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Investigating the effect of earnings quality on the company's trade credit with an emphasis on the moderating role of accounting information comparability

Mohammed Reza Gorji
Ph.D Student in Accounting, Accounting Group, Kashan Branch, Islamic Azad University, Kashan, Iran
Gorji_mr@yahoo.com

Hasan Ghodrati
Assistant Prof Accounting Group, kashan branch , islamic azad university , kashan , iran
Dr.Ghodrati42@gmail.com

Meisam Arabzadeh
Assistant Prof Accounting Group , kashan branch , islamic azad university , kashan , iran
arabzadeh62@yahoo.com

Hossein Panahian
Associate Prof Accounting Group, kashan branch , islamic azad university , kashan , iran
h.panahian@iaukashan.ac.ir

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ABSTRACT

The most important concern of credit providers is the timely payment of obligations by clients, since most clients pay their obligations late. For this reason, they should have accurate information from their buyers. The basic question is whether the information is provided to creditors through financial reporting or through other channels of information. Thus, the aim of present study is to investigate the effect of earnings quality on trade credit considering the moderating role of accounting information comparability. To achieve this goal, the financial information of 77 companies listed on the Tehran Stock Exchange from 2014 to 2019 was used. Also, to test the research hypotheses, regression models with panel data structure were used. The results showed that the earnings quality has a positive effect on trade credit. The results also indicated that by increasing the accounting information comparability, the effect of earnings quality on trade credit is intensified.

Keywords:

Earnings quality, Financing, Trade credit, Comparability.

1. Introduction

The issue of financing trade units in recent years has become one of the main challenges for private sector development and thus a barrier to accelerating the country's economic growth. Since there is no active debt market in Iran, companies are strongly dependent on the banking system for their financing. This problem has already crippled companies in the current time, when businesses are in recession and banks are facing liquidity shortages. Furthermore, the small size of capital market has increased the financing problems. In the current situation, long-term decisions are more ambiguous than short-term decisions. Trade credits as a short-term source of financing can help improve the turbulent situation of companies. Klapper et al. (2012) report that it is estimated that 90% of global commodity trade to be financed through trade credit in 2007. Trade credit is an agreement between the buyer and the seller whereby the seller allows the buyer to pay for the purchased goods late (Main and Smith, 1992). Trade credit applicants underestimate the cost of trade credit financing compared to other financing methods.

Trade credit providers view low-cost trade credit as a strategy to expand the market for their products (Chen et al., 2017). The most important concern of credit providers is the timely payment of obligations by clients, since most clients pay their obligations late. Altunok (2012) indicated that about 60% of companies pay their accounts payable late. Previous studies such as Beatty et al. (2010), Biddle and Hilary (2006), Garcı´a Lara et al. (2011) and Gormley et al. (2012) argue that due to information asymmetries, financial institutions and stock investors rely on accounting information to assess the risk of borrowing companies. High-quality financial reports help capital suppliers in assessing corporate credit risk and thus reduce information asymmetries (Chen et al., 2017). Capital suppliers are more likely to finance high-quality accounting companies (Barth et al., 2008). Some suppliers know that clients with low quality accounting are risky and thus may not be willing to offer them trade credit (Enomoto, 2019). The factor that can increase the severity of the relationship between earnings quality and trade credit is the qualitative characteristics of financial reporting (Zhang, 2020). One of the indicators of earnings quality is the quality of accruals (Zivdar et al., 2020). Moreover, based on the statement of theoretical concepts of financial reporting, comparability as one of these qualitative characteristics of accounting information enables users to identify and understand the similarities and differences between items. As comparability increases, the transparency of financial information provided to investors will increase, thus motivation of managers to manage earnings based on accrual figures is reduced. Increasing accounting information comparability makes managers have less space to manipulate earnings through accrual figures (De Franco et al., 2011). Since accounting information comparability can affect the earnings quality and Iranian companies have many problems in paying their obligations due to economic conditions, it is necessary to assess the moderating role of this criterion in the relationship between earnings quality and trade credit. It should be noted that the moderating role of comparability on the above relationship has not been studied so far in domestic studies. Thus, it is one of the new aspects of the present study.

2. Theoretical foundations of research

The use of trade credit in interim trade is very prominent in developed and developing countries. Trade credit contracts are related to buying and selling of goods. The long history of trade credit as a common method of short-term financing among non-financial companies suggests that companies find value through it. There are a number of theories to explain why companies operate as suppliers, recipients, or both in trade activities. The first financial-based theories emerged. Subsequently, non-financial theories emerged, including transaction costs and trade theories (Stanley and Harvey, 2020). Carvalho and Shiser (2015) describe trade credit as an important

financing source and investment channel that companies typically supply and demand with each other. Trade credit is included in a contractual agreement and through which the buyer and supplier agree that payment may be delayed until a predetermined date. The importance of trade credit between companies has also been highlighted in the economic and financial literature. What can make it difficult in providing trade credits between the supplier and the applicant is that the applicant companies are generally risky and have much information ambiguity (Shang, 2020). In these companies, there is high level of ambiguity and uncertainty about the quality of their

management and not much data is available about them (Ang et al., 2000). If companies that receive trade credit fail to pay their obligations timely, there will be many constraints for suppliers, such as reduced capital expenditures, reduced production cycle, lack of liquidity, and weakened company performance, so suppliers should delay payment and even consider default of obligations. In this regard, they should have accurate information from their buyers (Chen et al., 2017). Since the earnings quality depends on quality of revenues and expenditures and revenues and expenditures depend on assets and liabilities, it is reasonable to think that the foundation of reporting quality is revealed in the earnings quality (Chen and Gong, 2019). Based on Conceptual Statement 1 of the American Financial Accounting Standards Board, the primary goal of financial reporting is to provide information about the performance of a business through measurement of earnings and its components.

