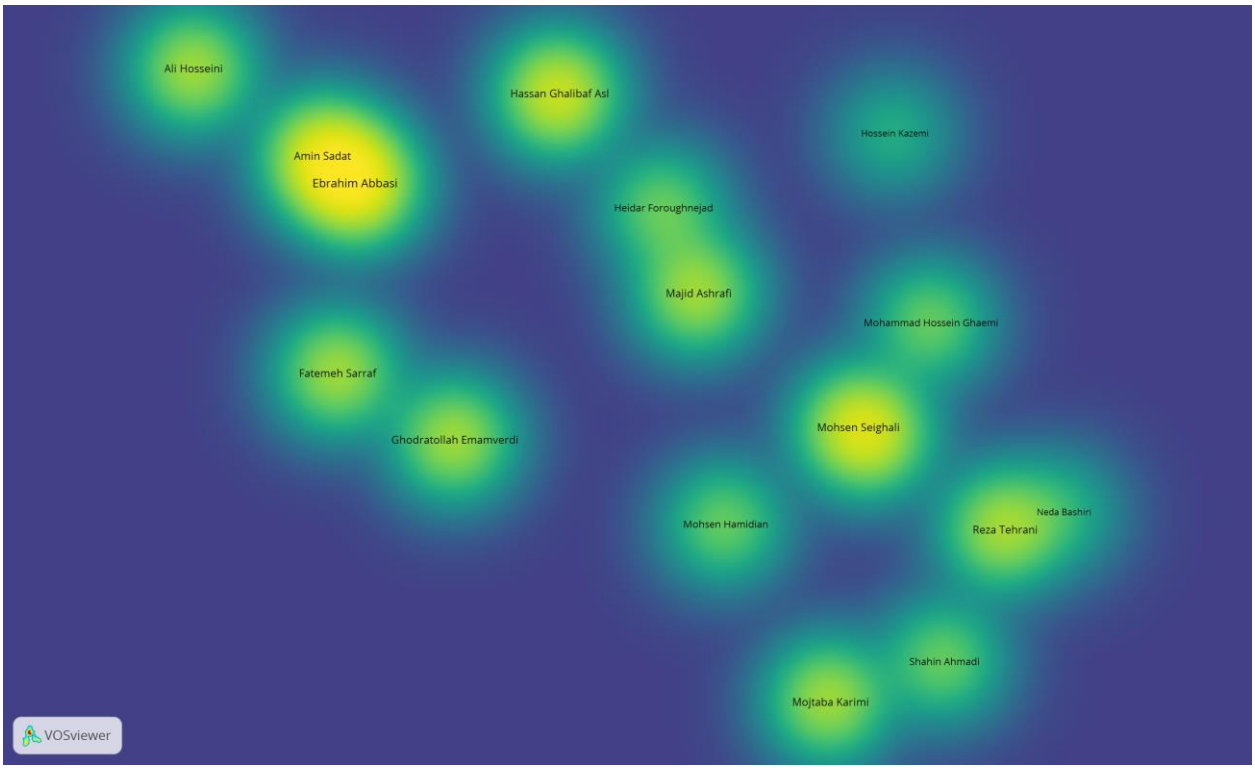

Figure 4. Density visualization of the network in Journal 3

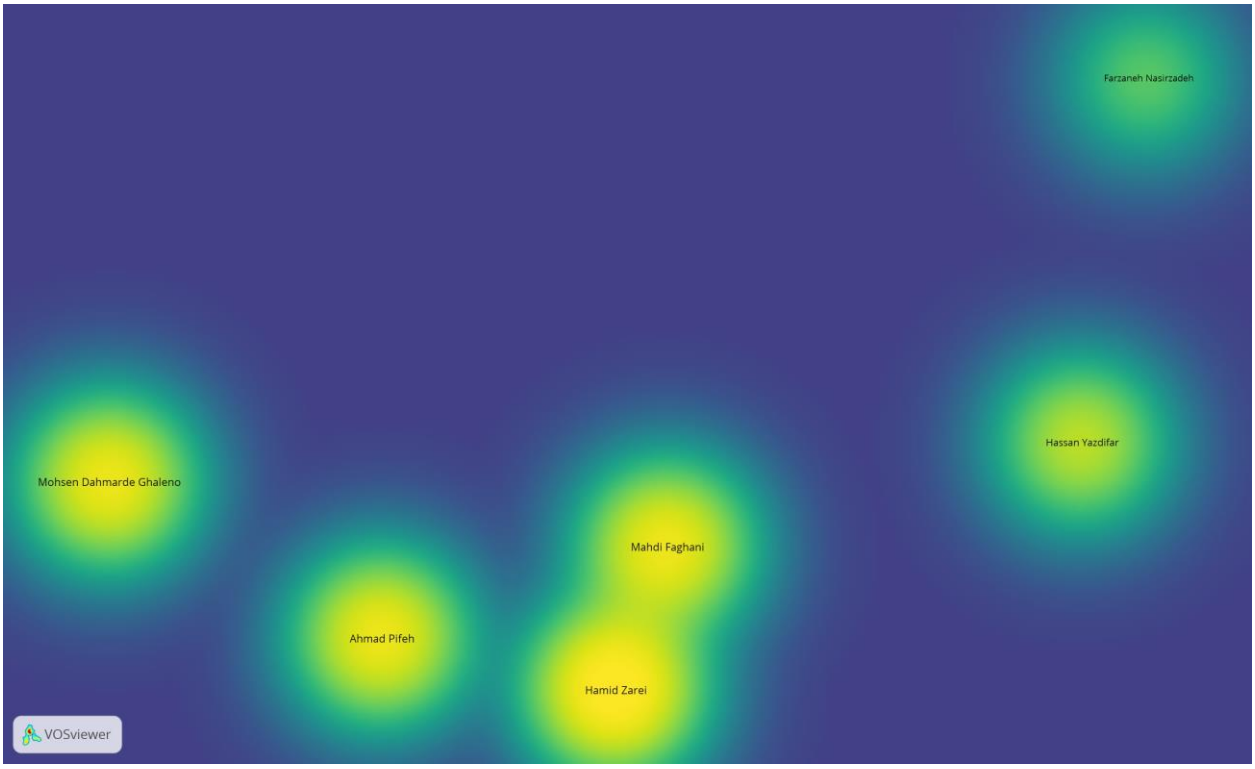

Figure 5. Density visualization of the network in Journal 4

4.4 Answering to the fourth question

What macro-indicators define the scholarly collaboration network among scholars in these published papers?

Macro indicators for scholarly collaboration networks in English-language accounting and finance journals in Iran are outlined in Table 8. The density measure provides insight into the level of interconnectedness within a network, representing the ratio of actual connections to potential connections among actors. In simpler terms, network density measures the number of links in a network relative to the maximum number of possible links (Godley, Barron, and Sharma, 2011). The overall network density across all journals is calculated at 0.018. However, Journal 1 stands out with a notably higher density measure of 0.051, indicating a greater level of interconnectedness within the network specific to Journal 1.

The examination of social networks within English accounting and finance journals in Iran, both across all journals and specific to Journals 1 to 4, reveals the presence of 178, 57, 46, 59, and 51 nodes representing scholars, respectively. Furthermore, 562, 162, 56, 114, and 58 ties denote the co-authorship connections among scholars. Each node represents a distinct author in this context, and the ties symbolize collaborative authorship between these individuals. Essentially, if a tie links two authors, it signifies their collaboration on at least one paper. Figures 6 to 10 visually depict these scholarly collaboration networks among nodes. Notably, the thickness of the lines represents the strength of the ties, reflecting the number of co-authored papers between two groups of authors. Thicker lines indicate a higher number of collaborative papers between these authors, as illustrated in the figures.

Table 8. Macro-indicators of present social networks in English journals of accounting and finance

Indicator	Description	Total	Journal 1	Journal 2	Journal 3	Journal 4
Node (author)		178	57	46	59	51
Tie	Collaborative authorship among scholars	562	162	56	114	58
Average Degree		3.157	2.842	1.217	1.932	1.137
Degree centralization		0.079	0.169	0.065	0.055	0.039
Density	Density or connections between network nodes is a value ranging from zero to one, representing the ratio of existing connections to all potential relationships within the network.	0.018	0.051	0.027	0.033	0.023
Component	It is a subset of the network, comprising nodes linked to another node through single or multiple ties.	31	11	23	18	25
Connectedness (% of the size of the largest components)	The extent of connectivity and interrelation among nodes within a network through ties or interconnected networks of ties.	0.390	0.319	0.083	0.134	0.038
Closure		0.315	0.427	0.375	0.535	0.409
Average (Mean) distance	The average distance between any two distinct groups within the social network.	4.271	2.837	2.291	3.178	1.612
Diameter	The distance between the farthest nodes within the primary component of the network.	12	7	5	9	4
Breadth		0.942	0.855	0.952	0.935	0.971
Compactness		0.117	0.145	0.048	0.065	0.029

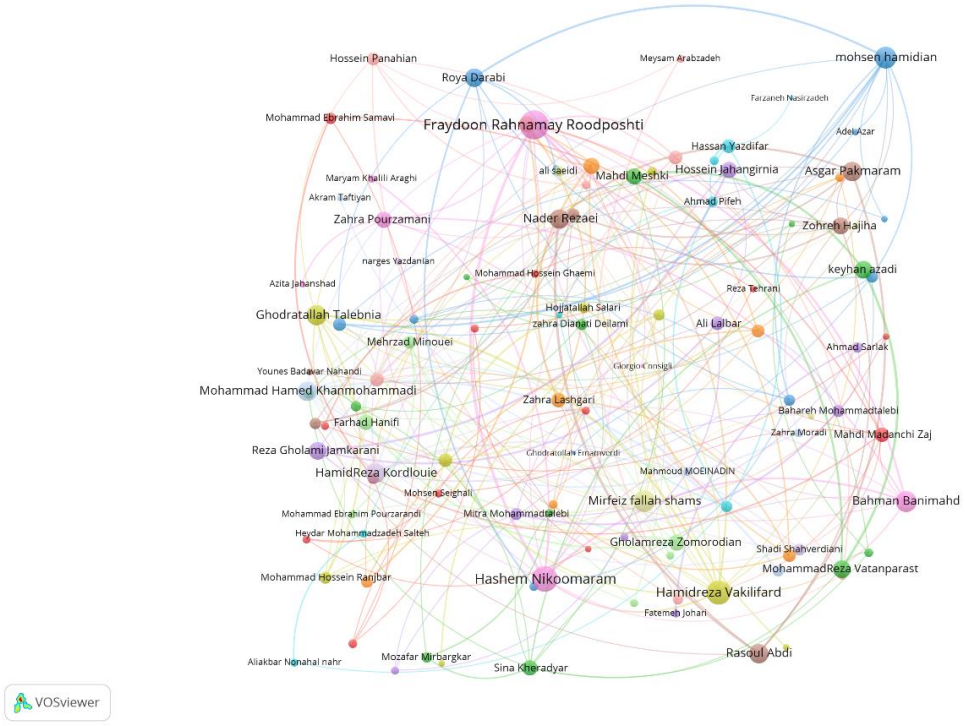

Figure 6. Network visualization across for journals

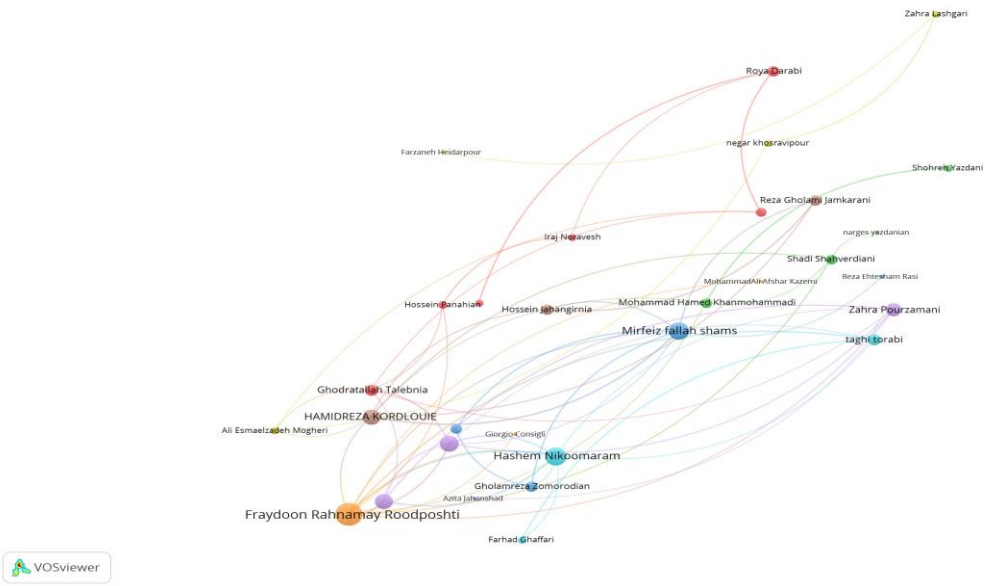

Figure 7. Network visualization for Journal 1

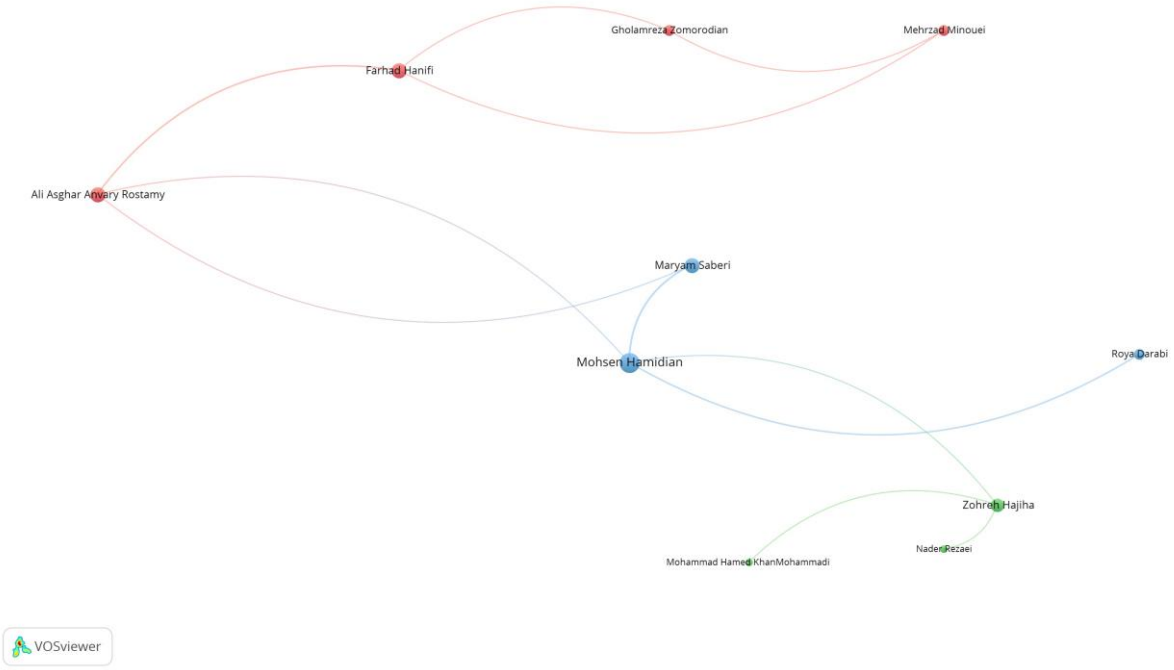

Figure 8. Network visualization for Journal 2

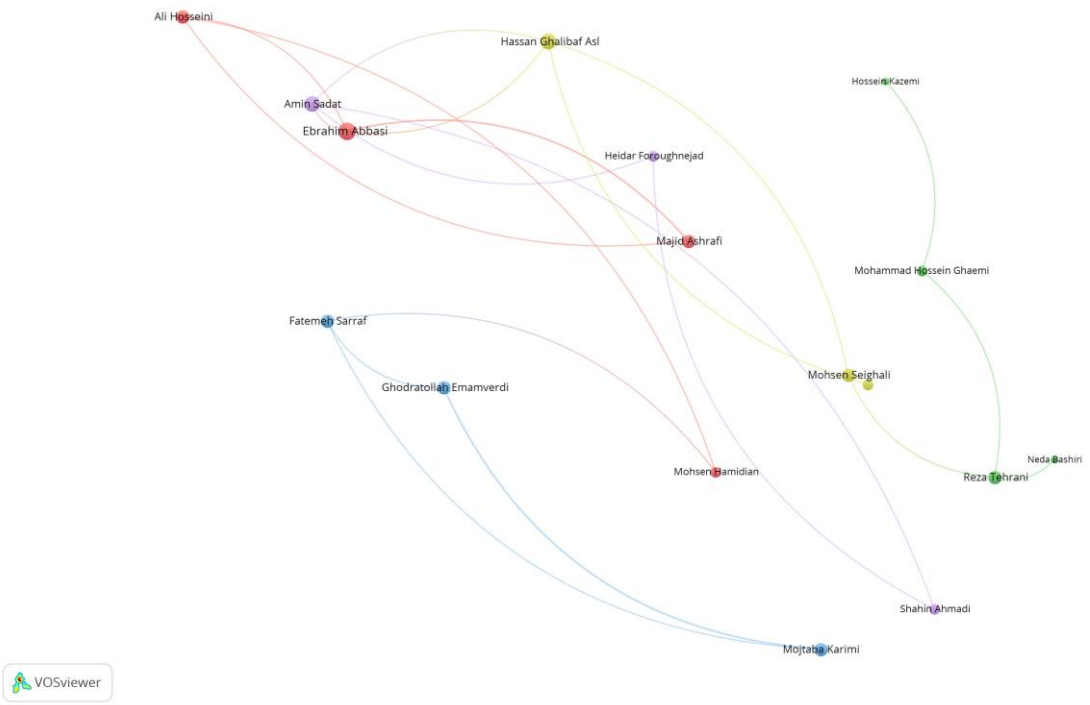

Figure 9. Network visualization for Journal 3

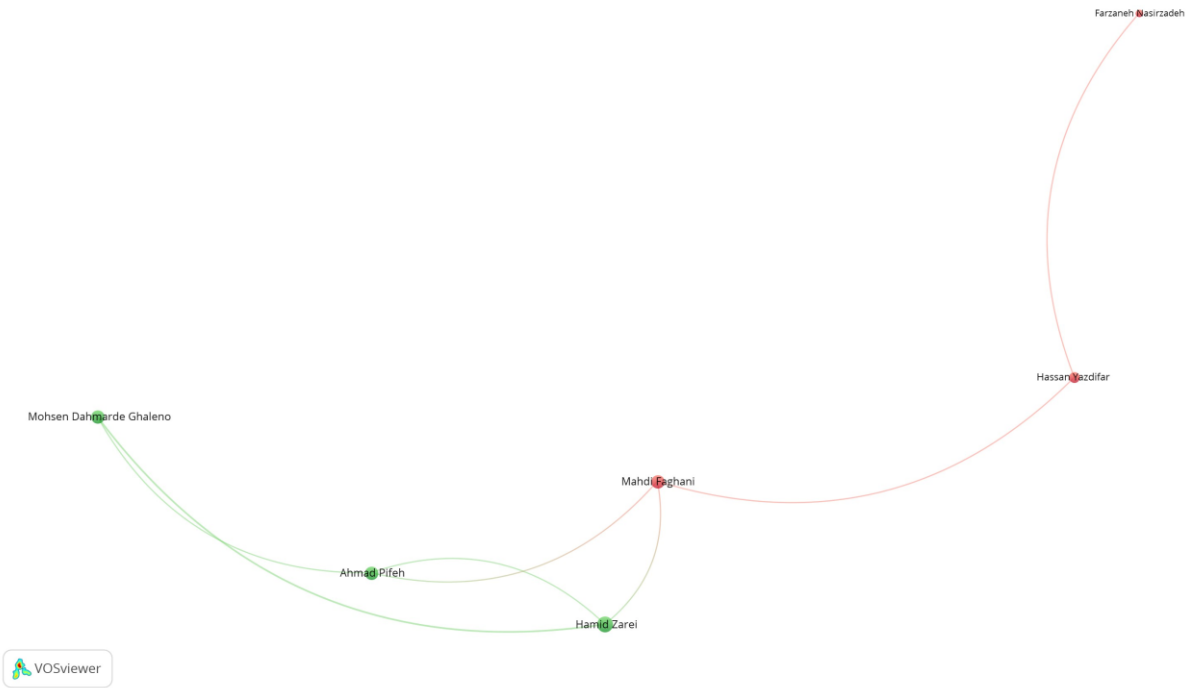

Figure10. Network visualization for Journal 4

4.5 Answering the fifth question

How do micro-indicators of scholarly collaboration networks among scholars (such as the Degree Centrality Index, Closeness Centrality Index, Betweenness Centrality Index, and Eigenvector Index) manifest in these published papers?

4.5.1 Degree centrality indicated in journals of the study

Degree centrality gauges a node's connections within the network, essentially representing the number of ties received by a node (Wasserman and Faust, 1994). For instance, it indicates the number of papers where Ghannad et al. (2023) collaborate with others. If Ghannad et al. (2023) co-author one paper with three others, another with two, and one as a sole author, their degree centrality would be 4 (3+1+0). Nodes with the highest degree centrality index are regarded as the most collaborative within the network. At the universal level encompassing all journals, F. Rahnamay Roodposhti, Hashem Nikoomaram, and Hamidreza Vakilifard hold the highest degree centrality indices, each scoring 17, 13, and 13, respectively. Among the four journals, F. Rahnamay Roodposhti boasts the highest degree centrality index, with 12. For further details about researchers with the highest degree centrality index, both in the universal context and sorted by journal, refer to Table 9.

Table 9. Degree centrality of researchers in English journals of accounting and finance of Iran

rank	In universal level		Journal 1		Journal 2		Journal 3		Journal 4	
	Name	Degree Centrality	Name	Degree Centrality	Name	Degree Centrality	Name	Degree Centrality	Name	Degree Centrality
1	F. Rahnamay Roodposhti	17	F. Rahnamay Roodposhti	12	Mohsen Hamidian	4	Ali Khozain	5	Ahmad Pifeh	3
2	Hashem Nikoomaram	13	Mirfeiz fallah shams	8	Ali Lalbar	4	Ebrahim Abbasi	4	Asgar Pakmaram	3
3	Hamidreza Vakilifard	13	Hashem Nikoomaram	7	Ali Asghar Anvary Rostamy	3	Amin Sadat	4	Hamid Zarei	3
4	Mirfeiz Fallah Shams	12	Zahra Pourzamani	7	Zohreh Hajiha	3	Ghodratallah Talebnia	4	Mahdi Faghani	3
5	Mohsen Hamidian	12	Hamidreza Vakilifard	7	Ahmad Sarlak	3	Hamidreza Kordlouie	4	Zohreh Hajiha	3
6	Ghodratallah Talebnia	11	HamidReza Kordlouie	7	Farhad Hanifi	3	Hassan Ghalibaf Asl	4	Hassan Yazdifar	2
7	HamidReza Kordlouie	11	Ghodratallah Talebnia	6	Mahdi Madanchi Zaj	3	Mahboobeh Jafari	4	M.Ali Bagherpour	2
8	Zohreh Hajiha	10	Bahman Banimahd	5	B.Mohammadtalebi	3	Reza Tehrani	3	Mohsen Dastgir	2

4.5.2 Betweenness centrality indicated in journals of the study

Betweenness centrality pinpoints nodes that act as intermediaries between other pairs of nodes across multiple potential shortest paths. High betweenness centrality substantially influences network dynamics (Freeman, 1978). In simpler terms, it represents the likelihood of a node being positioned in the shortest path between two distinct groups of nodes within the network. When an author is placed on the shortest path between two others, they play an essential role and contribute to the network's social capital. Groups with high betweenness centrality wield control over the network's content flow. At the universal level, Zohreh Hajiha held the highest betweenness index in 1918. In Journal 1, Fraydoon Rahnamay Roodposhti and Ali Esmaelzadeh Mogheri lead with betweenness indices of 162 and 105, respectively. For other journals, the betweenness index is less significant. For

detailed information about researchers with the highest betweenness centrality index at the universal level, sorted by journal, refer to Table 10.

Table 10. Betweenness centrality of researchers in English journals of accounting and finance of Iran

rank	In universal level		Journal 1		Journal 2		Journal 3		Journal 4	
	Name	Betweenness	Name	Betweenness	Name	Betweenness	Name	Betweenness	Name	Betweenness
1	Zohreh Hajiha	1917.982	F. Rahnamay Roodposhti	161.679	Mohsen Hamidian	23	Ebrahim Abbasi	60	Asgar Pakmaram	6
2	F. Rahnamay Roodposhti	1528.968	Ali Esmaelzadeh Mogheri	105.386	Ali Asghar Anvary Rostamy	18	Hassan Ghalibaf Asl	60	Mahdi Faghani	6
3	mohsen hamidian	1268.075	HAMIDREZA KORDLOUIE	99.933	Zohreh Hajiha	15	Ali Hosseini	48	Zohreh Hajiha	4
4	Asgar Pakmaram	1085.501	Mirfeiz fallah shams	83.602	Ali Lalbar	14	Mohsen Seighali	48	Hassan Yazdifar	4
5	Mirfeiz fallah shams	760.664	Ghodratallah Talebnia	62.629	Farhad Hanifi	14	Reza Tehrani	41	Heydar Mohammadzadeh Salteh	4
6	Heydar Mohammadzadeh Salteh	714	negar khosravipour	56	Ahmad Sarlak	6	Mohsen Hamidian	39	Ahmad Pifeh	1.5
7	Ali Lalbar	620	Hossein Panahian	40.46	Reza Gholami Jamkarani	6	Hamidreza Kordlouie	30	Hamid Zarei	1.5
8	Aliakbar Nonahal nahr	618	Zahra Pourzamani	39.817	Mahdi Madanchi Zaj	4	Fatemeh Sarraf	28	M. Ali Bagherpour Velashani	1

4.5.3 Closeness centrality indicated in journals of the study

Closeness centrality gauges the proximity of each node to all other nodes within a social network. It reflects an individual's position in terms of outreach and visibility. Nodes with lower closeness scores wield more influence within the network, providing enhanced accessibility for interactions with other nodes. Consequently, unlike other centrality indices, a lower closeness centrality score signifies a more pivotal role that a researcher holds within the network. Details about researchers with the lowest closeness centrality index at the universal level, sorted by journal, can be found in Table 11.

4.5.4 Eigenvector index in journals of the study

The essence of eigenvector centrality lies in understanding a node's importance based on its own attributes and the significance of its neighboring nodes. When connected to influential nodes within the network, a node's importance amplifies due to these associations (Freeman, 1978). This centrality index offers insights into an individual's connections with other central and influential figures in a social network, unveiling key players and clandestine actors.

Notably, the eigenvector centrality index tends to be higher in smaller groups within the universal network. For instance, the highest eigenvector centrality within the entire network is attributed to Ahmad Pifeh and Hamid Zarei, with an index of 0.53. In Journal 4, Mitra and Bahareh Mohammadtalebi closely follow with an index of 0.498. However, at the universal level, the eigenvector index does not surpass 0.4, with F. Rahnamay Roodposhti holding the highest index at 0.37. Furthermore, it's important to note that in Journal 3, the eigenvector index for less prolific researchers exceeds zero; hence, it is not included in the information table.

Table 11. Closeness Centrality of researchers in English journals of accounting and finance of Iran

rank	In universal level		Journal 1		Journal 2		Journal 3		Journal 4	
	Name	Closeness	Name	Closeness	Name	Closeness	Name	Closeness	Name	Closeness
1	F. Rahnamay Roodposhti	1184	F. Rahnamay Roodposhti	266	Mohsen Hamidian	232	Ebrahim Abbasi	461	Asgar Pakmaram	232
2	Zohreh Hajiha	1189	HAMIDREZA KORDLOUIE	270	Ali Asghar Anvary Rostamy	233	Hassan Ghalibaf Asl	461	Mahdi Faghani	232
3	Ghodratallah Talebnia	1210	Hamidreza Vakilifard	273	Zohreh Hajiha	236	Amin Sadat	465	Zohreh Hajiha	233
4	HamidReza Kordlouie	1210	Mirfeiz fallah shams	277	Maryam Saberi	236	Ali Hosseini	467	Ahmad Pifeh	233
5	mohsen hamidian	1210	Zahra Pourzamani	277	Farhad Hanifi	237	Mohsen Seighali	467	Hamid Zarei	233
6	Hamidreza Vakilifard	1211	Ali Esmaelzadeh Mogheri	279	Ali Lalbar	239	Majid Ashrafi	471	Hassan Yazdifar	234
7	Bahman Banimahd	1217	Bahman Banimahd	279	Bahareh Mohammadtalebi	240	Moslem Peymani Foroushani	471	Heydar Mohammadzadeh Salteh	234
8	Hashem Nikoomaram	1220	Ghodratallah Talebnia	280	Roya Darabi	240	Reza Tehrani	476	Nader Rezaei	234

4.6 Answering the sixth question

Which collaborative groups feature most prominently as dual collaborative entities in these published papers?

Twosome scholarly collaborations, often referred to as co-authorship pairs, represent a significant discovery in the analysis of scholarly collaboration networks. In this study, we thoroughly analyzed 853 English-language papers, identifying pairs of researchers involved in more than three scholarly collaborations. We compiled a detailed list of researchers likely to co-author with others, totaling the co-authorships attributed to each researcher, presented in Table 13. This table includes authors who have engaged in numerous scholarly collaborations with more than one person, listed in the right column. It's important to note that Fraydoon Rahnamay Roodposhti might have been previously mentioned as a co-researcher. A closer examination of Table 13 reveals that both Fraydoon Rahnamay Roodposhti and Hashem Nikoomaram hold the highest number of twosome collaborations, with 10 co-authorship pairs. Additionally, these two researchers have established the highest level of collaboration repetition by forming collaborative groups, each with more than four collaborations, as detailed in Table 13.

5. Discussion and conclusion

It has been over seven years since the Scholarly Journals Commission of the Ministry of Science, Research, and Technology authorized the establishment of four English-language accounting and finance journals in 2016 and 2017. As of 2022, these journals collectively published 853 papers. This study's primary objective is to investigate and analyze the scholarly collaboration networks among authors whose work appears in these English accounting and finance journals, spanning from the first issue to the latest in 2022. Visualizing these networks offers valuable insights for policymakers within English-language accounting and finance journals, providing a clear view of collaboration extents.

Table 12. Eigenvector Index of researchers in English journals of accounting and finance of Iran

rank	In universal level		Journal 1		Journal 2		Journal 3	Journal 4	
	Names of individuals	Eigenvector Index	Names of individuals	Eigenvector Index	Names of individuals	Eigenvector Index	Eigenvector Index	Names of individuals	Eigenvector Index
1	F. Rahnamay Roodposhti	0.37	F. Rahnamay Roodposhti	0.448	Bahareh Mohammadtalebi	0.498	0	Ahmad Pifeh	0.53
2	Hamidreza Vakilifard	0.323	Hamidreza Vakilifard	0.367	Mitra Mohammadtalebi	0.498		Hamid Zarei	0.53
3	Hashem Nikoomaram	0.311	Zahra Pourzamani	0.34	Ali Lalbar	0.49		Mahdi Faghani	0.478
4	Bahman Banimahd	0.273	Hashem Nikoomaram	0.331	Ahmad Sarlak	0.408		Mohsen Dahmarde Ghaleno	0.399
5	Ghodratallah Talebnia	0.272	Bahman Banimahd	0.291	Reza Gholami Jamkarani	0.2		Hassan Yazdifar	0.21
6	HamidReza Kordlouie	0.245	taghi torabi	0.272	Majid Zanjirdar	0.175		Farzaneh Nasirzadeh	0.079
7	Zahra Pourzamani	0.231	Mirfeiz fallah shams	0.245	Fatemeh Johari	0.146		else	0.000
8	Mirfeiz fallah shams	0.219	Ghodratallah Talebnia	0.215	Hossein Jahangirnia	0.072			

Table 13. Formation of certain collaboration groups among researchers with more than 4 or more collaborations.

Row	Researcher	Co-researcher	Number of Collaborative Papers	The sum of more than 4 Collaborations of the Researcher
1	Fraydoon Rahnamay Roodposhti	Hashem Nikoomaram	10	19
		Bahman Banimahd	5	
		Hamidreza Vakilifard	4	
2	Hashem Nikoomaram	F Rahnamay Roodposhti	10	19
		Bahman Banimahd	5	
		Hamidreza Vakilifard	4	
3	Hamidreza Vakilifard	Ghodratallah Talebnia	5	13
		F Rahnamay Roodposhti	4	
		Hamidreza Vakilifard	4	
4	Nader Rezaei	Rasoul Abdi	8	13
		Asgar Pakmaram	5	
5	Rasoul Abdi	Asgar Pakmaram	5	13
		Nader Rezaei	8	
6	keyhan azadi	MReza Vatanparast	7	12
		Mahdi Meshki	5	
7	MohammadReza Vatanparast	keyhan azadi	7	12
		Mahdi Meshki	5	
8	Mahdi Meshki	keyhan azadi	5	10
		MReza Vatanparast	5	
9	Bahman Banimahd	Hashem Nikoomaram	5	10
		F Rahnamay Roodposhti	5	
10	Asgar Pakmaram	Rasoul Abdi	5	10
		Nader Rezaei	5	
11	Reza Gholami jamkarani	Hossein Jahangirnia	6	10
		Ali Lalbar	4	
12	Mohsen Hamidian	maryam saberi	5	9
		Roya Darabi	4	
13	Babak Jamshidinavid	Mehrdad Ghanbari	7	
14	MHamed Khanmohammadi	Shohreh Yazdani	6	
15	Mohammadreza Abdoli	Farhad Dehdar	5	
16	Mahdi Safari Gerayli	hassan Valiyan	5	
17	Mirfeiz fallah shams	HAMIDREZA KORDLOUIE	4	
18	Negar Khosravipour	Zahra Lashgari	4	
19	Farhad Hanifi	GholamReza Zomorodian	4	
20	Mansour Garkaz	Alireza Maetoofi	4	
21	Ahmad Nasseri	Hassan Yazdifar	4	
22	Bahareh Mohammadtalebi	Mitra Mohammadtalebi	4	

The results of this study reveal that 2,438 different authors contributed to the total 853 papers, resulting in an average of approximately 2.8 authors per paper in accounting and finance. This aligns closely with a study by Ghane and Rahimi (2011), which reported an average co-authorship of 2.9 in English-language engineering journals. However, this contrasts with findings by Erfanmanesh and Hosseini (2015) and Thavamani (2014), which reported an average of 2 authors for papers in

information science in Malaysia and Iran. Erfanmanesh and Morovati (2016) also found an average of 1.47 authors per paper in a quarterly journal of interdisciplinary studies in human sciences. International collaboration among professors occurred in only 6% of the total papers, significantly lower than the international collaboration rates reported in similar studies within accounting and finance, suggesting a need for enhanced international partnerships and effective policy-making in this field.

Analysis of paper authorship patterns revealed that only 8% of papers were authored individually, while the rest were collaborative efforts. The collaboration percentage among authors ranged from 92% to 95% across journals, dropping to 78% in Journal 4, which published the most monographs. Notably, Mohammad Izadikhah and Reza Jamei each have three monographs to their credit. The most prolific authors, Fraydoon Rahnamay Roodposhti, Hashem Nikoomaram, and Mirfeiz Fallah Shams, have published over 80% of their papers in the "International Journal of Finance and Managerial Accounting."

Regarding publication shares, the highest contributors are Fraydoon Rahnamay Roodposhti (8% in one journal), Hashem Nikoomaram (5.7% in one journal), Mohammadreza Abdoli (5.3% in three journals), and Mirfeiz Fallah Shams (5.1% in one journal). In prior studies, Norouzi, the Editor of the Journal of Viewlogy, held the highest share of published papers at 11% (Khalili and Mohammadi, 2021), followed by Professor Mehrad, an editor, at 8.7% (Erfanmanesh and Hosseini, 2015), while this index in other journals was below 5% (Erfanmanesh and Morovati, 2016; Hajipour et al., 2019; Khalili and Mohammadi, 2021, in other investigated journals).

The analysis of the scholarly collaboration network reveals that out of 1,406 collaborating scholars, 71% contributed to only a single paper. Nodes for network analysis included 178 authors with more than two papers, accounting for a total of 562 connections in the network. The overall compression index is 0.018, indicating relatively low coherence and a prevalence of isolated nodes. The International Journal of Finance and Managerial Accounting stands out with a compression index 0.051, signifying the highest coherence.

The average degree of centrality aligns closely with major accounting journals worldwide. However, the connectedness index, representing the connectedness percentage of the largest component size, is at 39%, indicating relatively low group collaboration within the network. The most central scholars in the network include Fraydoon Rahmany Roodposhti, Hashem Nikoomaram, and Hamidreza Vakilifard, with the highest degree of centrality scores.

