FOREIGN TRADE UNIVERSITY

FACULTY OF BANKING AND FINANCE

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Topic

DETERMINANTS OF TRADE CREDIT: A STUDY OF LISTED FIRMS IN VIETNAM

Group: **7**

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CHAPTER 1: INTRODUCTION

1.1. The urgency of the topic

Credit is a transaction of assets between a lender (banks and other financial institutions) and a borrower (businesses and others), in which the lender transfers the asset for the borrower to use for a certain period of time as agreed. Access to credit is one of the key factors affecting the growth and success of businesses. So, why do businesses need to borrow capital from outside?

Firstly, the business process requires a relative amount of time between the act of purchasing raw materials for production, and the act of selling the product and generating a profit. In this case, the business needs short-term capital to buy raw materials and meet other spending needs. Secondly, businesses also need to pay and invest in machinery and equipment to expand production scale. In this case, the business needs long-term capital. If the internal capital sources of businesses are still not enough to meet the demand in the short, medium, and long term, the inevitable solution is to borrow capital from outside. But considering the context of the world economy's recession due to the impact of the covid-19 pandemic, accessing loans from credit institutions is still a difficult problem for businesses. Therefore, accessing trade credit has received more attention from businessmen nowadays.

1.2. Objectives of the study

The main objective of the study is to evaluate the impact of a number of factors on the ability to access trade credit of businesses in Vietnam. Based on the theoretical framework and research results, the authors will make some recommendations to help businesses improve their ability to access trade credit in the near future.

1.3. The object and scope of the study

Object: Factors affecting a business's ability to access trade credit

Scope:

- *Research space*: 20 specific businesses in Vietnam are listed on HOSE.
- *Research time*: Data is collected from the time the business is listed on the HOSE exchange until 2020

1.4. Research methods

Data collection: The data collected on accounts payable to suppliers and factors affecting the payables is in the form of secondary information obtained from annual reports of Vietnamese firms from their IPO years to 2020.

Data processing: Data is processed by Stata software to produce statistical description, correlation matrix, regression results and model defect testing.

1.5. The structure of the research paper

The research consists of 5 chapters:

- Chapter 1: Introduction
- Chapter 2: Theoretical Frameworks and Experimental Foundations
- Chapter 3: Research Methods and Model
- Chapter 4: Results and Discussion
- Chapter 5: Conclusions and Recommendations

CHAPTER 2: THEORATICAL FRAMEWORKS AND EXPERIMENTAL FOUNDATIONS

Trade credit, often known as merchant credit or open account, is defined as the exchange of goods and services under deferred payment terms between businesses ((Martínez-Sola et al., 2012). Trade credit is a source of short-term financing for our recipient's business, i.e. it represents our accounts receivable on the one hand, while being our own credit from suppliers, i.e. our account payable on the other hand.

2.1. Motives of Trade Credit

A number of theories are addressed in explaining why suppliers are willing to extend credit to buyers and why buyers prefer to accept the more expensive type of trade credit. The most prevailing motives are explained by Petersen and Rajan (1997) using 3 theories.

2.1.1. Financial advantage theory

First, through their business, suppliers can simply assess a buyer's financial performance and creditworthiness (Petersen & Rajan, 1997; Garcia-Teruel & Martinez-Solano, 2010a). Therefore they have less risk for offering trade credit compared with bank credit. Second, suppliers have more authority to compel payment by pressuring buyers with a reduction in future supply of products and services, especially in markets with less competition, because buyers will rely heavily on a small number of providers. Financial institutions, on the other hand, may be limited by bankruptcy law when draw back its past financial lending (Emery, 1984; Demirguc-Kunt & Maksimovic, 2001). This advantage enables suppliers to offer trade credit beyond what banks are willing to offer. (Cunat, 2007). Third, suppliers in some industries have another advantage: they can quickly repossess products if purchasers fail to pay, and those commodities can then be resold to other customers.

2.1.2. Price discrimination theory

Peterson và Rajan (1997) noted the point of Schwart và Whitcomb (1978) that stated, trade credit is allowed when public price discrimination is not legalized. In the

research of Danielson và Scott (2004), the authors mentioned the view of Brennan (1988) that stated: A monopolist finds it profitable to price discriminate between cash and credit customers by setting attractive credit terms to credit customers but not cash customers. This model is also maintained in case of imperfect competition market. Suppliers use trade credit as a financing instrument for customers who are not able to borrow from financial institutes. Trade credit considerably reduces the cost for low creditworthiness borrowers, as the terms tend to be independent of customer's quality – contradict to banks. The rate then reflects the buyer's risk characteristics. Customers with more risks prefer trade credit to other sources of financing (Atanasova, 2007).