Accounting earnings and its components are among the information that should be considered when making decisions by individuals. One of the special interests of financial statement stakeholders is to forecast the future cash flows of a trade unit to estimate its expected returns using current earnings (Francis et al., 2005). To increase the predictability of future cash flows, the reported earnings should be of good quality. Earnings quality is a multidimensional concept that researchers have not yet achieved a single method for measuring it. However, if only one dimension or a limited set of dimensions is considered in the evaluation of earnings quality, the result on the company's earnings quality might be wrong (Velury and Jenkins, 2006). Based on Statement 1 of the Financial Accounting Standards Board, high-quality earnings provide more information about the characteristics of a company's financial performance regarding specific decisions made by a particular decision maker. This definition includes three characteristics for earnings quality. First, the term earnings quality alone is meaningless. Earnings quality is defined only within a specific decision model framework. Second, the quality of reported earnings depends on whether the amount of earnings contains useful information about the financial performance of the company. Third, the earnings quality in this definition is determined by two methods: 1- Through the company's financial performance relationship with the decisions made 2- Through the ability of accounting system to measure performance (Dichev et al., 2010)

Dechev and Dichow (2002) define earnings based on the relationship between accruals and operating cash flows of the past, present, and future periods. In this case, the earnings quality will result from quality of accruals. When accruals have higher impact on operating cash flow, its quality will be higher. In other words, high-quality earnings are closer to cash. It is believed that accruals reduce the earnings quality. Thus, it can be stated that more accruals mean lower earnings quality (Noorwash et al., 2009). The first theory that underestimates the role of accounting information in trade credit is the financing theory, which includes information advantage theory, liquidity theory, and the monetary policy impacts (Stanley and Harvey, 2020). According to information advantage theory, unlike banks and financial and credit institutions, suppliers have a comparative advantage in financing low-earnings companies, since they do not rely solely on financial information to reduce information asymmetry with their clients. Suppliers can access their clients' information directly through daily transactions because they have a close relationship with their clients so they can engage in financial intermediation at lower transaction costs (Peterson and Rajan, 1977).

First, they may have more supply chain leverage than clients. Suppliers can threaten their clients to supply discontinuation when their actions increase the likelihood of default. This threat becomes more serious when clients have fewer alternative suppliers. In contrast, threats from other credit suppliers, such as financial and credit institutions, to discontinue future financing may not quickly affect borrowers' operations. Second, suppliers are less vulnerable to losses caused by client default, since they have a higher coverage rate than financial institutions. If a client default occurs, it is easier for the supplier to re-control the supplied inventories. Based on the asset liquidity theory, firms are superior to traditional financial intermediaries in capturing and liquidating the assets of deferred borrowers at lower transaction costs (Lin and Chou, 2015). In contrast, other creditors can hardly own the benefits of the collateral assets. For example, suppliers can reduce the impact of client bankruptcy by defending their rights timely. It means that they have the right to re-take the possession of goods sold (Sullivan and Ravert, 2006). In addition,

the suppliers can use their networks to sell possessed goods. Finally, suppliers may have the benefit of obtaining information.

Petersen and Rajan (1997) state that the supplier can visit the buyer site more than the financial institutions. The size and timing of the order also provide an idea of the buyer's business situation for supplier (Cheung and Pok, 2019). The Buyer's inability to use of initial cash discounts may be a warning sign to the supplier, indicating the buyer's credit loss. Given these advantages, suppliers are less dependent on clients' financial statements to monitor and evaluate their credit. As a result, the quality of client accounting is lower in suppliers' decisions to expand trade credit (Chen et al., 2017). However, based on the transaction cost theory, the use of commercial credit can improve the operational efficiency of transaction costs for all parties of the transaction (Stanley and Harvey, 2020), because quality of accounting information can reduce the cost of obtaining information. Evidence suggests that suppliers can still rely on client accounting information since they may have trouble in predicting client demand and assessing their credit risk. Accounting information such as level of capital assets, corporate earnings margin can be used to predict future client demand and evaluate the risk-free client (Raman and Shahrur, 2008). Suppliers may realize that clients with low quality accounting are risky and thus may be unwilling to offer them trade credit. Previous studies have shown that large and reliable companies, which are likely to be more transparent in terms of information, use trade credit provided by smaller suppliers (Klapper et al., 2012; Murfin & Njoroge, 2015). Accordingly, financing may not improve the liability capacity of low-quality accounting companies. In addition, it is easier for high-quality accounting clients to obtain traditional financing, since cost of trade credit using is probably greater than its benefits and it is expected that the use of trade credit with high quality accounting to increase. Thus, the direction of the relationship between the quality of financial reporting and the use of trade credit is an open question.