The study acknowledges significant limitations, such as the dispersion of authors' names in papers published in Iranian journals, impacting data retrieval. Additionally, exploring other dimensions of scholarly collaboration networks beyond English-language journals and including collaborations from foreign journals, reputable accounting conferences in Iran, Master's theses, and PhD dissertations is recommended for a more comprehensive understanding.

References

1. Aghdam, M. Y., Nikoomaram, H., Rahnamay R ,F., and BaniMahd, B. (2019). Civil liberties and accounting development, *Financial Accounting and Auditing Research*, 11(43), pp. 27-48. https://faar.ctb.iau.ir/article_668501.html
2. Andrikopoulos, A., and Kostaris, K. (2017). Collaboration networks in accounting research. *Journal of International Accounting, Auditing and Taxation*, 28(1), pp. 1–9. https://doi.org/10.1016/j.intaccaudtax.2016.12.001
3. BehroozFar, H., and Davarpanah, M.R. (2009). The visibility of Iranian scientific journal articles indexed in the Institute of Scientific Information (ISI) compared to Iranian articles published in

foreign international scientific journals. *Library and Information Sciences*, 12(3), pp. 87-113. https://lis.aqr-libjournal.ir/article_43596.html. (In Persian)

4. Cheong, F., and Corbitt, B. J. (2009). A social network analysis of the co-authorship network of the Pacific Asia Conference on Information Systems from 1993 to 2008. Paper Presented at the 17th European Conference on Information Systems, Verona, Italy. https://www.researchgate.net/publication/221229402_A_Social_Network_Analysis_of_the_Co-Authorship_Network_of_the_Pacific_Asia_Conference_on_Information_Systems_from_1993_to_2008
5. Chong, A.Y.L., Ooi, K.B. and Sohal, A. (2009) The Relationship between Supply Chain Factors and Adoption of E-Collaboration Tools: An Empirical Examination. International Journal of Production Economics, 122, pp. 150-160. https://doi.org/10.1016/j.ijpe.2009.05.012
6. Collins, D. L., Oler, D. K., and Skousen, C. J. (2018). How to be a Good Co-author: Advice for Ph.D. Students and Junior Faculty. *Issues in Accounting Education*, 33(4), pp. 1–12. https://doi.org/10.2308/iace-52253
7. Erfanmanesh M, and Nojavan F..(2016). International Performance of Iranian Medical Science, *Journal Citation Reports*. 19(63), pp. 68-80. http://jha.iums.ac.ir/article-1-1850-en.html.
8. Erfanmanesh, M. A., and Morovati Ardakani, M. (2016). A Scientometrics and Collaboration Network Analysis of the Quarterly Journal of Interdisciplinary Studies in the Humanities. *Interdisciplinary Studies in Humanities*, *8*(4), pp. 55-77. https://doi.org/10.22035/isih.2016.230.(In Persian)
9. Erfanmanesh, M., and Arshadi, H. (2015). Co-authorship Network of Institutions in Iranian Knowledge and Information Science Papers. *Academic Librarianship and Information Research*, *49*(1), pp. 79-99. https://doi.org/10.22059/jlib.2015.56966
10. Erfanmanesh, M., and Hosseini, E. (2015). 10 Years of the International Journal of Information Science and Management: A Scientometric and Social Network Analysis Study. *International Journal of Information Science and Management (IJISM)*, 13(1), pp. 14-29. https://ijism.ricest.ac.ir/article_698213.html
11. Faraji, O., Mohammad Rezaei, F., Khodakarami, M., and Soukhakian, I. (2022). Effective Research Collaboration; Status and Barriers (An Important Factor for Accepting Articles in Top International Accounting Journals). *Accounting and Auditing Review*, 29(4), pp. 650-672. https://doi.org/10.22059/ACCTGREV.2020.289096.1008272
12. Freeman, L. C. (1978). Centrality in social networks conceptual clarification. *Social Networks*, 1(3), pp. 215–239. https://doi.org/10.1016/0378-8733(78)90021-7
13. Fleischman, R. K., and Schuele, K. (2009). Co-authorship in accounting history: advantages and pitfalls. *Accounting, Business & Financial History*, 19(3), pp. 287–303. https://doi.org/10.1080/09585200903246536
14. Ghane M A, and Rahimi F.(2011). Citation Analysis and Collaboration Pattern of Six Iranian *English Journals in Engineering Area Indexed in Islamic World Science Citation Center*. 26(4), pp. 1303-1319. https://jipm.irandoc.ac.ir/article_699096.html?lang=en
15. Ghannad, M., Arabmazar Yazdi, M., Safarzadeh Bandari, M. H., and HesarZadeh, R. (2023). Application of Text Mining Techniques in Analyzing the Topic Flow of Papers Published in *Iranian Accounting Journals. Financial Accounting and Auditing* Research, 15(58), pp. 79-106. https://doi.org/10.30495/FAAR.2023.702103
16. Godley, J., Barron, G., and Sharma, A. M. (2011). Using social network analysis to assess collaboration in health research. *Journal of Healthcare, Science & the Humanities*, 1(2), pp. 99-116. https://www.academia.edu/download/37588479/Godley-Barron-

EvaluatingObesityNetwork-Published
17. Hajipour, B., Tayebi Abolhasani, A., and Rouhani Rad, S. (2019). Scientific Collaboration Networks in Iranian Strategic Management journals. *Strategic Management Thought*, *13*(1), pp. 83-109. https://doi.org/10.30497/smt.2019.2551
18. Han, Y.-J., and Park, Y. (2006). Patent network analysis of inter-industrial knowledge flows: The case of Korea between traditional and emerging industries. *World Patent Information*, 28(3), pp. 235–247. https://doi.org/10.1016/j.wpi.2006.01.015
19. Hart, R. L. (2000). Co-authorship in the academic library literature: A survey of attitudes and behaviors. *The Journal of Academic Librarianship*, 26(5), pp. 339–345. https://doi.org/10.1016/s0099-1333(00)00140-3
20. Hesarzadeh, R. (2018). Comments on the Context-Specific Nature of Financial Reporting Quality. *Iranian Journal of Accounting, Auditing and Finance*, 2(4), pp. 29-39. https://doi.org/10.22067/IJAAF.V4I1.88702
21. Hesarzadeh, R. (2020). Difference-in-differences Design and Propensity Score Matching in Top Accounting Research: A Short Guide for Ph.D. Students in Iran. *Iranian Journal of Accounting, Auditing and Finance*, 4(3), pp. 35-47. https://doi.org/10.22067/IJAAF.2020.39426
22. Hudson, J. (1996). Trends in Multi-Authored Papers in Economics. *Journal of Economic Perspectives*, 10(3), pp. 153–158. https://doi.org/10.1257/jep.10.3.153
23. Inkpen, A. C., and Tsang, E. W. K. (2005). Social Capital, Networks, and Knowledge Transfer. *Academy of Management Review*, 30(1), pp. 146–165. https://doi.org/10.5465/amr.2005.15281445
24. Khalili, L., and Mohammadi, F. (2021). Scientometric Analysis of English-language Journals in the Field of Knowledge and Information Science in Iran Based on Scopus Data. *Scientometrics Research Journal*, 7(14), pp. 197-220. https://doi.org/10.22070/rsci.2020.5329.1368
25. Kılıç, M., Uyar, A., and Koseoglu, M. A. (2019). Co-authorship Network Analysis in the Accounting Discipline. *Australian Accounting Review*, 29(1), pp. 235–251. https://doi.org/10.1111/auar.12271
26. Law on the fifth five-year development plan (2010) (2011.2015). Date of ratification: 01/05/2011; Date of Service: 01/20/2011. https://rc.majlis.ir/fa/law/show/790196
27. Law on the sixth five-year economic, social, and cultural development plan of the Islamic Republic of Iran 2016 to 2021 (2017). Ratified in session of 16/01/1396 -> 04/05/2017 of Islamic Consultative Assembly of Iran. https://rc.majlis.ir/fa/law/show/1014547
28. Li, E. Y., Liao, C. H., and Yen, H. R. (2013). Co-authorship networks and research impact: A social capital perspective. *Research Policy*, 42(9), pp. 1515–1530. https://doi.org/10.1016/j.respol.2013.06.012
29. Liu, X., Bollen, J., Nelson, M. L., and Van de Sompel, H. (2005). Co-authorship networks in the digital library research community. *Information Processing & Management*, 41(6), pp. 1462–1480. https://doi.org/10.1016/j.ipm.2005.03.012
30. Marefat, R., and Marefat, M. M. (2022). Collaboration rate of authors in producing scientific papers in The Journal of Advanced Periodontology & Implant Dentistry (JAPID) during 2009-2020. *International Journal of Information Science and Management (IJISM)*, *20*(2), pp. 67-74. https://ijism.ricest.ac.ir/article_698400.html
31. Mastechaman, N., Mohammadzadeh Salteh, H., Nonahal Nahr, A., and Mehrani, S. (2021). A Comprehensive Talent Management Plan in Iranian Accounting and Auditing Using the Grounded Theory Approach. *Iranian Journal of Accounting, Auditing and Finance*, *5*(3), pp. 49-64. https://doi.org/49-64. 10.22067/IJAAF.2021.40685
32. Nejad Ebrahimi, S. Ilbeygi, N., and Vara, N. (2023). Webinar of Evaluation and Ranking of

Scientific Journals in 2022: Approaches, Plans, and Indexes. (February 14th 2023), https://repository.msrt.ir/Core/file/7/2/2023/a0cbb166-bb4-10e67198-8674-67e963b6f.pdf

33. Newman, M. E. J. (2001). Scientific collaboration networks. I. Network construction and fundamental results. *Physical Review E*, 64(1). pp. 1-16. https://doi.org/10.1103/physreve.64.016131
34. Nocheh Nasar, H., Shams Mourkani, G., and Ghanei Rad, M. A. (2018). Social Network Analysis of Co-Authorship of Faculty Members in Science Education Based on their Foreign Articles. *Scientometrics Research Journal*, 4(8). pp. 33-56. https://doi.org/10.22070/RSCI.2017.563
35. Nooy, W., A. Mrvar, ., and V. Batagelj (2005). Exploratory social network analysis with Pajek. Cambridge: Cambridge University Press. pp. 292–302. https://doi.org/10.1017/cbo9780511806452.019
36. Portal of Scientific Journals (2023). Evaluation system of scientific journals authorized by the Ministry of Science supervised by the Commission of Scientific Journals Evaluation, research deputy- office of policy making and planning research affairs of the Ministry of Science, *research and technology. Accessible* in https://journals.msrt.ir
37. Racherla, P., and Hu, C. (2010). A social network perspective of tourism research collaborations. *Annals of Tourism Research*, 37(4), pp. 1012–1034. https://doi.org/10.1016/j.annals.2010.03.008
38. Regulations of scientific publications (2019). Preparation of the ledger of policy making and planning of research affairs and approved by the Deputy of Research and Technology - Ministry of Science, *Research and Technology*. Available at: https://qavanin.ir/Law/PrintText/267697.
39. Sadatmoosavi, A., Nooshinfard, F., Hariri, N., and Mohammad Esmaeil, S. (2018). Does the superior position of countries in co-authorship networks lead to their high citation performance. *Malaysian Journal of Library & Information Science*, 23(1), pp. 51–65. https://doi.org/10.22452/mjlis.vol23no1.4
40. Singh, B. (2021). A Bibliometric Analysis of Behavioral Finance and Behavioral Accounting. *American Business Review*, 24(2), pp. 198–230. https://doi.org/10.37625/abr.24.2.198-230
41. Soheili, F., and Osareh, F. (2014). A survey on density and size of co-authorship networks in information science journals. *Journal of Information Processing and Management*, 29(2), pp. 351-72. https://jipm.irandoc.ac.ir/article_699248.html?lang=en
42. De Stefano, D., Giordano, G., and Vitale, M. P. (2011). Issues in the analysis of co-authorship networks. *Quality & Quantity*, 45(5). pp. 1091–1107. https://doi.org/10.1007/s11135-011-9493-2
43. Subramanyam, K. (1983). Bibliometric studies of research collaboration: A review. *Journal of Information Science*, 6(1). pp. 33-38. https://doi.org/10.1177/016555158300600105
44. Supreme Council of the Cultural Revolution (2010). Document of comprehensive scientific map of the country. Retrievable in: https://msrt.ir.file.download.page.1488284345-m01.pdf
45. Taghizadeh, R., Abdzadeh Kanafi, M., Kordabadi, F., and Heidari Ashkezari, F. (2021). Network Analysis of Accounting Departments of Iranian Governmental Universities. *Accounting and Auditing Review*, 28(2). pp. 274-295. https://acctgrev.ut.ac.ir/article_83006.html?lang=en
46. Thavamani, K. (2014). Research Contributions in Malaysian Journal of Library and Information Science during 1996 - 2012. *International Journal of Information Science and Management (IJISM), 12*(2). pp. 1-17. https://ijism.ricest.ac.ir/article_698206.html
47. Wasserman, S., and Faust, K. (1994). Social network analysis: Methods and applications. *England: Cambridge University Press*. pp. 28–66.(8)

https://doi.org/10.1017/cbo9780511815478.003

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

The Impact of Media News on Investors' Decision-Making According to their Degree of Risk-Taking

Ensieh Sharifi, Khadijeh Ebrahimi kahrizsangi*, Arezoo Aghaei Chadegani

Department of Accounting, Najafabad Branch, Islamic Azad University, Najafabad, Iran

How to cite this article:
Sharifi, E., Ebrahimi Kahrizsangi, K., & Aghaei Chadegani, A. (2024). The Impact of Media News on Investors' Decision-Making According to their Degree of Risk-Taking. Iranian Journal of Accounting, Auditing and Finance, 8(1), 67-87. doi: 10.22067/ijaaf.2024.42801.1167
https://ijaaf.um.ac.ir/article_42801.html

ARTICLE INFO

Article History
Received: 2023-08-31
Accepted: 2023-11-05
Published online: 2024-01-01

Keywords:
Behavioral Finance, Investor Decisions, Social Media News, Investor Risk Level

Abstract

Optimal investment in today's competitive market demands well-informed decisions by astute investors within the capital market. These decisions focus on identifying and prioritizing key factors influencing investor decision-making behavior. In this context, the present study is designed to explore the impact of mass media news on the decision-making styles of investors in the Tehran Stock Exchange. These decision-making styles include avoidant, dependency, spontaneous, intuitive, and rational approaches and their relationship with investors' level of risk tolerance. This research follows an experimental foundation approach regarding its objectives, nature, and execution methodology. It takes the form of a descriptive survey, with data collection carried out through administering a questionnaire. The questionnaires were distributed among investors selected via random sampling from the statistical population, encompassing all investors with a stock code on the Tehran Stock Exchange. Structural Equation Modeling (SEM) was employed to test the research hypotheses. The findings of this study reveal that mass media news exerts a positive and significant influence on avoidant, dependency, and spontaneous decision-making styles, contingent on the degree of risk tolerance of the investors. In contrast, mass media news does not significantly impact intuitive and rational decision-making styles relative to the investors' level of risk tolerance.

https://doi.org/10.22067/IJAAF.2024.42801.1167

NUMBER OF REFERENCES
59

NUMBER OF FIGURES
2

NUMBER OF TABLES
6

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author:
Khadijeh Ebrahimi kahrizsangi
Email:Ebrahimi641@yahoo.com
Tel: 09139319600
ORCID:

1. Introduction

In recent years, finance has entered a new phase of contemplation, wherein it has critically scrutinized certain assumptions of modern economics and finance. Among these assumptions, the concept of investor rationality has faced substantial challenges, as evidenced by several studies. Presently, a majority of investors acknowledge that attitudes and psychological factors can play a pivotal role in response to market fluctuations, often surpassing the influence of fundamental variables. Consequently, in recent research endeavors, behavioral finance has gained increased prominence and importance (Nikoomaram et al., 2012).

One of the fundamental inquiries in behavioral finance centers around identifying critical factors that influence investors' decision-making behavior. Consequently, numerous studies have been conducted on this subject since the 1960s. In today's financial markets, investors' choices may often be grounded in intuition, trial and error, and practical experience. Moreover, investor behavior can sometimes manifest collectively, resembling a crowdfunding or mass phenomenon. The prevalence of mass behavior within financial markets can be attributed to several factors, including a lack of information transparency, societal and cultural norms, a relatively underdeveloped stock market, and inefficiencies in the financial market (Khoshnood et al., 2013). One of the critical assumptions underpinning an efficient market is that investors will respond rationally to new information, leading to well-informed decision-making. Evidence suggests investors may base their decisions on additional supplementary information (Nikbakht and Moradi, 2005).

In the capital market, investors have traditionally relied on information intermediaries, such as financial advisors, financial analysts, credit rating agencies, and auditors, to access timely and valuable information about prospective stocks. However, the past decade has witnessed a proliferation of new information sources that are readily accessible to participants in the stock market. The advent of the internet has led to investors' increasing reliance on social media platforms to stay abreast of the latest information, aiding in sound decision-making. Through social media, investors can readily access timely information about stocks and exchange views with fellow investors, ultimately leading to more informed investment choices (Miller and Skinner, 2015). Information technology has exerted a transformative influence on the information landscape within stock markets, impacting three key aspects: The application of information by investors to make informed decisions. The involvement of media and other information intermediaries (Lee et al., 2015). The methods investors use to acquire and interpret information (Drake et al., 2012). Various social media platforms have emerged as crucial information sources in recent years. The news and commentary shared on these platforms compensate for the lack of timeliness and feedback inherent in traditional media. With the rise of social media, a complete information dissemination chain for financial information generation and distribution has been established. Consequently, market participants have significantly changed their cognitive habits, behavioral patterns, risk management strategies, and even the pricing dynamics of financial assets (Larcker et al., 2013). Social media has been demonstrated to influence financial markets and other economic activities (Chen et al., 2014). In stock markets, social media platforms have expanded the channels through which listed companies can release information promptly and have provided investors with convenient access to a wealth of information (Li et al., 2021).

Nonetheless, most studies focus primarily on the utilization of social media and often overlook the pivotal role that social media can play, particularly in facilitating the timely utilization of information across various decision-making scenarios within financial markets. Harnessing the power of social media can significantly enhance investors' access to information and, as a result, effectively mitigate information asymmetry. An intriguing question that remains largely unaddressed is how the quantity of pertinent information exchanged among investors on social media impacts market efficiency. The

scarcity of available data has been a primary hindrance in investigating this matter (Xu et al., 2020). When investors do not have sufficient access to information, it can lead to uninformed decision-making, fostering collective behavior in the stock market and ultimately undermining the efficiency of the financial market.

In addition to the influence of social media on individuals' decision-making processes, when investors contemplate an investment and make their final decisions, they invariably weigh it against other prospective investments. Simultaneously, the degree of risk investors are willing to assume is contingent upon their psychological attributes, including their conservatism and risk aversion level. However, it is reasonable to expect that any prudent investor would opt for the investment with a higher potential return when the risks associated with the two investments are comparable (Jalilvand et al., 2015).

In this study, we aim to investigate the influence of social media news on the decision-making styles of investors in the Tehran Stock Exchange. Two primary objectives guide our research. Firstly, we aim to understand how investors rely on media news when making financial decisions. Secondly, we are interested in evaluating this information's timely and accurate utilization to make more informed decisions. This can potentially enhance the efficiency of the stock market, mitigate information asymmetry, and improve the precision of market earnings expectations. Our study is designed to encourage investors to make judicious decisions regarding their capital investments, thereby reducing the risk of incurring capital losses in the stock market.

The findings from behavioral finance research shed light on the various rational and irrational factors that impact investors' decision-making processes. The present study carries significant implications, particularly in highlighting the influence of social media news on investors' choices within the financial market. Correct utilization of information, as suggested by this study, can enhance market efficiency, thereby enriching Iran's financial market and economy. Furthermore, these findings can serve as a valuable resource for stock market authorities seeking to attract more investors. Based on this study's results, investors can gain insights into the factors that shape their decisions regarding securities investments, allowing for more informed choices. Additionally, scholars and individuals interested in behavioral finance theories can acquire essential and pertinent information concerning stock market investments and the factors that influence them. This is especially valuable considering the scarcity of research on these issues within the context of Iran.

One of the prominent issues observed in prior studies is the utilization of less objective assessments of the impact of news media on investor decisions, potentially resulting in irrational behavior among investors. Hence, the primary aim of this study is to address the central question: "To what extent do social media news affect investors' decisions in the stock market, taking into account their degree of risk tolerance?"

Reviewing existing studies, the researchers have observed a predominant focus on behavioral financial markets, with limited attention given to decision-making styles and influencing factors, such as media news. Recognizing this research gap and the significance of these factors in aiding investors in making more informed decisions within the stock market, this study seeks to contribute to the existing body of research. One noteworthy distinction between this paper and other studies in the media field is its comprehensive investigation of the impact of media news across four distinct components: websites, technical analysis websites, TV networks, newspapers, and social networks. This examination is conducted for investors' decision-making styles, considering factors such as avoidance, dependency, spontaneity, intuition, and rationality, all within their respective risk tolerance levels.

The remainder of this paper is organized as follows: In the second section, we conduct a comprehensive review of pertinent literature that explores the impact of social media on financial

markets. The third section provides a detailed account of this research's data sources and methodology. The fourth section rigorously assesses the robustness of our empirical findings. Finally, the fifth section presents our conclusions and provides recommendations informed by the results obtained in this study.

2. Literature Review and Prior Studies

In investment, the nature of investors' decisions and the forces influencing them hold paramount importance. In recent decades, financial theories and hypotheses have traversed two distinct paths. The first path aligns with the neoclassical perspective within financial sciences. Under this framework, market efficiency and rational behavior are foundational tenets underpinning assumptions and theories within the financial market. This approach originated in several models, including the Capital Asset Pricing Model (CAPM), the Efficient Market Hypothesis (EMH) of the 1960s, the Medium-Term Capital Asset Pricing Model, and the Arbitrage Pricing Theory. However, numerous investigations have unveiled instances of market turbulence and deviations from traditional financial theories over time. These observations ultimately paved the way for the emergence of the behavioral revolution in 1979, spearheaded by Kahneman and Tversky. Behavioral finance studies argue that investors are influenced not only by economic indicators and rationality but also by a plethora of other factors that significantly shape their behavior and decision-making styles.

One of the foundational assumptions in behavioral finance hinges on the utility theory originally developed by Von Neumann and Morgenstern in 2007. This theory posits that:

- Investors are entirely rational and capable of making logical decisions.
- They possess the ability to solve intricate problems.
- They exhibit risk-averse tendencies.
- Their primary objective is consistently maximizing their wealth (Barna, 1946).

Within the utility theory framework, it is postulated that investors seek to optimize their contentment by making informed choices that involve an interplay between irrational decisions and the correlation between returns and risks (Khaksarian et al., 2021).

The utility theory serves as a robust framework for predicting human behavior. Within this theory, individuals strive to optimize their desired utility rather than solely pursuing their intended income. A pivotal concept in utility theory is "risk acceptance," which holds considerable significance in both investment decisions and the management of investment firms (Sharma and Bikhchandani, 2000). In accordance with this theory, individuals aim to make optimal choices within risky scenarios to enhance their desirability, value, and wealth. Consequently, it can be posited that the theory of desirability is firmly grounded in the utility above theory when presented with two scenarios, each offering different levels of value but varying in terms of risk; risk-tolerant individuals opt for the higher-risk option in pursuit of greater future benefits. Conversely, risk-averse individuals are disinclined to take present risks to secure more substantial future gains. Neutral individuals, on the other hand, remain impartial in their acceptance or rejection of risk (McNichols and Stubben, 2008).

The relationship between risk and efficiency significantly impacts investors' choices and investment company managers' decisions. In decision-making contexts, risk represents the variance between an investor's actual and anticipated returns (Helland, 1990). Furthermore, risk encompasses any factor or event capable of altering the expected outcome for the investor (Economou et al., 2015).

According to utility theory, one of the decision-making styles that have gained attention from behavioral finance experts in recent years is the General Decision-Making style introduced by Scott and Bruce (1995). This comprehensive study will consider their classification, which includes five distinct decision-making styles. These five styles are as follows: Avoidant, Dependency, Spontaneous, Intuitive, and Rational.

One crucial psychological factor that significantly impacts investors' decision-making styles in

financial markets is the influence of social media news. Social media platforms are interactive technologies and digital channels that enable the creation and sharing of information, ideas, interests, and various forms of expression within online communities and networks (Kietzmann et al., 2011). These social networks play a substantial role in today's societies and, in turn, in the global economy. In Iran, investors often base their decisions on various mass media news sources, including professional and public websites, technical analysis software and websites, newspapers (news sites), and TV networks. These media outlets have had a notable influence on financial markets and stock exchanges, with their impact on mass behavior providing valuable insights for investors seeking better models for predicting market movements. The advantages of social media are evident, such as the rapid and cost-effective dissemination of news and information. However, they also carry the risk of spreading false information and rumors. Fortunately, social media empowers the audience to critically evaluate and compare different perspectives, enhancing their analytical capabilities. It is important to note that while social media offer the advantage of rapid information dissemination, they also have the potential to amplify the spread of false rumors and news (Raie et al., 2016).

Social media encompass interactive technologies and digital channels that facilitate the creation and sharing information, ideas, interests, and various forms of expression within virtual communities and networks (Kietzmann et al., 2011). These social networks play pivotal roles in today's communities and substantially impact the global economy. Investors in Iran often make decisions based on various mass media sources, including professional and public websites, technical analysis software and websites, newspapers (news sites), and TV networks. Notably, these networks have exerted influence on financial markets and stock exchanges. Analyzing the existence of mass movements and their effects can provide valuable insights for investors seeking to develop improved models for predicting market trends. The popularity of social media can be attributed to several advantages, including the rapid and cost-effective dissemination of news, information, and rumors. However, it is essential to acknowledge that these platforms also present risks, such as the high potential for spreading false information. Fortunately, social media empower their audiences to critically assess information and engage in discussions, enhancing their analytical capabilities. Nevertheless, it is crucial to recognize that social media news can sometimes lead to the swift dissemination of inaccurate information and unfounded rumors (Raie et al., 2016).

Fang and Peress (2009) assert that online social media plays a substantial role in disseminating information to a broad audience, particularly individual investors. To examine this hypothesis, they investigated the cross-sectional relationship between media coverage and anticipated stock returns. Their study outcomes reveal that stocks lacking media coverage yield higher returns than those with extensive media coverage, even after accounting for well-established risk factors. These results are notably more evident in the case of small stocks and those characterized by high levels of individual ownership, low analyst coverage, and elevated idiosyncratic volatility. Furthermore, their findings suggest that the scope of information dissemination has a discernible impact on stock returns.

Schniederjans et al. (2013) investigated the connection between a company's reputation and online social media. They uncovered a partially positive correlation between the use of online social media and investment choices, depending on the impression management strategy. Negative exposure on online social media platforms can significantly and promptly impact investment decisions made by investors.

Farokhi et al. (2016) conducted an empirical study on the Tehran Stock Exchange from 1393 to 1394. The research aimed to assess the impact of online support on generating herding behavior in stock trading. Data for the study were collected through a survey of 400 investors on the Tehran Stock Exchange. The gathered data were analyzed using Lisrel and SPSS software. The study's results indicate that online support plays a significant role in fostering herding behavior. Consequently, it

can be inferred that the actions of others influence investors' decisions; even if they are not part of virtual groups, their behavior is shaped by the collective actions of the masses.

Narayan and Bannigidadmath (2017) studied financial news predictability on Islamic and non-Islamic stocks. Their research covered the period from January 1, 2006, to August 31, 2012. The authors created a daily series of positive (good) and negative (bad) news and observed that these indicators successfully predicted the returns of Islamic and non-Islamic stocks. Furthermore, their results indicated that positive news had a more pronounced influence on stock returns in both cases.

Barzegari Khanghah et al. (2017) conducted a study to investigate the impact of social media on investors' decisions in the stock market. Their data were subjected to correlation and regression tests. The study's results revealed a significant relationship between the use of social media and investors' participation in the stock market and stock selection. Investors were found to utilize the internet and television-based mass media for participation and stock selection.

Ansary Khaledi (2020) examined the influence of mass media news on the stock indices of select companies on the Tehran Stock Exchange. Following an LSD test, the analysis showed that the publication of mass media news had a significant positive impact on the stock prices of companies listed on the Tehran Stock Exchange. Additionally, the study found that news related to GDP growth had a greater impact compared to news about oil prices and decreasing inflation.

Cu and Le (2021) conducted a study to assess the impact of social media marketing on attracting investment capital to industrial parks during the COVID-19 pandemic in Vietnam. This research aimed to analyze the factors influencing the attraction of investment capital to Vietnam's industrial parks, focusing on the role of social media marketing. Data for the study were collected through a survey of 256 enterprises operating in Vietnam and analyzed using factor analysis and multivariate regression. The findings indicated that social media marketing positively attracted investment capital to Vietnam's industrial parks. Other factors, such as human resources, industrial park infrastructure, and local policies, also had positive effects with varying degrees of influence.

Hatam et al. (2021) investigated the relationship between cyberspace rumors and the perceptions of stock market participants using a qualitative approach and a phenomenological method. Data for the study were gathered through interviews with 20 experts, including regional exchange managers, analysts, and experts from stock brokerage companies. The Dikelmann method was applied to analyze the data. The study's findings revealed that government involvement in the stock market and investors' emotional and mass behavior had heightened the spread of business rumors. According to investors, the Codal website was perceived as the most authentic and effective information network. However, recent political developments and negative sentiments toward the government have somewhat altered their attitudes and reduced confidence in Codal's network information.

Ren et al. (2021) focused on the influence of social media sentiment on mass media sentiment. Their study utilized Sina Weibo and Sina Finance data, encompassing around 60 million web posts and 6.2 million news articles. The research demonstrated that social media impacts the emergence of sentiment in mass media financial news. Furthermore, the consistency of sentiment between social media reactions and prior news articles amplified the persistence of sentiment in mass media over time.

Heidari Haratmeh (2022) explored the effect of mass media on the sentiment of stock market investors. The study aimed to investigate the impact of mass media on investors' inclinations and utilized data collected from a survey of 234 enterprises operating in Tehran. The data were analyzed using the Logit Model. The study's findings indicated that: 1. Mass media influenced fluctuations in investor sentiment and impacted their transaction decisions. 2. In a bear market, the influence of news media was greater than that of social and specialized media. 3. In a bull market or reform market, news media's impact was greater than social media's. 4. The impact of media reports on investor

sentiment was found to be asymmetric.

Wu et al. (2022) evaluated the model regarding the impact of real negative news on stock prices, utilizing China's A-share listed companies as a case study. The study began by defining online negative news and subsequently constructing a model to assess its influence on stock prices. It adopted the perspective of behavioral finance to systematically analyze the relationship between the stock market and investor sentiment. The research provided theoretical support by defining the concept of online negative news. It employed event studies, abnormal returns tests, regression analysis on a selected sample, observations of stock price reactions before and after abnormal returns, and changes in excess returns. The study's findings revealed that when online media disclosed negative information about listed companies from one day before to four days later, it led to significant stock price fluctuations, generating excess returns. This effect continued to make stock prices more volatile in the short term. Additionally, the study identified that the company's performance influenced stock price fluctuations.

Dong et al. (2022) conducted a comparative analysis of social media and mass media in the stock market, focusing on information coverage diversity and predictive value concerning future stock absolute returns. They examined a large dataset comprising nearly a million stock-related news articles from the Sina Finance news platform and 12.7 million stock-related social media messages from China's popular Weibo platform. The study's findings indicated that social media covered fewer stocks than mass media, and this effect became more pronounced as the volume of media information increased. Furthermore, the research revealed that both sources had some short-term predictive value, but their predictiveness differed. Mass media information coverage was more predictive than social media information coverage over a one-day horizon, while the reverse was true over a two-to-five-day horizon.

Drawing on theoretical foundations, the first hypothesis explored in this study pertains to assessing the relationship between the avoidant decision-making style and social media news, considering the degree of risk-taking. Individuals adopting an avoidant decision-making style tend to avoid decision-making positions as much as possible (Parker et al., 2007). Consequently, those who employ this style seek to minimize their involvement in decision-making scenarios. They tend to delay their decisions based on situational factors and opportunities. Consequently, it can be inferred that individuals with an avoidant decision-making style place greater emphasis on media news when making decisions. Thus, they are considered to exhibit a higher degree of risk-taking. This relationship is examined in the following hypothesis:

H1: Social media news positively impacts the avoidant decision-making style, considering the degree of risk-taking among investors in the stock market.

The dependent decision-making style indicates a lack of independent thinking on the part of the decision-maker (Robbins and Judge, 2009). Decision-makers with this style tend to rely on media news and the opinions of others when buying and selling stocks in the stock market (Pourmohammadshahini and Ranjbar, 2019). It has been observed that many investors and stock traders utilize information exchanged among investors. Notably, online conversations among investors have been found to influence stock prices (Raie et al., 2016).

Hence, it can be inferred that individuals adopting a dependency decision-making style exhibit a greater inclination for risk-taking. These individuals tend to align their behavior and decisions with the actions of others, often succumbing to mass behavior (Moghimi, 2018). Therefore, the second hypothesis explores the relationship between the dependency decision-making style and social media news, taking into account the degree of risk-taking.

H2: Social media news positively impacts the dependency decision-making style, considering the degree of risk-taking among investors in the stock market.

The third hypothesis delves into the relationship between the spontaneous decision-making style and media news with regard to the degree of risk-taking exhibited by investors. Spontaneous decision-making reflects the decision-maker's inclination to make quick decisions (Khaksarian et al., 2021). This style is typically employed in critical situations where prompt decision-making is imperative to avert potential disaster and harm. Decisions influenced by this style often rely more on media news than on the opinions of other investors. Investors employing the spontaneous style make their primary decisions swiftly when confronted with decision-making scenarios. Consequently, investors demonstrating a spontaneous style tend to exhibit a higher degree of risk-taking. Risk-taking in decision-making entails selecting the option with greater risk when faced with two scenarios of equal value but varying levels of risk. This implies that these individuals assume higher risks in pursuing greater future benefits (McNichols and Stubben, 2008).

H3: Social media news positively affects the spontaneous decision-making style according to the degree of risk-taking of investors in the stock market.

In the realm of intuitive decision-making, decision-makers lack a clearly defined logical basis for explaining the accuracy of their choices. They rely on their intuition and inner awareness to guide them in making what they perceive as the right decision (Robbins and Judge, 2009). Spicer and Sadler-Smith (2005) have identified three primary sources of intuition: intrinsic, innate responses, general experiences, and focused training. Individuals with an intuitive decision-making style believe that their intuition and inner insights are pivotal in guiding them to make the right decisions. Consequently, investors who favor this style tend to be more risk-averse in accordance with their degree of risk-taking. They are less willing to embrace the risks associated with the information presented in media news.

In line with the risk-efficiency relationship, investors who accept higher levels of risk anticipate greater returns, whereas those who are more risk-averse expect lower returns. Therefore, considering the investors' degree of risk-taking, the fourth hypothesis explores the correlation between the intuitive decision-making style and social media news.

H4: Social media news negatively affects the intuitive decision-making style according to the degree of risk-taking of investors in the stock market.

In the rational decision-making style, the decision-maker is willing to thoroughly evaluate all potential approaches before choosing the optimal option when faced with a decision-making scenario (Oliveira, 2007). Those who embrace the rational decision-making style do so by conducting a comprehensive search and analysis of all accessible information, including external and internal resources, encompassing information disseminated by mass media (Singh and Greenhaus, 2004). The rational style entails an exhaustive problem-solving process before selecting the most suitable option. Rational decision-makers tend to be risk-averse and anticipate higher returns in exchange for assuming risk (Helland, 1990). Consequently, social media news positively influences the rational decision-making style in line with the investors' degree of risk-taking in the stock market.

H5: Social media news negatively affects the rational decision-making style according to the degree of risk-taking of investors in the stock market.

3. Research Methodology

Considering the stated objectives, this research is primarily an experimental foundation study. Given the utilization of a questionnaire as a data collection tool, the study can also be classified as a field study. In terms of its nature and methodological approach, it is fundamentally a descriptive survey.

