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Structural Equation Modeling to Investigate the Impact of Information Quality Indicators on Financial Reporting Quality Risk with Emphasis on the Mediating Role of Risk Management: Evidence from Tehran Stock Exchange

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ABSTRACT

The quality of financial reporting is an effective factor in reducing information asymmetry that can affect different dimensions of the company. Although this has been the subject of many researches in the financial and accounting literature, a few researches have been done on the impact of the quality of accounting information and risk management on the quality of reporting through structural analysis. In this study, in order to measure the quality of financial reporting, six methods have been used in Iranian companies. For this purpose, 138 companies from selected companies in the Tehran Stock Exchange have been selected as the sample and their financial information has been examined during the years 2011 to 2018. Evidence of analysis on the method of structural equations shows that the quality of accounting information has a significant and positive effect on the quality of financial reporting, but risk management cannot play a role in moderating this relationship.

Keywords:

Financial Reporting Quality, Accounting Quality Information, Risk Management, Structural Equations.

1. Introduction

Quality accounting information is one of the most important sources of information for investors, which can have a significant impact on the optimal decisions of investors. The quality of accounting information usually indicates that the information is based on generally accepted principles, such as international standards in accounting or auditing (Bahar Moghaddam and Jokar, 2018).The quality of financial reporting is a broad concept that refers not only to financial information, but also to other non-financial information that is useful in making decision by users. According to the definition of the Financial Accounting Standard Board, the International Accounting Standard Board, the British Accounting Standard Board and the Australian Accounting Standard Board, the quality of financial reporting leads to the presentation of financial statements with accurate and fair information about a firm's financial status and economic performance Herath and Albarqi, 2017). The quality of financial reporting, on the one hand, depends on the operational and trading characteristics of the company and, on the other hand, on the presentation and reflection of these characteristics in the financial statements. It is difficult to determine the standard for measuring the quality of financial reporting. Francis et al. (2005) stated that the quality of financial reporting comes from two sources, entitled "Intrinsic Characteristics" and "Optional Reporting System Characteristics". Intrinsic characteristics are derived from the business model and the operating environment of the company, and the characteristics of the financial reporting system are derived from the company's accounting system and financial reporting process. Financial reporting is one of the available sources of information for the capital market that is expected to play an effective role in the development of investment and increase its efficiency. Increasing the quality of financial reporting is a tool to fulfill the responsibility of meeting the needs of society. The usefulness of financial statements or other financial statements is affected by the quality of financial reporting, in which the stability of the procedure and the accuracy of the information are the basic aspects of quality (Kurdistani and Rahimi, 2011). The quality of financial reporting is a criterion that separates useful information from other information and enhances the usefulness of financial information. It is clear that legislators and investors all agree on having high-quality financial reporting; because the dominant belief is that the quality of financial reporting affects capital markets directly (Amir Azad & et al., 2018). The transparency of financial information is also important economically, because it improves resource allocation, therefore, in many fractures of the capital market, the lack of transparency is considered one of the influential factors (Noruzi & et al., 2020). The major part of the information that organizations mangers need to make decisions is accounting information. Accounting information includes individuals, methods and methods of information technology. Most of the decisions of managers are economic decisions and choosing appropriate solutions to improve the performance of the organization. Because accounting seeks to measure and provide economic information to users for judging and making informed decisions, we recognize it as an information system. Therefore, for the success of organizations, considering the importance and effectiveness of reports that can be extracted and presented from the accounting information system, managers need to use the quality information of this system correctly to make decisions (Samareh Sandi & et al., 2015). The main means of transferring information to individuals and external users are basic financial statements; and if accounting information has characteristics such as: - comprehensibility - having a logical knowledge of accounting - relevance - predictive value - emphasizing value - nature and importance - reliability - honest expression - content preference over form - precautions - neutrality - completeness - comparability - procedural stability and - full disclosure, therefore, financial reporting, which is the end product of the accounting system, should express accounting information in such a way that it can be useful for investors, current and potential creditors and other users in reasonable investment decision makings, credit grant and other similar decisions (Samareh Sandi & et al., 2015). Due to the importance of financial reporting quality and also the analysis of the factors affecting it in this research, all the criteria of financial reporting quality have been considered as the dependent variable in structural analysis and the impact of the role of information quality and risk management on financial reporting quality have been analyzed.

