

MANUFACTURING SMES' CREDIT COLLECTION PERIOD AND ITS DETERMINANTS: SOME EVIDENCE FROM MALAYSIA

Nasruddin Zainudin, Assoc. Prof. Dr

Universiti Utara Malaysia
email: nash@uum.edu.my
email: nzainudi@pobox.une.edu.au

Angappan Regupathi, Assoc. Prof. Dr

Universiti Utara Malaysia
email: angappan@uum.edu.my

Received 18 September 2010, Accepted 31 July 2011

Abstract

Collection period is the length of time taken by a company's credit customers to pay their debts. During this time, company resources are tied up as it is effectively financing its customers' purchases out of its own funds. Credit collection period is, therefore, an important factor that might have an impact on the cash flows, and hence, the survival of a company. An attempt has been made in this paper to explore the profile of credit collection period among small and medium-sized manufacturing enterprises in Malaysia. Besides that, we also identify some determinants of this credit collection period. The study is based primarily on secondary data derived from financial statements of manufacturing SMEs from 2001 through 2004. The findings of this study indicate that liquidity, efficiency, profitability, industry sub-sector and size have some influence over the credit collection period.

Keywords: trade credit, collection period, SMEs.

JEL classification: D22, D24, G32.

The authors are particularly grateful to Business and Search Information Services (BASIS) for their generosity in providing the financial data for the study.

Introduction

Trade credit arises when a supplier allows a customer to delay the payment for goods and services already delivered. The deferral arrangement creates an interval between the time of purchase and payment. Pending full settlement by the customer, the amount yet to be paid is reflected in the supplier's balance sheet as trade debtor or accounts receivable. This item, which represents the supplier's claim against the customer, is classified under the current assets, as the period granted for the deferment, that is the credit period, is generally short. The fulfilment of debt obligation at a date beyond the credit period would provide certain negative signals. Recurring and widespread practice of late collection would eventually deteriorate the financial position of the supplier. For this reason, prudent trade credit management is a vital component of success and survival, particularly to the small and medium-sized enterprises (SMEs).

Similar to other business sectors, SMEs typically sell merchandise on credit. Giving credit in any business transaction has its benefits as it could generate larger volume of business. However, there is also the risk of not being able to collect when the credit term is due. Losses due to late payment and non-payment will pose a great strain to the supplier's resources and can negatively affect its business operation and survival. Slow collection of debts will delay or deny the seller company the use of its own capital for reinvestment. On the other hand, prompt collections will reduce collection period and will enable the company to increase its frequency of reinvestment of its capital¹. In addition, a shorter debt collection period, *ceteris paribus*, would allow the company to transact a higher business volume with no corresponding increase in the investment in accounts receivable.

The importance of credit management in the operation of a company needs no emphasis. However, the analysis of the quantum of accounts receivable in the company's balance sheet demands a more worthy attention from company management. Earlier studies have indicated that accounts receivable represent a major proportion of company assets. For example, trade debtors are 21% of US manufacturing corporations' total assets². In the UK, the figures are 19% for large companies³ and over 30% for small and medium-sized firms⁴. Previous studies conducted on Malaysian companies, however, did not give any figure that would indicate the size of investment companies undertake in providing trade credit to customers. For the present study, as presented in Table 1, we find that on average, accounts receivable made up about 29% of a company's assets, with two-third of the sample having more than 20% of total assets as receivables. Undoubtedly, the considerable percentages displayed highlight the importance of efficiently managing the sizeable resources that companies have tied up as accounts receivables.

In fact, this has been acknowledged several decades ago by Brennan⁵ when, after observing the magnitude of receivables in American corporations, he said that “it is readily apparent that effective management of receivable investment is a required characteristic of a successful and growing enterprise”.

Table 1. Proportion of receivables to total assets of manufacturing SMEs

Percentage of receivables to total assets		Frequency	Share (%)
10% and below		23	10.75
Between 10% and below 20%		47	21.96
Between 20% and below 30%		50	23.36
Between 30% and below 40%		37	17.29
Between 40% and below 50%		34	15.89
Between 50% and below 60%		15	7.01
More than 60%		8	3.74
Total		214	100.00
Mean	29.45	Skewness .653	Kolmogorov-Smirnov Z .923
Median	27.77	Kurtosis .399	Asymp. Sig. (2-tailed) .362
Std. dev.	16.35		

Source: data collected for this study.

As indicated earlier, accounts receivable, a component of current assets, is an investment that will tie up the company's resources. Like any investment, trade credit has a cost. The company providing credit is effectively forgoing the use of its own financial resources for a period, hence there exist an opportunity cost associated with giving credit. In addition, there are costs of administering the accounts receivable – keeping track of what is owed, and chasing up the clients once the due date has passed. And, there is a possibility that the debtor may not pay what is due and when it is due. While late payment results in increased collection cost, non-payment will end up as bad debt expenses. The practice of late payment and non-payment can, and does, undermine companies' cash flow, profitability and competitiveness. Several studies on collection period, credit period, and late payment by small firms, to be elaborated in the next section, have been conducted in more developed economies. Regrettably, despite its importance to performance and survival of SMEs, financial management has not been a favourite study topic, in the developing countries in particular. Accordingly, research themes related to credit and collections are very rare. In view of the scarcity of literature in this area in the Malaysian context, this paper attempts to fill this gap.