2.1.3. Transaction costs theory

Schwartz (1974) presented the transaction costs theory, which claims that TC reduces both transaction costs and the necessity for clients to keep high cash balances or convert liquid assets to cash. This is essential since the timing of when cash is needed and the frequency of payments required are both unknown; bills are accumulated in one transaction, resulting in lower transaction costs (Ferris, 1981). Furthermore, enterprises with larger-than-average inventory levels (relative to their size) have higher quantities of purchases, implying higher transaction volumes. This could lead to more firms using TC to save money on transactions (Summers and Wilson, 1997). Cost advantages can result from the fact that both commodities and funding are supplied from a single source, cutting costs when compared to using separate vendors, according to Mian and Smith (1992).

2.2. Explanation of choosing independent variables

Many researchers have investigated the determinants of trade credit with respect to their countries to analyze the importance and use of trade credit. This report only examines the case of 20 Vietnamese listed firms, during their listed year to 2020.

In this report, we use the account payable as a proxy for the level of trade credit.

Previous research suggested a couple of firm characteristics as determinants of trade credit. First is a firm's creditworthiness. Better access to the credit market, according to Petersen and Rajan (1997), necessitates creditworthiness, which varies depending on the size of the firm. Larger firms typically have greater cash flows and fewer growth opportunities, therefore they borrow more, implying that they are more creditworthy.

It's possible to conclude that larger companies are given greater trade credit because of their creditworthiness, not because of their higher demand. Several papers (Deloof and Jegers, Miwa and Ramseyer et al., etc) also report a positive relationship between accounts payable and size (usually measured by total assets or log of total assets). In this report, total assets will be used as a proxy for the firm’s size.

Revenue is one of the factors that most directly reflects a business's ability to generate profits. Regarding the relationship between profitability and trade credit use, it is hypothesized that the profitable private firms are more likely to extend trade credit than unprofitable ones. Moreover, increase in sales revenue makes borrowers believe in the business’ ability to pay.

Another factor reflecting the profit a firm can attain is earnings before tax. There is also a positive relationship between earning before tax and accounts payable as high EBT demonstrate not only the profitability but also efficiency of corporate governance. In the countries with poorly developed financial institutions, compared to state owned firms, non-state owned firms use more trade credit, and this higher usage is primarily for financing their prosperous growth opportunities rather than transactional purposes. Poorly performing state-owned enterprises are more likely to redistribute credit to firms with less privileged access to loans via trade credit. Also, research found that state-controlled listed firms in countries such as China receive preferential treatment when borrowing from commercial banks and, in contrast, private controlled firms rely on informal finance and on trade credit.

In terms of inventory, Bougheas, Mateut and Mizen had derived empirically testable propositions with respect to accounts payable and its relationship with changes in costs of inventories by using a formal two period model which incorporates the tradeoff between inventories and trade credit under conditions of stochastic demand. They show that firms with higher stock of inventories would have lower accounts payables.

A firm's holding of liquid assets (cash and other short term securities) has been used as a determinant of trade credit in a number of papers. Cunat reports a negative influence of liquid assets on accounts payable. Cunat further shows that when liquid assets fall, this is accompanied by a rise in accounts payable. This finding is interpreted as an adjustment in accounts payable whenever there is an unexpected liquidity shock.

Some researchers explain that large firms with the ability of accessing bank loans, resort less on trade credit. Garcia-Teruel and Martinez-Solano have found evidence that larger firms, with better access to alternative internal and external financing and with a lower cost, use less credit from suppliers. In this report, to measure the ability of accessing bank loans, the total assets over total liabilities will be used, which means that the higher this ratio is, the lower the account payables are.

CHAPTER 3: RESEARCH METHOD AND MODEL

3.1. Model defect testing methods

Using the quantitative research method with Stata, we create a model based on the OLS Normal Least Squares method to estimate the parameters of the multivariable regression model. Additionally, we utilize Stata to test for goodness-of-fit, omitted variables, multicollinearity, heteroscedasticity, autocorrelation and normal distribution of random errors in the model.