Qualitative characteristics of financial reporting can increase the severity of the relationship between earnings quality and trade credit. The earnings quality depends on the quality of company's financial reporting. In other words, paying attention to the qualitative characteristics of the financial reporting conceptual framework such as disclosure, accounting information comparability and consistency of procedure can be useful in assessing the quality of the company's earnings (Bedier and Abdel-Azim, 2019). Users of financial statements should be able to compare the financial statements of a trade unit over time to identify trends in changes in financial position, tax performance, and flexibility of the trade unit. Users should also be able to compare the financial statements of different trade units to measure their financial position, tax performance, and tax flexibility relative to each other. Comparability is a feature that helps users identify and understand similarities and differences, reduces the cost of acquiring and processing information, and increases the quantity and general quality of information in companies. It leads to efficient capital allocation (Chen et al., 2013). Other advantages of comparability include increasing the quality of available information, and thus, increased analysts' coverage and accuracy of earnings forecasts, reducing dispersion of earnings forecasts, increasing liquidity and stock trading volume, and more reflecting company specific information in current period returns (Barth et al., 2013), and reducing the benefits of using confidential information (Broochet et al., 2012, quoted in Mehrvarz and Marfoo, 2016).

If the amounts of accounting information of a company are more comparable with those of other companies in a particular industry, the final costs of stakeholders to collect and process accounting information of competing companies will be reduced. As a result, they can assess the real performance of companies much more accurately because the comparability of companies' accounting information is a valuable tool for analyzing the status of a company. Comparability can affect the earnings quality in two ways. First, it expands the comparability of the set of information available to investors. Comparable financial statements that use similar accounting techniques, estimates, and assumptions allow investors to learn more about financial reporting transactions and estimates (Campbell and Young, 2012) and identify the differences and similarities between companies in an industry, and make accurate comparisons between companies. Further information about the company's current transactions and performance estimates can facilitate investors' accurate

predictions about the company's future performance (Haw et al., 2012).

Lee et al. (2020) showed that when higher quality information is available to the public people, it influences suppliers' decisions to grant trade credit. This increase is also greater for companies exposed to foreign markets. Other research results suggest that companies in countries that implement IFRS also offer more trade credit to their clients. In general, the results of their research confirm the hypothesis that financial reporting can have a positive impact on trade credit. Zhang (2020) indicated a positive relationship between conditional conservatism and trade credit before and after the crisis, reflecting the demand of suppliers for conditional conservatism. They also showed that the relationship between conditional conservatism and trade credit declined significantly after the onset of financial crisis, and it occurs when suppliers and clients had frequent or close transactions, when traded goods are standardized rather than differentiated, when clients have high financial constraints and bargaining power and suppliers have sufficient liquidity. It means that when information asymmetry in the supply chain is low and clients have high bargaining power, cash suppliers increase their tolerance compared to less conservative clients, and they are even more willing to give less credit to conservative clients, who have financial constraints.

Shang (2020) showed that companies with higher stock liquidity are more likely to increase their trade credit to their clients and less dependent on receiving credit from suppliers. Other results suggest that the relationship between trade credit policies and stock liquidity is more severe for companies that are financially constrained, dependent on external financing, or constrained by short-term liabilities. Enomoto (2019) investigated the effect of stockholding on the relationship between accounting quality and trade credit in Japan. The results showed that clients' trade credit increased through accounting quality without having stable shareholders, and such a stable shareholders' structure weakened the relationship between accounting quality and trade credit. Results suggest that close relationship with stable shareholders reduces the importance of accounting information through the sharing of private information. Chen and Gong (2019) showed that the comparability of the previous period is associated with higher quality of financial reporting. They showed that comparability improved managers' ability to predict a company's future performance. Furthermore, they indicated that when the comparability of the previous period is higher, the discretionary accruals of the current period are less positively correlated with current returns and less negatively correlated with future returns. The results also revealed that comparability increased the pricing efficiency of accruals. In general, their results suggest that developing accounting comparability is beneficial for producers and users of financial statements.

Chen et al. (2017) examined whether companies with low quality accounting information use trade credit more as a source of financing. Their results revealed that trade credit was reduced with accounting quality. They also found that this relationship was more highlighted for companies with lower inventory liquidity costs or higher information asymmetries. Their results enrich the literature on the relationship between the quality of accounting information and financial decisions. Dai and Yang (2015) investigated the association between conservatism and trade credit in Chinese companies. They revealed a positive and significant relationship between conservatism and trade credit. In a study entitled "The effect of accounting information comparability on real earnings management and earnings management based on accruals", Sohn (2016) examined what will change with increasing real earnings accounting information and management based on accruals. The results above-mentioned study showed that with increasing accounting information comparability of one company, earnings management through discretionary accruals decreases but real earnings management increases.

Anthony et al. (2015) revealed a positive relationship between the quality of accounting information and trade credit and found that suppliers give less credit to clients whose quality of accruals is lower. Zafari et al. (2017) showed that accounting comparability has a positive effect on earnings quality. Also, the results confirmed that with increasing the consistency in the company's practice and procedure, the company's earnings quality also increases. Using the approach of instrumental variables, Aflatooni and Nemati (2018) showed that with increasing the quality of financial reporting and the quality of disclosure, the level of trade credit increases. However, the results of the ordinary least squares approach only indicate a positive and significant effect of the quality of disclosure (not quality of financial reporting) on trade

credit. Kia and Safari Graeili (2017) showed that accounting information comparability reduced earnings management based on accruals and, conversely, increased actual earnings management.

3. Research hypotheses

Hypothesis 1: Earnings quality has an impact on trade credit.