2. Theoretical Foundations

The quality of financial reporting determines the value of financial reporting, and therefore, providing a clear and complete definition of the quality of financial reporting is a global demand. In general, it is necessary to provide quality financial reports that affects consumers' investment decisions and increases market efficiency; therefore, providing ideal methods for assessing the quality of financial reporting is another requirement in the field of financial reporting, and the higher the quality of financial reporting, the greater the benefits that investors and users of financial reporting gain (Akeju and Babatunde, 2017). The purpose of accounting and financial reporting is to meet the demands and information needs of users. The main means of transferring information to individuals and extra organization users is basic financial statements. If accounting information has characteristics such as: comprehensibility - having a logical knowledge of accounting - relevance - predictive value - emphasizing value - nature and importance - reliability - honest expression - content preference over form - precautions - neutrality - completeness - comparability - procedural stability and - full disclosure, financial reporting quality will be higher and accounting information should be expressed in such a way that it be useful for investors, current and potential creditors and other users in their reasonable investment decision makings, credit granting and other similar decisions (Samareh Sandi & et al., 2015). Due to the scandals of big companies and fraudulent accounting activities in some companies, the importance of disclosing information as much as possible in the non-financial parts of these reports has increased. Risk management is an important and fundamental component in the internal control and governance management system of companies, and through it, the goals and objectives of activities can be achieved. In summary, risk management refers to the methods and processes used in organizations through which the risks in the organization can be managed (or increase opportunities) and achieve the company's goals (Vakilifard et al., 2013). Theoretically, it is accepted in the capital market that better financial disclosure, as a basis for decision-making, should lead to greater confidence and less risk for investment, thus reduce the cost of investment for companies (Johnston, 2006). The annual report of the companies should be prepared every year and it is expected that by doing so, it will be possible to provide useful information to the users of these reports and help them in making the final decision. Still, due to changes in business models, the financial sector has not been able to meet the information needs of the stakeholders and cannot meet all of them. As a result, individuals and different groups are now seeking to use the non-financial sectors of corporate reports to help them find a more comprehensive disclosure of required information. Watts (2003) states that one of the important roles of conservatism is to limit the opportunistic financial reporting behavior of managers and also to neutralize and eliminate the biases applied in financial reports by profiteers. Managers of companies facing financial crises have high incentives to use optional accruals and profit manipulation due to declining profitability and, as a result, lower stock prices and rewards. Doing so can reduce the quality of profits and reduce the quality of financial information. Therefore, in the circumstances of the financial crisis, the confidence and trust of investors in the financial reporting system weaken; therefore determining the quality of accounting is of great importance (Ebrahimi et al., 2017). As the quality of information in financial reporting improves, the lack of information asymmetry, capital costs, and agency costs will decrease. Accordingly, firms with higher quality financial reporting will perform better (Delpsand and Talebi, 2018). Companies with higher reporting quality are less sensitive to macroeconomic consequences. Risk management of a company is a tool aimed at relative confidence in achieving the company's profitability goals. If risk management in the business unit is well implemented. By creating a competitive advantage, it can create a competitive advantage (Gordon et al., 2009). Theoretically, it is accepted in the capital market that better financial disclosure, as a basis for decision-making, should lead to greater confidence and spending less risk for capital, thereby reducing the cost of corporate capital (Johnston, 2006). The annual report of the companies should be prepared every year and it is expected that by doing so, it will be possible to provide useful information to the users of these reports and help them in the final decision. Still, based on changes in business models, the financial sector alone has not been able to meet the needs of the information needs of the stakeholders and cannot meet all of them. As a result, individuals and different groups are now

seeking to use non-financial sections of corporate reports to provide more comprehensive disclosure of the required information. Given that the role of risk management, if effective, can moderate the risk of low quality financial reporting, this study simultaneously used the criteria of information quality and financial reporting quality in the presence of risk management index.

3. Research background

Samari Sandi & eta la. (2015) in examining the effect of accounting information quality on financial reporting quality stated that there is a significant and positive relationship between the quality of accounting information and the quality of financial reporting. Amirazad et al. (2018) presented a conceptual model of factors affecting the quality of financial reporting in Iran using the method of grounded theory. Statistical society of experts on financial reporting quality are from the four main groups of accounting information producers; users of accounting information, auditing profession and researchers who have been selected for the interview based on the purpose of the research using the snowball or chain sampling method. The results showed that political spending, capital market pressures, tax avoidance, dealing with affiliates, lack of information symmetry, terms of loan agreements were the managers' rewards motivation and competition in the market affect the quality of financial reporting. Kashanipour et al. (2018) examined the relationship between financial reporting quality and disclosure of sustainability information of companies listed on the Tehran Stock Exchange. The results show that there is a positive and significant relationship between earnings management, conservatism and quality of accruals with disclosure of sustainability information. Nowruzi et al. (2020) designed the model and evaluated the impact of the role of adjustment of management ability on the relationship between readability of financial reporting and agency cost. The research findings show that the readability of financial reporting reduces the agency costs of the company. In addition, the results show that the ability of manager moderates and weakens the negative relationship between readability of financial reporting and the cost of agency. Roychowdhury & et al. (2019) examined the effects of financial reporting quality and disclosure of accounting information on corporate investment. They showed that higher report quality enhances shareholders' ability to monitor managers and thus reduces investment incentives for over-investment. At the same time, relying on accounting information in contracts and evaluation create financial reporting criteria that managers are motivated to achieve or go beyond them to some extent by distorting their investment behaviors.

4. Research hypotheses

Quality accounting information is one of the most important sources of information for investors, which can have a significant impact on the optimal decisions of investors (Yang and Jiang, 2008). The quality of accounting information usually indicates that the information is based on generally accepted principles, such as international standards in accounting or auditing. Investors on the Tehran Stock Exchange use less quantitative methods to determine the value of stocks, and their judgments are based more on mental imagination, unscientific information, rumors, and blindly following a small number of capital market participants. In this regard, and in order to improve the conditions for the expansion of capital market activities and prevent failure, in the measures taken to attract people's participation in investment, scientific results should replace mental imaginations and the necessary training in this field should be given to the participants in the market. Undoubtedly, information also plays an essential role in the stock market, and this has led to the increasing importance of improving the quality of accounting information in the stock market. Quality accounting information is a prerequisite for the healthy functioning of the capital market and of the economy in general and is very important for investors, companies and compilers of accounting standards (Moradi and Shahriari, 2014). The lack of information asymmetry between managers and stakeholders and the lack of complete quality in accounting information causes to increase the demand for the quality of financial reporting. According to this issue, the first hypothesis of the research is explained as follows.

Hypothesis 1: There is a significant relationship between information quality indicators and financial reporting quality.

Risk management is an important and fundamental component in the internal control and governance management system of companies, and through it, the goals and objectives of activities can be achieved. In

short, risk management refers to the methods and processes used in organizations through which the risks in the organization can be managed (or increase opportunities) and achieve the company's goals (Vakilifard et al., 2013). In this study, the role of risk management in adjusting the relationship between information quality and risk quality of financial reporting has been investigated through the following hypothesis.

Hypothesis 2: Risk management has a significant effect on the relationship between information quality and financial reporting quality.

