

Yazdinejad, Esmail Akhlaghi; Jokar, Hossein

**Article**

## Discovering determinants of trade credit demand: Evidence from top managers insight

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\*Corresponding author: Hossein Jokar  
Accounting, Shahid Bahonar  
University of Kerman, Kerman, Iran.  
E-mail: [h.jhesabdar93@gmail.com](mailto:h.jhesabdar93@gmail.com)

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## FINANCIAL ECONOMICS | RESEARCH ARTICLE

# Discovering determinants of trade credit demand: Evidence from top managers insight

Esmail Akhlaghi Yazdinejad<sup>1</sup> and Hossein Jokar<sup>2\*</sup>

**Abstract:** In resources consumption management, determining the volume of trade credit demand (TCD) is the main concern for financial managers. Despite the importance of TCD, it is not well explored in developing countries. Therefore, this paper investigates the internal and external factors affecting the amount of TCD. Qualitative research method and questionnaire were used to collect opinions of top managers about the factors determining the volume of TCD. SPSS and AMOS statistical tools were used to analyze the quantitative data collected from the questionnaire. Based on the results, internal factors such as available collaterals, inventory turnover, reorder point, and payable payment period affect the volume of TCD. Furthermore, external factors such as banks availability, customer monopoly, and living in metropolitans affect the volume of TCD.

**Subjects:** Finance; Business and Industry; Business; Management and Accounting; Marketing

**Keywords:** Trade credit demand; internal factors; external factors; working capital

### 1. Introduction

The recent financial crisis in developing and developed countries led to studies that are more comprehensive on working capital. Proper management of working capital is a competitive advantage for business entities; hence, they should keep up an ideal volume of working capital to maximize their values (Taurigana & Adjapong Afrifa, 2013). Trade credit channels lead to payable and receivable accounts, which are significant parts of working capital. Trade credit is a type of credit, extended by one business to another, allowing the latter to buy goods from the former without making an immediate full payment by check or cash. According to Ferris (1981), trade credit, a short-term loan that tied in both timing and value of the exchange of goods, may substitute for money if the loan is transferable. TCD refers to the credit requested from

### ABOUT THE AUTHORS

Esmail Akhlaghi Yazdinejad is an assistant Professor of accounting at University of Hormozgan, Iran. His research interests relate to the risk management, asset pricing, and investors' behavior.

Hossein Jokar is a MSc. of accounting at Shahid Bahonar University of Kerman, Iran. His research interest includes investor sentiment, accounting information and stock price. He has been doing research on the behavioral finance in Iran.

### PUBLIC INTEREST STATEMENT

In the current challenging economy with increasing environmental pressures and limited resources, working capital is remarkable. Optimal management of working capital is considered a competitive advantage for firms. Companies should have the optimal level of working capital to maximize their value. Working capital works as the blood vessels in a business unit, so its management is vital for its health. Credit transactions (credit purchases and sales) as significant part of the working capital are the concern of the present study. However, experience has shown that credit transactions are important parts of the working capital management.

suppliers by a demander. TCD is usually called credit purchase, and it represents unpaid purchases from the suppliers. TCD is common for some reasons. First, trade credit reduces the cost of paying, while administering invoices between suppliers and buyers. Second, credit terms are usually invariant to the credit quality of the buyer, so trade credit reduces the effective price to the lower-quality borrowers. Third, Trade credit is also helpful when the buyer lacks information about the seller. Moreover, credit rationed or constrained firms demand more trade credit in comparison to the firms, which have better liquidity or access to financial institutions.

Trade credit is economically significant from both micro- and macroeconomic perspectives. Trade credit is one of the most important sources of working capital for Iranian firms. Looking at firm-level data, accounts payable is generally more than 70% of liabilities for half of the manufacturing firms at the end of 2017. It is very important for both big and small businesses, as 92% of businesses use trade credit. Obviously, it is apparent how crucial trade credit is, and what a great role it can play in businesses success. There is very little recognition about trade credit, and even less on actual terms of trade credit at the individual supplier and customer level. Since trade credit serves as an important source of external finance, we should have some comprehensive knowledge of the determinants of trade credit. Therefore, the main objective of this study is to investigate trade credit concept in-depth. The trade credit channel has received comparatively little attention (Mateut, Bougheas, & Mizen, 2006), and its existence remains controversial. Neither Gertler and Gilchrist (1993) nor Oliner and Rudebusch (1996) found the evidence that trade credit expands during tight money periods. On the other hand, Nilsen (2002), and Choi and Kim (2005) have found the opposite results. Garcia-Appendini and Montoriol-Garriga (2013), and Yang (2011) examined the supply and demand for trade credit around the 2008 financial crisis, but their studies have focused too narrowly to provide general conclusions. This research study fills a literature gap on the determinants factors in Iran as a developing country. Moreover, as credit sale is an important part of working capital by providing both internal and external factors, affecting its amount is essential for financial managers. Therefore, the key contribution of this study is providing comprehensive factors, which managers should concern in making the decision about the optimal level of credit sale.

