International Journal of Finance and Managerial Accounting, Vol.11, No.41, Spring 2026 IJFMA

Relationship between Income Quality and Cost of Equity: the Role of Voluntary Disclosure of Non-Financial Information and Sustainability Performance

Ali Homayuon
Ph.D Student of Accounting. Qeshm Branch, Islamic Azad University, Qeshm, Iran

Mohammad Hossein Ranjbar*
Associate Professor, Department of Accounting and Finance, Bandar Abbas Branch, Islamic Azad University, Bandar Abbas, Iran (Corresponding)
Mhranjbar54@iauba.ac.ir

Faegh Ahmadi
Assistant Professor,Department of Accounting, Qeshm Branch, Islamic Azad University, Qeshm, Iran.

Ghodrat Allah Talebnia
Associate Professor, Department of Management and Economics, Tehran Science and Research Branch, Islamic Azad University, Tehran, Iran

Submit: 09/12/2023 **Accept:** 07/05/2024

ABSTRACT

The purpose of this study is to investigate the relationship between income quality (IQ) and cost of equity (CEC) through the role of voluntary disclosure of non-financial information and sustainability performance (SP). SP indicators (60 indicators) are used in three economic, social and environmental dimensions to measure the voluntary disclosure of non-financial information at both retrospective and prospective levels and SP, and the data of 120 firms in the period of 2015-2021 have been used to calculate research variables. The results of data analysis using multiple regression and panel data method indicate that the IQ does not have a significant effect on the CEC, which is observed by entering the adjusting variables (voluntary disclosure and SP). Voluntary retrospective and prospective non-financial information and SP have a significant impact on the relationship between the IQ and CEC.

Keywords: Quality of Earnings, Cost of Equity, Voluntary Disclosure of Non-Financial Information, Sustainability Performance.

1. Introduction

According to stakeholder theory, there are two aspects of sustainability, sustainability disclosure and sustainability performance (SP), both of which are interrelated and benefit all stakeholders. Evidence shows that management often pays attention to prospective sustainable environmental, social, and governance (ESG) practices because they affect business activities, improve corporate governance and effectiveness, and align corporate interests with shareholder interests; therefore, voluntary disclosure of prospective non-financial information can improve the efficiency and effectiveness of a company's ESG projects, which can ultimately lead to improved financial SP in the future. In contrast, in disclosing retrospective non-financial information, management tends to provide non-financial performance that can influence current ESG projects. It is so that it improves the financial performance and ultimately leads to an increase in the value of the company (Neg and Rezaei, 2015). The relationship between non-financial sustainability disclosure and SP is debatable when researchers use voluntary disclosure theory or legitimacy theory to describe its relationship with SP (Hummel and Sckliek, 2016). According to the theory of voluntary disclosure, companies announce good news related to their performance through the publication of sustainability reports in order to be superior to weak competitors (Lys et al., 2015). Furthermore, voluntary disclosure theory suggests that higher (lower) specific costs are associated with lower (higher) levels of voluntary disclosure because disclosure may increase the risk of vulnerability to competitors. On the contrary, according to legitimacy theory, firms tend to publish sustainability reports to reduce the negative impact of bad performance news (Rezaei, 2015; 2016).

Income is one of the accounting information which, in comparison with other accounting information, attracts the attention and emphasis of the shareholders, investors and beneficiaries, so that they search for their interests in the information related to it. The income quality (IQ) can affect the decisions of shareholders, investors and beneficiaries in relation to the reliability of financial reporting information. One of the potential outcomes of IQ is its impact on asymmetric information behavior. Asymmetric information behavior increases the risk of wrong choice and as a result, increases business costs and lack of liquidity in financial markets (Bhattacharya et al., 2008). Accounting concepts such as assets, liabilities and profits are considered as informative indicators that provide news about the company to the stakeholders. In this connection, the cost of equity is considered as a criterion for evaluating performance in the model of economic added value. The cost of capital has other uses such as the basis for accepting investment plans, the discount rate to calculate the added value of the market, and the evaluation criteria of capital return rates (Bolo, 2017). The cost of equity (CEC) is very important for managers, because it is one of the basic elements in making investment decisions, and as it decreases, the added economic value of companies increases. Since CEC is a comparison criterion in the evaluation of investment opportunities, companies are obliged to maintain their capital cost at a reasonable and rational level; because if the CEC is high, the company will inevitably eliminate many potential investment projects (Abbasi and Bazarafshan, 2015). The disclosure of capital market information is of utmost importance for the stakeholders, which leads to an increase in transparency in the transactions and market efficiency; therefore, it can be said that disclosure of information is one of the influential factors to increase transparency. Disclosure of information has a close relationship with information asymmetry, which can affect the reduction of asymmetric behavior (Verrecchia, 2001). Information asymmetry has an inverse relationship with the level of disclosure and causes a decrease in the efficiency of the capital market, increases transaction costs, slows down the liquidity of stocks, and ultimately leads to an increase in the company's cost of capital (Brown et al., 2004).

Evidence also shows that investors value voluntary disclosure of meaningful information and use mandatory disclosure to confirm voluntary disclosure. Scientific research confirms the importance of the relationship between mandatory and voluntary disclosure. On the one hand, voluntary disclosure may provide confidential information to existing competitors and potential users, as well as reduce the cost of ownership of the company's competitiveness and profitability; on the other hand, voluntary disclosure can serve the interests of investors and management by reducing information asymmetry. Also, voluntary disclosure can improve stock liquidity, improve IQ, and increase information mediation.