5. Research methodology

The present study is applied and uses a quasi-experimental design and a post-event approach. Using Friedman and Wilkaxon methods, this study first analyzed and compared financial reporting quality and finally used criteria that have significant differences in structural analysis model. The researchers' reason for using the structural analysis method is that structural equation modeling is a very general and powerful multivariate regression analysis technique that allows the researcher to test a set of regression equations simultaneously. This method is a comprehensive statistical approach to test hypotheses about the relationships between variables (Hooman; HeidarAli, 2008). A structural equation model generally consists of two types of measurement models and structural models. The measurement model defines how a latent variable is measured using two or more observed variables, and in fact links a set of observed variables to a smaller set of latent variables. The structural model shows the relationships between hidden internal and external variables and allows the evaluation of the direction and severity of causal effects between these variables; therefore, based on measurement models, the researcher defines which observed variables are the measurement of which hidden variables and based on structural models, it will become clear that which independent variables have an effect on which dependent variable.

6. Population and statistical sample of research

The statistical population of this study includes all companies listed on the Tehran Stock Exchange. In this study, for the statistical sample to be a suitable representative of the statistical population, the systematic elimination method has been used. For this purpose, the following 4 criteria have been considered, and if the company has met all the criteria, it will be selected as the research sample and the rest will be deleted. The sample selection process is presented in Figure (1).

1) To select a homogeneous sample according, due to the need for data 6 of years ago, to calculate some variables (information quality), companies should have been accepted in the Tehran Stock Exchange before 2005 and be active in the stock exchange until March 2019.
2) Due to the increasing the comparability of the company's fiscal year, it ended on March 20, and the company did not change its fiscal year and type of activity during the period 2005-2018.
3) Because of the separate reporting structure that financial investment and intermediation companies have (leasing and insurance companies, holdings, banks and financial institutions), they are excluded from the sample.
4) Their financial information should be available between 2005 and 2018.

After considering all of the above criteria, 138 companies remain as screened population; All of which have been selected as samples. Therefore, our observations during the period 2011 to 2018 is 1104 year-company (8 years x 138 companies).

Figure 1: Sample selection process

513	**The total number of listed companies on the stock exchange on March 2018**
	Criteria:
(185)	The number of companies that were not active in the stock market in the time range of 2005-March 2019
(86)	The number of companies listed on the stock exchange since 2005
(39)	Number of companies that have been among holdings, investment, financial intermediaries, banks or leasing companies
(63)	The number of companies the fiscal year of which did not end on March 20 or changed the fiscal year in the time domain of the research
138	Number of sample companies

7-Research Variables

7.1. Independent variable (accounting information quality)

Criteria:

Earning quality

EQ = CFO / NI

CFO = operating cash flow

NI = net income

Earning stability

$Earning_{t+1}$ (($_0$+$\alpha_1 Earning_t$ (e_{it}

EARNING = Operating earning

α1 = The alpha value represents the stability of the earning.

Earning predictability

$$EBEI_{it} = \beta_0 + \beta_1 EBEI_{it-1} + \varepsilon_{,it}$$

EBIT = Earning before interest and taxes

Income smoothing

In this study, the EQL index has been used to calculate income smoothing, in which changes in the income time series are divided into changes in the sales time series, and if the DF is less than 1, the company is income smoother.

$$DF=\frac{\Delta CV\ I}{\Delta CVS}$$

Relevance of income

$$R_{it}= \alpha_0 + \alpha_1 E_{it}/P_{it-1} + \varepsilon_{it}$$

R_{it} = Company's market return at the end of the year t.

E_{it} = earnings per share i company at the end of the year t.

P_{it-1}= market price per share i company at the end of the year t-1

Transparency in income

$$Ri,t = \alpha_0 + \alpha_1 E_{i,t}/ P_{i,t-1} + \alpha_2 \Delta E_{i,t} /P_{i,t-1} +\varepsilon_{i,t}$$

In the above model, the variables are:

$R_{i,t}$ = annual return on i shares in year t;

$E_{i,t}$ = earnings per share before the company's unusual items company i in the year t;

$E_{i,t}\Delta$= change in earnings per share before unusual items from year t-1 to t;

$P_{i,t-1}$ = stock price at the end of the year t-1.

Being close to cash

$$CFO_{it}=\beta_0 + \beta_1 NI_{it} + \varepsilon_{it}$$

CFOit = Operating cash flow divided by the company's total assets

NI_{it} = Net profit divided by the company's total assets

This variable is calculated from the net profit (NI_{it})coefficient (β1).

-Awareness

$$RET_{it}=\beta_0 + \beta_1 NI_{it} + \beta_2 \Delta NI_{it} + \varepsilon_{it}$$

RETit = Average 12-month return on company stock

NIit = Net profit divided by the company's total assets

This variable is calculated from the modified determination coefficient of the model.

-Conservatism

(1-) × Total assets at the beginning of the period / Operating accruals = Accounting conservatism

-Being on time

To calculate being on time, the number of days from the end of the fiscal year on to the time of publication of the audited financial statements has been used.

7.2. Moderator variable (Risk Management)

Criteria:

In this study, risk management is recognized as an independent variable that has four key factors. These four factors, according to research (by Gordon et al., 2009) are:

Environmental Uncertainty (Eu):

It is defined as a change or variability in the internal environment of an organization that is measured using the following three parameters (Gordon et al., 2009):

(A) Market - sales change coefficient

$$CV\ (S_{it})$$

S_{it} = Company i sales in the year t.

(B) Technology - the coefficient of change in the cost of capital.

To calculate the cost of capital, the relation (1), that is, the weighted average cost of capital method (WACC) was used.

Relationship (1)

$$WACC = \left(\frac{D}{D+E}\right)k_d + \left(\frac{E}{D+E}\right)k_e$$

WACC = weighted average cost of capital

E = market value of equity

D = market value of interest-bearing liabilities

Ke = cost of equity

Kd = cost of interest-bearing liabilities

Relationship (2) is used to calculate the cost of interest-bearing liabilities.

Relationship (2)

$$kd = kD\ (1\text{-}t)$$

t is the effective tax rate, 22.5% of which is considered.

kD = interest rate on interest-bearing liabilities market (central bank interest rate)

kd = cost of interest-bearing liabilities

The cost of equity of each year-company is calculated and determined through the Gordon Growth Model. According to this model, the cost of the company's capital is obtained through relationship (3).

