

Examining the Moderating Role of Firm Complexity in the Relationship between Integrated Reporting and Investor Sentiment with Stock Price and Earnings Management

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ABSTRACT

The purpose of the present study is to examine the moderating role of firm complexity in the relationship between integrated reporting and investor sentiment with stock price and earnings management in companies listed on the Tehran Stock Exchange. In terms of purpose, the study is applied, and in terms of method, it is descriptive-correlational. The spatial scope includes companies listed on the Tehran Stock Exchange. The statistical sample of the study consists of 126 companies during the years 2016 to 2024. The required information in this study was collected from financial statements published on the website of the Tehran Securities and Exchange Organization. The tests of this study were conducted using EViews software. The data were collected through both library and field methods. Multiple regression was used to test the research hypotheses. The results showed that there is a significant relationship between investor sentiment and earnings management and stock price. There is a significant relationship between integrated reporting and stock price. There is a significant relationship between integrated reporting and earnings management considering the moderating role of firm complexity. There is a significant relationship between integrated reporting and stock price considering the moderating role of firm complexity. There is a significant relationship between investor sentiment and stock price considering the moderating role of firm complexity.

Keywords: firm complexity, integrated reporting, investor sentiment, stock price, earnings management

Introduction

In contemporary capital markets, corporate information has become a strategic resource that shapes investor expectations, market valuation, and managerial reporting incentives. Traditional financial statements, while essential for assessing profitability, liquidity, leverage, and cash-flow generation, are no longer sufficient to capture the multidimensional value-creation process of modern firms. Firms are increasingly evaluated not only through historical financial performance but also through their governance quality, environmental accountability, social responsibility, risk exposure, business-model resilience, and ability to communicate long-term value creation. This change has strengthened the importance of integrated reporting as a broader disclosure mechanism that connects financial and non-financial information and presents a more comprehensive picture of corporate performance, strategy, governance, risks, opportunities, and sustainability-related outcomes. Integrated reporting has therefore



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been introduced as a response to the limitations of fragmented disclosure systems and as a means of improving information transparency, reducing information asymmetry, and supporting more informed capital-market decisions. Prior research has emphasized that integrated reporting can enhance the quality, completeness, balance, and usefulness of corporate reporting by linking sustainability management with financial communication and by helping stakeholders understand how organizations create value over time (1-5).

The growing attention to integrated reporting is also rooted in its potential capital-market consequences. When firms provide higher-quality integrated reports, investors may obtain richer information about the firm's strategy, resource allocation, environmental and social commitments, governance mechanisms, and long-term risk profile. This may improve investors' ability to evaluate firm value, forecast future performance, and distinguish between substantive value creation and short-term accounting signals. Empirical evidence indicates that integrated reporting quality may be associated with favorable economic consequences, including improved capital-market perceptions, higher firm valuation, and real effects on corporate behavior (6). Similarly, the association between integrated reporting and firm valuation suggests that markets may price the informational content embedded in integrated reports, particularly when such reports reduce uncertainty regarding future cash flows and corporate sustainability capacity (7). Integrated reporting has also been examined as a disclosure tool related to higher financial reporting quality and stronger accountability, suggesting that it may support more credible and decision-useful corporate communication (8). However, the value relevance of integrated reporting is not necessarily uniform across firms and markets, because the usefulness of such disclosure depends on institutional context, reporting incentives, assurance mechanisms, investor sophistication, and the degree to which the disclosed information reflects substantive corporate practices rather than symbolic communication (9, 10).

One of the most important issues in financial reporting research is earnings management, which refers to managerial discretion in financial reporting that may alter reported earnings to influence stakeholders' perceptions of firm performance. Earnings management may arise from incentives related to capital-market expectations, debt contracts, compensation plans, political costs, or attempts to conceal weak operating performance. The literature distinguishes between accrual-based and real earnings management, both of which can distort the quality of reported financial information and weaken the reliability of accounting numbers. Earnings management is especially important because investors, analysts, creditors, and regulators rely heavily on earnings as a summary measure of corporate performance. When managers manipulate earnings, the informativeness of accounting data decreases, information asymmetry increases, and market participants may misprice securities. Prior research has shown that disclosure quality can be negatively associated with earnings management, implying that stronger disclosure environments may constrain opportunistic managerial behavior (11). At the same time, earnings management can influence the extent and credibility of disclosure and may obscure the true financial performance of firms (12). Recent bibliometric evidence also confirms that earnings management remains a central and expanding theme in accounting and finance research due to its implications for reporting quality, governance, and market efficiency (13).

Integrated reporting may affect earnings management through several theoretical channels. From an agency perspective, integrated reporting can reduce information asymmetry between managers and stakeholders by requiring broader disclosure about financial and non-financial dimensions of performance. This broader transparency can increase managerial accountability and make opportunistic reporting more detectable. From a legitimacy and stakeholder perspective, firms that disclose integrated information may face greater public scrutiny and reputational pressure, which can discourage aggressive earnings manipulation. From a signaling perspective,

high-quality integrated reporting may signal stronger internal governance, better sustainability management, and higher commitment to transparent communication. Consistent with this view, prior studies have linked integrated reporting to earnings quality and financial reporting quality, including evidence that integrated reporting may interact with agency costs in shaping earnings quality outcomes (14, 15). Moreover, research directly examining integrated reporting and earnings management suggests that integrated reporting may be relevant to understanding managerial reporting behavior (16). Nevertheless, the relationship may be complex, because some firms may use integrated reporting strategically to construct a favorable image while simultaneously engaging in earnings management, especially where enforcement is weak, disclosure is less standardized, or investors have limited ability to verify non-financial information.

Another major determinant of capital-market outcomes is investor sentiment, which reflects investors' beliefs, emotions, optimism, pessimism, and behavioral biases that are not fully justified by fundamental information. Behavioral finance argues that investors do not always process information rationally; instead, their decisions may be influenced by mood, attention, overconfidence, herding, representativeness, and market narratives. Investor sentiment can therefore affect demand for stocks, stock price movements, market liquidity, volatility, and deviations from intrinsic value. Empirical studies have shown that investor sentiment is associated with stock prices, and that sentiment-based fluctuations may shape market returns, liquidity, and volatility (17, 18). The development of direct measures of investor sentiment has further expanded the ability of researchers to capture psychological and behavioral components of market behavior (19). Evidence from emerging and international markets also confirms that sentiment may interact with broader financial conditions, including spillover effects across stock markets, cryptocurrencies, and investor expectations during periods of crisis and uncertainty (20). In the Iranian capital market, prior studies have similarly documented the relevance of investor sentiment for stock prices and voluntary disclosure decisions (21, 22).

Investor sentiment may also influence earnings management. When investor optimism is high, managers may face stronger incentives to meet market expectations, maintain inflated valuations, or avoid disappointing sentiment-driven investors. Conversely, during periods of pessimism, managers may attempt to smooth earnings, conceal poor performance, or signal stability through accounting choices. Therefore, investor sentiment may operate not only as a market-level behavioral variable but also as an external pressure that shapes managerial reporting behavior. Prior evidence indicates that firm-specific investor sentiment is associated with earnings management, suggesting that managers may respond to sentiment-driven valuation pressures through discretionary reporting choices (23). In the Iranian context, investors' emotional behavior has also been linked to accounting earnings management, reinforcing the relevance of behavioral factors in explaining financial reporting outcomes (24). Furthermore, studies on investor sentiment, accounting information, and stock price show that sentiment may affect how accounting information is incorporated into market prices, thereby influencing the relationship between disclosure, earnings signals, and valuation (25). These findings suggest that investor sentiment should be examined simultaneously with reporting mechanisms, because both informational and behavioral forces shape capital-market outcomes.