Smart PLS software was employed to analyze the data, aligning with the data measurement and statistical assumptions inherent in the study's design. The statistical population for this investigation

encompasses all individuals holding a stock exchange code in Iran. It is worth noting that, according to statistics reported in the Donya Eghtesad newspaper, more than 30 million people in Iran possess an active stock exchange code. Various methods exist for estimating sample sizes in structural equation modeling that require fewer samples. However, the researchers have chosen to work with a larger sample size by referencing the Krejcie and Morgan table to ensure increased accuracy in the results. They have specified that for a population exceeding 100,000 individuals, a minimum sample size of 385 is recommended, which was considered an appropriate figure for this particular study. Given the limitations imposed by the coronavirus pandemic, questionnaires were distributed to the sample through both in-person and electronic means. In the face-to-face approach, approximately 230 questionnaires were delivered to individuals, and 198 completed questionnaires were returned. Through electronic distribution, the process continued until 187 complete and analyzable questionnaires were obtained. Consequently, a total of 385 analyzable questionnaires were gathered. The available sampling method was used for this purpose. Questionnaires were disseminated to the sample electronically via email and social networks to 187 individuals and in person to 198 participants. Several members of the statistical community assessed the face validity of the questionnaires, while content validity was determined based on the input from experts and professors. Convergent validity was verified through factor load indices (with an optimal value exceeding 0.5) and the average variance extracted (with an optimal value exceeding 0.5). Diagnostic validity and reliability were established using the Fornell-Larker index and Cronbach's alpha coefficient, respectively. Lastly, the combined reliability (with an optimal value exceeding 0.7) was also confirmed.

In this research, the dependent variable is investors' decisions, a qualitative variable characterized by a relative scale. The Scott and Bruce (1995) Decision Style Questionnaire was employed to gauge these variables, encompassing Avoidant, Dependency, Spontaneous, Intuitive, and Rational styles. Responses were assessed using a 5-point Likert scale.

Conversely, media news serves as the independent variable in this study, representing the influence of news media on investors' decisions, another qualitative variable evaluated through relative comparison. To measure this variable, a researcher-designed questionnaire was initially comprised of 17 questions. Following feedback from several respected professors and stock exchange experts, it was expanded to include 24 questions. Subsequently, these questions were distributed among 50 participants for validation and reliability assessment. The questionnaire was structured around four components: websites (12 items), technical analysis websites (3 items), newspapers (3 items), TV networks (3 items), and social networks (3 items). Participants provided their responses using a 5-point Likert scale. Furthermore, the investors' level of risk-taking was considered a moderating variable. The Gomez-Mejia and Balkin (1989) Risk Questionnaire was employed to measure this variable, where a higher score denotes a greater propensity for risk-taking. Similar to the other questionnaires, it was scored using a 5-point Likert scale.

4. Findings

Based on the descriptive analysis of the data, the research samples were categorized by education level as follows: Eight people (2.1%) held a diploma, 151 people (39.2%) possessed a bachelor's degree, 163 people (42.3%) had a master's degree, and 63 people (16.4%) held a doctorate. In terms of age distribution, 81 people (21%) were between 20-30 years old, 209 people (54.3%) fell within the 31-40 age group, 62 people (16.1%) were in the 41-50 age range, and 33 people (8.6%) were over 50 years old. Regarding gender, 260 people (67.5%) were male, and 125 people (32.5%) were female.

In terms of professional experience, 145 people (37.7%), 60 people (15.6%), 39 people (10.1%), 68 people (17.7%), and 73 people (19%) had professional backgrounds spanning 1-3 years, 4-6 years, 7-10 years, and over ten years, respectively. It is essential to note that the research model becomes significantly more complex due to including demographic variables in the analysis. Consequently, these details have been omitted.

Subsequently, the adaptability of the proposed model is examined across three sections. The first section scrutinizes the research measurement model, focusing on reliability and validity indicators. The second section delves into the internal model of the research (structural model), encompassing path coefficients, the coefficient of determination (R2), and effect size (F2). Finally, the third section assesses the overall adaptability of the model. All criteria for the measurement model and the structural model are summarized in Table (1).

Table 1. Measurement model fit indices and structural model

	Indicator		Optimal Amount
Measurement Model	Validity	Convergent Validity	Loads Factor More than 0.5
			Amount of More than 0.5 AVE
		Divergent Criterion of Discriminant Validity Fornell-Larcker Validity[1]	
Reliability			Cronbach's alpha Reliability More than 0.7
			Composite Reliability More than 0.7
Impact Factor			The same beta coefficients are in regression and (standardizes) its values are evaluated in terms of the sign, value and significance
Structure Model	At the 95% confidence level, if the T statistic of Student's t-test, the path between the two variables is more than 1.96, indicating the significant effect of the independent variable on the dependent variable.		
	R^2	However, R^2 , the equivalent of 0.25,0.50 and 0.75 are considered weak, medium, and strong values, respectively, The higher the number of exogenous variables of an endogenous variable, the higher its the higher its R^2 is expected to be.	
	F^2	The values of 0.02, 0.15, and 0.35 indicate the size of the small, medium, and large impact of one structure on another, respectively.	
	Q^2	A value higher than zero is acceptable.	

(Gholamzadeh and Azar, 2016; Davari and Rezazadeh, 2018)

Convergent validity was established through factor load indices, with the ideal value exceeding 0.5, and AVE value, with the ideal value surpassing 0.5, as well. Reliability was subsequently affirmed using both Cronbach's alpha coefficient and combined reliability, which exceeded the optimal value of 0.7. The outcomes for these indicators are displayed in the tables below. As demonstrated in Table (2), the values for combined reliability, Cronbach's alpha coefficient, and the mean of extracted variances exceed 0.7. This underscores the confirmation of the instrument's reliability and validity. It is worth noting that the factor load values in the model diagram are explicitly defined in the standard model, with all of them surpassing 0.5.

Moving on to Table (3), the research model's divergent validity is confirmed. The Fornell-Larcker criterion establishes that the square root of the mean values of the variances extracted from each structure (the principal diagonal of the matrix) should exceed its correlation values with other structures. Because each structure's correlation values are lower than those of other structures,

[1] - The values of the original diameter are greater than the corresponding rows and columns

divergent validity is conclusively confirmed.

Table 2. The Combined reliability, Cronbach's alpha, and AVE

Construct Reliability and Validity	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Social Networks	0.842	0.904	0.760
TV networks	0.808	0.912	0.839
Technical Analysis Websites	0.759	0.813	0.594
Websites	0.893	0.912	0.502
Newspapers	0.777	0.829	0.627
News and social media	0.902	0.919	0.502
Risk-taking	0.760	0.843	0.592
Avoidance decision making	0.737	0.845	0.732
spontaneous decision making	0.818	0.916	0.846
Intuitive decision making	0.717	0.819	0.542
Rational decision making	0.894	0.927	0.759
Dependency decision making	0.730	0.803	0.581

Table 3. Divergent validity results (diagnostic validity)

	News and social media	risk-taking	Dependency decision making	Rational decision making	Intuitive decision making	spontaneous decision making	Avoidance decision making
Avoidance decision making							0.856
Spontaneous decision making						0.920	0.657
Intuitive decision making					0.736	0.211	0.183
Rational decision making				0.871	0.382	-0.020	-0.134
Dependency decision making			0.762	0.277	0.505	0.211	0.178
Risk-taking		0.755	0.116	0.488	0.202	-0.155	-0.274
News and social media	0.789	0.133	0.149	0.155	0.083	0.101	0.102

To fit the structural model, the coefficient of determination, R2, also shows the percentage of the dependent variable changes explained by the independent variables. Researchers have also stressed that the predictive power index, Q2, more than zero, is acceptable and that the closer it gets to one, the higher its predictive power. Accordingly, the obtained results are approved if the effect size, F2, means the model's explanatory power and determines the relationship between the structures of the model. The variance of inflation factor (VIF) measures the intensity of multiple alignments. As a rule of thumb, if the value of VIF is greater than 5, multiple lines are high. As Table (4) shows, all values obtained are above the average of the specified values.

Table 4. Results of predictive power, Q^2 values and determination coefficient, R^2

		Avoidance decision making	Dependency decision making	Spontaneous decision making	Rational decision making	Intuitive decision making
F2	Risk-taking	0.351	0.128	0.061	0.376	0.184
	News and social media	0.222	0.208	0.208	0.316	0.311
VIF	risk-taking	1.132	1.132	1.132	1.132	1.132
	News and social media	1.020	1.020	1.020	1.020	1.020
	R2	0.198	0.102	0.141	0.351	0.188
	Q2	0.130	0.06	0.087	0.249	0.127

One of the primary indicators for assessing the overall model's adaptability is the GOF (Goodness of Fit) criterion. This criterion pertains to the comprehensive aspects of both the structural and measurement models. It allows researchers to evaluate the overall model's fitness after scrutinizing the adequacy of the measurement section and the confirmatory factor model in their research. The GOF standard, initially formulated by Tenenhaus et al. (2005), is calculated using the following formula.

Communality: This value is obtained from the mean squared of the factor loads of each factor. $\overline{communality}$ is obtained from the average values of each endogenous factor of the model.

$\overline{R^2}$: The mean values of the coefficient of determination of endogenous factors of the model.

The calculated GOF value is as follows:

GOF=$\sqrt{\overline{COMMUNALITY} * \overline{R^2}} = \sqrt{0.656 * 0.196} = 0.358$

Wetzels et al. (2009) determined three values of 0.01, 0.25, and 0.36 as weak, medium, and strong values, respectively, for GOF, obtained a value of 0.368, indicating a good adaptability of the model. In addition, the findings related to other indicators of overall model adaptability are presented in Table (5). All the studied indicators have a good score, meaning the research model has a good adaptability.

Table 5. Indicators of research model adaptability

Indicator	Statistic	Standard value	Resource
SRMR	0.049	Less than 0.08	Hu and Bentle (1999)
RMS Theta	0.099	Less than 0.12	Ringle et al (2020)
GOF	0.358	More than 0.25	Wetzels et al (2009)
NFI	0.92	More than 0.9	Bentler and Bonett (1980)
d_ULS	0.455	Less than 0.95	Henseler et al (2016)
d_G	0.561	Less than 0.95	Henseler et al (2016)

The results of the implemented model, the regression coefficients or path coefficient, T value, and significant level are shown in Figures (1) and (2).

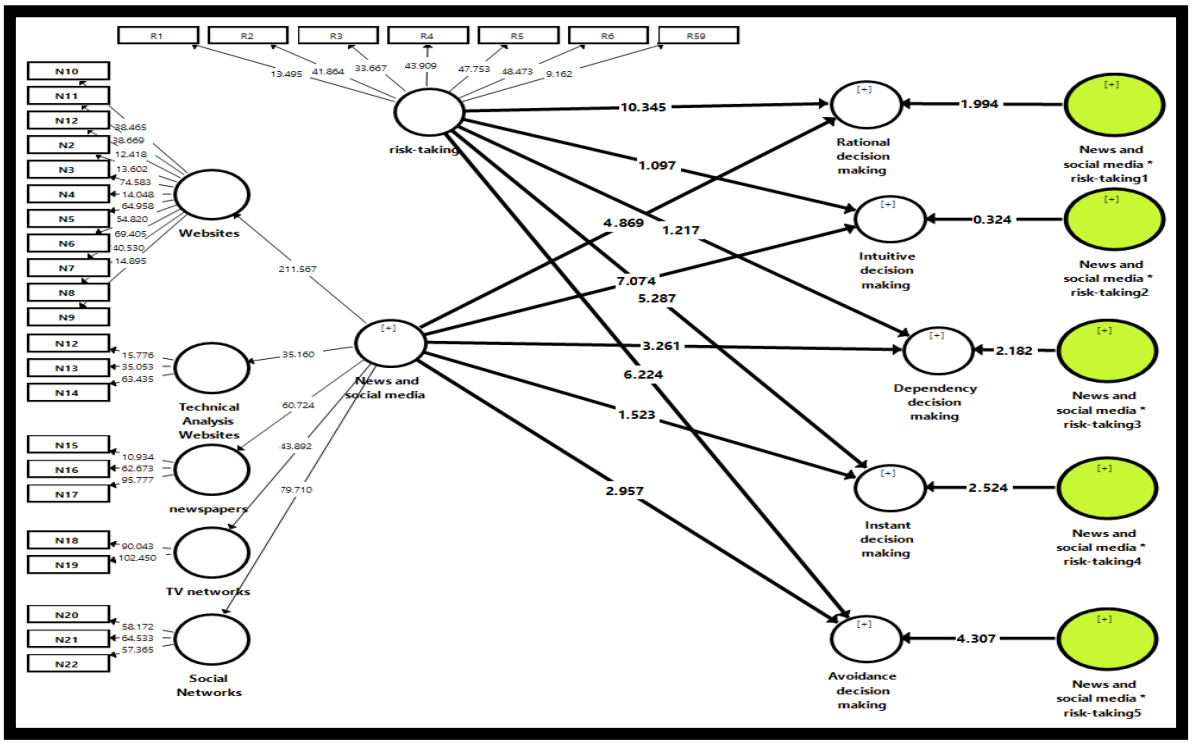

Figure 1. Results of the model implemented in PLS software for standard mod

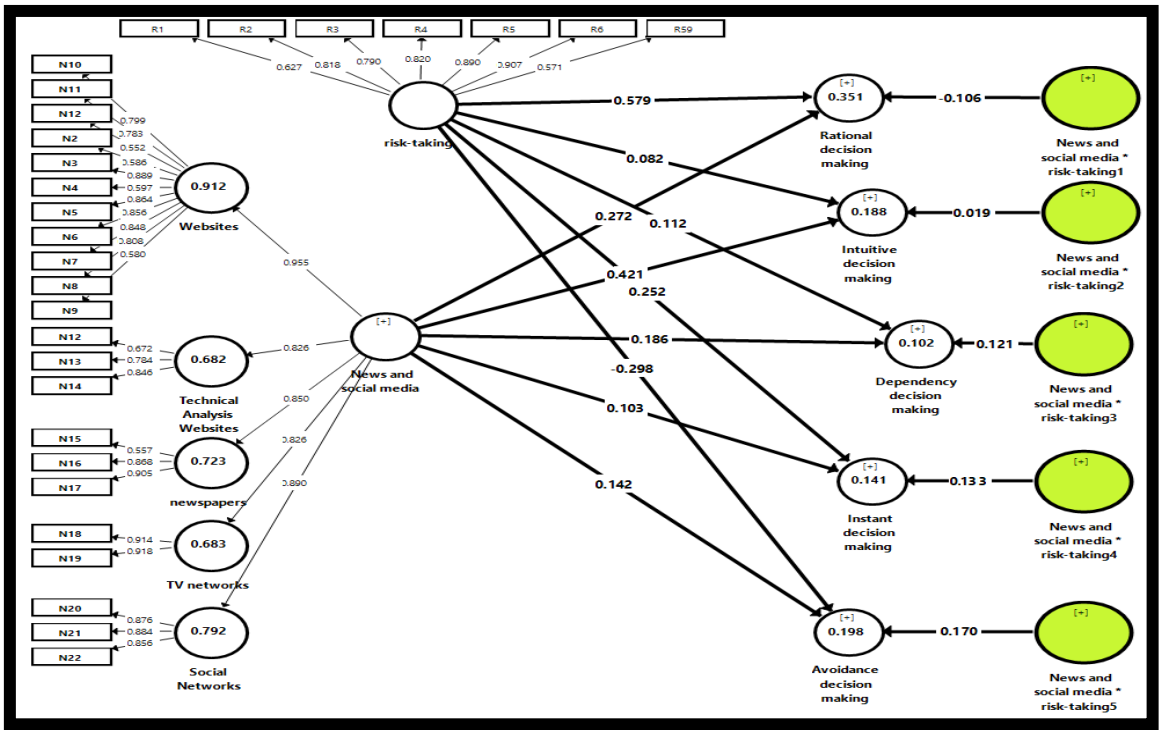

Figure 2. Results of the model implemented in PLS software for significance

The relationship between the research variables is significant or not based on the path coefficients, T-coefficients, and significance level. These results are presented more clearly in Table (6).

Table 6. Results of the relationship between research variables

Path Coefficients	Original Sample (O)	T Statistics (|O/STDEV|)	P Values
News and social media -> Avoidance of decision-making	0.142	2.957	0.033
News and social media -> Dependency decision-making	0.186	3.261	0.012
News and social media -> spontaneous decision-making	0.103	1.523	0.128
News and social media -> Intuitive decision-making	0.421	7.077	0.001
News and social media -> Rational decision-making	0.272	4.869	0.002
risk-taking -> Avoidance decision making	-0.298	6.224	0.001
risk-taking -> Dependency decision making	0.112	1.217	0.224
risk-taking -> spontaneous decision making	0.252	5.287	0.027
risk-taking -> Intuitive decision making	0.082	1.097	0.293
risk-taking -> Rational decision making	0.579	10.345	0.001
News and social media * risk-taking5 -> Avoidance decision making	0.170	4.307	0.006
News and social media * risk-taking3 -> Dependency decision making	0.121	2.182	0.041
News and social media * risk-taking4 -> spontaneous decision making	0.133	2.524	0.037
News and social media * risk-taking2 -> Intuitive decision making	0.019	0.324	0.746
News and social media * risk-taking1 -> Rational decision making	-0.106	0.199	0.048

The results showed that the effect of news and social media on avoidant decision-making style (β = 0.142; P = 0.033) is positive and significant, while the effect of risk-taking on avoidant decision-making (β = -0.298; P = 0.001) is negative and significant. Also, the effect of news and social media on avoidance decision-making style has been positively and significantly confirmed according to the degree of risk-taking of investors in the Tehran Stock Exchange (β = 0.170; P = 0.006). Therefore, the avoidance decision-making style can be expected to increase by increasing the reading of news and social media and the high degree of risk-taking. Also, with the impact of news and social media and investors' risk-taking, approximately 20% (R^2= 0.198) of changes in avoidance decision-making style can be predicted.

Findings indicated that the effect of news and social media on dependency decision-making style (β = 0.186; P = 0.012) was positive and significant, and the effect of risk-taking on dependency decision-making (β = 0.112; P = 0.224) was insignificant. Also, the effect of social media news on dependency decision-making style has been positively and significantly confirmed according to the degree of investor risk-taking (β = 0.121; P = 0.041). More specifically, increasing the degree of investor risk-taking can enhance the impact of news and social media on dependency decision-making style. Also, to the effects of news and social media and investors' risk-taking, approximately 10% (R^2 = 0.102) of changes in dependency decision-making style can be predicted.

Emphasizing the findings, the effect of news and social media on spontaneous decision-making style (β = 0.103; P = 0.128) was insignificant, but the effect of risk-taking on spontaneous decision-making (β = 0.252; P = 0.027) was positive and significant. On the other hand, risk-taking positively moderates the relationship between news and social media with a spontaneous decision-making style (β = 0.133; P = 0.037). It can be interpreted that increasing risk-taking increases the impact of news and social media on spontaneous decision-making style. Finally, with the impact of news and social media and investors' risk-taking, approximately 14% (R^2 = 0.141) of changes in spontaneous decision-making style can be predicted.

Based on the mentioned results, the effect of news and social media on intuitive decision-making style (β = 0.421; P = 0.001) was positive and significant, but the effect of risk-taking on intuitive decision-making (β = 0.082; 0.293 = P) was less significant. In addition, the impact of news and social media on intuitive decision-making style has been rejected due to the degree of risk-taking of investors in the Tehran Stock Exchange because the significance level is less than 0.05. In general, with the impact of news and social media and investors' risk-taking, approximately 19% (R^2 = 0.188) of changes in intuitive decision-making style can be predicted.

The results showed that news and social media positively affected the logical decision-making style (β = 0.272; P = 0.002), meaning that the more investors pay attention to news and social media, the higher the decision-making rate. Hence, they will be more logical. In addition, the effect of risk-taking on rational decision-making (β = 0.579; P = 0.001) was positive and significant. On the other hand, the impact of news and social media on the rational decision-making model has been negatively and significantly confirmed due to their degree of risk-taking in the Tehran Stock Exchange market (β = -0.106; P = 0.048). That means that, whatever the degree of investor risk is higher, the impact of news and social media on rational decision-making style is less. Finally, to the effects of news and social media and investor risk-taking, approximately 35% (R^2 = 0.351) of changes in rational decision-making style can be predicted.

5. Conclusion

The primary objective of this study was to investigate the influence of social media news on investor decision-making styles within the Tehran Stock Exchange, considering their risk tolerance level. Five hypotheses were formulated based on the research's theoretical foundations and the provided background to achieve this goal. In the first hypothesis, the study examined the impact of mass media news on the avoidant decision-making style concerning the investors' risk tolerance. The results of this hypothesis revealed a significant positive effect of media news on the avoidant decision-making style. In the context of the avoidant decision-making style, it can be described as a tendency to delay decisions whenever possible, avoiding decision-making situations, often leading to heightened stress during the decision-making process. According to Parker et al. (2007), this style involves deferring decisions when confronted with challenges and avoiding immediate reactions to events. Moghadam et al. (2008) suggest that individuals adopting this style avoid decision-making and actively seek to steer clear of decision-making situations. They are typically hesitant about making decisions, and concerned about the potential consequences of their choices. Consequently, decision-makers following this style tend to rely more heavily on external sources, such as media news and other external information. Furthermore, in terms of risk tolerance, individuals adopting the avoidant decision-making style are often categorized as risk-averse. Einav et al. (2012) conducted a study indicating that investors' risk tolerance can be influenced by their tendency to follow mass behavior.

The second hypothesis delved into the impact of mass media news on the dependency decision-making style in relation to the investors' risk tolerance. The results of this hypothesis indicate a significant positive association between investors employing the dependency style and media news, thereby confirming the hypothesis. As described in the theoretical foundations of this research, individuals who exhibit a dependency style in their decision-making processes often lack intellectual independence. They predominantly base their decisions on the input and guidance of others. When faced with significant and intricate choices, these individuals are highly influenced by external factors, including media news, and tend to seek the advice and support of others before arriving at a decision. Daniel et al. (2002) assert that many investors and traders place greater emphasis on information exchange and communication among investors when making decisions, largely due to their reliance on external input. Parker et al. (2007) also propose that individuals following this style lack practical and intellectual independence in their decision-making, and they heavily depend on the guidance and support of others, as well as media news, to inform their choices. Consequently, individuals adopting this style tend to anchor their decisions on the beliefs of others and may, at times, exhibit herding behavior in their choices. In light of the results of Hypothesis 2, it can be inferred that decision-makers who favor the dependency style tend to be more risk-tolerant. Their decision-making

strategy is oriented toward patience, increasing utility when investing. In other words, they are willing to take risks and inclined towards risk-seeking behavior (Ghalibaf Asl et al., 2015).

The third hypothesis investigated the influence of mass media news on the spontaneous decision-making style concerning investors' risk tolerance. The results of this hypothesis demonstrated a significant positive relationship between media news and the spontaneous decision-making style, with the degree of risk-taking positively moderating this association. According to Scott and Bruce (1995), individuals adopting the spontaneous decision-making style make their primary decisions in the shortest possible time without prior intellectual support, often relying on available news. However, utilizing this style does not imply making hasty or immature decisions, as individuals making decisions this way draw upon their experiences and available data. Barzegari Khanghah et al. (2017) explored the impact of media coverage on investors' decisions, specifically examining investors' use of social media. This study revealed that investors utilize various internet and television mass media forms to make immediate decisions, enabling them to participate in and select a wider range of stocks. Consistent with these findings, the third hypothesis suggests that individuals employing the spontaneous style are inclined towards risk-taking behavior. This aligns with the study conducted by Fallah Shams Leyalestani et al. (2011), which explored the relationship between risk-taking behavior and mass behavior. Their study concluded that there is indeed a correlation between risk-taking and mass behavior, supporting the results of this hypothesis.

The fourth hypothesis sought to examine the impact of social media news on the intuitive decision-making style, with consideration of the investors' risk tolerance. Surprisingly, the results of this hypothesis led to its rejection. Within the framework of the intuitive style, investors rely on their insights and adhere to them, although they may also incorporate external information and news into their decision-making process. According to Spicer and Sadler-Smith (2005), individuals with an intuitive decision-making style typically draw upon three primary sources of intuition: general experiences, focused education, and expertise. Robbins and Judge (2009) concur that this style represents an unconscious decision-making process where decision-makers do not adhere to a systematic approach but rely on their personal experiences and tacit knowledge when making decisions. In essence, individuals with less intuitive decision-making styles may be influenced by news and external factors in their decisions, playing a role as followers and relying more on their intuition and foresight. According to these results, investors within the capital market can be categorized as either risk-averse or demonstrating a neutral stance toward risk. Tehrani (2021) highlights that internal factors primarily drive individuals' degree of risk aversion and remain largely unaffected by external market considerations. Moreover, in some instances, investors exhibit a neutral approach to risk, strongly influenced by their individual preferences and financial circumstances. This neutral risk behavior is commonly observed among individuals with substantial wealth.

The fifth hypothesis aimed to explore the impact of social media news on the rational decision-making style. Interestingly, the results of this hypothesis revealed a negative and significant effect of news mass media on investors who adhere to a rational style, contingent upon their degree of risk tolerance. Individuals employing a rational style in their decision-making processes ultimately strive to make the most informed and meticulously evaluated choices. They meticulously analyze all accessible information sources, including social media news, newspapers, and websites. However, it can be argued that they ultimately rely more on their knowledge and experience in shaping their decisions rather than merely following media reports. This outcome aligns with findings from foreign studies, such as Maditinos et al. (2007), who contend that novice investors rely more on media news and market hearsay when making decisions, while professional investors prioritize fundamental and technical analysis and allocate less attention to news and rumors. Similarly, Fallah Shams et al. (2012) observed that individuals adopting a rational approach harness their knowledge, skills, and experience

to address and resolve issues actively. Consequently, they arrive at decisions characterized by sound and logical reasoning. By adeptly utilizing up-to-date knowledge and meticulous processing of information acquired from the media, these individuals mitigate the risk of cognitive and perceptual errors, such as herd behavior, in their decision-making. In summation, it can be asserted that this group tends to exhibit a degree of risk aversion due to their preference for the rational decision-making style.

References

1. Ansari Khaledi, M. (2020). Investigating the effect of media news on economic indicators of shares of automobile companies listed on the Tehran Stock Exchange. Fourth Scientific Conference on New Achievements in the Studies of Management Sciences, Accounting and Economics of Ilam, Iran. (In Persian). https://civilica.com/doc/1144699.
2. Barna, T. (1946). Theory of games and economic behavior. In: JSTOR, 50(13), pp. 136-138. https://doi.org/10.2307/2550081.
3. Barzegari Khanghah, J., Hejazi, R., and Rezazadeh, F. (2017). The effect of media coverage on investors' stock market decisions. Journal of Financial Accounting and Auditing Research, 9(33), pp. 107-124. https://dorl.net/dor/20.1001.1.23830379.1396.9.33.7.2.
4. Bentler, P. M. and Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. Psychological Bulletin, 88(3), pp. 588. http://dx.doi.org/10.1037/0033-2909.88.3.588.
5. Chen, H., De, P., Hu, Y. J. and Hwang, B.-H. (2014). Wisdom of crowds: The value of stock opinions transmitted through social media. The Review of Financial Studies, 27(5), pp. 1367-1403. https://doi.org/10.1093/rfs/hhu001.
6. Cu, T. and Le, T. (2021). The role of social media marketing in attracting investment capital in industrial parks in the context of COVID-19. International Journal of Data and Network Science, 5(4), pp. 727-736. http://dx.doi.org/10.5267/j.ijdns.2021.7.009.
7. Daniel, K., Hirshleifer, D. and Teoh, S. H. (2002). Investor psychology in capital markets: Evidence and policy implications. Journal of Monetary Economics, 49(1), pp. 139-209. http://dx.doi.org/10.1016/S0304-3932(01)00091-5.
8. Davari, A. and Rezazadeh, A .(2018). Structural equation modeling with PLS software. Iranian student booking agency. Jahade Daneshgahi. Tehran, Iran (In Persian). http://dx.doi.org/10.13140/2.1.3280.1922.
9. Dong, H., Ren, J., Padmanabhan, B. and Nickerson, J. V. (2022). How are social and mass media different in relation to the stock market? A study on topic coverage and predictive value. Information & Management, 59(2), pp. 103588. https://doi.org/10.1016/j.im.2021.103588.
10. Drake, M. S., Roulstone, D. T. andThornock, J. R. (2012). Investor information demand: Evidence from Google searches around earnings announcements. Journal of Accounting Research, 50(4), pp. 1001-1040. https://doi.org/10.1111/j.1475679X.2012.00443.x.
11. Economou, F., Gavriilidis, K., Kallinterakis, V. and Yordanov, N. (2015). Do fund managers herd in frontier markets—and why? International Review of Financial Analysis, 40 (7), pp. 76-87. https://doi.org/10.1016/j.irfa.2015.03.017.
12. Einav, L., Finkelstein, A., Pascu, I. and Cullen, M. R. (2012). How general are risk preferences? Choices under uncertainty in different domains. American Economic Review, 102 (6), pp. 2606-2638. http://www.aeaweb.org/articles.php?doi=10.1257/aer.102.6.2606.
13. Fallah Shams, M., Haghshenas Kashani, F, and Afsharhajar, F. (2012). Studying the Effects of the Locus of Control on the Perceptual Errors in the Decision Making of the Investors in the

Tehran Stock Exchange. Journal of Investment Knowledge, 3(1), pp. 105-124 (In Persian). https://jik.srbiau.ac.ir/article_7407.html.

14. Fallah Shams Leyalestani, M., Ghalibaf Asl, H. and Sarabi Nobakht, S. (2011). The Impact of Experience on Risk-taking, Overconfidence, and Herding of Investment Companies' Managers in. Journal of Securities Exchange, 3(12), pp. 25-42. (In Persian) https://journal.seo.ir/article_10903.html?lang=en.
15. Fang, L. and Peress, J. (2009). Media coverage and the cross-section of stock returns. The Journal of Finance, 64 (5), pp. 2023-2052. https://dx.doi.org/10.2139/ssrn.971202.
16. Farokhi, M., Sofi Mahdiyeh, A. and Farokhi, M. (2016). Evaluating the effect of virtual support in creating mass behavior (stock trading) in the Tehran Stock Exchange. Stock Exchange Journal, 9(33), pp. 5-24 (In Persian) https://dx.doi.org/10.22034/jse.2016.11073.
17. Ghalibaf asl, H., Poordadash mehrabani, N. and Dehghan, L. (2015). The Investigation of the Relationship between Managers` Risk Aversion and Financial Institutions` Performance in Market (Case Study: Mutual Funds). Journal of Financial Management Strategy, 10(3), pp. 1-23 (In Persian) https://doi.org/10.22051/jfm.2015.2246.
18. Gholamzadeh, R. and Azar, A. (2016). Structural Equation Modeling: Minimum Partial Squares (PLS-SEM). Author: Joseph Huff. Knowledge Look Publications. Tehran, Iran (In Persian) https://www.negahedanesh.com/fa/product/%D9%85%D (PLS-SEM).html.
19. Gomez-Mejia, L. R. and Balkin, D. B. (1989). Effectiveness of individual and aggregate compensation strategies. Industrial Relations: A Journal of Economy and Society, 28(3), pp. 431-445. https://doi.org/10.1111/j.1468-232X.1989.tb00736.x.
20. Hatam, J., Bokharaeian Khorasani, M., Naderian. and A., Jamadverdi, D. (2021). Dissemination of commercial rumors in cyberspace: Evidence from Tehran Stock Exchange (phenomenological method). Journal of Investment Knowledge, 5(3), pp. 17-37 (In Persian). https://www.doi.org/10.30699/ijf.2021.256891.1173.
21. Hafner-Burton, E. M., Haggard, S., Lake, D. A. and Victor, D. G. (2017). The behavioral revolution and international relations. International Organization, 71(1), pp. 1-31. https://doi.org/10.1017/S0020818316000400.
22. Helland, I. S. (1990). Partial least squares regression and statistical models. Scandinavian Journal of Statistics, 17(2), pp. 97-114. https://www.jstor.org/stable/4616159..
23. Heidari Haratmeh, M. (2022). The Impact of Mass Media on Sentiment of Stock Market Investors. Society Culture Media, 10(39), pp. 195-204 (In Persian). https://dorl.net/dor/20.1001.1.38552322.1400.10.39.9.0.
24. Henseler, J., Hubona, G. and Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. Industrial Management & Data Systems. 116(1), pp. 2-20. https://doi.org/10.1108/IMDS-09-2015-0382.
25. Hu, L. T. and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: a Multidisciplinary Journal, 6(1), pp. 1-55. https://doi.org/10.1080/10705519909540118.
26. Jalilvand, A., Rostami Noorozabadi, M. and Rahmani, S. (2015). Recent Evidence on Investors' Behavior in the Tehran Stock Exchange: Preliminary Evidence and Future Insights. Journal of Financial Research, 18(1), pp. 95-125 (In Persian). https://doi.org/10.22059/jfr.2016.59622.
27. Khaksarian, F.,Azadi. and Mirbargkar, M. (2021). Identifying and Ranking Factors Affecting Shareholders' Decision to Invest in the Iranian Stock Exchange. Journal of Financial Engineering and Securities Management, 11(45). pp. 1-29 (In Persian) https://dorl.net/dor/20.1001.1.22519165.1399.11.45.1.8.

28. Khoshnood, M., Vakilifard, H. and Foroghnejad, H.(2013). Evaluation of Investors' Behavior in Tehran Stock Exchange with Analytic Network Process (ANP). Journal of Asset Management and Financing, 2(1), pp. 19-34 (In Persian) https://dorl.net/dor/20.1001.1.23831170.1392.1.2.3.1.
29. Kietzmann, J. H., Hermkens, K., McCarthy, I. P. and Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. Business Horizons, 54 (3), pp. 241-251. https://doi.org/10.1016/j.bushor.2011.01.005.
30. Larcker, D. F., So, E. C. and Wang, C. C. (2013). Boardroom centrality and firm performance. Journal of Accounting and Economics, 55(2-3), pp. 225-250. https://dx.doi.org/10.2139/ssrn.1651407.
31. Lee, L. F., Hutton, A. P. and Shu, S. (2015). The role of social media in the capital market: Evidence from consumer product recalls. Journal of Accounting Research, 53(2), pp. 367-404. https://dx.doi.org/10.2139/ssrn.2557212.
32. Li, J., Tian, G., Fonseka, M. and Si, Y. (2021). The reverse corporate governance effect of online media management. Asia-Pacific Journal of Accounting & Economics, 28(3), pp. 285-310. https://doi.org/10.1080/16081625.2019.1618719.
33. Maditinos, D. I., Šević, Ž. And Theriou, N. G. (2007). Investors' behavior in the Athens Stock Exchange (ASE). Studies in Economics and Finance. 24(3). pp. 32-50. http://dx.doi.org/10.1108/10867370710737373.
34. McNichols, M. F. and Stubben, S. R. (2008). Does earnings management affect firms' investment decisions? The Accounting Review, 83(6), pp. 1571-1603. http://dx.doi.org/10.2308/accr.2008.83.6.1571.
35. Miller, G. S. and Skinner, D. J. (2015). The evolving disclosure landscape: How changes in technology, the media, and capital markets affect disclosure. Journal of Accounting Research, 53(2), pp. 221-239. https://doi.org/10.1111/1475-679X.12075.
36. Moghadam, A. H., Tehrani, M. and Amin, F. (2011). Study of the relationship between emotional intelligence (EI) and management decision-making styles. World Applied Sciences Journal, 12(7), pp. 1017-1025. https://www.researchgate.net/publication/267803496_Study_of_the_Relationship_Between_Emotional_Intelligence_EI_and_Management_Decision_Making_Styles.
37. Moghimi, S. M. (2018). Organizational behavior management: An Islamic approach: Emerald Group Publishing. University of Tehran, Iran. https://doi.org/10.1108/978-1-78769-677-820181012.
38. Narayan, P. K. and Bannigidadmath, D. (2017). Does financial news predict stock returns? New evidence from Islamic and non-Islamic stocks. Pacific-Basin Finance Journal, 42(4), pp. 24-45. https://doi.org/10.1016/j.pacfin.2015.12.009.
39. Nikbakht, M.R. and Moradi, M. (2005). The Evaluation of Investors Overreaction in the Tehran Stock Exchange (TSE). Empirical Studied in Financial Accounting, 9(3), pp. 1-26 (In Persian) https://dorl.net/dor/20.1001.1.28210166.1384.3.9.1.7.
40. Nikoomaram, H., Rahnama Roodposhti, F., Heybati, F. and Yazdani, sh. (2012). The effect of the cognitive bias of Tehran Stock Exchange investors on stock valuation. Journal of Financial Knowledge of Securities Analysis, 1(5), pp. 65-81 (In Persian) https://jfksa.srbiau.ac.ir/article_3012.html.
41. Oliveira, A. (2007). A discussion of rational and psychological decision-making theories and models: The search for a cultural-ethical decision-making model. Electronic Journal of Business Ethics and Organization Studies, 12(2), pp. 12-17. https://www.researchgate.net/publication

42. Parker, A. M., De Bruin, W. B. and Fischhoff, B. (2007). Maximizers versus satisficers: Decision-making styles, competence, and outcomes. Judgment and Decision making, 2(6), pp. 342. https://doi.org/10.1017/S1930297500000486.
43. Pourmohammadshahini, K. and Ranjbar, M. (2019). Identifying Decision-Making Styles and Components of Succession Planning Capabilities and Examine their Relationship. Petroleum Business Review, 3(4), pp. 55-62. https://doi.org/10.22050/pbr.2019.118620.
44. Raie, R., Hoseini, F. and Kiani Harchegani, M. (2016). Evaluate the Ability of Social Networks to Predict the Direction and Stock Prices in the Tehran Stock Exchange. Journal of Investment Knowledge, 5(19), pp. 107-128 (In Persian) https://jik.srbiau.ac.ir/article_9329.html.
45. Ren, J., Dong, H., Padmanabhan, B. and Nickerson, J. V. (2021). How does social media sentiment impact mass media sentiment? A study of news in the financial markets. Journal of the Association for Information Science and Technology, 72(9), pp. 1183-1197. https://dx.doi.org/10.2139/ssrn.3434163.
46. Ringle, C. M., Sarstedt, M., Mitchell, R. and Gudergan, S. P. (2020). Partial least squares structural equation modeling in HRM research. The International Journal of Human Resource Management, 31(12), pp. 1617-1643. https://doi.org/10.1080/09585192.2017.1416655.
47. Robbins, S. P. and Judge, T. (2009). Organizational Behavior: Pearson, South Africa. https://doi.org/10.4236/ce.2020.1111168.
48. Saneifar, M. and Saeedi, P. (2020). Comparison of Complex Networks of Stock Markets and Economic Variables in the Period Before and After the Outbreak of Coronavirus (Covid-19). Journal of Economic Modeling Research, 10(40), pp. 123-158 (In Persian). http://dx.doi.org/10.29252/jemr.10.40.123.
49. Schniederjans, D., Cao, E. S. and Schniederjans, M. (2013). Enhancing financial performance with social media: An impression management perspective. Decision Support Systems, 55(4), pp. 911-918. https://doi.org/10.1016/j.dss.2012.12.027.
50. Scott, S. G. and Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. Educational and Psychological Measurement, 55(5), pp. 818-831. https://psycnet.apa.org/doi/10.1177/0013164495055005017.
51. Sharma, M. S. and Bikhchandani, S. (2000). Herd behavior in financial markets: a review. International Monetary Fund. IMF Working Papers (2000/048). Washington, D.C, United Nations. https://doi.org/10.5089/9781451846737.001.
52. Singh, R. and Greenhaus, J. H. (2004). The relation between career decision-making strategies and person-job fit: A study of job changers. Journal of Vocational Behavior, 64(1), pp. 198-221. https://doi.org/10.1016/S0001-8791(03)00034-4.
53. Spicer, D. P. and Sadler-Smith, E. (2005). An examination of the general decision-making style questionnaire in two UK samples. Journal of Managerial Psychology. 20(2). pp. 137-149. https://psycnet.apa.org/doi/10.1108/02683940510579777.
54. Tehrani, R. (2021). Fundamental of Managerial Finance.Working paper. Publisher of Negahe Danesh. Tehran, Iran. (In Persian). https://naghshedanesh.ir/product.
55. Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M. and Lauro, C. (2005). PLS path modeling. Computational Statistics & Data Analysis, 48(1), pp. 159-205. https://doi.org/10.1016/j.csda.2004.03.005.
56. Von Neumann, J. and Morgenstern, O. (2007). Theory of games and economic behavior. In Theory of Games and Economic Behavior: Princeton University Press. https://press.princeton.edu/books/paperback/9780691130613/theory-of-games-and-economic-behavior.
57. Wetzels, M., Odekerken-Schröder, G. and Van Oppen, C. (2009). Using PLS path modeling

for assessing hierarchical construct models: Guidelines and empirical illustration. MIS Quarterly, 33(1), pp. 177-195. http://dx.doi.org/10.2307/20650284.

