MANAGEMENT OF RECEIVABLES, FINANCIAL DISTRESS, AND PROFITABILITY IN BANGLADESH

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ABSTRACT

If a firm's profitability is affected by inefficient working capital practices, it is logical to assume that an adjustment of working capital will improve profitability. In particular, small and medium-sized businesses in the least developed countries (LDCs) and the new economies of Europe suffer from long delays relating to the payment of dues which threaten their survival. When the policies and practices are reasonably efficient, tweaking practices is not expected to be very beneficial. We should observe benefits from adjusting working capital practices for those companies that are clearly outside the norm in the industry. A major part of working capital management is receivables management and collection. In this study, we examine the data on receivables from Bangladesh from 2000 to 2017 to see if companies with inefficient working capital levels benefit from adjusting toward the norm, which is a new way of examining the benefits of adjustment. Specific actions and reactions will depend on the situation. Any adjustments that management make to fine-tune working capital management are unlikely to produce much value unless the underlying circumstances are taken into account. A new firm with a compelling case of quality and competitive strength may be more successful in managing a successful low average collection period (ACP) operating structure, and keeping the ACP low is strongly advised.

Contribution/Originality: This study uses a novel approach to the evaluation of receivable collections policy in emerging economies where credit is scarce. It provides powerful evidence that relaxing credit collection policy may not be effective, even when a firm has a very strict credit collection practice.

1. INTRODUCTION

If one scans the pool of articles related to working capital management, they will find that most of the articles are about small businesses that have a setting in the relatively smaller economies of the world. A small number of articles have focused on the USA, and there are good reasons for that. The US and the large European firms are well-capitalized and likely have settled on their respective working capital strategies and policies based on years of history, experience, knowledge, and skills of the executives and technology support. On the other hand, developing countries are still going through their development phases and growing pains. Unlike their compatriots in the developed world, they may face limited access to capital. The same thing may be valid for relatively new firms or

small firms in the developed world, and therefore, examining what has been happening in the developing world is insightful.

Interestingly, practitioners and experts often report that US firms overinvest in working capital (Hill, Kelly, & Highfield, 2010; Kieschnick, Laplante, & Moussawi, 2006). Many articles on working capital in developing countries imply that the firms overinvest in inventory and accounts receivable. Fairly often, authors suggest actions that will result in a more efficient working capital management. Overinvestment in cash is possible in developed countries, but firms in developing countries are cash-starved, and overinvestment in cash is out of the question.

We are going to make a clear distinction between working capital policy and working capital management. Authors have often used the terms "aggressive," "effective," and "efficient" to describe working capital management. We understand the words "efficient" and "effective" to imply a timely recovery pattern of accounts receivable and maintaining inventory at a level that does not result in either stock-outs or high carrying costs. However, using the term "aggressive" is more about the financing aspect of working capital, where a firm carries high short-term liabilities relative to current assets. For receivables collection, the term "aggressive" is not meaningful. Aggressive working capital management must also look at the financing side of the investments in receivables and inventory. This brings liability management into the equation, which is often inadequately addressed.

Our focus is narrow, and we will therefore not look at the financing side and accounts payable. The specific questions addressed in this paper arise from the characterization of "inefficient" working capital management. Inefficient working capital management may mean overinvestment in accounts receivable (a relaxed credit policy) or inventory or both, and underinvestment in accounts receivable (a tight credit policy) or very lean inventory or both. We will also leave the examination of inventory for a future study. Aside from boosting trade credits and discounts that may move inventory faster and lower the inventory balance, it is more a function of the production and logistics system and is not quickly adjustable. Lowering the inventory balance may need significant capital investment and may very well be a long-term strategic decision.

We would like to point out that managing receivables is one of the major challenges for management in emerging economies and for new entrepreneurs, small businesses in LDCs, and the new economies of Europe. An article by Majkova & Kljucnikov (2017) quoted Justitia (2016), who conducted a European payment survey, with a statement indicating that late payments and long payment terms are significant reasons for lost jobs and a lack of growth opportunities. Thirty five percent of the respondents said that they did not get paid on time which threatened their business survival. They also reported that Greece, Bulgaria, and Slovakia have the largest shares of late payments of 30 percent, 30 percent, and 28 percent, respectively.

Our research questions then are:

1. Can a firm with presumable overinvestment in receivables benefit from a reduction in receivables?
2. Can a firm with presumable underinvestment in receivables benefit from an increase in receivables?

We plan to examine these two questions thoroughly from several different angles. Once we suggest a particular course of action for management, those actions should have a positive effect on profitability. More specifically, the following should happen:

1. An increase in the average collection period should improve profitability for a firm with a very strict trade credit policy and receivables collections. For these firms, any increase in the average collection period (ACP) should more often be associated with an improvement in profitability.
2. A decrease in the average collection period should improve profitability for a firm with a relaxed trade credit policy and slow receivables collections. For these firms, any reduction in ACP should more often be associated with improvement in profitability.
3. If we regress profitability on change in the average collection period, the ACP should have a positive coefficient for firms with a very low ACP, and a negative coefficient (positive effect) for firms with a very high initial ACP (observations are negative).