Despite the potential benefits of integrated reporting and the explanatory power of investor sentiment, firm-level structural characteristics can alter these relationships. One such characteristic is firm complexity. Firm complexity may arise from larger size, higher leverage, diversified operations, multiple business segments, complex ownership structures, extensive transactions, international exposure, or more complicated reporting environments. Complex

firms often have broader information sets, greater operational opacity, more sophisticated financing structures, and higher monitoring costs. These characteristics can increase information asymmetry and create opportunities for managerial discretion. Prior research has shown that firm complexity is related to corporate social responsibility among companies listed on the Tehran Stock Exchange, indicating that complex firms may face distinct pressures and disclosure patterns in sustainability-related domains (26). Firm complexity has also been associated with information opacity and managerial ability, suggesting that complex organizational structures can affect the transparency of financial information (27). In addition, evidence from European markets indicates that diversification, as one dimension of complexity, may influence earnings management strategies (28). These arguments imply that firm complexity may not merely be a control variable but a theoretically meaningful moderator that changes the strength or direction of the relationship between disclosure, sentiment, valuation, and earnings management.

The moderating role of firm complexity is especially important in the relationship between integrated reporting and earnings management. On one hand, integrated reporting may be more valuable in complex firms because these firms require broader disclosure to explain their business model, risk structure, and value-creation process. In such cases, integrated reporting may reduce opacity and constrain earnings management. On the other hand, complexity may weaken the disciplinary effect of integrated reporting if extensive disclosure makes reports longer, less readable, or more difficult for investors to interpret. Research on annual report readability shows that earnings management is related to reporting complexity, suggesting that managers may use complex reporting environments to obscure opportunistic behavior (29). Evidence from the Baltic markets also indicates that management reporting complexity is associated with earnings management, reinforcing the idea that complexity may create opportunities for less transparent reporting behavior (30). More directly, recent research has examined the role of firm complexity in the relationship between integrated reporting and earnings management, showing that complexity can condition the consequences of integrated reporting for reporting quality (31). Therefore, examining firm complexity as a moderator can clarify why integrated reporting may reduce earnings management in some contexts but fail to do so, or even coexist with opportunistic reporting, in others.

Firm complexity may also moderate the effect of investor sentiment on stock price and earnings management. In less complex firms, investors may more easily interpret financial statements, non-financial disclosures, and performance signals; therefore, sentiment may be more directly reflected in prices. In complex firms, however, investors may face greater uncertainty, lower readability, and more difficulty distinguishing fundamentals from managerial narratives. Under these conditions, sentiment may either be amplified because investors rely more heavily on heuristics, or weakened because uncertainty reduces confidence in sentiment-driven valuation. Recent evidence indicates that financial reporting complexity interacts with investor sentiment in influencing stock prices, which supports the argument that complexity changes how behavioral factors are incorporated into market valuation (32). At the same time, corporate sustainability performance and board diversity research shows that firm characteristics, governance structures, and environmental sensitivity may condition how corporate information is perceived and evaluated by stakeholders (33, 34). These insights are relevant because integrated reporting, investor sentiment, and firm complexity all operate within a broader governance and disclosure ecosystem in which market participants interpret both accounting and sustainability-related signals.

In emerging markets such as Iran, the relationships among integrated reporting, investor sentiment, stock price, earnings management, and firm complexity require particular attention. Emerging capital markets are often characterized by higher information asymmetry, lower analyst coverage, more concentrated ownership, weaker

enforcement mechanisms, and stronger behavioral responses to market news and macroeconomic uncertainty. In such environments, integrated reporting may play a critical role in improving disclosure transparency, yet its effectiveness depends on report quality, investor trust, institutional enforcement, and the complexity of the reporting firm. Similarly, investor sentiment may have stronger effects in markets where informational inefficiencies and behavioral trading are more pronounced. The Tehran Stock Exchange provides an appropriate context for examining these relationships because listed firms operate under formal reporting regulations while also facing heterogeneous levels of disclosure quality, governance structures, firm size, leverage, and operational complexity. The simultaneous examination of integrated reporting and investor sentiment makes it possible to integrate two complementary perspectives: the information-based perspective, which emphasizes disclosure and reporting quality, and the behavioral perspective, which emphasizes investor psychology and market reactions.

Accordingly, the aim of the present study is to examine the moderating role of firm complexity in the relationship between integrated reporting and investor sentiment with stock price and earnings management in companies listed on the Tehran Stock Exchange.

Methods and Materials

In terms of research method, this study falls within the category of descriptive research. Descriptive studies describe and interpret existing conditions and relationships. In terms of research purpose, this study falls within the category of applied research. In this type of research, the purpose is to discover new knowledge that has a specific application concerning a product or process in reality. More precisely, applied research is an attempt to respond to a practical problem or issue that exists in the real world. In applied research, theories or principles developed in basic research are used to solve operational and real problems. The design of this study is based on an ex post facto approach. The ex post facto method is used when the researcher examines the subject after the events have occurred. The statistical population in this study consists of companies listed on the Tehran Stock Exchange. The reason for this selection is the easy accessibility of the financial information of these companies, as well as their homogeneity due to the existence of regulations and standards of the Tehran Securities and Exchange Organization. These standards and regulations provide integration and consistency in companies' financial information and enable researchers to conduct more accurate analyses. In addition, selecting this statistical population can enhance the validity and generalizability of the research findings to companies operating in the Iranian capital market. In this study, in order to conduct the intended tests and based on the available information, the research period is between 2015 and 2022. The statistical sample was selected using the systematic elimination method. For this purpose, companies that met the following conditions were included in the statistical sample, and companies that did not meet these criteria were excluded from the statistical sample.

- The company must not have changed its fiscal year or its activity during the research period.
- The fiscal year of the companies must end on March 20 of each year.
- The company must have been listed on the stock exchange before 2015 and must have remained active on the stock exchange until the end of 2022. This is because some companies entered or exited the stock exchange during the period under study, and the data of these companies are not suitable for comparison with other companies. Therefore, at this stage, companies that were not fully active on the stock exchange throughout the research period were excluded.
- The data required for the study must be available.

- The company must not be among financial intermediary companies, including banks, insurance companies, investment companies, and leasing companies. For example, in banks and insurance companies, the debt ratio is high, but it does not indicate financial risk and represents customers' deposits. Moreover, the profit of investment companies is the same as the profit of investee companies, which are often included in the selected sample; alternatively, part of the operating cash flow section of financial investment companies may overlap with part of the financing cash flow section of manufacturing companies. Therefore, using the data of these companies alongside other companies leads to incorrect analyses and distorts the results of the regression model.
- The company's stock must have been traded continuously on the Tehran Stock Exchange, and no trading halt of more than three months must have occurred for the relevant stock. Considering the above conditions and limitations, among the companies listed on the Tehran Stock Exchange, a total of 130 companies were selected as the statistical sample of the study.

Regression Model

$$EM_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 SENT_{it} + \beta_3 FCcomp_{it} + \beta_4 IR_{it} \times FCcomp_{it} + \beta_5 SENT_{it} \times FCcomp_{it} + \beta_6 FSize_{it} + \beta_7 LEV_{it} \\ + \beta_8 ROA_{it} + \beta_9 CFO_{it} + \beta_{10} Sgrowth_{it} + \beta_{11} LOSS_{it} + \beta_{12} BSize_{it} + \beta_{13} BInd_{it} + \beta_{14} AInd_{it} + \varepsilon_{it}$$

$$RET_{i,t+1} = \beta_0 + \beta_1 IR_{it} + \beta_2 SENT_{it} + \beta_3 FCcomp_{it} + \beta_4 IR_{it} \times FCcomp_{it} + \beta_5 SENT_{it} \times FCcomp_{it} + \beta_6 FSize_{it} \\ + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \beta_9 CFO_{it} + \beta_{10} Sgrowth_{it} + \beta_{11} LOSS_{it} + \beta_{12} BSize_{it} + \beta_{13} BInd_{it} + \beta_{14} AInd_{it} \\ + \varepsilon_{it}$$

Research Variables

Independent Variable

Integrated Reporting (IR): In this study, the extent of corporate sustainability reporting, including the disclosure of environmental, social, and economic information, is considered as the integrated reporting variable. To construct the disclosure index, in the first stage, by reviewing the theoretical literature on the subject and the variables used by the Global Reporting Initiative, which provides standards and guidelines in the field of sustainability, 72 indicators were identified. Subsequently, considering the economic, social, environmental, and political conditions of Iran and taking into account prior studies conducted in this area, a revised list of sustainability information items expected to be disclosed in the annual reports of Iranian companies was prepared, consisting of 51 indicators in three economic, social, and environmental dimensions. In this study, the scoring procedure used to measure corporate sustainability reporting, consistent with other studies, is content analysis. Accordingly, if each item of sustainability information listed in the checklist is disclosed in the annual report of the bank, a score of one is assigned, and if it is not disclosed, a score of zero is assigned.

