The Relationship between Trade Credit and Bank Credit: An Empirical Case in Vietnam

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Abstract— *This research is to examine the relationship between commercial credit and bank credit of companies listed on the HSX stock exchange in Vietnam during the period from 2008 to 2019. Through analysis, we find that bank credit has an alternative relationship to firms' commercial credit. However, during periods of great global economic upheaval, such as the global financial crisis or the US-China trade war, this relationship will change a lot. Specifically, during a global financial crisis, bank credit will have a reciprocal relationship with the expansion of commercial credit for its customers, but an alternative relationship in the use of Trade credit of the business itself with suppliers. During the US-China trade war, bank credit did not affect the credit policy expansion for suppliers but had a reciprocal relationship with the demand for commercial credit.*

Keywords— *Trade credit; bank credit, financial crisis, US-China trade war.*

I. INTRODUCTION

Trade credit is seen as a short-term financing instrument offered to customers by vendors or sellers. In a company, trade credit is usually expressed through two categories: accounts receivable and accounts payable. Accounts receivable from customers measure the outstanding debts a company has to its customers at a given point in time, reflecting the trade credit the company offers to its customers (Yang, 2011). Firms provide trade credit to customers through accounts receivable to boost their sales (Lin & Chou, 2014). This is considered to finance working capital for other firms, which often have small capital or have limited credit (Marotta, 2005; McMillan & Woodruff, 1999; Lin & Chou, 2014).

On the contrary, account payable measures a company's trade use of credit, representing how much credit a company owes suppliers for goods it has received but not paid for. Payables to suppliers reflect the company's trade credit needs (Lin & Chou, 2014; Yang, 2011). Among a firm's formal channels of financing (such as bank loans), trade credit plays a very important role in maintaining firm growth (Garmaise & Moskowitz, 2003). All companies, whether large or small, use this source of trade credit, showing how important this funding is in the operations of businesses (Demirgüç-Kunt & Maksimovic, 1999).

The cost of trade credits will depend a lot on your credit terms. According to modern financial theories, since trade credit has a higher risk than bank credit, the interest rate on trade credit contracts is expected to usually be higher than that of bank credit. However, trade credit is widely used for its convenience and flexibility. At the same time, companies are limited when they cannot access bank loans. This means that

when formal sources of finance are difficult to access, firms will make more use of informal finance from trade credit (Lin & Chou, 2014).

The fluctuations in the global economy and finance will have a strong impact on the credit sources of businesses. The 2008-2010 global financial crisis led to a considerable tightening of credit in countries in the early stages, but at a later stage, most central banks in the country increased money supply for the economy, leading to the tendency of credit activities to be loosened. During the early stages of financial crisis, commercial banks were quite reluctant to lend, even to companies with high credit ratings or creditworthiness. Consequently, firms, especially small firms, will have to increase their trade credit operations, in the context of their negative cash flow or a significant decline in revenue (Petersen & Rajan, 1997). According to Petersen & Rajan (1997), during these periods, suppliers will be able to more effectively monitor, while the suppliers themselves can offer better credit terms for themselves. In commercial contracts, trade credit tends to be used more than bank credit. Vendors are more likely to support their customers when they have financial problems to maintain a long-term commercial relationship (Wilner, 2000). Cunat (2007) found that trade credit is more costly than bank credit for two reasons: suppliers have to provide liquidity support to customers and risk liquidity shocks maybe encountered in the short term.

The supply of trade credit, as well as the demand for trade credit of enterprises, tends to increase, especially in periods of strong global economic and financial fluctuations. Choi and Kim (2005) found that both the accounts payable and the receivables of companies increased in the context of the central bank's stricter monetary policy. This shows that trade credit is an essential funding channel to support businesses when the financial market is in trouble. Love & Zaidi (2010) found that trade credit has the potential to significantly replace corporate finance, especially for firms with limited access to bank credit. Capital sources from trade credit need to be promoted in the context of a tighter credit market (Coulibaly, Sapriza, & Zlate, 2013).