### **1.1. Problem statement**

Working capital has a significant role in resource management and profitability of corporations (Tauringana & Adjapong Afrifa, 2013). Since TCD is a noteworthy portion of current debts, it is an important part of working capital. Understanding factors that are affecting the volume of TCD is a significant concern of managers to manage their short-term resources and consumptions, specifically in crisis periods. Supporting this issue, Yang (2011) showed that in the last global financial crisis, most of the companies increased their TCD, and faced with difficulty to pay the payables, which increased the possibility of bankruptcy. In recent years, due to sanctions and economic crises in Iran, small and large companies have demanded trade credit increasingly. They raised their TCD, because they did not have enough cash, and they wanted to match their payables by receivables consistent with liquidity and transaction cost theories. As their payables increased, they had difficulties to settle them. The average payables payment period of non-financial listed companies has increased from 86 days in 2008 to 132 days in 2015. This trend implies that trade credit suppliers had problems to settle their payables. Of course, this trend and its consequences are noticeable for managers and other stakeholders. Although the problem is widespread across the country, researchers have not done adequate analysis on this topic. In addition, there is not a confirmed or proposed model to indicate the factors that are affecting the amount of TCD in Iran. Because of the different economic, social, and cultural conditions of Iran, the results of developed countries studies might not be adaptable. Therefore, this paper provides a conceptual model of internal and external factors affecting the amount of TCD to fill the void. We developed a structured questionnaire to collect the opinions of expert managers of selected companies in Tehran. Accordingly, the main objective of this study is to provide a conceptual model for determinants of TCD. Therefore, the primary question is which factors affect TCD? 1- Which internal

factors do affect the amount of TCD? 2- What is the priority of confirmed internal factors? 3- Which external factors do affect the amount of TCD? 4- What is the priority of confirmed external factors?

## 2. Literature

Emery (1984) argues that when the borrowing and lending rates differ across firms, trade credit can serve to arbitrage the difference. More specifically, trade credit may arise due to the asymmetric information and imperfections in the capital markets. There are some theories such as transaction cost minimization, price discrimination, quality guarantees, and pecking order theory, which explain TCD. Each theory describes some justifications for TCD, which helps us to find out the factors that are affecting it, but none of them shows the whole situation. Therefore, it is substantial to review them in order to make a comprehensive overview.

Based on Transaction Cost Theory, Nilsen (2002) argues that trade credit reduces the cost of paying, and administering invoices between suppliers and buyers. There might be a significant volume of uncertainty in the delivery of goods. Incomplete markets where there is no asymmetric information minimizing the transaction costs is the main motive behind trade credit. In the absence of trade, credit firms keep large balances of cash. Therefore, trade credit is a very efficient payment method, which provides the separation of payment from delivery and reduces uncertainty. Buyers can defer the obligations and pay them only monthly or quarterly, so it can be used as a cash-management tool as the buyer will match the cash receipts for sales and cash outlays for purchases (Ng, Smith, & Smith, 1999).

The second one is Price Discrimination Theory. Trade credit can be offered to price discriminate even if the supplier has no financing advantage over financial institutions (Brennan, Miksimovic, & Zechner, 1988; Mian & Smith, 1992). Credit terms are usually invariant to the credit quality of the buyer, so trade credit reduces the effective price to the lower-quality borrowers. Since the low-quality firms are more credit constrained they comprise the elastic segment of demand and the price discrimination, which lowers the effective price of the goods. This behavior allows low-quality firms to buy goods and services, and conduct business in the market. Risky customers accept expensive trade credit offers, because it is still cheaper than alternative sources, whereas creditworthy buyers will take advantage of early payment discounts to avoid overpriced credit.

In the liquidity Theory, Emery (1984) argues that credit rationed or constrained firms use more trade credit than other firms, which have better liquidity or better access to financial institutions. Many studies support the liquidity Theory especially during monetary contractions (See Atanasova, 2007; Atanasova & Wilson, 2003; Demir & Javorcik, 2018; Mateut et al., 2006; Nilsen, 2002).

Firms' liquidity position and relationships with financial institutions may affect the demand for trade credit. According to the pecking order theory, firms prefer first internal resources and then apply for external funding options. If trade credit comes lower down in the pecking order than borrowing from close financial institutions, it can be hypothesized that there is a negative relationship between the financial institutions or an available line of credit and the demand for trade credit.

### 2.1. Background of research

Previous studies address the factors affecting TCD. Petersen and Rajan (1997) argued that better access to credit market requires creditworthiness, which may also depend upon the age and size of the firm. Firm age and size are good proxies for the creditworthiness of a firm. Older firms are supposed to have more experience, as they survived for a long time on the market, and thus have more of a reputation for potential lenders. Usually, larger firms are more likely to have greater cash flows and fewer growth opportunities, where they borrow more, which suggests they are more creditworthy. It could be concluded that larger firms are offered more trade credit not because of their higher demand, but because of their creditworthiness. Both variables, age and size, are expected to have positive impacts on TCD. Small firms are supposed to be more credit constrained

than larger firms, implying that small firms borrow more and extend less trade credit. However, larger firms have higher ratios of accounts payable to sales, indicating that larger firms demand more trade credit than small firms do. In addition, Petersen and Rajan (1997) found some evidence that available lines of credit have a negative, significant, and large effect, thus firms with higher available lines of credit demand less trade credit.

