The challenge in managing working capital in an emerging economy: The case of Bangladesh

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ABSTRACT

The paper seeks to determine whether management can offset an increase in the age of inventory with a reduction in the age of receivables, and which variable is more important in managing the overall cash conversion cycle. Using data from 2011 to 2020 on 77 non-financial companies listed on the Dhaka Stock Exchange, we applied the generalized method of moments regression with a specific goal of examining the impact of receivables and inventory on profitability. When limiting the total amount tied up in working capital is a goal, a legitimate question is whether a firm can limit the total amount tied up in receivables alone, with inventory alone, or net the total reduction. Both variables should have a similar financial cost of working capital. This paper strongly indicates that in managing working capital, the focus needs to be on receivables management. Losing control of receivables will impact profitability much more than managing inventory, and the option to balance an increase in the age of receivables through a decrease in inventory is generally not possible. The results also indicate that larger firms generally do a better job than smaller firms.

Contribution/Originality: This study is unique in its aim to determine whether a firm can limit the amount tied up in receivables alone, inventory alone, or net total reduction. We found that the focus needs to be on receivables management. Losing control of receivables will impact profitability more than managing inventory.

1. INTRODUCTION

Working capital management was not a widely discussed and followed topic in finance journals until recent decades. The frequency of articles on working capital in major journals rose after the emergence of new economies, emerging economies, and frontier economies after the collapse of the Soviet Union. Large firms in developed economies are well capitalized, and their working capital strategies and management policies are based on years of knowledge and executive skills, and they benefit from ever-improving technology. Contrarily, in developing countries, firms are still evolving and adopting better practices and technology tools, and unlike the firms in Western countries, their access to capital may be significantly limited. Most businesses are family-run, and it is rare to find a company that is entrusted to a professional management team. While this may also happen in relatively

new firms in stronger economies, examining how a firm goes through its development phases in the developing world through the lens of published research may provide useful insights.

The practices related to the management of working capital and liquidity in emerging economies may be very different from those of developed economies. Variations in practices and applied rules among firms and industries also exist in the developed world. Many practitioners and experts suggest that US firms have too many resources tied up in working capital (Hill, Kelly, & Highfield, 2010; Kieschnick, LaPlante, & Moussawi, 2006). Various articles on working capital in emerging economies also indicate that firms manage their working capital inefficiently because they keep too many resources tied up in inventory and accounts receivable. A 2019 report by Ernst and Young (2019) found that there was as much as US $2.5 trillion in excess working capital by 1,500 top US and European firms. They also claimed that there might be opportunities to improve working capital management by US $100 million per year. That may provide a strong incentive for focusing on working capital management.

This paper is organized as follows: In Section 2, the literature review and a brief discussion of some of the issues raised in working capital management studies is provided. Section 3 covers the methodology and a summary of the data. The main focus of this paper is to show a process that will more precisely identify exactly what type of change should be targeted to improve working capital management, develop a better understanding of the roles of the components of receivables and inventory in working capital management, and develop greater clarity of the options available in managing working capital. Section 4 contains the results and interpretations. Section 5 provides some general recommendations which will be helpful to practitioners.

2. LITERATURE REVIEW

Because of the different definitions and terminologies used in the literature, it becomes somewhat confusing whether the authors' findings are similar or conflicting. As defined by Hill et al. (2010) a conclusion regarding working capital requirements may not conflict with a conclusion drawn about the cash conversion cycle (CCC) or net trading cycle. Leading authors of working capital literature using similar terminologies include Afrifa (2016), Baños-Caballero, García-Teruel, and Martínez-Solano (2014), Eda and Mehmet (2009), Pais and Gama (2015), Deloof (2003) and Lazaridis and Tryfonidis (2006). Generally, the conclusions suggest that tighter receivables and inventory management can improve profitability. However, such a conclusion does not specify whether just one variable or all variables jointly need to be tightly controlled for better profitability. Hassan, Aysan, Kayani, and Choudhury (2023) Senan, Al-Faryan, Anagreh, Al-Homaidi, and Tabash (2022) and Yilmaz and Nobanee (2023) have recently used similar-sounding terminologies in different countries and drawn similar conclusions.

Managing working capital must continuously monitor the age of receivables and inventory. We assume that accounts payable cannot be delayed without damaging the relationship with suppliers, or unless management is forced to do so due to a lack of funds. Inventory management involves efforts to maintain inventory at or near a target level. If the actual level falls below the target level, it may be due to unexpected demand for extra production, which is not an entirely undesirable situation. A temporary dip or sudden short-term rise does not necessarily imply inefficiency. A sudden increase in the inventory volume may be due to events beyond the management's control, even though it will require attention going forward. If the increase is caused by a decline in demand for products, that will certainly be a cause for concern, but management may deliberately increase inventory on the shelf to prepare for an expected increase in demand.

Recently, Afrifa, Tingbani, and Adesina (2022) introduced a measure called "Working Capital Efficiency (WCE)" that relies on an estimated regression output based on the usually accepted explanatory variables, and the average value is just above 0.5. According to this model, firms (or countries) scoring above the average may be considered more efficient than those who do not. Prasad, Sivasankaran, Paul, and Kannadhasan (2019) introduced a measure called the Working Capital Efficiency Multiplier (WCEM), by which a lower number implies greater working capital management efficiency.