58. Wu, C. C., Yan, Y., Yuan, T., Huang, C. C. and Tsai, Y. J. (2022). A Study of Network Negative News Based on Behavioral Finance Analysis of Abnormal Fluctuation of Stock Price. Discrete Dynamics in Nature and Society, 28(1), pp. 16. https://doi.org/10.1155/2022/7952532.
59. Xu, Q., Li, Q., Jiang, C., Wu, J. and Zhang, X. (2020). Social media, interaction information and stock market efficiency: evidence from the Shenzhen stock exchange easy interaction platform in China. Asia-Pacific Journal of Accounting & Economics, 29(6), pp. 1-28. http://dx.doi.org/10.1080/16081625.2020.1829976.

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Iranian Journal of
Accounting, Auditing & Finance

Ferdowsi University of Mashhad

Quarterly

RESEARCH ARTICLE

Mitigating the Mental Accounting Cognitive Bias through Instruction

Mona Parsaei*, Mahnaz Molanazari
Department of Accounting, Faculty of social sciences and economics, Alzahra University, Tehran, Iran
Bita Mashayekhi
Department of Accounting, Faculty of Management, University of Tehran, Tehran, Iran
Farzaneh Jalali Aliabadi
Department of Accounting and Data Analytics, La Trobe Business School, Latrobe University, Bundoora, Victoria, Australia

How to cite this article:
Parsaei, M., Molanazari, M., Mashayekhi, B., & Jalalialiabadi, F. (2024). Mitigating the Mental Accounting Cognitive Bias through Instruction. Iranian Journal of Accounting, Auditing and Finance, 8(1), 89-109. doi: 10.22067/ijaaf.2024.43891.1319
https://ijaaf.um.ac.ir/article_43891.html

ARTICLE INFO

Article History
Received: 2023-09-30
Accepted: 2023-12-05
Published online: 2024-01-01

Keywords:
Cognitive Bias, Instruction, Mental Accounting, Investment Decision Behavior, Judgment and Decision Making

Abstract

This study explores the influence of instructional interventions in mitigating mental accounting bias during capital investment decisions. Initially, we investigate the potential costly errors resulting from mental accounting. Subsequently, we employ instructional strategies to reduce this cognitive bias. Employing an experimental methodology, we employ an 8x2 mixed factorial design to examine the impact of financing sources on mental accounting and the effectiveness of instructional interventions. The findings reveal that managers prone to mental accounting tend to retain debt-financed assets over equity-financed assets. Importantly, instruction proves effective in alleviating this cognitive bias. This research holds significance for both academic scholars and practitioners. It sheds light on the deficiency of instructional resources in accounting education for fostering essential professional judgment skills among students. It is recommended that Finance, Business, and Accounting faculties incorporate modules on mental accounting and related cognitive biases in postgraduate programs. Furthermore, manufacturing industries can benefit from employee training programs to reduce cognitive biases associated with mental accounting in capital budgeting.

https://doi.org/10.22067/ijaaf.2024.43891.1319

NUMBER OF REFERENCES
49

NUMBER OF FIGURES
-

NUMBER OF TABLES
12

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Mona Parsaei
Email: m.parsaei@alzahra.ac.ir
Tel: 09122505244
ORCID: 0000-0001-5-41

1. Introduction

Neoclassical economics assumes that individuals are rational and use thorough information processing when making decisions (Serfas, 2011). However, behavioral economics has unveiled that human decisions are not always rational (Mnif, Salhi, and Jarboui, 2019; Bonner, 2008). The shortcomings of traditional economic theories in elucidating human behavior have spurred the development of practical models that incorporate psychological insights (Shefrin and Thaler, 1988). These models take into account the influence of "heuristics" techniques, which are grounded in cognitive psychology and serve to elucidate and predict biases in judgment and decision-making (JDM) (Tversky and Kahneman, 1981). Heuristics are mental shortcuts individuals employ to simplify information processing due to their inherent limitations in rationality. While these shortcuts may offer certain advantages, they can also lead to systematic biases in decision outcomes (Serfas, 2011; Beasley et al., 2014).

Mental accounting functions as a problem-solving heuristic in financial decision-making, yet it can result in deviations from rational choices. Substantial evidence supports the idea that heuristics can adversely affect judgments related to accounting (Fay and Montague, 2015; Cloyd and Spilker, 1999). Previous literature in the field of accounting has explored the impact of cognitive biases on financial decisions, with studies by Bhattacharjee, Moreno, and Salbador (2015), Bonner, Clor-Proell, and Koonce (2014), Falsetta, Rupert, and Wright (2013), Jackson, Keune, and Salzsieder (2013), Jackson, Rodgers, and Tuttle (2010), and Lipe (1993) providing insights into this subject. As researchers explore cognitive biases in judgment and decision-making, they have not only criticized these biases but also identified debiasing techniques (Bonner, 2008). Publications by KPMG (Ranzilla et al., 2011) and the Committee of Sponsoring Organizations of Treadway Commission (Glover and Prawitt, 2012) offer guidance for accounting professionals to mitigate prevalent judgment biases and improve accounting decisions.

Studies have shown that debiasing techniques yield varying results, and their effectiveness depends on the specific type of cognitive bias (Bonner, 2008; Serfas, 2011). Furthermore, certain behaviors are deeply ingrained and resistant to permanent change because they are rooted in unconscious mental activities or established behavioral patterns (Serfas, 2011). Capital budgeting decisions shape a corporation's long-term strategies (Du Toit and Pienaar, 2005). Consequently, managerial judgment and decision-making biases can impose significant costs on an organization (Bylinski and Chow, 1985). Bonner (2008) asserts that improving the quality of judgment and decision-making, as well as fostering economic growth within corporations, can be achieved by (1) gaining a comprehensive understanding of managers' decision-making processes and (2) identifying and mitigating cognitive biases through the use of debiasing techniques. Lack of training is a key factor contributing to biases in judgment and decision-making (Bonner, 2008). By alerting managers to the potential pitfalls stemming from heuristics, this source of bias can be effectively controlled (Bylinski and Chow, 1985).

The primary objective of this study is to investigate the possibility of reducing cognitive bias arising from mental accounting by applying the instruction technique. To achieve this goal, we first examine the impact of mental accounting on capital investment decisions and subsequently assess the effectiveness of the instruction technique in mitigating potential cognitive biases. Our research questions are as follows:

How does mental accounting influence the decision-making process in capital investment decisions?

Can the instruction technique effectively reduce the impact of mental accounting on capital investment decisions?

This research is categorized as a Judgment and Decision-Making (JDM) study, utilizing

experimental data at the individual level. In the initial phase of this study, we build upon the work of Jackson et al. (2013) by demonstrating the influence of psychological factors on managerial decisions. The results further indicate that individuals' use of mental accounting may result in irrational investment decisions. In the second phase, we investigate the effectiveness of instruction as a debiasing technique and provide insights into the decision-making process of individuals. Numerous studies have delved into heuristics and cognitive biases to gain insights into investors' decision-making in stock exchanges (Cherono, 2020; Bakar and Yi, 2016; Kengatharan and Kengatharan, 2014; Nofsingera and Varmab, 2013). However, prior research has paid limited attention to the influence of mental accounting on capital budgeting decisions and the potential impact of instructional debiasing techniques on mental accounting. Our research aims to address this gap by investigating the specific impact of mental accounting on capital investment decisions, contributing to the literature where empirical evidence is scarce regarding this relationship. We emphasize mental accounting biases in the context of capital investment, thus enhancing our understanding of the cognitive processes and biases that affect decision-making quality. This study offers several noteworthy contributions to the literature. Firstly, from the standpoint of accounting education, it is the first study to explore the impact of instruction on the cognitive bias of mental accounting in the context of capital budgeting decisions, providing practical insights to improve managerial decision-making. Secondly, we present empirical evidence concerning the presence and influence of economically irrelevant psychological factors on managers' investment decisions, shedding light on previously unexplored facets of decision-making processes in capital investments.

The remainder of the paper is structured as follows: Section 2 provides an overview of existing research related to mental accounting and debiasing techniques, laying the groundwork for developing our hypotheses. Section 3 elaborates on the research methodology, encompassing aspects of research design, participant demographics, and experimental materials. In Section 4, we delve into the intricacies of the results obtained, along with rigorous checks to ensure their robustness. Finally, Section 5 offers a conclusion and outlines potential avenues for future research.

2. Prior Literature and Hypotheses Development

2.1 Mental accounting

Kahneman and Tversky (1979) and Thaler (1980) introduced a pioneering fusion of traditional economics and psychology, culminating in a novel framework for economic theories. One of the significant outcomes of this paradigm shift is the inception of "mental accounting." Mental accounting is the cognitive process employed by individuals to categorize, assess, and evaluate economic outcomes (Thaler, 1985) or as a set of mental operations used to organize, evaluate, and track financial activities (Thaler, 1999). According to Thaler's concepts (Chatterjee et al., 2009), the mental accounting process unfolds in three distinct phases.

The first phase involves identifying and assigning economic elements, such as costs and benefits, to a specific mental account associated with a particular transaction. This phase can be selective, as individuals may choose to transfer only certain costs and benefits to the mental account (Cheema and Soman, 2006; Chatterjee et al., 2009). The second phase entails framing or coding these costs and benefits within the mental account in a manner that aligns with the decision-maker's preferences. The third and final phase occurs when a decision is made to close the mental account. This closure can happen either after all the relevant benefits have been realized and transferred into the corresponding mental account or without identifying all the pertinent benefits (Prelec and Loewenstein, 1998; Chatterjee et al., 2009). Throughout each phase, cognitive biases can significantly impact the quality of judgment and decision-making (Thaler, 1980, 1985).

Prospect theory introduced the concept of framing mental accounts and aligning costs and benefits (Kahneman and Tversky, 1979). Thaler (1985) further expanded on this concept by considering multiple outcomes to determine whether individuals value costs and benefits jointly or separately (Hearst et al., 1994). Lipe (1993) was the first to apply the theory of mental accounting to analyze variance investigation decisions, and since then, it has been extensively studied in accounting research. For example, studies have examined the impact of multiple tax returns on tax compliance behavior (Bhattacharjee, Moreno, and Salbador, 2015), the effect of depreciation method choice on asset selling prices (Jackson et al., 2010), and the influence of timing and direction of capital gain tax changes on investment in risky assets (Falsetta et al., 2013). Mental accounting theory has also been utilized to examine the disaggregation of managers based on the sign and relative magnitude of income statement items (Bonner et al., 2014).

Using mental accounting in investment decisions can potentially decrease the quality of individuals' judgment and decision-making (JDM). Prelec and Loewenstein (1998) discuss how individuals align costs and benefits to enhance the pleasure of consuming an asset, and they also highlight the effect of timing on individuals' perceptions of alignment. Mental accounting suggests that initial instalment payments are more psychologically painful, leading to a noticeable reduction in the utility level, but consumption utility gradually recovers as debt is settled (Prelec and Loewenstein, 1998). In general, upfront payments accelerate the perception of receiving sufficient consumption-related benefits from an asset, which may lead individuals to rational decision-making regarding asset replacement more quickly (Jackson et al., 2013). However, the literature on mental accounting has yet to determine effective debiasing techniques to mitigate these cognitive biases.

2.2 Debiasing techniques

Debiasing techniques can be categorized into three main categories (Serfas, 2011; Bonner, 2008; Koehler and Harvey, 2004). The first category is "knowledge, experience, and expertise," where proponents argue that awareness of biases and domain expertise can help eliminate biases. The other two categories are "incentive and accountability" and "personnel screening practices and promotions based on appraisal." Instruction plays a critical role in mitigating cognitive biases within these techniques. Instruction serves a dual role: as a separate debiasing technique and a prerequisite for implementing other strategies. However, it is important to note that certain biases, such as hindsight biases and anchors, may persist even when individuals know their bias effects (Serfas, 2011).

Instruction is the most commonly used method by psychologists to counteract cognitive biases. It is a "set of events deliberately designed to support learning" (Gredler, 2005). Instruction can take various forms, ranging from simple techniques like "considering the opposite," "seeking input from an outsider with a different perspective," and "analyzing competing hypotheses" to more advanced procedures such as "analogical reasoning" (Serfas, 2011). Learning, as defined in psychology literature, encompasses knowledge acquisition and a change in performance. Formal classroom activities and preparation activities, which can be conducted in universities or training courses supported by corporations and professional institutes, are part of the learning process. These activities include reading texts, listening to lectures, solving worked-out example problems, asking and answering questions, and engaging in problem-solving and case studies (Bonner, 2008).

The existing literature on cognitive biases can be categorized into two main groups. The first category encompasses studies that delve into the psychological aspects of investment decisions. These studies provide compelling evidence for behavioral biases arising from mental accounting in decision-making (Okada, 2001; Jackson et al., 2013; Yalcin et al., 2016). The second category includes studies examining instructional techniques' impact in mitigating cognitive biases in judgment and decision-making (JDM). Research findings suggest that implementing instructional

interventions can positively reduce belief bias and the framing effect (Evans et al., 1994; Cheng and Wu, 2010; Cheng et al., 2014). In contrast, research focusing on hindsight bias and anchoring effects indicates that these biases persist even when participants are exposed to interventions to reduce them and are taught strategies to avoid them (Bazerman and Moore, 2008). The diverse nature of these biases may be a potential factor contributing to the contradictory findings in this area.

2.3 Hypothesis development

The theory of separation, initially proposed by Ferrara in 1966, posits that irrational investments may arise when investment and financial decisions are amalgamated. This theory suggests that the unpaid principal balance of debt is considered irrelevant in accounting. In contrast, as outlined by Jackson et al. in 2013, the mental accounting theory argues that the unpaid principal balance of debt, as a psychological factor, diminishes managers' inclination to replace or dispose of an asset. This reduced willingness is attributed to individuals' cognitive processing, which seeks to align costs and benefits. Equity financing is recommended to address the cognitive discomfort stemming from the misalignment between costs and benefits during asset replacement or disposal. Employing the full payment method associated with equity financing can help mitigate cognitive discomfort, a view supported by Prelec and Loewenstein (1998). In the context of contemplated capital investment, where a new capital investment could serve as a source of financing to replace a prior one, the misalignment between future costs and benefits is resolved. Consequently, the "separation principle," "relevant costing," and mental accounting all advocate that the source of financing should not influence managers' capital investment decisions in the context of contemplated capital investment. These concepts and theories, including the separation principle, relevant costing, and mental accounting, have been explored in various studies, such as those by Jackson et al. (2013), Okada (2001), and Heath and Fennema (1996). Based on these ideas, we can formulate two testable hypotheses:

H1: Individuals engaging in mental accounting will be reluctant to replace debt-financed assets compared to equity-financed assets.

H2: Individuals engaging in mental accounting have an identical tendency to invest in assets financed by debt and equity.

Researchers have devised debiasing techniques to mitigate cognitive biases in investment decisions, and their efficacy varies depending on the specific technique and the cognitive bias in question. One relatively recent approach centers on "instruction," as proposed by Bazerman and Moore in 2008. Studies, including the one conducted by Serfas in 2011, have demonstrated the effectiveness of instruction in reducing cognitive biases. Evans et al. (1994) further classified instruction into feedback learning and verbal instruction. For this study, we will be employing the verbal instruction technique. Expanding on this, our next hypothesis explores the impact of instruction on investment decisions:

H3: Instruction significantly influences the investment decisions made by individuals.

3. Research Methodology

3.1 Research design

Empirical studies in judgment and decision-making (JDM) often employ experimental methods to uncover the behavioral determinants of individuals' choices (Bonner, 2008; Christensen, 2007). Experimental research in accounting is highly regarded within the discipline (Turner and Coote, 2017; Libby et al., 2002). In our experiment, we aim to assess the influence of the source of finance on the decisions made by the subjects. Contingent upon the presence of such an effect, we will investigate

whether the instructional technique has the potential to enhance decision-making.

We employ a pretest-posttest control group design to examine the impact of instruction on reducing cognitive bias. This design is known for its strong internal validity (Christensen, 2007; Sekaran, 2016). Participants are divided into eight groups based on their "retrospective and prospective source of finance." Each of these groups comprises four experimental and four control groups. A pretest is administered to all participants, ensuring that the relevant conditions (i.e., retrospective and prospective source of finance) are the same for both experimental and control groups. Following the pretest, participants in the experimental groups receive a dedicated instructional program. This instruction program covers the influence of the source of finance on decision-making and addresses cognitive biases stemming from the application of mental accounting. The details of the instruction program are outlined in the "Instruction" section.

Following the instructions, the experimental groups are asked to complete the posttest. The pretest and posttest are administered to the control groups consecutively. We employ an 8x2 mixed factorial design, with participants being randomly assigned to the eight groups, representing a between-subjects design. In our pretest-posttest design, group members make decisions twice, reflecting a within-subjects design.

The initial manipulated variable (retrospective and prospective source of finance) comprises eight levels, with four pairs assigned to the experimental groups (debt-debt, debt-equity, equity-debt, equity-equity) and four pairs allocated to the control groups (debt-debt, debt-equity, equity-debt, equity-equity). The second variable (instruction) is presented at two levels (pretest-posttest). The dependent variable under consideration is the participants' capital investment decision.

The experimental design is orthogonal, characterized by the random selection and assignment of participants and an equal sample size for all groups. Both the experimental and control groups undergo pretest and posttest procedures to control for testing effects and instrumentation. Furthermore, the experiment's maximum duration of one hour serves to mitigate the potential effects of history and maturation.

3.2 Participants

Our research participants encompass postgraduate students and professionals. Data collection occurred in two distinct stages: In the first stage, we randomly selected postgraduate students from top-ranked universities, including Tehran University, Allameh Tabataba'i University, Shahid Beheshti University, Tarbiat Modares University, Islamic Azad University-Science and Research Branch, Qom University, Farabi Campus, and Alzahra University. Those students with no work experience or less than 4 years of work experience were categorized as student participants. In contrast, individuals with 4 or more years of work experience in the manufacturing industry and expertise in capital budgeting were classified as professional participants for our analysis. In the second stage, we selected other professional participants who held managerial positions, such as CEOs, deputy CEOs, financial managers, management accounting unit managers or supervisors, and internal audit managers. These selections were made based on their substantial work experience in capital budgeting. This combined representation of university students and experienced professionals enhances the external validity of our research.

We excluded 16 experiments from the sample due to incorrect responses in the designated comprehension test. The final sample comprises 160 participants, randomly assigned to 8 groups. To ensure an equivalent level of experience across all groups, we homogenized participants with respect to their level of expertise. In each group, 12 participants are university students, some of whom have limited experience, and 8 participants are professionals in the manufacturing industry holding positions relevant to management accounting decisions. To mitigate the potential influence of age

and gender variables, randomization was employed. We upheld the principles of informed consent, emphasizing to the subjects that their participation is voluntary and that all information obtained during the investigation will remain confidential. Given the research's focus on expertise in project evaluation for capital investment, more than 87% of the participants hold postgraduate degrees in accounting, while the remaining 13% have backgrounds in financial management. The participants are approximately 29 years old, with an average of around 5 years of work experience in the manufacturing industry. Each participant has previously completed courses in capital budgeting. To provide further insight into descriptive statistics, we have organized and presented the data for professional and university participants in Tables 1 and 2.

In Table 1, concerning the professional participants, 70% were male, and over 60% of these professionals occupied managerial or supervisory roles within financial, management accounting, internal auditing, and other related units. The average age of professional participants was 34 years, with the age range spanning from the youngest individual at 23 years old to the oldest at 58 years old. Furthermore, the average work experience among these professionals was 10.5 years, with the minimum work experience being 4 years and the maximum experience reaching 30 years.

Table 1. The descriptive statistics of participants-professionals

Variable	Category	Frequency	Relative Frequency	Variable	Category	Frequency	Relative Frequency
Gender	Male	45	70.300	**University**	Specialist	4	6.200
	Female	19	29.700		Senior Specialist	14	21.900
	Total	64	100.000		Supervisor	19	29.700
Degree	Master	44	68.800		Manager	21	32.800
	PhD	20	31.200		Deputy CEO	1	1.500
	Total	64	100.000		CEO	5	7.900
Variable	Mean	min	Max		Total	64	100.000
Age	34.22	23	58				
Experience (year)	10.5	4	30				

In Table 2, we provide descriptive statistics for the group of university students. This group comprises a total of 96 participants, with approximately 33% of them being male and 67% female. Given the substantial sample size in this research, the researcher included master's and Ph.D. students from 8 universities. The average work experience of the students is 9 months, and the average age is 25 years. The age range of participants varies, with the oldest being 36 years old and the youngest 21 years old.

3.3 Experimental materials

The rational decision in our experiment involves replacing the existing asset with a new one. However, existing literature indicates that managers often hesitate to invest in a new asset when their current one is financed with debt (Prelec and Loewenstein, 1998; Jackson et al., 2013). In the pretest phase, we assess this potential bias. Participants are instructed to step into the role of a manager at a manufacturing corporation facing a situation where the efficiency of a key machine (Machine M) has declined, resulting in negative material and labor variances. Their task is to decide whether to continue using Machine M or to replace it. To ensure informed decision-making, we provide

participants with comprehensive information about the asset, including the purchase time, remaining useful life, salvage value, and current value.

Table 2. The descriptive statistics of participants post graduate students

Variable	Category	Frequency	Relative Frequency	Variable	Category	Frequency	Relative Frequency
Gender	Male	32	33.300	**University**	Tehran	12	12.500
	Female	64	66.700		Allameh Tabata'i	19	19.800
	Total	96	100.000		Shahid Beheshti	9	9.400
Degree	Master	90	93.800		Tarbiat Modares	9	9.400
	PhD	6	6.300		Alzahra	27	28.100
	Total	96	100.000		Qom,.Farabi	16	16.700
Variable	Mean	Min	Max		Islamic Azad	4	4.100
Age	25.26	21	36.000		Total	96	100.000
Experience (year)	0.76	0	3.000				

Participants' capital investment decisions, our dependent variable, are recorded on a ten-point scale. The scale's left endpoint is marked as "strong inclination to continue using Machine M," while the right endpoint is designated as "strong inclination to purchase the new machine." A vertical line indicates the midpoint of the scale. We aim to examine how the source of finance influences managers' investment decisions. Additional specifics about the experiment can be found in Appendix 1.

3.4 Instruction

Bonner (2008) posits that the spectrum of available instructional techniques encompasses a wide array of theoretical foundations, ranging from simple warnings to comprehensive instructions. In our study, we employ the verbal full instruction method to investigate its potential to reduce cognitive biases resulting from mental accounting. One of the researchers conducted the instruction process for all participants in the experimental condition. Our instructional content delves into the intricacies of mental accounting and elucidates how cognitive biases manifest within individuals' thought processes when aligning costs and benefits. The instruction content is meticulously structured with specific headings crafted by the researchers and is delivered to the participants through a PowerPoint presentation.

We train the participants within each of the four experimental groups, followed by their responses to the subsequent test questions. The second test maintains similar content, with minor numerical adjustments to mitigate learning effects. Control group subjects, on the other hand, answer the second test questions without prior instruction. Here is an outline of the instruction content:

1- The importance of JDM quality in capital budgeting decisions and the factors affecting it. These factors include person, task and environmental variables and introduce individuals' cognitive processes as person variables.

2- The usage of heuristics by individuals, the possibility of low-quality JDM caused by the usage, and the introduction of mental accounting as a heuristic.

3- Introducing the prospect theory, explaining mental accounting, and elaborating individuals' cognitive processes in diagnostic tests (four examples are given, including the Theater Ticket problem in Tversky and Kahneman (1981), the Basketball Game problem in Thaler (1980), investments in stock exchange, and sunk costs in making decisions).

4- Investigating the cause of individuals' attention to sunk costs as per "costs and benefits alignment" and "mental depreciation" and the necessity of ignoring sunk costs and irrelevant costs in capital budgeting decisions (by simulating unpaid principal of debt-financed asset to book value of an asset).

5- Notifying participants about the effects of mental accounting usage in this study (i.e. viewing unpaid principal of debt-financed asset as a cost and misaligning costs and benefits in decision making).

4. Results

We apply a mixed two-factorial analysis of variances to compare capital investment decisions in pretest and measure the impact of instruction on decision-making. The results are discussed below. All assumptions before performing mixed ANOVAs have been satisfied including "the existence of at least two independent variables, at least one of which is between-group and the other is within-group", "the existence of at least two groups or conditions for all independent variables", "the parametricity of dependent variable", "the reasonable normal distribution for the dependent variable across the independent groups and over the within-group conditions", "the sphericity of within-group variance", "the homogeneity of variance-covariance matrices" and "the homogeneity of the between-group variances"(Myers, 2013).

4.1 Interpretation of repeated-measures ANOVA

Table 3 presents the results of the ANOVA tests for the main effects of instruction and groups, along with the interaction effects on capital investment decisions. Given the significance of the interaction effect, we should interpret the main effects cautiously. We conducted two additional one-way ANOVA tests and eight t-tests to delve into this interaction's source.

Table 3. Repeated-measures ANOVA results for capital investment decisions

Tests of within-subjects Effects					
Source	**SS**	**DF**	**MS**	**F**	**Sig**
Instruction	121.278	1	121.278	97.730	0.000
Instruction × group	276,597	7	39.514	31.842	0.000
Error (Instruction)	188.625	152	1.241	-	-
Tests of Between-Subjects Effects					
Source	SS	DF	MS	F	Sig
Group	1209.597	7	172.8	60.308	0.000
Error	435.525	152	2.865	-	-

4.2 Descriptive statistics

Table 4 displays the means and standard deviations of investment decision scores for each group in both the pretest and posttest conditions. Participants in Groups 1 and 2 exhibit significant shifts in their investment decisions after receiving instruction. The initial estimates of investment decisions suggest a preference for retaining the current asset, but this changes to an inclination toward investing in a new asset after instruction. A comparative analysis with the control groups yields precise insights. The mean values of investment decisions in Groups 5 and 6, which serve as the control groups for Groups 1 and 2, remain relatively consistent between pretest and posttest conditions (3.6 vs 3.75 and 3.7 vs 3.75), indicating a tendency to maintain the existing asset. Furthermore, the pretest conditions for Groups 1 and 5 (3.7 vs 3.6) and Groups 2 and 6 (3.1 vs 3.7) show similarity. Therefore, it becomes

evident that instruction significantly influences decisions regarding the maintenance or acquisition of a new asset.

Specifically, we have observed a significant disparity in individuals' inclination to replace a debt-financed asset as opposed to an equity-financed one. As evident in Table 4, the proclivity to replace the machine is notably lower in cases of debt financing (Groups 1 and 2, where the retrospective source of finance is debt) compared to situations with equity financing (Groups 3 and 4, where the retrospective source of finance is equity).

The decisions of Groups 3 and 4 do not exhibit significant differences between pretest and posttest conditions (8.25 vs 8.35 and 7.5 vs 8.35). The mean values of investment decisions for these groups imply a consistent intention to acquire a new asset in both the pretest and posttest phases. A comparison of Groups 3 and 4 with their respective control groups (Groups 7 and 8) reveals that the mean values of investment decisions remain relatively consistent. Furthermore, the mean values for Groups 3 and 7 (8.25 vs 8.55) and Groups 4 and 8 (7.5 vs 8.4) show minimal disparity before the instructional intervention. Overall, instruction has not significantly altered the investment decisions of Groups 3 and 4. Nevertheless, we conducted one-way ANOVA tests and paired sample t-tests for a more precise analysis.

Table 4. Descriptive statistics of Mixed design for Capital Investment Decision

Group	Pretest			Posttest		
	N	Mean	Standard Deviation	N	Mean	Standard Deviation
(Experimental) Group 1 - (Debt-Debt)	20	3.700	1.129	20	7.850	1.387
(Experimental) Group 2 - (Debt-Equity)	20	3.100	1.483	20	7.850	1.552
(Experimental) Group 3 - (Equity-Debt)	20	8.250	1.251	20	8.350	1.268
(Experimental) Group 4 - (Equity-Equity)	20	7.500	1.192	20	8.350	1.226
(Control) Group 5 - (Debt-Debt)	20	3.600	1.759	20	3.750	1.773
(Control) Group 6 - (Debt-Equity)	20	3.700	1.525	20	3.750	1.888
(Control) Group 7- (Equity-Debt)	20	8.550	1.099	20	8.200	1.508
(Control) Group 8 - (Equity-Equity)	20	8.400	1.429	20	8.650	1.137
Total	160	5.850	2.713	160	7.080	2.431

4.3 Independent one-way ANOVA

First, we conducted one-way ANOVA to examine the disparities in means between the experimental groups and their respective control groups prior to the instructional intervention. As shown in Table 5, the results indicate at least two groups with means that differ significantly. To pinpoint the sources of these differences, we employed post hoc tests. Given the equitability of group sizes and the homogeneity of variances, we utilized the Tukey option (as detailed in Table 6). Consistent with the methodology suggested by Myers (2013), we divided the significance cutoff point by 2 and conducted one-way ANOVA twice. A significant outcome is only deemed valid when $p<0.025$.

Table 5. one-way ANOVA Results

Source	SS	df	F	Sig
Between-groups	882.900	7	66.684	0.000
Error	287.500	152	-	-

Tukey post hoc analyses in Table 6 reveal no significant difference in the means of investment decisions between the experimental groups and their respective control groups (as depicted in Part 1). In Part 2, we present the results of mean comparisons between groups with differing retrospective and prospective sources of finance (1 vs 3 and 2 vs 4) and different prospective sources of finance (1 vs 2 and 3 vs 4). Our findings show that the decisions of participants in Groups 1 and 2 are notably distinct from those in Groups 3 and 4. Consequently, the first hypothesis is not rejected, indicating that the retrospective source of finance indeed impacts participants' decisions. However, there is no noteworthy difference between the means of Groups 1 and 2 and Groups 3 and 4. This suggests that the prospective source of finance does not influence participants' decisions; thus, the second hypothesis is not rejected. These results align with the findings of Jackson et al. (2013). Furthermore, our results support Okada's (2001) observations regarding using mental accounting in asset replacement decisions and Heath and Fennema's (1996) insights concerning the depreciation process and the alignment of costs and benefits. Mental accounting is a cognitive bias that can generally influence individuals' decision-making processes, particularly within asset replacement decisions (Jackson et al., 2013). By delving into the impact of mental accounting biases, we aim to enhance the understanding of how individuals' decision-making can be influenced in capital investment scenarios. Our findings suggest that individuals display reluctance to replace the current machine financed through debt, thereby highlighting the presence of a cognitive bias. We infer that individuals tend to favor retaining the current asset for two main reasons: (1) the discomfort experienced by participants when facing a lump-sum payment to the lender during replacement and (2) the absence of current or acquired benefits to offset the payment during this process. The net present value of the increased benefits of acquiring the new machine in the experiment is positive. This should serve as a guiding factor for individuals to consider replacing the current asset. In conjunction with participants' expertise in capital budgeting techniques, this observation leads us to conclude that individuals' cognitive inclination to retain the existing machine tends to override their capacity for sound decision-making.

Table 6. Tukey Outcomes for Capital Investment Decisions in Pretest

Tukey Outcome			
Part 1:Comparison of each experimental group with the corresponding control group	**Mean Difference**	**Standard Error**	**Sig.**
Group 1(Debt-Debt) and Group 5 (Debt-Debt)	0.100	0.435	1.000
Group 2(Debt-Equity) and Group 6 (Debt-Equity)	-0.600	0.435	0.865
Group 3(Equity- Debt) and Group 7 (Equity- Debt)	-0.300	0.435	0.997
Group 4(Equity-Equity) and Group 8 (Equity-Equity)	-0.900	0.435	0.439
Part 2:Comparison of groups for the effect of retrospective source of finance and prospective source of finance	**Mean difference**	**standard error**	**Sig.**
Group 1 (Debt-Debt) and Group 3 (Equity-Debt)	-4.550	0.435	0.000
Group 2 (Debt- Equity) and Group 4 (Equity - Equity)	-4.400	0.435	0.000
Group 1 (Debt - Debt) and Group 2 (Debt-Equity)	0.600	0.435	0.865
Group 3 (Equity-Debt) and Group 4 (Equity - Equity)	0.750	0.435	0.671

4.4 Paired Sample t-tests

Table 7 presents the results regarding the impact of instructions on individuals' investment decisions. The first column is divided into four panels, each consisting of two rows. These panels compare pretest and posttest conditions within the groups and across the experimental and control groups. With eight pairs of groups, significance is reached if $p < 0.00625$. In Group 1, the pretest means exhibit significant differences from the posttest means. In the corresponding control Group 5, investment decisions (which align with pretest decisions in Group 1 according to Table 6) do not significantly change after receiving instruction (p-value = 0.643). Thus, we find compelling evidence that instruction changes biased investment decisions. Group 2 demonstrates similar results, supporting further the notion that instruction significantly alters participants' investment decisions. We base this inference on two key findings: Groups 2 and 6 do not exhibit significant differences in the pretest (as shown in Table 6), and the means of Group 6 do not significantly differ between the pretest and posttest conditions. Consequently, Hypothesis 3 is not rejected.