Diamond (1991) argues that longer relationships with lenders will increase the reputation of the borrower in the debt market. Accordingly, if suppliers are taking into account the signal coming from financial institutions, firms having long relationships with financial institutions should be offered more trade credit. According to Diamond (1991), and Hart and Moore (1994) most firms match the maturities of assets and liabilities. Therefore, we can hypothesize that firms with more current assets demand more trade credit since trade credit is a short-term source of finance.

Choi and Kim (2005) estimate the supply of trade credit on quarterly Compustat data for 659 S&P 500 firms, and 689 non-S&P 500 firms. They showed that size, sales growth, inventory balance, sales to asset ratio, earnings-to-assets ratio, and leverage affect TCD. Francis, LaFond, Olsson, and Schipper (2005) show that companies that have a better financial situation, demand more credit trading and have no problem in paying it on time, and they offer more trade credit. It is hypothesized that higher necessity for capital, results in higher accounts payable. A firm's credit needs can be affected by investment opportunities, asset maturity, liquidity, and access to credit from financial institutions. Firms that are growing, proxied by the change in sales, will need more funds, and thus demand more trade credit. Furthermore, the demand for trade credit may depend on the implicit price of credit, where the implicit price depends on trade credit terms. Trade credit terms include offered cash discounts, early payment discounts, discount period, the maturity date (due date for the full payment), and late-payment penalty.

Altunok (2012) found evidence that firms with increased sales growth demand more trade credit. In addition, he found a strong and positive significant effect of increasing sales on the demand for trade credit, which indicates that fast-growing firms demand more trade credit. There is no evidence that shows the impact of age of the firm on the accounts payable. This result is different from Petersen and Rajan (1997) study, who found that older firms are demanding more trade credit up to a certain age.

Additionally, firms using more cash discounts demand less trade credit, indicating that firms benefit from the cash discounts since trade credit is not a free form of financing when the discount period is forgone. Moreover, this result is consistent with the evidence that firms with more cash holdings demand less trade credit. The higher size of the early payment discount refers to the higher implicit price of trade credit, implying that more firms may choose to make payments within the discount period. Furthermore, strong evidence exists, which shows that higher monthly fees reduce the demand for trade credit. In addition, a longer maturity of trade credit strongly increases the demand for trade credit.

Altunok, Mitchell, and Pearce (2015) showed that firms, which have longer maturities of bank loans and fixed interest rates, demand less trade credit strongly. In addition, firms in a Metropolis are offered more trade credit suggesting that trade credit substitutes for institutional finance in more competitive markets. According to the Pecking Order Theory, if bank credit is cheaper than trade credit for a creditworthy firm, bank credit should come before trade credit. Consistent with this theory, firms which have long relationships with banks demand less trade credit (Deloof & Van Overfelt, 2011; Ge & Qiu, 2007). Once a bank loan is available, the motives for the demand for expensive trade credit such as liquidity control and reduction in informational asymmetries, no longer remains influential. This causes actual demand for trade credit to decline (Molina & Preve, 2012; Wilner, 2000).

In another study, Ng et al. (1999) found evidence that trade credit terms do not vary very much within the industry or overtime, but vary across industries. Casey and O'Toole (2014)

showed that credit rationed firms are more likely to use and apply for trade credit. Firms denied credit for working capital tends to turn to trade credit. Hill, Kelly, Preve, and Sarria-Allende (2017) showed that trade credit financing is chosen by firms that have more restricted access to financial credit. In addition, Breza and Liberman (2017) showed that the restriction reduces the likelihood of trade by 11%. The retailer also responds by internalizing procurement to its own subsidiaries and reducing overall purchases. Finally, they found that relational contracts could mitigate the inability to extend long trade credit terms. These results seem to be stronger for firms in emerging markets.

Jaleel, Hui, and Khan (2015) pointed out that firms with better profitability and liquidity ratios demand less for trade credit. They showed return on asset, quick and current ratio affect TCD negatively. In another study, Fabbri and Klapper (2016) showed that inventory turnover affect TCD positively also as accounts payable payment period increases the number of TCD increases. Hill et al. (2017) study findings showed that firms suffering low liquidity would demand less trade credit.

Carbó-valverde, Rodríguez-Fernández, and Udell (2016) documented increased dependence on trade credit for Spanish firms that are credit constrained. Similarly, Garcia-Appendini and Montoriol-Garriga (2013) stated that accounts payable increase for constrained firms during a crisis., In another study, Ferrando and Muller (2013) found that financially constrained firms are more likely to use trade credit as a part of their overall growth strategy. Yazdanfar and Öhman (2017) provided empirical evidence that both long-term debt and profitability, significantly and negatively influence on trade credit (i.e. accounts payable), and that short-term debt positively influences trade credit. Notably, while trade credit seems to complement other short-term debt, it replaces long-term debt.

