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Factors Affecting the Use of Trade Credit in Construction Enterprises Listed on the Vietnam Stock Market

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Abstract

This article analyzes factors affecting accounts payable to suppliers of construction enterprises listed on the Vietnam stock market. With the application of E-view software in quantitative analysis to build a panel data regression model, use White, Hausman and Wald tests to select the appropriate model based on pooled ordinary least squares model (POLS), fixed effect model (FEM), random effect model (REM), the article has built a regression model to determine the relationship of internal factors. Affecting the use of trade credit of 132 construction enterprises listed on the Vietnam stock market. The results indicate that business size is positively correlated, while short-term loan ratio is negatively correlated with accounts payable to suppliers. Based on the empirical results, the study proposes a number of recommendations to help business administrators balance between the benefits and risks when using trade credit policies.

1. Introduction

In a market economy, trade credit is increasingly developed. Trade credit is a form of credit in which the seller (supplier) agrees to allow the buyer to defer the value of purchased goods for a certain period of time (Peterson & Rajan, 1997) [13]. Businesses that sell on credit will grant trade credit to customers, thereby businesses that buy on credit will receive trade credit from the seller. The granting or receiving of trade credit by businesses depends on both subjective and objective factors.

Trade credit has a great effect in the production and business operation of enterprises, in addition, the person granting or receiving trade credit also faces certain constraints.

For the recipient of trade credit, that is, the user of trade credit, they will be able to use appropriated capital and have a source of goods for production and business operation without having to pay immediately. But at that time, the business is supposed to be in a passive position, unable to decide the amount of trade credit received. In addition, in some cases, the supplier offers a discount policy when the buyer pays immediately, causing the buyer to consider whether to use trade credit or debt. These reasons cause businesses to consider the benefits and risks when implementing trade credit policies. Thus, in order to take advantage of capital from suppliers while ensure business reputation, companies need to identify factors that affect accounts payable to suppliers.

Enterprises in Vietnam generally have a high rate of payables to suppliers, especially for construction enterprises, the amount is quite large, due to the characteristics of construction industry products such as long production time, great value of necessary raw materials, while collecting money from customers according to project progress often lead to lack of capital. On the other hand, listed construction enterprises have a very large capital scale, and the amount of trade credit is also large. Therefore, research on factors affecting the use of trade credit by listed construction industry enterprises is necessary. Within the scope of this article, the author will research the internal factors affecting the use of trade credit by construction enterprises listed on the Vietnam stock market, through research on nternal factors affecting accounts payable to sellers.

2. Literature review

Trade credit was initially researched by Le Goff (1957) [9] and then the topic continued to be studied by many researchers

around the world.

Research by Nadiri (1969) [10] analyzed factors affecting payables of US manufacturing enterprises, and the result showed that financial costs and liquidity positively affect accounts payable to suppliers.

Niskanen & Niskanen (2006) [12] studied the trade credit policies of small businesses operating in a bank-dominated environment (Finland). The study shows that business size, financial costs, revenue growth, and short-term asset ratio have a positive influence, while net cash flow, short-term loan ratio, and number of years of operation have a negative influence on accounts payable to sellers.

Bougheas *et al*. (2009) [3] studied businesses operating in the manufacturing sector in the UK and concluded that the factors affecting accounts payable to suppliers are business size and liquidity.

Giannetti *et al*. (2011) [7] studied the trade credit of 3,489 small businesses, from data from the 1998 national survey of small business finance in the United States in the transportation industry under the Services industry group. Analysis results show that many factors have a meaningful impact on accounts payable: Size (assets), years of operation and warranty have a positive impact on accounts payable while profitability ratio, asset immobilization, banking limits, and the risk of using signals that have a negative impact. In addition, the Service industry has lower demand for commercial testing than the manufacturing industry.

Vaidya's (2011) [16] research on businesses in India with a data set of 1,522 businesses in the period 1993-2006, using the GMM method, showed factors affecting the use of trade credit include the ratio of inventory and liquidity.

Akinlo (2012) [2] analyzed panel data of 66 non-financial companies listed on the Nigerian stock market for the period 1999 - 2007, to study factors affecting trade credit. Analysis results show that many factors have a significant impact on payables: size, inventory, fixed assets (fixed assets/total assets) all have a positive impact, while the ability to solvency has a negative impact.

Santos & Silva (2014) [15] analyzed data on 11,040 industrial enterprises in Portugal in the period 2003 - 2009 using the FEM method to determine factors affecting trade credit. The results of regression analysis confirm many factors affecting accounts payable to sellers. Negative impact factors: Years of operation, profitability, revenue growth, bank debt. Factors that have a positive influence: Equity capital, lack of official credit.