The paper is organized as follows: In the next section (section 2), we provide a literature review; in section 3, we discuss the methodology we used in this paper. The methodology section starts with a brief discussion of the rationale of this study, a brief background of the practices in Bangladesh, and then, we specify the hypotheses we tested. In section 4, we elaborate the variables, the data set we used, and the sources of the data. The results of the proportion tests are presented in section 5, and in section 6, we present the results and interpretation of piecewise regressions. In section 7 titled summary and discussions, the paper is wrapped up with some generalized statements and policy recommendations for practitioners.

2. LITERATURE REVIEW

We do not see the average collection period as the focus of working capital management-related publications. It is generally recognized that working capital varies from industry to industry (Hill et al., 2010; Weinraub & Visscher, 1998). Most often, a positive association between profitability and "effective" management of working capital has been indicated. In the studies on working capital, it has been measured in several ways. Some authors measured working capital as current assets minus current liabilities, which is the typical textbook definition of net working capital. Hill et al. (2010) use the term "working capital requirement" as current assets minus cash minus current liabilities. Thus, the working capital requirement becomes inventory plus receivables minus payables and thus excludes cash holding since there may be other motivations for holding cash. The cash conversion cycle (CCC) has been used by Eda & Mehmet (2009); Afrifa (2016); Baños-Caballero, García-Teruel, & Martínez-Solano (2014); and Pais & Gama (2015). Implicitly, relaxed working capital management (a longer CCC) is associated with lower profitability (Deloof, 2003; García-Teruel & Martínez-Solano, 2007; Lazaridis & Tryfonidis, 2006; Shin & Soenen, 1998), leading to the suggestion that working capital management can improve profitability. Conflicting results about the effect of the nature of working capital management on firm profit and value are particularly true for the liability side of working capital. However, lengthening accounts payable will mathematically lower the cash conversion cycle, which is a desirable goal, but García-Teruel & Martínez-Solano (2007); Deloof (2003) and Lazaridis & Tryfonidis (2006) indicated that lengthening the accounts payable period could be negatively associated with profits. Knauer & Wöhrmann (2013) reported that firms extend the payables period during difficult times, which is not surprising. They also reported that firms can improve performance by relaxing the collection period during difficult times, which should not be surprising either. Lazaridis & Tryfonidis (2006) also concluded that operating performance will dictate to some extent how working capital is managed. Van Horne & Wachowicz (2005) suggested excluding payables and focusing only on the asset side, arguing that since management has very little control over the payables policy, it made very little sense to be included in determining ideal levels of investment in working capital assets. Some authors concluded that there is an optimal level of working capital. While high levels of current assets increase liquidity, overinvestment in current assets reduces profitability. A mathematical definition of an optimum level of working capital will theoretically maximize profit, all else being equal. Alternatively, we may view the optimal level of working capital, stated by Baños-Caballero, García-Teruel, & Martínez-Solano (2012) as a situation that results in a balance between risk and efficiency, and minimization of carrying costs and opportunity costs. Minimizing costs points to optimization and not necessarily seeking a balance. In our paper, we argue that the existence of an optimum working capital level, while theoretically acceptable, is not observable. Clearly, the working capital level will likely be dictated by industry practices and will vary by industry. Focusing on an optimal level denies the flexibility that is very important to management.

3. METHODOLOGY

a. Rationale

Working capital policies will establish rules regarding trade credit and collections, standard delay in paying off bills and payables, and inventory level with adequate safety stocks. Decisions regarding the inventory level are an

internal matter that does not generally involve the input of outsiders. We will assume that the size of receivables is independent of the level of inventory. Assuming that we do not have to make any change in the inventory level, effective working capital management will focus mostly on three things: timely collection of receivables; determining how to finance working capital requirement, as defined by Hill et al. (2010); and how much of the requirement will be provided from short-term sources and how much from permanent sources. In this paper, we are concerned only about the first part. Imagine an optimization policy that targets cash conversion cycle (CCC), which is lower by X number of days compared with the pre-change CCC. If reducing or extending the CCC is desired, it can be accomplished in several ways. In this article, we focus on just one component of working capital, the average collection period (ACP), that can isolate firms that should make changes in their operating policies and what those policies should be. This change of X may be achieved in numerous combinations, for example, $X = (I-d_1) + (R-d_2)$, where I is inventory conversion period, R is receivable conversion period, d_1 is the number of days reduction in inventory, d_2 is the number of days increase in receivables, and X is the sum of d_1 and d_2. The same result may also be achieved by keeping I unchanged but reducing R by d_3, where $d3 = X = d_1 + d_2$. Such a policy implementation will reflect the timely collection of receivables without adjusting the inventory level. The policy aspect will establish a trade credit policy, keeping in mind that the effective implementation of the policy will determine how much financing will be required. A strict credit policy will result in a relatively small balance in receivables and requiring relatively low financing. A relaxed policy will allow customers to take a long time to pay, swelling the receivables, which have to be financed at a cost.