The variation in working capital fluctuates from industry to industry and country to country and has been well-documented (Hill et al., 2010). Evidence of a positive association between profitability and investment in working capital has been presented by many authors, who often implied that tightly controlled receivables and inventory results in better profit. The authors go on to state that the "effective" management of working capital leads to better results. Associating the term "effective" with the lowest holding of receivables and inventory leaves value creation out of the equation. We find this assertion somewhat problematic. Survival of some firms may depend on extending credit terms to their customers because these firms may do business in a space where their customers are not financially strong. Performance may depend on an offer of flexibility with receivables and the build-up of inventory.

Generally, we may never have a zero-inventory policy and the closest we can get is with just-in-time management. In most cases, we must have finished products on the shelves if we want to sell. We must have raw materials if we want to produce/manufacture something. An inventory of finished goods is more likely to vary based on the fluctuations in the demand and supply of the product. Receivables, on the other hand, will vary quite a bit based on how relaxed or how strictly a policy of collections is followed. A better definition of "effective" working capital management should mean how well and closely the firm executes its established policies regarding working capital management. If management determines that a change in its policies and executing such policies may have benefits, the policy should change first. Suppose we define net working capital as accounts receivable (AR) plus inventory (INV) minus accounts payable (AP). In that case, there are twenty-seven different combinations to move to a longer cash conversion cycle (CCC) or a shorter CCC stance. Combining a change in AP level with a change in AR or INV, or both, it is difficult to tell, without comparing costs, if we get a desirable CCC value. Additionally, it is important to recognize that the potential impact of each combination will rely on the magnitude of the change in each variable.

Stretching accounts payable is generally not an option for actively managing working capital. Lengthening accounts payable, endogenous or not, will mathematically lower the cash conversion cycle, a desirable goal, but we should not overlook the possibility that this lengthening could actually be associated negatively with profits, as argued by García-Teruel and Martínez-Solano (2007); Deloof (2003) and Lazaridis and Tryfonidis (2006). Knauer and Wöhrmann (2013) and Kestens, Van Cauwenberge, and Bauwhede (2012) reported that the payables period is often stretched during difficult times, which is not surprising, and this appears to be the case in Bangladesh during the time period under study. In Bangladesh, payables are stretched due to an increase in the average collection period (ACP) and the age of inventory (AoI), forcing firms to rely on short-term debt. We will assume that lengthening the payable age is not part of active working capital management. Table 1 presents several scenarios and possible associated questions. The acronyms are as follows: Accounts receivable is AR, accounts payable is AP, net working capital is NWC, and cash conversion cycle is CCC. The actual management horizon and the policy options associated with the horizon will be more complex.

The table shows only a few of the possible combinations that produce a change in overall working capital investment and CCC. We have not shown the possible combinations where one rises and the other falls, which may soften the negative impact of the rising cost of working capital.

Some authors claim that their results indicate that an optimal level of working capital exists for companies, but we disagree with the use of the terms "effective" or "optimal." A high level of current assets increases liquidity, especially if this includes substantial cash holding. However, overinvestment in current assets increases financial costs and reduces profitability. We prefer the García-Teruel and Martínez-Solano (2007) definition of the optimum working capital as a state that balances risk and efficiency and minimizes both carrying and opportunity costs. Incorporating risk in the cost and profit equation is not easy; we will sidestep this and focus on cost or profitability. This paper argues that the existence of an optimum working capital level, while theoretically acceptable, is not observable and not easily manageable for a small firm.

Table 1. Impact on profitability due to changes in CCC components.

Changes (Increase or decrease)	What is the overall impact?	Will it improve profits/lower cost?
AR tightened, inventory same, AP same	Investment in NWC will decrease/CCC will decrease	May go either way. If incremental cost savings from carrying lower AR more than offset margin from lost sales, profit will increase.
AR same, inventory lower, AP same	Investment in NWC will decrease/CCC will decrease	We don't know. If the margin from lost sales does not fully offset cost savings of holding lower inventory, profit will increase.
AR tightened, inventory lower, AP same	Investment in NWC will decrease/CCC will decrease	If the margin from lost sales does not fully offset cost savings resulting from lower CCC, profit will increase. If one completely offsets the other, then there may be no change at all.
AR higher, inventory same, AP higher	Impact on NWC and CCC will depend on the relative increase and their weight in the working capital structure	We don't know. There may be incremental margins from higher sales. There may be a higher carrying cost of AR. There may be negative (Both noticeable and unnoticeable) impacts on supplier relationships, loyalty, quality of supplies, etc.
AR same, inventory higher, AP higher	Impact on NWC and CCC will depend on their relative increase and weight in the working capital structure	We don't know. There may be a reduction in stock-outs. There may be a higher carrying cost of inventory. There may be negative (Both noticeable and unnoticeable) impacts on supplier relationships, loyalty, quality of supplies, etc.
AR same, inventory same, AP higher	Investment in NWC will decrease/CCC will decrease	Lower cost of working capital financing. There may be negative (Both noticeable and unnoticeable) impacts on supplier relationship, loyalty, quality of supplies, etc.

The idea of an optimal policy that minimizes cost and hinges on the idea that the cost curve is U-shaped was put forward by Afrifa (2016); Baños-Caballero et al. (2014) and Pais and Gama (2015). However, this may not be true for emerging and frontier economies. Ahkam and Alom (2019) provide evidence that the impact on cost or profitability may not be clear except for extreme levels of current asset–current liability mixes. This implies that most firms will be in a very broad range that will allow them to take advantage of their specific situations, and inefficiency only manifests when the actual numbers are extreme. It will be difficult to say definitively if a firm can noticeably improve profitability or efficiency with an adjustment in accounts receivable or inventory policies.