Voluntary information disclosure includes financial and non-financial information (ESG) that is of great importance to stakeholders and management. At the same time, the positive relationship between non-financial SP and financial performance and their integrated effect on the cost of ownership adds to the importance of the issue. From other aspects, the topic of voluntary disclosure of retrospective and prospective non-financial information is important, as the disclosure of prospective non-financial information provides current and potential stakeholders with more relevant information about the company's future forecast than retrospective non-financial information. Moreover, it creates more long-term SP (Rezaei and Tuo, 2017). According to the stated cases, examining the amount of voluntary disclosure of information (retrospective and prospective), providing a model of the relationship between IQ and CEC with regard to the role of voluntary disclosure of information, and SP of companies accepted in the capital market and identifying factors which can affect them adds to the necessity of doing such a research; therefore, the purpose of this research is to investigate the relationship between the IQ and CEC in terms of the moderating role of the company's SP and the voluntary disclosure of non-financial information.

Theoretical foundations and research background

The cost of equity indicates the interests of the shareholders and the main owners of the company to the company's net assets. Equity shows the remaining interest of the company's owners in the company's assets, being obtained after deducting the company's debts. In a business entity, equity represents the interests of the main owners of the entity. In accounting, shareholders' equity attempts to attain goals such as determining the legal and registered capital, determining the company's capital sources, and determining the dividends that can be distributed among the shareholders. In a joint-stock company, equity encompasses items such as accumulated profits and losses, capital, shares deductions, and company reserves. Based on the accounting standard No. 1 (revised) which has been enforced since the early 2019, the "equity" has been renamed as "proprietary rights". By investing and buying shares of stock exchange companies, each shareholder enjoys interests and rights that cannot be violated and should be aware of it, these rights and interests are necessary and can be useful in the future of the presence of shareholders in the capital market. Thus, according to Iran's commercial law, each shareholder has financial and non-financial rights. The rights of capital owners depend on the type of business unit in terms of reporting. So, business units can be divided into two general categories: stock and non-stock. Partnership and relative companies are examples of non-stock companies whose capital owners' rights are normally presented separately to partners. The balance of each partner's capital account is presented in equity, and each partner's share of past profits or losses and withdrawals are included in the partners' current account. As most of the important economic units are joint-stock companies, in discussions on the rights of capital owners of such companies, the difference between assets and debts is called equity or shareholders' rights in joint-stock companies. In the balance sheet, it is usually attempted to separate the equity based on the source of the supplier. For example, the capital shows the amount invested by the shareholders, and the undivided profit represents the part of the shareholders' equity that is provided via the company's operations. What separates the equity components is the legal requirements, especially the commercial law. According to the commercial law, the legal capital of the company and its increase and decrease has certain requirements and therefore should be shown separately. Also, according to Articles 140 and 238 of the amendment of the Commercial Law, part of the allocable profit should be transferred to the legal reserve until the legal reserve reaches 10% of the company's capital. Legal reserve cannot be transferred to capital and cannot be divided based on the normal conditions. Hence, it is better to report the legal reserve as a separate figure as it has a special nature.

The studies conducted in the field of IQ indicate that the relationship between IQ and CEC has been explored by many researchers. The relationship between the seven qualitative characteristics of income, including the quality of accruals, stability, predictability and smoothness (characteristics based on accounting data) and relevance, timeliness and conservatism (characteristics based on market data), with CEC has been studied. It is found that companies with low IQ experience higher CEC (Francies et al., 2004). Also, a similar research was conducted in Iran,

the results of which also indicated the existence of a negative relationship between the qualitative characteristics of income and CEC (Bolo, 2008). Haghighat and Bayat (2023) examined the relationship between social responsibility and cost of equity based on the mediating role of operational risk. This study collected sample data including 153 companies listed on the Tehran Stock Exchange (TSE) during the period of 2013 to 2020, and evaluated the relations. The findings of this study show that social responsibility has a negative and significant impact on the cost of equity and operational risk of companies, and operational risk completely and significantly mediates the impact of social responsibility on the cost of equity. This means that social responsibility leads to a decrease in the cost of equity by reducing operational risk. Hashemi Gohar et al. (2023) examined the impact of corporate sustainability disclosure on the cost of equity and unsystematic risk. The statistical sample of their study includes 105 companies listed the TSE during the years 2016 to 2021. It was found that there is a negative and significant relationship between sustainability disclosure and cost of equity and unsystematic risk. It means that by increasing sustainability disclosure, unsystematic risk and equity cost are decreased. In a study, Abbasi et al. (2021) examined the role of political expenses on the cost of equity and by using the data of 121 companies from 2016 to 2020 showed that political expenses have a positive and significant impact on the cost of equity. Ghodrati Zavarem et al (2022) examined the effect of the ownership structure on the relationship between the cost of equity and the value of the company among 105 companies during the years 2015 to 2020, the results showed that there is a significant relationship between the cost of equity and the value of the company . Also, the ownership structure of the company has a significant impact on the relationship between the cost of equity and the value of the company.Eghdami and Bani Mahd (2018) investigated the impact of leadership strategy and product differentiation on CEC and found that there is an inverse and significant relationship between cost leadership strategy and CEC; but there is no significant relationship between product differentiation strategy and CEC. Feizi et al. (2018) studied the effect of voluntary disclosure of non-financial information and SP on the improvement of audit quality and found that voluntary disclosure of non-financial information and its dimensions strengthen SP and improve the audit quality of the company. Ghorbani et al. (2016) examined the effect of disclosure of strategic, non-financial and financial information on profit management and found that disclosure of strategic, non-financial and financial information has a significant effect on profit management. In this way, the increase in the disclosure of financial information has led to a decrease in profit management, while with the increase in the disclosure of strategic and non-financial information, profit management has also increased. Abbasi and Bazarafshan (2015) investigated the relationship between IQ, voluntary disclosure and information asymmetric behavior with CEC and found that there is a negative and significant relationship between IQ and voluntary disclosure with the CEC. In other words, improving IQ and voluntary disclosure of companies will reduce the CEC of the company. Also, there is a positive and significant relationship between information asymmetric behavior and CEC, so that information asymmetric behavior increases CEC. Bolo and Hosni al-Qar (2013) investigated the relationship between IQ, information asymmetry and CEC and found that there is a significant positive relationship between information asymmetry and CEC and a significant negative relationship between information asymmetry and IQ. Also, the results of this test rejected the existence of a relationship between IQ and CEC.Gholami et al. (2022) examined the impact of the company's sustainability performance on the cost of equity and unsystematic risk of companies. Their statistical sample is the companies listed on the Australian Stock Exchange in the years 2007 to 2017. For testing the research hypotheses, the multiple regression method has been applied. It was found that there is a negative and significant relationship between the sustainability performance of the company and the cost of equity. Also, increasing the sustainability performance of the company leads to the reduction of unsystematic risk.Chen and Zhang (2021) investigated the effect of corporate social responsibility on the cost of equity via operational risk. By using a sample consisting of 7241 observations during the years 2013 to 2018, the study showed that the performance of social responsibility has a negative and significant effect on the cost of equity and operational risk of companies, and the operational risk mediates the effect of the performance of social responsibility on the cost of equity significantly.Saci and Jasimuddin (2020)