Ahmed *et al*. (2014) [1] analyzed panel data for the period 2005-2011 of 399 non-financial companies listed on the stock market in Pakistan using pooled OLS and FEM, REM methods to determine factors affecting commercial credit. Through the use of F-test and Hausman test, the study shows that the FEM method is the most suitable among the methods used for analysis. The results of regression analysis using the pooled OLS method and the FEM and REM methods confirm that scale has a negative impact, while liquidity and revenue growth both have a positive impact on payables.

There are also many other empirical studies that analyze factors affecting accounts payable. The authors will summarize each factor as follows:

Table 1: Overview of research about factors affecting the accounts payable to suppliers

Factors	Affecting the accounts payable to suppliers	Authors
Revenue growth	+	Petersen & Rajan (1997) [13], Wilson & Summers (2002) [17], Garcia-Teruel & Martinez-Solano (2010) [6]
	-	Santos & Silva (2014) [15]
Enterprise size	+	Pertersen & Rajan (1997) [13], Niskanen & Niskanen (2006) [12], Bougheas *et al*. (2009) [3], Garcia-Teruel & Martinez-Solano (2010) [6], Giannetti *et al*. (2011) [7], Khan *et al*. (2012) [8], Akinlo (2012) [2]
Short-term loan ratio	-	Petersen & Rajan (1997) [13], Niskanen & Niskanen (2006) [12], Rodriguez- Rodriguez (2006) [14], Garcia-Teruel & Martinez-Solano (2010) [6], Santos & Silva (2014) [15]
Financial charges	+	Nadiri (1969) [10], Pertersen & Rajan (1997) [13], Niskanen & Niskanen (2006) [12], Nilsen (2002) [11], Khan *et al*. (2012) [8]
Net cash flow	-	Petersen & Rajan (1997) [12], Niskanen & Niskanen (2006) [12]
Short-term assets ratio	+	Niskanen & Niskanen (2006) [12], Garcia-Teruel & Martinez-Solano (2010) [6], Vaidya (2011) [16]
Inventory ratio	-	Petersen & Rajan (1997) [13]
	+	Cunat (2007) [5], Vaidya (2011) [16], Akinlo (2012) [2]
Solvency ratio	+	Nadiri (1969) [10], Bougheas *et al*. (2009) [3]
	-	Akinlo (2012) [2]

Source: Compilation author

3. Research Method
3.1 Research Data
The research sample includes data collected over a 5-year period (from 2018 to 2022) of 132 construction industry companies listed on the Vietnam stock market. The source of data collected is from data on stock exchanges, securities companies and data collected directly from companies. These sources of data, according to the author, are trustworthy.

The data used in the research are collected from financial reports and financial information of construction enterprises. The financial statements of these enterprises are established on the basis of compliance with the Vietnamese accounting standards system and have been audited.

3.2 Research Models
In this study, the research model is built on the basis of inheriting previous research results. Research model:

$$APS_{it} = \beta_0 + \beta_X X_{it} + e_{it}$$

The dependent variable is accounts payable to suppliers (APS) variable.

The independent variables are the variables Revenue

growth, Enterprise size, Short-term loan ratio, Financial costs, Net cash flow, Short-term assets ratio, Inventory ratio, Solvency ratio.

The dependent variable and independent variables are described in Table 2.

Table 2: Description of variables in the model

Name of variables	Code	Method of calculation
Accounts payable to suppliers	APS	Accounts payable to suppliers /Total assets
Revenue growth	GRO	(Revenue of analysis year - Revenue of reporting year)/ Revenue of reporting year
Enterprise size	SIZE	Log(Revenue)
Short-term loan ratio	SL	Short-term loan / Total assets
Financial charges	FC	Financial charges/(Liabilities - Accounts payable to suppliers)
Net cash flow	CF	(Profit After Tax + Depreciation of Fixed Assets)/ Revenue
Short-term assets ratio	SA	Short-term assets/Total assets
Inventory ratio	INV	Inventory/Total assets
Solvency ratio	SOL	(Cash and cash equivalents + Short-term financial investment)/ Short-term loan

Source: Data processing by the author's team

3.3 Data Analysis

To analyze factors affecting accounts payable to suppliers, the authors analyzed the correlation matrix and estimated a regression model. The study uses panel data regression with three methods: Pooled ordinary least squares (POLS), random effects model (REM), fixed effects model (FEM).

This article runs the model using E-view software. Based on the results obtained when running the program, we will write equations for factors affecting the business's accounts payable to suppliers. Then test the model's suitability by testing for multicollinearity, heteroscedasticity, and autocorrelation, then use the adjusted coefficient of determination R^2 (Adjusted R Square) to determine the ability to explain the model in practice.

4. Results and Discussion
4.1 Correlation Coefficient Matrix
Table 3 shows the correlation coefficient between the dependent variable and the independent variables and the independent variables with one another.