Several authors have suggested that certain actions may lead to more efficient working capital management. In working capital management literature, we often encounter the terms "effective" working capital management and "efficiency" of working capital management. We know that "effective" and "efficient" are not the same thing, but in the context of working capital management, we think that "effective" and "efficient" are not that different. Both terms suggest that "something better" is to be pursued. An efficient policy will pursue a level of working capital so that firms can avoid excessive investment in current assets and increase profitability (Eda & Mehmet, 2009). We recognize that the differences among the terms "efficiency", "effectiveness," and "optimal" may be just semantics. However, in this paper we use the term "efficient" instead of "effective," which attempts to pursue a balanced policy.

This study focuses mainly on the reduction of the average collection period (ACP) and the age of inventory (AoI) because this seems to be the most common advice recommended by research related to these two variables. Working capital policies articulate rules regarding trade credit and collections, identify standard delays in paying off bills and payables, and hold inventory at a reasonable level with sufficient safety stocks. Effective working capital management monitors three critical elements: (1) on-time collection, (2) financing working capital requirements, as suggested by Hill et al. (2010) and (3) setting general guidelines regarding what short-term or long-term sources will be used to meet the requirements.

An association of higher profit with a shorter net trading cycle or a lower investment in net working capital does not necessarily lead to the recommendation that working capital should be lowered. Any decision to reduce the working capital balance must examine the incremental benefit from a change in policy, which will save the carrying cost of the assets. However, if the incremental savings are less than the incremental loss of revenue and deteriorating client and supplier relationships, the minor savings will not be justified.

The possible conflicting mixes of working capital components and the challenge of knowing what we can characterize as efficient mean that the analyses fail to fully consider the risk aspect of decisions. It is fairly common to assume that lower CCC and smaller overall working capital are more efficient and should produce greater profitability. With respect to managing trade receivables, the literature has indicated quite definitively that controlling the age of receivables and inventory is very important, and they should not be allowed to inflate. Many authors have suggested that tighter control of receivables and inventory and an aggressive collections policy may improve profitability (Mandipa & Sibindi, 2022; Nwude, Allison, & Nwude, 2021; Rojas, Cueva, Armas, & Matailo, 2017). However, provide evidence that while a reduction in ACP should improve profitability even when the ACP is high, it does not necessarily work that way in reality. They also show that a movement to easier trade credit for firms with very low ACP does not necessarily improve profitability.

3. METHODOLOGY

The impact on profitability is tested by regressing ACP and AoI using firm size and total debt ratio as control variables. Given potential autoregressive behavior and multicollinearity, generalized method of moments (GMM) regressions have been run. This is done through panel regression via the following specification:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it} \qquad (1)$$

Y_{it} is the return on equity of firm i in year t,

X_1 is the number of days of sales uncollected (ACP),

X_2 is the number of days of inventory held,

X_3 is the size of the business measured by the natural log of total assets (Ln Total Assets) and

X_4 is the total debt ratio.

X_3 serves as the control variable.

β_1, β_2, and β_4 should have negative signs, but the sign of β_3 cannot be prespecified. It needs to be pointed out that bigger firms in developing and emerging economies tend to be more profitable than smaller firms.

