

THE EFFECT OF TRADE CREDIT ON COMPANY PROFITABILITY

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Abstract

Our study aims to analyze the effect of trade credit on company profitability and the non-linear relationship between them for the period 2010 - 2019. The study used panel data methodology to examine a sample of 254 non-financial sector companies listed on the Indonesia Stock Exchange. The study found an inverted curve-shaped relationship between trade credit receivables and profitability. However, empirical studies also found insufficient evidence to explain a non-linear relationship between trade credit payable and profitability. In addition, the study found a negative and significant effect of company size and sales fluctuation in moderating the relationship between trade credit and profitability. moderation of this variable in the non-linear relationship between trade credit receivables and profitability shifts the optimal point value for trade credit utilization to a lower level. The study concludes that the company should maintain its trade credit receivable level as close as its optimum point to maximize the profitability by considering company size, the stability of sales, and considering the classification of the company's sector that causes a shift in the optimal point of trade credit. The paper gives empirical evidence of a non-linear relationship between trade credit receivable and profitability; consequently, the company can precisely determine the optimal value in investing in trade credit receivable.

Keywords: Trade credit, profitability, non-linear, optimum point

INTRODUCTION

In conducting business activities, companies involve accounts payables and accounts receivable transactions. Many firms invest in trade credit as part of their business operations (Dary & James Jr, 2019). The trade credit policy will have important implications for corporate value because the company has invested a large amount of capital (Martínez-Sola, 2013). The capital related to accounts payables and accounts receivables is trade credit (Lorenz, 2014). The usage of trade credit is twofold (Petersen, 1997; Ferrando, 2013). First, trade credit is used as a form of short-term funding provided by suppliers and plays an essential role for the company (Shang, 2020). On the other hand, by delaying payments to suppliers, the company has the opportunity to develop its operations relative to competitors in similar industries (Box, 2018). Thus, trade credit management's efficiency is essential in corporate financing policy because it impacts firms' risks and performance (Lewellen, 1980; Hill, 2012).

Each industry or sector's characteristics will directly influence how companies take advantage of trade credit and determine profitability (Grau, 2018). Therefore, in analyzing trade credit, proper classification based on the

industry type is crucial to obtain accurate and relevant analysis results. The research uses The Global Industry Classification Standard (GICS), which is known globally as a company classification type in analyzing and classifying companies. This classification is made by Standard & Poor's (S&P) and Morgan Stanley Capital International (Hrazdil, 2013). The characteristics that affect how companies use trade credit are company size (Afrifa & Gyapong, 2017; Abuhommous, 2017; Tsuruta, 2015; Dary & James Jr, 2019; Hoang, 2019), although there are differences in the results obtained. Another characteristic that affects the relationship between trade credit and profitability is company growth (Martínez-Sola, 2013; Abuhommous, 2017; Afrifa & Gyapong, 2017; Dary & James Jr, 2019; Hoang, 2019).

By utilizing trade credit, the company could increase profitability. Nevertheless, high investment in trade credit also related to an increased risk of revenue loss or high financial costs, hence reducing firm profitability (Hoang, 2019). There are indications that the relationship between trade credit and profitability is non-linear. Based on the literature study, research recognizes a non-linear relationship between trade credit and profitability by several researchers (Martínez-Sola, 2013; Hoang, 2019; Pham & Huynh, 2020). However, this research does not include Indonesia as an object of study.

The use of trade credit as a tool to generate profit has a significant ratio compared to the total assets owned by the company. D'Mello (2020), in his research in the United States, found that the ratio between trade credit receivables to total sales on average was 15.99% and the ratio between trade credit payable to total sales had an average of 17.87%. Also, Abdulla (2017) conducted research that obtained an average ratio between trade credit receivables to total assets in general; in private companies, it reached 13.6%, while in public companies, it was 8.9%. Of course, there will be a similarity in the industry ratio, but the ratio will differ across different sectors (Abdulla, Dang, & Khurshed, 2017). However, based on 592 financial statements of nonfinancial companies listed on the Indonesia Stock Exchange, there was an increase in the ratio of trade credit receivable to revenue generated by CAGR 3.61% and an increase in the ratio of trade credit receivable to revenue generated by CAGR 2.10% between 2010 – 2019. The ratio of accounts receivable to revenue was 26.55%, and the ratio of accounts payable to revenue was 16.13% in 2010. Based on the data above, the use of trade credit for leveraging revenue is in a reasonably large proportion; Besides, accounts receivable and payable are essential for managing firm growth (Ferrando, 2013).