Panels 3 and 4 present the results of t-tests for groups that relied on equity as their retrospective source of finance. The average investment decision pretest scores in Groups 3 and 7 exhibit no significant differences from their posttest scores. Given that the pretest scores in these groups show no significant variance (as seen in Table 6), we infer that instruction does not significantly impact individuals' investment decisions in Group 3. This is because the participants' decisions in Group 3 are already rational before receiving instruction. Likewise, Groups 4 and 8 also demonstrate no significant differences between their pretest and posttest scores. Since their pretest means are similar (as indicated in Table 6), we can conclude that instruction does not significantly affect the investment decisions in Group 4. This outcome aligns with expectations, as the primary goal of instruction is to mitigate cognitive biases in individuals' investment decisions. Given that participants in Groups 3 and 4 made rational pretest decisions, it is likely that they were unaffected by the instruction, as anticipated.

Table 7. Paired Sample T-test results for capital investment decision scores across Instruction by group

Paired Comparison	Mean	T	Sig.
Experimental Group 1 (Debt - Debt)	-4.150	-9.631	0.000
Control Group 5 (Debt - Debt)	-0.150	-0.471	0.643
Experimental Group 2 (Debt - Equity)	-4.650	-8.700	0.000
Control Group 6 (Debt - Equity)	-0.050	-0.188	0.853
Experimental Group 3 (Equity - Debt)	-0.100	-0.370	0.716
Control Group 7 (Equity - Debt)	0.350	1.377	0.185
Experimental Group 4 (Equity - Equity)	-0.850	-2.203	0.040
Control Group 8 (Equity - Equity)	-0.250	-1.000	0.330

4.5 Manipulation checks

A comprehension test has been employed to determine whether the participants in each group paid proper attention to the manipulated variable when responding to the key question. To clarify this point, participants were required to answer two additional questions related to the retrospective and prospective sources of finance before addressing the main question. To mitigate the influence of other potential factors that could impact participants' decisions, individuals were also asked to respond to questions concerning liquidity problems and personal responsibility. Subjects were excluded from the sample if they answered any of these questions incorrectly. A total of 16 experiments were omitted from the sample due to incorrect responses. In the following sections, we will elaborate on the potential factors that may exist and explain how these experiments controlled for each.

Liquidity Problems: Participants may be concerned that the repayment of the loan associated with

Machine M could lead to liquidity problems for the company, making them hesitant to invest in a new machine. To address this potential concern, participants were provided with information about the sufficiency of cash resources to maintain/replace the current machine, and it was emphasized that their decisions would not significantly impact the company's financial ratios. Additionally, they were asked questions regarding the company's financial situation. These questions were designed to help us gauge whether the participants processed the provided information.

Personal Responsibility: Participants' sense of personal responsibility for the poor performance of the machine may lead them (especially if the retrospective source of finance is debt) to believe that their reputation within the corporation might be at risk if they opt to replace the asset. Consequently, they may lean towards retaining the machine. This potential factor is examined by analyzing participants' responses to a question inquiring about their level of personal responsibility for the inefficient performance of the current machine.

4.6 Additional analysis

4.6.1 Additional Tests: Individuals' Perceptions about the Obtained Benefits

Another 2×8 mixed factorial design is employed to gauge participants' perceptions regarding past benefits derived from the asset. The manipulated variables remain consistent with the previous design, while the dependent variable centers on individual perceptions of past benefits. To this end, a set of questions is designed to probe participants' opinions on the realized benefits of Machine M, rated on a seven-point scale. The left endpoint of the scale is denoted as 'completely agree,' indicating that past benefits from Machine M have not yet been fully realized. The right endpoint, labeled 'completely disagree,' signifies that past usage of Machine M has realized most, if not all, of the desired benefits. We calculate the average responses of the participants to the five questions to evaluate their perspectives on the obtained benefits. To ensure that these questions represent a single underlying construct, we compute Cronbach's alpha (1951). The resulting alpha value is 0.76, surpassing the threshold of 0.7, which affirms that the questions measure a one-dimensional construct (Myers, 2013). For more comprehensive details regarding the experiment, please refer to Appendix 1.

Table 8. Repeated-measures ANOVA results for past benefit perceptions

Tests of within-subjects Effects					
Source	**SS**	**DF**	**MS**	**F**	**Sig**
Instruction	0.006	1	0.006	0.009	0.923
Instruction × group	279.147	7	39.878	61.384	0.000
Error (Instruction)	98.747	152	0.650	-	-
Tests of Between-Subjects effects					
Source	**SS**	**DF**	**MS**	**F**	**Sig**
Group	150.115	7	21.445	18.475	0.000
Error	176.435	152	1.161	-	-

4.6.2 Interpretation of repeated-measures ANOVA

Table 8 presents the main effects of instruction and group and their interaction effect on individuals' perceptions of past benefits derived from the asset. Given the statistical significance of the interaction term, we conducted additional tests, including one-way ANOVA tests and t-tests, to delve into the source of this difference.

4.6.3 Descriptive statistics

Table 9 presents the means and standard deviations of participants' perception scores for each group in both the pretest and posttest conditions. Notably, the mean values of Groups 1 and 2 (where

the retrospective source of finance is debt) exhibit substantial changes after instruction (2.93 to 5.45 and 3.09 to 5.65). Specifically, the perspective that benefits have not been adequately realized may shift to the point where the retrospective source of finance becomes irrelevant. Conversely, the perception scores for the corresponding control groups remain consistent between pretest and posttest conditions (3.02 vs. 3.11 and 3.26 vs. 3.32), indicating that participants do not consider the past benefits to be sufficient. Furthermore, the mean values of all four groups are similar prior to instruction, suggesting that the instruction has prompted subjects to alter their perceptions regarding the influence of the source of finance on realized benefits. The results for Groups 3 and 4 support this finding in the context of equity-financed assets. In particular, the perception that the asset has provided sufficient benefits may transform, leaning towards the viewpoint that the source of finance is not a relevant factor.

Table 9. The descriptive statistics of mixed design for past benefit perceptions

Group	Pretest			Posttest		
	N	Mean	Standard Deviation	N	Mean	Standard Deviation
(Experimental) Group 1 - (Debt-Debt)	20	2.930	0.734	20	5.450	1.070
(Experimental) Group 2 - (Debt-Equity)	20	3.090	0.832	20	5.650	0.851
(Experimental) Group 3 - (Equity-Debt)	20	4.940	0.818	20	1.750	0.765
(Experimental) Group 4 - (Equity-Equity)	20	4.70	0.709	20	2.510	1.057
(Control) Group 5 - (Debt-Debt)	20	3.020	1.030	20	3.110	0.914
(Control) Group 6 - (Debt-Equity)	20	3.260	1.293	20	3.320	1.083
(Control) Group 7- (Equity-Debt)	20	4.660	1.040	20	4.810	1.162
(Control) Group 8 - (Equity-Equity)	20	5.080	0.680	20	5.010	0.939
Total	160	3.960	1.270	160	3.950	1.680

4.6.4 Independent one-way ANOVA

Table 10 reveals a notable variance in the mean perception scores among the groups. Table 11 presents the results of Tukey tests to pinpoint this disparity's origin. The findings in Part 1 suggest that there is no statistically significant difference in the mean perception scores of the experimental groups and their corresponding control groups.

Table 10. one-way ANOVA results

Source	SS	df	F	Sig
Between-groups	128.876	7	22.072	0.000
Error	126.788	152	-	-

Part 2 in Table 11 compares the means of groups in which the retrospective source of finance is debt (Groups 1 and 2) with groups in which the retrospective source of finance is equity (Groups 3 and 4). This suggests that individuals' perceptions in Groups 1 and 2 significantly differ from those in Groups 3 and 4. As suggested by the descriptive statistics in Table 9, the results from Table 9 imply that the perception of participants in Groups 1 and 2 is the opposite of those in Groups 3.

Table 11. Tukey outcomes for past benefit perceptions in pretest

Tukey Outcome			
part 2: Comparison of each experimental group with the corresponding control group	**Mean Difference**	**Standard Error**	**Sig.**
Group 1(Debt-Debt) and Group 5 (Debt-Debt)	-0.090	0.289	1.000
Group 2(Debt-Equity) and Group 6 (Debt-Equity)	-0.170	0.289	0.990
Group 3(Equity- Debt) and Group 7 (Equity- Debt)	0.280	0.289	0.970
Group 4(Equity-Equity) and Group 8 (Equity-Equity)	-0.380	0.289	0.890
part 2:Comparison of groups for the effect of retrospective source of finance and prospective source of finance	**Mean Difference**	**Standard Error**	**Sig.**
Group 1 (Debt-Debt) and Group 3 (Equity-Debt)	-2.010	0.289	0.000
Group 2 (Debt- Equity) and Group 4 (Equity - Equity)	-1.610	0.289	0.000
Group 1 (Debt - Debt) and Group 2 (Debt-Equity)	-0.160	0.289	0.999
Group 3 (Equity-Debt) and Group 4 (Equity - Equity)	0.240	0.289	0.991

4.6.5 Paired Sample t-tests

Table 12 presents the results concerning the impact of instruction on the subjects' perceptions, following the format of Table 7. The paired sample t-test results in Panel 1 indicate a statistically significant difference in the average perception scores of participants in Group 1 between the pretest and posttest conditions. Conversely, the mean for Group 5 (which, as shown in Table 9, is approximately the same as the Group 1 mean in the pretest) does not change significantly following instruction. Therefore, we can conclude that instruction changes individuals' perceptions. Similarly, in Panel 2, the results in Table 11 suggest that instruction influences participants' perceptions in Group 2. The instruction prompts individuals in Groups 1 and 2 to view financing an asset as irrelevant in capital investment decisions.

Table 12. Paired Sample T-test results for past benefit perception scores across instruction by group

Paired comparison	**Mean**	**T**	**Sig**
Experimental Group 1 (Debt - Debt)	-2.520	-6.847	0.000
Control Group 5 (Debt - Debt)	-0.090	-0.619	0.543
Experimental Group 2 (Debt - Equity)	-2.560	-10.786	0.000
Control Group 6 (Debt - Equity)	-0.060	-0.302	0.766
Experimental Group 3 (Equity - Debt)	3.190	13.368	0.000
Control Group 7 (Equity - Debt)	-0.150	-0.546	0.591
Experimental Group 4 (Equity - Equity)	2.190	6.767	0.000
Control Group 8 (Equity - Equity)	0.070	0.402	0.692

Panel 3 reveals a notable distinction in the means of Group 3 between pretest and posttest conditions, while Panel 4 presents a similar outcome for Group 4. In contrast, control Groups 7 and 8 show no significant variation in means between pretest and posttest conditions. Since the means of Groups 3 and 4 match those of their respective control groups in the pretest (as seen in Table 11), we can deduce that instruction impacts individuals' perceptions in Groups 3 and 4. Therefore, the instruction alters the perspective of these two groups, although it does not affect their investment decisions.

The rationale behind this is that individuals believe that covering an asset's cost (whether through loan repayments or a lump-sum payment) or unpaid debt should not influence their investment

decisions. In our experiment, participants in Groups 1 and 2, where the retrospective source of finance is debt, initially believe that the machine's obtained benefits are insufficient, thus justifying the retention of the machine. Conversely, participants in Groups 3 and 4, where the retrospective source of finance is equity, start with the perspective that a significant portion of the required benefits from the machine has already been realized, justifying its replacement. Through the instructional intervention, participants' perceptions of realized benefits' influence on their investment decisions are recalibrated. In the case of Groups 3 and 4, the decision to replace the asset remains unchanged after instruction, as it aligns with rationality. However, the underlying rationale behind this decision undergoes a shift from considering an irrelevant factor associated with mental accounting (balancing costs and benefits) to the relevant factor of Net Present Value (NPV).

5. Conclusion and Discussion

One of the primary challenges within the decision-making process in the accounting field is the frequent reliance on heuristics by decision-makers, often without their awareness (Fay and Montague, 2015). Consequently, educating professionals on the specific biases that commonly impact accounting Judgment and Decision Making (JDM) becomes essential. Mental accounting, as a cognitive bias, has been recognized for diminishing the quality of JDM during the decision-making process (Jackson et al., 2013). In addition to mental accounting, our study incorporates various related theories and concepts, such as prospect theory (Kahneman and Tversky, 1979), which elucidates how individuals' decisions are shaped by the framing of choices and the reference points used in their evaluations.

Comprehensive evidence regarding the effectiveness of instructional techniques in mitigating the mental accounting bias within capital investment decisions is limited (Evans et al., 1994; Cheng and Wu, 2010; Chang et al., 2014; Bazerman and Moore, 2008). This study investigates how individuals engage in mental accounting during their capital investment decisions and evaluate instructional techniques' impact on optimizing decision outcomes. Our findings contribute to the body of knowledge concerning the effects of instruction, one of the most commonly employed debiasing techniques (Bonner, 2008), on capital investment decisions. The results indicate that instruction aids participants in transitioning from irrational decisions to economically efficient ones. Furthermore, participants' initial perceptions, which suggest that the benefits derived from assets are insufficient when there is a high unpaid principal balance, are subject to modification through instruction.

Past research on decision biases has predominantly emphasized factors that contribute to these biases (Banerjee et al., 2019; Chandra and Kumar, 2012; Boylan, 2008). Furthermore, studies on debiasing techniques have focused on the framing effect (Cheng et al., 2014) and anchors (Kaustia and Perttula, 2012), with limited attention given to mental accounting.

Furthermore, our research unveils the presence of an irrelevant psychological factor that influences managers' decision-making processes, leading to suboptimal choices. The results indicate that participants' reluctance to part with debt-financed assets may result in missed opportunities to enhance firm value through investments. The relationship between the source of finance and individuals' choices to replace assets is partly mediated by their perceptions of past benefits. These findings resonate with previous studies conducted by Heath and Fennema (1996), Prelec and Loewenstein (1998), Okada (2001), and Jackson et al. (2013). This study provides substantial evidence supporting the effectiveness of instructional techniques in mitigating cognitive biases stemming from mental accounting. The insights into the efficacy of instruction have the potential to aid management in improving investment decisions and facilitating more rational choices.

The findings of this research hold significance for both practitioners and academic researchers. Academic institutions offering Finance, Business, and Accounting programs can enhance their

postgraduate curriculum by incorporating modules on mental accounting and related cognitive biases. This study underscores the importance of managers and investors being cognizant of the biases influencing their decision-making processes. By recognizing the presence and impact of these biases, decision-makers can equip themselves to make more well-informed and rational choices. Our study suggests that instruction can facilitate a transition from irrational decisions to economically efficient ones. This discovery implies that managers and investors have the potential to enhance their decision-making processes by implementing strategies that counteract biases and promote more effective choices. Furthermore, manufacturing industries may consider introducing employee training programs designed to reduce cognitive biases arising from mental accounting within capital budgeting environments.

Future research endeavors could explore the impacts of succinct instructional interventions, such as warnings, the presentation of multiple perspectives, the articulation of the reasons that underpin Judgment and Decision Making (JDM), and the provision of counter-explanations. Additionally, studies may delve into how factors related to individuals' cognitive abilities (such as verbal, reasoning, and spatial skills), intrinsic motivation, and a range of personality characteristics may enhance the quality of JDM. Lastly, as our experiments are grounded in manipulating independent variables and controlling extraneous factors, prospective research could focus on the cognitive processes within the human brain and the identification of mental patterns. This could be accomplished through collaboration with cognitive neuroscience laboratories.

Experimental scenarios, by their nature, do not perfectly replicate real-world decision-making settings due to certain simplifications and limitations imposed on participants' behavior. For instance, in our experiment, participants were prohibited from using educational resources or engaging in collaborative discussions. Additionally, participants operated under implicit time constraints. Another generalizability limitation stems from inherent disparities between the participants and real-life populations. We included professionals in our sample to bolster external validity, making it somewhat more representative of real-world conditions. The final limitation of our experimental studies pertains to methodological constraints arising from the influence of environmental and participant variables. The logistical challenges included the difficulty of assembling academic and professional participants within a laboratory setting, given their time constraints. Moreover, instructional sessions typically require around an hour to administer, making it more challenging to recreate real-life conditions. Nevertheless, we made efforts to minimize the impact of environmental variables by maintaining consistency. All participants were subject to the same experimental conditions, received identical background information and instructions, and were allotted the same amount of time to answer questions. They were also closely supervised to prevent the use of any additional tools. Consequently, the influence of environmental variables was kept to a minimum, minimizing the potential distortion of our results.

References

1. Bakar, S., and Yi, A. N. C. (2016). The impact of psychological factors on investors' decision making in Malaysian stock market: a case of Klang Valley and Pahang. *Procedia Economics and Finance*, 35(1), pp. 319-328. https://doi.org/10.1016/S2212-5671(16)00040-X
2. Banerjee, P., Chatterjee, P., Mishra, S., Mishra, A. (2019). Loss is a loss, why categorize it? Mental accounting across cultures. *Journal of Consumer Behavior*. 18(2). pp. 77-88. https://doi.org/10.1002/cb.1748
3. Bazerman, M.H., Moore, D.A. (2008), Judgment in Managerial Decision Making, 7th edition. New York: *Wiley*. New York

4. Beasley, M.S., Buckless, F.A., Glover, S.M., and Prawitt, D.F. (2014). Auditing Cases: An Interactive Learning Approach, Sixth Edition, *Pearson*. The U.S.
5. Bhattacharjee, S., Moreno, K. K., and Salbador, D. A. (2015). The impact of multiple tax returns on tax compliance behavior. *Behavioral Research in Accounting*, 27(1), pp. 99-119. https://doi.org/10.2308/bria-50976.
6. Bonner, S. E., Clor-Proell, S. M., and Koonce, L. (2014). Mental accounting and disaggregation based on the sign and relative magnitude of income statement items. *The Accounting Review*, 89(6), pp. 2087-2114. https://doi.org/10.2308/accr-50838.
7. Bonner, S. (2008). Judgment and decision making in accounting. 1st edition. *Pearson Prentice Hall.*
8. Boylan, S J. (2008). A classroom Exercise on Unconscious Bias in Financial Reporting and Auditing. *Issues in Accounting Education.* 33(2), *229-245.* https://doi.org/10.2308/iace.2008.23.2.229.
9. Bylinski, J H., Chow, C W. (1985). Human Judgment biases and the teaching of management accounting. *Journal of Accounting Education*. 3(1), pp. 167-172. https://doi.org/10.1016/0748-5751(89)90046-8.
10. Chandra, A., Kumar, R. (2012). Factors Influencing Indian Individual Investor Behavior: Survey Evidence. *Decision*, 39(3), pp. 141-167. http://dx.doi.org/10.2139/ssrn.2029642.
11. Chatterjee, S., Heath, T., and Min, J. (2009). The susceptibility of mental accounting principles to evaluation mode effects. *Journal of Behavioral Decision Making*. 22(2), pp. 120-137. https://doi.org/10.1002/bdm.616.
12. Cheema, A., and Soman, D. (2006). Malleable Mental Accounting: The Effect of Flexibility on the Justification of Attractive Spending and Consumption Decisions. *Journal of Consumer Psychology*. 16(1). pp. 33-44. https://doi.org/10.1207/s15327663jcp1601_6.
13. Cheng, F., and Wu, C., (2010). Debiasing the framing effect: The effect of warning and involvement. *Decision Support Systems*. 49(3), pp. 328–334. https://doi.org/10.1016/j.dss.2010.04.002.
14. Cheng, F., Wu, C., and Lin, H. (2014). Reducing the influence of framing on internet consumers' decisions: The role of elaboration. *Computers in Human Behavior*. 37(8), pp. 56-63. https://doi.org/10.1016/j.chb.2014.04.015.
15. Cherono, I. (2020). Investor Behavior and Stock Market Reaction in Kenya. *European Journal of Economic and Financial Research.* 4(2). pp. 89-127. http://dx.doi.org/10.46827/ejefr.v4i2.856.
16. Christensen, L. B. (2007). Experimental Methodology, 10. Aufl., Boston ua, *Pearson*/Allyn & Bacon, Psychology.
17. Cloyd, C., and B. Spilker. 1999. The influence of client preferences on tax professionals' search for judicial precedents, subsequent judgments, and recommendations. *The Accounting Review*, 74(3), pp. 299–322. https://doi.org/10.2308/accr.1999.74.3.299.
18. Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, 16(3), pp. 297-334. https://doi.org/10.1007/BF02310555.
19. Du Toit, M.J. and Pienaar, A. (2005), A review of the capital budgeting behaviour of large South African firms, *Meditari Accountancy Research*, 13(1), pp. 19-27. https://doi.org/10.1108/10222529200500002.
20. Evans, J. S. B., Newstead, S. E., Allen, J. L., and Pollard, P. (1994). Debiasing by instruction: The case of belief bias, *European Journal of Cognitive Psychology*, 6(3), pp. 262-285. https://doi.org/10.1080/09541449408520148
21. Falsetta, D., Rupert, T. J., and Wright, A. M. (2013). The effect of the timing and direction of

capital gain tax changes on investment in risky assets. *The Accounting Review*, 88(2), pp. 499-520. https://doi.org/10.2308/accr-50319.

22. Fay, R G., and Montague, N R. (2015). Witnessing Your Own Cognitive Bias: A Compendium of Classroom Exercises. Issues *in Accounting Education*, 30(1), pp. 13–34. https://doi.org/10.2308/iacze-50919.
23. Ferrara, W. (1966). Should investment and financing decisions be separated? *Accounting Review*. 41(1), pp. 106-114. https://www.jstor.org/stable/242528.
24. Glover, S. M., & Prawitt, D. F. (2012). Enhancing board oversight: Avoiding judgment traps and biases. *Monograph Distributed by COSO*.
25. Gredler, M. (2005). Learning and instruction: theory in to practice. Edition 5. *Pearson*.
26. Heath, C., and Fennema, M. (1996). Mental Depreciation and Marginal Decision Making. *Organizational Behavior and Human Decision Processes*. 68(2), pp. 95-108. https://doi.org/10.1006/obhd.1996.0092.
27. Jackson, S., Keune, T., and Salzsieder, L. (2013). Debt, Equity, and Capital Investment. *Journal of Accounting and Economics*, 56(s2–3), pp. 291–310. https://doi.org/10.1016/j.jacceco.2013.09.001.
28. Jackson, S. B., Rodgers, T. C., and Tuttle, B. (2010). The effect of depreciation method choice on asset selling prices. *Accounting, Organizations and Society*, *35*(8), pp. 757-774. https://doi.org/10.1016/j.aos.2010.09.004.
29. Kahneman, D., and Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk, In *Handbook of the fundamentals of financial decision making: Part I*, pp. 99-127. https://doi.org/10.1142/9789814417358_0006.
30. Kaustia, M., and Perttula, M. (2012). Overconfidence and debiasing in the financial industry. *Review of Behavioral Finance*, 4(1), pp. 46-62. https://doi.org/10.1108/19405971211261100
31. Koehler, D., and Harvey, N. (2004). Blackwell handbook of judgment and decision making. First edition. *Blackwell Publishing Ltd*.
32. Libby, R., Bloomfield, R., and Nelson, M. W. (2002). Experimental research in financial accounting. *Accounting, Organizations and Society*, 27(8), pp. 775-810. https://doi.org/10.1016/S0361-3682(01)00011-3.
33. Lipe, M. G. (1993). Analyzing the variance investigation decision: The effects of outcomes, mental accounting, and framing. *The Accounting Review*, 68(4), pp. 748-764. https://www.jstor.org/stable/248502.
34. Kengatharan, L., and Kengatharan, N. (2014). The Influence of Behavioral Factors in Making Investment Decisions and Performance: Study on Investors of Colombo Stock Exchange, Sri Lanka. *Asian Journal of Finance & Accounting* 6(1), pp. 1-23. doi:10.5296/ajfa.v6i1.4893.
35. Mnif, E., Salhi, B. and Jarboui, A. (2020), "Herding behaviour and Islamic market efficiency assessment: case of Dow Jones and Sukuk market", *International Journal of Islamic and Middle Eastern Finance and Management*, 13(1), pp. 24-41. https://doi.org/10.1108/IMEFM-10-2018-0354
36. Myers, A. (2013). Introduction to Statistics and SPSS in Psychology. *Bournemouth University*. *Pearson*.
37. Nofsingera, J. R., and Varmab, A. (2013). Availability, Recency and Sophistication in the Repurchasing Behavior of Retail Investors. *Journal of Banking & Finance*. 37(7), pp. 2572–2585. https://doi.org/10.1016/j.jbankfin.2013.02.023
38. Okada, E. (2001). Trade-ins, mental accounting, and product replacement decisions. *Journal of*

Consumer Research, 27, pp. 433-446. https://doi.org/10.1086/319619
39. Prelec, D., and Loewenstein, G. (1998). The red and the black: mental accounting of savings and debt. *Marketing Science*. 17(1). pp. 4-28. https://doi.org/10.1287/mksc.17.1.4
40. Ranzilla, S., Chevalier R. E., Herrmann G., Glover S. M., and Prawitt D. F. (2011). Elevating Professional Judgment in Auditing: The KPMG Professional Judgment Framework. *New York, NY: KPMG LLP*.
41. Sekaran, U., and Bougie, R. (2016). Research Methods for business: a skill building approach. 7th edition. *John Wiley and Sons*. The U.S.
42. Serfas, S. (2011). Cognitive biases in the capital investment context. In Cognitive biases in the capital investment context: Theoretical considerations and empirical experiments on violations of normative rationality, *Wiesbaden: Gabler*.
43. Shefrin, H. M., and Thaler, R. H .(1988). The behavioral life-cycle hypothesis. *Economic Inquiry*, 26(4), pp. 609-643. https://doi.org/10.1111/j.1465-7295.1988.tb01520.x
44. Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 1(1), pp. 39-60. https://doi.org/10.1016/0167-2681(80)90051-
45. Thaler, R. (1985). Mental Accounting and Consumer Choice, *Marketing Science*,(4)3, pp. 199-214. https://doi.org/10.1287/mksc.4.3.199.
46. Thaler, R. (1999). Mental accounting matters. *Journal of Behavioral Decision Making*. 12(3), pp. 183-206. https://doi.org/10.1002/(SICI)1099-0771(199909)12:3<183::AID-BDM318>3.0.CO;2-F
47. Turner, M.J. and Coote, L.V. (2017), "Discrete choice experiments: a research agenda for experimental accounting", *Meditari Accountancy Research*, 25(1), pp. 158-182. https://doi.org/10.1108/MEDAR-07-2016-0068
48. Tversky, A., and Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, pp. 453-458. DOI: 10.1126/science.7455683
49. Yalcin, K.C., Tatoglu, E., and Zaim,S. (2016). Developing an instrument for measuring the effects of heuristics on investment decisions. *Kybernetes*, 45(7), pp. 1052-1071. https://doi.org/10.1108/K-05-2015-0130

Appendix 1

Further information about the experiment provided to participants is as follows:
Experimental materials

Machine M has been used from three years ago and engineering reports suggest that the Machine M can be used for the next five years before becoming worn out. The current value of Machine M is $ 42,000, but the salvage value would be zero after five years. The new machine has a useful life of five years with no residual value.

The two levels of the retrospective source of finance are defined as follows:

The condition that the retrospective source of finance is debt - Machine M was purchased 3 years ago with an 8-year secured loan of $ 210,000 at an 8% interest rate. The corporation should make equal annual payments of $ 36,500 at the end of each year (each installment includes principal plus interest). The third installment has been made and the firm will continue to make payments for up to 5 years. However, if you decide to sell Machine M, the unpaid principal balance of $ 146,000 should instantly be paid to the lender for loan settlement.

The condition that the retrospective source of finance is equity - Machine M is purchased with $ 210,000 of cash flows created by the firm's operations.

The two levels of prospective sources of finance are defined similarly as follows:

The condition that the prospective source of finance is debt- A new machine can be purchased with a 5-year secured loan of $ 231,000 at an 8% interest rate. The corporation should make equal annual payments of $ 57,900 at the end of each year over the next 5 years.

The condition that the prospective source of finance is equity – A new machine can be purchased with $ 231,000 of cash flows created by the firm's operations.

In all conditions, the present value amounts are given to the subjects. The present value of the increased benefits obtained from the new machine is $ 273,000 due to eliminating negative variances in production and improving operational efficiency.

Benefit perceptions

Content of questions related to obtained benefits of the asset are listed below:

- Sense of wasting resources (Machine M) when deciding to maintain or replace it.
- Failure to obtain sufficient past benefits from Machine M up to now when deciding to maintain or replace it.
- Consumption pleasure attained from past usage of Machine M when making a decision to maintain or replace it.
- Adequate benefits obtained from Machine M in the alignment of the initial cost.
- Participants' picture about obtained benefits of Machine M, in the way of comparing the cost of purchased asset (Machine M) financed by debt and repaid through instalments rather than fully paid at the time of purchase.

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

Accountants' Risk-Taking and Alertness to Investment Opportunities

Behrooz Badpa*

Assistant Professor, Department of Accounting, Faculty of Literature and Humanities, Ilam University, Ilam, Iran

Ruhollah Amareh

Faculty of Economics and Administrative Sciences, Mazandaran University, Mazandaran, Iran

How to cite this article:
Badpa, B., & Amareh, R. (2024). Accountants' Risk-Taking and Alertness to Investment Opportunities. Iranian Journal of Accounting, Auditing and Finance, 8(1), 111-129. doi: 10.22067/ijaaf.2024.43938.1339
https://ijaaf.um.ac.ir/article_43938.html

ARTICLE INFO

Article History
Received: 2023-08-30
Accepted: 2023-12-05
Published online: 2024-01-01

Keywords:

Alertness to Investment Opportunities, Ambiguity Tolerance, Experience Intelligence, Risk-Taking

Abstract

While accountants working in financial institutions possess extensive expertise in accounting, finance, and investment activities, it can be challenging to identify the primary factors influencing their investment decisions. This study examines the alertness of experienced accountants to investment opportunities (AIOs), with a particular focus on their propensity for risk-taking (RT). A random sample of 468 Iranian accountants, including accounting students and graduates from public and private institutions, was selected to achieve this. Data analysis was conducted using Structural Equation Modeling (SEM) and SPSS 26 software. In this study, financial intelligence, ambiguity tolerance, and optimism positively influenced RT and AIOs. Additionally, there was a positive relationship between RT and AIOs. However, it was observed that accounting education significantly impacted AIOs, whereas the propensity for RT decreased with age among accountants. From a theoretical perspective, the findings of this study can contribute to the understanding of decision-making processes among accountants, investors, and entrepreneurs, shedding light on the factors affecting their RT and AIOs. In terms of practical implications, the results of this study can be valuable for those involved in establishing rules and regulations, as well as educational planners. By promoting the best possible investments and rational decision-making, these insights can contribute to the optimal allocation and utilization of resources, facilitate job creation and entrepreneurship, and ultimately foster economic growth and development within society.

https://doi.org/10.22067/IJAAF.2024.43938.1339

NUMBER OF REFERENCES
71

NUMBER OF FIGURES
3

NUMBER OF TABLES
5

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Behrooz Badpa
Email: b.badpa@ilam.ac.ir
Tel: 09183431831
ORCID: 0000-0002-1048-0787

1. Introduction

Individual investors encounter numerous challenges in various societies, including making decisions about the most suitable investments for achieving high returns when confronted with many options. Additionally, they often miss emerging opportunities (Haws, 2021). Sahi (2017) has pointed out that individual investors face even greater difficulties evaluating all aspects of these new investment opportunities. Consequently, the human brain is wired to respond to events in a manner that leads to lasting benefits (Toricelli et al., 2021). A rational decision-making process typically considers multiple factors, including risk-taking (RT), knowledge, and experience, when making financial decisions or responding to financial matters. Surprisingly, observed behavior often diverges from the principles of conventional finance theory (Sahi, 2017). As the term "Homo economicus" implies, humans are not purely rational beings but rather Homo sapiens with emotions, beliefs, and preferences influenced by cognitive limitations, reactions, and psychological motives. These factors help individuals make sense of their surroundings and can influence or bias their decision-making processes. The relevant literature suggests that these biases can significantly impact financial behavior and comfort, underscoring the importance of evaluating and addressing them. Evolutionary psychology posits that these biases can lead individuals to make wise investment choices, avoid costly mistakes, and ultimately find satisfaction in their financial decisions (Sahi, 2017).

Consequently, individual investors may need assistance making rational decisions (Kahneman and Riepe, 1998; Barber and Odean, 2001; Baker and Nofsinger, 2002; Shefrin, 2002). Psychological biases and emotions have the potential to erode their wealth. Furthermore, they may encounter unforeseen outcomes, engage in unwarranted trading, and attribute blame to themselves or others. Addressing financial issues is paramount for investors to succeed in their investment and entrepreneurial endeavors (Gerardi, Goette, and Meier, 2010). Identifying and correcting biases in individual investors can significantly enhance their decision-making regarding investments (Shefrin, 2002; Pompian, 2006). Huhmann and McQuitty (2009) contend that certain factors can be integrated to improve the rationality of complex financial markets. Despite the common association of rationality with cognitive ability, general intelligence, and financial literacy, objective and subjective intelligence tests should be considered. Nguyen, Gallery, and Newton (2016) propose an advisory process for evaluating clients' risk tolerance (RT) and assisting financial advisers in making informed investment decisions. Despite extensive research on RT, its precise impact on investment decision-making in the financial context remains somewhat enigmatic.

This study aimed to identify factors and personality traits affecting accountants' opportunities when investing in various types of assets. Also, the study's purpose is to:

1. identify the key factors influencing the risk-taking of accountants in investment decision-making,
2. examine how alertness to investment opportunities is affected by certain traits and characteristics of accountants,
3. explore the role of accountants' age in their risk-taking behavior,
4. investigate the impact of selected variables on the accountants' risk-taking and alertness.

As a contribution to the literature, first, accounting professionals gain the essential knowledge and skills required to master accounting, finance, and investment expertise. A second advantage of accountants is their practical skills and theoretical knowledge, which empowers them to navigate a wide range of concepts and make informed and prudent investment decisions. Furthermore, accountants can independently engage in entrepreneurial activities, generate employment opportunities, and play constructive economic roles through their knowledge, skills, and financial acumen.

The next section discusses the related literature and outlines the main testable hypotheses. Our survey methods and data are summarized in Section 3. The primary empirical results are presented in Section 4, followed by a concise discussion of the findings in Section 5.

2. Literature Review

2.1 Effect of FI on accountants' RT and alertness to investment opportunities (AIOs)

Due to the intricate nature of finance and investment decisions, it is crucial to comprehend concepts such as event probabilities and compound interest rates. Cole and Shastry (2008) indicate that individuals with high Financial Intelligence (FI) are more likely to succeed. An individual's knowledge, skills, and decision-making abilities can significantly impact their financial success, as observed by Kamil, Musa, and Sahak (2014). While FI plays a vital role in shaping financial behaviors and decision-making outcomes, it differs from general intelligence, as assessed through IQ tests. Individuals can enhance their financial behaviors and well-being by assessing their essential financial expertise. Remund (2010) argued that financial literacy can be viewed as managing money effectively. Specifically, he identified five core financial literacy categories: understanding financial concepts, communicating economic ideas, managing personal finances, making sound financial decisions, and planning for the future. Operational financial literacy categories include budgeting, saving, borrowing, and investing. Similarly, Berman et al. (2008) have defined FI as a concept comprising three fundamental skills. The first skill involves comprehending fundamental concepts related to investments and business, such as understanding a balance sheet, income statement, and cash flow statement. The second key skill pertains to understanding accounting and financial techniques, including estimating depreciation on long-term assets and allocating costs. The third essential skill involves proficiency in financial analysis; for instance, individuals with financial intelligence can calculate financial ratios such as return on equity and return on assets.

Before venturing into investments or exploring new markets, individuals need to acquire financial knowledge and skills, as Lusardi (2008) emphasized. Sages and Grable (2010) contend that individuals with solid financial intelligence (FI) skills are more inclined to take calculated risks. This is particularly important in the current landscape, where financial instruments are growing increasingly complex, and concerns about scams and unscrupulous brokers abound. Research by Almenberg and Widmark (2011) suggests a positive relationship between FI and risk tolerance (RT). In the study conducted by Sages and Grable (2010), individuals with low RT levels exhibited lower competence in financial matters, held less accurate asset pricing perspectives, and expressed dissatisfaction with their financial management. The researchers concluded that higher financial expertise positively correlated with RT, enabling individuals to optimize their wealth. Individual risk tolerance is instrumental in pursuing improved economic and investment opportunities. Almenberg and Widmark (2011) further assert that individuals' risk preferences significantly impact their decision-making, their ability to leverage financial and investment opportunities, and the subsequent economic consequences of those decisions. Nguyen et al. (2016) collected survey data from 538 financial advisors in Australia, finding a positive correlation between RT and investment decision-making.

Individuals and institutional investors' planning and counseling are influenced by risk tolerance (RT), as indicated by Bayar et al. (2020). Their study also explored the connection between financial literacy and risk tolerance among individual investors. Their findings suggest that specific demographic characteristics, such as age, gender, education, and income, impact an individual's

financial risk tolerance. Sahi, Dhameja, and Arora (2012) discovered that individual investors' biases, financial risk tolerance, and perceived knowledge of financial markets also shape their preferences. Moreover, Grable and Joo (2000) demonstrated that individuals with strong financial skills and expertise are more likely to exhibit higher risk tolerance levels. Therefore, financial intelligence (FI) is expected to enhance individual investors' risk tolerance and investment outcomes (AIOs). In addition, more risk-tolerant investors will likely have a greater number of investment opportunities and potentially achieve better results.