While regression is the most widely used form of aggregate analysis, it is worthwhile examining the relationships individually. This will be done by looking at individual cases and trying to gain insight into how management decisions were taken and how effective they were relative to a supposedly better solution. The line charts of the individual companies are indicative of management "muddling through". It is not possible to present all cases within the space permissible for this paper, therefore, a number of cases were randomly selected for this paper. All figures will be made available to any interested reader. We will also apply some simple descriptive analyses along with some standard statistical analyses to closely examine working capital management in Bangladesh from 2011 to 2020.
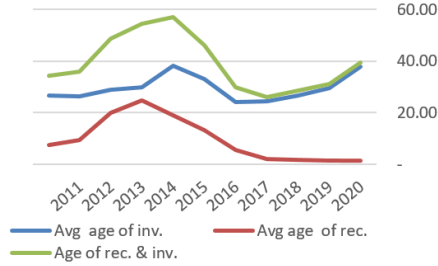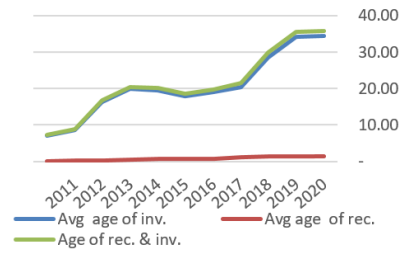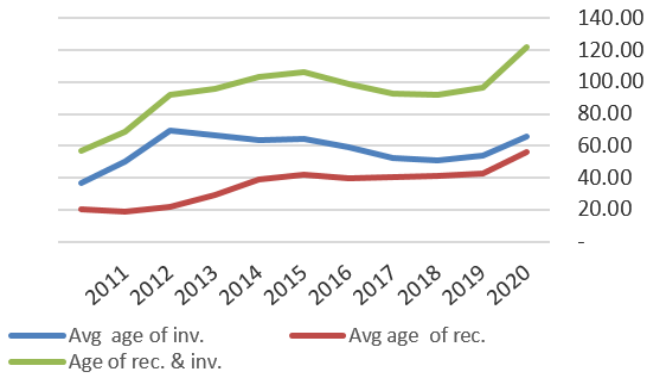
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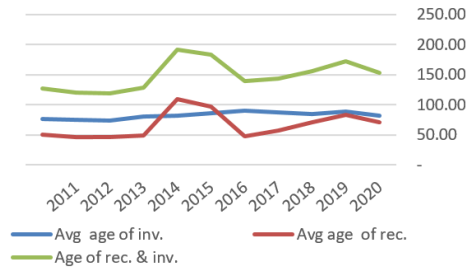
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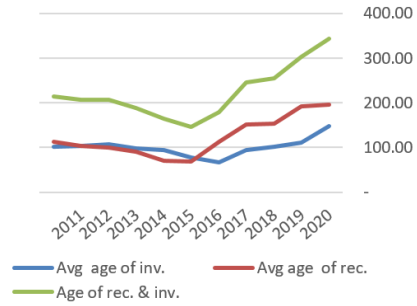
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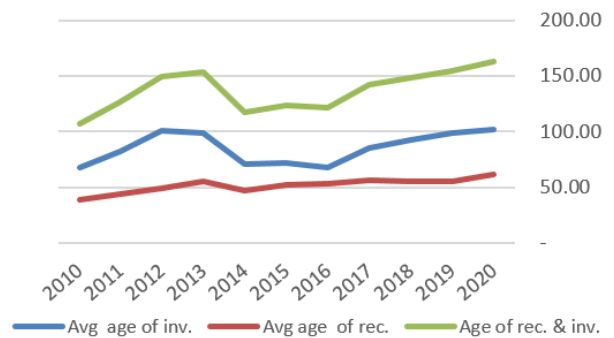### Olympic
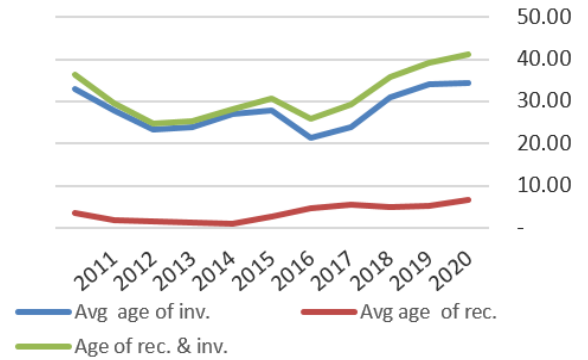
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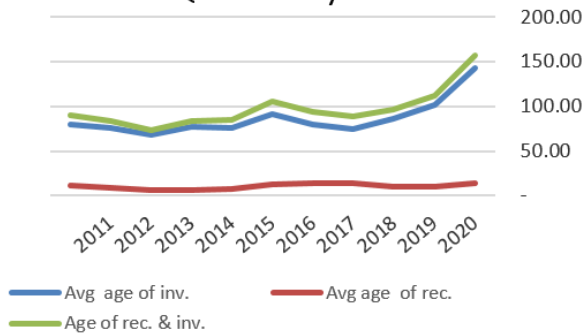
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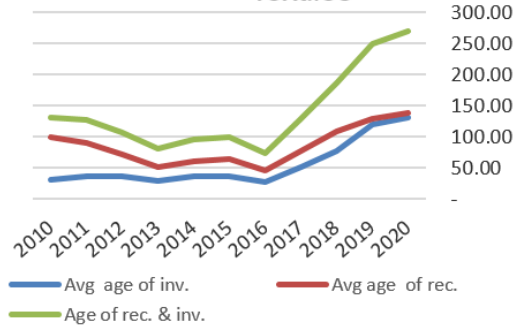
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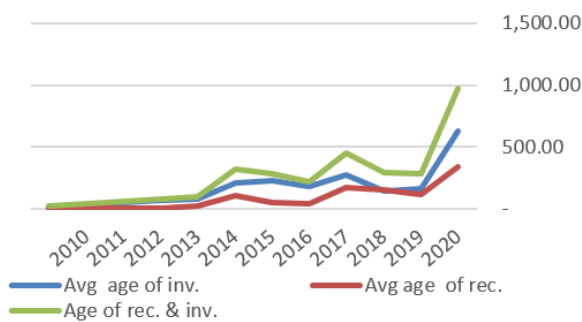
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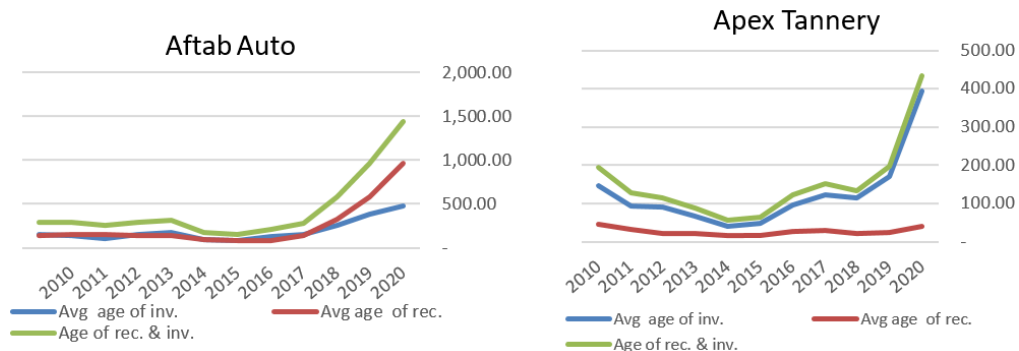
Figure 1. Working capital tied up by days: Company view.