The relationship between trade credit and profitability is still an interesting topic and can be further explored (Pattnaik, Kumar, & Vashishtha, 2020) to complement existing empirical evidence. Therefore, the current study analyzes the non-linear relationship between trade credit receivables & payable on public companies' profitability in Indonesia's non-financial sector company. The study explores the influence of company size and sales stability as a catalyst to support profitability. Analysis of the use of trade credit receivables & payable will provide empirical evidence regarding the effect of trade credit from the

point of view of debtors (account payable) and creditors (account receivable) on company profitability. The company can determine the optimal value in utilizing trade credit to maximize its profit by optimally and efficiently managing trade credit.

METHOD

Variables and Regression Models

The study used panel data regression. Panel data regression combines time series and crosssection data into one calculation method. The measurement of profitability refers to the model used by Grau (2018) using the return on assets (ROA) ratio as a measure of profitability. The theoretical models used by Grau (2018) are:

$$ROA_{jt} = \alpha + \sum_{k=1} \beta_k \cdot X_{kjt} + \mu_{jt}$$

X is a vector of k number of independent variables affecting the dependent variable, β_k is the estimated coefficient value, and μ_{jt} is the random disturbance. Determining the inverted u-shape relationship between trade credit and profitability, the study uses a non-linear model as follows:

$$ROA_{jt} = \alpha + \beta_1 TCR_{jt} + \beta_2 TCR_{jt}^2 + \beta_3 TCRIND_{jt} + \beta_4 SIZE_{jt} + \beta_5 GR_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots \dots \dots (1)$$

$$ROA_{jt} = \alpha + \beta_1 TCP_{jt} + \beta_2 TCP_{jt}^2 + \beta_3 TCPIND_{jt} + \beta_4 SIZE_{jt} + \beta_5 GR_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots \dots \dots (2)$$

The profitability measurement used is the return on assets ratio (ROA), which calculates income divided by total assets (Afrifa, Gyapong, & Monem, 2018; Grau, 2018; Dary & James Jr, 2019; Pham & Huynh, 2020). Control variables were used to minimize bias in the study (Abdulla, Dang, & Khurshed, 2017). Each industry has different characteristics of the use of trade credit (Seifert, Seifert, & Protopappa-Sieke, 2013). The use of TCRIND and TCPIND variables controls differences in trade credit levels for different industries. The influence of the SIZE variable on profitability has not yet obtained the same consensus. Grau (2018) found that SIZE has a negative effect on profitability, but it is different from Hoang's (2019) finding that the SIZE variable positively impacts profitability. According to Dary (2019), a company with high leverage is a company that is experiencing financial constraints so that the leverage will be inversely correlated to profitability. However, different results were obtained by Hoang (2019), where the relationship between LEV and profitability is positive and significant. The GR variable shows the condition of the company's growth. Companies with high growth will get extra revenue due to their effectiveness in managing their capital (Brush, Bromiley, & Hendrickx, 2000). Another variable that is used as a control variable is CR. In general, its current liabilities will be funded by its current assets; this indicates that current assets will affect the level of use of the company's trade credit (Li, 2016). Therefore, CR variable is expected to have a positive effect on profitability.

In addition, to find out how the firm size variable (SIZE) as a moderating variable affects trade credit on profitability and how the shift in the optimal value of trade credit occurs, the following model is used:

$$ROA_{jt} = \alpha + \beta_1 TCR_{jt} + \beta_2 TCR_{jt}^2 + \beta_3 (SIZE_{jt} TCR_{jt}) + \beta_4 TCRIND_{jt} + \beta_5 GR_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots\dots (3)$$

$$ROA_{jt} = \alpha + \beta_1 TCP_{jt} + \beta_2 TCP_{jt}^2 + \beta_3 (SIZE_{jt} TCP_{jt}) + \beta_4 TCRIND_{jt} + \beta_5 GR_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots\dots (4)$$