Trade credit plays an important role in countries with underdeveloped financial markets or in economies that are heavily dependent on banks. Lin & Chou (2014) found that in China, a developed country that relies heavily on the banking system, although the two stock exchanges of Chinese companies have rapid development, a relationship exists. A strong replacement between bank credit and business credit of firms in a financial crisis: a decrease in bank credit will cause

a decline in receivables but an increase in accounts payable to suppliers. After the financial crisis, Chinese enterprises continued to increase the supply and demand of trade credit, from which trade credit has been and will continue to be an important channel of funding for businesses.

From the above reasons, our main research objective is to investigate the relationship between trade credit and bank credit, especially in the context of comparisons. Great fluctuations in the global financial and economic situation in Vietnam, a country with a developing financial market and heavily dependent on the commercial banking system in providing funding sources for the enterprise. This research topic has not been done much in Vietnam. Also, in the context of the US-China trade war, we want to consider how the impact of these results differs from the period during and post the global financial crisis or not.

The structure of this research paper includes 5 parts. The next section describes the sample of the data collected in the research paper. The estimation method and model of the paper are presented in Section 3. Part 4 reports on the empirical results, followed by the concluding remarks.

II. LITERATURE REVIEW

Nilsen (2002) examined the relationship between trade credit and bank financing channels of US firms. He found that during the period of tightening monetary policy, when the capital mobilization channel from commercial banks was limited, leading to a decline in access to bank credit forced dependent businesses to shift to use more trade credit to reduce their dependence on bank credit, especially for small businesses when they do not have many alternative funding sources. Not only small businesses but also large enterprises are increasing the use of trade credit because the advantage of the ability to access trade credit will make the cost of using trade credit cheaper than bank credit.

Love et al. (2007) studied the relationship between trade credit and bank credit in the context of the 1997 financial crisis for businesses in Indonesia, Korea, Malaysia, the Philippines, Thailand and the case of devaluation 1994 peso for Mexican businesses. Using data samples from 890 firms, they observed that there was an immediate increase in the supply and demand of trade credit during the peak of the crises. However, right after that, the supply of trade credit will decrease, while the demand for trade credit will tend to fluctuate in the opposite direction. Going into the analysis, the authors found that, before crises occur, businesses with high short-term debt will often become providers of trade credit. However, after the crises, these businesses will cut the amount of credit they give to their customers, and their need for trade credit will increase, meaning they slowly move away from work. Providing trade credit to the need for trade credit from your suppliers. Conversely, businesses with a higher degree of liquidity will broaden the supply of trade credit to their customers and will accept fewer trade credits from their side. their supplier. Hence, the authors suggest that a decrease in the total trade-credit ratio will be significantly affected by a decrease in the supply of trade credit, leading to a decline in bank credit. The results of the research data have implications for the alternative relationship of trade credit and bank credit, especially in times of crisis.

Demirguc-Kunt and Maksimovic (2001) researched 6,514 non-financial enterprises of 40 developing and developed countries in the world in the period 1989-1996. Through analyzing the data, the authors found that several research results are statistically significant. First, in countries with strong banking systems, firms will use more of the supply of bank credit than they would use trade credit from their suppliers. Second, they found that in countries with strong and effective legal systems, businesses tend to depend more on bank credit than trade credits. This is explained because the comparative advantage of the formal financial intermediary in providing credit will help their interest payments to be more effective than those from trade credit. Also, in countries with some restrictions on holding shares in commercial banks, businesses will tend to be more dependent on trade credits. Third, the authors found that the development of trade credit among firms in the economy would complement the development of the banking system, especially in countries where the legal system inefficient. According to the authors, since the effectiveness of the legal system in a country is less affected by short-term policy measures, the development of trade credit will impulse the development of the banking credit system goods in particular and the economy in general. From there, they concluded that trade credit plays a very important role in economies, both supporting bank credit and promoting growth in economies.