Table 3: Matrix of correlation coefficients between variables in the model

	APS	GRO	SIZE	SL	FC	CF	SA	INV	LIQ
APS	1,000								
GRO	0,063	1,000							
SIZE	0,184	0,002	1,000						
SL	0,639	0,018	0,233	1,000					
FC	-0,095	-0,012	-0,150	-0,160	1,000				
CF	-0,035	0,005	-0,035	0,018	0,023	1,000			
SA	0,374	0,036	-0,102	0,522	0,036	0,038	1,000		
INV	0,151	0,008	0,025	0,381	-0,071	0,060	0,428	1,000	
LIQ	-0,258	-0,027	-0,253	-0,371	0,519	-0,023	0,084	-0,181	1,000

Source: Data processing by the author's team

The correlation coefficient between independent variables is not greater than 0, 8, so there is no multicollinearity phenomenon between the variables (Cohen, 1988) [4]. The variables revenue growth (GRO), size (SIZE), short-term loan ratio (SL), short-term asset ratio (SA), inventory ratio (INV) are positively correlated with the variable payables to seller, meanwhile, financial charges (FC), net cash flow (CF), and solvency ratio (SOL) are negatively correlated with variables of accounts payable to suppliers. The results of correlation analysis between independent variables in the model show that the possibility of multicollinearity between independent variables in the model is not high.

4.2 Results of Correlation Regression Analysis and Discussion

Table 4: Regression results

Biến	VIF	Dependent variable ARC		
		POLS	FEM	REM
C	NA	-0,073002	-0,281088***	-0,138750**
GRO	1,170322	0,000726	0,000374	0,000451
SIZE	1,155699	0,006614	0,026874***	0,012871**
SL	1,360235	0,245273***	-0,270521***	0,265659***
FC	1,252373	0,012429	-0,002573	-2,71E-05
CF	1,101554	-0,000819*	-0,000386	-0,000929
SA	1,173834	0,056222***	-0,025673	0,016040
INV	1,052128	-0,100072***	-0,044284	-0,059045**
LIQ	1,422021	-0,005239**	0,001625	-0,000178
N		660	660	660
R-Sq		0,435684	0,796832	0,320587
Significance		Prob(F-statistic) = 0,0000	Prob(F-statistic) = 0,0000	Prob(F-statistic) = 0,0000
Kiểm định White		Prob = 0,0000		
Kiểm định Hausman			Prob = 0,0373	
Kiểm định Wald			Prob = 0,0000	

*$p<0,1$ **$p<0,05$ ***$p<0,01$
Source: Data processing by the author's team

Table 4 presents the models describing the regression results and the testing results when choosing the appropriate model. The results of multicollinearity testing show that the variance inflation factor VIF is <10, the model does not have multicollinearity phenomenon. The largest VIF index is 1.42, indicating that the possibility of multicollinearity is negligible. The White test shows that the model has heterogeneity (p-value = 0.0000 <5%), so the POLS model is not appropriate. The Hausman test gives p-value = 0.0373 < 0.05, so H_0 is rejected, so use the fixed effects model (FEM) to analyze factors affecting the business's accounts payable to suppliers in listed construction industry. After selecting the FEM model as the appropriate model, the authors performed a defect check of the model using the Wald test. The results obtained prob = 0.0000 < 0.05 show that the FEM model has defects. The result of the corrected model is to remove 6 variables FC, CF, SA, SOL, GRO, INV from the model, showing that the independent variables FC, CF, SA, SOL, GRO, INV have no corelationship with accounts payable to sellers. The remaining variables of the model can explain 79.68% of the dependent variable.

The Prob values of the remaining variables all have p < 0.01, showing that the independent variables SIZE; SL all have a great influence on the dependent variable APS, in which business size (SIZE) is positively correlated with accounts payable to suppliers and short-term loan ratio (SL) is negatively correlated with accounts payable to suppliers.

The model of factors affecting accounts payable to suppliers of construction enterprises listed on the Vietnam stock market is:

APS= -0, 281088 + 0,026874SIZE - 0,270521SL

In Table 5, in the selected FEM model, $R^2 = 0,796832$ shows that in the regression model, the selected variables have a great influence on APS, capable of explaining 79.6832% of the fluctuations of APS, which means that 79.6832% of the change in APS of construction companies listed on the Vietnam stock market is due to the impact of selected variables.

+ $\beta_1 = 0,026874$ reflects that business size impacts in the same direction on accounts payable to suppliers, meaning that construction enterprises with higher scale have a higher ratio of accounts payable to suppliers. Large-scale businesses have better reliability than small-scale businesses, so they can better utilize the seller's capital. This result is consistent with the research of Pertersen & Rajan (1997) [13], Niskanen & Niskanen (2006) [12], Bougheas *et al.* (2009) [3], Garcia-Teruel & Martinez-Solano (2010) [6], Giannetti *et al.* (2011) [7], Khan *et al.* (2012) [8], Akinlo (2012) [2].