Hypothesis 2: The impact of earnings quality on trade credit is greater in companies with higher comparability than in companies with lower comparability.

4. Research variables

The independent, dependent, moderator and control variables of the study are as follows:

Dependent variable

Trade Credit (TC): It is equivalent to the ratio of accounts payable to the book value of total assets (Chen et al., 2017).

Independent variable

Earnings quality (EQ): To measure the earnings quality, the quality of accruals index was used.

The reason for using the accruals criterion is that accounting earnings can be represented as the sum of operating cash flows and accruals. Accounting earnings accruals are expected to predict future operating cash flows and reflect current cash flows or the return of past cash flows. Measurement error in determining accruals can potentially distort the ability of accruals to predict future cash flows or to reflect past and present cash flows. The variance of this measurement error can be considered as an inverse measure of earnings quality. Based on Dichev & Dechow (2002), sectional regression model to predict accruals was used as follows:

$$\frac{TCA_{it}}{A_{it-1}} = \beta_0 + \beta_1 \frac{cfo_{it-1}}{A_{it-1}} + \beta_2 \frac{cfo_{it}}{A_{it-1}} + \beta_3 \frac{cfo_{it+1}}{A_{it-1}} + \beta_4 \frac{\Delta REV_{it}}{A_{it-1}} + \beta_5 \frac{PPE_{it}}{A_{it-1}} + \varepsilon_{it}$$

Model 1

In this model:

TCA_{it}: Company's current accruals in year t (equivalent to changes in current assets other than cash minus changes in current liabilities other than notes payables and other interest-bearing short-term liabilities)

A_{it-1}: Book value of total assets at the beginning of the period

cfo: Net operating cash flow in the previous year, current year and the next year

ΔREV_{it}: Company i sales changes in year i

PPE_{it}: Book value of property, plant and equipment (tangible fixed assets) of Company i in year t

ε_{it}: Accruals estimation error

After determining the residuals of the above model, the standard deviation of the residuals during the current years (t) up to four years ago will be calculated. The calculated standard deviation will indicate the inverse index of the quality of accruals (earnings quality) of each company in one year.

If the standard deviation of the residuals is higher, the accruals and the earnings quality will be lower. For simplicity in interpreting the results, the standard deviation values are multiplied by -1 to express the interpretation of the results based on a direct relation.

Moderator variable:

To measure the accounting comparability, the earnings-return correlation of a pair of companies in a particular industry was used (Barth et al.; 2012; De Franco et al., 2011) and Frooghi and Ghasemzad (2015). In this model, two companies are considered similar when they have provided similar financial statements (such as accounting earnings) for a set of same economic events (such as returns). To measure comparability between companies i and j, regression model (2) is first estimated for each company-year using time series data (six months) for the last four-year period ending year t:

$$Earnings_{i,k} = \alpha_{it} + \beta_{ij} Return_{i,k} + \varepsilon_{ik}$$

(Model 2)

Where:

$Earnings_{i,k}$: Company i net earnings in six months k dividend by stock market value at the beginning of six months

$Return_{i,k}$: Company i stock returns in six months k

The coefficients estimated from Model 2 for each company-year are a measure of that company's accounting operations. It means that αi and iβ represent the accounting operations of company i and the coefficients αj and βj represent the accounting operations of company j. The similarity between the

accounting operations of the two companies represents the degree of comparability between the two companies. To estimate the difference between the accounting operations of companies i and j, the concept of comparability (providing similar reports on a set of similar events) is used. Therefore, in each year, using Equations (3) and (4), the earnings of Company i are predicted separately once with coefficients of company i and once with coefficients of company j, but with return of company i (similar event) for a interval similar to the Equation (2) interval:

$$E(Earnings)_{ii,k} = \hat{\alpha}_i + \hat{\beta}_i Return_{i,k} \quad (3)$$

$$E(Earnings)_{ij,k} = \hat{\alpha}_j + \hat{\beta}_j Return_{i,k} \quad (4)$$

In these equations, E (Earnings) $_{ii,\ k}$ is predicted earnings for company i and six months k using company i coefficients i and E (Earnings) ij, k is predicted earnings for company i and six months k using company j coefficients.

Then, the comparability between two companies i and j in the year t was calculated through Equation (5) as follows:

$$AccComp_{i,j,t} = \frac{-1}{8}\sum_{k-7}^{k} it \left|E(Earnings)_{ii,k} - E(Earnings)_{ij,k}\right| (equation\ 5)$$

The mathematical value for AccComp $_{i,\ j,\ t}$ represents greater comparability between the two companies. Similarly, for each year and each pair of companies i with j, criterion of accounting comparability will be calculated. Finally, the mean of the 4 larger numbers calculated for it is defined as the company i comparability criterion, represented by AccComp $_{i,\ t}$. The reason for using the empirical criterion of comparability of financial statements presented by De Franco et al. (2011) is that in accounting research, earnings is often considered as the most important component of financial reporting and that this criterion is based on the output (earnings) and specific to the company and does not have the challenges that input-based criteria (such as criteria based on accounting choices) face.

Control variables

Information Asymmetry (InfoAsym): Some inter-organizational investors, such as managers, their analysts, and the institutions that receive information from these individuals, have access to confidential news. As information is more confidential, the range of differences between offered bid and ask prices of stock will be higher, resulting in lower returns for investors who do not have access to this information (LaFond and Watts, 2008). Differences in the bid price of stocks occur because of abnormal supply and demand, and abnormal supply and demand occurs because of confidential information, so that in case of bad confidential news, the supply of stocks increases and the bid price decreases.