H1: Accountants' FI has a positive effect on their RT.
H2: Accountants' RT has a positive effect on their AIOs.
H3: Accountants' FI has a positive effect on their AIOs.

2.2 Effect of optimism on accountants' RT and AIOs

Optimists demonstrate a greater propensity for anticipating positive future events than pessimists, as highlighted by Meza and Southey (1996) and Green and Heywood (2011). Research by Weinstein in 1980 and Hey in 1984 similarly indicates that optimists perceive positive future events as more likely than pessimists. Optimistic individuals are inclined to selectively follow information that aligns with their beliefs and may disregard information that contradicts or has a negative outlook, as Mitchell et al. (2002) observed. The notion that optimism is inherently detrimental to financial and investment decisions is not universally accepted. Nevertheless, it is acknowledged that optimism can occasionally lead to incorrect decisions stemming from a misinterpretation of current and future circumstances, as noted by Naeiji and Esfandiari (2015). Optimists often encourage others to adopt a similar outlook, per Simon and Houghton's (2003) definition of optimism. However, as Puri and Robinson (2007) suggest, investors with elevated levels of financial optimism may not attain their financial objectives because they tend to perceive new investment risks less and give less importance to ambiguity.

Furthermore, Kim and Nofsinger (2007) assert that optimistic investors tend to overlook negative stock news. Moreover, investors exhibit diverse experiences, personality traits, and investment needs, influencing their selection of investment options based on their psychological characteristics. In addition to their objectives and risk tolerance (RT), investors consider factors like liquidity balance, profitability, and return expectations, as Gakhar (2019) suggested. Stocks, bonds, and derivatives represent high-risk options in the capital markets for those willing to embrace greater risks. Foo (2011) suggests that individuals with an optimistic outlook are more likely to take on increased risk and invest in ventures with higher inherent risk. Gakhar (2019) posits that both optimism and risk tolerance have a significant impact on investment decisions. According to Kahneman and Tversky (1979), investors often display optimism when making investment choices. It's noteworthy that financial optimism is frequently practiced in economic contexts to meet future expectations, as Astebro et al. (2014) outlined. Consequently, the following hypotheses warrant exploration:

H4: Accountants' optimism has a positive effect on their RT.
H5: Accountants' optimism has a positive effect on their AIOs.

2.3 Effect of AT on accountants' RT and AIOs

Ambiguity tolerance (AT) refers to individuals' perceptions and responses in the face of unpredictable, unknown, and complex situations, as noted by Budner (1962) and Furnham and Ribchester (1995). Furnham and Ribchester (1995) highlight that individuals with high AT are more

adept at handling ambiguous circumstances and do not shy away from complexity. In contrast, those with low AT tend to avoid ambiguous stimuli. Endres, Chowdhury, and Milner (2009) provide supporting evidence for the connection between AT and self-efficacy in intricate decision-making processes, signifying AT's positive role in uncertain decision-making situations (Morris et al., 2013; Ng, 2013) and its contribution to improving decision-making quality (Xu and Tracey, 2014). The economic decision-making theory proposed by Tversky and Kahneman (1981) underscores the importance of AT in decision outcomes. Tversky and Kahneman (1981) demonstrate that available information and preferences for ambiguity frequently influence decisions. Their perspective challenges rational choice theory, which places greater emphasis on information collection and processing while neglecting the aspects of information availability and consistency. AT scores predict enhanced information-handling capabilities (Xu and Tracey, 2014).

Hence, recognizing and accounting for future fluctuations and ambiguities can influence risk tolerance (RT). Risk-takers are those who embrace volatility and uncertainty in investment outcomes and performance. For instance, Haws (2021) suggests that investors willing to take risks may achieve higher returns by accepting greater uncertainty and ambiguity. Acknowledging that any investment decision inherently carries elements of uncertainty and risk (Slovic, 1972; Thaler, 1999) is crucial. Consequently, risk-taking constitutes a fundamental component of the decision-making process in circumstances marked by uncertainty and ambiguity, potentially leading to either rewards or adverse consequences (Bechara et al., 2005; Krain et al., 2006; Brand et al., 2007). Krein et al. (2006) contribute valuable medical insights into the mechanisms underlying risky and confounding decision-making. As a result, individuals often face the dilemma of choosing between a safe or a risky approach to decisions characterized by risk. While the rewards of safe choices may be modest, the potential value of risky choices could be more substantial. The absence of contradictions arises from ambiguous decisions being inherently uncertain or stemming from chance. Although both risky and ambiguous decisions may engage similar underlying neural mechanisms, as they entail choices without knowledge of the outcomes, they are likely to represent qualitatively distinct modes of decision-making. Furthermore, statistical comparisons reveal notable disparities between decision-making processes in the frontal cortex for risky and ambiguous scenarios.

Given this, AT in individuals who intend to invest can have a positive effect on their RT as well as AIOs. Thus, the following hypotheses are put forth:

H6: Higher levels of AT lead to more RT in accountants.
H7: Higher levels of AT lead to more AIOs in accountants.

2.4 Effect of education on accountants' RT and AIOs

While Hallahan, Faff, and McKenzie (2003) did not find a significant correlation between education and risk tolerance (RT), Grable (2000) and Yao, Sharpe, and Wang (2011) demonstrated that higher levels of education could indeed influence RT. Sages and Grable (2010) argue that individuals can effectively engage in risk-taking when equipped with financial and accounting education. This, in turn, enables them to seize investment opportunities, ultimately leading to the capacity to generate wealth and value. Consequently, accounting and financial education can significantly enhance an individual's prospects for success in achieving their investment objectives (AIOs). The concepts presented by Sages and Grable (2010) can be analyzed from two additional perspectives: First, the relationship between financial education and RT, despite variations in findings across studies. Second, the connection between RT and wealth and value creation typically aligns with the expectations of the capital markets. Additionally, investors often anticipate higher

returns with increased risk tolerance (RT), leading to wealth creation through opportunistic investments. The study conducted by Haws (2021) delved into the realm of investment decision-making and its impact on better decision-making processes. It explored the factors influencing individual investors' choices, the sources of information employed for sound investment decisions, the potential risks associated with such decisions, and strategies for mitigating those risks. Through a sample of 12 private investors, the study revealed that investors can make more informed investment choices by equipping themselves with accounting, portfolio management, investment analysis, and emotional intelligence knowledge. To better cater to individual investors' financial needs, a comprehensive understanding of diverse investment options and their associated opportunities is paramount. Accounting education can positively influence the outcomes of accountants' investment choices (AIOs). However, it is important to note that there isn't a direct, one-size-fits-all relationship between education level and risk tolerance (RT). Education can yield positive or negative effects for two primary reasons. Some individuals may become overconfident, leading them to take greater risks based on their knowledge and skills. In contrast, others embrace conservatism or the precautionary principle, making them more risk-averse. The following hypotheses are proposed:

H8: There is a significant relationship between levels of education and RT among accountants.
H9: Higher levels of education lead to more AIOs among accountants.

2.5 Effect of age on RT

Research findings indicate that risk tolerance (RT) typically decreases over an individual's lifespan, as documented in earlier studies (Wallach and Kogan, 1961; McInish, 1982; Morin and Suarez, 1983; Palsson, 1996; Hallahan et al., 2003). However, some researchers, such as Weber, Weber, and Nosic (2012), Guiso and Paiella (2008), and Grable and Lytton (1999), have concluded that there is no substantial relationship between RT and age. Bakshi and Chen (1994) also discovered that risk aversion tends to increase with age, a result that was further supported by Hallahan et al. (2004). Moreover, McInish (1982) examined the correlation between the personality traits of individual investors and their risk aversion, employing the Capital Asset Pricing Model (CAPM) and the beta factor to evaluate their systematic risks. This analysis indicated that both the level of education and age may have adverse effects on RT, meaning that RT may decline with age and higher levels of education. Given the consistent positive correlation between ageing and heightened risk aversion or reduced RT in most of the studies reviewed, it was hypothesized that there would be a negative relationship between age and RT among accountants. Hence, the following hypothesis was posited:

H10: RT decreases with the accountants' age.

Based on the theoretical foundations and the results reported in the related research, the conceptual model of this study is initially offered below, and thenceforth, the research hypotheses are tested.

By employing the conceptual model presented here, we anticipate that several attributes of accountants working within institutions, namely Financial Intelligence (FI), Ambiguity Tolerance (AT), and optimism, may exert a positive influence on their Risk Tolerance (RT) and, consequently, their Attainment of Investment Objectives (AIOs). Accountants possessing higher levels of FI, AT, and optimism are likely to be more inclined to take on investment risks, resulting in improved performance when capitalizing on investment opportunities. Additionally, those accountants who exhibit a greater propensity for risk-taking and possess higher educational qualifications could excel

in seizing such opportunities. Conversely, RT among accountants is expected to decrease with advancing age. Consequently, we anticipated discovering a significant relationship between education levels and RT among accountants.

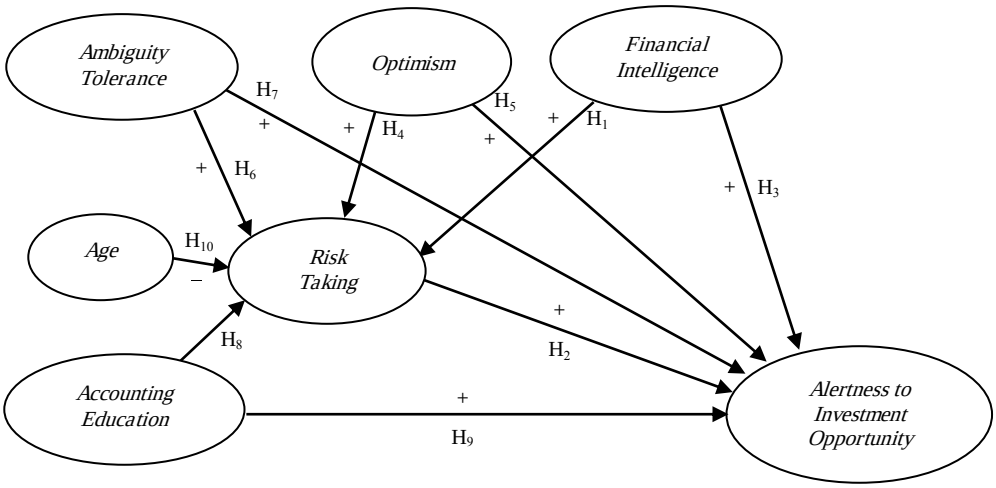

Figure 1. The conceptual model for the factors affecting RT and AIOs among accountants

3. Methodology

3.1 Research design

The present study employed a descriptive-correlational approach and utilized Structural Equation Modeling (SEM). This field study was conducted at a single time point during the summer of 2022. Structural Equation Modeling (SEM) models are employed to elucidate how latent variables are elucidated by the corresponding observable variables (questions) or to illustrate the relationships between latent variables. One of the foremost justifications for using SEM in this research lies in its capacity to test theories by representing them as equations connecting variables. Another rationale for employing this method is its capability to account for measurement errors, thus enabling us to conduct data analysis while considering measurement inaccuracies.

3.2 Statistical population and samples

The statistical population for this study comprised both Iranian public and private accountants. Due to the diversity within this statistical population and the presence of the Coronavirus disease 2019 (COVID-19) within the study environment, an electronic research questionnaire was designed and administered using AvalForm. After distributing the questionnaire link and conducting multiple follow-ups, 468 complete questionnaires were collected. Cochran's formula was then employed to determine the sample size, which yielded a requirement of 384 questionnaires at a 95% confidence level. Consequently, as 468 questionnaires were obtained, they exceeded the adequacy criteria, allowing for the generalization of the results.

3.3 Instruments

We gathered data using a standardized questionnaire. The initial section of the questionnaire covered respondents' age, gender, work experience, educational background, and their field of accounting specialization. Financial Intelligence (FI) was assessed on a scale. To evaluate FI, we employed a Likert-type scale with five response options (1: not at all, 2: rarely, 3: sometimes, 4: most of the time, and 5: always) while analyzing the 25-item Indices of Financial Intelligence (IFI)

developed by Igbokwe, Gerinde, and Adeoye (2014). In addition, we used Likert-type scales developed by Cui et al. (2021) for measuring risk propensity (5 items) and optimism (6 items). To gauge accountants' Attainment of Investment Objectives (AIOs) (6 items), we utilized the Alertness to Opportunity Scale, also proposed by Cui et al. (2021). In assessing Ambiguity Tolerance (AT), we adopted the Ambiguity Tolerance Scale developed by Cui et al. (2021). Both scales were presented in a Likert-type format (1: very low, 2: low, 3: moderate, 4: high, and 5: very high). We ensured content validity by interviewing eight accounting, entrepreneurship, sociology, and professional investing experts. The questionnaire's reliability was assessed by calculating Cronbach's alpha coefficient, which indicated satisfactory reliability. In the pre-test phase, we distributed thirty questionnaires, and any identified issues were rectified accordingly.

3.4 Data analysis

We used IBM SPSS Statistics (version 26.0) and SmartPLS (version 3.0) for data analysis. In the initial phase, we presented descriptive statistics, encompassing frequency, mean, standard deviation, and minimum/maximum values. Inferential statistics were calculated using the partial least squares (PLS) estimation method. Partial Least Squares-Structural Equation Modeling (PLS-SEM) is recognized for its suitability in identifying significant explanatory factors within models and for predictive research. This approach aims to reduce and enhance the explanation of residuals in dependent indicators and constructs within the model (Dash and Paul, 2021; Richter et al., 2016). Conversely, covariance-based SEM (CB-SEM) is more appropriate when the research objective pertains to theory testing and confirmation. Subsequently, we evaluated the measurement model for the research variables, considering reliability, validity, and fit factors. Following this assessment, we conducted hypothesis testing.

4. Findings

4.1 Descriptive statistics

In this study, a total of 468 Iranian accountants employed in both public and private institutions participated, comprising 226 men and 242 women. It's worth noting that the study had a mean age of 29, with a standard deviation of 7.4 years. This relatively lower age range can be attributed to the limited participation of more senior accountants, perhaps less inclined to partake. However, the study successfully included a significant number of working students and recently graduated accountants. The data revealed that accountants, on average, possessed a level of education equivalent to a bachelor's or master's degree, with an average educational level of 4.78. The statistics corroborated these findings, which indicated that the participant pool consisted of 8 doctoral graduates, 266 senior experts holding master's degrees, and 194 experts who held bachelor's degrees, in addition to accounting students and recent graduates.

Table 1. The descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Age	468	19.000	46.000	29.030	7.402
Experience	434	1.000	20.000	4.060	4.146
Accounting Education	458	1.000	10.000	4.780	1.767
Ambiguity Tolerance	468	1.330	5.000	3.757	0.657
Optimism	468	1.340	5.000	3.745	0.788
Financial Intelligence	468	1.220	5.000	3.792	0.766
Risk-Taking	468	1.000	5.000	3.374	0.983
Alertness to Investment Opportunity	468	1.250	5.000	3.696	0.775

The results of the one-sample t-test indicate that the mean scores for all three variables were significantly higher than the midpoint of the Likert-type scale (i.e., 3). Specifically, Attainment of Investment Objectives (AIOs), Risk Tolerance (RT), and Financial Intelligence (FI) were observed to be 3.70, 3.37, and 3.79, respectively. Regarding education levels, the descriptive statistics reveal that mean AIOs were higher for accountants with higher education, namely, 3.59, 3.74, and 4.66 for bachelor's, master's, and doctoral degrees, respectively. In the case of FI, the mean scores for individuals with bachelor's, master's, and doctoral degrees were 3.71, 3.84, and 4.52, respectively. The data suggest that as the education level of accountants increased, both FI and AIOs improved. However, these trends did not extend to accountants' Risk Tolerance (RT). Specifically, the mean RT scores for individuals with bachelor's, master's, and doctoral degrees were 3.47, 3.28, and 4.44, respectively, with the lowest RT mean score belonging to master's degree holders. You can find the detailed descriptive statistics in Table 1.

4.2 Inferential statistics

The Structural Equation Modeling (SEM) analysis was conducted to assess the research hypotheses, comprising two key phases: the evaluation of the measurement model and the assessment of the structural model. First, the measurement model of the research variables was examined, followed by the evaluation of the proposed conceptual model, i.e., the structural model. Subsequently, the results of these analyses are presented as follows.

4.3 Measurement model evaluation

In this study, we employed Confirmatory Factor Analysis (CFA) to assess the measurement model's validity, reliability, and fit. The goodness of fit (GoF) indices are reported in Table 2, while a summary of the outcomes of the measurement model evaluation is presented in Table 3. Additionally, Table 4 displays the correlation coefficients and the Average Variance Extracted (AVE).

4.4 Model fit

The GoF index was used to simultaneously calculate the fit of the structural and measurement models. This index could be computed using the geometric mean of the average communality and the average R2. Of note, the GoF index was devised by Tenenhaus et al. (2004) and computed by the following relationship:

$$\text{GoF} = \sqrt{\text{Average (Commonality)} \times \text{Average } (R^2)}$$

To evaluate the Goodness of Fit (GoF) index, we adopted the criteria proposed by Wetzels, Odekerken-Schroder, and Van-Oppen (2009), which categorize fit values as follows: weak (between 0.1 and 0.25), moderate (between 0.25 and 0.36), and strong (above 0.36). Our analysis yielded a GoF index of 0.50 based on the software output and the formula, indicating a favorable model fit. According to Tenenhaus et al. (2004), the GoF index is a useful tool to assess the model's fit, similar to the fit indices used in covariance-based modeling. This index ranges between zero and one, with values closer to one signifying high model quality. While this index was satisfactory for the overall evaluation of the fit in the measurement and structural models, we also examined the Standardized Root-Mean-Square Residual (SRMR) index. An SRMR value below 0.10 indicates an excellent fit for the proposed model, as Hair et al. (2017) and Henseler et al. (2014) recommended. As depicted in Table 2, the GoF indices for the measurement model evaluation in this study are

indeed favorable.

4.5 Composite reliability (CR)

According to Hair et al. (2017), a construct was desirable if its CR value was equal to or greater than 0.7. The results in Table 3 depict that the CR value for all research variables is greater than 0.7, so they were satisfactory.

Table 2. GOF indices of the measurement model of the study

Fitness index	GOF	SRMR
Suggested value	>0.25	<0.10
Estimated value	0.50	0.088

4.6 Convergent validity (CV)

It is appropriate if the AVE value for each variable is equal to 0.5 or more, as Hair et al. (2017) stated. The results in Table 3 confirm that the AVE in the measurement model here is favorable.

Table 3. Measurement model evaluation results

Latent Variable	Items	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Ambiguity Tolerance	5	0.676	0.814	0.594
Optimism	6	0.742	0.851	0.656
Risk-Taking	5	0.841	0.903	0.757
Alertness to Investment Opportunity	6	0.840	0.893	0.677
Financial Intelligence	25	0.880	0.901	0.507

4.7 Discriminant validity (DV)

Based on the criterion of Fornell and Larcker (1981), the DV of variables could be confirmed if the AVE square root for each construct was higher than the estimated correlation between that construct and others in the research model. According to the results presented in Table 4, the AVE for each model construct (0.71< AVE <0.87) was greater than the correlation (0.33< r <0.51) between all. Thus, the DV of all research variables in the measurement model was suitable.

Table 4. Discriminant validity (The criterion of Fornell and Larcker, 1981)

	Latent Variable	1	2	3	4	5
1	Alertness to Investment Opportunity	0.823				
2	Ambiguity Tolerance	0.477	0.771			
3	Financial Intelligence	0.478	0.365	0.712		
4	Optimism	0.511	0.385	0.393	0.810	
5	Risk-Taking	0.418	0.348	0.338	0.358	0.870

Note: The diameter numbers of the table are the square root of each AVE and the lower diameter elements are the correlation coefficients between the constructs

4.8 Structural model evaluation

Once the measurement model was confirmed using the CFA, path analysis was utilized to test the research hypotheses. Therefore, the structural model with standardized path coefficients and the

significance value (t-statistic) is illustrated in Figures 2 and 3, respectively. The summary of the structural model evaluation is also given in Table 5.

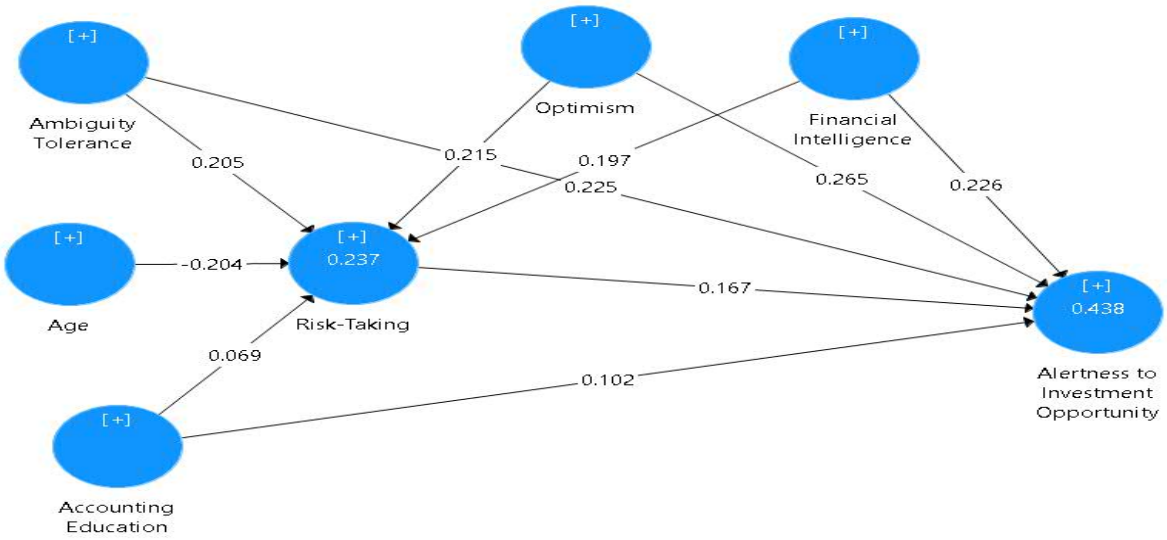

Figure 2. The structural model with standardized path coefficients

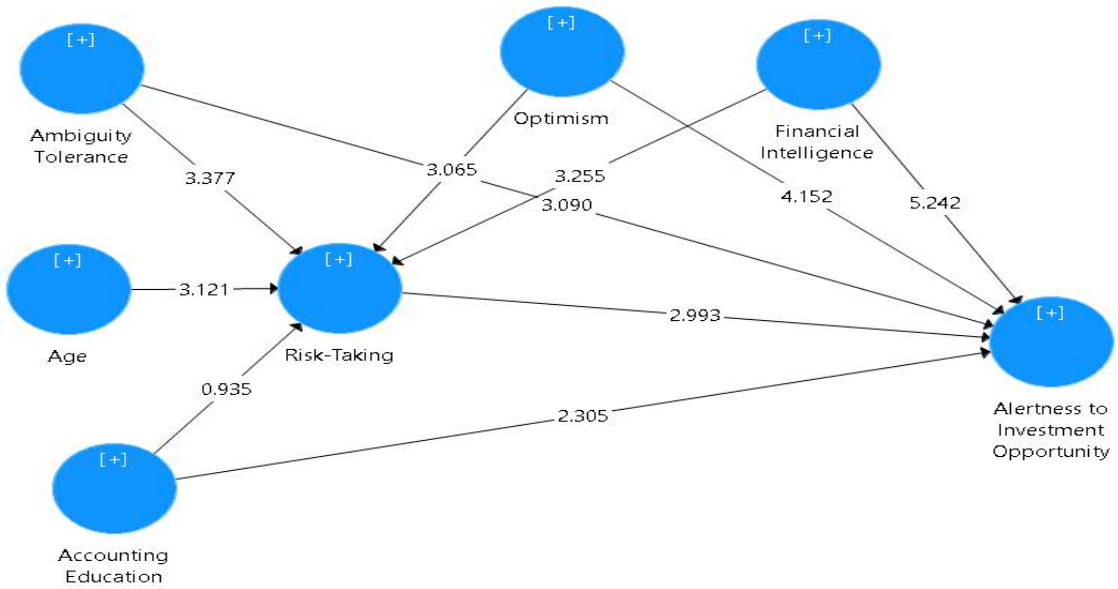

Figure 3. The structural model with t-statistics

To examine the presence of Common Method Bias (CMB), we conducted a multicollinearity test developed by Kock and Lynn (2012). Multicollinearity is indicated by Variance Inflation Factors (VIFs) exceeding 3.3, which may suggest the presence of CMB in the model, as outlined by Kock (2015). In our analysis, all independent variables displayed VIFs within the range of 1.02 to 1.50. Given that all the VIF values for the independent variables were below the threshold of 3.3, the

evaluation results of the proposed research model were found to be unbiased and, importantly, reliable in this context.

Table 5. Structural model evaluation results

Direct Path	Path Coefficients	T Statistics (|O/STDEV|)	P-Values	
Accounting Education -> Alertness to Investment Opportunity	0.102	2.305	0.022	Accept
Accounting Education -> Risk-Taking	0.069	0.935	0.350	Reject
Age -> Risk-Taking	-0.204	3.121	0.002	Accept
Ambiguity Tolerance -> Alertness to Investment Opportunity	0.225	3.090	0.002	Accept
Ambiguity Tolerance -> Risk-Taking	0.205	3.377	0.001	Accept
Financial Intelligence -> Alertness to Investment Opportunity	0.226	5.242	0.000	Accept
Financial Intelligence -> Risk-Taking	0.197	3.255	0.001	Accept
Optimism -> Alertness to Investment Opportunity	0.265	4.152	0.000	Accept
Optimism -> Risk-Taking	0.215	3.065	0.002	Accept
Risk-Taking -> Alertness to Investment Opportunity	0.167	2.993	0.003	Accept
Q^2=0.268		R^2=0.438		

As depicted in Table 5, the first and third hypotheses were confirmed when analyzing the path coefficients between the research variables at the 99% confidence interval (CI). In other words, the relationship between RT and AIO could increase as Financial Investment (FI) increases among experienced accountants. The results of testing the second research hypothesis also demonstrate that RT positively influences Accountants' Investment Opportunities (AIOs) ($p = 0.003$). Accountants with higher RT scores exhibited increased AIOs. The research findings also indicate that optimism positively affected RT and AIOs in accountants ($p < 0.01$). Consequently, optimistic accountants tend to take more risks during investments and excel when presented with investment opportunities. As a result, the fourth and fifth research hypotheses were substantiated. Regarding the analysis of the sixth and seventh hypotheses, Attitude Towards Risk (AT) positively affected accountants' RT and AIOs ($p < 0.01$). Consequently, accountants with a higher AT tended to take more risks and displayed greater AIOs. Both of these views were confirmed. However, no significant relationship was observed between accountants' level of education and RT, according to the research findings in Table 5. Thus, the eighth research hypothesis was rejected. Moreover, the results in Table 5 indicate that accounting education positively impacts accountants' AIOs ($p < 0.05$). Specifically, individuals with higher levels of accounting education demonstrated a greater propensity for AIOs. Additionally, the research findings revealed that accountants' age negatively impacted their RT ($p < 0.01$). Consequently, the tenth research hypothesis was not rejected.

4.9 Predictive relevance (Q^2)

The Q2 index was introduced by Stone (1974) to determine the predictive power of the model. According to Henseler, Ringle, and Sinkovics (2009), the weak predictive power of a model could occur when the Q2 value of a construct was close to 0.02. Still, the model's moderate and strong

predictive power means this value had been closer to 0.15 and higher than 0.35, respectively. The correlation coefficient of AIOs as a predictor variable was approximately equal to 0.27 (Table 5); therefore, the proposed research model had the appropriate predictive power at a moderate level to account for the changes in AIOs. Of note, the Q2 value for RT was 0.16.

5. Discussion and Conclusion

Individual investors in various societies encounter challenges when making effective and efficient investments with their savings and comprehending upcoming investment opportunities (Haws, 2021). Assessing investment opportunities can be particularly daunting for investors lacking accounting, finance, or investment knowledge. Given the significant advancements in capital markets, the growth of innovative entrepreneurial endeavors, and the expansion of financial and investment prospects, understanding the factors and characteristics that influence their ability to identify opportunities and make informed, efficient investments is paramount. Since accountants employed by businesses and organizations are well-versed in fundamental accounting, finance, and investment concepts, this study sought to investigate the impact of several financial variables (specifically, FI, AT, optimism, education level, and age) on the Risk Tolerance (RT) and investment awareness of accountants working within Iran's public and private institutions. Additionally, the study delved into the influence of RT on Accountants' Investment Opportunities (AIOs) within this group, shedding light on its role in elucidating these variables.

With a 99% confidence level, it was determined that the first and third research hypotheses collectively positively impact both Risk Tolerance (RT) and Accountants' Investment Opportunities (AIOs) at a 1% error rate. In simpler terms, as Financial Investment (FI) increases among experienced accountants, RT and AIOs may also increase. These findings align with the conclusions drawn by Sages and Grable (2010) and Almenberg and Widmark (2011), who suggested that enhancing FI and financial skills can positively influence risk tolerance. Additionally, Berman et al. (2008), Sages and Grable (2010), Kamil et al. (2014), and Grable and Joo (2000) all found that greater financial knowledge and skills lead to improved financial and investment decision-making. Based on these insights, it becomes evident that utilizing training programs and in-service courses to enhance the financial, accounting, and investment knowledge and skills of accounting students, graduates, and practicing accountants can elevate their financial acumen. This, in turn, can enhance individual economic decision-making and their awareness of investment opportunities. In the subsequent analysis, the second research hypothesis unveiled that RT positively influences AIOs; accountants with higher RT scores exhibited increased AIOs. According to general capital market theories, high-yield investment opportunities are often linked to higher risk tolerance levels, a perspective shared by Bayar et al. (2020) and Nguyen et al. (2016).

In line with this, optimism positively impacts the Risk Tolerance (RT) of accountants contemplating new investments. Consequently, optimistic accountants tend to embrace higher levels of risk in their investment endeavors. These findings align with and corroborate Foo's (2011) discovery that optimistic individuals are more likely to invest in ventures characterized by higher risk. This propensity stems from the fact that optimists typically downplay or assign lesser significance to uncertainty in their investment outcomes and any unfavorable information regarding future investment prospects. Moreover, based on the outcomes of testing the fifth research hypothesis, optimism also demonstrates a positive influence on accountants' Accountants' Investment Opportunities (AIOs). In other words, optimistic accountants tend to excel when

presented with investment prospects. This finding corresponds with Gakhar's (2019) observation that optimism can significantly influence investment decisions, and it echoes the insights from Kahneman and Tversky (1979), who noted that optimistic investors are more likely to achieve financial success.

The outcomes of the sixth and seventh research hypotheses testing revealed that Attitude Towards Risk (AT) has a positive influence on both Risk Tolerance (RT) and Accountants' Investment Opportunities (AIOs) in accountants who are contemplating investments. In essence, accountants with a higher AT are more inclined to take on increased levels of risk and exhibit greater AIOs. These findings align with the research conducted by Furnham and Ribchester (1995), which indicates that individuals with a stronger AT tend to have a heightened interest in future opportunities and ambiguities. The study results corroborate the findings presented by Haws (2021), demonstrating that investors who display higher RT levels are more willing to accept volatility and uncertainty in future investment prospects, consequently achieving superior performance. RT plays a crucial role in the decision-making process when dealing with ambiguity and uncertainty, as highlighted by Bechara et al. (2005) and Krain et al. (2006), where taking risks can lead to both positive and negative outcomes.

Furthermore, the examination of the eighth hypothesis yielded no significant correlation between the level of education and Risk Tolerance (RT) among accountants, which contrasts with the findings of Grable (2000), Sages and Grable (2010), Yao et al. (2011), and McInish (1982), all of which indicated a positive association between higher education levels and RT. Nevertheless, the results align with the conclusions drawn by Hallahan et al. (2003). These findings could potentially be attributed to a combination of overconfidence and conservatism among accountants or influenced by the particular orientations of the participants. On the other hand, the results of testing the ninth research hypothesis unveiled a positive impact of accounting education on Accountants' Investment Opportunities (AIOs). In particular, individuals with higher levels of accounting education tend to possess greater AIOs. Sages and Grable (2010) suggested that those with lower financial and accounting education levels might face wealth creation challenges. Likewise, Haws (2021) determined that better-educated investors are better equipped to leverage investment opportunities and make informed decisions, thus supporting the findings presented here.

Studies exploring the relationship between age and Risk Tolerance (RT) can be categorized into three distinct groups. First, some studies have found no significant correlation between these two variables, although such studies are relatively limited. Second, some research has indicated a negative relationship between age and RT, while thirdly, there are studies that have identified a positive relationship between age and risk aversion. Notably, both the second and third categories of research demonstrate that RT declines with age in the context of investment. As a result, the outcomes of testing the final research hypothesis confirm this trend, emphasizing that age has a negative impact on RT among accountants. This aligns with the findings reported by Hallahan et al. (2003, 2004), Wallach and Kogan (1961), McInish (1982), Morin and Suarez (1983), Bakshi and Chen (1994), and Palsson (1996).

In summary, the Risk Tolerance (RT) and Accountants' Investment Opportunities (AIOs) of accountants were significantly influenced by Financial Investment (FI), Attitude Towards Risk (AT), and optimism. Investors willing to take on greater risks reported higher AIOs and demonstrated better investment performance. Furthermore, accountants' RT was affected by their age, while higher levels of education were shown to enhance their success in investing. As a result, this study can serve as a foundation for establishing guidelines regarding accountants' RTs and AIOs. The practical insights drawn from this research can be valuable for lawmakers, policymakers, standard-setting bodies, and higher education planners, empowering them to make well-informed

decisions in the investment process and ensuring efficient resource allocation and collaboration. This may include offering training programs for business development within the community and providing education to entrepreneurs, business professionals, and individuals interested in investment and innovation, both in formal and informal educational settings, thereby promoting sound decision-making. Undergraduate and higher education students can leverage these findings to deepen their knowledge and skills in finance and accounting related to Financial Investment (FI). Moreover, the research findings can also be of interest to investors who seek to acquire the necessary skills for making effective and efficient investments, ultimately leading to a higher return on investment.

Future studies may explore the impact of various other factors, such as computational intelligence, emotional intelligence, overconfidence, and self-deprecation, on Risk Tolerance (RT) and Accountants' Investment Opportunities (AIOs) among accountants and other individuals involved in investment decision-making. It's worth noting that, in the current study, gender was not considered. However, accountants did investigate AIOs, encompassing stocks, assets, and other options. Nevertheless, accountants may have a limited inclination to invest in areas beyond the stock market or banking and financial institutions. This aspect could be explored in future research. One of the limitations of this study was the relatively young sample, with an average age of 29, consisting mostly of individuals with bachelor's and master's degrees. Consequently, the results may not be readily generalized to more experienced or senior accountants.