### 3. Methodology

Based on the objective of the study, we performed a qualitative research design, to provide a conceptual model by using interviews and a questionnaire. First, the related literature on TCD and factors affecting it, reviewed and several factors discovered. Second, interviews adopted with few financial experts to confirm or remove some factors based on the economic environment of Iran. Third, a questionnaire was developed to find out the important factors affecting TCD. This study used a statistical sampling method, based on Cochran, (1997) study.

#### 3.1. Population and sampling

The population of this study includes financial managers of Tehran Stock Exchange-listed companies, which are expert in credit sales decision making. All population members have at least 5 years' experience in positions like chief financial officer (CFO), chief executive officer (CEO), and Board member. They also have at least a bachelor degree of finance, accounting, or management. This study uses Cochran, (1997) statistical sampling method (Ershadi & Eskandari Dehdazzi, 2019; Krysczun et al., 2018). The Cochran sampling method is as below:

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left( \frac{z^2 pq}{d^2} - 1 \right)}$$

Where n is the sample size, N is the population size, Z is the standardize normal distribution score at a specified confident level, P is the (estimated) proportion of the population which has the attribute in question, q is the 1-p, and d is the acceptable margin of error for proportion being estimated.

The population size (N) was 1200. Z score for 95% level of confidence is 1.96. The most stringent level for p and q is 0.05, and the acceptable margin of error for this study was 7%. The result showed the sample size of 168. Finally, 194 questionnaires collected and after eliminating invalid responses, 181 questionnaire remained, which exceeded the sample size.



### 3.2. Measures

The measurement items (dimensions) of the questionnaire were developed from the existing literature and interviews with financial managers. The formal questionnaire contains four parts. In the first part of the questionnaire, respondents were assured that the results are reported only in statistical formats. The second part was about the demographic characteristics of respondents. In the third part, we asked the respondents about the importance level of internal factors affecting TCD, while in the last part we asked the respondents about the importance level of external factors affecting TCD. The constructs studied here are measured using 7-point Likert's scales.

### 3.3. Subjects, validity, and reliability

This study used the opinion of scholars and professors familiar with the concepts and structure of the questionnaire to determine the content and structural validity. Then, the consistency and stability (two parts of reliability) of the measurement items (dimensions) checked. The test-retest statistical exam conducted on 30 respondents within two weeks to ensure the questionnaire consistency. The retest coefficient for internal and external factors was 0.822 and 0.794 respectively, thus the consistency was approved. Cronbach's alpha for internal and external factors was 0.853 and 0.88 respectively, which confirms the stability. In the next step, the questionnaire distributed between two different groups of respondents within two weeks. The T statistics showed that the responses from the two groups are not statistically different, thus the potential effect of non-respondents' responses could be ignored.

## 4. Results

First, descriptive statistics is shown in Table 1. Secondly, the Explanatory Factor Analysis (EFA) is presented. Finally, the Confirmatory Factor Analysis (CFA) is conducted. The KMO index and Bartlett test are used to check the suitability of data for factor analysis in the first step of EFA. Table 2 indicates that the data are suitable for factor analysis for both internal and external factors.

In the second step, EFA is done with Varimax method, and the result of internal and external factors is presented in Tables 3 and 4 respectively. Table 3 shows four latent variables, which determine TCD. The first latent variable (factor 1) is measured with five observed variables (item 13, 14, 15, 16, 17), which include internal factors as current ratio, quick ratio, working capital, return on assets, and leverage. The second latent variable (factor 2) is measured with four observed variables (item 8, 9, 10, 12), which include available collateral, inventory turnover, reorder point, and accounts payable payment period. The third latent variable is measured with four observed variables (item 1, 2, 3, 4), which include firm size, firm age, product corruptibility, and bankruptcy possibility. The last factor is measured with three observed variables (item 5, 7, 11), which include growth opportunities, long-term debts and collection period.

The results in Table 4 show there are four latent variables, which determine the TCD. The first latent variable is measured with five observed variables (item 8, 10, 11, 12, 13), which include time length of relationship with customer, firm creditworthiness, acceptable collaterals, seasonal boom or depression, and the existence of a primary-secondary relationship with the supplier as the external factors. The second latent variable is measured with four observed variables (item 4–7), which include firm familiarity, industry type, firm monopoly, and supplier credit terms. The third latent variable is measured with three observed variables (item 14–16), which include banks' financing terms, economic monetary policy, manufacturing sector boom or depression. The last one is measured with three observed variables (item 1, 2, 17), which include living in metropolitans, availability of banks and supplier monopoly.

The next steps assert the first order and second-order confirmatory factor analysis. All the first order and second-order CFA were run for internal and external factors separately, using AMOS 22. This study follows the two-step approach recommended by Anderson and Gerbing (1988) running confirmatory factor analysis. The measurement model was assessed to examine construct validity, and the structural model was assessed to test the suitability of the model (model fitness).