+ $\beta_2 = -0,270521$ means that short-term loan rates have a negative impact on accounts payable to suppliers of construction enterprises. In cases where businesses have alternative short-term financing sources, they have little need to use supplier financing. This result is similar to the research results of Petersen & Rajan (1997) [13], Niskanen & Niskanen (2006) [12], Rodriguez- Rodriguez (2006) [14], Garcia-Teruel & Martinez-Solano (2010) [6], Santos & Silva (2014) [15].

5. Conclusion and Recommendations
The study has shown empirical evidence on the impact of internal factors on accounts payable to suppliers of listed construction enterprises. Accordingly, business size (SIZE) is positively correlated, while short-term loan ratio (SL) is negatively correlated with accounts payable to suppliers.

For construction enterprises, financial administrators need to consider internal characteristics to build and implement the most appropriate trade credit policy for the enterprise, in which administrators need to pay attention to the following factors:

Firstly, businesses need to enhance their large-scale advantages to use trade credit. According to research results, the larger construction enterprises are, the more capital they can have from sellers because these enterprises have prestige, financial potential and strong influence on the market, many suppliers wish to establish economic relationships with businesses. Therefore, large-scale businesses should take advantage of the opportunity to use credit capital from suppliers at affordable and flexible costs.

Secondly, businesses need to calculate reasonable time to bring benefits to the business. Normally, if you pay early, businesses will have the opportunity to receive a discount from the seller. In this case, businesses need to calculate and compare with credit interest rates to consider enjoying the benefits of discounts. In addition, businesses should not delay or extend the payment term agreed in the contract to ensure the reputation of the business, avoid affecting the negotiation of deferred payment purchases in the future.

6. References
1. Ahmed J, Xiaofeng H, Khalid. Determinants of Trade Credit: The Case of a Developing Economy. European Researcher. 2014; 83(9-2):1694-1706.
2. Akinlo AE. The determinants of Trade Credit: Evidence from Nigerian Manufacturing Firms. Economic Journal of A2Z. 2012; 1(1):31-42.
3. Bougheas S, Mateut S, Mizen P. Corporate trade credit and inventories: New evidence of trade-off from accounts payable and receivable. Journal of Banking and Finance. 2009; 33(2):300-307.
4. Cohen J. Set correlation and contingency tables. Applied psychological measurement. 1988; 12(4):425-434.
5. Cunat V. Trade credit: Suppliers as dept collectors and insurance providers, Review of Financial Studies. 2007; 20:491-527.
6. Garcia-Teruel PJ, Martinez-Solano P. A dynamic perspective on the determinants of accounts payable. Review of Quantitative Finance an Accounting. 2010; 34(4):439-457.
7. Giannetti M, Burkart M, Ellingsen T. What You Sell Is What You Lend? Explaining Trade Credit Contracts. Review of Financial Studies. 2011; 24(4):1261-1298.
8. Khan MA, Tragar GA, Bhutto NA. Determinants of Accounts Receivable and Accounts Payable: A case of Pakistan Textile Sector. Interdisciplinary Journal of Contemporary Research in Business. 2012; 3(9):240-251.
9. Le Goff J. Marchands et Banquiers au Moyen-Age. Presses Universitaires de France, Paris, 1957.
10. Nadiri MI. The determinants of trade credit in the US total manufacting sector. Econometrica. 1969; 37(3):408-423.
11. Nilsen JH. Trade credit and the bank lending channel. Journal of Mone, Credit and Banking. 2002; 34(1):226-253.
12. Niskanen J, Niskanen M. The determinants of corporate trade credit policies in a bank-dominated financial environment: The case of Finnish small firms. European Financial Management. 2006; 12:81-102.
13. Petersen MA, Rajan RG. Trade credit: Theory an evidence. Society for Financial Studies. 1997; 10(3):661-691.
14. Rodriguez- Rodriguez OM. Trade credit in small and medium size firms: An application of the system estimator with panel data. Small Business Economics. 2006; 27(2-3):103-126.
15. Santos J, Silva A. The Determinants of Trade Credit: A Study of Portuguese Industrial Companies. International Journal of Financial Research. 2014; 5(4):128-138.
16. Vaidya RR. The Determinants of Trade Credit: Evidence from Indian Manufacting Firms. Modern Economy. 2011; 2(5):707-716.
17. Wilson N, Summer B. Trade credit terms offered by small firms: Survey evidence and empirical analysis. Journal of Business, Finance and Accounting. 2002; 29:317-351.