The rest of the paper is structured as follows. The next section provides the background literature. The section that follows presents the research questions to be answered. The fourth section describes the data and a method undertaken in carrying out the research. The findings are discussed in the following section, and the conclusions are drawn in the final section.

1. Review of Related Literature

Most of the previous studies on trade credit management of small and medium-sized enterprises have focused on the practices of businesses in the US⁶, the UK⁷, and some other more developed countries⁸. These studies examined various aspects of credit management and have yielded a variety of empirical evidence on numerous trade credit management issues. We, however, do not intend to review them in any depth, but to draw precisely on those relating to the focus of this study – the credit collection period.

Reviews of related literature reveal that many of the research works on credit collection deliberate on late payment and collection period. Average collection period (ACP), also referred to as debtor days or days sales outstanding (DSO), is the average number of days taken by credit customers to pay their bills. This period may not be the same as credit period, the length of time allowed to the buyer to settle the payment for purchases made. Late payment occurs when payment is made on a date beyond the credit period. Pike and Cheng⁹ refer the excess of collection period over the credit period as *days overdue*. Unlike collection period, information on credit period could not be drawn from financial statements. Hence, this study merely focuses on ACP. Nevertheless, we would also assess literature on late payment as it is closely connected to ACP.

The issue of late collection, however, is not new. A survey by Grablowsky¹⁰ reports that most firms moved an account from active in-house collection to the bad debt file between four to twelve months after the due date. The survey also reveals that even if a customer became a slow payer or was occasionally delinquent, many retailers continued to extend credit to him or her. McMahon and Holmes¹¹, in their review of small business financial management practices in North America, also highlight a similar situation. Earlier in the UK, the Bolton Committee¹² reports that many firms are haphazard in granting credit, slow and irregular in the collection of debts, and on occasion, even neglecting for weeks on end to submit bills for work done or goods delivered. Although dated, these patterns still appear to hold today. More recent research reports in the UK show that there are still persisting problems related to collection, late payments and non-payments¹³.

Analyses on late collection reveal that most small firms are experiencing the problem¹⁴. Nevertheless, late payment problems affect firms differently, depending on their financial strength and management. Firms that are badly affected typically were undercapitalised and had poor credit management practices while those less pressured are firms with financial stability and knowledge of cash flow planning. Actual late payment was less in firms with good credit management procedures.

Several studies concentrated on late payment by small firms in the UK. Howorth and Wilson¹⁵ developed 13 small firm case studies and carried out detail analyses on their management and financing of trade credit and showed that late payment problems were common. However, firms that suffered due to these problems were those that were undercapitalised and had poor credit management practices, and did not do anything about their debtors' late payments. Chittenden and Bragg¹⁶ examine the impact of late payment on SMEs and the overall economy. Peel et al.¹⁷ analysed the response of small firms to the legislative and regulatory measures in curbing late payment in the UK. Pike and Cheng¹⁸ in a study on large UK firms revealed that contextual variables like customer concentration, marketing channel and industry sector, and adopted specific credit policies influenced the credit period taken. They concluded that a longer-term credit was taken when firms were smaller, the customer concentration was lower, the market was highly competitive, and customers were end-users.

Relatively little evidence is available on trade credit management for Malaysian companies. As for the determinants of trade credit collection period, we find even less prior research on which to rely. Although there have been several publications on Malaysian SMEs previously, financial management was not one of the main issues of discussion. There have been very few studies concerned exclusively with the trade credit collection period. One such study, however, focused on large corporations listed on the local bourse¹⁹, and observed that the relationship between company size and ACP was dependent on the industry sector. In a study on SME collection period, Zainudin²⁰ found that there was a negative correlation between ACP and financial performance, as well as between ACP and company size.

What the above review illustrates is that there is scant evidence on the determinants of trade collection period of manufacturing SMEs, particularly in the local context. Research in this area may help increase our understanding on collection period and its determinants and, subsequently, these may help improve the collection process.

2. Research Questions

Collection of trade debt, being the concluding stage in the process of sales transaction, is an integral part of overall management of trade credit. For, without collection, a credit sale transaction cannot be considered completed. It is in this context that an attempt has been made in this paper to examine the trade credit collection period of manufacturing SMEs in Malaysia. For this purpose, we will attempt to answer the following research questions:

1. What is the profile of ACP for manufacturing SMEs in Malaysia?
2. What are the determinants of ACP of manufacturing SMEs? More specifically:
 - Does the SME industry sector affect ACP?
 - Does the SME size affect ACP?
 - Does the SME liquidity affect ACP?
 - Does the SME efficiency affect ACP?
 - Does the SME profitability affect ACP?

3. Data and Methods

The data utilised for the present study comprise financial statements of 214 small and medium-sized manufacturing enterprises selected from the Small and Medium Industries Development Corporation (SMIDEC) directory which was posted on their official website²¹ as at end of December 2004. SMIDEC is a specialised government agency that was established to further promote the development of small and medium industries in the manufacturing sector through the provision of advisory services, fiscal and financial assistance, infrastructural facilities, market access and other support programmes. However, SMIDEC does not maintain any financial record of SMEs. We, therefore, sought the information from Business and Search Information Services (BASIS), an independent and private credit information agency that had been managing and providing online credit information to financial institutions, stockbroking companies, legal firms, prominent multinational corporations and other corporate entities to assist credit decision makers in making sound credit decisions²².