Table 1. Research Variables

Dimension	Component	Indicator
Economic	Economic performance	Economic value added
Economic	Economic performance	Coverage of the objectives and requirements defined in the company's planning
Economic	Economic performance	Return on assets
Economic	Economic performance	Financial consequences and other risks and opportunities for the organization's activities due to climate change
Economic	Economic performance	Value-added statement
Economic	Market presence	The company's market share in the whole industry and in the local/native region

Economic	Market presence	Growth or changes in market share and its future forecast
Economic	Market presence	Trend and quantitative/monetary changes in sales by products, region, customers, and so forth
Economic	Market presence	Technological and regulatory trends and changes affecting the market and products in the local or native region or environment
Economic	Market presence	Market and competitor changes in the industry and region, including competitive advantages and pressures, and their outlook
Economic	Indirect economic impacts and responsible investment	Significant indirect economic impacts, including foreign-exchange savings and similar items
Economic	Indirect economic impacts and responsible investment	Social costs and investments by type and area
Economic	Indirect economic impacts and responsible investment	Production and labor productivity indicators of the company
Social	Labor, employees, and human rights	Total employees by employment type, age group, geographical region, gender, and so forth
Social	Labor, employees, and human rights	Benefits provided to full-time employees that are not provided to temporary or part-time employees, according to major operating locations
Social	Labor, employees, and human rights	Employee-owned shares
Social	Labor, employees, and human rights	Retirement and end-of-service benefits
Social	Labor, employees, and human rights	Sports and welfare programs for employees
Social	Labor, employees, and human rights	Occupational health and safety issues
Social	Labor, employees, and human rights	Average annual training hours for each employee by gender and employee category
Social	Labor, employees, and human rights	Scholarship fund and related gifts
Social	Labor, employees, and human rights	System for reporting violations, criticisms, and suggestions
Social	Community participation and development	Support for the development of small and entrepreneurial industries, especially among native/local people
Social	Community participation and development	Awards and certificates received in relation to social, cultural, environmental, educational, and sports activities
Social	Community participation and development	Resources consumed and financial aid in the form of cash, products, and services to support social, educational, training, and artistic activities
Social	Community participation and development	Charitable and public-benefit donations
Social	Community participation and development	Recruitment or employment of university or school students on a part-time basis for internships
Social	Community participation and development	Support for educational conferences and art exhibitions
Social	Community participation and development	Social, cultural, and religious activities
Social	Community participation and development	Membership in national, regional, or international associations, institutions, and communities active in the field of sustainability and social responsibility
Social	Community participation and development	Financial assistance for victims of natural disasters, including floods, earthquakes, and so forth
Social	Product support and business ethics	After-sales services
Social	Product support and business ethics	Customer satisfaction and responsiveness to customer needs
Social	Product support and business ethics	Product research and development programs
Social	Product support and business ethics	The company's ethical and social code, charter, or code of conduct
Environmental	Raw materials, water, and energy	Amount and value of raw materials consumed, separately for direct and indirect materials
Environmental	Raw materials, water, and energy	Total water withdrawn by source
Environmental	Raw materials, water, and energy	Volume of water recycled and reused
Environmental	Raw materials, water, and energy	Direct and indirect energy consumption by source and amount

Environmental	Raw materials, water, and energy	Renewable energy production and consumption programs
Environmental	Raw materials, water, and energy	Reduction in energy consumption
Environmental	Gas emissions and waste disposal	Measures taken to reduce greenhouse gas emissions, methods and criteria for gas removal, and the resulting outcomes
Environmental	Gas emissions and waste disposal	Procedures for reducing hazardous and non-hazardous waste and properly disposing of waste while observing environmental considerations
Environmental	Gas emissions and waste disposal	Total weight of waste by type and disposal method
Environmental	Environmental impacts of products and services	Extent of reduction in the environmental impacts of products and services on soil, forests, and so forth
Environmental	Environmental impacts of products and services	Description of activities for observing environmental considerations from the perspective of customers, consumers, and the company's supply chain
Environmental	Environmental impacts of products and services	Design of environmentally compatible facilities and equipment and environmentally friendly products
Environmental	Environmental impacts of products and services	Providing information and advice to company customers for environmentally conscious consumption and reduction
Environmental	Legal claims arising from environmental issues	Harmful environmental impacts
Environmental	Legal claims arising from environmental issues	The company's environmental code, charter, or code of conduct
Environmental	Legal claims arising from environmental issues	Legal claims arising from environmental issues

Investor Sentiment (SENT): In the present study, a composite index is used to measure investor sentiment. This index has been used in the Iranian capital market by Mehrani and Madanchi Zaj (2018).

The investor sentiment index is calculated using the following relationships:

The calculation of the investor sentiment index, similar to the study by Yang and Zhou (2015), is performed in the first step by calculating four indices, including the relative strength index, the psychological line index, the trading volume index, and the adjusted turnover rate index.

1. Relative Strength Index

To calculate the relative strength index, RS is first calculated.

Equation 1:

$$RS_{it} = \frac{\sum_{t=0}^6 \max(P_t - P_{t-1}, 0)}{\sum_{t=0}^6 \max(P_{t-1} - P_t, 0)}$$

In this equation:

P_t : stock price at the end of time period t

P_{t-1} : stock price at the end of time period $t - 1$

Then, the Relative Strength Index RSI is calculated:

Equation 2:

$$RSI_{it} = \left[\frac{RS_{it}}{1 + RS_{it}} \right] \times 100$$

Considering that t ranges from one to six and other data are considered on an annual basis, the time period t for P is considered on a two-month basis. Accordingly, RS and RSI are also calculated on an annual basis.

2. Psychological Line Index

Equation 3:

$$PSY_{it} = \frac{TU_t}{T} \times 100$$

TU_t : number of days on which the stock price increased compared with the previous day

T : number of trading days

3. Trading Volume Index

$$LTV_{it} = \ln(V_{it})$$

To calculate the trading volume of the company's shares, the natural logarithm of the number of the company's shares traded during the year is used.

4. Adjusted Turnover Rate Index

Equation 4:

$$ART_{it} = \frac{R_{it}}{|R_{it}|} + \frac{VOL_{it}}{C_{it}}$$

R_{it} : company's stock return

VOL_{it} : number of shares traded by the company

C_{it} : number of shares issued by the company

After calculating the above four indices, principal component analysis is used to combine these indices.

Equation 5:

$$S_t = 0.5743RSI_t + 0.5551PSY_t + 0.4038LTV_t + 0.4461ART_t$$

Dependent Variable

Stock Price (RET): The average market value per share at the beginning and end of each period.

Earnings Management (EM):

Accrual-based earnings management (AEM) represents earnings management through accrual items and can be measured using the following relationship:

Jones identified the difference between earnings and cash flows from operations as total accruals (TA).