The firms in Figure 1 were randomly selected. Successful working capital management should have flat trend lines for age of inventory and age of receivables, if not pointing down. Any effort to balance the age of inventory and the age of receivables should indicate opposite movement in one responding to the other. However, this pattern is almost completely absent as the top trend line is almost always higher on the right than on the left, more often showing a constantly increasing upward movement. We don't see any clearly noticeable offsetting movement (one rising while the other falling, and vice versa) when we look at the chart lines of the age variables for inventory and receivables.
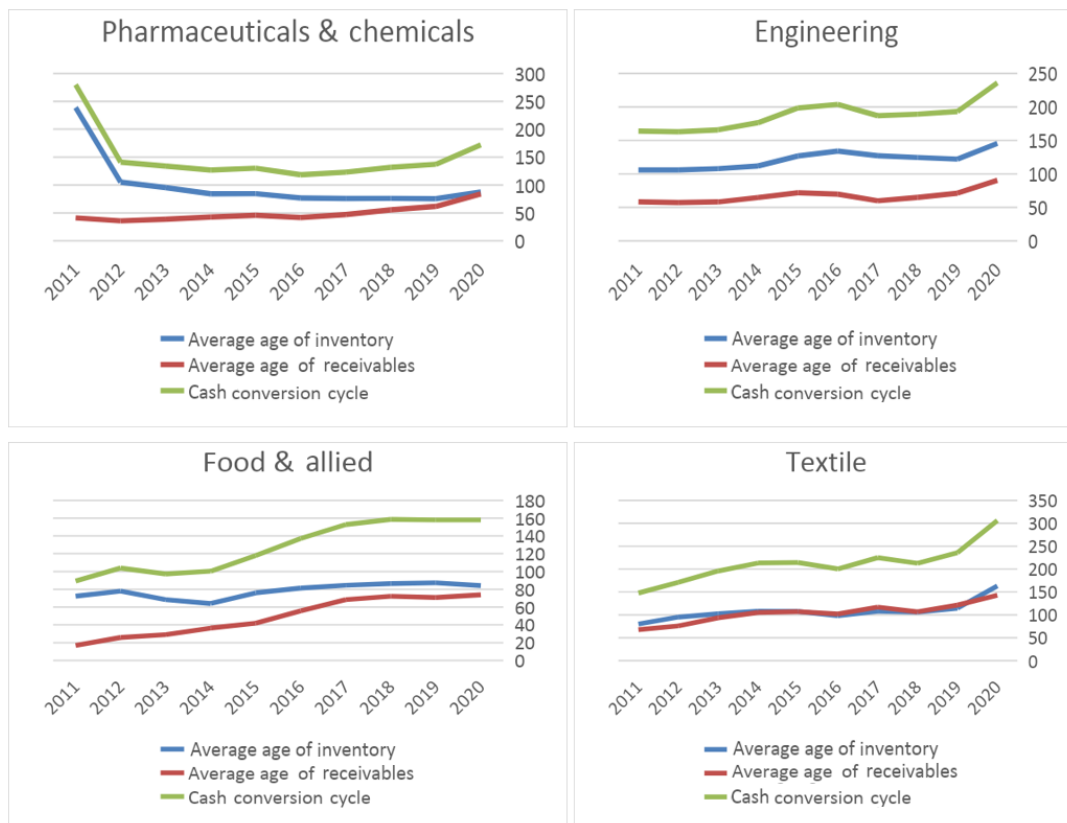
Figure 2. Working capital tied up by days: Industry view.

If we review Figure 2, which shows the patterns in the industry, the curves indicate similar patterns where the trend line for both receivables and inventory holdings have generally increased during the time frame. The only exception is the pharmaceutical and chemical indust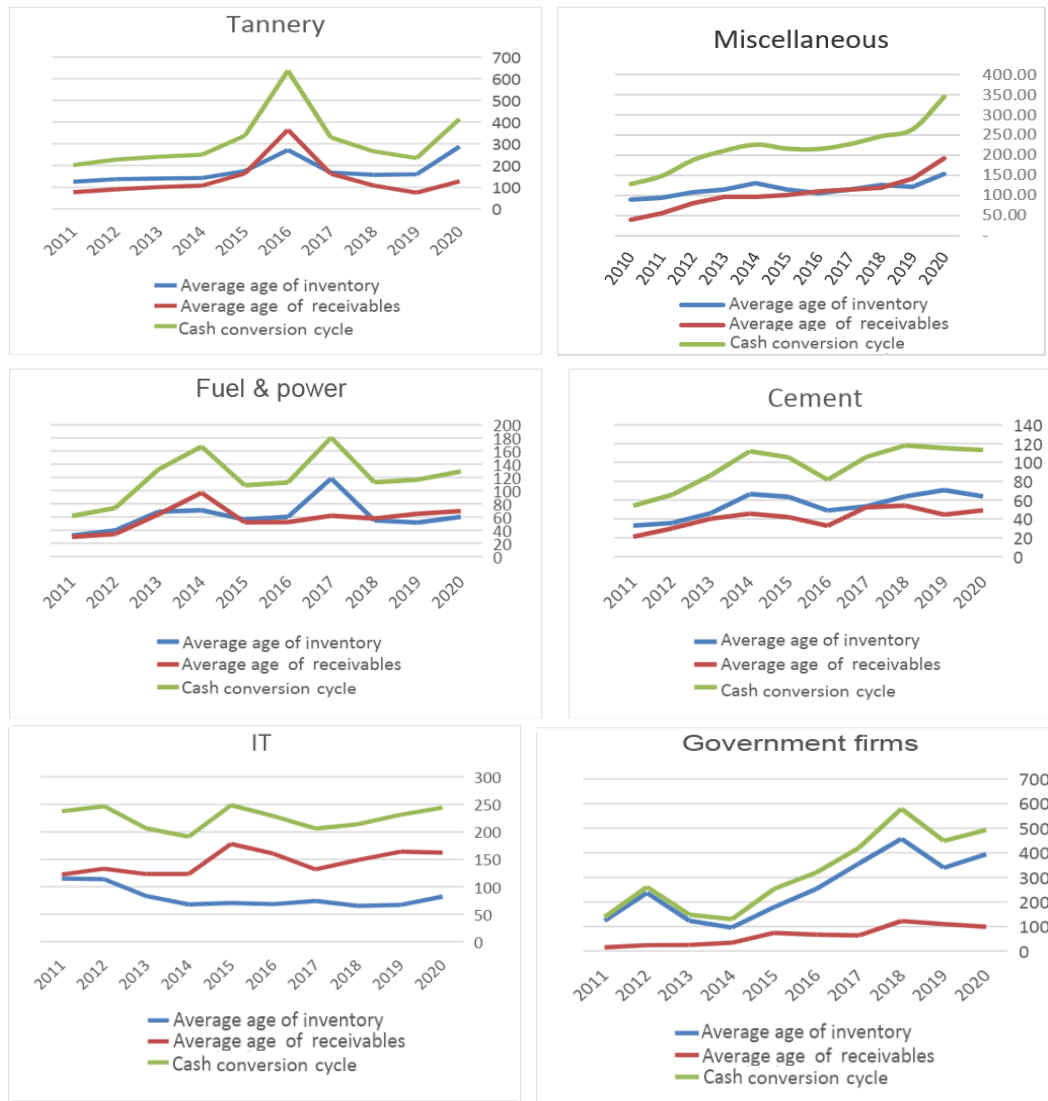ries and IT firms, which have better leverage over customers. There is no indication of offsetting behavior (i.e., a rise in one associated with a fall in the other.) While we do not see this offsetting behavior in the charts, we can statistically for it by stating a simple null hypothesis that the two variables move in the opposite direction.