Relationship (3)

$$K_e = \frac{D_1}{P_o(1-F)} + g$$

F = Percentage of export and sales costs

Ke = the expected rate of return expected by the shareholders

D0 = latest dividend per share

g = Dividend growth rate

D1 = end-of-year dividend, ie D1 = D0 (1 + g)

P0 = current stock price

For costs of equity payments paid only in the capital sector, a fixed rate of 1% is used.

Growth rate (g) is obtained through relationship (4).

If the ratio of profit accumulation and return on equity is relatively stable, then the product of the multiplicity of two relations can be used to calculate g.

Relationship (4)

(Shareholders' equity ÷ net profit) = ROE

(EPS of the same year ÷ DPS of the same year) - 1) = Profit accumulation ratio

(Profit accumulation ratio × ROE) = g

(C) Profit - The coefficient of change of net profit before tax

CV (I_{it}).

I_{it} = net profit before company i tax in the year t.

Thus, environmental uncertainty (Eu) is obtained from relationship (5).

Relationship (5)

$$EU = \log(\sum\sum_{k=1}^{3} CV(X_k))$$

$$CV(X_k) = \frac{\sum_{t=1}^{N} \frac{(Z_{k,t} - \bar{Z}_k)^2}{N}}{|\bar{Z}_k|}$$

Uncertainty changes coefficient of $CV(X_k) = 1$

$= X_{k,t} Z_{k,t} = (X_{k,t} - X_{k,t-1})$Uncertainty K in year t.

$\bar{Z}_k$= Average uncertainty changes K during the research period.

K = 1, 2, 3 for uncertainty 1. Market 2. Technology 3. Profit

Industry Competition (CI):

Industry competition measures the concentration of industry; low concentration means high competition. Industry competition comes from the total market share of all companies in the industry. Market share is achieved through the following relationship, the sales of each company divided by the total number of sales in the industry (Gordon et al., 2009).

$$CI = \sum_{1}^{n} \frac{S_{it}}{\text{Total } S_{st}}$$

S_{it} = Company i sales in the year t

S_{st} = the sale of industry s in the year t

Firm Size (FS):

Here the size of the company is measured by the relationship (6), through the natural logarithm of the mean of the total assets (Gordon et al., 2009).

Relationship (6)

$$FS = \log(\text{total assets}_{i,t})$$

$assets_{it}$ = assets of company i in the year t.

Board of Directors (MBD):

The variable of the board's oversight of the following relationship is calculated and measured by dividing the number of board members by the sales natural logarithm (Gordon et al., 2009).

$$MBD = \frac{\text{board of directors}}{\log(S_{it})}$$

7.3. Dependent variable (financial reporting quality)

Criteria:

Quality of Financial Reporting Method 1 (Koo et al., 2017)

Following Koo et al. (2017), the relationship (7) was used to measure the quality of financial reporting:

Relationship (7)

$$\Delta WCA_{jt} = \alpha_{+0} + \alpha_1\ CFO_{jt-1} + \alpha_2\ CFO_{jt} + \alpha_3\ CFO_{jt+1} + \alpha_4\ \Delta REV_{jt} + \alpha_5\ \Delta PPE_{jt} + \varepsilon_{jt}$$

In this relationship:

ΔWCA_{jt}= Ratio of changes in accruals of working capital on average assets.

CFO = Operating cash flow ratio on average assets,

ΔREV = The ratio of changes in the company's income to the average assets and
PPE = Fixed asset ratio is evident on average assets.
Relationship (8)

$$\Delta Wac_{i,t} = \Delta CA_{i,t} - \Delta C_{i,t} - \Delta CL_{i,t} + \Delta STD_{i,t}$$

In this relationship:
ΔC_i = ratio of change in cash ratio to average of assets,
$\Delta CL_{i,t}$ = ratio of changes in current liabilities to average of assets and
$\Delta STD_{i,t}$= ratio of changes in short-term financial facilities to the average of assets.
In the above relationship, it is possible to multiply the values of errors in negative one and use it as an indicator to calculate the quality of financial reporting. Dechow and Dichev, 2002).
Quality of Financial Reporting Method 2 (Kotari et al., 2005)
Relationship (9)

$$TAccr_{i,t} = \alpha_0 + \alpha_1(1/Assets_{i,t-1}) + \alpha_2\ \Delta Rev_{i,t} + \alpha_3 PPE_{i,t} + \alpha_4 ROA_{i,t} + \varepsilon_{i,t}$$

In this relationship, TA represents the sum of accruals that can be calculated as relationship (10):
Relationship (10)

$$TA_{i,t} = (\Delta CA_{i,t} - \Delta CASH_{i,t} - \Delta CL_{i,t} + \Delta STDEBT_{i,t} - DEPN_{i,t})$$

In the above equation, the variables are as follows:
$TA_{i,t}$= company I accruals in year t,
$\Delta CA_{i,t}$= Changes in the company's current assets in the year t,
$\Delta CASH_{i,t}$= = Cash changes of the company i in the year t,
$\Delta CL_{i,t}$= Changes in current liabilities in the company i in the year t,
$\Delta STDEBT_{i,t}$= Short-term facility changes or current share of company i in the year t,
$DEPN_{i,t}$= Depreciation cost of the company i tangible and intangible assets in the year t
$Assets_{i,t-1}$= assets at the beginning of the period in the company i in the year t,
$TAccr_{i,t}$ = Total accruals of the company i in the year t divided by assets at the beginning of the period,
$\Delta Rev_{i,t}$ = equal to the annual change in operating income divided by total assets at the beginning of the period,
$PPE_{i,t}$ = Property, machinery and equipment for the company i in the year t divided by assets at the beginning of the year,
$ROA_{i,t}$ = Return on assets for the company i in the year t divided by assets at the beginning of the year.
In this study, the absolute value of optional accruals is multiplied by negative one; Therefore, higher values indicate higher financial reporting quality (Taghizadeh Khanghah and Zeinali, 2015 and Kotari et al., 2005).
Financial Reporting Quality Method 3 (Kaznik, 1999)
This model adjusts the Jones model by adding a special change in operating cash and is calculated as a relationship (11).
Relationship (11)

$$TAC/TA_{i,t} = \beta_1(1/TA)_{i,t} + \beta_2(\Delta REV - \Delta REC)_{i,t}/TA_{i,t} + \beta_3(PPE/TA)_{i,t} + \beta_4(\Delta CFO/TA)_{i,t} + \varepsilon_{i,t}$$