investigated the impact of research conducted by institutional shareholders on CEC. Using data from the Chinese capital market, they investigated the relationship between institutional investors' research, institutional investors' heterogeneity and CEC of companies and found that institutional investors' research can significantly reduce the company's CEC. That is, the higher the proportion of field research in the total investment activity, the lower the company's CEC. In addition, institutional investors can reduce the company's CEC by conducting on-site research, site visits, etc., intervening in corporate governance, improving the level of corporate information disclosure, and playing an external monitoring role. Guo et al. (2019) investigated the relationship between marketing, information transparency and CEC of family firms. The results of their research based on 573 family companies in China showed that CEC has a positive relationship with family control. As information transparency increases, the effect of family control on CEC weakens. The tripartite interaction between marketing, family control and information transparency has a negative effect on CEC. This means that as marketization increases, the negative effect of information transparency on the relationship between family control and CEC weakens. Rezaeei and Tuo (2017) studied the effect of voluntary disclosure of non-financial information on SP. They extracted the voluntary nonfinancial disclosures of 580 sample companies in four selected industries in the United States about product, competition, industry, customers, trends, and technical data from their 2010 annual reports and found that information content and managerial incentives play an important role in evaluating the precedents and the antecedents of non-financial disclosure. Using ratings obtained from the KLD database to construct ESG sustainability performance, they observed a bidirectional relationship between non-financial disclosures and SP. Bhattacharya et al. (2011) investigated the relationship between profit quality, information asymmetry and CEC and found reliable evidence of a direct relationship between information asymmetry and CEC and the inverse relationship between IQ and CEC, on the one hand, and IQ and information asymmetry, on the other hand.

Research hypotheses

First hypothesis: Voluntary disclosure of retrospective non-financial information has a significant effect on the relationship between IQ and CEC.

Second hypothesis: Voluntary disclosure of prospective non-financial information has a significant effect on the relationship between IQ and CEC.

Third hypothesis: SP has a significant effect on the relationship between IQ and CEC.

Methodology

The present study is descriptive-correlational in terms of its nature and methodology, it is quantitative in terms of data collection, and it is applied in terms of its implications. The research method is analytical in terms of its objective, deductive-inductive in terms of its logic of execution, and post-hoc in terms of temporal dimension. In the hypothesis testing section, information was collected through document mining of companies' financial statements on the Tehran Stock Exchange website, and the required information was extracted from the audited financial statements, Codal website and Rahavard Novin software. To test the hypotheses of the research, multiple linear regression was used, and for the final analysis, in order to analyze the data, the Eviews 9 and Stata 13 software were used. The statistical population of the study included companies accepted to the Tehran Stock Exchange during the period from 2015 to 2021, i.e. 120 companies, selected by the method of systematic elimination and applying restrictions such as the need to match the fiscal year, being a manufacturing unit, and the possibility of accessing the required information, and so on.

Research model and variables

To test the hypotheses of the research, equations (1), (2) and (3), which are taken from the research of Rezaeei and Tuo (2017), are used:

$$CEC_{i,t} = \alpha_0 + \beta_1 EQ_{i,t} + \beta_2 H_{NDSCORE_{i,t}} + \beta_3 EQ_{i,t} * H_{NDSCORE_{i,t}} + \beta_4 BM_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 INTAN_{i,t} + \beta_7 ISSU_{i,t} + \beta_8 LEV_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10} SIZE_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$CEC_{i,t} = \alpha_0 + \beta_1 EQ_{i,t} + \beta_2 F_{NDSCORE_{i,t}} + \beta_3 EQ_{i,t} * F_{NDSCORE\,i,t} + \beta_4 BM_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 8INTAN_{i,t} + \beta_7 ISSU_{\,i,t} + \beta_8 LEV_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10}\, SIZE_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$CEC_{i,t} = \alpha_0 + \beta_1 EQ_{i,t} + \beta_2 CSP_{SCORE_{i,t}} + \beta_3 EQ_{i,t} * CSP_{SCORE_{i,t}} + \beta_4 BM_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 INTAN_{i,t} + \beta_7 ISSU_{\,i,t} + \beta_8 LEV_{i,t} + \beta_9 LOSS_{i,t} + \beta_{10}\, SIZE_{i,t} + \varepsilon_{i,t} \quad (3)$$