Lost in the discussions on working capital policies and management is the risk aspect and trade-off between the risks and returns associated with strict receivable policies and relaxed receivables policies. A relaxed trade credit policy will result in a high receivables balance increasing the cost and risk for managers and investors. The cost may be measured in terms of the financing cost. The impact of the increasing risk should be reflected in the bad debt amounts suffered by the firm and the impairment of liquidity. On the positive side, a loose credit policy attracts more customers and sales, and hence the increase in sales increases the marginal profit of the firm. Adjustment of the policies can be justified if the benefits of an adjustment exceed the cost. The two variables focused on in this paper are returns on assets (ROA) and the average collection period (ACP).

b. Background on Bangladesh Experience

Before we state our hypothesis, it will be useful to take a quick look at the status of collection practices in Bangladesh. A chart showing the coordinates of profitability and the average collection period is presented in Figure 1 below. It shows the scatter plots of the ROA-ACP paired values at the end of every year from 2000 to 2017 for 60 DSE-listed firms. The ACP is not likely to be negative for manufacturing and trading firms. Firms following a very strict credit policy have a low ACP, and they are plotted on the very left of the ACP axis; the better performing firms with good ROA are plotted high on the vertical axis. Having a zero ACP, or a near zero ACP, basically implies that a firm is conducting a cash-based business. The firms with a very relaxed credit policy, or that are unable to enforce a sound credit collection practice, are plotted on the extreme right of the ACP axis. Many of the near-zero ACPs will result from the quick discounting of receivables, which is common in many export-oriented businesses.

We discard any cases where the ACP exceeds 300 (there are 18 such observations), since those samples do not add to our understanding of the dynamics between ACP and ROA any more than those with ACP values close to 300. Those cases arose either due to some very unusual circumstances, or the business simply carrying bad debts.
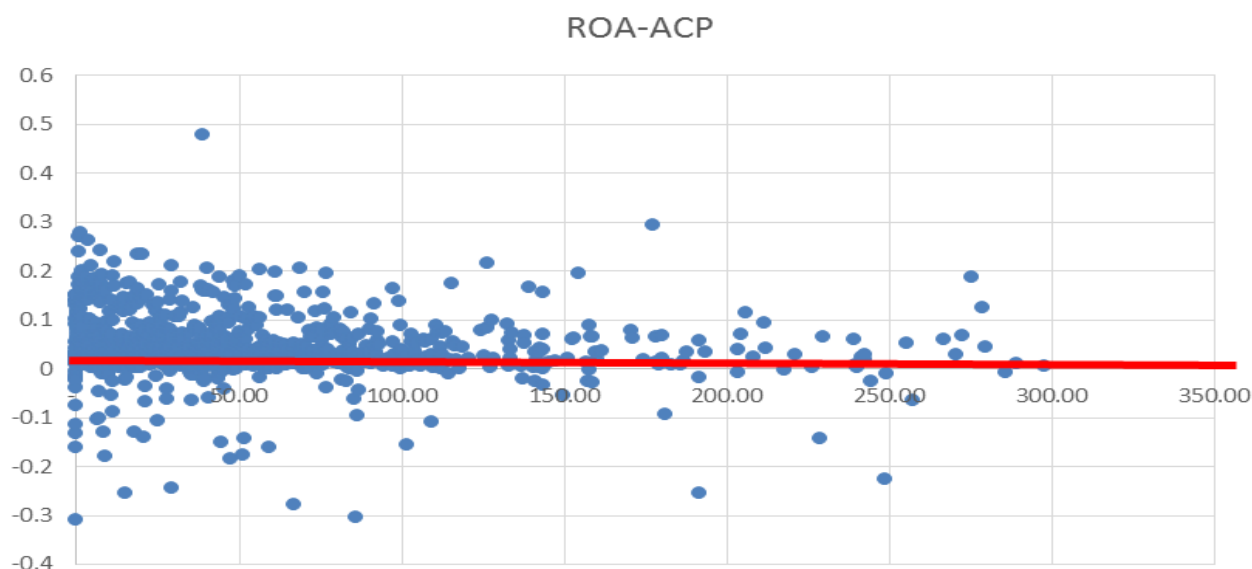
ROA-ACP

Figure 1. Scatter plot of ROA-ACP.

Source: (Annual data from 2000–2017)

The plot showed a surprisingly high concentration of zero and near-zero ACP plots, which are mostly associated with high ROA. We expected to see a concentration of high returns associated with an ACP value in the range of 20–90 days, but that did not appear. We also do not see any indication that ROA could be higher at any point of the ACP axis that is greater than 0.

If we block the seemingly outlying ROA values plotted outside the main cluster, the chart shows that small ACP numbers are more likely to be associated with better returns. If optimizing the receivables policy means increasing sales through relaxing credit policy because profits on incremental sales will exceed financing cost, these firms on the left side of the chart (close to the origin) need to move to the right along the ACP axis. Such a move should also be associated with a move up on the vertical axis. For these firms, the option to tighten further is not advisable. However, we suspect that the firms are there because of their experience with easy credit, and it would be interesting to see if this pattern holds in other emerging developing countries.

Textbooks generally suggest that the firms on the extreme right of the ACP axis should be moving to the left to move up on the vertical axis. We see firms clustering on the left side of the ACP axis, which is expected, although we expected it to be somewhat to the right of the origin. Management's task is to identify where its plot is relative to the cluster. Based on the relative plot and business environment, management must decide on the appropriate course of action. Firms plotting high on the ROA axis while they operate with a low ACP are firms with very good profitability with very lean working capital investment. These firms may be doing something well that other firms may try to replicate. It may also be something unique in the operational structure of the firms that allows them to have very low investment in working capital. A summary depicting ROA for ranges of ACP from low to high is presented in Table 1. The table provides a strong indication that a relaxed credit collection policy is inversely related to ROA.