References

1. Almenberg, J., and Widmark, J. (2011). Numeracy, financial literacy, and participation in asset markets. *SSRN Electronic Journal.* 1(1), pp. 1–40. http://dx.doi.org/10.2139/ssrn.1756674.
2. Astebro, T., Herz, H., Nanda, R., and Weber, R. A. (2014). Seeking the roots of entrepreneurship: insights from behavioral economics. *Journal of Economic Perspectives*, 28(3), pp. 49–69. https://doi.org/10.1257/jep.28.3.49
3. Baker, H. K., and Nofsinger, J. R. (2002). Psychological biases of investors. *Financial Services Review*, 11(5), pp. 97–116. https://www.proquest.com/openview/71733cc3dac821b5a48b3a06bf8da7ca/1?pq-origsite=gscholar&cbl=31458
4. Bakshi, G. S., and Chen, Z. (1994). Baby boom, population aging, and capital markets. *Journal of Business*, 67(2), pp. 163-202. https://doi.org/10.1086/296629
5. Barber, B., and Odean, T. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics*, 116, pp. 261–292. https://doi.org/10.1162/003355301556400
6. Bayar, Y., Sezgin, H. F., Öztürk, O. F., and Şaşmaz, M. U. (2020). Financial literacy and financial risk tolerance of individual investors: Multinomial logistic regression approach. *SAGE Open*, 10(3), pp. 1-11. https://doi.org/10.1177/2158244020945717
7. Bechara, A., Damasio, H., Tranel, D., and Damasio, A. R. (2005). The Iowa Gambling Task and the somatic marker hypothesis: some questions and answers. *Trends in Cognitive Sciences*. 9(4), pp. 159–162. https://doi.org/10.1016/j.tics.2005.02.002
8. Berman, K., Knight, J., and Case, J. (2008). Financial intelligence for entrepreneurs: what you need to know about the numbers. Cambridge, MA: Harvard: Business School Press. Cambridge. https://hbsp.harvard.edu/product/1915-PDF-ENG
9. Brand, M., Recknor, E. C., Grabenhorst, F., and Bechara, A. (2007). Decisions under ambiguity and decisions under risk: correlations with executive functions and comparisons of

two different gambling tasks with implicit and explicit rules. *Journal of Clinical and Experimental Neuropsychology*, 29(1), pp. 86–99. https://doi.org/10.1080/13803390500507196
10. Budner, S. (1962). Intolerance of ambiguity as a personality variable. *Journal of Personality*, 30(1), pp. 29–50. https://doi.org/10.1111/j.1467-6494.1962.tb02303.x
11. Cole, S., and Shastry, G. K. (2008). If you are so smart, why aren't you rich? Education, financial literacy, and cognitive ability affect financial market participation. Cambridge, Mass: Harvard Business School. https://doi.org/10.2307/j.ctvc7778k.5
12. Cui, J., Sun, J., and Bell, R. (2021). The impact of entrepreneurship education on the entrepreneurial mindset of college students in China: The mediating role of inspiration and the role of educational attributes. *The International Journal of Management Education*, 19(1), pp. 100278-100296. https://doi.org/10.1016/j.ijme.2019.04.001
13. Dash, G., and Paul, J. (2021). CB-SEM vs PLS-SEM methods for research in social sciences and technology forecasting. *Technological Forecasting and Social Change*, 173, A. 121092. https://doi.org/10.1016/j.techfore.2021.121092
14. Endres, M. L., Chowdhury, S., and Milner, M. (2009). Ambiguity tolerance and accurate assessment of self-efficacy in a complex decision task. *Journal of Management & Organization*, 15, pp. 31–46. https://doi.org/10.1017/s1833367200002868
15. Foo, M. (2011). Emotions and entrepreneurial opportunity evaluation. *Entrepreneurship Theory and Practice*, 35(2), pp. 375-393. https://doi.org/10.1111/j.1540-6520.2009.00357.x
16. Fornell, C., and Larcker, D. F. (1981). Evaluating structural equation models with unobservables variables and measurement error. *Journal of High Technology Management Research*, 11(1), pp. 137-153. https://doi.org/10.2307/3151312
17. Furnham, A., and Ribchester, T. (1995). Tolerance of ambiguity: A review of the concept, its measurement and applications. *Current Psychology*, 14(3), pp. 179–199. https://doi.org/10.1007/bf02686907
18. Gerardi, K., Goette, L., and Meier, S. (2010). Financial literacy and subprime mortgage delinquency: evidence from a survey matched to administrative data. Federal Reserve Bank of Atlanta. *Diane Publishing, 2010 SSRN Electronic Journal*. 1(1), pp. 1-51 https://doi.org/10.2139/ssrn.1600905
19. Gakhar, D. (2019). Role of optimism bias and risk attitude on investment behaviour. *Theoretical Economics Letters*, 9, pp. 852-871. https://doi.org/10.4236/tel.2019.94056
20. Grable, J. E. (2000). Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology*, 14(4), pp. 625-630. https://doi.org/10.1023/a:1022994314982
21. Grable, J. E., and Joo, S. H. (2000). A cross-disciplinary examination of financial risk tolerance. *Consumer Interests Annual*, 46(3), pp. 151-157. https://doi.org/10.1007/978-3-319-28887-1_2
22. Grable, J., and Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review*, 8(3), pp. 163-181. https://doi.org/10.1016/s1057-0810(99)00041-4
23. Green, C. P., and Heywood, J. S. (2011). Flexible contracts and subjective well-being. *Economic Inquiry*, 49(3), pp. 716-729. https://doi.org/10.1111/j.1465-7295.2010.00291.x
24. Guiso, L., and Paiella, M. (2008). Risk aversion, wealth and background risk. *Journal of the European Economic Association*, 6(6), pp. 1109-1150. https://doi.org/10.1162/jeea.2008.6.6.1109
25. Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., and Thiele, K. O. (2017). Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling

methods. *Journal of the Academy of Marketing Science*, 45, pp. 616-632. https://doi.org/10.54055/ejtr.v6i2.134

26. Haws, M. K. (2021). Investor investment choices for better decision-making among investment options. A dissertation submitted in partial fulfillment of the requirements for the degree of PhD of Business Administration: Accounting. Baker College. Flint, Michigan. https://www.proquest.com/openview/b6970bc76db7460010c420cad83f272d/1?pq-origsite=gscholar&cbl=18750&diss=y
27. Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009), The use of partial least squares path modeling in international marketing, Sinkovics, R.R. and Ghauri, P.N. (Ed.) New Challenges to International Marketing (Advances in International Marketing, Vol. 20), Emerald Group Publishing Limited, *Bingley*, pp. 277-319. https://doi.org/10.1108/S1474-7979(2009)0000020014
28. Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., and Calantone, R. J. (2014). Common beliefs and reality about partial least squares: Comments on Rönkkö & Evermann (2013). *Organizational Research Methods*, 17(2), pp. 182-209. https://doi.org/10.1177/1094428114526928
29. Huhmann, B. A., and McQuitty, S. (2009). A model of consumer financial numeracy. *International Journal of Bank Marketing*, 27, pp. 270-293. https://doi.org/10.1108/02652320910968359
30. Hallahan, T., Faff, R., and McKenzie, M. (2003). An exploratory investigation of the relation between risk tolerance scores and demographic characteristics. *Journal of Multinational Financial Management*, 13(4-5), pp. 483-502. https://doi.org/10.1016/s1042-444x(03)00022-7
31. Hallahan, T., Faff, R., and McKenzie, M. (2004). An empirical investigation of personal financial risk tolerance. *Financial Services Review*, 13(1), pp. 57-78. https://www.proquest.com/docview/212017690
32. Hey, J. D. (1984). The economics of optimism and pessimism. *Kyklos*, 37(2), pp. 181–205. https://doi.org/10.1111/j.1467-6435.1984.tb00748.x
33. Igbokwe, D., Gesinde, A., and Adeoye, T. A. (2014). Development and validation of indices of financial intelligence among a cross-section of Nigerian private university students. *International Journal of Business and Management Study*, 1(3), pp. 76-80. https://www.researchgate.net/publication/306038231_DEVELOPMENT_AND_VALIDATION_OF_INDICES_OF_FINANCIAL_INTELLIGENCE_AMONG_A_CROSS-SECTION_OF_A_NIGERIAN_PRIVATE_UNIVERSITY_STUDENTS
34. Kahneman, D., and Riepe, M. W. (1998). Aspects of investor psychology. *Journal of Portfolio Management*, 24(4), pp. 52–65. https://doi.org/10.3905/jpm.1998.409643
35. Kahneman, D., and Tversky, A. (1979). Intuition prediction: biases and corrective procedures. *Management Science*, 12, pp. 313-27. https://doi.org/10.1017/cbo9780511809477.031
36. Kamil, N. S. S. N., Musa, R., and Sahak, S. Z. (2014). Examining the role of financial intelligence quotient (FiQ) in explaining credit card usage behavior: A conceptual framework. *Procedia - Social and Behavioral Sciences*, 130, pp. 568-576. https://doi.org/10.1016/j.sbspro.2014.04.066
37. Kim, K. A. and Nofsinger, J. R. (2007). The Behaviour of Japanese Individual Investors during Bull and Bear Markets. *The Journal of Behavioral Finance*, 8(3), pp. 138-153. https://doi.org/10.1080/15427560701545598
38. Kock, N., and Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), pp. 546-580. https://doi.org/10.17705/1jais.00302

39. Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, 11(4), pp. 1-10. https://doi.org/10.4018/ijec.2015100101
40. Krain, A. L., Wilson, A. M., Arbuckle, R., Castellanos, F. X., and Milhama, M. P. (2006). Distinct neural mechanisms of risk and ambiguity: a meta-analysis of decision-making. *Neuroimage*, 32, pp. 477–484. https://doi.org/10.1016/j.neuroimage.2006.02.047
41. Lusardi, A. (2008). Household saving behavior: The role of financial literacy, information, and financial education programs. National Bureau of Economic Research, NBER Working Paper No. 13824. Federal Reserve Bank of Boston, 2009, pp. 109-149. https://doi.org/10.3386/w13824
42. Meza, D., and Southey, C. (1996). The borrower's curse: optimism, finance and entrepreneurship. *Economic Journal*, 106(435), pp. 375–386. https://doi.org/10.2307/2235253
43. Mitchell, R. K., Busenitz, L., Lant, T., McDougall, P. P., Morse, E. A., and Smith, J. B. (2002). Toward a Theory of Entrepreneurial Cognition: Rethinking the People Side of Entrepreneurship Research. *Entrepreneurship Theory and Practice*, 27(2), pp. 93–104. https://doi.org/10.1111/1540-8520.00001
44. McInish, T. H. (1982). Individual investors and risk-taking. *Journal of Economic Psychology*, 2(2), 125–136. https://doi.org/10.1016/0167-4870(82)90030-7
45. Morin, R. A., and Suarez, A. F. (1983). Risk aversion revisited. *Journal of Finance*, 38(4), pp. 1201-1216. https://doi.org/10.1111/j.1540-6261.1983.tb02291.x
46. Morris, M. H., Webb, J. W., Fu, J., and Singhal, S. (2013). A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights. *Journal of Small Business Management*, 51(3), pp. 352–369. https://doi.org/10.1111/jsbm.12023
47. Naeiji, M., and Esfandiari, Z. (2015). The effect of overconfidence and optimism on decision to start innovative activities: the mediating role of risk perception (Case study: the companies of university incubators). *Journal of Entrepreneurship Development*, 8(3), pp. 531-550 [In Persian]. 10.22059/JED.2015.57649
48. Ng, D. (2013). Seeing through the fog of ambiguity: Entrepreneurial judgments under decision settings of complexity. *Human Systems Management*, 32(1), pp. 57–66. https://doi.org/10.3233/hsm-130784
49. Nguyen, L. T. M., Gallery, G., and Newton, C. (2016). The influence of financial Risk tolerance on investment decision-making in a financial advice context. *Australasian Accounting, Business and Finance Journal*, 10(3), pp. 3-22. https://doi.org/10.14453/aabfj.v10i3.2
50. Pålsson, A.-M. (1996). Does the degree of relative risk aversion vary with household characteristics? *Journal of Economic Psychology*, 17(6), pp. 771–787. https://doi.org/10.1016/s0167-4870(96)00039-6
51. Pompian, M. M. (2006). Behavioural finance and wealth management: How to build optimal portfolios that account for investor biases. New York: John Wiley & Sons, Inc. New York, U.S. https://doi.org/10.1002/9781119202400
52. Puri, M., and Robinson, D.T. (2007). Optimism and economic choice. *Journal of Financial Economics*, 86(1), pp. 71-99. https://doi.org/10.1016/j.jfineco.2006.09.003
53. Remund, D. L. (2010). Financial literacy explicated: The case for a clearer definition in an increasingly complex economy. *Journal of Consumer Affairs*, 44(2), pp. 276–295. https://doi.org/10.1111/j.1745-6606.2010.01169.x
54. Richter, N. F., Cepeda, G., Roldán, J. L., and Ringle, C. M. (2016). European management research using partial least squares structural equation modeling (PLS-SEM). *European*

Management Journal, 34(6), pp. 589–597. https://doi.org/10.1016/j.emj.2016.08.001
55. Sages, R. A., and Grable, J. E. (2010). Financial numeracy, net worth, and financial management skills: client characteristics that differ based on financial risk tolerance. *Journal of Financial Service Professionals*, 64(6), pp. 57-65. https://fpperformancelab.org/wp-content/uploads/Financial-Numeracy-Net-Worth-and-Financial-Management-Skills-Client-Characteristics-that-Differ-based-on-Financial-Risk-Tolerance.pdf
56. Sahi, S. K. (2017). Psychological biases of individual investors and financial satisfaction. *Journal of Consumer Behaviour*, 16(6), pp. 511–535. https://doi.org/10.1002/cb.1644
57. Sahi, S. K., Dhameja, N., and Arora, A. P. (2012). Predictors of preference for financial investment products using CART analysis. *Journal of Indian Business Research*, 4(1), pp. 61–86. https://doi.org/10.1108/17554191211206807
58. Shefrin, H. (2002). Beyond greed and fear: Understanding behavioural finance and the psychology of investing. Boston: Harvard Business School Press. https://doi.org/10.1093/0195161211.001.0001
59. Simon, M., and Houghton, S. M. (2003). The relationship between overconfidence and introducing risky products: Evidence from a field study. *Academy of Management Journal*, 46(2), pp. 139-149. https://doi.org/10.2307/30040610
60. Slovic, P. (1972). A psychological study of human judgment: Implications for investment decision making. *The Journal of Finance*, 27(4), pp. 779–799. https://doi.org/10.1111/j.1540-6261.1972.tb01311.x
61. Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society*, 36(2), pp. 111-147. https://doi.org/10.1111/j.2517-6161.1974.tb00994.x
62. Tenenhaus, M., Amato, S., and Esposito Vinzi, V. (2004, June). A global goodness-of-fit index for PLS structural equation modelling. *In Proceedings of the XLII SIS scientific meetin*g, 1(2), pp. 739–742. https://doi.org/10.1002/cem.917
63. Thaler, R. H. (1999). Mental accounting matters. Journal of Behavioral Decision Making, 12(3), pp. 183–206. https://doi.org/10.1002/(sici)1099-0771(199909)12:3<183::aid-bdm318>3.0.co;2-f
64. Toricelli, M., Pereira, A. A. R., Abrao, G. S., Malerba, H. N., Maia, J., Buck, H. S., and Viel, T. A. (2021). Mechanisms of neuroplasticity and brain degeneration: strategies for protecting during aging. *Neural Regen Res*, 16(1), pp. 58-67. https://doi.org/10.4103/1673-5374.286952
65. Tversky, A., and Kahneman, D. (1981). The Framing of Decisions and the Psychology of Choice. *Science*, 211(4481), pp. 453–458. https://doi.org/10.1126/science.7455683
66. Wallach, M. A., and Kogan, N. (2007). Aspects of judgment and decision making: Interrelationships and changes with age. *Behavioral Science*, 6(1), pp. 23–36. https://doi.org/10.1002/bs.3830060104
67. Weber, M., Weber, W. U., and Nosic, A. (2012). Who takes risks when and why: Determinants of changes in investor risk taking. *Review of Finance*, 17(3), pp. 847-883. https://doi.org/10.1093/rof/rfs024
68. Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of Personality and Social Psychology*, 39(5), pp. 806–820. https://doi.org/10.1037/0022-3514.39.5.806
69. Wetzels, M., Odekerken-Schröder, G., and Van Oppen, C. (2009). Using PLS path modeling for assessing hierarchical construct models: Guidelines and empirical illustration. *Management Information Systems Quarterly*, 33(1), pp. 177-195. https://doi.org/10.2307/20650284
70. Yao, R., Sharpe, D. L. and Wang, F. (2011). Decomposing the age effect on risk tolerance. *The Journal of Socio-Economics*, 40(6), pp. 879-887. https://doi.org/10.1016/j.socec.2011.08.023

71. Xu, H., and Tracey, T. J. G. (2014). The role of ambiguity tolerance in career decision making. *Journal of Vocational Behavior*, 85(1), pp. 18–26. https://doi.org/10.1016/j.jvb.2014.04.001

IJAAF; Vol. 8, No. 1, Winter 2024, Serial 26

Ferdowsi University of Mashhad

Iranian Journal of
Accounting, Auditing & Finance

Quarterly

RESEARCH ARTICLE

The Effect of Product Market Competition on Conditional and Unconditional Conservative Accounting Procedures

Mohamad Tavakoli*
Department of Accounting, Petroleum University *of Technology, Tehran, Iran*
Ali Daemi Gah
Department of Economics and Administrative Sciences, Imam Reza International University of Mashhad, Mashhad, Iran

How to cite this article:
Tavakoli, M., & Daemi Gah, A. (2024). The Effect of Product Market Competition on Conditional and Unconditional Conservative Accounting Procedures. Iranian Journal of Accounting, Auditing and Finance, 8(1), 131-150. doi: 10.22067/ijaaf.2024.43895.1349
https://ijaaf.um.ac.ir/article_43895.html

ARTICLE INFO

Article History
Received: 2023-08-18
Accepted: 2023-10-29
Published online: 2024-01-01

Keywords:
Conditional Conservatism, PMC, Political Costs, Unconditional Conservatism.

Abstract

Through a cross-sectional analysis, this paper explores the influence of Product Market Competition (PMC) structure on conditional and unconditional accounting conservatism. The study utilizes financial data from the Tehran Stock Exchange from 2012 to 2019. Conditional and unconditional conservatism are measured using Basu's (1997) and Beaver and Ryan's (2000) models, respectively. Additionally, the Herfindahl–Hirschman index (HHI) is employed to introduce exogenous variations in PMC, allowing an assessment of how increased competition in market valuation impacts accounting conservatism in manufacturing companies. Despite previous findings by Dhaliwal et al. (2014) suggesting a positive association between intense PMC and conditional conservatism, the results of this study demonstrate that PMC does not affect the implementation of conditional conservatism. Furthermore, this investigation reveals that PMC has no bearing on applying unconditional conservatism in financial reporting. This aligns with the theory of unconditional conservatism, indicating that companies employ it based on their financial policies. The outcomes of this research contribute to the existing literature on conservatism.

https://doi.org/10.22067/IJAAF.2024.43895.1349

NUMBER OF REFERENCES
53

NUMBER OF FIGURES
-

NUMBER OF TABLES
10

Homepage: https://ijaaf.um.ac.ir
E-Issn: 2717-4131
P-Issn: 2588-6142

*Corresponding Author: Mohamad Tavakoli
Email: mtavakoli@put.ac.ir
Tel: 09125044392
ORCID:

1. Introduction

This paper delves into the influence of Product Market Competition (PMC) on conditional and unconditional accounting conservatism, specifically focusing on asymmetric timely loss recognition. This concept involves recognizing economic losses more promptly than gains in earnings. Several perspectives underpin the rationale for this study. One perspective posits that PMC has a favorable impact on conditional conservatism. This suggests that firms may opt for timely loss recognition to enhance their competitive position in the face of potential new entrants and existing competitors. In industries with fewer competitors, timely loss recognition can offer advantages, deterring new entrants. Similarly, firms facing substantial competition from existing rivals in their industry may opt for accelerated loss recognition to discourage overproduction by these rivals or encourage them to reduce production levels (Clinch and Verrecchia, 1997).

An alternative perspective posits that competition can mitigate conflicts of interest between managers and shareholders. According to this viewpoint, competing firms serve as a benchmark, facilitating a more robust evaluation of managerial performance. Intense competition also curtails managerial slack, compelling managers to enhance overall firm efficiency. In line with the implications of this perspective, Product Market Competition (PMC) diminishes managerial slack, enhances the monitoring process, and bolsters the equilibrium between managers' and shareholders' interests. As a result, managers are more inclined to refrain from disclosing losses to avert potential managerial dismissals during their tenure. This reduced the need for conditional conservatism as a monitoring mechanism. Furthermore, conservatism fosters timely recognition of losses, providing both shareholders and managers with insights into the causes of losses. Cumulatively, these investigations reduce the likelihood of managerial dismissal or turnover and eliminate projects with a negative net present value.

Additional studies have contributed further arguments regarding the relationship between competition and conservatism. Monopolistic firms, as opposed to those in competitive industries, face heightened political costs, as Watts and Zimmerman (1986) documented. Consequently, dominant firms in less competitive sectors have a stronger incentive to implement more timely loss recognition, effectively sidestepping regulatory scrutiny. Moreover, the empirical association between competition and conditional conservatism can be influenced by monopoly rents, giving rise to errors-in-variables issues in assessments of conditional conservatism (Ball and Shiva Kumar, 2006; Roychowdhury and Watts, 2007). One of the noteworthy advantages of embracing conditional conservatism lies in the reduction of competitive pressures and threats. In contrast, a prominent drawback of this policy is the potential decrease in investors' and shareholders' future performance expectations for firms, leading to a corresponding decline in the market value of the firm's equities.

This paper aligns with the existing literature to construct the provided measures. The central measure of conditional accounting conservatism relies on Basu's (1997) model, which quantifies the asymmetric timeliness in recognizing economic losses in accounting income, emphasizing quicker recognition of economic losses relative to economic gains in the current-period reported earnings. In addition, the measurement of unconditional conservatism is determined by the market-to-book ratio, following Beaver and Ryan's (2000) approach. Lastly, the Herfindahl–Hirschman index (HHI) is employed as a fitted proxy for PMC.

The paper is closely related to three recent studies investigating the multifaceted aspects of PMC and its effects on accounting and information environments. Specifically, Dhaliwal et al. (2014) and Hui et al. (2012) delve into the influence of a firm's significant customers and suppliers on the demand for conditional conservatism. Our comprehensive consideration of a firm's industry competitiveness sets our study apart. Although our PMC measurement index is akin to Dhaliwal et al. (2014), our research distinguishes itself in its broader scope.

Concerning the objective of wealth maximization for shareholders, an enduring question revolves around whether shareholder wealth is enhanced by adopting a higher degree of conservatism (which reduces competitive pressures and threats) or diminished (due to elevated capital market expectations regarding the entity's future performance). Moreover, the level of conservatism is influenced by the extent to which competitive pressures and threats increase or decrease.

As an emerging market, the escalating competition within the Iranian business environment prompts an exploration of the expected implications of competition within this particular context. It's worth noting that the charter of the Iranian National Audit Organization outlines accounting standard setting as one of its core objectives. Additionally, considering the primary goals of the IACPA establishment, this organization is mandated to support the government in the oversight of financial activities in manufacturing, commercial, and service entities while also ensuring the reliability of these entities' financial statements to safeguard the interests of the general public, capital owners, and other stakeholders. Hence, this demonstrates a keen interest in addressing topics related to establishing compatible standards that align with these objectives.

Most previous research has examined the relationship between firms' value and conditional and unconditional accounting conservatism. In the domestic literature and developed markets, notable works like Asadi and Bayat (2015) have explored these aspects. In contrast, studies in developed markets, such as Dhaliwal et al. (2014), have predominantly concentrated on the association between Product Market Competition (PMC) and conditional conservatism. However, the current study delves into the effects of various competition aspects on both types of accounting conservatism. The remainder of this paper is structured as follows: Section 2 provides an overview of the relevant literature and outlines the paper's hypotheses. Section 3 elaborates on the data and the empirical methodologies employed. Section 4 presents our findings, Section 5 provides a detailed discussion of the results, and Section 6 concludes and summarizes the paper.

2. Theoretical Framework and Hypothesis Development

Early research on Product Market Competition (PMC) primarily emphasized its impact on prices and economic efficiency, as seen in the seminal contributions of scholars such as Chamberlain (1933), Robinson (1933), Fellner (1949), Alchian (1950), and Stigler (1958). In recent years, researchers have extended their focus to examine how competition influences corporate investment decisions (Indrarini Laksmana and Ya-wen Yang, 2015) and its impact on R&D investment and stock returns (Gu, 2016). This study delves into the intricate relationship between PMC and a firm's choice regarding accounting conservatism, aiming to provide insights into the multiple channels through which PMC can affect both conditional and unconditional conservatism. Traditionally, accounting conservatism has been defined as the practice of refraining from recognizing gains until all losses have been acknowledged. This foundational concept has its roots in Bliss's work from 1924. Accounting conservatism can be categorized into two primary types. The first type, often referred to as "exposure conservatism," is also known as news conservatism, conditional conservatism, and asymmetric timely recognition of losses and gains. This form of conservatism significantly impacts the income statement. The second type of conservatism is labeled "ex-ante conservatism." It operates independently of external news and is commonly referred to as unconditional conservatism. Exemplified by the application of specific accounting standards, this type of conservatism has a profound impact on the balance sheet and serves to reduce income regardless of current economic events. Accounting conservatism is a multifaceted concept, subject to various interpretations and viewpoints.

There are several views of accounting conservatism.

The primary definition associated with accounting conservatism emphasizes the significance of implementing conservative practices in financial reporting. Additionally, it underscores the advantages of this approach for businesses. To elucidate this definition, accounting scholars offer the following perspectives:

Certainly, here is the improved version of the text:

1. The Contractual view of conservatism pertains to contracts between firms and managers and between firms and external stakeholders.
2. The litigation view highlights the objective of minimizing shareholders' obligations.
3. The Consistency concept is relevant to the application of conservatism.
4. The interplay between reported earnings and taxation (tax concept of accounting conservatism).
5. The balance between reported earnings and potential costs (in the context of political cost and accounting conservatism).
6. The connection between PMC and reported information (product market competition view).

Watts (2003) suggests that the foundation of conservative reporting is rooted in economic considerations, which encompass the first four views of conservative reporting discussed earlier.

Several studies have delved into the elements of accounting conservatism in financial reporting. Beaver and Ryan (2005) offer models that measure the interplay between the two types of conservatism, conditional and unconditional conservatism, alongside other factors, investigating how they influence the asymmetric response of earnings to positive and negative share returns, shaping conservatism. Gassen et al. (2006) assert that two attributes of earnings, income smoothing and conditional conservatism, are fundamentally distinct, as they yield different distributions of results. Specifically, an increased emphasis on funding amplifies conditional conservatism, while a heightened focus on dividends leads to income smoothing. Moreover, Setayesh et al. (2013) report no statistically significant relationship between the negative coefficient of accumulated accruals (non-operational) and forecasted profit across various industries.

In alternative perspectives, Ball et al. (2000) propose that the legal framework of countries exerts an influence on the degree of conservatism in accounting reports, with common-law accounting systems demonstrating significantly higher conservatism compared to code-law accounting systems. Ahmed et al. (2002) contend that companies grappling with more pronounced conflicts regarding dividend policies tend to employ a higher degree of conservative accounting in their financial reports. In a subsequent study (2007), Ahmed discovered that governance mechanisms also impact the utilization of conservative accounting procedures.

Alternative perspectives include Porter (1980), who presents a market-centered approach where firms formulate strategies while considering competitive forces that influence their respective industries. In contrast to Hui et al. (2012), who examine the influence of a firm's major customers and suppliers on the demand for conditional conservatism, our study distinctively focuses on the competitiveness within a firm's industry. When considering prior research, we can categorize the factors influencing accounting conservatism into two main inquiries: first, market-level factors that encompass legal systems and the institutional environment, and second, firm-level factors, such as the firm's own demand for conservative reporting (unconditional conservatism). Consequently, it becomes evident that studies like Porter (1980), Ball et al. (2000), Ball et al. (2003), Guay and Verrecchia (2007), Lafond and Watts (2008, 2003), and Hui et al. (2012) primarily address the impact of market-level factors on accounting conservatism. Conversely, research by Ahmed et al. (2002), Ahmed (2007), and Beekes et al. (2004) focuses on the influence of firm-level factors on accounting conservatism.

The recent inquiry into accounting conservatism delves into the following empirical discoveries:

Empirical data from Cheng and Kung (2016) suggests that government-mandated corporate social

responsibility policies might effectively promote conservative financial reporting. Kim and Zhang (2015) discovered that conditional conservatism is linked to a reduced likelihood of future stock price crashes for firms. Within domestic literature, Asadi and Bayat (2015) scrutinized the correlation between conditional and unconditional conservatism in financial reporting and a firm's value. The empirical evidence implies that conditional and unconditional conservatism is positively associated with a firm's value. In other words, the more conservative practices managers employ, the higher the value of their companies. Furthermore, Mashayekh and Kazemi (2015) assert that the quality of accounting information, particularly in terms of conservatism, has remained relatively unchanged in the period both before and after the development of national standards. Furthermore, Etemadi and Montazeri (2013) propose that, in both static and dynamic analyses, there exists a positive association between PMC and capital structure. This suggests that companies operating in competitive environments tend to carry more debt in their capital structures.

The definition of a market encompasses a regular gathering of people to purchase and sell provisions, livestock, and other commodities. For instance, international stock markets deal with international telecommunications, so they do not require a physical residence. A competitive market is one where a multitude of informed stock buyers and sellers engage in transactions without any party exerting influence over share prices. In a competitive market, firms must choose efficient methods to achieve higher quality and lower prices. This ensures economic resources are used efficiently, resulting in gains for all economic sectors. Cupian and Muhamad Abduh (2017) affirm that the Islamic banking industry in Indonesia operates with a higher degree of market power, leading to a less competitive market. Islamic banks earn revenues in a monopolistic competition environment over the tested period. Their study's results also suggest a negative but insignificant relationship between concentration and competition, indicating that, in recent years, the market power of leading firms in the Indonesian Islamic banking industry has diminished. Gu (2016) observes that a standard real options model predicts a strong positive interaction effect between research and development (R&D) investment and PMC (Profit Margin Changes). He also observes that R&D-intensive firms tend to exhibit higher risk and earn higher expected returns than R&D-weak firms, especially within competitive industries. Louati and Boujelbene (2015) assert that heightened competition in the Islamic banking sector enhances overall banking stability.

One of the most justifiable aspects of applying accounting conservatism is PMC (Profit Margin Changes). Financial reporting must adhere to Generally Accepted Accounting Principles (GAAP) and accounting standards. Furthermore, disclosing some information is voluntary; as a result, financial reporters may include creative or conservative information selected from among accepted accounting procedures. Financial information providers can choose between these procedures to respond to different situations, such as intense competition or financing intentions. This paper addresses how variations in PMC affect the application of accounting procedures, whether conservative or creative. Four reasons outlined below suggest that PMC positively influences accounting conservatism. Dhaliwal et al. (2014) discovered that intense competition in the market enhances the information environment for all parties, including beneficiaries and firms. Additionally, intense competition exposes firms to the risk of liquidation and removal from competitive markets.

Hence, firms endeavor to establish effective contracts associated with a demand for accounting conservatism (Watts 2003). Ahmed et al. (2002) demonstrate that an increase in debt results in a greater demand for accounting conservatism, as it reduces capital expenditures arising from liabilities. Consequently, firms in competitive industries are more inclined to opt for conservative procedures. In highly competitive environments, if management decisions do not align with shareholders' interests, the firm faces the risk of being removed from the market (Ball and Shiva Kumar, 2005). Therefore, applying accounting conservatism serves to deter managers from investing in projects with

negative net present value. This timely recognition of losses keeps shareholders informed about the suitability of their invested projects. Furthermore, accounting conservatism is a deterrent to the premature recognition of positive news. These constraints prevent managers from overestimating a firm's profit and assets, reducing potential issues in competitive markets. Lastly, another important aspect suggests that firms operating in monopoly markets tend to adopt a higher level of conservatism due to political and regulatory costs.

Companies aim to escape competition from both existing rivals and the potential threat posed by new entrants in their industry. To achieve this, the timely disclosure of unfavorable news prompts uninformed competitors to scale back their production. Consequently, the revelation and acknowledgement of bad news create a competitive disadvantage for newcomers. In simpler terms, unanticipated bad news is viewed by unaware competitors as a sign of reduced future demand.

Competition typically manifests in two distinct forms: the first involves competition to deter potential newcomers from entering the market, where listed firms in the industry collaborate to block potential entrants. The second form revolves around competition among the existing industry players, where companies within the same sector vie against each other. Companies resort to conservative accounting practices to mitigate competitive threats regardless of the form.

Darrough and Stoughton (1990), Feltham and Xie (1992), and Evans and Sridhar (2002) propose that the information disclosed in financial statements is accessible to all users, including competitors. This information undergoes evaluation by the market and significantly influences stock prices, future expectations regarding a company's performance, product pricing, and sales volume. When companies emphasize positive news and attempt to mitigate negative news, it substantially impacts future expectations. As a result, stock prices increase, satisfying stakeholders. However, this strategy can lead to the entry of new competitors into the industry. Conversely, if companies downplay good news and emphasize bad news, stock prices decrease, reducing the threat of new competitors entering the market. When new competitors enter, the industry may need to allocate some of its sales volume to accommodate them. Consequently, firms must strike a balance between these potential threats and benefits. Thus, the question arises: should companies maximize the wealth of stakeholders by employing creative accounting (resulting in an increase in stock price and the threat of new competitor entry) or conservative accounting (leading to a decrease in stock price and a reduced threat of new competitors entering the market)?

In addressing this question, Darrough and Stoughton (1990) present an incomplete information model that suggests the selective disclosure of good news while emphasizing the necessity to reveal certain bad news. This approach aligns with the principles of accounting conservatism, which mandate the presentation of both favorable and unfavorable information. However, accounting standards tend to emphasize recognizing good news more than bad news.

Furthermore, Darrough (1993) demonstrates that companies are more inclined to report adverse news related to primary costs in competitive markets where product substitutability is higher. When firms disclose elevated primary costs in highly competitive environments, the market adjusts product prices and sales volume. On the one hand, this encourages firms in the industry to increase prices, while on the other, it convinces consumers to accept higher prices, ultimately leading to increased shareholder satisfaction. Additionally, all publicly listed companies in a given market aim to overstate primary costs or reduce sales prices. This strategic choice enables them to maximize shareholder profits, resulting in an overstatement of primary costs and reduced sales prices. Consequently, the ratio of sales to gross profit or primary cost decreases. It is also anticipated that in competitive markets or those with a higher degree of product substitutability, the ratio of sales to primary cost (gross income) will be lower than in other markets.

In addition to these two aspects, the political costs argument suggests that monopolistic firms opt

for more prompt recognition of losses over earnings to evade the risks and penalties associated with regulatory scrutiny. In essence, in industries with less competition, companies are more inclined to employ conservative accounting practices in their financial reports. Furthermore, the political costs perspective implies that leaders in monopoly industries are more likely to implement higher conditional conservatism, as they are at greater risk of facing regulatory scrutiny. Lara et al. (2009) have noted an increase in conditional conservatism following regulatory changes. Dhaliwal et al. (2014) propose that discouraging new and existing competitors predicts a positive impact of Profit Margin Changes (PMC) alongside the governance and political cost considerations that indicate a negative relationship. Moreover, distinguishing between industry leaders and followers allows these alternative causal explanations to be differentiated. It is expected that as the level of business transactions increases in developing countries, Profit Margin Changes (PMC) will rise rapidly.

Several investigations have explored the relationship between Profit Margin Changes (PMC) and the level of accounting conservatism adoption. Muhammad et al. (2017) propose that intense competition and non-price competition contribute to increased conservatism. They also advocate a positive correlation between competition from existing or potential rivals and adopting accounting conservatism. Mahdavi and Momtazian (2014) point out that there is generally a significant relationship between PMC indicators and two criteria for unconditional accounting conservatism: the ratio of total accruals before depreciation divided by average total assets and the ratio of book value divided by the market value of firms' net assets. This suggests that as competition increases in various industries, companies tend to apply conservatism in financial reporting in response to competitive pressures, reducing profit, regardless of current economic conditions. Iatridis (2011) finds that, due to high agency concerns in small firms, accounting conservatism is more prevalent compared to larger companies. Therefore, intense competition is associated with a higher degree of conservatism in financial reports, particularly in small firms. Furthermore, Folsom (2009) discovers that the level and intensity of market competition influence the adoption of conservative reporting practices in financial statements. He concludes that firms are more inclined to adopt accounting conservatism in highly competitive environments. Firms facing significant competition from existing rivals within their own industry tend to recognize losses more swiftly. This is done to deter over-production by these firms or encourage under-production (Clinch and Verrecchia 1997). Conversely, other arguments delve into the relationship between competition and conditional conservatism. In monopolistic settings, firms encounter more substantial political costs compared to those in competitive industries (Watts and Zimmerman 1986). Consequently, there is a greater incentive for larger firms in less competitive industries to employ more conservative practices in order to avoid regulatory scrutiny. Zimmerman (1983) suggests that larger companies apply accounting conservatism to reduce political costs, implying a negative association between Profit Margin Changes (PMC) and accounting conservatism. Hagerman and Zmijewski (1979) also propose that firms in monopoly markets tend to adopt a more conservative approach in their financial reporting. In domestic research, Kordlor and Shahriary (2010) similarly find a negative association between PMC and accounting conservatism.

In this current study, focusing on another facet of conservatism, we examine the correlation between initial loan sales in the secondary loan market and the accounting conservatism of borrowing firms (Deng et al. 2017). The findings reveal a significant reduction in accounting conservatism among borrowing firms following the initial loan sales. They demonstrate that this decline in borrower conservatism is more pronounced for firms borrowing from lenders with lower monitoring incentives and firms with a reduced motivation to apply conservatism. Contrastingly, Aven (2016) contends that accounting conservatism should not be employed as a means to assess risk. In another study, Lu and Trabelsi (2013) investigate information asymmetry and accounting conservatism in the context of IFRS adoption. Their results indicate that the level of accounting conservatism decreases

after the mandatory adoption of IFRS. However, IFRS adoption is likely to diminish the relationship between information asymmetry and accounting conservatism. LaFond and Watts (2008) argue that information asymmetry between insiders of a firm and outside equity investors gives rise to conservatism in financial statements. This, in turn, reduces a manager's incentives and capacity to manipulate accounting figures, subsequently mitigating information asymmetry and the associated deadweight losses.