Independent variable

Income quality ($IQ_{i,t}$): IQ refers to the potential field of growth and the probability of realizing future earnings. In other words, the value of a share does not only depend on the company's current year's profit, but also on our expectations of the company's future and the profitability of future years and the confidence factor regarding future profits (Fard and Jahankhani, 2014). There are different models to measure IQ. In this research, the model of Francies et al. (2004) is used.

$$TCA_{j\,,t} = \emptyset_{0j} + \emptyset_{1j} CFO_{j,t-1} + \emptyset_{2j} CFO_{j,t} + \emptyset_{\,3j} \mathrm{CFO}_{j,t+1} + \emptyset_{4j} \Delta Rev_{j,t} + \emptyset_{sj} PPE_{j0t} + \varepsilon_{j,t} \quad (4)$$

Where, TCA is the total current accruals of the company, CFO is the operating cash flow, ΔRev is company's income change, and PPE is gross value of property, plant, and equipment. Standard deviation of model residuals indicate IQ. It is so that standard deviation of model residuals are inversely correlated with IQ, i.e. the less the standard deviation is, the more IQ is, and vice versa.

Dependent variable

Cost of equity ($CEC_{i,t}$): CEC is conceptually defined in relation to expected return. In other words, CEC refers to the minimum expected return rate. Gordon's growth model was used to calculate it (Damodaran, 2002):

$$CEC = \frac{D_1}{P_0} + g \quad (5)$$

Where, CEC is cost of equity capital, D_1 is dividend paid at the end of the first year, and g is the growth rate of the dividend. The following equation is used to calculate the growth rate of dividend:

$$g = \left[\frac{EPS_t}{EPS_0}\right]^{\left(\frac{1}{t}\right)} - 1 \quad (6)$$

Also, the following relationship was used to calculate the price of each share at the beginning of the year:

$$P_0 = \frac{DPS_1}{r-g} \quad (3)$$

Where, r is the expected return of shareholders.

Moderating variables

Voluntary disclosure of non-financial information ($ND_{SCORE_{i,t}}$): Voluntary disclosure of non-financial information of company i in year t is obtained by basing the items mentioned below; therefore, if an item of disclosure of non-financial information of companies has been done, a score of one is given, and if it has not been disclosed, a score of zero is given. Therefore, the number of disclosed items to the total items that can be disclosed in the voluntary disclosure of non-financial information of companies based on the data included in the annual reports of companies indicates the percentage of voluntary disclosure of non-financial information of companies or the score of voluntary disclosure of non-financial information of companies.

Prospective non-financial information, including the company's surrounding environment, the intensity of competition in the industry, and the company's trends.

The surrounding environment of the company, including the ability of new firms to enter the industry, the ability of substitute products or services, the state of competition and position in the industry, changes in the market, competition or technology (identity, sourcing and sustainability), a description of the structure of the firm's industry, changes in market share and information about economic situation of the company and industry.

Intensity of competition in the industry, including recent changes in the environment, the nature and timing of the company's response, laws and regulations affecting the industry, business strategy and the degree of compatibility of strategies with the environment, emphasis on providing financial information based on management accountability, goals of return on assets, return on equity and capital ratio, identity and the background of the board members and managers, the nature of the major shareholders and management

shares, goals, methods of directing the economic unit, mission and goals, the nature of disagreements with the board members, banks, independent auditors and former auditors, and the types and amounts of bonuses of the board members and managers and calculation methods.

Company's trend, including beneficial or disadvantageous conditions with which the company is involved and may increase or decrease cash flows in the future, changes in the financial position and financial flexibility of the company, explanation of relationships and changes among data, prospective qualitative information such as forecasts, information about the future, providing information about the stage of research and development, discussing new products, discussing patented inventions, and emphasizing and future directions of technological innovations.

Retrospective non-financial information, including company environment, production, customers, and technologies

Company's environment, including description of business and industry structure, employee participation, public events in the business environment and economic unit during the last five years, number of employees, average salaries and benefits of employees, identity of related parties and description of relationships, scope and description of activities of economic unit and related assets, and seasonal and periodic affairs of the economic unit.

The company's production, including number and quality of sources and key suppliers, industry definition, description and continuity of important inventions, trademarks, description of basic products/services, information on geographic concentration based on production, information on changes in the nature of a product warranty, significant changes in ratio of materials purchased from one or two large suppliers, retrospective non-financial business information over the last ten years, innovative products or services, bargaining power with suppliers of resources and satisfaction of suppliers, timeliness of key activities (production, delivery, development of new products), sales trends, sales price, unit prime cost and volume and price of materials used, information about the place of production and delivery of manufactured products, information about the geographic concentration of sales.

Customers, including information about technological and governance changes affecting the market, commercial information, significant changes in sales to major customers, major contractual relationships, price, volume and product changes and their reasons, penetration and quality of presence in the market, providing customer satisfaction criteria and bargaining power.

Technologies, including current product innovation, description of ongoing research projects, failure of old projects and description of inventions.