**Table 1. Descriptive statistics**

Characteristics	Classification	frequency percent	Cumulative frequency percent
Organizational position	CEO	17.7	17.7
	financial managers	37.5	55.2
	Credit Manager	28.7	83.9
	Member of board	16.1	100
Education	Bachelor	21	21
	Master	50.2	71.3
	Ph.D. and Ph.D. student	28.7	100
	Other	0	100
work experience	Less than 5 years	0	0
	5 to 10	34.3	34.3
	11 to 15	53.6	87.9
	More than 15	12.1	100
Field of Study	Accounting	51.3	51.3
	Management	37.5	88.8
	Economics	11.2	100
	Other	0	100
Sex	Male	89.6	89.6
	Female	10.4	100

**Table 2. KMO index and Bartlett test**

Factor/Statistics	KMO	Bartlett $\chi^2$	Bartlett- P-value
Internal	0.82	1183.39	0.00
External	0.877	1485.069	0.00

Construct validity analysis splits into two: convergent validity and discriminant validity. This study tests convergent validity holding that all item loadings should exceed 0.50 (Anderson & Gerbing, 1988).

#### 4.1. CFA for internal factors

Results of the construct validity analysis are shown in Figure 1. All research constructs conform to the criteria. To assess for discriminant validity, the square root of the average variance extracted (AVE) for each construct was compared with the inter-factor correlations between that construct and all other constructs. If the AVE is higher than the squared inter-scale correlations of the construct, then it shows good discriminant validity (Gefen, Straub, & Boudreau, 2000; Hair, Sarstedt, Ringle, & Mena, 2012). As shown in Table 5, for each factor the square root of AVE is larger than the correlation coefficients with other factors and that confirms sufficient discriminant validity. In sum, the measurement model for this research shows good convergent validity and discriminant validity. To assess the structural model goodness-of-fit measures were examined. The values showed in Table 6 indicating a satisfactory model fit.

To run the second-order CFA the measurement model and structural model (second-order) should be assessed again. The construct validity of second-order CFA just includes convergent validity. The results showed in Figure 2 indicates the construct validity of satisfactory measurement model as all item loadings exceeded 0.50. Table 7 indicates the model fitness assessment for the second -order model.

**Table 3. Explanatory factor analysis for internal factors**

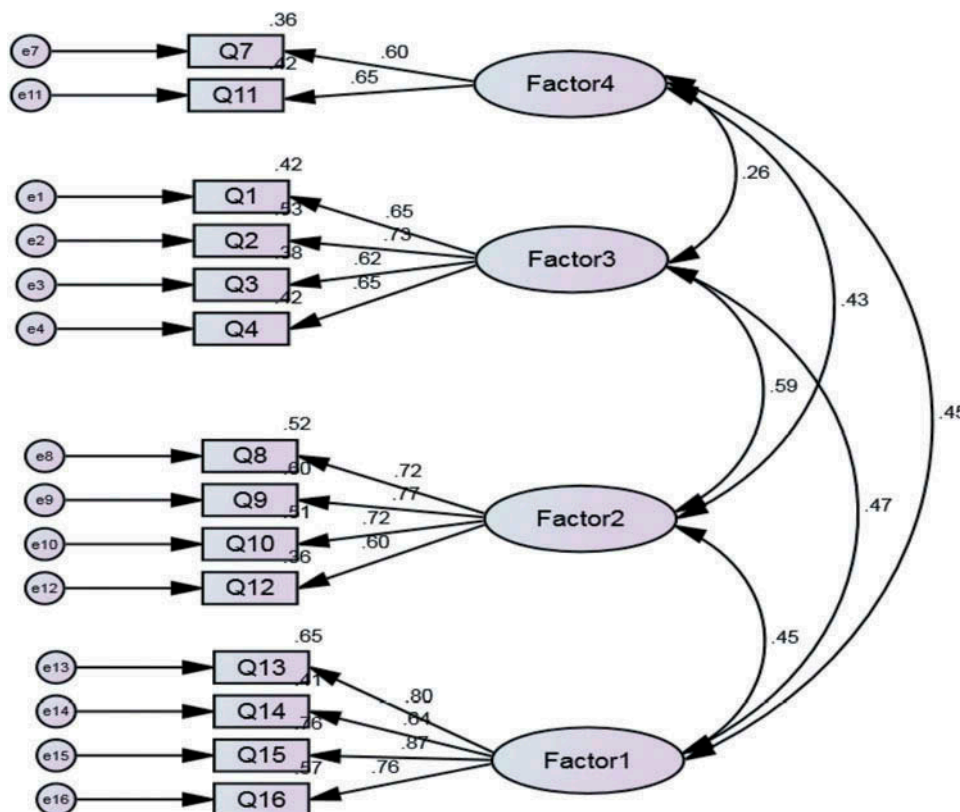
Latent variable 4 (Factor 4)	Latent variable 3 (Factor 3)	Latent variable 2 (Factor 2)	Latent variable 1 (Factor 1)	Observed variable (Item)
.114	.783	.109	.003	1
.127	.723	.174	.175	2
-.146	.682	.201	.104	3
.038	.685	.184	.199	4
.739	.119	-.088	-.052	5
.254	.201	.338	.362	6
.695	-.094	.123	.317	7
.163	.345	.636	.208	8
.086	.200	.795	.085	9
-.105	.160	.820	.122	10
.638	.056	.258	.166	11
.154	.093	.678	.145	12
.019	.275	-.037	.805	13
.233	.002	.101	.770	14
.068	.300	.151	.763	15
.036	.095	.261	.782	16
.086	-.005	.141	.618	17
1.273	1.476	2.001	5.301	Eigenvalue