In which:
$TAC_{i,t}$ =the sum of accruals
$TA_{i,t}$= assets at the beginning of the period in the company i in the year t,
$\Delta REV_{i,t}$= change in sales revenue of company i in year t,
$\Delta REC_{i,t}$= Change in receivable accounts in the company i in the year t,
$PPE_{i,t}$= Property, machinery and equipment of the company i in the year t,
$\Delta CFO_{i,t}$= Change in the operating cash flow of company i in the year t
The quality of financial reporting is equal to the absolute value of the error multiplied by negative one, and therefore, a higher value indicates higher reporting quality (Mashayekhi and Mohammadpour, 2014 and Kaznik, 1999).
Quality Financial Reporting Method 4

$$\Delta AR_{it} = \beta_0 + \beta_1 \Delta Sales_{it} + \varepsilon_{it}$$

ΔAR = Change in receivable accounts
$\Delta Sales$ = Annual change in sales revenue.
For financial reporting quality, the net value is the balances multiplied by -1; therefore, higher value indicates higher financial reporting quality.
Financial Reporting Quality Method 5 (Dechow and Dichev, 2002)
This index is based on the quality model of accrual provided Dechow and Dichev (2002), which is calculated in relationship (12):

Relationship (12)

$$WCA_{it} = \beta_1 CFP_{it-1} + \beta_2 CFO_{it+1} + \varepsilon_{it}$$

WCA = working capital accruals (changes in current non-cash assets minus changes in current liabilities plus changes in short-term bank debt). In this index, the quality of financial reporting will be the net value of the balances multiplied by -1-; therefore, higher value indicates higher financial reporting quality.

Financial Reporting Quality Method 6 (Modified Jones Model)

In the modified Jones model, first the accruals are calculated by relationship (13):

Relationship (13)

$$TA_{t,i} = \Delta CA_{t,i} - \Delta CL_{t,i} - \Delta CASH_{t,i} + \Delta STD_{t,i} - DEP_{t,i}$$

TA = Company i accruals in year t

$\Delta CA_{t,i}$= Change in current assets of Company i between year t and t-1

$\Delta CL_{t,i}$= Change in current debts of company i between year t and t-1

$\Delta CASH_{t,i}$) = Change in cash of the company i between year t and t-1

$\Delta STD_{t,i}$= Changes in the current share of the company i long-term debts between the years t and t-1

$DEP_{t,i}$= depreciation cost of company i in the year t

After calculating the total accruals, the parameters $\alpha_1\ \alpha_2\ , \alpha_3$are estimated through the relation (14) in order to determine the non-optional accruals.

Relationship (14)

$$\left[TA_{i,t}/A_{i,t-1} = \alpha_1(1/A_{i,t-1}) + \alpha_2\left[(\Delta REV_{i,t} - \Delta REC)/A_{it,-1}\right] + \alpha_3(PPE_{it}/A_{i,t}) = +\varepsilon_{it}\right.$$

In which:

$TA_{i,t}$= Total accruals of the company i in the year t

$\Delta REV_{i,t}$= Change in sales revenue of company i between year t and t-1

ΔREC = Change in i accounts receivable between year t and t-1

PPE_{it}= Gross assets, machinery and equipment of the company i in the year t

$A_{it,-1}$= the total book value of the company i assets in the year t-1

ε_{it}= Indefinite effects of random factors

$\alpha_1\ \alpha_2\ , \alpha_3$ = Estimated parameters of company i

After calculating the parameters $\alpha_1\ \alpha_2\ , \alpha_3$ by the least squares method, according to the following formula the non-optional accruals (NDA) is obtained through relation (15):

Relationship (15)

$$NDA_{t,i} = \alpha_1(1/A_{i,t-1}) + \alpha_2[(\Delta REV_{i,t} - \Delta REC)/A_{i,t-1}] + \alpha_3(PPE_{i,t}/A_{i,t-1})$$

Finally, optional accruals (DA) are calculated after determining the NDA through the relationship (16):

Relationship (16)

$$DA_{i,t} - (TA_{i,t}/A_{i,t-1}) - NDA_{i,t}$$

8. Research findings

8.1. Descriptive statistics

In order to examine the general characteristics of the variables and to analyze them accurately, it is necessary to be familiar with the descriptive statistics related to the variables. Figure (2) is a descriptive statistic of the variables used in the study, which includes central indicators and scattering.

Figure 2: Descriptive statistics of research variables

SD	Max	Min	median	Mean	Variable
103/893	457/197	-3363/400	0/865	-0/403	Earning quality
0/707	5/411	-7/996	0/404	0/416	Earning stability
0/058	0/515	0/006	0/064	0/080	Earning profitability
0/493	1/000	0/000	0/000	0/415	Earning smoothing
0/166	0/874	-2/264	-0/008	0/000	Unusual accruals
0/445	1/000	0/000	0/000	0/272	Earning relevance
0/268	0/999	0/000	0/690	0/635	Transparency in earning
1/770	31/506	-7/713	0/259	0/296	Being close to cash
0/575	1/000	-0/995	0/201	0/149	Awareness
0/174	1/062	-1/275	-0/010	-0/020	Conservatism
25/812	187/000	19/000	86/500	83/947	Being on time
0/458	2/932	-0/509	0/144	0/271	Environmental uncertainty