Corporate sustainability performance ($CSP_{SCORE_{i,t}}$): SP is related to the components that show the social responsibilities of the organization. The better the organization does in maintaining and promoting its social responsibilities, the more it can lead to the success of the organization in other sectors as well. In order to measure SP, its indicators (60 indicators) are used in the 3 dimensions of economic, social and environmental SP, and if a company has the specified criteria, it is assigned number 1 and otherwise it is assigned zero (Rezaeei and Tuo, 2017). To measure the disclosure level of companies' SP, the total number of disclosed items is divided by the total number of items that can be disclosed (Barzegar, 2013).

Economic indicators: includes financial aspects and socioeconomic effects, which are placed in 15 classes and groups. In general, among the most important indicators mentioned are specific goals and requirements for planning, added value of the worker's share, targeting to gain return, the company's market share in relation to the industry and region, growth or changes in the market share and its forecast in the future, geographical concentration of sales and customers by region, changes in sales in terms of Rials and products and regions and customers, changes in technology and market requirements, changes caused by the market and other competitors, recognition of indirect economic effects with importance and production efficiency scales, social investment separately and their costs, value added tax and other taxes.

Social indicators: are related to the demographic characteristics of the employees, the most important of which are the processes and policies of communication with the employees and the survey of the employees and the examination of its results in the company environment, explaining the hygiene and safety criteria and activities and job health, disclosure of recruitment and employment policies and procedures, compliance

with consumer rights, customer satisfaction management systems, description of supply chain characteristics, disclosure of information on product development and research projects, R&D expenses, fund of scholarship programs and allowances related to them, supporting the development of small industries and entrepreneurs, creating infrastructure, financial assistance to support social, educational, cultural and artistic activities and natural disasters, hiring or recruiting part-time student interns in the form of university-industry relations, supporting projects related to health and medical research, supporting scientific and cultural conferences, industrial relations, marketing, advertising and explaining the measures taken to prevent and deal with corruption, bribery, and money laundering.

Environmental indicators: are related to the environment and surrounding environment. The most important environmental indicators are the amount and value of raw materials, consumed resources, ways to reduce waste and also reduce harmful effects on the environment, ideas for producing products based on recycling, the amount of energy saved, considering current and future plans for management of environmental effects, actions taken regarding greenhouse gases, separation of wastes, as well as methods of reducing and eliminating hazardous wastes and their proper disposal, environmental effects of transportation in different areas, expressing activities regarding compliance with environmental issues on the side of consumers and the value supply chain, informing customers on the consumption of products with environmental considerations, having methods of reviving natural resources such as forests and soil, designing equipment and products that are compatible with the environment, compiling regulations and environmental charters, and environmental legal claims.

Control variables

Long-term liabilities: It is equal to the division of long-term liabilities by total assets.

Size of the company (SIZE): equal to the natural logarithm of the company's assets.

Book value to market value: To control the effect of the company's investment opportunities on CEC, the ratio of book value to market value has been used.

Financial leverage: An increase in the company's financial leverage leads to an increase in the company's risk and, as a result, an increase in the expected profit rate of the shareholders, and ultimately causes an increase in company's common CEC. Therefore, it is expected that with the increase of financial leverage, the common CEC will also increase. In this research, financial leverage is calculated as the ratio of liabilities to total assets of the company.

Loss: If the company has a loss during the financial period, it is given a value of one and otherwise a value of zero.

Growth opportunity: It comes through the ratio of changes in the company's assets in the current year to the assets at the beginning of the period.

Intangible assets: It is equal to the ratio of fixed intangible assets to the total assets of the company.

Research findings

Descriptive findings

The descriptive statistics of the research are presented in Table No. 1. The standard deviation is one of the dispersion indices that determines the dispersion of the data from the average. The average and median of CEC are 0.451 and 0.145, respectively, and the average and median of SP are 0.285 and 0.283, respectively. A low standard deviation indicates a low dispersion of the data from the mean, and a high standard deviation indicates a high dispersion of the data from the mean. The variable of intangible assets with a standard deviation of 0.004 has the lowest dispersion from the average and the company size variable with a standard deviation of 82.38 has the highest dispersion from the average. If the standard deviation is close to zero, it means that the data is close to the average and has little dispersion, while a large standard deviation shows that the data dispersion is significant. According to the presented table, it can be stated that all the research variables have a suitable statistical distribution and their standard deviation is not zero, as a result, the research variables can be included in the model.

Table 1. Descriptive statistics results

Variable	Average	Median	SD	Min.	Max.	Skewness	Kurtosis
IQ	-0.005	-0.019	0.097	-0.157	0.207	0.540	2.620
CEC	0.451	0.145	1.229	-0.840	4.270	1.777	5.885
SP	0.285	0.283	0.079	0.050	0.483	-0.162	3.027
Retrospective non-financial information disclosure	0.238	0.229	0.071	0.114	0.400	0.311	2.845
Prospective non-financial information disclosure	0.302	0.310	0.109	0.138	0.552	0.769	2.862
Book-to-market value	0.474	0.432	0.250	0.136	1.063	0.769	4.228
Growth opportunity	0.171	0.125	0.198	-0.084	0.668	1.034	2.218
Intangible assets	0.004	0.001	0.006	0	0.024	1.707	20.152
Long-term liabilities	0.058	0.037	0.059	0.002	0.219	1.469	2.976
Financial leverage	0.547	0.567	0.184	0.828	0.180	-0.393	2.862
Loss	0.045	0	0.207	0	1	4.376	3.402
Size	14.505	14.162	1.508	12.434	18.005	0.847	4.872

Inferential findings

In order to validate the results of statistical tests, the presuppositions of the regression model must first be checked; therefore, before interpreting the regression results, the classic assumptions of regression and how to estimate the model are examined. In order to determine the appropriate model of the research, Limer and Hausman's F test was used, the results of which are presented in Table 2. The results of Limer's F test indicate that the null hypothesis (accepting the same intercept) is not rejected at the 5% level; therefore, according to the obtained results, the panel data method is suitable. Due to the fact that the panel data model was accepted to estimate the regression model, there is no need for the Hausman test.