Table 1. Frequencies of ACP and average ROA.

ACP Range	Frequency	Average ROA
0–20	300	6.25%
20–40	202	4.1
40–80	257	4.34
80–120	113	2.93
120–200	71	3.62
200+	55	0.39

Source: Derived from DSE Annual Reports.

To get a better perspective of what is happening in Bangladesh, we plot the trend in ACP over the 2000–2017 period after we classify all firms into four, roughly equal, groups:

(1) Very high ACP (Group 1): These firms have a very easy credit policy.

(2) Moderately high ACP (Group 2): This group exercises moderate control over receivables.

(3) Moderate ACP (Group 3): This group has a fairly tightly controlled trade credit policy, but not the strictest.

(4) Very low ACP (Group 4): This group seems to exercise the tightest possible receivables control.

We produced this classification based on the first ten years of data (2000–2009), placing a roughly equal number of firms (about 14–15) in each group. The ACP ranges were roughly 0–25 days (with Group 4 clearly relying on quick collection), 25–55 days (Group 3), 55–100 days (Group 2), and 100 days and above (Group 1). A quick look at Figure 2 reveals some very interesting trends. In 2000, the average collection period ranged from 25 to 65 days. However, the firms that had the strictest control (Group 4) on receivables display a slightly downward trend. These firms actually resorted to stricter control on the collection of their receivables. There is no suggestion in the chart that these firms attempted to increase sales by relaxing credit. The firms in Group 3 (with an ACP range of 25–55 days) remain in a tight range, even though there is a slight hint of an increase in ACP over time. The firms in Group 2 (with an ACP of 55–100 days) display a clear upward trend, and the firms in Group 1 (with an ACP of 100 and above) have seen an extreme increase in ACP, which points to a loss of leverage with their customers.
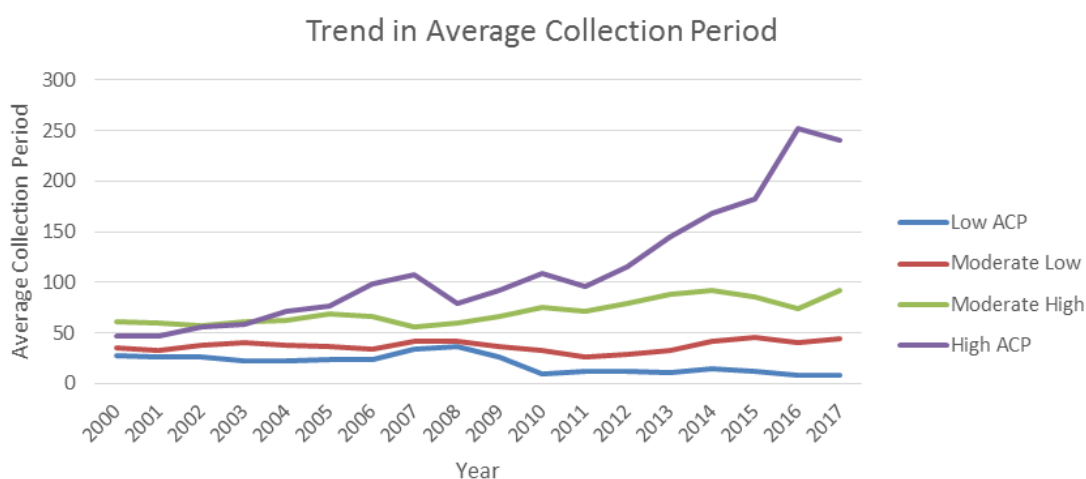

Figure 2. Trend in average collection period in Bangladesh.
Source: Derived from DSE Annual Reports.

The extremely high ACP instances may point to serious problems for these firms. In many of these cases, the firms may be carrying bad debts in their books. These firms seem to have lost control of their receivables, which in turn, may have originated from their lack of competitiveness and/or quality of their products. Firms in the other groups may have been managing their receivables better. It is interesting that the firms with the lowest ACP did not change their receivables management policies over the 18-year period, and they probably do not see any benefit from relaxing the receivables policy to improve profitability. These firms do not see any incentive for sliding to the right on the ACP axis in Figure 1. It seems that these firms have internalized the idea that cash and near-cash deals are better. The averages of those firms with a moderately lax practice in receivables management reach a maximum of about 100 days and a minimum of about 50 days. We do not expect to detect any benefit from a movement for firms that make up the middle, firms that may represent the norm (perhaps keeping the ACP in the 50–100 days range.)

c. Univariate Conditional Proportion and Average Return Test

We postulate a simple structure to examine the relationship between ACP and ROA. We will work with the same four groups for the univariate tests. For firms with very strict credit collection policies and quick collection windows, an increase in ACP should be associated with an increase in ROA. Therefore, if we separate the pairs of ROA-ACP, where ACP values are very low, relaxing the credit policy will increase sales, and the cumulative margin on sales will more than offset the incremental carrying cost of receivables. The improvement in profitability measured by ROA for the samples where ACP increases from a very low value (near the origin) must show up in the data. When there is no conscious effort to adjust ACP, there will be random changes in ACP and ROA, and a lower ACP should still mean a lower carrying cost. With a large number of observations, benefits should show up with a frequency greater than 50 percent. This behavior can manifest in two ways. First, a significantly high proportion of ACP increases should be associated with a positive increase in ROA. Let us define that proportion p = number of observations with positive change in ROA/total observations. The true proportion is π; thus, our first null and alternative hypotheses are as follows:

Hypothesis 1 (for relaxing credit with initial tight credit):

H_o: $\pi | (d > 0) \leq .50$,

H_a: $\pi | (d > 0) > .50$.