Table 2 shows the breakdown of the 214 SMEs the study involved, by industry sub-sector. As can be seen from the table, metal products contributed the most number of SMEs in this study. While machinery and engineering, chemical and chemical products, and plastic products are fairly represented; sectors poorly represented include pharmaceutical and oil palm-based products. For the further analysis these 14 sub-sectors will be reclassified as it will be explained later.

Table 2. SME distribution by industry sub-sector

Industry sub-sector	Frequency	Share (%)
Food, Beverages and Tobacco	16	7.5
Machinery and Engineering	22	10.3
Chemical and Chemical Products	23	10.7
Paper and Printing	11	5.1
Plastic Products	26	12.1
Electric and Electronics	21	9.8
Textile, Apparel and Leather	10	4.7
Rubber Products	9	4.2
Transport Equipment	13	6.1
Pharmaceutical Products	2	0.9
Non-Metallic Mineral Products	8	3.7
Wood Products	10	4.7
Palm Oil-based Products	3	1.4
Metal Products	40	18.7
Total	214	100.0

Source: data collected for this study.

As indicated earlier, the data used in this study are extracted from financial statements of the sample companies. However, financial figures tend to fluctuate from year to year as the data for a single year may be affected by some temporary extraordinary circumstances occurring in that year. Subsequently, they may not represent the true financial characteristics of the companies. Taking that into consideration, for this study, we used the annual financial statements, from 2001 to 2004, of the selected manufacturing SMEs. We then transformed the four-year annual data into a single statement by averaging all the individual items in the financial statements. The time period is considered sufficient, as the use of averages over too long a period would have disadvantages. Meric et al.²³, for example, state that averages for longer period, say 10 years or more, may reflect characteristics that prevailed long time ago, which may no longer exist.

To investigate the determinants of credit collection period, we run the multivariate OLS regression. Multivariate regression analysis was appropriate in this study because the data were cross-sectional and thus did not suffer from autocorrelation problems. The objective of multiple regression analysis is to predict the changes in the dependent variable, in this case the collection period, in response to changes in the independent variables. This objective is most often achieved through the statistical rule of least squares²⁴, hence the use of multivariate OLS regression method.

3.1. Dependent variable

In this study, we are primarily interested in examining manufacturing SMEs' trade credit collection period. Trade credit collection period here refers to the average collection period (ACP), which is the dependent variable in this study. ACP is measured by the accounts receivable (or trade debtors) amount divided by the total annual sales (turnover or revenue) and multiplied by 365 days (the number of days in a year). This measure reflects the proportion of annual total sales (stated in the number of days) that is tied up as trade credit or receivables to be collected from customers. The measure can also be interpreted as reflecting the speed – number of days taken – in collecting the sales made to customers. In short, ACP is measured using the formula given below:

$$\text{ACP} = \text{AR} \div \text{S} \cdot 365 \text{ days},$$

where:

ACP – average collection period,

AR – accounts receivable (or trade debtors),

S – total annual sales (turnover or revenue).

3.2. Independent variables

In this study, we are also interested in identifying some of the determinants of trade credit collection period. More specifically, we aim to find out what the determinants of ACP are. There are several possible factors that could influence ACP. Unfortunately, there is not much empirical evidence in relation to this in Malaysia. Regupathi & Zainudin²⁵ found that an industry sector and a company size influenced the company ACP. In extending this in this study we wished to explore the influence of the four major financial ratio categories, i.e. liquidity, efficiency, profitability, and leverage on ACP. However, due to the lack of data on debt used by the small and medium companies in this sample we had to omit the leverage variable. Summing up, in this study we focused on five selected factors (or independent variables), namely, (1) industry sub-sector, (2) size, (3) liquidity, (4) efficiency, and (5) profitability. These factors are explained further below.

Industry sub-sector

Although all the companies used in this study are from the manufacturing industry, they actually come from different sub-sectors. These sub-sectors have been reclassified – collapsed to a smaller number of (four) categories – to allow us to see if these industry sub-sectors influence

a company's ACP. The reclassification has grouped together sub-sectors that are thought to be similar or related. The four reclassified sub-sector categories are as follows: (1) food, beverage & tobacco sector, electric & electronic products, and textiles, apparels & leather; (2) machinery & engineering sector, transport equipment sector, non-metallic mineral products, and metal products; (3) chemicals & petrochemical products, plastic products, rubber products, palm oil-based products, and pharmaceuticals; and (4) paper & printing sector and wood products. In this study, these sub-sectors are represented by three dummy variables, with the base being the first sub-sector (reflected by the constant in the regression model). The dummy variables representing the sub-sectors are presented below:

SEC1*	= Food, beverage & tobacco; electric & electronic products; textiles, apparels & leather	47 (22%)
SEC2	= Machinery & engineering; transport equipment non-metallic mineral products; metal products	83 (39%)
SEC3	= Chemicals & petrochemical; plastic products, rubber products; palm oil-based products; pharmaceuticals	63 (29%)
SEC4	= Paper & printing; wood products	21 (10%)

*This dummy variable is not included in regression as it is the base category.

Company size

Company size is another factor that could influence trade credit collection period. Generally, larger companies have greater resources, or greater access to resources, that could be used to collect trade credit more quickly. Therefore, it is expected that a larger company would collect its trade credit sooner, and thus, have a shorter ACP. On the other hand, however, larger companies have, in general, greater access to the credit market. They may offer this credit, in turn, to their (smaller) customers who have less access to the credit market, for a profit. This means that a larger company could also be expected to offer more credit to its customers or collect its trade credit later, and thus, has a longer ACP. Due to these contradictory arguments, the net impact of company size on ACP must be determined empirically.