Other presuppositions required for regression model estimation are homoscedasticity and serial autocorrelation of model error terms. If there is heteroscedasticity and autocorrelation, the validity of the regression model will be doubted, and for this purpose, Brush-Pagan test and Waldrich test were used in the panel data. The test results are presented in table 4. According to the results, it can be said that there is no serial autocorrelation in the regression models, but the regression models have heteroscedasticity, and to solve this problem, the generalized least squares method is used in the final fitting of the model.

Table 2. Data analysis pattern selection test

Model	F-statistics	DF	Sig.	Result	Selected model
1	0.949	(119.710)	0.631	H_0 is not rejected	Panel data
2	0.929	(119.710)	0.685	H_0 is not rejected	Panel data
3	0.949	(119.710)	0.631	H_0 is not rejected	Panel data

Table 3: Results of serial autocorrelation test

Model	Test	F-statistics	Sig.	Result	Status
1	Waldrich	0.008	0.929	H_0 is not rejected	Lack of serial autocorrelation
2	Waldrich	0.069	0.792	H_0 is not rejected	Lack of serial autocorrelation
3	Waldrich	0.001	0.971	H_0 is not rejected	Lack of serial autocorrelation

Table 4: Results of heteroscedasticity test

Model	Test	Chi^2	Sig.	Result	Status
1	Brush-Pagan	14	0.000	H_0 is rejected	Heteroscedasticity
2	Brush-Pagan	15.05	0.000	H_0 is rejected	Heteroscedasticity
3	Brush-Pagan	14.78	0.000	H_0 is rejected	Heteroscedasticity

Results of research hypothesis testing

First hypothesis: Voluntary disclosure of retrospective non-financial information has a significant effect on the relationship between IQ and CEC.

The results of table (5) show that Durbin-Watson's statistic is equal to 2.16, i.e. between 1.5 and 2.5, indicating the absence of autocorrelation errors in the model. According to the F statistic and significance level (0.000), the fitted regression model is significant. In this model, the adjusted coefficient of determination is equal to 0.181, showing that 18% of the changes in the dependent variable can be explained by the independent variable and control variables. Examining the results of the first question shows that the significance level of the regression coefficient of IQ is equal to 0.241, as a result, it can be said that IQ does not have a significant effect on CEC at the 95% confidence level. With the inclusion of the variable of voluntary disclosure of retrospective non-financial information to the model as a moderating variable, the significance level of the regression coefficient of the disclosure of retrospective non-financial information*IQ was equal to 0.000, which shows that the voluntary disclosure of retrospective non-financial information has a significant effect on the relationship between IQ and CEC. Examining the significance level of control variables shows that the ratio of book value to market value has a negative effect and the variables of asset growth, the ratio of long-term liabilities and company losses have a positive and significant effect on CEC.

Second hypothesis: Voluntary disclosure of prospective non-financial information has a significant effect on the relationship between IQ and CEC.

The results of table 6 show that Durbin-Watson's statistic is equal to 2.15 (between 1.5 and 2.5), indicating the absence of model autocorrelation errors. According to the F statistic and significance level (0.000), the fitted regression model is significant. In this model, the adjusted coefficient of determination is equal to 0.178, showing that about 18% of the changes in the dependent variable can be explained by the independent variable and control variables of the model. Examining the results of the second question shows that the significance level of the regression coefficient of IQ is equal to 0.854, as a result, it can be said that IQ does not have a significant effect on CEC at the 95% confidence level. With the inclusion of the variable of disclosure of prospective non-financial information to the model as a moderating variable, the significance level of the regression coefficient of voluntary disclosure of prospective non-financial information*IQ was equal to 0.000, which shows that voluntary disclosure of prospective non-financial information has a significant effect on the relationship between IQ and CEC. Examining the significance level of control variables shows that the ratio of book value to market value has a negative effect and the variables of asset growth, the ratio of intangible assets, the ratio of long-term liabilities and company losses have a positive and significant effect on CEC.

Table 5: The results of estimating the regression model of the first hypothesis

Variable	Regression coefficient	Standard error	t-statistics	Sig. level
Fixed value	0.959	0.256	3.735	0.000
IQ	-0.587	0.500	-1.173	0.241
Retrospective non-financial information disclosure	-0.601	0.306	-1.962	0.050
Prospective non-financial information disclosure*IQ	8.518	1.617	5.265	0.000
Book-to-market value	-0.509	0.099	-5.141	0.000
Growth opportunity	0.574	0.145	3.954	0.000
Intangible assets	5.398	2.848	1.895	0.058
Long-term liabilities	0.860	0.416	2.064	0.039
Financial leverage	-0.243	0.153	-1.584	0.113
Loss	0.777	0.218	3.551	0.000
Size	-0.024	0.014	-1.674	0.094
Coefficient of determination	0.190			
Adjusted coefficient of determination	0.181			
F-statistics	19.548 (0.000)			
Durbin-Watson	2.16			

Table 6: The results of estimating the regression model of the second hypothesis

Variable	Regression coefficient	Standard error	t-statistics	Sig. level
Fixed value	0.725	0.244	2.964	0.003
IQ	-0.087	0.476	-0.183	0.854
Retrospective non-financial information disclosure	0.292	0.202	1.442	0.149
Prospective non-financial information disclosure*IQ	5.295	1.193	4.435	0.000
Book-to-market value	-0.536	0.098	-5.424	0.000
Growth opportunity	0.539	0.146	3.690	0.000
Intangible assets	6.716	2.882	2.329	0.020
Long-term liabilities	0.915	0.420	2.176	0.029
Financial leverage	-0.246	0.150	-1.634	0.102
Loss	0.778	0.218	3.562	0.000
Size	-0.023	0.014	-1.608	0.108
Coefficient of determination	0.188			
Adjusted coefficient of determination	0.178			
F-statistics	19.197 (0.000)			
Durbin-Watson	2.15			

Third hypothesis: Non-financial SP has a significant effect on the relationship between IQ and CEC.