Andrieua et al. (2011) studied the relationship between trade credit and bank credit with the control variables for firm age, firm size, and ability to mobilize funding sources. small and medium enterprises in the European region. The research results show that there is a positive relationship between trade credit and bank credit, showing that there is a supportive relationship between these two sources of funding. The authors also found that firms' ability to mobilize debt (including commercial or bank credit) will be affected by firm age and size of firms, especially "young" businesses, and small businesses are often limited in accessing bank credit.

Yang (2011) examined the causal relationship between trade credit and bank credit for non-financial companies in the period 2005 - 2009. Through analysis, he found that there is a statistical significance between bank credit and trade credit: increasing the supply of bank credit will help reduce the payable of the business; on the contrary, when the supply of bank credit increases, the business accounts receivable increase. This would imply an alternative effect between bank credit and accounts payable, and it would also imply an additional effect between bank credit and receivables. During the period of the global financial crisis, when the supply of bank credit fell sharply, the enterprise's receivables also fell sharply, while the enterprise's payables tended to increase. Also, he found that firms with high financial constraints will cut the supply of trade credit more to their customers and they will also increase the use of trade credit from their suppliers.

Lin & Chou (2014) used quarterly financial report data of 1213 Chinese enterprises from the first quarter of 2006 to the fourth quarter of 2012 to examine the relationship between

trade credit and bank credit. They have focused on studying the differences in the relationship between these two objects during the world financial crisis of 2008 - 2009 and the post-world economic crisis period (the next period). Through analysis, they found many valuable research results. First, trade credit supply (represented by receivables) is positively related while trade credit demand (represented by payables) is inversely related to bank credit. This shows that trade credit has both an alternative relationship and a supportive relationship for bank credit. Second, during the financial crisis, both the supply and demand of trade credit decreased in enterprises, consistent with the general trend of credit tightening of the credit market. In the post-financial crisis period, trade credit began to increase: small businesses took on the role of providing trade credit by loosening credit to their customers to increase sales, in large firms and SOEs are the main users of trade credits. Third, non-manufacturing enterprises mainly use cash in commercial transactions, the change in supply and demand of trade credit does not affect these firms. Finally, after the financial crisis, businesses, in general, will continue to increase the use of supply and demand for trade credit, becoming an important source of funding for businesses, even trade credit supply, and demand. also exceeds capital from bank credit.

Carbo et al. (2016) conducted a study on the impact of external funding by SMEs during the world financial crisis of 40,000 SMEs in Spain. Nha. Unlike previous studies of European SMEs, the authors found evidence that the financial crisis had a significant impact on SMEs in Spain. Depending on the nature of the firm, different SMEs (SMEs) will have the ability to access two different sources of external financing, trade credit, and bank credit, and this will vary throughout the crisis period. Specifically, for SMEs that are limited in bank credit or do not have access to bank credit, they will be reliant on trade credit and the extent of this dependence increasingly increased during the crisis. In contrast, businesses that are not limited to bank credit are highly dependent on bank loans, not on trade credit. Thus, it can be seen that trade credit has shown the role of providing credit when businesses are in the most difficult situation and this role will become even more important during the financial crisis.

From the review of the above studies, it can be seen that trade credit is viewed as similar to short-term bank credit, especially for working capital financing of banks. Previous studies have not shown any firm conclusions about the relationship between these two types of credit, in particular, the substitution effect or the supportive effect of short-term credit with trade credit? Also, when there are other controlling factors such as firm size and especially economic volatility factors (such as financial crisis, US-China trade war), it will affect how substitution effect or supports the effect of these 2 credits. Therefore, this study will focus on examining the impact of bank credit on the trade credit of businesses, thereby giving an assessment of these effects.