In this hypothesis, the changes in ACP in days are indicated by d, and d must be greater than zero. The standard deviation for testing the significance of proportions is $\sqrt{p * (1 - p)/(n - 1)}$. The value of p for the null hypothesis is 0.5. The test statistics will be computed as follows:

$$t = (p\text{-}\pi)/ \sqrt{p * (1 - p)/(n - 1)}$$

The above test is applicable for firms with a very low initial ACP (on the left side of Figure 1, Group 4), and the observations with a condition of only positive changes in ACP will be used. We have applied this, and the next three hypothesis tests to the four groups defined above.

For the firms with a relaxed trade credit policy and very high ACP (on the right side of the ACP axis, Figure 1, Group 1), we need to check if a reduction in ACP is associated with an improved ROA. This is done with hypothesis 2, stated below, which is tested with the condition that a response only to decreasing ACP will be used.

Hypothesis 2 (for tightening credit with initial lax credit resulting in a reduction in ACP):

H_o: $\pi | (d < 0) \leq .50$,

H_a: $\pi | (d < 0) > .50$.

In this hypothesis, the changes in ACP in days are indicated by d, and d must be negative. The test statistic, t, is the same as hypothesis 1, but as seen in the conditions to the hypotheses, the proportion of the increase in ROA from all responses is computed only for reductions in ACP.

The second way that an increase in ACP positively impacts ROA is that an average increase in ROA from an increase in ACP should show up with a positive average increase in ROA. If the average ROA increase is not positive, then we have no evidence that relaxing the credit policy will materially increase profit. We compute the average change in ROA for the same four groups. For each group, we isolate only positive changes in ACP from one year to the next in that specific range. Next, we isolate the ROA changes within that range. Thus, $\bar{X}$ =

$(\sum Xt)$/n, where the observation X is the change in ROA for a positive change in an ACP range. This leads to the

following hypothesis and right-sided univariate test, where μ is the true increase in ROA that responds to a positive

change in ACP, and $\overline{X}$ is the estimator.

Hypothesis 3 (for relaxing credit with initial tight credit)

H_o: μ | (d > 0) ≤ 0,

H_a: μ | (d > 0) > 0.

In this specification, μ is the true change in ROA resulting from an increase in ACP.

The situation reverses if we look from the right side of the ACP axis in Figure 1 (Group 1) and move to the left. When the ACP is high (Group 1), the firm is incurring a high carrying cost, and the cost exceeds the benefit resulting from higher sales. Theoretically, a firm with a very high ACP should try to reduce the ACP by tightening credit and improving collection efforts resulting in lower carrying costs, which should more than offset the loss from lost sales. If that happens, the firm should find that a reduction in ACP is associated with an increase in ROA. This time, we are isolating reduction in ACP from a very high ACP number to a lower number and measuring the impact of the move on ROA. This leads to the following hypothesis, where μ| is the true increase in ROA that

responds to a negative change in ACP starting on the right side, and $\overline{X}$ is the estimator.

Hypothesis 4 (for tightening credit with initial lax credit)

H_o: μ | (d<0) ≤ 0,

H_a: μ | (d<0) > 0.

It will not be unexpected if the results from the tests indicate that the conditional responses to positive and negative changes in ACP for Group 2 and Group 3 firms are approximately 50 percent and the average change in ROA is zero.

d. Piecewise Bivariate Regression

The conditional univariate tests, as laid out above, test the frequency of association and the average change in return responding to a change in ACP at different levels of initial ACP. We can also apply a bivariate ordinary least squares (OLS) regression model to examine if the desired response is received from a movement in ACP from an initial point. However, there are some challenges. The variance of the changes in ACP is likely to be much larger for higher levels of ACP. Using the percentage change in ACP is also unacceptable because it will magnify the changes at low ACP levels. Considering this, we opted to run piecewise regression using the following estimation scheme:

Step 1: The changes in ACP and ROA are calculated according to Equations 1 and 2, as given below:

$$\Delta ACP_{i,t} = ACP_{i,t} - ACP_{i,t-1} \tag{1}$$

$$\Delta ROA_{i,t} = ROA_{i,t} - ROA_{i,t-1} \tag{2}$$

Step 2: The data pairs are arranged from low ACP to high ACP and the corresponding return on assets values. This will break the time series feature of the data. Whether consciously done or not, a negative change in ACP (quicker collection) should bring out the expected change in ROA. Theoretically, when the ACP is low, a positive change in ACP should also be positive for ROA; and for high ACP, a negative change in ACP should have a positive effect on ROA.