In contrast, when good confidential news is released, demand increases and the bid price increases, so the difference between offered bid and ask prices of stocks is due to information asymmetry between information providers and information users. In this study, following the model of Venkatesh and Chiang (1986); Ghaemi and Watanparast (2005) and Ahmadpour and Rasaeian (2006) will use the criterion of the offered bid and ask prices of stock, which is calculated through Equation 5:

$$BASPREAD_{it} = \frac{AP_{i,t} - BP_{i,t}}{(AP_{i,t} + BP_{i,t})/2} \times 100$$

(Equation 5)

In this Equation:

$ASY_{i,t}$: The range of the difference between the offered bid and ask prices

ASK PRICE) AP $_{i,\ t}$: Mean ask price of company i in period t

BID PRICE) BP $_{i,\ t}$: The mean bid price of company i in period t.

The best ask price is the highest ask price offered for buying stock in each day and the best bid price is the lowest price offered for selling the stock in each day. Then, based on the model, the mean figures calculated for the different days of each of the study years for the sample companies is considered as the range of the difference between the bid prices and ask prices of that company during that year. Based on the above model, if the value of difference between bid and ask prices is larger, the information asymmetry will be greater. In testing the hypotheses, the absolute value of the number obtained from this model is used. The information required to calculate this variable has been extracted from Tehran Stock Exchange site.

Company Size Log (Asset): The natural logarithm of the book value of all assets

Company Age Log (Age + 1): The natural logarithm of the company age plus one.

Company market share (MktSharei): It is equal to the ratio of company sales to sales of the entire industry

Positive Sales Changes (POS_ChgSale): Positive changes in sales divided by the book value of total asset

Negative sales changes (NEG_ChgSale): Negative sales changes divided by the book value of total assets

Market to book value (MTB): The ratio of capital market value to net book value of assets

Return on Assets (ROA): Division of net income by total assets

Leverage: The sum of liabilities divided by the total assets

Current Assets Ratio (**CA**): The ratio of non-cash current assets to book value of total assets

Current Liabilities Ratio (**CL_XTrade**): Current liabilities including accounts payable divided by total assets

Cash Holding Level (Cash Hold): The ratio of cash and trading securities divided by total assets.

5. Statistical population and sample selection

The statistical population of this research includes the companies listed on the Tehran Stock Exchange. The sampling method used in this study was systematic elimination method. For this purpose, companies that met the following criteria were included in the statistical sample and those companies that do not meet these criteria were excluded from the statistical sample. These criteria are as follows:

- For comparability of information, the financial year of the companies should be the last year of year.
- Their stocks should have been exchanged at least once every three months during the study period.
- They should not be among the investment, financial intermediation and leasing companies.
- They should not have change in fiscal year during the study period.
- All the variables required for the research should be available.
- Listed in Tehran Stock Exchange from 2010 to 2019 (to calculate some variables, it is necessary to use the information from 2010 onwards).

Given the above-mentioned criteria, a total number of 77 companies were selected from the companies listed on the Tehran Stock Exchange. The time domain of the research is a 6-year period from 2014 to 2019.

6. Research methods

The present research is applied in terms of aim and descriptive-correlated in terms of method. Also, in terms of the nature of data, it is a quantitative research and in terms of the type of argument, it is an inductive research, meaning that it seeks to design a general model based on observations and the collection of quantitative data. In terms of temporal dimension, it is a retrospective research and in terms of length of time, it is a mixed research (cross-sectional - time series). In terms of methods and techniques of data collection, it is archival. In terms of the nature of research, it is a first-hand study, and finally, in terms of research design, it is a post-hoc. In the present study, data were analyzed in two sections of descriptive statistics and inferential statistics using **STATA** software. To test the research hypotheses, regression models 2 and 3 derived from the studies conducted by Chen et al. (2017), Peterson et al. (2015), and Chiang and Pack (2019) were used:

Test model of the first hypothesis:

$$TC_{i,t} = \beta_0 + \beta_1 EQ_{it} + \beta_2 InfoAsym_{it} + \beta_3 Log(Asset)it + \beta_4 Log(Age+1)\ it + \beta_5 MktShare_{it} + \beta_6 POS\_ChgSale_{it} + \beta_7 NEG\_\ ChgSale\ it + \beta_8 ROA\ it + \beta_9\ MTB + \beta_{10}\ Leverage\ it + \beta_{11} CA\ it + \beta_{12} CL\_\ XTrade\ it + \beta_{13} CashHold\ it + \varepsilon$$

(Model 2)

Test model of the second hypothesis:

$$TC_{i,t} = \beta_0 + \beta_1 EQ_{it} + \beta_2\ AccComp + \beta_3\ AccComp\ *EQ + \beta_4\ InfoAsym_{it} + \beta_5\ Log(Asset)jt + \beta_6\ Log(Age+1) + \beta_7 MktShare_{it} + \beta_8 POS\_ChgSale_{it} + \beta_9\ NEG\_\ ChgSale + \beta_{10}\ ROA + \beta_{11}\ MTB + \beta_{12}\ Leverage + \beta_{13} CA + b14CL\_\ XTrade + b15CashHold + \varepsilon$$

(Model 3)

7. Results

The research results are presented in two sections of descriptive statistics and inferential statistics:

Descriptive statistics

To provide an overview of the important characteristics of the calculated variables, some of the concepts of descriptive statistics of these variables, including mean, median, maximum, minimum and standard deviation are presented in Table 1: Observations:462

In this study, instead of eliminating outliers, they were modified by winsorizing. The mean value is exactly at equilibrium and center point of the data. For example, the mean variable of financial leverage is equal to 0.77, meaning that 77% of companies' assets on average are financed from liabilities. The highest and lowest values of standard deviation are related to the variables of positive changes in sales and information asymmetry, respectively. The minimum level of cash holding is zero and its maximum level is about 46% of the company's total assets.