Through the process of reviewing research documents, the author found that in addition to considering the relationship between trade credit and bank credit, the control variables on corporate characteristics, financial crisis factors, and the US-China trade war factor may affect the impact of bank credit on trade credit. Therefore, we will include additional factors on corporate characteristics to consider this, including revenue; cost of goods sold; size; operating cash flow; inventory

We makes the following research hypotheses:

First: Bank credit has an impact on trade credit. This effect can be either the same direction or the opposite direction, depending on the magnitude of the substitution effect and the filler effect. If the substitution effect is greater than the support effect, the impact will be the opposite and vice versa

=> H1: Bank credit can have a positive or negative impact on trade credit

Second: fluctuations in the world economy will affect the relationship between bank credit and trade credit.

=> H2: The financial crisis and the US-China trade war have a statistically significant impact on trade credit

III. DATA AND METHODOLOGY

We use secondary data from the annual reports, audited financial statements of non-financial companies with continuous operations, being continuously listed and not subject to warning or restriction during the period 2008 - 2019 on the Ho Chi Minh City Stock Exchange Ho Chi Minh City (HOSE). The sample was collected including 167 firms with 2004 observations. The companies in the selected data sample do not finance companies, banks, insurance, and public service companies.

Data sources of financial statements are obtained from the websites http://www.cophieu68.vn/ and http://vietstock.vn/. Based on the summary of previous studies, in which mainly studies by Lin, & Chou (2014) and Carbo et al. (2016), we take the variables, calculate and process the data as follows:

Variable's Name	Symbol	Calculation
The ratio of receivables to total assets	TcRec	$\dfrac{\text{Receivables}}{\text{Total assets}}$
The ratio of payables to total assets	TcPay	$\dfrac{\text{Payables}}{\text{Total assets}}$
Net trade credit ratio	TcNet	$\dfrac{\text{Receivables} - \text{Payables}}{\text{Total assets}}$
Bank credit	BKCRE	$\dfrac{\text{Short} - \text{term bank loans}}{\text{Total assets}}$
Net sales	SALE	$\dfrac{\text{Net sales}}{\text{Total assets}}$
Business size	SIZE	Logarithm of Total assets
Cost of goods sold	CGS	$\dfrac{\text{Cost of Goods Sold}}{\text{Total assets}}$
Cash flow	CF	$\dfrac{\text{Operating Cash Flow}}{\text{Total assets}}$
Inventory	INV	$\dfrac{\text{Inventory}}{\text{Total assets}}$

To measure trade credit, we use 03 representative variables: accounts receivable, payables, and net trade credit. Then, the regression equations are proposed as follows:

$$TcREC_{it} = \alpha_0 + \beta_1.BkCre_{it} + \beta_2.Fluc + \gamma_i.Z_i + \varepsilon_i$$
$$TcPAY_{it} = \alpha_0 + \beta_1.BkCre_{it} + \beta_2.Fluc + \gamma_i.Z_i + \varepsilon_i$$
$$TcNET_{it} = \alpha_0 + \beta_1.BkCre_{it} + \beta_2.Fluc + \gamma_i.Z_i + \varepsilon_i$$

Fluc is a period of fluctuations in the world economy, receiving the value of 1 if it is in the period from 2008 to 2010

and the period of 2018 - 2019; is zero for the rest of the time

Z_i is control variables, related to the size of the firm, the cost of goods sold, the firm's cash flow, the firm's inventory, and the firm's age.

With data in balanced table form, there are 3 commonly used analysis methods: Pooled OLS, Fixed Effective Model (FEM), and Random Effective Model (REM). We will use tests to choose the most suitable analysis method in each case.

IV.   RESULTS

4.1. Descriptive Data

The descriptive statistical results show that on average, accounts receivable account for 19.3% of total assets of enterprises, while accounts payable account for 22.1% of total assets. The average net trade credit of businesses accounted for -2.7% of total assets. Thus, the firms in the survey sample have a higher average account receivable than accounts receivable. In other words, firms' credit demand in the sample is higher than the trade credit they provide to their customers.

Also, the descriptive statistical results show that bank credit accounts for 24.7% of total assets. This value is higher than the ratio of accounts payable, the ratio of receivables, and net trade credit. Thus, it can be seen that for enterprises in Vietnam, the bank credit channel is still more important than the financing from trade credit.