**Table 4. Explanatory factor analysis for internal factors**

Latent variable 4 (Factor 4)	Latent variable 3 (Factor 3)	Latent variable 2 (Factor 2)	Latent variable 1 (Factor 1)	Observed variable (Item)
.847	.090	.013	.200	1
.780	.192	.266	.061	2
.436	.282	.158	.407	3
.068	.121	.868	.128	4
.197	.243	.790	-.043	5
.173	-.022	.834	.197	6
.054	.098	.739	.360	7
.034	.168	.234	.709	8
.089	.360	-.012	.459	9
.032	.280	.184	.740	10
.208	.041	.197	.723	11
.395	.118	-.018	.682	12
.176	.375	.141	.632	13
.306	.720	.183	.252	14
.222	.687	.102	.361	15
.086	.820	.113	.158	16
.501	.331	.254	.220	17
1.057	1.319	2.009	6.515	Eigenvalue

According to second-order CFA, the first research question has been replied. The results show that four internal factors (category of items) explain the TCD. The first category contains the current ratio, quick ratio, working capital, and return on assets. The second category consists of

**Figure 1. The structural model with standardized path coefficients.**



**Table 5. Discriminant validity results for the measurement model**

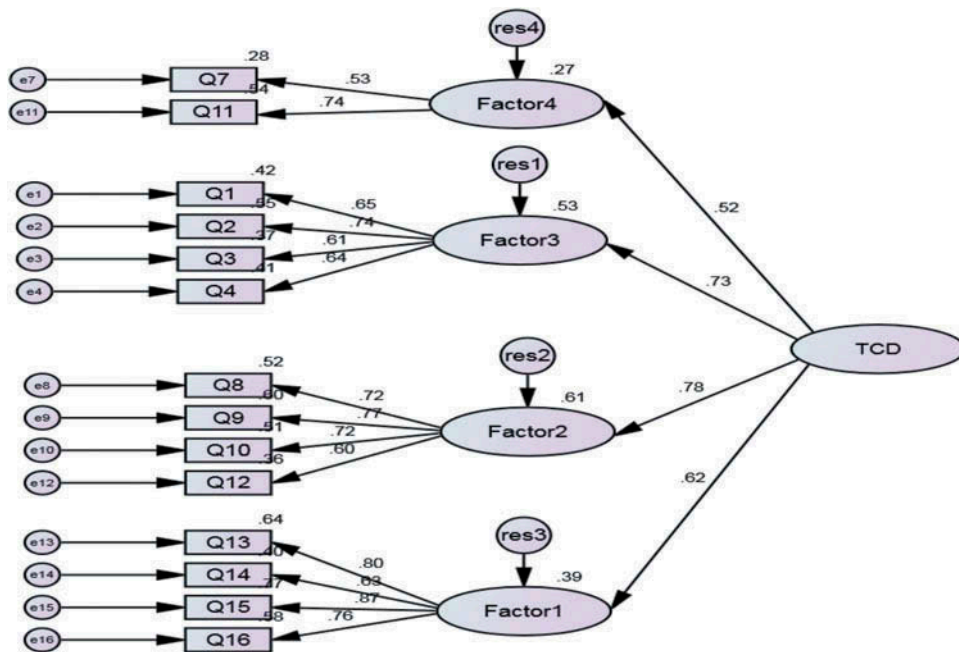
Construct	Factor 1	Factor 2	Factor 3	Factor 4	AVE
Factor 1	-				.531
Factor 2	.46	-			.538
Factor 3	.47	.59	-		.509
Factor 4	.45	.43	.26	-	.767

**Table 6. Structural model fitness**

Goodness-of-fit measures	Result	Criteria
CMIN/df	2.142	Less than 3
GFI	0.901	More than 0.9
AGFI	0.854	More than 0.8
IFI	0.915	More than 0.9
CFI	0.914	More than 0.9
RMSEA	0.077	Less than 0.08

available collateral, inventory turnover, reorder point, and accounts payable payment period. The third category includes firm size, firm age, product corruptibility, and bankruptcy possibility. The last one includes long-term debts and collection period. In order to answer the second question, which seeks to determine the importance of internal factors determining TCD the regression coefficients of second-order CFA were used. Table 8 shows that the most important factors are factor 2 and 3.