Equation 6:

$$TA_t = NI_{it} - CFO_{it}$$

NI : income before extraordinary items

CFO : cash flows from operating activities

After calculating total accruals, to calculate the coefficients β_1 , β_2 , and β_3 of this model, which are considered firm-specific estimated parameters, Equation 7 is used:

Equation 7:

$$\frac{TA_{it}}{A_{it-1}} = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 \left(\frac{\Delta REV_{it}}{A_{t-1}} \right) + \beta_3 \left(\frac{PPE_{it}}{A_{t-1}} \right)$$

In this relationship:

TA : total accruals of the company

A : total assets of the company

ΔREV : change in sales revenue of company i between years t and $t - 1$

PPE : gross property, plant, and equipment of company i in year t

After estimating the parameters of the above relationship, non-discretionary accruals (NDA) are calculated through the following relationship:

Equation 8:

$$NDA_{it} = \beta_1 \left(\frac{1}{A_{t-1}} \right) + \beta_2 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}} \right) + \beta_3 \left(\frac{PPE_{it}}{A_{t-1}} \right)$$

ΔREC : change in accounts receivable of company i between years t and $t - 1$

Finally, discretionary accruals are calculated as follows:

Equation 9:

Equation 10:

$$DA = \frac{TA_{it}}{A_{it-1}} - NDA_{it}$$

Finally, the absolute value of discretionary accruals was taken and multiplied by negative one so that the figures could be properly included in the regression for analysis.

Moderating Variable

Firm Complexity (FC comp): Following Uygur et al. (2017), firm complexity is measured using the criteria of firm size and financial leverage. Accordingly, if the value of the firm complexity index for both criteria is equal to or greater than its median, it is considered complex. In other words, for complex firms that received a value of one in terms of both criteria, a value of one was assigned; otherwise, zero was assigned.

Control Variables

Firm size (FSize) is measured as the natural logarithm of total assets.

Financial leverage (LEV) is measured as the ratio of total debt to total assets.

Return on assets (ROA) is measured as income before tax divided by total assets.

Cash flow from operations (CFO) is operating cash flow divided by total assets.

Sales growth (Sgrowth) is measured as the ratio of change in sales to sales at time t .

Loss (LOSS) is a dummy variable that takes the value of 1 when a firm incurs a loss; otherwise, it is assigned a value of 0 (Obeng et al., 2020).

Board independence (BInd) is measured as the ratio of non-executive directors to total board size.

Audit committee independence (AInd) is measured as the ratio of non-executive directors on the audit committee.

Findings and Results

Descriptive statistics of the research variables is presented in Table 2.

Table 2. Descriptive Statistics of the Research Variables

Panel A: Continuous Variables

Variable	Symbol	Mean	Median	Maximum	Minimum	Standard Deviation	Skewness	Kurtosis
Earnings management	EM	0.000	-0.009	0.256	-0.198	0.123	0.382	2.428
Stock price	RET	0.781	0.139	5.650	-0.135	1.495	2.274	7.155
Integrated reporting	IR	0.217	0.214	0.366	0.087	0.077	0.211	2.209
Investor sentiment	SENT	0.538	0.539	0.717	0.344	0.110	-0.067	1.883
Firm size	FSIZE	15.173	15.007	18.067	13.033	1.335	0.432	2.505
Financial leverage	LEV	0.539	0.544	0.869	0.178	0.198	-0.123	2.053
Return on assets	ROA	0.148	0.119	0.427	-0.046	0.135	0.577	2.320
Operating cash flow	CFO	0.119	0.097	0.397	-0.060	0.121	0.719	2.839
Sales growth	SGROWTH	0.400	0.347	1.330	-0.249	0.427	0.509	2.533
Board independence	BIND	0.661	0.600	1.000	0.000	0.184	-0.288	3.410
Audit committee independence	AIND	0.715	0.667	1.000	0.000	0.235	-1.121	5.297

Panel B: Discrete Variables

Variable	Symbol	Number of Ones	Number of Zeros	Percentage of Ones	Percentage of Zeros
Firm complexity	FCCOMP	257	751	25.496	74.504
Loss	LOSS	85	923	8.433	91.568

As observed in Table 2, the mean of earnings management is equal to zero. This variable is calculated based on the error component of the modified Jones model. For this reason, its mean is zero, because the nature of an error component is to have a mean of zero. An increase in this index indicates an increase in earnings management. The median of the variable is also approximately equal to zero and is -0.009. In fact, half of the observations have earnings management greater than this value, and the other half have earnings management lower than this value. The highest value of earnings management is 0.256, and the lowest value is -0.198. The standard deviation, which indicates the dispersion of observations around the mean, is 0.123, which, considering the minimum and maximum values, represents a relatively moderate deviation.

By examining stock price, which is calculated based on stock returns, it can be observed that, on average, companies have an annual return of 78.1%. The highest annual return is 565%, and the lowest return for the period under study is a 13.5% decrease in return. Integrated reporting is also measured based on environmental, social, and governance reporting, and its mean is 0.217. In fact, companies pay attention to integrated reporting at about 22%, which is a relatively low percentage for Iranian companies.

By examining investor sentiment, which is calculated based on the mean of four indices, namely the relative strength index, psychological line, trading volume, and adjusted turnover rate index, which were homogenized within the range of zero to one, it can be observed that its mean is 0.538. An increase in this index indicates an increase in investor sentiment.

To examine the selection of panel data versus pooled data, the Limer F-test is used.

Based on the statistical results in Table 3, and because the probability value of the Limer F-test statistic in the research models is lower than the 5% error level, the panel data model is confirmed. Given the obtained results and the confirmation of panel data, it is necessary to conduct the Hausman test. The results of the Hausman test are reported in Table 4.

Table 3. Results of the Limer F-Test

Model	F-Test Statistic	Degrees of Freedom	Probability of the Test Statistic	Result
First research model	3.430	(125, 869)	0.000	Panel data method
Second research model	4.325	(125, 743)	0.000	Panel data method

Given the results and the fact that the probability value of the test statistic is lower than the 5% error level, the panel data model with fixed effects is confirmed, because the null hypothesis based on the existence of random effects is rejected.

Table 4. Results of the Hausman Test

Model	F-Test Statistic	Degrees of Freedom	Probability of the Test Statistic	Result
First research model	420.467	13	0.000	Fixed effects
Second research model	371.058	13	0.000	Fixed effects

In this study, the assumption of homoscedasticity of residuals was examined using the White test. The results in Table 5 show that the null hypothesis based on the existence of homoscedasticity in the research models is rejected. Therefore, the problem of heteroscedasticity exists in the two research models. To resolve the problem of heteroscedasticity, generalized least squares (GLS) regression is used.

Table 5. Results of the Test for the Constancy of the Variance of the Error Term

Model	F-Statistic Value	Probability of F-Statistic	Result
First research model	1.756	0.046	Presence of heteroscedasticity problem
Second research model	2.089	0.013	Presence of heteroscedasticity problem

To examine the independence of residuals, the Breusch–Godfrey statistic was used. The results in Table 6 show that the value of this statistic is significant at the 95% probability level in both models; therefore, the problem of autocorrelation exists among the model residuals. To resolve the problem of autocorrelation in the error term, regression with robust standard errors is used.

Table 6. Results of the Test for the Absence of Autocorrelation in the Error Term

Model	F-Statistic Value	Probability of F-Statistic	Result
First research model	43.293	0.000	Presence of autocorrelation
Second research model	17.698	0.000	Presence of autocorrelation

Multicollinearity means the existence of a strong relationship among the independent and control variables in the model. To diagnose multicollinearity, the variance inflation factor related to the variable under consideration must be less than 10; otherwise, the variable under consideration leads to multicollinearity. In this regard, the results of the VIF test for the research model are presented in Table 7. Based on the results, it is observed that the variance inflation factor for some variables in the first and second models is greater than 10. Therefore, the problem of multicollinearity exists. In this regard, the multicollinearity problem was resolved using the mean-centering method. It should be noted that because the independent and control variables are the same in both models, the multicollinearity results are also similar and, therefore, are reported once.