SD	Max	Min	median	Mean	Variable
0/202	1/000	0/000	0/053	0/161	Industry competition
1/434	19/261	10/101	13/869	14/028	Size of the company
0/043	0/562	0/256	0/363	0/368	Supervision of the board
0/082	-0/004	-0/897	-0/075	-0/096	The first method of the quality of financial reporting
0/117	0/000	-2/351	-0/068	-0/096	The second method of the quality of financial reporting
0/128	0/000	-2/236	-0/085	-0/116	The third method of the quality of financial reporting
0/101	0/000	-1/170	-0/065	-0/092	The fourth method of the quality of financial reporting
0/119	0/000	-2/216	-0/060	-0/089	The fifth method of the quality of financial reporting
0/128	0/000	-2/194	-0/080	-0/114	The sixth method of the quality of financial reporting

8.2. Inferential statistics

The quality of financial reporting for each company is examined by six methods. In this section, it is examined whether there is a significant difference between these six methods. Due to the abnormality of these variables, Friedman test was used to investigate the difference between these six methods, the results of which are shown in Figure (3).

Based on the results obtained from the Friedman test, the test statistic is 131/753 and the significance level is less than 0.05, so it can be said that there is a significant difference between the quality of financial reporting in different methods. To investigate which method is different, the individual Wilcoxon test is used using Bonferroni alpha-level correction; which will include 16 tests; according to the results of the Wilcoxon test, there is no significant difference between the first and second methods, the first and the fourth, the first with the fifth, the second with the fourth, the third with the fifth and the fourth with the sixth; Therefore, the second, fourth and fifth methods of financial reporting quality are removed from the model. In other methods, the level of significance is less than 0.003, so there is a significant difference between these methods.

Figure 3: Friedman test results and Wilcoxon test

Significance level	Degree of freedom	Chi square
0/000	5	131/753
Significance level	Test statistic	Methods of financial reporting quality
0/048	-1/980	The first and second methods
0/000	-3/773	The first and third methods
0/007	-2/709	The first and fourth methods
0/003	-2/929	The first and fifth methods
0/000	-4/241	The first and sixth methods
0/000	-6/394	The second and third methods
0/578	-0/556	The second and fourth methods
0/000	-8/532	The second and fifth methods
0/001	-3/412	The second and sixth methods
0/000	-5/471	The third and fourth methods
0/494	-0/684	The third and fifth methods
0/000	-9/216	The third and sixth methods
0/000	-5/037	The fourth and fifth methods
0/042	-2/031	The fourth and sixth methods
0/000	-9/757	The fifth and sixth methods

9. Structural equation modeling

9.1. Investigating the validity of the model

In order to analyze the research data, in the first stage, the validity of the model is examined and in the second stage, the structural model is examined. To validate the validity of the measurement tool, structural validity, convergent validity and divergent validity have been investigated. Structural validity has been used to examine the accuracy and importance of selected markers that indicate whether the markers provided the appropriate operating structures to measure the structures studied in the research model. If the value of the operating load is greater than 0.4 and the absolute value of the T statistic is greater than 1.96, it can be concluded at 95% confidence level that the markers provide a suitable factor structure to measure the structures studied in the research model. In order to investigate the validity of the structure, confirmatory factor analysis has been used (Hooman, 2008). The results of confirmatory factor analysis are shown in Figure (5).

Figure 5: Confirmatory Factor Analysis Results

T statistic	Factor load	Questions	Variables
9/460	0/636	Earning quality	Information quality
10/142	0/708	Earning stability	
14/707	0/849	Earning predictability	
11/238	0/6545	Earning smoothing	
10/889	0/623	Unusual accruals	
13/698	0/738	Earning relevance	
10/739	0/613	Transparency in Earning	
12/514	0/703	Being close to cash	
13/486	0/896	Awareness	
12/314	0/715	Conservatism	
8/394	0641	Being on time	
12/736	0/73	Environmental uncertainty	Risk management
10/525	0/668	Industry competition	
14/244	0/8	Size of the company	
13/105	0/726	Supervision of the board	
11/906	0/605	The first method	Financial reporting quality
13/209	0/81	The third method	
14/265	0/524	The sixth method	

Based on the above chart, the value of t statistic is observed to be greater than 1.96 in all cases and also the factor load is greater than 0.4. Therefore, it can be concluded that the selected questions provide appropriate factor structures to measure the dimensions in the research model. In order to confirm the validity of the measurement tool, in addition to the validity of the structure, the convergent validity index is used. Convergent validity refers to the principle that the indicators of each structure are highly correlated with each other. The AVE criterion is used for convergence validity. The value of this coefficient varies from 0 to 1, and values above 0.5 are accepted because this value ensures that at least 50% of the variance of a structure is defined by its markers. The following are the results of the study of convergent validity in the present study.

Figure 6: Convergent validity results and correlation matrix

Financial reporting quality	Risk management	Information quality	Convergent validity AVE	Variables
		0/709	0/503	Information quality
	0/732	0/469	0/537	Risk management
0/753	0/501	0/564	0/567	Financial reporting quality

Finally, divergent validity is the third criterion for measuring validity in PLS method. Fornell's and Larker's (1981) method was used in this study to investigate divergent validity. In this method, acceptable divergent validity indicates that a structure in the model interacts more with its indicators than with other structures. Forenell and Larker argue that divergent validity is acceptable when the AVE rate for each structure is greater than the common variance between that structure and other structures, or in other words, the AVE square is greater than the correlation coefficients. Figure 7 shows this matrix. This model has an acceptable divergent validity if the numbers in the main diameter (AVE square) are greater than their following values:

Based on the results of the above tables, it can be concluded that the convergent and divergent validity of the model is desirable. According to the validation of the validity in the next part, the hypotheses are examined using the confirmed dimensions.