Determining the company's sales stability is calculated by measuring the sales value this year compared to the sales value in the previous year. Finding out how the sales stability variable (GR) moderating the relationship between trade credit and profitability and how the shifting of the optimal value of trade credit occurs, the following model is used:

$$ROA_{jt} = \alpha + \beta_1 TCR_{jt} + \beta_2 TCR_{jt}^2 + \beta_3 (GR_{jt} TCR_{jt}) + \beta_4 TCRIND_{jt} + \beta_5 SIZE_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots\dots (5)$$

$$ROA_{jt} = \alpha + \beta_1 TCP_{jt} + \beta_2 TCP_{jt}^2 + \beta_3 (GR_{jt} TCP_{jt}) + \beta_4 TCRIND_{jt} + \beta_5 SIZE_{jt} + \beta_6 LEV_{jt} + \beta_7 CR_{jt} + \mu_{jt} \dots\dots (6)$$

In obtaining the optimal value of trade credit, the equations of model 1 and model 2 will be derived; This refers to research conducted by Hoang (2019). The derived model that will be used is as follows:

$$\text{Trade Credit Receivable (TCR): } \frac{dROA}{dTCR} = \beta_1 + 2\beta_2 TCR ; \text{ optimum value: } TCR = \frac{-\beta_1}{2\beta_2} \dots\dots (7)$$

$$\text{Trade Credit Payable (TCP): } \frac{dROA}{dTCP} = \beta_1 + 2\beta_2 TCP ; \text{ optimum value: } TCP = \frac{-\beta_1}{2\beta_2} \dots\dots (8)$$

RESULTS AND DISCUSSION

Trade Credit's Non-Linear Relationship to Profitability

It is necessary to choose a common effect, fixed effect, or random effect model as the suitable model in analyzing panel data. The choice of the model is based on the results of the Hausman test, Chow test, and Lagrange test. The test results show that the fixed effect model is the suitable model to be used in the analysis.

Using the fixed-effect model, in model 1, the TCR coefficient is positive and significant at 1 percent confidence level, and the TCR2 coefficient is negative and significant at 1 percent confidence level. The result indicates a relationship in the form of an inverted curve-shaped between trade credit receivables and profitability, characterized by a minus value in the quadratic coefficient of TCR2. By increasing the value of trade credit receivable, a TCR optimum point will be obtained and will give the maximum value of ROA. After obtaining the optimum value, increasing the value of TCR will decrease the optimal value of obtained ROA. Finding out the optimal point for using TCR can be obtained by using equation 7 (seven). By substituting the coefficient in equation 7 (seven), the optimal point is obtained = $(-0.7938 / 2 (-0.5733)) = 0.6923$. So that in general, the use of TCR will have an impact on increasing company profits. However, when the TCR value exceeds 0,6923, the use of TCR will negatively affect ROA. However, this is a general description, considering that the research combines various sectors. Based on these arguments and facts, H1 is accepted.

Whereas in model 2, it is known that the value of the TCP coefficient is negative and significant at a confidence level of 5 percent, but the value of the TCP2 coefficient is not significant in explaining ROA so that the non-linear relationship between trade credit payable and profitability cannot be determined. In other words, the prediction model rejects H0 in hypothesis two. Research by Fernández - López (2020) found that trade credit payable has a negative effect on profitability. There is no evidence that there is an inverted u-shape relationship for the relationship between the two things. Following model 2, the TCP coefficient is negative and significant at a confidence level of 5

percent. Although TCP impacts ROA, the effect given is not as significant as the use of TCR. The negative relationship between TCP and profitability may occur because the costs required by the company to obtain trade credit payable are more significant than the benefits obtained. In addition, when a company has a poor track record in making trade credit payable payments, suppliers can mark up the prices of the products it sells to anticipate the risk of delays in payments made by the company (Fernández-López, Rodeiro- Pazos, & Rey-Ares, 2020). According to Deloof (2003), a company that delays payment of trade credit payable is indicated as a company with financial problems.

In general, it is known that companies with high levels of leverage have high-risk factors. However, companies with too low leverage levels do not maximize the potential profit that the company can obtain, so there will be trade-offs in utilizing trade credit payable. Even though trade credit payable is one of the components of the company's liabilities, the research did not find an inverted u-shape relationship, which represented the nature of the trade-off. Another possibility is that companies use other sources of funding, which also include the liability component, with a more significant proportion such as bank loans or bonds to obtain the required funding, because the model shows that the LEV variable has a negative and significant effect on a 1 percent confidence level in all model. In addition, the characteristics of using trade credit in the different sectors influence the results of the analysis. So that, in this case, H2 in the study is rejected. In other control variables, the effect of SIZE and GR is negative and significant on ROA with a confidence level of 1 percent in the overall model. However, the magnitude of the variable coefficients on ROA is not significant. At the same time, the CR variable has a positive and significant effect on a 5 percent confidence level unless the coefficient value does not affect ROA too much.