Inferential statistics

A: Pre-tests of regression models

Harris test was used to survey the stationary variables in this study, which the results of this test are provided in Table 2.

Table (1): Descriptive statistics of variables after modifying them by winsorizing

variable	Symbol of variable	mean	median	SD	Min	max	skewness	Kurtosis
Trade credit	TC	085.0	055.0	096.0	0	725.0	04.2	56.9
Earnings quality	AQ	134-0.	123.-	072.0	46.-	011.-	24.1-	50.5
Accounting comparability	AccComp	408.0-	335.0-	304.0	937.0-	003.0-	440.0-	728.1
Information asymmetry	InfoAsym	022.0	015.0	024.0	0	08.0	713.0	26.2
Company size	Log(Asset	66.13	52.13	43.1	76.10	53.19	706.0	08.4
Company age	Log(Age+1	671.3	828.3	353.0	70.2	15.4	954.-	96.2
Market share	$MktShare_i$	131.0	069.0	197.0	001.0	1	83.2	59.10
Positive changes in sales	POS_ChgSale	27.14	45.12	89.11	0	97.42	541.0	21.2
Negative changes in sales	NEG_ChgSale	042.-	0	130.0	866.-	0	63.3-	33.17
Market value	MTB	55.3	008.3	25.2	024.0	76.8	723.0	53.2
Return on assets	ROA	109.0	090.0	142.0	479.-	545.0	244.0	13.4
Financial Leverage	Leverage	778.0	813.0	142.0	114.0	974.0	56.1-	98.5
Current Asset Ratio	CA	615.0	642.0	192.0	102.0	949.0	43.-	35.2
Current liability ratio	CL_XTrade	456.0	452.0	183.0	040.0	949.0	190.0	71.2
Cash holding	CashHold	041.0	023.0	056.0	0	461.0	72.3	40.22

Table (2). Test of stationary variables

Variables	Symbol	Test statistic	Sig.	Test result
Commercial credit	TC	-9.643	0.000	Stationary
Earnings quality	EQ	-1.759	0.039	Stationary
Accounting comparability	AccComp	-12.279	0.000	Stationary
Information asymmetry	InfoAsym	-17.710	0.000	Stationary
Company size	Log(Asset)	-3.599	0.000	Stationary
Company age	Log(Age+1)	-7.040	0.000	Stationary
Market share	$MktShare_i$	-12.377	0.000	Stationary
Positive sale changes	POS_ChgSale	-8.580	0.000	Stationary
Negative sale changes	NEG_ChgSale	-2.943	0.001	Stationary
Price-to-Book ratio	MTB	-12.418	0.000	Stationary
Return on assets	ROA	-6.473	0.000	Stationary
Financial leverage	Leverage	-2.559	0.005	Stationary
Current asset ratio	CA	-1.589	0.045	Stationary
Current liabilities	CL_XTrade	-11.205	0.000	Stationary
Cash holding	CashHold	-12.502	0.000	Stationary

As seen in Table 2, all independent, dependent, and control variables are station because the significance level of this test for them is <0.05; i.e., the mean and variance of the variables over time and the covariance of the variables between different years have been constant. As a result, the studied companies did not have any structural changes and the application of these variables in the model does not result in a spurious regression.

The data type of the present study is composite data. In this type of data, F-Limer, Breusch–Pagan, and Hausman tests were used to select one of the panel data and the consolidated data methods. The results of these tests are summarized in Table 3.

Table (3). Results of determining data type tests

Model type	Test type	Test statistic	Sig.	Test result
Test model for first hypothesis	F-Limer	3.47	0.000	Panel data (fixed panel)
	Hausman	25.22	0.021	Fixed effects
	Breusch–Pagan	70.02	0.000	Random panel
Test model for second hypothesis	F-Limer	3.06	0.000	Panel data (fixed panel)
	Hausman	32.31	0.005	Fixed effects
	Breusch–Pagan	48.28	0.000	Random panel

ince the probability value obtained from the F-Limer test for both models is 0.000, the null hypothesis is rejected and the panel data method (fixed panel) is accepted. The results of the Breusch–Pagan test also confirm the random panel data method as the probability value is <0.05. Finally, by performing the Hausman test, the method of fixed effects was selected between the fixed and random methods because the obtained probability level is <0.05. The adjusted Wald test was used to detect the variance heterogeneity of the error terms and the Wooldridge test was used to detect the serial autocorrelation of the error terms. The results of these two tests are shown in Table 4:

According to the results of Wooldridge test, the problem of serial autocorrelation of error terms is not observed in the research models, since the probability level obtained for these two models is >0.05. Moreover, according to Table 4, as the significance level of the adjusted Wald test for hypothesis test models is <0.05, so both hypothesis test models show the problem of variance heterogeneity, therefore, this problem was solved in the final estimates by the panel-corrected standard error (PCSE) method. According to Table 4, the results of the cross-sectional dependence test also indicate that there is no cross-sectional dependence problem in the two models as the probability level is >0.05.