Ho: $\rho_{ri} \leq 0$.

Where ρ_{ri} is the correlation between receivables and inventory. We can simply look at the cross-correlation matrix to test this hypothesis.

The age of inventory will not decrease (increase) to adjust to the increase (decrease) in the age of receivables. Even if there is an effort and policy-driven decline in the age of receivables, the age of inventory will not respond to that. We argue that firms will see the age of inventory and the age of receivables move in the opposite direction when there is an effort to have a targeted ACP plus AoI number. If the ACP increases, there should be an effort to reduce the inventory. If receivables collection is good, a more relaxed stance can be taken with respect to the size of the inventory. The correlation between the ACP and AoI values should be negative. The pairwise Granger causality tests will also shed some light on this dynamic.

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As stated in the previous section, many authors found that there is a negative relationship between CCC and profitability or market value. In the findings section, authors often conclude with a statement such as "Firms perhaps can improve profitability by managing receivables better." Managing receivables includes increasing receivables to improve profitability. Relaxing credit policy will increase sales and profit margin, as well as receivables and financial costs. However, in emerging and less developed economies, in recent years, data rarely shows any decreasing trend in receivables. Taken together with Figure 1 and Figure 2, the first three scenarios in Table 1 are inconsistent with the data in the figures. In the other three scenarios in Table 1, there is no evidence of decreasing inventory offsetting an increase in receivables.

There may be several ways of controlling working capital, but adjusting inventory and payables is not realistic in many cases. Efficient working capital management comes down to the management of receivables and inventory, whenever possible, and the financing of working capital. If we assume that the management will not willfully delay payments, payment on time has to rely on borrowed money for working capital, and that will affect profitability. To identify that impact, we do not need the age of accounts payable or the size of the borrowed amount. Many firms do not carry permanent long-term debt. From time to time, there may be some long-term loans that gradually decrease to zero, but nearly all firms carry a relatively high amount of short-term debt shown in current liabilities. Those firms rely on short-term loans to fund long-term assets, including permanent working capital. We will try to cover the effect of reliance on borrowed money through the total debt ratio of firms.

The age of inventory may be more stable relative to the average collection period. The age of receivables can be brought down by persuasion, policy, and a strong collection system. However, once a policy is implemented for inventory, there is unlikely to be a policy change soon after. The size of the inventory is likely to be impacted by sales and the average collection period. We should also see the age of inventory in a much smaller range. If our argument is correct, then the standard deviation of the age of inventory will be smaller (narrower range). Unlike receivables, where the firm may have difficulty collecting receivables, an increase in the age of inventory may be reduced to its normal mean without having to involve external parties. To test these, we can test the variances of these two variables and check if the age of inventory has a smaller variance. We will also look at the plots over time and compare them for industry differences. We can also test the following hypothesis:

Ho: $\sigma^2_{AoI} \geq \sigma^2_{AoR.}$

A simple F-test is required, and rejection will support a narrower range of AoI.

3.1. Variables and Data

The Dhaka Stock Exchange (DSE) is our primary data source. Seventy-seven companies from our data set comprising non-bank and non-financial sectors qualified for the study. Return on assets (ROA) is the dependent variable. The predictor variables are the days sales outstanding or average collection period (ACP), average inventory in days (age of inventory or AoI), log of total assets (Ln Total Assets), and total debt ratio (TDR). The Ln Total Assets is used as a control variable. The TDR may have an endogenous relationship with working capital in Bangladesh. If receivables and inventory increase, it will lead to an increase in debt. The data summary is presented in Table 2.