Other descriptive statistical results are presented in Table I.

TABLE I: Statistical results describing the research variables

Variable	Obs	Mean	Max	Min	S.D
TcNET	2,004	-0.027	0.991	-1.123	0.222
TcREC	2,004	0.193	1.101	0.003	0.134
TcPAY	2,004	0.221	1.326	0.001	0.221
BkCRE	2,004	0.247	0.963	0	0.195
Sale	2,004	1.038	11.736	0.001	1.043
CGS	2,004	0.881	11.283	-0.506	1.002
Inv	2,004	0.302	28.981	0.0002	0.810
CF	2,004	0.049	1.189	-0.696	0.139
Size	2,004	14.195	19.816	8.058	1.259

4.2. Empirical Result

4.2.1. Overall results of the study

The results of the regression analysis in Table II all show that bank credit has a statistically significant impact on trade credit, in particular, bank credit has a positive impact on receivables (column 1) and the enterprise's payables (column 2); while having the opposite effect of net business credit (column 3). This shows that bank credit has a reciprocal relationship with the receivables and payables of businesses: an increase in bank credit will motivate businesses to expand trade-credit activities. the demand for trade credit of businesses will also increase. In terms of net trade credit (the difference between receivables and payables), bank credit also has an alternative relationship to the net trade credit activity of the firm, that is, as firms increase their use of bank credit, they also have greater demand for trade credit at the same time than they provide trade credit to their customers.

Also, for other variables, the results show that cost of goods sold has a statistically significant positive impact on TcREC, TcPAY, and TcNET. This shows that the cost of goods sold of the business will push the business to expand

credit more than they need for trade credit to increase. Inventories do not affect the variables that represent a company's trade credit. Operating cash flow (CF) and company size (Size) have a statistically significant positive impact on the value of accounts payable; also had a statistically significant opposite effect on net trade credit. This suggests that an increase in operating cash flows or larger firms boost demand for trade credit, while it will not affect firms expanding their trade credit policy.

In addition to the main results of the impact of bank credit on trade credit, we also find that strong fluctuations in the world economic situation will have a statistically significant impact on trade credit. net trade. Specifically, in periods of financial volatility, businesses will expand their trade credit activities, while the demand for trade credit of businesses will also increase. In terms of net trade credit, during periods of great volatility in the world economy firms' trade-credit needs will be higher than if they provide trade credit to their customers. goods. From this result, we will conduct a deeper analysis of the impacts in 2 phases: the 2008-2010 economic crisis and the US-China trade war period 2018 - 2019.

TABLE III: Research results with all data samples

	TcREC	TcPAY	TcNET
Const	0.102 (0.106)	-1.507*** (0.000)	1.609*** (0.000)
BkCRE	0.164*** (0.000)	0.482*** (0.000)	-0.319*** (0.000)
Fluc	0.011** (0.012)	0.151*** (0.000)	-0.140*** (0.000)
CGS	0.038*** (0.000)	0.022*** (0.005)	0.016* (0.076)
Inv	0.005 (0.432)	0.003 (0.707)	0.001 (0.892)
CF	-0.027 (0.101)	0.136*** (0.000)	-0.163*** (0.000)
Size	0.001 (0.844)	0.107*** (0.000)	-0.106*** (0.000)

Notes: In the regression results, there is a strong collinearity relationship between the variable Sale and the CGS. Therefore, we will eliminate the variable causing the stronger collinearity in the model as the Sale variable. After testing to compare the 3 models, the FEM model was the best in all 3 cases above.

***, **, * are significance of 10%; 5%; 1%. In ( ) is the p-value.

4.2.2. Research results in periods of economic fluctuations: The period of financial crisis 2008 - 2010; US-China trade war period 2018 - 2019.