Therefore, examining the under-influenced elements, such as conservatism is justified. For this purpose, the following hypotheses are presented in order to explore a deeper understanding of PMC's effect on conditional and unconditional accounting conservatism:

H₁: PMC has an impact on conditional conservatism.
H₂: PMC has an impact on unconditional conservatism.

3. Research Methodology

3.1. Sample selection

Given the consistent growth in business trade on the Tehran Stock Exchange in recent years, this study utilizes financial and market data for listed companies as presented in Table 1. Only manufacturing firms are included in the sample to ensure accuracy in measuring concentration within an industry's Profit Margin Changes (PMC). Additionally, industries with fewer than three firm-years are excluded from the primary analyses to mitigate potential bias arising from industry decline.

Table 1. List of industries and firm years

Industries	Firm years							
Automobiles and Parts	27	27	27	27	27	27	26	26
Nonmetal products	8	8	8	8	8	8	8	8
Cement, lime, plaster products	17	17	17	17	17	17	14	17
Manufacture of basic metals	17	17	17	17	17	17	16	15
Sugar products	3	3	3	3	3	3	3	3
Ceramic Tile products	10	10	10	10	10	10	9	8
Rubber and plastic products	9	9	9	9	9	9	9	9
Electric equipment	5	5	5	5	5	5	5	5
Equipment and machinery	3	3	3	3	3	3	3	3
Chemical products	17	17	17	17	17	17	15	15
Food except for sugar	5	5	5	5	5	5	5	5
Pharmaceutical	24	24	24	24	24	24	22	22
Total	145	145	145	145	145	145	135	136

3.2 Measure of conditional conservatism

To measure conditional conservatism, we begin with Basu's (1997) model, which is:

$$NI_t = \beta 0 + \beta 1\ RET_t * \beta 2\ NEG_t + \beta 3\ RET_t * NEG_t + € \quad (1)$$

In Model (1), the dependent variable, NI (reported earnings, including income after extraordinary items), is normalized by the market value of equity at the beginning of the fiscal year. The variable RET signifies the buy-and-hold return over the fiscal year and verifies publicly available information

about the firm's performance during the current year, including information known to the market before the annual earnings announcement (Ball et al. 2000, Basu 1997). The explanatory variable NEG is an indicator variable with a value of 1 if RET is negative and 0 otherwise. Negative returns (RET < 0) are utilized as a proxy for bad news, while positive returns (RET >= 0) represent good news. The concept of asymmetric timeliness in recognizing bad news implies a higher earnings sensitivity to bad news. This means that the slope coefficient related to stock returns (variable RET) is expected to be more pronounced for negative returns (often referred to as "bad news") compared to positive returns (often referred to as "good news"). The difference in the slope coefficients for variable RET, essentially the variance in the sensitivity of earnings to negative and positive returns, is captured by the slope coefficient denoted as b3 in the interaction variable RET*NEG. In summary, the variable RET, which denotes the buy-and-hold return throughout the fiscal year, distinguishes between good and bad news in the context of this analysis.

We extend Basu's (1997) model to examine the relationship between PMC and conditional conservatism empirically. The Model (2) incorporates the test variable along with other firm characteristics found in prior research to influence the extent of a firm's conditional conservatism:

(2)

$$
\begin{aligned}
NI_t = {} & \beta_{0+} \beta_1 PMC_{t-1} + \beta_2 SIZE_{t-1} + \beta_3 BM_{t-1} + \beta_4 LEV_{t-1} + \beta_5 ROA_{t-1} + \beta_6 BIG\_N_t + \beta_7 SH_{t-1} \\
& + \beta_8 NEG_t + \beta_9 NEG_t{*}PMC_{t-1} + \beta_{10} NEG{*}SIZE_{t-1} + \beta_{11} NEG_t{*}BM_{t-1} + \beta_{12} NEG_t{*}LEV_{t-1} \\
& + \beta_{13} NEG_t{*}ROA_{t-1} + \beta_{14} NEG_t{*}\, BIG\_N_t + \beta_{15} NEG_t{*}SH_{t-1} + \beta_{16} RET_t \\
& + \beta_{17} RET_t{*}PMC_{t-1} + \beta_{18} RET_t{*}SIZE_{t-1} + \beta_{19} RET_t{*}BM_{t-1} + \beta_{20} RET_t{*}LEV_{t-1} \\
& + \beta_{21} RET_t{*}ROA_{t-1} + \beta_{22} RET_t{*}BIG\_N_t + \beta_{23} RET_t{*}SH_{t-1} + \beta_{24} NEG_t{*}RET_t \\
& + \beta_{25} NEG_t{*}RET_t{*}PMC_{t-1} + \beta_{26} NEG_t{*}RET_t{*}SIZE_{t-1} + \beta_{27} NEG_t{*}RET_t{*}BM_{t-1} \\
& + \beta_{28} NEG_t{*}RET_t{*}LEV_{t-1} + \beta_{29} NEG_t{*}RET_t{*}ROA_{t-1} + \beta_{31} NEG_t{*}RET_t{*}\, BIG\_N_t \\
& + \beta_{31} NEG_t{*}RET_t{*}SH_{t-1} - fixed\ effects + €
\end{aligned}
$$

The additional variables specified in Model (2) are proxies for conservatism demand (Khan and Watts 2009) and are defined in Appendix 1.

The significance tests for this estimation rely on robust t-statistics, which have been adjusted to account for residual correlation arising from the pooling of cross-sectional observations across time. In Model (2), the coefficient β16 signifies the timeliness of earnings in response to positive news, while the coefficient β25 quantifies the additional timeliness of earnings when it comes to recognizing negative news. We do not anticipate a specific direction for the coefficient related to PMC due to conflicting arguments. On one hand, increased competition can lead to reduced profit margins, thereby negatively impacting earnings. On the other hand, if PMC enhances governance, it should result in increased profitability. To provide a comprehensive analysis, we also examine the coefficients β17 for RETPMC and β25 for RETNEG*PMC.

The coefficient β17 gauges the influence of PMC on the pace at which earnings reflect positive news. Similarly, the coefficient β25 quantifies the impact of PMC on the added swiftness of earnings in acknowledging negative news. Suppose PMC encourages firms to enhance their application of accounting conservatism. In that case, it is anticipated that companies in competitive industries will enforce stricter verification when recognizing gains and promote asymmetrically timelier loss recognition. From an empirical standpoint, stricter verification of positive news would lead to an anticipated negative value for β15, while asymmetrically timelier loss recognition predicts a positive value for β25. Conversely, if PMC diminishes accounting conservatism, then it is expected that β17 and β25 will exhibit positive and negative values, respectively.

3.3 Measure of unconditional conservatism

Unconditional conservatism is measured by the market-to-book ratio (Beaver and Ryan 2000):

$$\frac{EB}{EM} \quad (3)$$

The ratio is calculated by dividing the market value (EB) by the book value (EM) of shareholders' equity. Observations with negative values of the market-to-book ratio are excluded. The market-to-book ratio directly reflects the discrepancy between net assets and economic values, offering a straightforward method to gauge cumulative conservatism. We build upon the Beaver and Ryan (2000) model to empirically investigate the connection between PMC and unconditional conservatism.

Model (4) includes the test variable, along with other firm characteristics identified in prior research as factors influencing the extent of a firm's unconditional conservatism:

$$NNI_t = \beta_{0+} \beta_1 PMC_{t-1} + \beta_2 SIZE_{t-1} + \beta_4 LEV_{t-1} + \beta_5 ROA_{t-1} + \beta_6 BIG\_N + \beta_7 SH_{t-1} + € \quad (4)$$

3.4 Measure of PMC

The most commonly used measure of the degree of PMC in the industrial organization literature is the Herfindahl–Hirschman index (HHI), which is defined as follows:

$$H_j = \sum_{i=1}^{I} s_{ij}^2$$

Where S_{ij} is the market share of firm i in industry j, for each firm, the market share is computed based on its net sales relative to the total net sales of the industry to which it belongs. The firm market shares are then squared and summed for each industry. The above calculations are carried out for each year and each industry based on the Tehran stock exchange. Lower HHI values imply that the market is shared among many competing firms, while higher values imply that the market share is concentrated in the hands of a few large firms. For ease of exposition, a new variable PMC is created by multiplying H_j by a negative one.

$$PMC_j = (-1) * H_j$$

Higher values of PMC reflect more intense PMC, with each firm having a small product market share.

4. Empirical results

4.1 Descriptive statistics

Table 2 provides summary statistics for selected variables utilized in the empirical analysis. In this table, we have omitted the presentation of variables resulting from the multiplication of other variables. According to Table 2, the average firm in the sample belongs to an industry with a mean PMC value of 8.147. NI's dependent variable exhibits left-skewness, suggesting fewer firms report large accounting losses. The explanatory variable, RET, demonstrates a right-skewed distribution, with a mean value of 1.514, exceeding the median of 1.003. This indicates that stockholders have limited liability and cannot incur losses beyond their investment. The mean book-to-market ratio is 1.942, greater than its median of 1.756. The mean and median values for the size of the sample firms are 13.737 and 13.600, respectively. The variable SH has a mean value of 0.429, representing the sample's average presence of institutional investors. The LEV and ROA ratios, at 0.664 and 0.098, respectively, are higher than their respective medians of 0.651 and 0.090. Finally, the national

auditing organization audits about 27% of the sample firms.

Table 2. The descriptive Statistics

variable	Max	Min	Mean	1st Qu.	3rd Qu.	Median
PMC	-0.046	-0.559	-0.224	-0.295	-0.082	-0.201
NI	25.916	-15.791	8.147	9.226	12.218	11.044
RET	71.087	-72.376	1.514	-1.140	3.649	1.003
BM	113.391	-152.922	1.942	0.975	2.981	1.756
SIZE	19.009	10.505	13.737	12.840	14.450	13.600
SH	0.991	0.002	0.429	0.140	0.360	0.742
LEV	3.065	0.008	0.664	0.522	0.773	0.651
ROA	0.622	-0.718	0.098	0.034	0.165	0.090
BIG_N	1.000	0.000	0.267	1.000	1.000	1.000

4.2.1 Spearman and pearson correlations

Table 3 presents the yearly average of Spearman and Pearson correlations for the sample. The PMC measure demonstrates a positive correlation with NI and a negative correlation with NEG, suggesting that firms in highly competitive industries tend to achieve higher profit levels and experience less negative stock returns. Additionally, the negative correlation between PMC and SIZE indicates that competitive industries typically consist of smaller firms in contrast to more concentrated industries.

A positive correlation between PMC and BM implies that monopoly rents are reflected in the book value of equity. PMC and LEV exhibit a negative correlation, which is not surprising as intense PMC, by constricting profit margins, can limit a firm's debt-carrying capacity. While BIG_N does not show a significant correlation with PMC in Pearson's correlation, it does exhibit a positive correlation with PMC in Spearman's correlation, suggesting that firms in highly competitive markets are more inclined to engage the national auditing organization.

Furthermore, PMC and NI are significantly associated with SH and ROA, indicating that institutional investors tend to invest in profitable firms within highly competitive industries, thereby experiencing higher returns on assets. In line with Dhaliwal et al. (2014) and Ball and Brown (1968), NI is significantly related to RET and NEG, highlighting that earnings convey certain information reflected in returns. Moreover, NI displays positive correlations with SIZE and BIG_N, suggesting that, as expected, larger firms tend to report greater earnings and are more likely to be audited by the national auditing organization.

Spearman (Pearson) correlations are below (above) the diagonal. All correlations are reported as the average of annual cross-sectional correlations estimated in each year 2009–2016. Two-tailed p-values are based on averages and standard deviations of annual correlation coefficients. All variables are defined in Appendix 1.

4.2.2. Primary results of PMC and conditional conservatism

Table 4 summarises the results from statistical tests aimed at selecting the best regression model. The regression outcomes for different specifications of Model (2) are presented in Table 3. As data for all listed companies on the Tehran Stock Exchange is not available for the years under study, an unbalanced panel is employed for statistical analysis. The expectation is that PMC will have a positive impact on conditional conservatism. The statistical explanation is outlined below:

Table 3. Spearman and Pearson Correlations

variables	NI	PMC	SIZE	BIG_N	LEV	RET	NEG	SH	BM	ROA
NI	1	0.353	0.583	0.135	-0.326	0.134	-0.103	0.197	0.305	0.544
PMC	0.243	1	0.042	-0.008	-0.163	0.001	-0.015	0.112	0.230	0.377
SIZE	0.184	-0.034	1	0.264	0.057	-0.110	0.109	0.108	-0.096	0.027
BIG_N	0.035	0.020	0.291	1	0.121	-0.007	0.031	0.081	-0.043	-0.025
LEV	-0.279	-0.117	0.058	0.104	1	-0.015	0.023	-0.135	0.059	-0.636
RET	0.194	-0.027	-0.061	-0.014	-0.040	1	-0.835	0.001	0.213	0.022
NEG	-0.157	-0.027	0.085	0.031	0.019	-0.516	1	-0.019	-0.150	-0.017
SH	0.112	0.148	0.083	0.073	-0.120	0.004	-0.014	1	0.015	0.165
BM	-0.017	0.039	0.033	0.044	-0.009	0.055	-0.014	-0.028	1	0.361
ROA	0.412	0.301	0.029	-0.043	-0.593	0.057	0.000	0.210	0.026	1

Table 4. Regression test selection

Tests	Statistic amounts	Probability	H_0 Hypothesis	results
F (Limer)	2.430	0.000	Priority of Ols	Fixed effect
F (Limer)	2.450	0.005	Priority of Ols (IET[1])	Fixed effect
Hausman	29.800	0.480	Random effect Priority of	Random effect
Integration	48.700	0.000	integration capability	Inability
Godfrey	8.060	0.004	The absence of serial correlation	The presence of serial correlation(GRF)[2]

Regarding statistical tests at 0.05 level, the obtained probability of F (limer) and Hausman tests suggest that the fixed effects method should be used in the regression model.

The regression results for Model (2) are presented in Table 5. Column (1) displays the regression outcomes for a model that incorporates all PMC variables. The coefficient and p-value for negative returns, NEG*RET, are 1.698 and 0.133, respectively. This indicates that, on average, sample firms do not recognize losses more quickly than gains at the 0.01 significance level. Furthermore, the results for control variables, such as NEGRETSIZE, show a negative and statistically significant relationship at the 0.01 level. This suggests that larger firms tend to exhibit less conservatism than smaller firms, aligning with prior research findings (Dhaliwal et al. 2014). Conversely, the coefficient for NEGRETBM is not statistically significant, which contrasts with the perspective that conditional conservatism is influenced by prior conditional and unconditional conservatism (Beaver and Ryan 2005; Dhaliwal et al. 2014). The coefficient for NEGRETLEV is also not statistically significant, implying that a firm's leverage has no impact on the timeliness of recognizing bad news. Additionally, the coefficient for NEGRETROA is positively significant, indicating that firms with higher returns on assets are more likely to recognize bad news in a timelier manner. The coefficient for RETPMC is not statistically significant at the 0.01 level, suggesting that PMC does not delay the recognition of

1 Include Effect of time
2 Generalized random effect

gains. Lastly, the coefficients for NEGRET*PMC are not statistically significant at the 0.01 level. These results indicate that the level of PMC does not influence the delayed recognition of gains and, consequently, the timely recognition of losses.

Table 5. Regression results from PMC and conditional accounting conservatism

variables	coefficient	standard deviation	t-statistic	p-value
PMC	6.788	3.412	1.990	0.047*
SIZE	0.844	0.311	2.715	0.007*
BM	-0.148	0.065	-2.270	0.023*
LEV	-2.354	2.494	-0.944	0.345
ROA	23.944	4.108	5.828	0.000*
BIG_N	-1.397	4.970	-0.281	0.779
SH	0.071	1.337	0.053	0.958
NEG	6.811	6.102	1.116	0.264
RET	-0.122	0.671	-0.181	0.856
PMC*NEG	-1.290	4.465	-0.289	0.773
SIZE*NEG	-0.862	0.443	-1.948	0.051
BM*NEG	0.026	0.091	0.286	0.775
LEV*NEG	5.428	3.643	1.490	0.136
ROA*NEG	9.080	5.664	1.603	0.109
BIG*NEG	0.351	1.428	0.246	0.806
SH*NEG	-2.307	1.959	-1.178	0.239
PMC*RET	-0.090	0.536	-0.167	0.867
SIZE*RET	0.012	0.039	0.317	0.751
BM*RET	0.016	0.010	1.629	0.103
LEV*RET	-0.122	0.361	-0.338	0.735
ROA*RET	-0.278	0.511	-0.543	0.587
BIG*RET	-0.014	0.186	-0.073	0.941
SH*RET	0.053	0.222	0.239	0.811
NEG*RET	1.698	1.131	1.501	0.133
PMC*NEG*RET	-1.372	1.064	-1.290	0.197
SIZE*NEG*RET	-0.207	0.083	-2.484	0.010*
BM*NEG*RET	-0.065	0.036	-1.808	0.071
LEV*NEG*RET	1.827	0.988	1.850	0.064
ROA*NEG*RET	3.871	1.168	3.312	0.001*
BIG*NEG*RET	-0.089	0.310	-0.288	0.774
SH*NEG*RET	-0.739	0.512	-1.443	0.149

Table 6. The results of R2 and Durbin-Watson statistics

No	R^2	D.W	General regression model (F)		
			statistic	Prob	Result
Model 1	0.700	1.970	35	0.000	Generally, the model is significant.

The presented results in Table 6 show that the regression model is significant for the whole model.

4.2.2. Primary results of PMC and unconditional conservatism

The regression outcomes for various specifications of Model (4) are detailed in Table 7. Due to the unavailability of data for all sample firms on the Tehran Stock Exchange market for the years under study, an unbalanced panel is employed for statistical analysis. In alignment with the strategy of unconditional conservatism, no relationship between PMC and unconditional conservatism is anticipated. The statistical explanation is presented below:

Table 7. Regression test selection

Tests	Statistic amounts	Probability	H0 Hypothesis	Results
F (Limer)	1.051	0.334	Priority of Ols	Ols
F (Limer)	0.938	0.676	Priority of Ols(IET)[1]	Priority of Ols(IET)
Kolmogorov-smirnov	0.394	0.000	Priority of Ols	Gls
Durbin–Watson	1.866	0.0143	Priority of Ols	Gls
Ols	5896.453	5939.941	-2939.227	ols
Ols(ITE)	5886.743	5964.055	-2927.372	

Regarding the statistical test at 0.05 level, the obtained probability of the above table tests suggests that the Ols method should be used in the regression model.

Table 8. Regression results from PMC and unconditional accounting conservatism

Variables	Coefficient	Standard Deviation	T-statistic	P-value
PMC	1.512	1.555	0.972	0.331
SIZE	-0.181	0.158	-1.150	0.250
BM	0.197	0.030	6.590	0.000*
LEV	3.813	1.351	2.822	0.005*
ROA	0.056	2.258	0.025	0.980
BIG_N	3.563	2.478	1.438	0.151
SH	-1.110	0.648	-1.713	0.087

Table 9. The results of R2 and Durbin-Watson statistics

No	R^2	D.W	General regression model (F)		
			Statistic	Prob	Result
Model 2	0.420	1.820	126	0.000	Generally, the model is significant.

The presented results in Table 6 show that the regression model is significant for the whole model.

1. Include Effect of time

Table 10. The VIF results for all independent variables

The variables	VIF
PMC	3.929
LEV	2.210
BM	2.600
SIZE	4.688
ROA	2.023
SH	2.419
BIG_N	5.248
NEG	2.989

The presented results in the table indicate that as all the values of the VIF index are less than 8, there is no multicollinearity between variables.

The regression results for Model (4) are displayed in Table 8. In Column (4), you will find the regression outcomes for a model encompassing all PMC variables. The coefficient for PMC and its associated p-value is not statistically significant at the 0.01 level, indicating that the market competition level does not affect unconditional conservatism. The variable SIZE also lacks statistical significance at the 0.01 level, signifying that the firm's size does not impact unconditional conservatism, which aligns with Model (3) findings. Additionally, the results demonstrate a positive association between BM and unconditional conservatism, suggesting that unconditional conservatism is influenced by prior conditional and unconditional conservatism. A significant and positive coefficient on LEV suggests that firms with higher leverage exhibit increased timeliness in recognizing costs. Conversely, the coefficient for BIG_N is not statistically significant at the 0.05 level, indicating that the presence of the national auditing organization has no effect on the adoption of unconditional conservatism, which is in line with the results from Model (3). Finally, the coefficient for SH is not statistically significant. In summary, these results collectively suggest that the level of PMC does not influence the adoption of unconditional conservatism.

5. Discussion and Conclusion

This study aims to investigate the impact of competition on accounting conservatism, specifically the timely recognition of losses in an asymmetric manner. It delves into the distinct implications of conditional and unconditional conservatism in shaping accounting practices. Achieving effective management within a company requires securing its future sustainability and profitability. The emergence of new competitors is an inevitable trend in product markets, especially in emerging markets experiencing increased competition. Furthermore, the existing literature presents a mixed perspective on the influence of competition on conservatism. Consequently, this study underscores the importance of innovating and generating fresh insights concerning the interplay of competition, conditional and unconditional conservatism. The findings presented here make a valuable contribution to the literature on the application of accounting conservatism in competitive markets. They highlight the effectiveness of a competitive environment in influencing the adoption of conservative accounting procedures.

According to the findings, the results have significant implications for managers, analysts, investors, tax authorities, and standard setters. Adopting a conservative approach when reporting in competitive conditions is advisable from a managerial perspective. Furthermore, to enhance market expectations regarding future business performance, it is desirable to reduce conservatism in financial reporting when financing through equity. Conversely, conservative reports ensure the recognition of all incurred expenses and only realized incomes. Therefore, in a competitive industry where more conservative approaches are employed, the financial situation of firms provides signals to investors

and analysts, indicating that these firms' situations are more favorable than what is presented in financial statements. Consequently, this enhances the accuracy and reliability of financial reports for investors. In other words, the presence of accounting conservatism in financial statements helps prevent fraudulent reporting, ultimately leading to the maximization of stockholders' wealth. For tax authorities, the adoption of conservative approaches is also of utmost importance. This is because the financial situation appears more favorable than what is reported, leading to the expectation of higher taxable income. Finally, since the objective of standard-setting is to provide fair information, the impact of competition on presenting unbiased information (which may involve employing more conservatism than usual) should be counteracted.

The findings suggest that the presence of Product Market Competition (PMC) does not significantly impact the implementation of conditional conservative procedures. In other words, firms in more competitive industries are not inclined to recognize losses more quickly than gains. The results of this study contradict the findings of Muhammad et al. (2017), Dhaliwal et al. (2014), Iatridis (2011), Folsom (2009), Watts (2003), Ahmed et al. (2002), Darrough (1993), Clinch and Verrecchia (1997), which suggest a positive association between intense competition in product markets and the use of conditional conservatism. Conversely, research by Hagerman and Zmijewski (1979), Zimmerman (1983), Watts and Zimmerman (1986), and Kordlor and Shahriary (2010) indicate that firms in absolute monopoly markets are more likely to recognize losses more quickly than gains. This is attributed to political and regulatory considerations.

Furthermore, we have observed that competition within an industry does not influence unconditional conservatism. These findings contrast with the results of Mahdavi and Momtazian (2014), who suggested a significant relationship between Product Market Competition (PMC) indicators and unconditional accounting conservatism. Specifically, as competition intensifies in any industry, companies tend to apply conservatism in their financial reporting due to competitive pressures, leading to reduced profits independent of current economic conditions. In contrast, our current findings align with the theory of unconditional conservatism, indicating that unconditional conservatism is not contingent on external news. Instead, it can be applied by considering a firm's financial policies. We have also discovered a positive association between the book-to-market ratio and unconditional conservatism. This suggests that both prior conditional and unconditional conservatism influences unconditional conservatism.

This paper investigates how existing competition within an industry influences the adoption of conservative approaches by firms operating within that industry. The underlying rationale for these findings suggests two alternative implications. The first implication proposes that firms facing intense competition from existing rivals may be inclined to recognize losses more promptly than gains. This may be done to deter over-production by rival firms or to incentivize them to produce less. On the other hand, a contrasting view suggests that firms are more likely to embrace conservatism as a strategic move to enhance their competitive standing against potential new entrants. The underlying reasoning for these findings is rooted in the capital structure of emerging markets. This implies that undisclosed factors may influence the application of varying levels of accounting conservatism in financial reporting within the Tehran Stock Exchange, in contrast to more developed countries. To underscore the significant impact of accounting conservatism and competition, it is recommended that future research considers the use of other determinants to measure these variables. Additionally, evaluating the effects of cost stickiness on these factors and examining the relationship between other aspects of competition and both conditional and unconditional conservatism should be explored in subsequent investigations.

Certain conditions are often beyond the researchers' control during an empirical study. In this context, the control variable "type of industry" is omitted because it's not feasible to measure

competition separately across various industries. The level of competition within an industry is influenced by several factors, including the expertise of the labor force, but these elements are excluded due to their qualitative nature.

References

1. Ahmed, A. and Duellman, S. (2007), Accounting conservatism and board of director characteristics: An empirical analysis, *Journal of Accounting and Economics*, 43(5), pp. 411-437. https://doi.org/10.1016/j.jacceco.2007.01.005
2. Ahmed, A., Billings, B.K. Morton. R.M. and Stanford-Harris. M. (2002), The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *The Accounting Review*, 77(4), pp. 867–890. https://doi.org/10.2308/accr.2002.77.4.867
3. Alchian, A. A. (1950). "Uncertainty, evolution, and economic theory", *Journal of Political Economy*, 58(3), pp. 211– 221. https://doi.org/10.1016/j.jacceco.2007.01.005
4. Asadi. Gh. and Bayat, M. (2015), The effect of conditional and unconditional conservatism on firm's value, *Management Accounting*, 19(67), pp. 1-14 (In Persian).
5. Aven, T. (2016), On the use of conservatism in risk assessments, *Reliability Engineering & System Safety*, 146, pp. 33-38.
6. Ball, B. and Brown, P. (1968), An Empirical Evaluation of Accounting Income Numbers, *Journal of Accounting Research*, 6(2), pp. 159-178.
7. Ball, R. and Shivakumar, L. (2006), The role of accruals in asymmetrically timely gain and loss recognition, *Journal of Accounting Research*, 44(2), pp. 204–242. https://doi.org/10.1111/j.1475-679X.2006.00198.x
8. Ball, R. Kothari S.P. and Robin, A. (2000), The effect of international institutional factors on properties of accounting earnings; *Journal of Accounting & Economics*, 29(1), pp. 1-52. https://doi.org/10.1016/S0165-4101(00)00012-4
9. Ball, R. Robin, S.P. Wu, J.S. (2003), Incentives versus standards: properties of accounting income in four East Asian countries, *Journal of Accounting and Economics*, 36(1-3), pp. 235-270. https://doi.org/10.1016/j.jacceco.2003.10.003
10. Ball, R. S. and Shivakumar, L. (2005), Earnings quality in U.K. private firms: Comparative loss recognition timeliness, *Journal of Accounting and Economics*, 39(1), pp. 83–128. https://doi.org/10.1016/j.jacceco.2004.04.001
11. Basu, S. (1997), The conservatism principle and the asymmetric timeliness of earnings, *Journal of Accounting and Economics*, 24(1), pp. 3–37. https://doi.org/10.1016/S0165-4101(97)00014-1
12. Beaver, W. H. and Ryan, S. G. (2005), Conditional and unconditional conservatism: Concepts and modeling, *Review of Accounting Studies*, 10(2–3), pp. 269–309.
13. Beaver, W.H. and Ryan, S.G. (2000), Biases and log sin book value and their effects on the ability of the book–to–market ratio to predict book return on equity, *Journal of Accounting Research*, 38(1), pp. 1359-1373. https://doi.org/10.2307/2672925
14. Beekes. W. Pope. P. and Young, S. (2004), The Link between Earnings Timeliness, Earnings Conservatism and Board Composition: evidence from the UK, *Corporate Governance*, 12, pp. 47-59. https://doi.org/10.1111/j.1467-8683.2004.00342.x

15. Bliss J. H. (1924), Management Through Accounts, *The Ronald Press Co*., and *New York*.
16. Chamberlain, E. (1933).The theory of monopolistic competition: A reorientation of the theory of value. Cambridge: *Harvard University Press*.
17. Cheng, C.L. and Kung, F.H. (2016), The effects of mandatory corporate social responsibility policy on accounting conservatism, *Review of Accounting and Finance*, 15(1), pp. 2–20. https://doi.org/10.1108/RAF-12-2014-0135
18. Clinch, G. and Verrecchia, R. E. (1997), Competitive disadvantage and discretionary disclosure in industries, *Australian Journal of Management*, 22(2), pp. 125–137.
19. Cupian, A. and Abduh, M. (2017), Competitive condition and market power of Islamic banks in Indonesia, *International Journal of Islamic and Middle Eastern Finance and Management*, 10(1), pp.77-91. https://doi.org/10.1108/IMEFM-09-2015-0098
20. Darrough, M. (1993), Disclosure policy and competition: Cornet vs. Bertrand, *Accounting Review*, Vol. 68, pp. 534–561.
21. Darrough, M. N. and Stoughton, N. M. (1990), Financial disclosure in an entry game, *Journal of Accounting and Economics*, 12(1-3), pp. 219–243. https://doi.org/10.1016/0165-4101(90)90048-9
22. Deng, S., Li, Y., Lobo, G. J., and Shao, P. (2018). Loan sales and borrowers' accounting conservatism. *Contemporary Accounting Research*, 35(2), pp. 1166-1194. https://doi.org/10.1111/1911-3846.12408
23. Dhaliwal, D. Huang, SH. Khurana, I.K. and Pereira. R. (2014), PMC and accounting conservatism, *Review of Accounting Studies*, 19(4), pp. 1309-1345.
24. Etemadi, H. and Montazeri, J. (2013), The effective factors on capital structure of listed firms in Tehran stock exchange market, *Journal of the Accounting and Auditing Review*, 20(3), pp. 1-26. (In Persian).
25. Evans, J.H. and Sridhar, S.S. (2002), Disclosure-disciplining mechanisms: Capital markets, product markets, and shareholder litigation, *The Accounting Review*, 77(3), pp. 595-626. https://doi.org/10.2308/accr.2002.77.3.595
26. Fellner, W. (1949), competition among the few: Oligopoly and similar market structures. New York: Knopf.
27. Feltham, G.A. and Xie, J.Z. (1992), Voluntary financial disclosure in an entry game with continues of types, *Contemporary Accounting Research*, 9(1), pp. 46-80. https://doi.org/10.1111/j.1911-3846.1992.tb00869.x
28. Folsom, D.M. (2009), Competitive Structure and Conditional Accounting Conservatism, A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy degree in Business Administration in the Graduate College of The University of Iowa"; online; https://doi.org/10.1111/j.1468-5957.2008.02122.x
29. Gassen, J. Fülbier, R. U. and Thorsten, S. (2006), International differences in conditional conservatism – The role of unconditional conservatism and income smoothing, *European Accounting Review*, 15(4), pp. 527-564. https://doi.org/10.1080/09638180601102107
30. Gu, L. (2016), PMC, R&D investment, and stock returns, *Journal of Financial Economic*, 119(2), pp. 441-445. https://doi.org/10.1016/j.jfineco.2015.09.008
31. Guay, W. R., and Verrecchia, R. E. (2018). Conservative disclosure. *Journal of Financial Reporting*, 3(1), pp. 73-92. http://ssrn.com/abstract=995562.

32. Hagerman, R.L. and Zmijewski, M. (1979), Some Economic Determinants of Accounting Policy Choice, *Journal of Accounting and Economics*. 1(2), pp. 141-161. https://doi.org/10.1016/0165-4101(79)90004-1
33. Hui, K.W. Klasa, S. and Yeung, P. E. (2012), Corporate suppliers and customers and accounting conservatism, *Journal of Accounting and Economics*, 53(1-2), pp. 115–135. https://doi.org/10.1016/j.jacceco.2011.11.007
34. Iatridis, G.E. (2011), Accounting disclosures, accounting quality and conditional and unconditional conservatism, *International Review of Financial Analysis*, 20(2), pp. 88–102. https://doi.org/10.1016/j.irfa.2011.02.013
35. Khan, M. and Watts, R. L. (2009), Estimation and empirical properties of a firm-year measure of accounting conservatism, *Journal of Accounting and Economics*, 48(2–3), pp. 132–150. https://doi.org/10.1016/j.jacceco.2009.08.002
36. Kim, J.B. and Zhang, L. (2015), Accounting Conservatism and Stock Price Crash Risk: Firm-level Evidence. University of Hong Kong, *Contemporary Accounting Research*, 33(1), pp. 412-441. https://doi.org/10.1111/1911-3846.12112
37. Kordlor, A.E. and Shahriary, A.R. (2010), The investigation between political costs (the political hypothesis and conservatism in Tehran Exchange Market), *Journal of the accounting and auditing review*, 16(57), pp. 3-16 (In Persian)
38. LaFond, R. and Watts, R. L. (2008), The information role of conservative financial statements, *The Accounting Review*, 83(2), pp. 447–478.
39. Lara, J. M. G., Osma, B. G., and Penalva, F. (2009). The economic determinants of conditional conservatism. *Journal of Business Finance & Accounting*, 36(3-4), pp. 336-372.
40. Louati, S., and Boujelbene, Y. (2015). Banks' stability-efficiency within dual banking system: a stochastic frontier analysis. International Journal of Islamic and Middle Eastern Finance and Management, 8(4), pp. 472-490. https://doi.org/10.1108/IMEFM-12-2014-0121
41. Lu, C. and Trabelsi, S. (2013), Information Asymmetry and Accounting Conservatism under IFRS Adoption, *CAAA Annual Conference 2013*. SSRN: https://ssrn.com/abstract=2201206
42. Mahdavi, Gh. and Momtazian, A. (2014), Investigating the Relationship between PMC and Unconditional Accounting Conservatism (Case Study: Companies listed on Tehran Stock Exchange), *Asian Journal of Research in Banking and Finance*, 4(9), pp. 13-27.
43. Mashayekh, Sh. and Kazemi, L. (2015), The effect of applying Iranian accounting standards on the level of conservatism in disclosing accounting information, *Journal Accounting Researches*, 21, pp. 37-50. (In Persian).
44. Muhammad, A. Xian-zhi, Z and Zhaonan, W. (2017), PMC, regulatory changes, ownership structure and accounting conservatism: Evidence from China, *Chinese Management Studies*, 11(4), pp. 658-688.
45. Porter, M. E. (1980). Techniques for analyzing industries and competitors. Competitive Strategy. New York: Free Press USA.
46. Qiang, X. (2007), The Effects of Contracting, Litigation, Regulation, and Tax Costs on Conditional and Unconditional Conservatism: Cross Sectional Evidence at the Firm Level, *The Accounting Review*, 82(3), pp. 759-796.
47. Robinson, J. (1933), The economics of imperfect competition. Working paper, London, Macmillan.
48. Roychowdhury, S. and Watts, R. L. (2007), Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting, *Journal of Accounting and Economics*, 44(1-2), pp. 2–31. https://doi.org/10.1016/j.jacceco.2006.12.003

49. Setayesh, M.H.and Shams, K., (2013), The investigation into influential structure on the level of accounting conservatism in listed firm of Tehran Stock Market, *Journal of Accounting Knowledge*, 4(14), pp. 109-127. (In Persian).
50. Stigler, G. J. (1958), The economies of scale. *Journal of Law and Economics*, 1, pp. 54–71.
51. Watts, R.L. (2003), Conservatism in accounting, part I: Explanations and implications, *Accounting Horizons*, 17(3), pp. 207–221. https://doi.org/10.2308/acch.2003.17.3.207
52. Watts, R.L., and Zimmerman, J.L. (1986), Positive Accounting Theory. New Jersey, Prentice Hall.
53. Zimmerman J.L. (1983), Taxes and Firm Size, *Journal of Accounting and Economics*, 5, pp. 119-149. https://doi.org/10.1016/0165-4101(83)90008-3

Appendix 1: variable Definitions

Dependent Variable:

NI: Net income after extraordinary items deflated by the beginning of the fiscal year market value of equity.

NNI: book value of equity dividend by market value of equity.

Test Variable:

PMC: A proxy for the extent of PMC

Control Variables:

SIZE: Natural logarithm of market value of equity.

BM: Book-to-market ratio computed as the book value of common equity scaled by market value at the beginning of the fiscal year.

LEV: Debt-to-asset ratio at the beginning of the fiscal year common equity at the beginning of the fiscal year

BIG_N: 1 if the auditor is a national auditing organization for the current fiscal year and 0 otherwise.

ROA: Net income in the year dividend by total asset.

SH: Percentage of Institutional investor