It is interesting to note that AoI has a narrower range (0 to 926) than ACP (0 to 1424). The standard deviation of AoI is also smaller than the standard deviation of ACP. The Jarque–Bera statistics indicate that we cannot assume stationarity in the distribution of the variables. Regarding the tendency of AoI to return to the mean, the charts in Figure 1 do not contradict that, but it is not supportive of the statement either. There is also no indication that ACP and AoI will move in any way to offset the increase of one with a decrease of the other. They generally move in the same direction.

Table 2. Data summary.

Statistic	ROA	ACP	Inventory age	Ln total assets	Total debt ratio
Mean	0.050	92.570	117.573	21.412	0.477
Median	0.035	56.734	87.842	21.392	0.479
Maximum	0.852	1424.497	926.425	25.600	1.816
Minimum	−0.227	0.000	0.000	0.000	0.000
Std. dev.	0.074	130.612	111.125	2.145	0.253
Skewness	3.662	4.457	2.600	−5.063	0.836
Kurtosis	33.583	33.673	12.833	52.478	6.159
Jarque–Bera	31728.860	32733.250	3970.018	81832.540	409.832
Probability	0.000	0.000	0.000	0.000	0.000
Sum	38.453	71279.280	90530.960	16486.870	367.419
Sum sq. dev.	4.246	13118842.000	9496160.000	3538.213	49.374
Observations	770	770	770	770	770

4. FINDINGS

The cross-correlation matrix is presented in Table 3. The correlation between ACP and AoI is positive and significant, even though, in absolute terms, the correlation values are not very high. This implies that an increase in ACP is unlikely to be offset by a decrease in AoI. Rather, when collection gets weak, AoI will likely increase despite efforts to rein it in. A significant negative correlation between the total debt ratio (TDR) and return on assets (ROA) is present, though it is not high. The debt ratio also has a clear negative impact on profitability.

Table 3. Cross-correlation.

Statistic	ROA	ACP	Inventory	Ln total assets	Total debt ratio
ROA	1.000	−0.222	−0.279	0.083	−0.150
ACP	−0.222	1.000	0.275	0.142	−0.022
Inventory	−0.279	0.275	1.000	0.002	−0.043
Ln total assets	0.083	0.142	0.002	1.000	0.017
Total debt ratio	−0.150	−0.022	−0.043	0.017	1.000

The pairwise Granger causality test results are presented in Table 4.

Table 4. Pairwise Granger causality test.

Observations: 768			
Lags: 2			
Null hypothesis	Box #	F-statistic	Prob
Inventory does not Granger-cause ACP	1	7.268**	0.001
ACP does not Granger-cause inventory		0.781	0.459
Ln total assets does not Granger-cause ACP	2	0.208	0.813
ACP does not Granger-cause Ln total assets		0.157	0.854
ROA does not Granger-cause ACP	3	0.724	0.485
ACP does not Granger-cause ROA		3.089*	0.046
Ln total assets does not Granger-cause inventory	4	1.595	0.204
Inventory does not Granger-cause Ln total assets		1.939	0.145
Total debt ratio does not Granger-cause ACP	5	0.900	0.407
ACP does not Granger-cause total debt ratio		2.682	0.069
ROA does not Granger-cause inventory	6	1.911	0.149
Inventory does not Granger-cause ROA		2.216	0.110
Total debt ratio does not Granger-cause inventory	7	1.074	0.342
Inventory does not Granger-cause total debt ratio		2.189	0.113
ROA does not Granger-cause Ln total assets	8	1.600	0.203
Ln total assets does not Granger-cause ROA		2.567	0.077
Total debt ratio does not Granger-cause Ln total assets	9	1.155	0.316
Ln total assets does not Granger-cause total debt ratio		1.610	0.201
Total debt ratio does not Granger-cause ROA	10	1.528	0.218
ROA does not Granger-cause total debt ratio		1.478	0.229

Note: * denotes significance at 5%, ** denotes significance at 1%.

The results are quite interesting, especially for the first pair at the top of the table. An increase in ACP does not appear to increase the age of inventory. This means that once ACP increases, there is no need to build up inventory. Products are likely being emptied regularly due to demand. However, once there is a build-up of inventory, management may relax the credit terms to push inventory. Therefore, whenever there is a sign that inventory is building up, measures are necessary to reduce it and perhaps production to avoid investment in short-term debt.

The only other significant result is in Box 3 where we see that an increase in ACP has a statistically significant impact on ROA. However, the impact of inventory age on ROA is not statistically significant. The evidence is clear that ACP deserves greater attention in managing working capital than the AoI. In Table 4, there are two other boxes where the probability value is below 0.10 but is not statistically significant at 0.05. This indicates that the ACP values may be associated with total debt ratio (Box 5), and firm size (total assets) may be associated with ROA (Box 8). As stated, GMM regression was run to overcome likely endogeneity among the explanatory variables. The results are presented in Table 5.

Table 5. Regression estimates.

Equation	Constant	ACP	AoI	Ln total assets	TDR
(1)	–0.019	–0.000	–0.000	0.004	–0.049
t-stat	0.73	–4.99**	–6.79**	3.27**	–4.93**

Note: (Dependent variable: ROA).
        ** indicate statistical significance at the 1% level.