The results of regression analysis in Table III show that there are significant differences in the analytical results in these 2 periods. Bank credit has a statistically significant positive effect on accounts receivable (column 1) and net trade credit (column 5); At the same time, it has a statistically significant opposite effect on the accounts payable (column 3). This shows that during the period of financial crisis 2008-2010, the increase in bank credit will motivate businesses to expand their trade credit for their customers (mutual relationship). Firms also reduce the use of trade credit with suppliers (alternative relationships). Considering both of these two aspects, bank credit will have a reciprocal relationship with trade credit. This is in stark contrast to the outcome during the US-China trade war period 2018-2019: Bank credit does not affect the expansion of credit policy for suppliers, but bank credit will increase. push businesses to increase the use of trade credit. Thus, during the period of the US-China trade war 2018-2019, bank credit has an alternative relationship to

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trade credit.

In addition, during the 2008-2010 financial crisis, factors such as cost of goods sold, inventory, and operating cash flow all had a statistically significant impact on trade credit net (column 5). This is in contrast to the US-China trade war period 2018-2019 when the only firm size had a statistically significant impact on net trade credit (column 6).

TABLE III: Research results in the period of the economic crisis 2008 - 2010 and the period of the US-China trade war 2018 – 2019

	TcREC		TcPAY		TcNET	
	2008-2010	2018-2019	2008-2010	2018-2019	2008-2010	2018-2019
Const	0.471*** (0.000)	0.829 (0.148)	0.259* (0.068)	1.242** (0.040)	0.111 (0.547)	0.561*** (0.001)
BkCRE	0.109*** (0.006)	0.078 (0.381)	-0.179*** (0.002)	0.816*** (0.000)	0.235*** (0.002)	-0.556*** (0.000)
CGS	0.020*** (0.001)	0.064*** (0.009)	-0.008 (0.445)	0.006 (0.818)	0.036*** (0.007)	0.013 (0.424)
Inv	-0.127*** (0.000)	0.004 (0.795)	-0.145*** (0.009)	0.013 (0.402)	-0.307*** (0.000)	0.005 (0.750)
CF	-0.064*** (0.004)	-0.068 (0.130)	0.106*** (0.000)	0.006 (0.903)	-0.168*** (0.000)	-0.073 (0.254)
Size	-0.021*** (0.000)	-0.047 (0.241)	-0.009 (0.374)	-0.073* (0.080)	-0.004 (0.750)	-0.042*** (0.000)

Notes: In the regression results, there is a strong collinearity relationship between the variable Sale and the CGS. Therefore, we will eliminate the variable causing the stronger collinearity in the model as the Sale variable. After testing to compare the 3 models, the FEM model was the best most in all of the cases above.

***, **, * corresponding to the statistical significance of 10%; 5%; 1%. In () is the p-value.

V. CONCLUSION

In this study, we have learned about the relationship between trade credit and bank credit of companies listed on the HSX stock exchange from 2008 to 2019. Through the analysis results, we obtained 2 main results as follows:

Firstly, in the whole period 2008 - 2019, when bank credit increases, the demand for trade credit of businesses will also increase, at the same time businesses will also expand trade credit to customers goods. Considering both receivables and payables, bank credit has an alternative relationship with the trade credit of enterprises.

Second, large fluctuations in the world economy will have a significant impact on this relationship. During the 2008-2010 financial crisis, bank credit will have a reciprocal relationship with the expansion of trade credit to its customers, but there is an alternative relationship in the use of trade credit. of the business itself with suppliers. However, during the period of the US-China trade war 2018 - 2019: Bank credit does not affect the expansion of credit policy for suppliers but has a reciprocal relationship with demand for trade credit. Thus, during the period of the US-China trade war 2018 - 2019, bank credit has a reciprocal relationship with the net trade credit.

From the above results, we have concluded that the two sources of trade credit and bank credit have a close relationship with each other in the financial activities of enterprises. These two sources of credit have an interchangeable relationship. However, when there are major fluctuations in the world economy, there will be many changes in the relationship between these two types of credit. The results of this study show that businesses need to have flexibility in their financial structure in the short term, especially in the period of great fluctuations in the world economy.

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