3.2. Model

The regression model is defined as:

$$PAYAB = \beta_0 + \beta_1 \text{ASSETS} + \beta_2 \text{REV} + \beta_3 \text{EBT} + \beta_4 \text{STATE} + \beta_5 \text{INVT} + \beta_6 \text{CASH} + \beta_7 \text{AL} + u_i$$

Based on models, β_0 is the intercept, meanwhile β_1, β_2, β_3, β_4 β_5, β_6 and β_7 are respectively the estimated coefficients of independent variables. In addition, u_i is random errors.

***Variables**:*

There are eight variables in the model, including one dependent variable and seven independent variables. The dependent variable PAYAB is defined as the accounts payable of the firm (in million VND), which measures the position of trade credit in financing of firms. The following table summarizes all independent variables used in this model.

Independent variable	*Unit*	*Abbreviation*	*Expected relationship*
Total assets	Million VND	ASSETS	Positive
Revenue	Million VND	REV	Positive
Earning before tax	Million VND	EBT	Positive
The state ownership	Percent	STATE	Negative
Inventory	Million VND	INVT	Negative
Cash and cash equivalent	Million VND	CASH	Negative
Total assets/Total liabilities	Unit	AL	Negative

***Hypotheses**:*

Considering factors discussed in chapter 2, hypotheses about relationships between firm-specific characteristics and trade credit are given in the following sections.

Hypothesis 1: Large firms have better access to financial debt, better creditworthiness and bargaining power compared with smaller ones.

H1: There is a positive relationship between total assets and accounts payable.

Hypothesis 2: Revenue is one of the factors that most directly reflects a business's ability to generate profits. Increase in sales revenue makes borrowers believe in the business potential.

H2: There is a positive relationship between revenue and accounts payable.

Hypothesis 3: High earnings before tax reflect not only the profitability of firms but also the efficiency of corporate governance.

H3: There is a positive relationship between earning before tax and accounts payable.

Hypothesis 4: Compared to state owned firms, non-state owned firms use more trade credit, and this higher usage is primarily for financing their growth opportunities rather than transactional purposes.

H4: There is a negative relationship between state ownership and accounts payable.

Hypothesis 5: As the amount of inventory increases and the inventory turnover decreases, showing that the business is increasing capital efficiency. Therefore, firms rarely have to borrow capital from sellers.

H5: There is a negative relationship between inventory and accounts payable.

Hypothesis 6: As a business owns an increased amount of cash and cash equivalent, it has more resources to pay off the seller's debts.

H6: There is a negative relationship between cash and cash equivalent and accounts payable.

Hypothesis 7: Some researchers explain that large firms with the ability to access bank loans, resort less on trade credit. As it is emphasized that trade credit is more expensive than bank credit.

H7: There is a negative relationship between total assets over total liabilities and accounts payable.

3.3. Data description

***Data sources**:*

The data on accounts payable and the above factors are extracted from the financial statements and annual reports from IPO year to 2020 of the following firms:

1	DIC Holdings Construction Jsc	*11*	Gelex Group Jsc
2	Development Investment Construction Jsc	*12*	Gemadept Corp
3	Dinh Vu Port Investment & Development Jsc	*13*	Hacisco Jsc
4	Dong Nai Port Jsc	*14*	Ha Do Group Jsc
5	Dien Quang Lamp Jsc	*15*	Hai An Transport and Stevedoring Jsc
6	Duc Long Gia Lai Group Jsc	*16*	Halcom Vietnam Jsc
7	Everland Group Jsc	*17*	Hoa Binh Construction Group Jsc
8	Fecon Corp	*18*	Thua Thien Hue Construction Jsc
9	FLC Faros Construction Jsc	*19*	HCD Investment Producing & Trading Jsc
10	FLC Stone Mining and Investment Jsc	*20*	Hoang Huy Investment Services Jsc

***Statistical description**:*

The data includes 154 observations, from 20 listed firms from IPO year to 2020. We believe the sample and the number of observations are sufficient to build the regression model. The following table is a statistical description of variables in the model.