Table (4). Tests for detecting variance heterogeneity and serial autocorrelation

Model type	Test type	Test statistic	Sig.	Test result
Test model for first hypothesis	Adjusted Wald	92686.63	0.000	Variance heterogeneity
	Wooldridge	0.522	0.472	No serial autocorrelation
	Pesaran	1.303	0.192	No cross-sectional dependence
Test model for second hypothesis	Adjusted Wald	37733.07	0.000	Variance heterogeneity
	Wooldridge	0.342	0.560	No serial autocorrelation
	Pesaran	0.688	0.491	No cross-sectional dependence

Testing the first research hypothesis

To test the first hypothesis of the research, regression model 2 was used. The estimation results of this model are presented in Table (4):

According to Table 4, the results of testing the first hypothesis (effect of earnings quality on credit credit) show that the statistic obtained for the earnings quality variable is 2.14, which according to significance level (p-value) is less than 5%, so at the 95% confidence level, the null hypothesis is rejected and the research hypothesis is confirmed. Since the coefficient obtained for this variable is 0.09, it can be stated that as the earnings quality increases, trade credit also increases. The value of the coefficient of determination indicates that 31% of the changes in the dependent variable are due to changes in explanatory variables. In other words, independent and control variables explain about 31% of the changes in the dependent variable. The significance level of Wald test is equal to 0.000 that is less than 5%, so the whole model credibility is confirmed. Based on Table 4, the significance level of the variables of information asymmetry, company size, company age, company market share, financial

leverage, return on assets, current assets ratio, current liabilities ratio and cash holding level is less than 5%. Thus, they are significant at the expected error level and affect the dependent variable and they should be controlled in future research.

C: Testing the second research hypothesis

To test the second hypothesis of the research, regression model 3 was used. The estimation results of this model are presented in Table (5):

Table (5): Final estimation of the first hypothesis test model

$+ \beta\ 6POS\_ChgSale_{it} + \beta_7\ NEG\_\ ChgSale\ it\ \beta_5\ MktShare_{it} + \beta_4\ Log(Age+1)\ it + +\beta_3\ Log(Asset)it\ \beta_2\ InfoAsym_{it} + \beta_1 EQ_{it}\ xtpcse\ TC_{i,t} = \beta_0 + \beta_{13} CashHold\ it + \varepsilon\ \beta_{12} CL\_\ XTrade\ it + \beta_{11} CA\ it + + \beta_8 ROA\ it + \beta_9\ MTB + \beta_{10}\ Leverage\ it +$						
Estimation method: Linear regression by panel-corrected standard error (PCSE) method dependent variable: TC						
variable	**Symbol**	**Coefficients**	**Standard error**	**Statistic Z**	**sig**	**VIF**
Earnings quality	EQ	090.0	042.0	14.2	032.0	13.1
Information asymmetry	InfoAsym	49.0-	127.0	87.3-	000.0	07.1
Company size	Log(Asset	003.0	001.0	59.2	010.0	17.1
Company age	Log(Age+1	026.0	013.0	99.1	046.0	08.1
Market share	$MktShare_i$	107.0	027.0	93.3	000.0	59.1
Positive changes in sales	POS_ChgSale	000.0	000.0	17.1	240.0	66.1
Negative changes in sales	NEG_ChgSale	042.0	028.0	47.1	142.0	44.1
Market value to book value	MTB	000.0	001.0	07.0	947.0	05.1
Return on assets	ROA	062.0	028.0	20.2	028.0	21.1
Financial Leverage	Leverage	036.-	016.0	27.2-	023.0	11.1
Current Asset Ratio	CA	035.0	016.0	17.2	030.0	17.1
Current liability ratio	CL_XTrade	232.0	023.0	87.9	000.0	28.1
Cash holding	CashHold	155.-	066.0	33.2	020.0	18.1
Intercept	cons	078.0	040.0	97.1	049.0	
The coefficient of determination		315.0	Wald statistic		03.200	
Number of observations		462	Wald significance elevel		000.0	