Table 7. Results of the Multicollinearity Test Using the VIF Test

Variable	Symbol	First and Second Research Models	First and Second Models after Resolving Multicollinearity
Integrated reporting	IR	1.602	1.172
Investor sentiment	SENT	1.445	1.097
Firm complexity	FCCOMP	32.232	1.863
Integrated reporting × firm complexity	IR × FCCOMP	10.798	1.079
Investor sentiment × firm complexity	SENT × FCCOMP	26.586	1.032
Firm size	FSIZE	1.546	1.546

Financial leverage	LEV	2.110	2.110
Return on assets	ROA	2.521	2.521
Operating cash flow	CFO	1.470	1.470
Sales growth	SGROWTH	1.336	1.336
Board independence	BIND	1.252	1.252
Audit committee independence	AIND	1.139	1.139
Loss	LOSS	1.045	1.045

As observed in Table 8, the F-statistic is 5.09, and the probability value, or significance level, of F is 0.000. Since this value is lower than 0.05, the null hypothesis is rejected at the 95% confidence level, meaning that the model is significant overall. The results related to the coefficient of determination and adjusted coefficient of determination show that 44.7% and 35.9%, respectively, of the changes in the dependent variable, namely earnings management, are explained by the independent and control variables of the model. Given the overall significance of the model, it is possible to comment on the significance of each individual variable.

In examining the first hypothesis, Table 8 shows that the coefficient of integrated reporting is -0.075. According to the t-statistic (-0.633) and the probability value of the t-statistic (0.527), the coefficient is not significant at the 95% level, because the probability value of the t-statistic is greater than 5%. Therefore, it can be stated that integrated reporting does not have a significant effect on earnings management. Thus, the first hypothesis, stating that “there is a significant relationship between integrated reporting and earnings management,” is rejected.

In examining the second hypothesis, the coefficient of investor sentiment is 0.052. This coefficient is significant at the 95% probability level, because the probability value of the t-statistic for this variable is lower than the 5% error level; therefore, the null hypothesis based on the non-significance of the relevant coefficient is rejected. Accordingly, it can be stated that with an increase in investor sentiment, earnings management also increases. Thus, the second hypothesis is confirmed, and it can be stated that there is a significant relationship between investor sentiment and earnings management.

In examining the fifth hypothesis, the coefficient of the interaction effect of integrated reporting and firm complexity is 0.295. This coefficient is significant at the 95% probability level. Considering that the relevant coefficient is positive and the coefficient of integrated reporting is negative, it can be stated that firm complexity weakens the negative effects of integrated reporting. Accordingly, the fifth hypothesis, stating that “there is a significant relationship between integrated reporting and earnings management considering the moderating role of firm complexity,” is confirmed.

The sixth hypothesis states that there is a significant relationship between investor sentiment and earnings management considering the moderating role of firm complexity. In this regard, the coefficient of the interaction effect of investor sentiment and firm complexity is 0.008. However, this coefficient is not significant at any probability level. Therefore, the sixth hypothesis is rejected, and it can be stated that firm complexity does not play a moderating role in the relationship between investor sentiment and earnings management.

Table 8. Test of the First Research Model: Dependent Variable: Earnings Management

$$EM_{it} = \beta_0 + \beta_1 IR_{it} + \beta_2 SENT_{it} + \beta_3 FCcomp_{it} + \beta_4 IR_{it} \times FCcomp_{it} + \beta_5 SENT_{it} \times FCcomp_{it} + \beta_6 FSize_{it} + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \beta_9 CFO_{it} + \beta_{10} Sgrowth_{it} + \beta_{11} LOSS_{it} + \beta_{13} BInd_{it} + \beta_{14} AInd_{it} + \varepsilon_{it}$$

Variable	Symbol	Coefficient	Error	t-Statistic	Probability of t-Statistic
Integrated reporting	IR	-0.075	0.118	-0.633	0.527
Investor sentiment	SENT	0.052	0.020	2.604	0.009
Firm complexity	FCCOMP	0.007	0.005	1.412	0.158
Integrated reporting × firm complexity	IR × FCCOMP	0.295	0.068	4.348	0.000
Investor sentiment × firm complexity	SENT × FCCOMP	0.008	0.042	0.196	0.845
Firm size	FSIZE	0.000	0.004	0.072	0.943
Financial leverage	LEV	0.027	0.015	1.737	0.083
Return on assets	ROA	0.244	0.062	3.927	0.000
Operating cash flow	CFO	-0.155	0.073	-2.125	0.034
Sales growth	SGROWTH	0.026	0.009	2.927	0.004
Board independence	BIND	0.021	0.010	1.972	0.049
Audit committee independence	AIND	0.022	0.027	0.815	0.415
Loss	LOSS	0.010	0.019	0.530	0.596
Constant	C	0.066	0.056	1.189	0.235
F-Statistic	Probability of F-Statistic	Coefficient of Determination	Adjusted Coefficient of Determination		Number of Observations
5.090	0.000	0.447	0.359		1008

In examining the third hypothesis, Table 9 shows that the coefficient of integrated reporting is -4.172. Based on the t-statistic, this coefficient is significant at the 95% probability level, because the probability value of the t-statistic is lower than 5%. Therefore, it can be stated that integrated reporting leads to a decrease in future stock price. Thus, the third hypothesis, stating that “there is a significant relationship between integrated reporting and stock price,” is confirmed.

In examining the fourth hypothesis, the coefficient of investor sentiment is 0.340. This coefficient is not significant at the 95% probability level, because the probability value of the t-statistic for this variable is greater than the 5% error level; therefore, the null hypothesis based on the non-significance of the relevant coefficient is not rejected. Accordingly, it can be stated that investor sentiment does not affect future stock price. Thus, the fourth hypothesis is rejected, and it can be stated that there is no significant relationship between investor sentiment and stock price.

To examine the seventh hypothesis, the coefficient of the interaction effect of integrated reporting and firm complexity is -2.431. This coefficient is significant at the 95% probability level. Considering that the relevant coefficient is negative and the coefficient of integrated reporting is also negative, it can be stated that firm complexity strengthens the negative effects of integrated reporting on future stock price. Accordingly, the seventh hypothesis, stating that “there is a significant relationship between integrated reporting and stock price considering the moderating role of firm complexity,” is confirmed.

Finally, the eighth hypothesis states that there is a significant relationship between investor sentiment and stock price considering the moderating role of firm complexity. In this regard, the coefficient of the interaction effect of investor sentiment and firm complexity is -1.387. This coefficient is significant at the 95% probability level. Considering that the coefficient of the interaction effect is negative and the coefficient of investor sentiment is positive, it can be stated that firm complexity weakens the positive effects of investor sentiment on future stock price. Thus, the eighth hypothesis is also confirmed.