Company size can be measured by using total assets or total annual sales (turnover or revenue). As the total sales amount is already used in deriving ACP, the total assets amount is used here instead. However, we have used a modified measure of total assets. Although accounts receivable is a part of total assets, it too is already used to derive ACP, and therefore, we have deducted it from total assets. Further, as the resulting total assets (net of accounts receivable)

data are heavily (positively) skewed, we have taken the natural log of this data. So, in this study, company size is measured using the formula given below:

$$\text{SIZE} = \ln(\text{TA} - \text{AR}),$$

where:

SIZE – company size,

TA – total assets,

AR – accounts receivable (or trade debtors).

Liquidity

Liquidity is another possible factor that might influence ACP. A company that has higher liquidity has more liquid assets, and typically therefore, has less financial risk. The company can easily convert these assets to cash for meeting unexpected cash outlays, and is likely to depend less on the external credit market. Consequently, a company with higher liquidity would be expected to extend more trade credit to its customers as the company can afford to allow a greater portion of its sales proceeds to remain as receivables instead of cash. In other words, a company with higher liquidity is expected to have longer ACP.

Although there are several possible measures of liquidity, we have used a modified net working capital ratio in this study. Net working capital ratio is simply the net working capital (current assets minus current liabilities) expressed as a proportion of total assets. We have modified this measure by, again, removing the accounts receivable amount from both the numerator (net working capital) and denominator (total assets) because it has already been used to derive ACP. In short, liquidity is measured as specified by the formula below:

$$\text{LIQ} = (\text{CA} - \text{CL} - \text{AR}) \div (\text{TA} - \text{AR}),$$

where:

LIQ – liquidity,

CA – current assets,

CL – current liabilities,

AR – accounts receivable (or trade debtors),

TA – total assets.

Efficiency

Efficiency is another potential factor that may affect ACP. Commonly, a company is said to be more efficient if it can generate relatively more sales (turnover or revenue) by using relatively less assets. Generally, we would expect a more efficient company to have less assets (relative to sales), including receivables. This means that a more efficient company would be expected to collect its trade credit faster, and thus, have shorter ACP.

Efficiency is generally, measured as the ratio of total annual sales to total assets, and can be interpreted as the amount of sales in a year that can be generated using one ringgit of assets. However, in this study, a modified measure of efficiency is used. Again, as the accounts receivable amount is already used to derive ACP, it is deducted from the total assets to compute efficiency. Note, however, that although the total annual sales amount has also been used to derive ACP, it is not modified or adjusted in computing efficiency. This is because it is simply not possible to come up with an alternative measure of efficiency without using sales. The formula used for deriving efficiency in this study is given below:

$$EFF = S \div (TA - AR),$$

where:

EFF – efficiency,

S – total annual sales (turnover or revenue),

TA – total assets,

AR – accounts receivable (or trade debtors).

Profitability

Profitability is another possible factor that could influence ACP. Typically, credit management is unlikely to be a company's mainstream activity because it is likely to obtain only a marginal profit from extending credit to its customers. Thus, arguably, only more profitable companies would be able and willing to extend longer credit to their customers. This means that a more profitable company would be expected to have longer ACP. Conversely, it could be argued that companies would be more profitable if they collected their trade credit faster, thereby reducing opportunity and financing costs as well as bad debts. In other words, a company with a shorter ACP would be expected to have a higher profit. This later argument contends that trade credit collection influences profitability, rather than the opposite. Thus, to gain an insight into the actual relationship between ACP and profitability, it must be determined empirically.

Profitability too can be measured in many ways. Here, we have used net profit margin as the measure of profitability. It is simply the net profit stated as a percentage of sales. Generally, higher net profit margin means higher profit per Ringgit of sales, but it also means lower operating and interest costs per Ringgit of sales. Thus, net profit margin is computed by dividing net annual profit with total annual sales. Note, again, that although the total annual sales amount has also been used to derive ACP, it is not modified or adjusted in computing profitability. Again, this is because it would not be possible to come up with an alternative measure of profitability without involving sales. The formula for computing profitability (net profit margin) is given below:

$$\text{NPM} = \text{NP} \div \text{S},$$

where:

- NPM – profitability (net profit margin),
- NP – net annual profit (or net annual income),
- S – total annual sales (turnover or revenue).

Interaction effects

Apart from the factors above, we are interested in examining the interaction effects between industry sector and each of the following factors – the size, liquidity, efficiency and profitability – on ACP. This is because we suspect that the impacts of these factors on ACP could depend on the industry sector.

The complete regression model that we have tested for this study is given below:

$$\begin{aligned} \text{ACP} = & \beta_1 + \beta_2(\text{SIZE}) + \beta_3(\text{LIQ}) + \beta_4(\text{EFF}) + \beta_5(\text{NPM}) + \beta_6(\text{SEC2}) + \beta_7(\text{SEC2})(\text{SIZE}) + \\ & \beta_8(\text{SEC2})(\text{LIQ}) + \beta_9(\text{SEC2})(\text{EFF}) + \beta_{10}(\text{SEC2})(\text{NPM}) + \beta_{11}(\text{SEC3}) + \beta_{12}(\text{SEC3})(\text{SIZE}) + \\ & \beta_{13}(\text{SEC3})(\text{LIQ}) + \beta_{14}(\text{SEC3})(\text{EFF}) + \beta_{15}(\text{SEC3})(\text{NPM}) + \beta_{16}(\text{SEC4}) + \\ & \beta_{17}(\text{SEC4})(\text{SIZE}) + \beta_{18}(\text{SEC4})(\text{LIQ}) + \beta_{19}(\text{SEC4})(\text{EFF}) + \beta_{20}(\text{SEC4})(\text{NPM}) + \varepsilon. \end{aligned}$$

The problem with such a model is that it is likely to suffer from multicollinearity due to the presence of several interaction variables. This problem must be overcome through a process of iterative examination and elimination. Therefore, we have used the backward elimination method in our regression analysis.