Variable	*Number of observations*	*Mean*	*Standard deviation*	*Min*	*Max*
PAYAB	177	327,076.8	637015.7	9	4,421,454
ASSETS	177	4,512,871	12200000	133	156,000,000
REV	177	1,945,787	3185270	66,201	18,700,000
EBT	177	392,255.9	2207587	-17,313	29,200,000
STATE	154	8.685584	18.12014	0	56.72
INVT	177	568,409.9	919349	81	4,395,132
CASH	177	217,018.9	262164.6	1,078	1,559,239
AL	177	3.618546	4.531459	1.172822	36.96872

***Correlation**:*

The summary of correlation among variables is as following:

	PAYAB	*ASSETS*	*REV*	*EBT*	*STATE*	*INVT*	*CASH*	*AL*
PAYAB	1							
ASSETS	0.5612	1						
REV	0.9371	0.4899	1					
EBT	0.0294	0.0188	0.079	1				
STATE	-0.1972	-0.0942	-0.2059	-0.0167	1			
INVT	0.3975	0.3612	0.455	0.199	0.0151	1		
CASH	0.4162	0.2268	0.557	0.1863	-0.0912	0.3968	1	
AL	-0.1229	0.1344	-0.0938	-0.0489	-0.0951	-0.1183	-0.0096	1

We can see that most of pairs of variables have low to medium correlation (<0.5), and there are three pair of variables get high correlation (>0.5), including (PAYAB,ASSETS), (PAYAB,REV) and (REV,CASH).

Most pairs of variables are positively correlated. The variable of the state ownership (STATE) is negatively correlated with all other variables, except for inventory (INVT). Moreover, the ratio of total assets over total liabilities (AL) is also negatively correlated with all other variables, except for assets.

CHAPTER 4: RESULTS AND DISCUSSION

Results for OLS estimation and defect testing:		*Robust*
	Model I	*Model II*
ASSETS	0.008*	0.008*
	(0.0015)	(0.0015)
REV	0.190*	0.190*
	(0.0071)	(0.0216)
EBT	-0.006	-0.006**
	(0.0073)	(0.0028)
STATE	-188.98	-188.98
	(956.4039)	(514.233)
INVT	-0.028	-0.028***
	(0.021)	(0.0168)
CASH	-0.315*	-0.315*
	(0.0768)	(0.1057)
AL	-9208.23*	-9208.23*
	(3889.265)	(3000.729)
Constant	44443.51	44443.51
	(29474.46)	(29483.21)
Number of obs	154	154
Adjusted R^2	0.9066	0.9108

***Note**:* Standard deviations are in parentheses. *Significant at 1%; **significant at 5%; ***significant at 10%.

From model I, we can interpret:

B_0 = 44443.51: When all all of the estimated coefficient of variables in the model are equal to zero, total accounts payable is 44,443.51 million VND.

B_1 = 0.008: All other things remaining constant, when total assets increase by 1 million VND, total accounts payable increases by 0.008 million VND.

B_2 = 0.190: All other things remaining constant, when revenue increases by 1 million VND, total accounts payable increases by 0.190 million VND.

B_3 = -0.006: All other things remaining constant, when earning before tax increases by 1 million VND, total accounts payable decreases by 0.006 million VND.

B_4 = -188.98: All other things remaining constant, when the state ownership increases by 1%, total accounts payable decreases by 1.89 million VND.

B_5 = -0.028: All other things remaining constant, when inventory increases by 1 million VND, total accounts payable decreases by 0.028 million VND.

B_6 = -0.315: All other things remaining constant, when cash and cash equivalent increases by 1 million VND, total accounts payable decreases by 0.315 million VND.

B_7 = -9208.23: All other things remaining constant, when the ratio of total assets over total liabilities increases by 1 unit, total accounts payable decreases by 90.28 million VND.

We carry on some defect testing on model I as follows:

Test for the goodness-of-fit of the model

We have:

H_0: $R^2 = 0$

H_1: $R^2 > 0$

P-value = 0.0000 < 0.05 -> Reject H_0

Therefore, the model is significant at the significant level of 5%.

Ramsey RESET test for the omitted variables

We have:

H_0: Model has no omitted variables

H_1: Model has omitted variables

F(3, 143)	35.96
Prob > F	0.00

P-value = 0.00 < 0.05 -> Reject H_0

Therefore, the model has omitted variables at the significant level of 5%.

VIF to test for multicollinearity

We have:

H_0: Multicollinearity does not exist

H_1: Multicollinearity exists

Variable	*VIF*
REV	2.04
CASH	1.57
ASSETS	1.46
INVT	1.44
AL	1.1
STATE	1.07
EBT	1.07
Mean	1.39

Mean VIF = 1.39 < 10 -> Do not reject H_0

Therefore, multicollinearity does not exist in the model at the significant level of 5%.