**Figure 2. The structural model with standardized path coefficients.**



**Table 7. Structural model fitness**

Goodness-of-fit measures	Result	Criteria
CMIN/df	2.155	Less than 3
AGFI	0.853	More than 0.8
IFI	0.912	More than 0.9
CFI	0.910	More than 0.9
RMSEA	0.078	Less than 0.08

**Table 8. Prioritizing the importance of the internal factors**

Factor	Regression coefficients	Priority
Factor 2	0.78	1
Factor 3	0.73	2
Factor 1	0.62	3
Factor 4	0.52	4

**Table 9. Discriminant validity results for the measurement model**

Construct	Factor 1	Factor 2	Factor 3	Factor 4	AVE
Factor 1	-				0.522
Factor 2	0.47	-			0.536
Factor 3	0.74	0.41	-		0.523
Factor 4	0.61	0.51	0.70	-	0.516

**4.2. CFA for external factors**

The results of the construct validity of first-order CFA are shown in Table 9 and Figure 3, and the result of the model fit measurement is shown in Table 10. As shown, the measurement model

**Figure 3. The structural model with standardized path coefficients.**

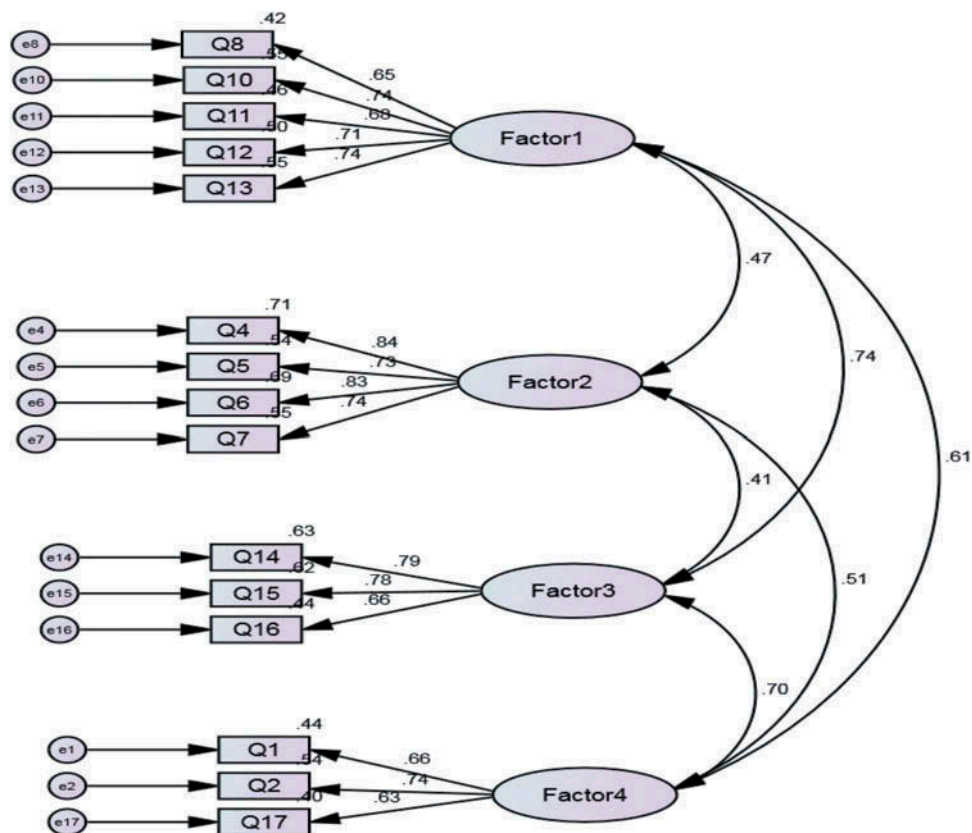


Table 10. Structural model fitness		
Goodness-of-fit measures	Result	Criteria
CMIN/df	2.140	Less than 3
AGFI	0.843	More than .8
IFI	0.924	More than .9
TLI	0.904	More than .9
CFI	0.923	More than .9
RMSEA	.077	Less than .08

reveals good convergent validity and discriminant validity. Furthermore, the results indicates that the model fit criteria are satisfactory.

The convergent validity assessment of second-order CFA is shown in Figure 4. The results indicate that the convergent validity is acceptable as all item loadings exceeded 0.50. The results of assessing model fitness for the second-order model are presented in Table 11.

According to second-order CFA, the third research question is addressed. Four external factors (category of items) explain the TCD. The first category contains time length of relationship with customer, firm creditworthiness, acceptable collaterals, seasonal boom or depression, and the existence of a primary-secondary relationship with the supplier. The second category contains firm familiarity, industry type, firm monopoly, and supplier credit terms. The third category banks' financing terms, economic monetary policy, manufacturing sector boom or depression. The last one includes living in metropolitans, availability of banks and supplier monopoly.

Figure 4. The structural model with standardized path coefficients.