4. Findings

This section presents the results of the study based on the research questions posed earlier – to provide the profile of ACP for manufacturing SMEs in Malaysia; and to identify some determinants of the credit collection period. In the first section, we use descriptive statistics to describe the profile of ACP of the SMEs. We also report the characteristics of the variables used in the analysis. In the following section, we offer the multiple regression results in response to the second research question.

4.1. Profile of Credit Collection Period

The summary of the ACP profile is presented in Table 3. The analysis on the ACP indicates that the ACP for manufacturing SMEs is relatively long. Both the mean and median, 106.73 and 90.81 days respectively, suggest that the SMEs take more than three months to collect their trade debts. Furthermore, about a third of the sample delays an average collection period beyond four months. Note that, as discussed in Zainudin²⁶, caution is essential in using the mean to interpret the ACP as the ratio might have been exaggerated by companies that do not regularly write off uncollectible old debts which would amplify the receivables, and therefore the ACP. All the same, the median does verify that the SMEs are slow in their trade credit collection. As indicated earlier, the longer the ACP the more serious the problem. Therefore, corrective actions must be taken immediately to improve the situation.

Table 3. Average collection period of manufacturing SMEs

Average collection period		Frequency		Share (%)	
1–30 days		17		7.95	
31–60 days		32		14.95	
61–90 days		58		27.10	
91–120 days		36		16.82	
More than 120 days		71		33.18	
Total		214		100.00	
Mean	106.73 days	Skewness	3.825	Kolmogorov-Smirnov Z	2.289
Median	90.81 days	Kurtosis	24.009	Asymp. Sig. (2-tailed)	.000
Std. dev.	84.221 days				

Source: data collected for this study.

Table 3 also shows the distribution of the ACP. A skewness of 3.825 (see Table 4) indicates that the curve is quite different from a normal curve. The distribution is more peaked than the normal curve as it has positive kurtosis of 24.009. In fact, the Kolmogorov-Smirnov test of goodness-of-fit was performed and there is evidence against the claim that the distribution is normal.

Additionally, we also observed the distribution of other relevant variables prior to further analysis. The distribution of the variables representing size, liquidity, efficiency and profitability of the sample companies are displayed in Table 4.

Table 4. Characteristics of variables

	ACP	SIZE	LIQ	EFF	NPM
N	214	214	214	214	214
Mean	106.730	15.748	-.508	1.992	.001
Median	90.810	15.667	-.455	1.547	.030
Std. Deviation	84.221	1.421	.658	1.727	.346
Skewness	3.825	.362	-2.725	3.763	-11.589
Kurtosis	24.009	1.529	15.640	20.867	153.282
Kolmogorov-Smirnov Z	2.289	.850	2.098	2.841	5.387
Asymp. Sig. (2-tailed)	.000	.465	.000	.000	.000

Source: data collected for this study.

4.2. Determinants of Credit Collection Period

The summary of the regression results is provided in Table 5. The fitted (final) regression model produced a very reasonable adjusted R-square value of 0.635, which indicates that the model accounted for about 63.5% of the variance in the dependent variable, i.e., ACP. The Durbin-Watson statistic shows that the error terms from the model were not serially correlated. The highly significant F-statistic from the analysis of variance (ANOVA) indicates that the set of independent variables included in the model explains ACP variance. The fitted coefficients in the final model are all statistically significant, indicating that all the associated independent variables remaining in the model were important in explaining ACP. The variance inflation factor (VIF) and tolerance statistics from this model were all reasonable, implying that multicollinearity was not a problem in this model.

Table 5. Regression results

Model Summary							
R	R Square	Adjusted R Square	Std. Error of the Estimate		Durbin-Watson		
.805	.649	.635	50.897		2.137		
ANOVA							
	Sum of Squares	df	Mean Square	F	Sig.		
Regression	979,775.1	8	122,471.890	47.277	.000		
Residual	531,054.3	205	2,590.509				
Total	1,510,829.4	213					
Coefficients							
	Unstandardised Coefficients		Standardised Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	110.763	6.343		17.463	0.000		
LIQ	-28.420	12.020	-0.222	-2.364	0.019	0.194	5.151
EFF	-16.849	2.770	-0.345	-6.083	0.000	0.532	1.880
NPM	-95.041	10.860	-0.391	-8.751	0.000	0.860	1.163
SEC3SIZE	-1.596	0.694	-0.135	-2.300	0.022	0.494	2.024
SEC2LIQ	-90.094	14.358	-0.626	-6.275	0.000	0.172	5.805
SEC3LIQ	-60.568	17.316	-0.278	-3.498	0.001	0.272	3.682
SEC2EFF	-11.342	3.888	-0.201	-2.918	0.004	0.362	2.761
SEC3NPM	205.979	37.782	0.252	5.452	0.000	0.803	1.246

Source: data collected for this study.