Table 9. Test of the Second Research Model: Dependent Variable: Future Stock Price

$$RET_{i,t+1} = \beta_0 + \beta_1 IR_{it} + \beta_2 SENT_{it} + \beta_3 FCcomp_{it} + \beta_4 IR_{it} \times FCcomp_{it} + \beta_5 SENT_{it} \times FCcomp_{it} + \beta_6 FSize_{it} + \beta_7 LEV_{it} + \beta_8 ROA_{it} + \beta_9 CFO_{it} + \beta_{10} Sgrowth_{it} + \beta_{11} LOSS_{it} + \beta_{13} BInd_{it} + \beta_{14} AInd_{it} + \varepsilon_{it}$$

Variable	Symbol	Coefficient	Error	t-Statistic	Probability of t-Statistic
Integrated reporting	IR	-4.172	1.185	-3.522	0.001
Investor sentiment	SENT	0.340	0.257	1.325	0.186
Firm complexity	FCCOMP	0.111	0.110	1.013	0.312
Integrated reporting × firm complexity	IR × FCCOMP	-2.431	1.144	-2.125	0.034
Investor sentiment × firm complexity	SENT × FCCOMP	-1.387	0.626	-2.215	0.027
Firm size	FSize	0.044	0.046	0.967	0.334
Financial leverage	LEV	-0.093	0.340	-0.272	0.785
Return on assets	ROA	2.859	0.422	6.771	0.000
Operating cash flow	CFO	-1.020	0.309	-3.300	0.001
Sales growth	SGROWTH	0.154	0.083	1.861	0.063
Board independence	BIND	0.372	0.139	2.677	0.008
Audit committee independence	AIND	-0.007	0.243	-0.028	0.978
Loss	LOSS	-0.013	0.187	-0.068	0.946
Constant	C	0.118	0.825	0.144	0.886
F-Statistic	Probability of F-Statistic	Coefficient of Determination	Adjusted Coefficient of Determination		Number of Observations
6.170	0.000	0.178	0.156		882

Discussion and Conclusion

The findings of the first model showed that integrated reporting did not have a significant direct effect on earnings management. This result indicates that, in the sample of companies listed on the Tehran Stock Exchange, the mere presence or higher level of integrated reporting disclosure was not sufficient to directly reduce or increase earnings management practices. Although integrated reporting is theoretically expected to enhance transparency, reduce information asymmetry, and strengthen managerial accountability, the non-significant coefficient suggests that the quality, credibility, enforcement, and actual use of integrated information may be more important than the extent of disclosure alone. This finding can be interpreted in light of studies arguing that integrated reporting is not automatically effective unless it reflects substantive reporting quality, balanced disclosure, and meaningful integration between financial and non-financial information (1, 3-5). In other words, if integrated reporting is implemented mainly as a formal or symbolic disclosure practice, it may not be strong enough to discipline managerial discretion in accrual choices. This interpretation is consistent with the view that the effectiveness of disclosure depends not only on the quantity of information but also on its credibility, readability, assurance, and ability to reduce opacity (9, 10). Therefore, the rejection of the first hypothesis suggests that integrated reporting, by itself, may not function as an effective governance mechanism for constraining earnings management in the Iranian capital market.

This result also differs from studies that have reported a positive role for integrated reporting in improving financial reporting quality and earnings quality. For example, prior evidence suggests that integrated reporting can be associated with higher-quality financial reporting and lower information asymmetry, particularly when agency problems are controlled and when reporting practices are more mature (8, 14, 15). Similarly, studies linking disclosure quality to lower earnings management emphasize that transparent and high-quality disclosure can restrict opportunistic managerial behavior (11). However, the present finding shows that such an effect is not necessarily universal. One explanation is that integrated reporting in emerging markets may still be developing, and

firms may disclose sustainability-related or integrated information without fully embedding integrated thinking into internal control, governance, and financial reporting processes. In this regard, the result is consistent with the argument that disclosure can sometimes coexist with opportunistic reporting when managers use disclosure as an impression-management tool rather than as a mechanism of accountability (2). Moreover, because earnings management is influenced by multiple incentives, including market pressure, debt contracting, taxation, and managerial compensation, integrated reporting alone may not be sufficient to eliminate such incentives (13).

The results of the first model also showed that investor sentiment had a positive and significant effect on earnings management. This finding means that when investor sentiment increases, managers are more likely to engage in earnings management. This result supports the behavioral-finance perspective, according to which investor emotions, optimism, expectations, and market pressures can influence managerial reporting incentives. When market sentiment is high, investors may develop optimistic expectations regarding future performance, and managers may attempt to maintain or justify these expectations through discretionary accruals. In such conditions, earnings management may be used to avoid negative market reactions, sustain stock valuation, or signal stability to sentiment-driven investors. This finding is aligned with evidence that investor sentiment is associated with stock-market behavior and that sentiment can affect how accounting information is interpreted and reflected in prices (17, 25). It is also consistent with research showing that firm-specific investor sentiment is related to earnings management, suggesting that managerial accounting choices may respond to sentiment-based valuation pressures (23). In the Iranian context, this result is further supported by evidence that investors' emotional behavior is associated with accounting earnings management (24).

The positive relationship between investor sentiment and earnings management can also be explained by the fact that sentiment-driven markets may reward short-term performance signals more strongly than long-term fundamentals. When investors rely heavily on market mood, recent price movements, and optimistic expectations, managers may become more motivated to manipulate earnings in order to meet perceived market benchmarks. Prior studies have shown that investor sentiment can affect stock prices, liquidity, volatility, and market returns, implying that managerial behavior may also be influenced by the broader sentiment environment (18, 19, 21). Furthermore, during unstable or crisis-like market conditions, sentiment can generate spillover effects across financial markets and strengthen non-fundamental price movements (20). In such settings, managers may face stronger incentives to manage earnings because accounting numbers become part of the narrative through which firms respond to investors' expectations. Therefore, the confirmation of the second hypothesis reinforces the importance of behavioral variables in accounting research and shows that earnings management is not only a product of internal managerial incentives but also a response to external capital-market psychology.

The moderating analysis showed that firm complexity significantly moderated the relationship between integrated reporting and earnings management. The interaction coefficient between integrated reporting and firm complexity was positive and significant, while the direct coefficient of integrated reporting was negative but non-significant. This result indicates that firm complexity changes the nature of the relationship between integrated reporting and earnings management. More specifically, firm complexity weakens the negative effect of integrated reporting on earnings management. This finding is theoretically meaningful because complex firms usually have larger organizational structures, higher leverage, more complicated transactions, greater information-processing demands, and higher monitoring costs. Under these conditions, even if integrated reporting increases disclosure, users may find it more difficult to interpret whether the disclosed information reflects real transparency or managerial

impression management. This result is consistent with studies showing that complexity can increase information opacity and affect the transparency of corporate reporting (27). It also supports prior research indicating that management reporting complexity and annual report readability are associated with earnings management, because complex reports can make it easier for managers to conceal opportunistic behavior (29, 30).

This result is also consistent with recent evidence directly emphasizing the role of firm complexity in the relationship between integrated reporting and earnings management (31). In complex firms, integrated reporting may require extensive disclosure about strategy, governance, risks, sustainability, and business-model components. Although such disclosure can theoretically increase transparency, it can also increase reporting volume and interpretive difficulty. Therefore, firm complexity may reduce the ability of stakeholders to use integrated reporting as a monitoring tool. Evidence from studies on diversification and earnings management also supports this argument, because diversified and structurally complex firms may adopt different earnings management strategies due to greater internal opacity and more discretion in allocating revenues, costs, and accruals across segments (28). Similarly, the relationship between firm complexity and corporate social responsibility in companies listed on the Tehran Stock Exchange suggests that complex firms may have distinctive disclosure incentives and stakeholder pressures (26). Accordingly, the confirmation of the moderating role of complexity indicates that integrated reporting cannot be evaluated independently of firm characteristics. Its disciplinary effect depends on whether users can effectively process the information disclosed by the firm.

However, the results showed that firm complexity did not significantly moderate the relationship between investor sentiment and earnings management. This finding suggests that although investor sentiment directly increases earnings management, this relationship does not significantly differ between complex and less complex firms. One possible explanation is that sentiment-driven pressure affects managers broadly across firms, regardless of their complexity. In other words, when investors are optimistic or emotionally responsive, managers in both simple and complex firms may experience similar pressure to report favorable earnings. Another explanation is that earnings management is more directly related to managerial incentives and market expectations than to structural complexity in this specific relationship. While complexity can affect the interpretability of integrated reporting, it may not necessarily change the behavioral pressure created by investor sentiment. This result partially differs from evidence suggesting that financial reporting complexity can interact with investor sentiment in shaping stock prices (32). However, the difference may be due to the dependent variable: complexity may play a stronger role in price formation than in managerial accrual choices. Therefore, the rejection of the sixth hypothesis indicates that the behavioral influence of investor sentiment on earnings management is relatively direct and may operate independently of firm complexity.