Table (6): Final estimation of the second hypothesis test model

$+ \beta 8\ \ \beta 7\ MktShare_{it} + \beta 6 Log(Age+1) + + \beta 5\ Log(Asset)jt\ \beta_3\ AccComp*EQ + \beta_4 InfoAsym_{it} + \beta_2\ AccComp + \beta_1 EQ_{it}\ xtpcse\ TC_{i,t} = \beta_0 + \beta 15 CashHold + \varepsilon\ \beta 14 CL\_\ XTrade + \beta\ 13CA + POS\_ChgSale_{it} + \beta 9 NEG\_\ ChgSale + \beta 10 ROA + \beta_{11} MTB + + \beta_{12} Leverage +$						
Estimation method: Linear regression by panel-corrected standard error (PCSE) method dependent variable: TC						
variable	**Symbol**	**Coef**	**Std error**	**Statistic Z**	**sig**	**VIF**
Earnings quality	EQ	167.0	048.0	45.3	001.0	06.2
Accounting comparability	AccComp	002.0	001.0	09.1	277.0	65.2
Interaction of comparability and profit quality	AccComp* EQ	229.0	065.0	47.3	001.0	46.3
Information asymmetry	InfoAsym	597.-	141.0	23.4-	000.0	05.1
Company size	Log(Asset)	002.0	001.0	14.2	032.0	64.1
Company age	Log(Age+1)	013.0	006.0	25.2	025.0	06.1
Market share	MktSharei	103.0	026.0	90.3	000.0	73.1
Positive changes in sales	POS_ChgSale	000.0	000.0	12.1	262.0	73.1
Negative changes in sales	NEG_ChgSale	048.0	028.0	72.1	086.0	46.1
Market value	MTB	000.0	001.0	12.0	905.0	14.1
Return on assets	ROA	062.0	026.0	34.2	019.0	66.1
Financial Leverage	Leverage	035.-	016.0	12.2-	034.0	44.1
Current Asset Ratio	CA	063.0	018.0	51.3	000.0	22.1
Current liability ratio	CL_XTrade	220.0	023.0	54.9	000.0	69.1
Cash holding	CashHold	162.-	066.0	44.2-	015.0	19.1
Intercept	Cons	013.0	006.0	10.2	035.0	
The coefficient of determination		365.0	**Wald statistic**		53.241	
Number of observations		462	**Wald significance level**		000.0	

The second hypothesis states that earnings quality has an effect on trade credit by considering the moderating role of accounting comparability. Based on the Table 5, to test the second hypothesis, the significance of the coefficient of AccComp * EQ interaction should be examined. The obtained statistic for this variable is 3.47, which is more than the critical value. Thus, since the significance level of this variable is equal to 0.001, the second hypothesis of the research is confirmed. The coefficient obtained for the AccComp * EQ variable is 0.229, which is increased compared to the EQ coefficient. Thus, accounting comparability increases the positive effect of earnings quality on the trade credit. In other words, the effect of earnings quality on trade credit is greater in companies that are more comparable than in companies that are less comparable.

The value of coefficient of determination indicates that 36% of the changes in the dependent variable are due to changes in the explanatory variables. In other words, the independent variables explain about 36% of the changes in the dependent variable. The significance level of Wald test is 0.000 that is less than 5%, so the validity of the whole model is confirmed. Based on the Table 5, the significant level of information asymmetry variables, company size, company age, company market share, financial leverage, return on assets, current assets ratio, current liabilities ratio and cash holding level is less than 5%, so they are significance at the expected error and affect the dependent variable. Thus, they should be controlled in future research.

8. Discussion and Conclusion

The issue of short-term financing through trade credit is essential for companies because other methods of financing are costly and time consuming, as results of first hypothesis test showed that earnings quality has a positive effect on trade credit. In other words, with increasing the earnings quality, trade credit increases. Results of this hypothesis confirm that increasing financial reporting quality can reduce information asymmetry and prevent undesirable selection and moral hazard. Suppliers examine the status of their clients when granting credit. Earning is one of the parameters that suppliers pay special attention to it. Suppliers probably know that low-quality accounting clients are highly risky and thus are unwilling to provide them trade credit. In other words, suppliers rely on high-quality financial reporting to assess clients' ability to meet business obligations and implicit claims. The obtained results contradict the idea that suppliers can obtain information through business transactions. These results are consistent with transaction cost theory and are in contrast to theory of financing, because business transactions only reflect parts of a company's operations, suppliers may not have a broad view of clients, while financial reporting provides information about the entire operation.

Consistent with previous studies such as Klapper et al. (2012), Murfin and Enjoridge (2015), which showed that large and reliable companies are probably more transparent in terms of information, they use trade credit provided by smaller suppliers. It can be stated that financing may not improve the liability capacity of companies with low accounting quality. In this case, suppliers will use financial information as a basis for granting credit. In this approach, higher quality information leads to more granting of credit. The results of this hypothesis are consistent with those of studies conducted by Aflatooni and Nemati (2018), Cheung and Pok (2019) and Anthony et al. (2015) but are inconsistent with those of study conducted by Chen et al. (2017). The results of the second hypothesis of the study showed that the effect of earnings quality on trade credit is greater in companies that have higher accounting information comparability than companies that lower accounting information comparability. In other words, accounting information comparability intensifies the effect of earnings quality on trade credit.

The results of this hypothesis confirm that if a company's accounting information comparability with other companies in the industry increases, the cost of processing information by investors and financial analysts will be reduced and will lead to improved predictions. By increasing the accounting information comparability, the advantage of private information decreases with the availability of company information. It seems that accounting information comparability in Iranian companies is highly considered by investors and users of accounting information and as a control mechanism for the behavior of managers. Thus, less managers in companies with higher accounting information

comparability will manipulate and manage earnings by using accruals. Thus, the earnings will have high quality. Predictability of accounting earnings can increase the earnings quality by reducing the prediction error of accounting earnings. In this condition, with increasing earnings quality, the trade credit provided by suppliers will increase significantly. The results of this hypothesis are consistent with results of previous studies, such as Kim and Li (2016) and Peterson et al. (2015). One of the limitations of the present study is that earnings-return correlation of a pair of company in an industry was used to measure comparability, while the use of other measurement methods may lead to different results. Based on the test results of the first hypothesis, it is recommended to creditors to pay special attention to the quality of their clients' financial reporting to grant trade credit. It is also recommended to managers applying for trade credit to reduce the ambiguity of trade credit providers by increasing more transparency and using the same accounting methods.

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