The results, particularly the coefficients from the final regression model are represented in Table 6 for easier reference. Note that the coefficients in the cells are rounded to the nearest whole number. The coefficients for the variables that were removed in the backward elimination process have been stated as zero.

Table 6. Coefficients of factors by industry sub-sectors

	(Base)	SEC2	SEC3	SEC4
(Constant)	$\beta_1 = +111$	$\beta_6 = 0$	$\beta_{11} = 0$	$\beta_{16} = 0$
SIZE	$\beta_2 = 0$	$\beta_7 = 0$	$\beta_{12} = -2$	$\beta_{17} = 0$
LIQ	$\beta_3 = -28$	$\beta_8 = -90$	$\beta_{13} = -61$	$\beta_{18} = 0$
EFF	$\beta_4 = -17$	$\beta_9 = -11$	$\beta_{14} = 0$	$\beta_{19} = 0$
NPM	$\beta_5 = -95$	$\beta_{10} = 0$	$\beta_{15} = +206$	$\beta_{20} = 0$

Source: extracted from Table 5.

One result that catches our attention straightaway is the set of zero coefficients for the factors in sub-sector 4. This is possibly due to the small number of cases in sub-sector 4. This indicates that the factors and their impacts on ACP in sub-sector 4 were no different than those in sub-sector 1. Nonetheless, some of the factors and their effects on ACP in sub-sectors 2 and 3 were significantly different from those in sub-sector 1. Thus, we can generalise the fitted regression equations of ACP for these sub-sectors as follows:

Sub-sectors 1 & 4, $ACP = (+111) + (-28)LIQ + (-17)EFF + (-95)NPM$

Sub-sector 2, $ACP = (+111) + (-28-90)LIQ + (-17-11)EFF + (-95)NPM$, or
 $= (+111) + (-118)LIQ + (-28)EFF + (-95)NPM$

Sub-sector 3, $ACP = (+111) + (-28-61)LIQ + (-17)EFF + (-95+206)NPM + (-2)SIZE$, or
 $= (+111) + (-89)LIQ + (-17)EFF + (+111)NPM + (-2)SIZE$

Therefore, these factors' effects on ACP, based on the sub-sectors, can be summarised as presented in Table 7. Note that the cell entries indicate the sign and the magnitude of the effect of a factor on ACP in a given sub-sector. Moreover it also indicates the factor's relative effect on ACP in the sub-sector, compared to that in the other sub-sectors.

Table 7. Recomputed factor coefficients by industry sub-sectors

Factor	Sub-sector			
	1	2	3	4
Liquidity (LIQ)	-28	-118	-89	-28
Efficiency (EFF)	-17	-28	-17	-17
Profitability (NPM)	-95	-95	+111	-95
Size (SIZE)	0	0	-2	0

Source: recomputed from Table 6.

Let us now interpret the findings. First, basing on Figure 1, liquidity seems to have influenced ACP negatively for all the sub-sectors, although this influence was more pronounced for sub-sectors 2 and 3. This means that companies that had greater liquidity generally collected their trade credit faster, more so in sub-sectors 2 (particularly) and 3. This is a surprising result because we had expected the converse – companies with greater liquidity were expected to offer more credit to their customers, and thus, collect their trade credit slower. Nonetheless, this result possibly indicates that, in practice, trade credit and liquidity policies are complementary (rather than substitutes) and they both may reflect a company's nature or inclination in managing its

working capital. For example, a company that is more risk-averse is likely to maintain greater liquidity as well as collect its trade credit faster, whereas a company that is less risk-averse is likely to have lower liquidity and allow longer trade credit to its customers. In other words, this result might imply that liquidity may be more reflective of a company's risk-aversion in managing working capital rather than its ability or willingness to offer longer trade credit to its customers.

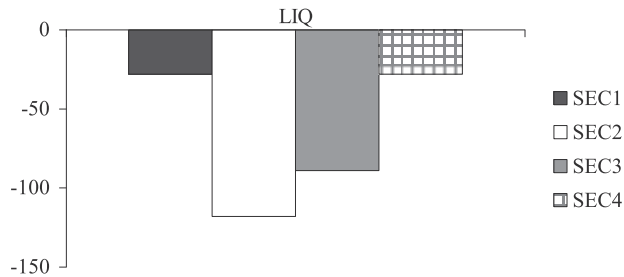


Fig. 1. Liquidity coefficients by industry sub-sectors

Source: own study.

Next, we found that efficiency too appears to have influenced ACP negatively for all the sub-sectors, although this influence was more pronounced for sub-sector 2 (see Figure 2). This result is as anticipated. This means that companies that were generally more efficient collected their trade credit faster, more so in sub-sector 2. It simply means that a company that was more efficient in using its assets (not including receivables) was also efficient in using its accounts receivable, i.e., it collected its trade credit sooner.

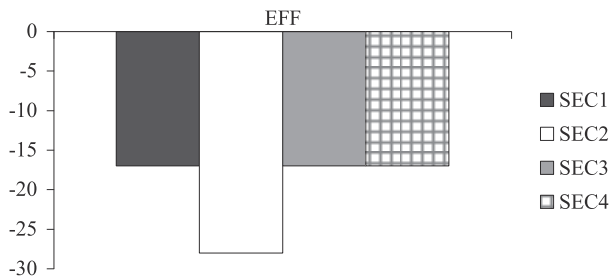


Fig. 2. Efficiency coefficients by industry sub-sectors

Source: own study.