Step 3: The data are broken up into separate groups based on ACP, such as ACP ranging from 0–30, 30–60, 90–120, 120–200, and 200–300. At the higher end of ACP, the ranges are wider and the data points are fewer.

Step 4: Positive and negative changes in ACP are separated within each ACP range.

Then, we run the regressions separately for various predefined segments for negative and positive ACP changes.

While regression results have been used to suggest that working capital management needs to be improved and made more effective, it does not point out exactly which firms should try to improve or exactly what they should do. First, referring back to Figure 1, firms on the right side of the horizontal axis are likely to benefit from a reduction in the ACP, which should save more from the carrying cost of financing than the gain to be made from increased sales. In fact, we recommend that management should keep a close eye on whether the firm is sliding toward the right side on the ACP axis. Sliding to the right may not be a concern if it is associated with a consistent increase in return, but that does not seem to be the case in Bangladesh.

If improvement in performance is sought, the firms with tight controls should gain from making credit easy, which will lead to increased ACP. If that is true, then an increase in ACP should be associated with an improvement in ROA. At the other end of the spectrum, firms with a very high ACP should ensure discipline in receivables management by tightening the credit policy. Therefore, firms with a high ACP should see an improved ROA from a reduction in receivables and ACP. Responses are different for positive changes to ACP and should be more pronounced on the left side for firms with a tight credit policy and for negative changes to ACP for firms with a relaxed trade credit policy, and the impact should fade as the ACP value approaches zero. We can test this with a segmented regression analysis for the two types of changes in ACP. Our testing plan is to compute the changes in ACP and ROA from the previous year. Then, the data are isolated based on the sign of the change in ACP and the corresponding change in ROA. We run a simple bivariate regression as follows:

$$Y1_{i,t} = \alpha + \beta \, X1_{i,t} \qquad (3)$$

where $Y1_{i,t}$ is the change in ROA computed according to Equation 2 and X1 is computed according to Equation 1. Relaxing the credit collection practice should show positive values of X and that should be associated with positive values of Y if relaxing credit is expected to have a positive effect on ROA, especially if the initial ACP value is very low. We will again note that the data is no longer time series data once we separate the positive ACP changes from negative ACP changes. In this regression, all X1 values are positive. We ran various segmentation schemes, and the one we report uses the following ranges in ACP: 0–30, 30–60, 60–90, 90–120, 120–200, 200–300. In terms of expectation, with positive changes in ACP, we should see a positive slope in the lower segments (left side of the ACP axis) and insignificant or negative values for right side segments.

We will run the same regression with only the negative values on the right side of Equation 4 for the same segments.

$$Y2_{it} = \alpha + \beta \, X2_{it} \qquad (4)$$

where $Y2_{it}$ is the change in ROA in year t from the previous year for firm i, and $X2_{it}$ is the negative change in ACP in year t from the previous year for the same firm i. We will run separate regressions for the various ACP groups.

4. VARIABLES AND DATA

The data are collected primarily from the annual reports submitted to the Dhaka Stock Exchange (DSE) and the websites of the sampled firms. We had 60 companies in our data set comprising only manufacturing and trading firms, and the equity capitalization varies from $20 million to $80 million.

To derive the ROA, we divided the net income after tax in the particular year by the average of the total year-end assets of that year and the previous year. We computed the average daily sales using a denominator of 365 days and divided the receivables at the end of the year by average sales. The data covered the period from 2000 to 2017. However, we also needed the data from 1999 to get the average needed to compute the ROA and ACP, and the changes in ACP and ROA for 2000. It was not possible to separate credit sales and cash sales. When the ACP figure turned out to be extraordinarily large, such as in the years when a firm had no production for some reason, we discarded those observations. We discarded 18 such observations.

5. RESULTS

Before we discuss our results, we would like to emphasize that we do not have any argument with the conclusions drawn in the literature that firms can do better by closely managing their working capital situations. We do have problems when the conclusions seem to suggest that a firm should be more aggressive in its receivables collections, or loosen its credit policies to improve profitability, or that there is an optimal working capital structure that a firm can identify. Policy recommendations will depend on the way a particular company operates and its leverage over its customers. In addition to that, there may be other factors in play that may prohibit a firm from acting on a recommendation. Textbooks generally discuss tools for making cost-based decisions on relaxing or tightening credit, which is at the disposal of the management to decide whether or not to make certain adjustments.

Now, let us look at the test results for the hypotheses. In hypothesis 1, if relaxing receivables collection is associated more often with positive changes in ROA, the proportion of positive changes in ROA should exceed 50 percent. We should see this in Group 4, and possibly in Group 3 too. The results are detailed below for the four groups of firms classified above and the overall results.

Table 2. Proportion test for response to an increase of ACP (test results for Hypothesis 1).

Group	Category	The proportion of ROA increase to ACP increase	T-value
Group 4	Very low ACP	0.29	–3.98
Group 3	Low ACP	0.30	–3.79
Group 2	High ACP	0.54	0.76
Group 1	Very high ACP	0.29	–3.98
	Overall	0.34	–3.04

Source: Derived from DSE Annual Reports.