10. Research model

Figures (1) and (2) of the research model are related to the research hypotheses. The coefficients in these diagrams are divided into two categories. The first category is the relationship between hidden variables (ellipse) and obvious variables (rectangular), which are called factor loads. Considering the operating loads, we can say the share of which variable is more in measuring the relevant structure and which variable has the less share. In other words, the variable that has a larger factor load has a greater share in measuring the relevant structure, and the variable that has a lower factor load has a smaller share, and the second category is the relationship between hidden and hidden variables, which is called path coefficients and are used to test hypotheses. All coefficients are tested using t-statistics. This t-value is significant when its absolute value is greater than 1.96.

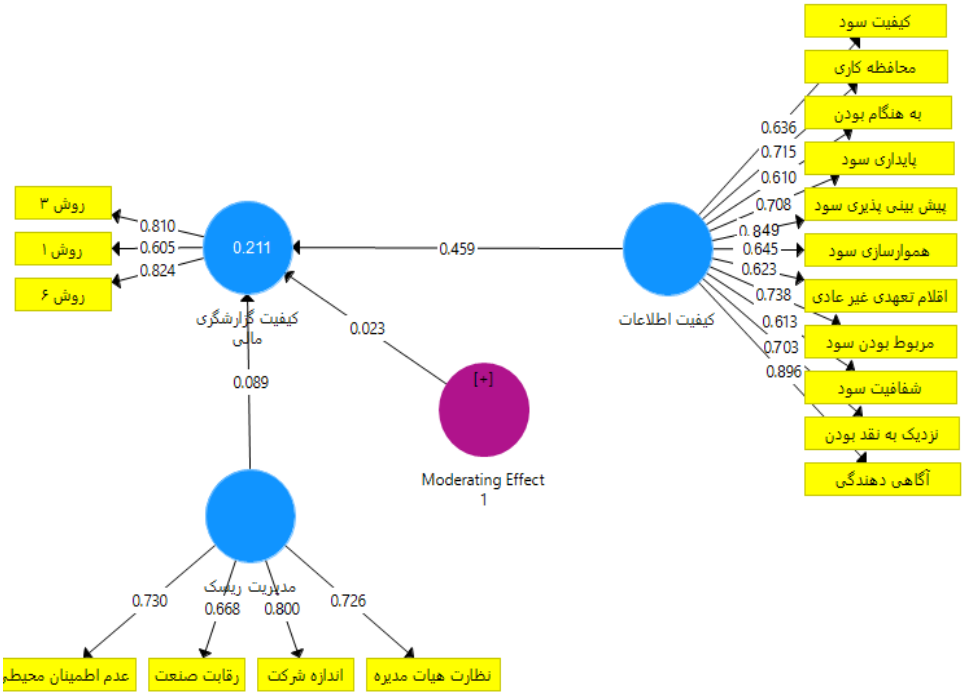

Figure 1: path coefficients of the research model

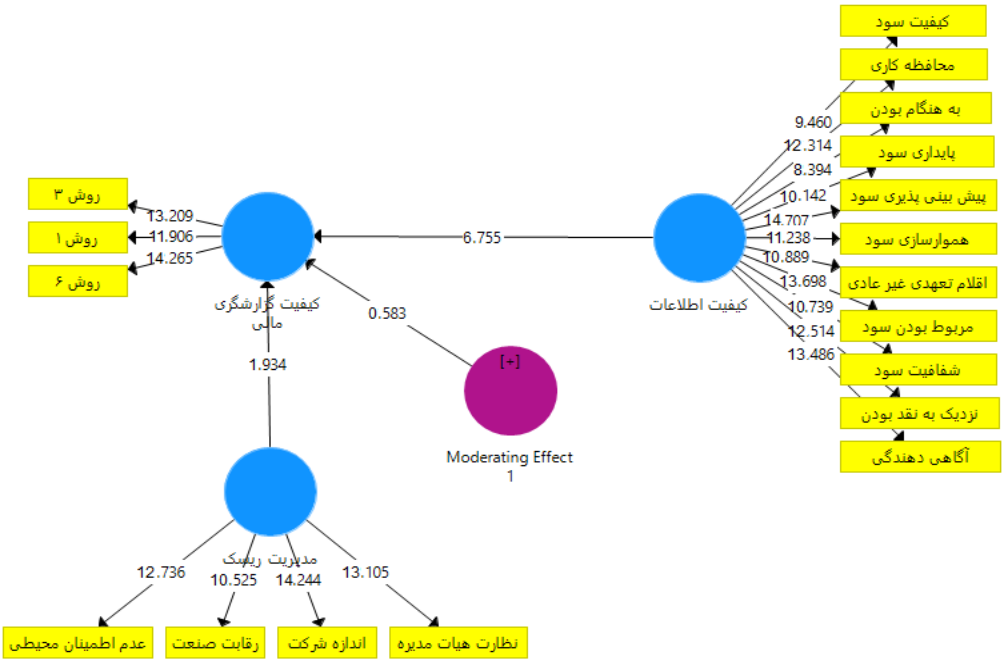

Figure 2: Significance of the path coefficients of the research model

11. Coefficient of determination and fit index of the research model

The predictive power of the designed model is analyzed using the explanatory variance value (R^2) for the dependent variables. Analysis of the coefficient of determination helps to understand how much of the variance of the dependent variable can be determined by a set of predictors. The coefficient of determination fluctuates between zero and one and thus it is justified that if it is equal to zero, it means that the regression line has never been able to attribute the changes of the function variable to the changes of the independent variable, if the coefficient of determination is equal to one, ie the regression line could exactly attribute the changes in the dependent variable to the changes in the dependent variable, and the three values 0.19, 0.33, and 0.67 are as the criteria for the values of the coefficient of determination, indicating the weak, moderate and strong coefficient of determination, respectively. Figure (8) shows the coefficient of determination of the model.

Figure 8: Coefficient of determination of the research model.