The second model showed that integrated reporting had a negative and significant effect on future stock price. This finding indicates that higher integrated reporting is associated with lower future stock price in the studied firms. Although this result may seem contrary to the expectation that integrated reporting improves valuation, it can be interpreted in several ways. First, in the Iranian capital market, investors may perceive extensive integrated reporting as a signal of higher costs, greater environmental or social exposure, or more complex risk disclosure rather than as a purely positive value signal. Second, integrated reporting may reveal risks and obligations that were previously less visible, leading investors to adjust their expectations downward. Third, if integrated reporting is not perceived as credible or value-relevant, investors may not reward it in stock prices. This finding contrasts with studies that have documented a positive association between integrated reporting and firm valuation or favorable

capital-market outcomes (6, 7). However, it is consistent with the broader argument that the market consequences of integrated reporting are context-dependent and may vary across institutional environments, levels of reporting quality, and investor understanding of non-financial information (1, 5).

The negative effect of integrated reporting on future stock price may also reflect the possibility that firms with weaker prospects, higher risks, or greater legitimacy concerns disclose more integrated information to manage stakeholder perceptions. In this case, the negative coefficient does not necessarily mean that integrated reporting destroys value; rather, it may indicate that firms with lower expected future performance are more motivated to disclose sustainability and integrated information. This interpretation is compatible with research suggesting that environmental and sustainability disclosures can sometimes be reluctant, strategic, or motivated by transparency and legitimacy concerns (10). It is also consistent with the argument that the quality and balance of integrated reports are essential, because more disclosure does not automatically mean better disclosure (3, 4). Therefore, the confirmation of the third hypothesis suggests that, in this context, investors may interpret integrated reporting cautiously, especially if they are uncertain about the credibility, comparability, and economic implications of the disclosed information.

The findings further showed that investor sentiment did not have a significant direct effect on future stock price. This result indicates that, after controlling for integrated reporting, firm complexity, financial characteristics, and governance variables, investor sentiment alone did not significantly explain future stock prices. Although prior studies have shown that investor sentiment can affect stock prices and market outcomes (17, 18, 21), the present finding suggests that the direct effect of sentiment may be unstable or conditional. One possible explanation is that investor sentiment may influence short-term price fluctuations more strongly than future annual stock price measures. Another explanation is that firm-level fundamentals, such as return on assets, operating cash flow, and governance characteristics, may dominate sentiment effects over longer horizons. This result also aligns with the idea that the relationship between sentiment, accounting information, and stock price depends on the quality and interpretation of information available to investors (25). Therefore, the rejection of the fourth hypothesis suggests that investor sentiment does not always have an independent direct pricing effect when firm-specific accounting and governance variables are incorporated into the model.

The moderating results of the second model showed that firm complexity strengthened the negative relationship between integrated reporting and future stock price. This finding indicates that in more complex firms, the negative effect of integrated reporting on future stock price becomes stronger. This result can be explained by the higher information-processing costs associated with complex firms. When a firm is structurally complex, integrated reporting may become more difficult for investors to interpret, especially if the report contains extensive qualitative information, multiple performance dimensions, and complex risk disclosures. Instead of reducing uncertainty, integrated reporting in complex firms may increase investors' awareness of organizational risks and reporting opacity, leading to lower future valuation. This result supports prior evidence that financial reporting complexity can affect investor interpretation and market pricing (32). It is also compatible with studies showing that complex reports and less readable annual reports are associated with earnings management and information opacity (29, 30). Therefore, the seventh hypothesis is confirmed, showing that firm complexity is an important boundary condition in the valuation consequences of integrated reporting.

Finally, the findings showed that firm complexity significantly moderated the relationship between investor sentiment and future stock price. The negative interaction coefficient indicates that firm complexity weakens the

positive effect of investor sentiment on future stock price. This result suggests that when firms are more complex, investor sentiment is less likely to translate into higher future stock prices. In complex firms, investors may be more cautious because they face greater uncertainty, more complicated financial information, and higher difficulty in evaluating firm fundamentals. As a result, even if sentiment is favorable, complexity may reduce the extent to which optimistic investor expectations are capitalized into future prices. This finding is aligned with evidence that reporting complexity can shape the relationship between investor sentiment and stock prices (32). It also supports behavioral-finance studies showing that investor sentiment affects market valuation, but its impact depends on the information environment and the degree of uncertainty surrounding the firm (18, 19). Overall, the confirmation of the eighth hypothesis indicates that firm complexity acts as a limiting factor in the sentiment–price relationship and that behavioral market effects are not independent of firm-level informational conditions.

The findings can also be understood within the broader literature on governance, sustainability, and disclosure. Board diversity, CEO power, environmental sensitivity, and country characteristics have been shown to affect sustainability performance and corporate accountability, suggesting that the consequences of disclosure depend on governance and contextual factors (33, 34). Therefore, the present study contributes to the literature by integrating integrated reporting, investor sentiment, firm complexity, stock price, and earnings management into a single empirical framework. The results show that integrated reporting and investor sentiment affect earnings management and stock price through different mechanisms. Investor sentiment directly increases earnings management, while integrated reporting directly reduces future stock price in the studied context. Firm complexity weakens the potential disciplinary role of integrated reporting in relation to earnings management, strengthens the negative valuation effect of integrated reporting, and weakens the positive valuation effect of investor sentiment. These findings demonstrate that the usefulness and consequences of corporate reporting cannot be separated from the complexity of the firm and the behavioral conditions of the market.

This study has several limitations that should be considered when interpreting the findings. First, the study was conducted only among companies listed on the Tehran Stock Exchange; therefore, the results may not be fully generalizable to unlisted companies, financial institutions, or firms operating in other institutional environments. Second, the measurement of integrated reporting was based on disclosed items, and such an approach may capture the extent of disclosure more strongly than the actual quality, credibility, or strategic integration of the reported information. Third, earnings management was measured using accrual-based models, while managers may also use real earnings management techniques that are not fully captured by discretionary accruals. Fourth, investor sentiment was measured through a composite index, and although this approach is common, it may not fully capture all psychological, behavioral, and market-based dimensions of sentiment. Fifth, firm complexity was measured using firm size and financial leverage, whereas complexity may also include diversification, ownership structure, business segments, international activities, and operational heterogeneity.

Future research can extend this study in several directions. First, researchers are encouraged to examine the same model in different industries, institutional settings, and emerging markets to determine whether the observed relationships are context-specific or generalizable across capital markets. Second, future studies may distinguish between the quantity and quality of integrated reporting by developing more detailed scoring systems that evaluate balance, connectivity, conciseness, assurance, readability, and strategic relevance. Third, subsequent research can incorporate real earnings management in addition to accrual-based earnings management to provide a more comprehensive understanding of managerial reporting behavior. Fourth, future studies may use alternative

measures of investor sentiment, including media tone, search-volume data, social-media sentiment, analyst tone, or market-wide behavioral indicators. Fifth, future research can examine additional dimensions of firm complexity, such as operational diversification, number of subsidiaries, foreign sales, ownership pyramids, board structure, supply-chain complexity, and segment reporting complexity.