Table 1. Regression Results Fixed Effect Models 1 & 2

Variable	Model 1	Model 2
C	0,2925*** (0,1087)	0,6144*** (0,0964)
TCR	0,7938*** (0,1598)	
TCR2	-0,5733*** (0,2010)	
TCRIND	-0,3907*** (0,1409)	
TCP		-0,1723** (0,0856)
TCP2		0,1724 (0,1427)
TCPIND		0,0620** (0,0271)
SIZE	-0,0095*** (0,0034)	-0,0173*** (0,0033)
LEV	-0,1454*** (0,0084)	-0,1489*** (0,0091)
GR	-0,0503*** (0,0052)	-0,0551*** (0,0052)
CR	0,0034** (0,0013)	0,0033** (0,0013)
Chow Test	0,0000	0,0000
Hausman Test	0,0000	0,0000
R ²	0,6075	0,6023
S.E. of Regression	0,0751	0,0756
F-Test	0,0000	0,0000
Observation	2540	2540

Note: in the whole model, the dependent variable is ROA, the independent variable and the dependent variable have been defined in Chapter 3, the number in brackets is the standard error, model 2 is linear using a one-tail test, *, **, *** is a confidence level of 10, 5, and 1 percent respectively.

The Effect of SIZE in moderating the use of Trade Credit on Profitability

Based on the regression coefficients obtained in table 8, it is known that in model 3, all variables have a confidence level of 1 percent, except for the intercept variable. The value of the intercept variable is not significant across all confidence levels. The moderation coefficient value of the SIZE X TCR variable is negative and significant, meaning that the effect of this moderation will shift the peak point of the optimal value of the use of trade credit receivables by the company to be lower. It is known that the company with the smaller size has the optimum value for the use of trade credit receivables which is greater than the larger company. The shift in the peak point of the curve will affect the ROA value that the company can obtain when utilizing trade credit receivables. It can be concluded that trade credit receivables will be more profitable for small companies than large companies. The result follows the research conducted by Ferrando (2013), which states that trade credit, in general, has a role in profitability. However, the impact that is given will be more significant for small companies compared to large companies.

A negative and significant relationship is also seen in model 4. Moderation of the SIZE variable on the relationship between TCP and ROA has a negative and significant effect on the 1 percent confidence level. The negative influence that arises can occur due to the substitution effect between bank loans and trade credit payable (Tang & Moro, 2020). Large companies tend to fund their short-term needs with bank loans because large companies have easier access to the bank (Coricelli & Frigerio, 2019). These limitations make companies with smaller sizes rely on trade credit payables to fund their short-term needs (Rodríguez-Rodríguez, 2006). Based on these arguments, it can be concluded that trade credit payable will be more profitable for small companies compared to larger companies.

Table 2. Regression Results Fixed Effect Models 3 & 4

Variable	Model 3	Model 4
C	0,0187 (0,0188)	0,1348*** (0,0075)
SIZE x TCR	-0,0497*** (0,0163)	
TCR	2,2350*** (0,4464)	
TCR2	-0,7245*** (0,2012)	
TCRIND	-0,4015*** (0,1387)	
SIZE x TCP		-0,1288*** (0,0129)
TCP		3,4379*** (0,3527)
TCPIND		0,0515** (0,0267)
LEV	-0,1448*** (0,0083)	-0,1629*** (0,0091)
GR	-0,0506*** (0,0052)	-0,0568*** (0,0051)
CR	0,0034** (0,0013)	0,0035*** (0,0013)
Chow Test	0,0000	0,0000
Hausman Test	0,0000	0,0000
R ²	0,6122	0,6141
S.E. of Regression	0,0747	0,0745
F-Test	0,0000	0,0000
Observation	2540	2540

Note: in the whole model, the dependent variable is ROA, the independent variable and the dependent variable have been defined in Chapter 3, the number in brackets is the standard error, the model 4 using a one-tail test, *, **, *** is a confidence level of 10, 5, and 1 percent respectively.