Further, we found that profitability too seems to have influenced ACP in all the sub-sectors, but the influence was negative in sub-sectors 1, 2 and 4, but positive in sub-sector 3. This result is intriguing. This means that, in sub-sectors 1, 2 and 4, more profitable companies were faster in collecting their trade credit, or extending shorter trade credit to their customers. In contrast, in sub-sector 3, more profitable companies were slower in collecting their trade credit, or extending longer trade credit to their customers. Why this difference? Initially, we had expected that more profitable companies would be more able to extend longer trade credit to their customers. However, the results (except for sub-sector 3) show that more profitable companies extended shorter trade credit. This probably implies that ACP (or credit policy) influences profitability, rather than the opposite (we had expected). In other words, companies that collected their trade credit sooner were, as a result, generally more profitable. However, this does not seem to be the case in sub-sector 3. In this sub-sector, unlike the others, perhaps there is lower need for growth funds, and therefore, more profitable companies are more able to extend longer trade credit to their customers²⁷. This then implies that, at least in sub-sector 3, profitability influences ACP or credit policy.

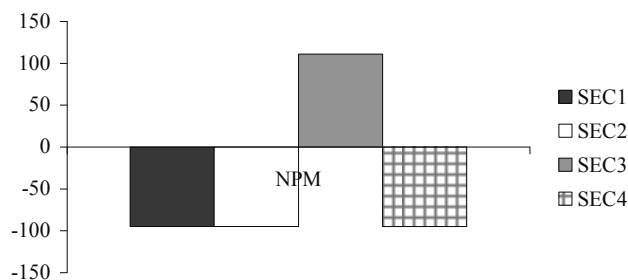


Fig. 3. Profitability coefficients by industry sub-sectors

Source: own study.

Finally, we found that size appeared to influence ACP negatively, but only in sub-sector 3. This means that in sub-sector 3, larger companies were collecting their trade credit faster. This was expected because larger companies generally have greater resources that can be channelled at more efficient trade credit management. However, we did not find size to be an influencing factor of ACP in the other sub-sectors. This was unexpected. A possible explanation is that, as suggested above, the need for growth funds may be lower in sub-sector 3, and thus, larger companies in that sub-sector could channel their excess resources to collect their trade credit faster, but this may not have been the case for the other sub-sectors. Possibly, larger companies

in the other sub-sectors might have had to use their resources to fund their (higher) growth, and thus, could not divert them to collect trade credit more quickly.

Conclusions

This study provides evidence on the determinants of trade credit collection period for a sample of manufacturing SMEs operating in Malaysia. The investigation on these determinants is novel since works on credit collection period for SMEs are scarce in the literature, and none in the Malaysian context.

In general, (1) liquidity, (2) efficiency, (3) profitability, (4) industry sub-sector, and (5) size appeared to influence manufacturing SME's trade credit collection period.

Broadly, manufacturing SME companies that had more liquid assets (not including receivables), and those that were more efficient in managing its assets (again, not including receivables) collected their trade credit faster.

The industry sub-sector was also important in influencing the other factors' effects on manufacturing SME companies' trade credit collection period. Generalising, the effects of a factor on credit collection period was sometimes – (1) present in some sub-sectors but not in others, (2) positive in some sub-sectors but negative in others, and (3) higher in magnitude in some sub-sectors compared to others.

In most of the sub-sectors, more profitable companies collected their trade credit earlier. However, in sub-sector 3, more profitable companies collected their trade credit later. Perhaps, this was due to the lower need for growth funds in that sub-sector.

In sub-sector 3, bigger companies collected their credit faster. In other sub-sectors, bigger companies were no more or less prompt in collecting their trade credit compared to smaller companies. This too, perhaps, is because larger companies in sub-sector 3 can divert some of their resources to collecting their trade credit faster arising from the lower need for growth funds in that sector.

The inferences drawn from this study, however, should be viewed with some caution due to some limitations, which possibly represent opportunities for further analyses in future studies. Several other variables, which were incorporated in previous research, but not included in this study, may be considered in future works particularly in the Malaysian context. Wilson et al.²⁸ for example, include variables such as firm age and ownership concentration, among others. Leverage, short-term borrowing, and growth opportunities are some other variables commonly used in other previous studies²⁹.

Notes

- ¹ Regupathi, Zainudin (2003).
- ² Mian, Smith (1992).
- ³ Pike, Cheng, Chadwick (1998).
- ⁴ Peel, Wilson, Howorth (2000), Wilson et al. (1996).
- ⁵ Brennan (1977).
- ⁶ For example, Chant, Walker (1988), Ellichausen, Wolken (1993), Grablowsky (1976), Petersen, Rajan (1997), Walker (1985).
- ⁷ Tamari (1970), Wilson (1996), Wilson, Summers (2002), Wilson et al. (1996).
- ⁸ Deloof, Jegers (1996), Lamminmaki, Guilding (2004), Garcia-Teruel, Martinez-Solano (2007).
- ⁹ Pike, Cheng (2001).
- ¹⁰ Grablowsky (1976).
- ¹¹ McMahon, Holmes (1991).
- ¹² Bolton (1971).
- ¹³ Howorth, Reber (2003), Howorth, Wilson (1998), Peel et al. (2000).
- ¹⁴ Howorth, Wilson (1998), Peel et al. (2000).
- ¹⁵ Wilson (1998).
- ¹⁶ Chittenden, Bragg (1997).
- ¹⁷ Peel et al. (2000).
- ¹⁸ Pike, Cheng (2001).
- ¹⁹ Regupathi, Zainudin (2003).
- ²⁰ Zainudin (2008).
- ²¹ www.smidec.gov.my.
- ²² www.basis.com.my.
- ²³ Meric et al. (2004).
- ²⁴ Hair et al. (1998).
- ²⁵ Regupathi, Zainudin (2003).
- ²⁶ Zainudin (2008).
- ²⁷ This is similar to our findings in a previous study on public listed companies (Regupathi, Zainudin (2003)). We found that, only in the plantation sector, bigger companies were slower in collecting their trade credit. We suggested that the low growth of the plantation sector (then) and the lower need for funds for growth, might have prompted bigger companies (with greater resources) in the sector to extend longer trade credit to their customers.
- ²⁸ Wilson et al. (1996).
- ²⁹ Deloof, Jegers (1996), Garcia-Teruel, Martinez-Solano (2007).