The findings of this study have practical implications for managers, investors, auditors, regulators, and standard-setters. Managers should recognize that integrated reporting is effective only when it reflects genuine transparency and integrated thinking rather than formal disclosure. Firms should improve the quality, clarity, comparability, and credibility of integrated reports so that investors can better understand the relationship between sustainability activities, governance mechanisms, risk management, and financial performance. Investors should interpret integrated reporting in light of firm complexity and should not rely only on the existence of integrated disclosure as a signal of lower reporting risk or higher future value. Auditors and assurance providers should pay closer attention to complex firms because complexity may increase the risk of information opacity and earnings management. Regulators should develop clearer reporting guidelines and encourage assurance mechanisms to improve the reliability of integrated information. Finally, capital-market participants should consider investor sentiment as an important behavioral force that may influence managerial reporting incentives and market reactions.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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References

1. De Villiers C, Venter ER, Hsiao PCK. Integrated reporting: Background, measurement issues, approaches and an agenda for future research. *Accounting & Finance*. 2017;57(4):937-59. doi: 10.1111/acfi.12246.

2. Stacchezzini R, Melloni G, Lai A. Sustainability management and reporting: The role of integrated reporting for communicating corporate sustainability management. *Journal of Cleaner Production*. 2016;136:102-10. doi: 10.1016/j.jclepro.2016.01.109.
3. Melloni G, Caglio A, Perego P. Saying more with less? Disclosure conciseness, completeness and balance in integrated reports. *Journal of Accounting and Public Policy*. 2017;36(3):220-38. doi: 10.1016/j.jaccpubpol.2017.03.001.
4. Pistoni A, Songini L, Bavagnoli F. Integrated reporting quality: An empirical analysis. *Corporate Social Responsibility and Environmental Management*. 2018;25(4):489-507. doi: 10.1002/csr.1474.
5. Vitolla F, Raimo N, Rubino M. Appreciations, criticisms, determinants, and effects of integrated reporting: A systematic literature review. *Corporate Social Responsibility and Environmental Management*. 2019;26(2):518-28. doi: 10.1002/csr.1734.
6. Barth ME, Cahan SF, Chen L, Venter ER. The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations and Society*. 2017;62:43-64. doi: 10.1016/j.aos.2017.08.005.
7. Lee KW, Yeo GHH. The association between integrated reporting and firm valuation. *Review of Quantitative Finance and Accounting*. 2016;47(4):1221-50. doi: 10.1007/s11156-015-0536-y.
8. Pavlopoulos A, Magnis C, Iatridis GE. Integrated reporting: An accounting disclosure tool for high quality financial reporting. *Research in International Business and Finance*. 2019;49:13-40. doi: 10.1016/j.ribaf.2019.02.007.
9. Zhou S, Simnett R, Hoang H. Evaluating combined assurance as a new credibility enhancement technique. *Auditing: A Journal of Practice & Theory*. 2019;38(2):235-59. doi: 10.2308/ajpt-52175.
10. Fabrizio KR, Kim EH. Reluctant disclosure and transparency: Evidence from environmental disclosures. *Organization Science*. 2019;30(6):1207-31. doi: 10.1287/orsc.2019.1298.
11. Alzoubi ESS. Disclosure quality and earnings management: Evidence from Jordan. *Accounting Research Journal*. 2016;29(4):429-56. doi: 10.1108/ARJ-04-2014-0041.
12. Bazrafshan E, Kandelousi AS, Hooy CW. The impact of earnings management on the extent of disclosure and true financial performance: Evidence from listed firms in Hong Kong. *The British Accounting Review*. 2016;48(2):206-19. doi: 10.1016/j.bar.2015.09.001.
13. Teixeira JF, Rodrigues LL. Earnings management: A bibliometric analysis. *International Journal of Accounting & Information Management*. 2022;30(5):664-83. doi: 10.1108/IJAIM-12-2021-0259.
14. Obeng VA, Ahmed K, Miglani S. Integrated reporting and earnings quality: The moderating effect of agency costs. *Pacific-Basin Finance Journal*. 2020;60:101285. doi: 10.1016/j.pacfin.2020.101285.
15. Muttakin MB, Mihret D, Lemma TT, Khan A. Integrated reporting, financial reporting quality and cost of debt. *International Journal of Accounting & Information Management*. 2020;28(3):517-34. doi: 10.1108/IJAIM-10-2019-0124.
16. Shirabe Y, Nakano M. Integrated reporting and earnings management. *SSRN Electronic Journal*. 2019:1-46. doi: 10.2139/ssrn.3427705.
17. Chen S. Investor sentiment and stock prices. *Academic Journal of Business & Management*. 2023;5(22):105-16. doi: 10.25236/AJBM.2023.052215.
18. Zhou Z. The impact of investor sentiment fluctuations on stock market liquidity and volatility: Implications for market returns. *Finance Research Letters*. 2025.
19. Yin H, Kong S, Kou W. A Direct Measure of Investor Sentiment. *International Review of Finance*. 2025;25(1). doi: 10.1111/irfi.70012.
20. Soltani H, Taleb J, Boujelbene Abbes M. Spillover effects between stock markets, cryptocurrency, and investor sentiment during COVID-19. *European Journal of Management and Business Economics*. 2025;34(1):23-46.
21. Setayesh MH, Shamseddini K. Examining the relationship between investor sentiment and stock prices of companies listed on the Tehran Stock Exchange. *Journal of Accounting Advances*. 2016;8(1):103-25.
22. Zarei A, Darabi R. The effect of investor sentiment on voluntary disclosure in the Iranian capital market. *Financial Accounting and Auditing Research*. 2018;10(37):131-58.

23. Esteves A, Piccoli P. Firm-specific investor sentiment and earnings management: Evidence from Brazil. *Academia Revista Latinoamericana de Administracion*. 2024. doi: 10.1108/ARLA-08-2023-0140.
24. Bashiri Manesh N, Owradi J. Investors' emotional behavior and accounting earnings management. *Empirical Accounting Research*. 2019(33).
25. Zhu B, Niu F. Investor sentiment, accounting information and stock price: Evidence from China. *Pacific-Basin Finance Journal*. 2016;38:125-34. doi: 10.1016/j.pacfin.2016.03.010.
26. Khoshkar F, Seifi S, Moein Nemati M. The relationship between firm complexity and corporate social responsibility in companies listed on the Tehran Stock Exchange. *Accounting and Management Vision*. 2022;5(64):70-82.
27. Nikbakht M, Jahandoust Marghoub M, Veysi Hesar S. Examining the effect of firm complexity on the relationship between managerial ability and information opacity. *Financial Accounting Research*. 2020;12(3):83-104.
28. Berrill J, Campa D, O'Hagan-Luff M. Firm diversification and earnings management strategies: European evidence. *International Review of Financial Analysis*. 2021;78:101955. doi: 10.1016/j.irfa.2021.101955.
29. Lo K, Ramos F, Rogo R. Earnings management and annual report readability. *Journal of Accounting and Economics*. 2017;63(1):1-25. doi: 10.1016/j.jacceco.2016.09.002.
30. Pajuste A, Poriete E, Novickis R. Management reporting complexity and earnings management: Evidence from the Baltic markets. *Baltic Journal of Management*. 2020;16(1):47-69. doi: 10.1108/BJM-01-2020-0019.
31. Donkor A, Trireksani T, Djajadikerta HG. The role of firm complexity in the relationship between integrated reporting and earnings management. *International Journal of Accounting & Information Management*. 2024. doi: 10.1108/IJAIM-11-2023-0285.
32. Chung MH, Chang YK. Financial reporting complexity, investor sentiment, and stock prices. *Finance Research Letters*. 2024;62:105026. doi: 10.1016/j.frl.2024.105026.
33. Donkor A, Trireksani T, Djajadikerta HG. Board diversity and corporate sustainability performance: Do CEO power and firm environmental sensitivity matter? *Sustainability*. 2023;15(23):16142. doi: 10.3390/su152316142.
34. Trireksani T, Djajadikerta HG, Kamran M, Butt P. The impact of country characteristics on board gender diversity and sustainability performance: A global perspective. *Sustainability*. 2024;16(7):3057. doi: 10.3390/su16073057.