The Effect of GR in Moderating the Use of Trade Credit on Profitability

From table 9, the greater the company's growth, the moderating effect of GR x TCR will have a negative impact on profitability. The result shows that companies experiencing fluctuating sales growth need to take advantage of trade credit instruments to help increase their profitability. However, in companies with relatively stable sales growth, control over the use of trade credit receivables needs to be done not to incur other costs, which ultimately have a negative impact on company profit. Trade credit receivables are tools that companies can use to improve their profits by extending the trade credit given to their customers. The result is in line with Abuhommous (2017) research that shows the companies take advantage of trade credit receivables not to lose potential sales when demand for company products decreases; by doing this, it is hoped that they can maintain the company stability of its sales. In relationship model 6, it can also be seen that the moderation of the GR variable on the TCP and ROA relationship has a negative and significant effect on the 1 percent confidence level.

The study results also align with Afrifa (2018) that companies with volatile sales will depend on trade credit payable to gain profit. So the companies that are experiencing a decline in sales compared to the previous year, the maximum utilization of trade credit payable as a source of short-term funding will become a leveraging tool to increase its potential profits.

Table 3. Regression Results Fixed Effect Models 5 & 6

Variable	Model 5	Model 6
C	0,2907*** (0,1096)	0,2907*** (0,1096)
GR x TCR	-0,2454*** (0,0343)	
TCR	0,9036*** (0,1603)	
TCR2	-0,6994*** (0,2030)	
TCRIND	-0,4854*** (0,1414)	
GR x TCP		-0,2577*** (0,0329)
TCP		-0,1116*** (0,0449)
TCPIND		0,0577** (0,0274)
SIZE	-0,0097*** (0,0035)	-0,0198*** (0,0033)
LEV	-0,1479*** (0,0084)	-0,1488*** (0,0092)
CR	0,0031** (0,0013)	0,0028** (0,0013)
Chow Test	0,0000	0,0000
Hausman Test	0,0000	0,0000
R ²	0,603	0,5937
S.E. of Regression	0,0756	0,07645
F-Test	0,0000	0,0000
Observation	2540	2540

Note: in the whole model, the dependent variable is ROA, the independent variable and the dependent variable have been defined in Chapter 3, the number in brackets is the standard error, the model 6 using a one-tail test, *, **, *** is the confidence level 10, 5, and 1 percent respectively.

CONCLUSION

Trade credit is an essential component because this transaction involves a large amount of capital owned by the company. Therefore, by conducting good trade credit management, companies can maximize the potential to obtain the extra effect of using trade credit on profitability. Several previous studies have proven a trade-off between trade credit and company profitability so that a non-linear relationship can be found between trade credit and profitability. However, from the results of the literature study conducted by the author, there has not been much research on the non-linear relationship between trade credit receivable and trade credit payable on profitability. So, this study aims to find empirical evidence regarding the non-linear relationship.

By using a sample of 2540 panel data sets in the observation period from 2010 to 2019, consisting of 254 non-financial companies in Indonesia from 11 different types of industries, the results of the study found that there is a non-linear relationship following an inverted curve shape between trade credit receivables and profitability. However, the non-linear relationship between trade credit payable and profitability cannot be determined. The study found that the relationship between trade payables and profitability was negative and significant. In general, it is known that companies need to maintain their level of leverage at an optimal level. The evidence of a non-linear relationship between trade credit payable and profitability cannot be found because there is a possibility that the company uses short-term resources from banks or other short-term loans, so it does not rely on trade payables as its short-term resources.

Moderation of company size on the relationship of accounts receivable to profitability impacts shifting the optimal value of the trade credit receivable. The study results found that the larger the company's size, the smaller the optimal trade credit receivable value. In addition, the moderation between trade credit payable on profitability has a negative impact on company profits. It can be concluded that trade credit has a more significant impact on small companies than large companies. The greater the value of trade credit owned by the company will increase the management cost, which can cause a decrease in company profits.

Moderation of sales growth on the relationship between trade credit receivables and company profits also shifts the optimum point of using trade credit receivable. Moreover, the moderation of sales growth on the relationship between trade credit payable and company profits also negatively impacts. Based on the result, it is concluded that trade credit has a more significant

impact on companies with lower sales growth. As a result of low sales growth, the company will maximize all available resources, including using trade credit as an instrument to generate its profits.

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