All of the above tests are right-tailed tests, and more than 50 percent of ACP increases should be associated with positive ROA increases. However, the evidence is contrary to that. Only Group 2 shows a proportion that barely and insignificantly exceeds 0.50. To support the suggestion that firms with tight ACP control should relax the tight control to improve profitability, we should expect that only from Groups 3 and 4, but what we found is that relaxing the receivables policy may be hurting profitability. The test result is strongly against the contention that firms can improve profit by relaxing trade credit, even when they have very tight credit.

For hypothesis 2, the test is for firms with very high initial ACP (Groups 1 and 2), and the test checks if a reduction in ACP is associated with a positive response in ROA. In this hypothesis, the proportion of responses to a decrease in ACP for firms that tighten their receivables collection is expected to be positive. The results are produced below in Table 3 for the four groups of firms classified above and the overall results.

Table 3. Proportion test for response to a decrease of ACP (test results for Hypothesis 2).

Group	Category	The proportion of ROA increase to ACP decrease	T-value
Group 4	Very low ACP	0.66	3.4*
Group 3	Low ACP	0.49	–0.19
Group 2	High ACP	0.43	–1.32
Group 1	Very high ACP	0.66	3.20*
	Overall	0.54	0.76

Source: Derived from DSE Annual Reports.

The results this time are mixed. Group 1 firms (very high initial ACP) seem to garner a positive response from a reduction of ACP. Surprisingly, the Group 4 firms also experience a statistically significant proportion of the positive responses, which is contrary to what is expected for firms with very tight credit.

We will now examine hypotheses 3 and 4 that test if a change in ACP brings about a positive return on average regardless of the proportion of respondents in the expected direction.

719

Table 4. Average ROA improvement test for response to an increase of ACP (test results for hypothesis 3).

Group	Category	Average increase (+) or decrease (-) in ROA for relaxing trade credit	T-value
Group 4	Very low ACP	-0.82%	-2.13
Group 3	Low ACP	-1.1%	-2.16
Group 2	High ACP	+.04%	0.13
Group 1	Very high ACP	-1.26%	-2.69

Source: Derived from DSE Annual Reports.

Increasing ACP is the normal prescription for Group 4 firms, and possibly also Group 3 firms with stringent control on receivables. In Table 3, we see that, in Bangladesh, these firms did not benefit from expanding trade credit. The same result is confirmed in Table 4. Not only did the average ROA not increase, but there was also an average decrease, which would be significant if we had done a left side test. A decrease in average ROA resulting from an increase in ACP may make sense for Group 1 firms, which should not increase the ACP anyway.

Next, we examine if a decrease in ACP, which is expected from high ACP firms (Group 1 and possibly Group 2), results in an improvement in ROA average. This is presented in Table 5 below.

Table 5. Average ROA improvement test for response to a decrease in ACP (test result for Hypothesis 4).

Group	Category	Average increase (+) or decrease (-) in	t value
Group 4	Very low ACP	1.02%	2.51*
Group 3	Low ACP	0.68%	1.25
Group 2	High ACP	.28%	0.67
Group 1	Very high ACP	0.83%	2.41*

Source: Derived from DSE Annual Reports.

The average gain from lowering ACP is positive and significant for high ACP firms (Group 1). Interestingly, even Group 4 (low ACP) firms also have also shown gains from cutting the length of the ACP. We think that these firms are showing the benefits of reducing their ACP from a high level to a low level. We have excluded the outliers (large reduction in Groups 3 and 4), and the result is still positive and significant for Group 1 firms. We checked the raw data for these firms, and there are some firms in this group that had quite high ACPs in the middle of our sample period, but in recent years their ACP length is quite low. This appears to be a response to the adverse effect of a high ACP, taking lessons from there, and implementing a very stringent trade credit policy. The indication is also seen in Figure 2. The gains more than offset the losses, even for firms in this group. In Figure 2, we can see that the ACP for these firms kept getting lower over time, even though they generally have low ACPs even in the early stage of the data period. Clearly, these firms do not see any benefit from extending credit to weak customers.

All test results presented above are quite contradictory to what we would normally expect to see. For example, in Table 2, we found that firms with very strict trade credit policies do not benefit from relaxing trade credit. Rather, relaxing trade credit appears to have a negative effect. Relaxing trade credit is not a great idea for a highly lax collection policy, and Table 2 indicates this. Table 3 indicates, that for firms with highly lax credit collection policies, a reduction in ACP is associated with a positive response. However, as far as support goes for the traditional trade management point of view, we understand that firms with very weak credit collection are adversely affected by being more lenient and will benefit from having stricter credit collection. Contrary to what we get from traditional theory, firms with very strict policies may be able to improve profitability, and the evidence indicates that there is no benefit from relaxing credit. Rather, it may hurt profitability. The same conclusion is demonstrated in Tables 4 and 5.

6. RESULT OF PIECEWISE REGRESSION

Through a simple regression structure, we plan to examine if firms with a history of a strict trade collection policy may benefit from relaxing their collection efforts. Similarly, we examine if firms with weak collection efforts benefit from stricter collection efforts. If there is to be an optimal length, it should show up in our regression. We examined the data and tried several segmentation schemes, all of which basically show the same thing.