Power of Coefficient of determination	Coefficient of determination	
weak	0/211	Financial reporting quality

In order to measure the model and its fit, the index of the fit of the model is examined. The fit of the model is to what extent the model is consistent with the relevant data. In analyzing structural equations, after estimating the parameters and before interpreting them, the fit of the model should be assured. The general criterion which is considered for the method of partial minimum squares is called Gof. The values of 0.01, 0.25 and 0.36 are as the criteria for the values of the fit coefficient, which indicate the weak, moderate and strong fit, respectively.

The good value of fitting is obtained from the following formula:

$$GOF=\sqrt{\overline{Communality} * \overline{R^2}}$$

In this relationship, $\overline{communality}$ is the mean of common values and (R^2) is the mean of coefficient of determination.

Figure 9: Common values for each of the variables

Common values (communality)	Variables	
0/503	Information quality	
0/537	Risk management	
0/567	Financial reporting quality	
Coefficient power	Coefficient Q2	
Moderate	0/162	Financial reporting quality

The fitness index of the research model is 0.336, which indicates that the research model is appropriate.

$$GOF=\sqrt{0.535 * 0.211} =0.336$$

Also, to measure the predictive power of the model, Q2 criterion is used. If the value of Q2 in the case of an endogenous structure (dependent variable) achieves three values of 0.02, 0.15 and 0.35, respectively, it indicates the weak, moderate and strong power of predictability of the structure or external structures related to it.

12- Examining the research hypotheses

This research includes two hypotheses that have been studied in this section.

Hypothesis 1: The quality of information has a significant effect on the quality of financial reporting.

In examining the effect of information quality on financial reporting quality, as shown in Figure 1, the path coefficient is 0.459, which is a positive value, and the absolute value of t-statistic is 6.755 (Figure 2) which is greater than 1.96, so with 95% confidence, it can be said that the quality of information has a significant positive effect on the quality of financial reporting. In other words, as the quality of information increases, the quality of financial reporting increases, so the first hypothesis of the research is accepted.

Hypothesis 2: Risk management moderates the impact of information quality on the quality of financial reporting.

In examining the effect of moderating risk management variable on the effect of information quality on financial reporting quality, as shown in Figure 1, the effect of risk management moderator is 0.233. The absolute value of t-statistic is equal to 0.583 (Figure 2), which is less than 1.96. Therefore, with 95% confidence, it can be said that the variable of risk management moderator has no significant effect on the relationship between information quality and financial reporting quality. As a result, the second hypothesis of the research is rejected.

Figure 11: Path coefficient and T statistic for the first hypothesis

Result	Standard error	T statistic	Path coefficient
accepted	0/068	6/755	0/459

Figure 12: Path coefficient and T statistic for the second hypothesis

result	Standard erroe	T statistic	Path coefficient
rejected	0/039	0/583	0/023

13. Conclusion

Prior literature states that the main goal of the recognition and measurement requirements of accounting standards is decision usefulness, supported by relevance, reliability, and comparability After the global financial crisis of 2008, the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB), sought to significantly improve the decision usefulness of financial instrument reporting for investors.

There has been much debate whether implementing a worldwide financial reporting standard is the most actionable, effective, and justified approach to improving financial reporting. Corporations which report comparable financial statements make it more useful, less costly, and easier to compare corporate financial statements for investors, regulators, other corporations, institutional investors, and decision makers. Corporate financial statements include essential information for investors to make assessments about a corporation's financial status, for example investors can evaluate key financial ratios and financial statements of a specific corporation to make decisions on its financial health. This data could be used to compare historical financial trends of the corporation and/or use this data to make comparisons against other corporations.

Firms can use derivatives to offset the risk that fair values or cash flows will be negatively impacted by adverse price or market movements (i.e. foreign currency and variable rate loans). The use of derivatives in instances such as these is referred to as hedging. However, only derivatives that meet certain complex accounting criteria qualify for hedge accounting treatment.9 Gains and losses from derivative instruments designated as qualifying hedges under SFAS 133 are netted with the changes in fair value of the asset or liability underlying the hedge. Only the portion of the derivative gain/loss that exceeds the netted amount is reported in current earnings. However, if derivative positions do not qualify for hedge accounting, then the firm must classify them as trading and report all gains or losses related to the trading derivative in current earnings (FASB, 1998). This study was conducted with two main objectives, which are to analyze the comparison of financial reporting quality assessment models and also to examine the relationship between information quality and financial reporting quality. For this purpose, the financial information of 138 companies during the years 2011 to 2018 and all the repeated criteria for the quality of accounting information and financial reporting quality with the moderating role of risk management were used. Initial results of the study showed that in the time period considered, only three of the six models of financial reporting quality were significantly different from other criteria of the research by comparing the models two by two, and three selected criteria were used to test other research hypotheses. Other results of the study include confirmation of the relationship between information quality indicators and financial reporting quality. This is consistent with the study by Samareh Sandi et al. (2015), Amir Azad et al. (2018) and Mashayekh and Nasiri (2016). These results can be seen as the accuracy of financial reporting in expressing the accounting information in order to give awareness to the investors. The research's expectation was that risk management could increase the quality of information quality and financial reporting quality as a suitable moderating element, but this relationship could not be confirmed. It can be stated that In Iran, risk management mechanisms in Iran have not shown their effectiveness in this regard in the studied sample. Therefore, according to the results, it is recommended that, in evaluating the financial reporting quality of the companies, the modified Jones Model and the financial reporting quality method (Koo et al., 2017 and Kaznik, 1999) be used, because other methods are not significantly different from these methods, and also that the increase in the quality of information will eventually lead to an increase in the quality of financial reporting and better decision-making and optimization of investors' capital. Therefore, it can be suggested to the Tehran Stock Exchange to rank stock exchange companies in terms of financial reporting quality and information quality criteria. Experts and researchers are advised to evaluate the sub-branches of risk management in Iran, because it seems that the existing risk management indicators need to be reformed and revised. For future research, researchers are recommended to evaluate the role of risk criteria on financial reporting quality and the moderating role of risk management.

Resources

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