References

- Bolton, J.E. (1971). *Report of the Committee of Inquiry on Small Firms*. London: Her Majesty's Stationery Office.
- Brennan, J.R. (1977). Accounts Receivable: A Method for Successful Management. *Credit and Financial Management*, 79(1), 15.

- Chant, E.M., & Walker, D.A. (1988). Small Business Demand for Trade Credit. *Applied Economics*, 20, 861–876.
- Chittenden, F., & Bragg, R. (1997). Trade Credit, Cash-flow and SMEs in the UK, Germany and France. *International Small Business Journal*, 16(1), 22–35.
- Deloof, M. & Jegers, M. (1996). Trade Credit, Product Quality, and Intragroup Trade: Some European Evidence. *Financial Management*, 25(3), 33–43.
- Elliehausen, G.E., Wolken, J.D. (1993). The Demand for Trade Credit: An Investigation of Motives for Trade Credit Use by Small Business. *Staff Study* 165, 1–18.
- Garcia-Teruel, P.J., Martinez-Solano, P. (2007). Effects of Working Capital Management on SME Profitability. *International Journal of Managerial Finance*, 3(2), 164–177.
- Grablowsky, B. J. (1976). Mismanagement of Accounts Receivable by Small Business. *Journal of Small Business Management*, 14(4), 23–28.
- Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C. (1998). *Multivariate Data Analysis* (5th ed.). Upper Saddle River NJ: Prentice-Hall.
- Howorth, C., Reber, B. (2003). Habitual Late Payment of Trade Credit: An Empirical Examination of UK Small Firms. *Managerial and Decision Economics*, 24(6), 471–482.
- Howorth, C., Wilson, N. (1998). Late Payment and the Small Firm: An Examination of Case Studies. *Journal of Small Business and Enterprise Development*, 5(4), 307–315.
- Lamminmaki, D. Guilding, C. (2004). A Study of Australian Trade Credit Management Outsourcing Practices. *Australian Accounting Review*, 14(1), 53–62.
- McMahon, R.G.P., Holmes, S. (1991). Small Business Financial Management Practices in North America: A Literature Survey. *Journal of Small Business Management*, 29(2), 19–29.
- Meric, I., Prober, L.M., Eichhorn, B.H., Meric, G. (2004). Integration and the Financial Characteristics of Manufacturing Firms in the European Union. *American Business Review*, 22(2), 88–96.
- Mian, S.L., Smith, C.W. (1992). Accounts Receivable Management Policy: Theory and Evidence. *The Journal of Finance*, 47(1), 169–200.
- Peel, M.J., Wilson, N., Howorth, C. (2000). Late Payment and Credit Management in the Small Firm Sector: Some Empirical Evidence. *International Small Business Journal*, 18(2), 17–37.
- Petersen, M.A., Rajan, R.G. (1997). Trade Credit: Theories and Evidence. *The Review of Financial Studies*, 10(3), 661–691.
- Pike, R., Cheng, N.S. (2001). Credit Management: An Examination of Policy Choices, Practices and Late Payment in UK Companies. *Journal of Business Finance and Accounting*, 28(7 & 8), 1013–1042.
- Pike, R., Cheng, N.S., Chadwick, L. (1998). *Managing Trade Credit to Sustain Competitive Advantage: A Study of Large UK Companies*. London: CIMA Publishing.

- Regupathi, A., Zainudin, N. (2003). The Credit Collection Period of KLSE Listed Companies. *Accountants Today*, 16(11), 24–27.
- SMIDEC. (2002). *SMI Development Plan (2001–2005): Executive Summary*. Petaling Jaya: Small and Medium Industries Development Corporation.
- Tamari, M. (1970). The Nature of Trade Credit. *Oxford Economic Papers*, 22(3), 406–419.
- Walker, D.A. (1985). Trade Credit Supply for Small Businesses. *American Journal of Small Business*, 9(3), 30–40.
- Wilson, N. (1996). Credit Management and Corporate Performance: A Survey. *Credit Management*, 32–36.
- Wilson, N., Summers, B. (2002). Trade Credit Terms Offered by Small Firms: Survey Evidence and Empirical Analysis. *Journal of Business Finance and Accounting*, 29(3 & 4), 317–351.
- Wilson, N., Watson, K.J., Singleton, C., Summers, B. (1996). *Credit Management, Late Payment and the SME Business Environment: A Survey*. Bradford: University of Bradford, Credit Management Research Group.
- Zainudin, N. (2008). Tracking the Credit Collection Period of Malaysian Small and Medium-Sized Enterprises. *International Business Research*, 1(1), 78–86.