The firms placed in the first segment with an ACP of 0–30 tend to be mostly in a very low ACP range through the observation period. Similarly, firms with a high ACP tend to remain in the high ACP group throughout the data period. Most of these firms belong to the high ACP group in Figure 2. The changes are computed from the previous year's numbers. These changes can be large for high ACP firms, as a reduction of ACP from 200 down to 30 is possible, but in the 0–30 group, we should not have a large negative number or a large positive number for the change in ACP. A large negative number may have been obtained when, for whatever reason, the average ACP in one year happens to fall in this category because the previous year's ACP was much larger. We discarded these numbers. Similarly, in the high ACP group, the observation might have been large because the ACP of the firm in the previous year was very small, and we discarded these numbers also. Once the data setup was complete, we ran a simple bivariate regression. The results are presented in Tables 6 and Table 7 below.

Table 6. Change in return on assets responding to a negative change in average collection period. Equation: $Y1_i = \alpha + \beta X1_i$ (Y = change in ROA, X = change in ACP).

Group	Constant	Slope Coefficient	T-stat for slope
0–30	0.0048	–0.000549	–1.46
30–60	0.0010	0.000035	0.127
60–90	0.0211	0.000303	1.05
90–120	–0.000931	–0.000013	–0.02
120–200	–0.07937	–0.000694	–1.75
200–300	0.002379	–0.000034	–.53

Source: Derived from DSE Annual Reports.

In Table 6, the independent X1 values are all negative, and therefore, if the slope coefficient is negative, it implies that a reduction is associated with an increase in ROA. However, the slope coefficients in none of the groups are significant, indicating that, over the observation period, a reduction in ACP did not improve profits. The slope coefficient for the 120–200 range is negative and relatively high but does not cross the significance threshold.

Table 7. Change in return on assets responding to a positive change in average collection period. Equation: $Y2_i = \alpha + \beta X2_i$ (Y = change in ROA, X = change in ACP).

Group	Constant	Slope Coefficient	T-stat for slope
0–30	–0.0048	–0.00457	–0.76
30–60	0.007147	–0.001333	–2.07
60–90	0.004751	–0.000229	–0.74
90–120	–.015578	0.000290	1.21
120–200	–0.013828	–0.000136	0.59
200–300	0.028267	–0.001096	–4.02*

In Table 7, the independent variable X2 values are positive, and a positive slope would indicate that increases in ACP are associated with increases in ROA. If the argument is that firms with strict credit policies may improve profits by relaxing credit, we should look at the first two groups where the slope coefficients are negative. Thus, there is no evidence that relaxing credit will improve profit. This reaffirms our results in Tables 2 and 4. The only significant slope coefficient is in the last group, and it indicates that relaxing credit further is not helpful. These firms are clearly in trouble, and their survival may depend on reining in receivables.

7. SUMMARY AND DISCUSSION

Our data do not provide any support for adjustments to managed receivables collection to improve profitability. It does emphatically say what not to do, and that is "Don't ease credit collection efforts". This may very well be the case in many emerging economies. Any movement to the right along the ACP axis from the present location (in Figure 1) is mostly associated with a negative impact on profitability. It prescribes to manage the receivables in a way that does not extend ACP. Our results consistently show that further extension of the ACP, regardless of where the firm is on the ACP axis (very strict or relaxed) gets negatively impacted. Table 3 indicates that for very high ACP firms, lowering ACP is beneficial. However, surprisingly, firms with very tight receivables control also benefit from a reduction in ACP. This may be explained by some firms moving into this group from a higher ACP group. Tables 2 and 5 indicate that a reduction in the ACP is associated with a positive impact on ROA all across, but they are not statistically significant, except for Group 4 (tight credit).

From the regression estimates provided in Table 6, we do not see any statistically significant impact on ROA from reducing the ACP. Similar to Tables 3 and 5, the positive impact may be recognized at a 10 percent significance level for the lowest and highest ACP groups. In Table 7, increasing ACP does not indicate any benefit for any group but implies a negative effect on profitability for the highest ACP group.

The overall message we derive from the data analyzed in this paper for management is to avoid easing credit collection. Relaxing collection is not advised for the firms with the lowest ACP, as shown in Tables 2, 4, and 7. Tightening credit seems to benefit firms in all categories, as shown in Tables 3, 4, and 6. We must note that, statistically, the benefits are significant for very high initial ACP, as shown in Table 6, Figure 2, combined with the analysis presented in this paper, efforts to improve credit collection is better than trying to sell to new customers, who are probably weaker customers, and being lenient with credit collection may result in loss of control of receivables. Firms cannot count on the weak legal framework in the country to recover overdue payments.

There may be some value in knowing what the norm in the industry is where a new firm will compete, and it is unlikely that such a firm will be able to create and execute a policy that is significantly different from the average. A firm with weak competitiveness may have to adopt a policy of easy credit, but it is very important for such a firm to maintain control over their receivables. Chasing customers with easy credit is not advisable in emerging economies. A new firm with a compelling case of quality and competitive strength may be more successful in managing a successful low ACP operating structure and keeping the ACP low remains a sound piece of advice.

Searching for improvement in performance from tweaking working capital levels is unlikely to be fruitful. Firms should carry out a simulation analysis or careful evaluation of a particular course of action before any decision is made regarding selling on credit, credit terms, and collection efforts. The suggestions made in the literature about the concept of an optimal working capital mix is not practical and may be counterproductive.

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