The results of table 7 show that Durbin-Watson's statistic is equal to 2.16 (between 1.5 and 2.5), indicating the absence of model autocorrelation errors. According to the F statistic and significance level (0.000), the fitted regression model is significant. In this model, the adjusted coefficient of determination is equal to 0.176, showing that about 18% of the changes in the dependent variable can be explained by the independent variable and control variables of the model. Examining the results of the third question shows that the significance level of the regression coefficient of IQ is equal to 0.442, as a result, it can be said that IQ does not have a significant effect on CEC at the 95% confidence level. With the inclusion of the variable of SP to the model as a moderating variable, the significance level of the regression coefficient of SP*IQ was equal to 0.000, which shows that SP has a significant effect on the relationship between IQ and CEC. Examining the significance level of control variables shows that the ratio of book value to market value has a negative effect and the variables of asset growth, the ratio of intangible assets, the ratio of long-term liabilities and company losses have a positive and significant effect on CEC.

Table 7: The results of estimating the regression model of the third hypothesis

Variable	Regression coefficient	Standard error	t-statistics	Sig. level
Fixed value	0.921	0.246	3.744	0.000
IQ	-0.414	0.539	-0.768	0.442
SP	-0.362	0.295	-1.225	0.220
SP*IQ	7.007	1.571	4.459	0.000
Book-to-market value	-0.558	0.100	-5.586	0.000
Growth opportunity	0.532	0.146	3.640	0.000
Intangible assets	5.487	2.770	1.980	0.048
Long-term liabilities	0.857	0.420	2.042	0.041
Financial leverage	-0.241	0.153	-1.579	0.114
Loss	0.806	0.218	3.690	0.000
Size	-0.022	0.014	-1.562	0.118
Coefficient of determination	0.18			
Adjusted coefficient of determination	0.176			
F-statistics	18.981 (0.000)			
Durbin-Watson	2.16			

Discussion and conclusion

The quality of financial information of companies, and especially the reported profit, can influence the confidence of investors in financial markets in financial reporting. A review of the studies conducted on the quality of profit indicates that in examining the relationship between the quality of profit and the cost of equity, researchers have neglected to examine the impact of voluntary disclosure of non-financial information and sustainability performance on the relationship between the quality of profit and the cost of equity. Hence, in this research, we attempt to investigate the impact of voluntary disclosure of non-financial information and sustainability performance of companies on the relationship between the quality of income and the cost of equity. For this purpose, 120 companies were investigated between 2015 and 2019. In order to measure the voluntary disclosure of non-financial information at two retrospective and prospective levels and sustainability performance, sustainability performance indicators (60 indicators) were applied in 3 dimensions of economic, social and environmental sustainability performance. It was found that there is no significant relationship between the quality of income and the cost of equity, but the effect of voluntary disclosure of historical, prospective and sustainable performance non-financial information showed that there is a significant relationship between the quality of income and the cost of equity.

This result showed that the voluntary disclosure of retrospective and prospective non-financial information and SP affect the companies' IQ; so that IQ as an effective and meaningful factor causes changes in the CEC of companies, and by applying changes in IQ, CEC of companies can be managed and controlled. Also, companies whose income is of high quality have less risk to attract investors for financing. Therefore, suppliers of companies' resources are looking to invest in companies that have quality income. In fact, the entry of capital and financing is easier for institutions and companies that have quality incomes because they create a logical confidence in investors to obtain the desired return. On the other hand, companies that experience low-quality incomes must provide them with a higher rate of return than other companies in order to attract the attention of investors, hence the rate of return increases from the point of view of investors and financers and the rate of CEC increases from the point of view of companies and institutions. The results of this hypothesis are similar to the results of Rezaeei and Tuo (2017), but consistent with the research of Francies et al. (2004) in terms of the direction of the relationship, but inconsistent in terms of the significance level. Also, according to the obtained results, the quality of income does not have a significant impact on the cost of equity, which is not consistent with the results of Bhattacharya et al. (2011).

Research recommendations

According to the results of research hypotheses, disclosure of non-financial information and sustainability performance are factors affecting the relationship between the quality of companies' income and the cost of equity. Thus, the followings are suggested:

It is recommended to investors, users, and standard and policy making organizations, in their decisions, to consider the disclosure of non-financial information and sustainable performance as factors that positively affect the quality of income on the increase or decrease in the cost of equity.

- It is suggested to the stock exchange organization and the legislators that encourage companies to disclose financial statements as best as possible with incentive mechanisms via codified laws.
- It is suggested that policy makers and company managers should pay special attention to issues regarding sustainable performance and disclosure of non-financial information in addition to financial information for shareholders and stakeholders.