Breusch - Pagan test for heteroscedasticity

We have:

H_0: The model has constant variance

H_1: Heteroscedasticity does exist

Chi2	467.97
Prob > Chi2	0.00

P-value = 0.0000 < 0.05 -> Do not reject H_0

Therefore, heteroscedasticity does exist in the model at the significant level of 5%.

Durbin - Watson test for autocorrelation

We have:

H_0: Autocorrelation does not exist

H_1: Autocorrelation exists

Number of gaps in sample	6
Durbin - Watson d-statistics (8,154)	1.43

$d_U = 1.43 < 2 < 4 - d_U$ -> Do not reject H_0

Therefore, autocorrelation does not exist in the model

Jarque - Bera to test the normal distribution of random errors

We have:

H_0: The model has normal distribution of random errors

H_1: The model does not have normal distribution of random errors

Jarque - Bera normality test	4416
Chi(2)	0

Chi(2) = 0 < P-value -> Do not reject H_0

Therefore, the random errors are not normally distributed.

So, at the significance level of 5%, we can say that the model has omitted variables and has non-normally distributed random errors and the defect of heteroscedasticity might lead to less reliable prediction of OLS estimate,however, heteroscedasticity does not affect the linearity of the model. To fix the problem, we use the Robust Standard Error method to produce the model avoiding heteroscedasticity.

According to result of the table above, after Robust regression, we achieve at a regression model without heteroscedasticity:

$$PAYAB = 44443.51 + 0.008\ \text{ASSETS} + 0.190\text{REV} - 0.0061\ \text{EBT} - 188.983\ \text{STATE} - 0.028\ \text{INVT} - 0.315\ \text{CASH} - 9208.23\ \text{AL} + u_i$$

CHAPTER 5: RECOMMENDATIONS AND CONCLUSIONS

5.1. Recommendations

Based on the theoretical framework and research results, the authors make some recommendations to improve the ability to access trade credit of these businesses as follows:

For the State Bank:

Implementing the resolutions of the Party and Government, to constantly improve legal regulations for the effectiveness of trade credit policies, contributing to promoting the development of businesses.

For commercial banks:

Firstly, strengthening the management and development of business credit customers. To do this, commercial banks need to build a suitable customer strategy. Carefully find out the needs and characteristics of customers, then have reasonable policies to attract a large number of customers. Additionally, commercial banks also need to have a dedicated and thoughtful customer care policy, especially for those who are prestigious and potential customers. In order to improve the quality of credit services, commercial banks can shorten the working time at each department, so that they can reduce the waiting time of their customers.

Secondly, commercial banks need to diversify their business lending products.

Thirdly, strengthening risk management and internal inspection and control. In order to do that, commercial banks need to periodically check due and overdue debts on a daily basis to promptly handle them; Complying with regulations in debt classification and risk provisioning; Actively classifying debts according to the characteristics and recoverability of the loan.

Lastly, the banking industry continues to effectively implement programs connecting banks - businesses, focusing on developing the private economy with many direct support solutions, such as increasing new loans, reducing lending interest rates, diversifying credit products, building specific credit programs to support businesses with reasonable interest rates, convenient processes and procedures.

5.2. Conclusion

Based on the theoretical basis about the factors affecting the access to trade credit of businesses in Vietnam, as well as the above-estimated results, the authors have selected these variables: Total asset, Total liabilities, Earnings before tax, State Ownership, Inventory, Cash and Cash equivalent, Asset/Liabilities. The above research results have given us an overview and relatively complete on the impact of the variables on the ability of businesses to access trade credit in Vietnam.

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APPENDIX

DO - FILE STATA:

1. gen AL = Totalassets/ Totalliabilities
2. su Totalaccountpayables Totalassets Revenue Earningsbeforetax Stateownership Inventory Cashandcashequivalent AL
3. reg Totalaccountpayables Totalassets Revenue Earningsbeforetax Stateownership Inventory Cashandcashequivalent AL
4. est store Model1
5. estat ovtest
6. estat hettest
7. vif
8. predict e, res
9. sktest e
10. ssc install outreg2
11. outreg2 [Model1]using Damn-it.xls, bdec (1) append
12. reg Totalaccountpayables Totalassets Revenue Earningsbeforetax Stateownership Inventory Cashandcashequivalent AL, robust
13. cor Totalaccountpayables Totalassets Revenue Earningsbeforetax Stateownership Inventory Cashandcashequivalent AL
14. bgodfrey
15. predict myResiduals, r
16. jb myResiduals

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