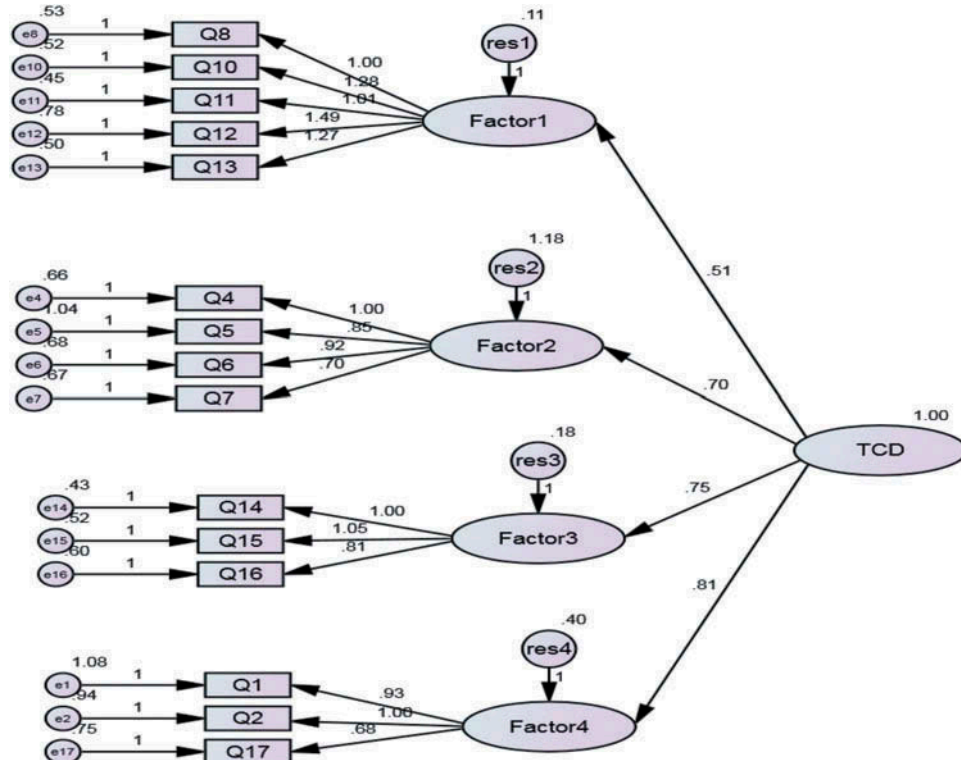


Table 11. Structural model fitness

Goodness-of-fit measures	Result	Criteria
CMIN/df	2.147	Less than 3
AGFI	.846	More than .8
IFI	.922	More than .9
TLI	.903	More than .9
CFI	.921	More than .9
RMSEA	.077	Less than .08

Table 12. Prioritizing the importance of the internal factors

Factor	Regression coefficients	Priority
Factor 4	0.81	1
Factor 3	0.75	2
Factor 2	0.70	3
Factor 1	0.51	4

In order to answer the last research question, which seeks to determine the importance of external factors determining TSC, regression coefficients of second-order CFA were used. The results in Table 12 show that the most important factor is factor 5. Moreover, factor 4 and factor 2 are in the next level of importance.

### 5. Conclusion

This study at first recognized and determined eight factors (four internal factors and four external factors) affecting the amount of TCD through exploratory factor analysis. Then, the impact of these

factors confirmed using structural equations. The internal factors include 15 dimensions and external factors include 14 dimensions. This study suggests business units to pay attention to these factors in determining the amount of TCD. Generally, this study provided two conceptual models as the first model addresses the first two research questions and the second model addresses the last two research questions.

The results indicate that the most important internal factor affecting TCD is factor 2, which includes available collateral, inventory turnover, reorder point, and accounts payable payment period. It is obvious that firms, which have more collaterals can demand more trade credit as their collaterals decrease sellers' risk. Moreover, as inventory turnover increases or reorders point decreases in firms with low liquidity, they increase their demand for trade credit. Lastly, firms demand more trade credit when the accounts payable payment period is long. The next important factor includes firm size, firm age, product corruptibility, and bankruptcy possibility. It is clear that big and long-lasting firms have more power to demand trade credit. When sellers provide corruptible products it allows buyers have more chance to demand trade credit. Finally, because of illiquidity, financially constrained firms demand more trade credit to increase their profitability through this short-term internal finance.

Additionally, the results showed that factor 4 is the most important external factor affecting TCD, which includes living in metropolitans, availability of banks, and supplier monopoly. The importance of this factor was explained below. At first, firms in metropolitans have more access to different kinds of banks and loans. Therefore, these situations decrease their need to finance through TCD. Secondly, the availability of banks increases the bargaining power of firms to finance externally and refuse to demand trade credit. Finally, in the case of supplier monopoly, buyers have less chance to bargain for TCD. Obviously, the results of this study could help small and large business entities to determine the amount of TCD as an important part of working capital.

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#### Author details

Esmail Akhlaghi Yazdinejad<sup>1</sup>

E-mail: [esmaeil6079@gmail.com](mailto:esmaeil6079@gmail.com)

Hossein Jokar<sup>2</sup>

E-mail: [hjhesabdar93@gmail.com](mailto:hjhesabdar93@gmail.com)

<sup>1</sup> Accounting, Hormozgan University, Bandar Abbas, Iran.

<sup>2</sup> Accounting, Shahid Bahonar University of Kerman, Kerman, Iran.

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