Research limitations

- Due to the potential limitations, only the data of 120 companies were investigated and studied in the current research (limitation of the sample size), thus, in generalizing these results to the larger population, we should be cautious and if we had a bigger sample size, more accurate results might have been obtained.
- Data analysis and hypothesis testing were performed using the multiple regression model and panel data method, which may change the

results with another method (changing the way the research is conducted).

- The limitation in determining the temporal domain can also make it difficult to generalize the obtained results to other years.
- Shortage of resources to compare results.

Conflict of interest

There is no conflict of interest.

Acknowledgement

We express our gratitude to all the respected professors and referees of the magazine who have helped us in conducting this research.

References

Eghdami, E. & Bani Mahd, B. (2018). The effect of leadership strategy and product differentiation on the cost of equity. *Scientific Journal of Management Accounting*, 12(43): 153-165. (In Persian)

Barzegar, Gh. (2013). A model for corporate social responsibility disclosure and its relationship with financial performance. PhD dissertation in accounting. Allameh Tabatabai University of Tehran. (In Persian)

Bolo, Q. (2017). Cost of equity and profit characteristics. Doctoral thesis in accounting. Allameh Tabatabai University. Faculty of Management and Accounting. (In Persian)

Bolo, Q. & Hosni al-Qar, M. (2013). The relationship between profit quality, information asymmetry and cost of equity. *Journal of accounting knowledge*, 17: 49-75. (In Persian)

Jahankhani, A. & Zariffard, A. (1995). Do managers and shareholders use appropriate criteria to measure the value of the company? *Financial research*, 2(7, 8): 41-66. (In Persian)

Haghighat, , H. &, Bayate, M.(2023). The relationship between social responsibility and the cost of equity based on the mediating role of operational risk. The perspective of accounting and management. Period 6. No. 80. pp. 117-134.(In Persian)

Abbasi, E. & Bazarafshan, M. (2015). Examining the relationship between profit quality, voluntary disclosure and asymmetric information behavior with the cost of equity in companies listed on the Tehran Stock Exchange. *Experimental accounting research*, 7(25): 39-60. (In Persian)

Abbasi, H. &, T, Aliasghar. (2021). The role of political costs on the cost of equity. The perspective of accounting and management. Period 4. NO. 53.pp. 85-95.(In Persian)

Feizi, M., Pour Agha Jan Sar Hamami, A.A., & Nasl Mousavi, H. (2018). The effect of voluntary disclosure of non-financial information and sustainability performance on improving audit quality. *Audit knowledge*, 77: 190-220. (In Persian)

Ghodrati Zavarem, A, Noruzi, M. Bagheri, Iraji, E, Nasiri, D. (2021). The impact of ownership structure on the relationship between cost of equity and company value. The new research approaches in management and accounting. Year 5. NO. 83. Pp.1879-1893. .(In Persian)

Hashemigohar, M, Ebrahimi Moghadam, M, Rezayi, M.(2023). The impact of sustainability disclosure of company on the cost of equity and non-systematic risk. Journal of perspective of accounting and management. Period 6. No. 80. Pp. 240-253. .(In Persian)

Bhattacharya, N., Desai, H. & Venkataraman, K. (2008). Earnings quality and information asymmetry: evidence from trading costs. Working Paper, Southern Methodist University.

Bhattacharya. N., Ecker, F., Per. M. Olsson & K. Schipper. (2011). Direct and mediated associations among earnings quality, information asymmetry, and the cost of equity. Accounting Review, 87 (2), pp.449- 482.

Chen, B., Zhang, A. (2021). "How does corporate social responsibility affect the cost of equity capital through operating risk?", Borsa Istanbul Review.

Brown, S., Hillegeist, S., & Lo, K. (2004). Conference calls and information asymmetry. Journal of Accounting and Economics, 37, (3), pp.343-366.

Damodaran, A. (2002). Investment Valuation: Tools and Techniques for Determining the Value of Any Asset, Second Edition, Publisher: Wiley; 2nd edition.

Francies, I., Lafond, R., Olsson, P & Schipper, K. (2003). Earnings quality and the pricing effects of earnings patterns, working paper Duke University, pp. 53.

Gholami, A., Sands, J. and Shams, S. (2022), "Corporates' sustainability disclosures impact on cost of capital and idiosyncratic risk", Meditari Accountancy Research, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/MEDAR-06-2020-0926

Guo, J. & Li, Ch. & Jiao, W. & Wang, Zh. (2019). Marketisation, information transparency and the cost of equity for family firms. Finance Research Letters. https://doi.org/10.1016/j.frl.2019.101394.

Hummel,K;Sckliek,C. (2016). The relation between Sustainability performance and Sustainability disclosure-reconciling voluntary disclosure theory and legitimacy theory. *Journal of Accounting and public policy*, 35(5): 455-476.

Neg, A.C & Rezaee, Z. (2015). Business sustainability performance and cost of equity capital. *Journal of corporate finance*, 34: 128-149.

Lys, T; Naughton, J. and Wang, C. (2015). Signaling through corporate account ability reporting. *Journal of Accounting and Economics*, 60(1), pp.56–72.

Rezaee, Z.(2016). Business sustainability research: A theoretical and integrated perspective. *Journal of Accounting Literature*, 36: 48-64.

Rezaee, Z. & Tuo, L. (2017). Voluntary disclosure of non-financial information and its association with sustainability performance. Advances in Accounting, 39, pp.47-59.

Saci, F. & Jasimuddin, S. M. (2020). Does the research done by the institutional investors affect the cost of equity capital?. Finance Research Letters, https://doi.org/10.1016/j.frl.2020.101834

Verrecchia, R. E. (2001). Essays on disclosure. Journal of Accounting and Economics, (32), pp. 97-180.