All variables in the regression model turned out to be strongly significant. The results are similar to those obtained by other authors, and the coefficient values are strongly significant. As reported by many authors, the results indicate that firms with lower ACP and/or AoI tend to have better profitability. Evidence also suggests that larger companies also manage ACP and AoI better than smaller companies. However, we do not agree with the statement that the profitability of firms with high ACP and AoI will be able to improve profitability simply by reducing ACP and AoI. The regression coefficients show association and not causality. The ACP and AoI of these companies are high and remain high because of weaknesses that they are unable to remedy easily. The Ln Total Assets variable representing the size of the firm indicates that larger firms are more profitable, which runs counter to what is normally seen in western and developed economies but is consistent with other works in the context of emerging and frontier countries. This is not surprising, as larger firms have better human capital, more resources, and more experience, while many small firms are still at the learning stage. The total debt ratio has a strong negative relationship with profitability. The over-reliance on debt, especially short-term debt, is at least somewhat due to the expansion of ACP and AoI. The dependence on debt is partly structural and partly behavioral, and this is unlikely to become less impactful in the short term. Note that the data indicates, ceteris paribus, that firms may benefit from a reduction of ACP and/or from AoI. The owner-managers are likely aware of the cost of a high ACP plus AoI, and conversations with them confirm they know that their high CCCs are a problem. However, from a close examination of the charts, we can conclude that they are simply unable to bring investment under control due to a high CCC. If we consider all possible explanations for a rational management group, (a) they have been unable to lower ACP plus AoI, (b) there are intangible benefits from the increase in ACP plus AoI during the time frame, or (c) the overall economic situation does not allow establishing and following a specific ACP and AoI management policy. The last possible interpretation is similar to Mintzberg's pronouncement that "management just muddles through" the situation that arises. Admittedly, the small sample size is a limitation of this study, but it also allowed us to examine the charts of all 20 sample firms presented in Figure 1. We have submitted all figures for the 77 firms for anyone who would like to examine them. The lines indicate in a significant number of cases that the ACP, AoI, and the resulting ACP plus AoI have generally risen from a relatively low value in 2011 to a high value by the end of 2020. Most of the firms that we excluded from this table have very high ACP, AoI, and the resulting values of

(ACP plus AoI) are high. In the figures included, ACI has the smallest rise. There is no indication that a firm has successfully brought down AoI to offset an increase in ACP. If the above companies had been following a policy of offsetting inventory with age of receivables, the lines representing ACP plus AoI would have been flat (or at least flatter). The actual data implies that there is an upward trend in ACP plus AoI. One cannot be used to offset an increase in the other. Given the observed negative impact on the profitability of ACP or AoI from the regressions, it should have been noticed by management, but we can conclude that circumstances do not permit them to successfully limit them to a desired level. Even if we could identify a level that could be good for the management of an industry, we may not prescribe to the management such a level if the management appeals to its customers only by being more lenient in collections. That should lead to a recommendation of controlling AoI better, but that does not appear to happen. Let us examine that from the perspective of an industry. In Figure 2, we have shown ten industries where the firms have some degree of homogeneity. All the figures present interesting features. The ACP and AoI mostly move in the same direction, and there is no indication of offsetting behavior. In the food and allied industries, the ACP has risen quite prominently, but the age of inventory remains at the same level. A comparison of the figures indicates that the average age of inventory (AoI) remains in a relatively narrow band as opposed to the average age of receivables (ACP). The AoI appears to increase at the end of the figure when the ACP also rises. As a result, it is not consistent with the recommendation that if ACP increases, the AoI reduction may offer an offset. It is interesting to see that when there is a sudden prominent blip in the ACP (Tannery, Fuel, and Power, for example), AoI also increases along with the total of ACP and AoI, indicating that even if the management feels the pressure, they are not able to reduce the amount tied up in inventory. The figures are more indicative of "muddling through" (Mintzberg, 1983) rather than any conscious effort to limit the total of the ACP and AoI at a targeted level. A remarkable feature in this chart is that both the lines appear to move in the same direction. In reality, a firm is not likely to offset a reduction of inventory held with a higher ACP. If the direction of movement in these two variables results from policy implementation, it is more likely that it is due to a desire to lower ACP, and an associated reduction in the age of inventory is a spontaneous impact. Overall, the inventory range has a much narrower range, the curve is generally flatter, and it is often less than the ACP. Except for the IT-related companies, both ACP and AoI rose over time. Theoretically, there may be optimal levels that vary by industry, but the same may not be true for individual firms. We are more inclined to say that firms either get used to a certain amount tied up in working capital or are forced into a situation they may not like but have to live with for a long time. They find it difficult to adjust to a more desirable level of investment in working capital when there are shocks or there is a strong economy-wide and/or industry-wide trend that they have difficulty fighting or reversing.

5. CONCLUSION AND RECOMMENDATIONS

Our results with respect to the relationship between firm size and profitability in a developing economy support the usual findings in the literature that larger firms tend to be more profitable. The regression coefficients also indicate that profitability is negatively associated with the total debt ratio. However, our conclusions regarding controlling collection and holding inventory to a target level are at odds with other studies. We have presented evidence that will significantly improve our understanding of the issues related to the management of the cash conversion cycle (CCC) and working capital. Our results indicate that knowing the benefits of less investment in working capital does not mean that it is achievable, especially in a developing or emerging country. Circumstances force management to engage in practices that do not lead to a reduction in the investment of receivables and inventory. Our results also indicate that the age of inventory is more stable, moves in a smaller range, and may not result in significant success with regard to reduction without addressing the ACP first. An inventory is also unlikely to offer an opportunity to offset the rise in investment. The actual fluctuations in the ACP and AoI indicate more of "muddling through" (Mintzberg, 1983) rather than a conscious and determined effort to limit or restrict CCC to a desirable level. If and when tighter control of working capital is desired, it will be more effective if we

focus on the ACP and not inventory or CCC as a whole. This appears to be the case both from an individual point of view and the industry as a whole. We have presented evidence of what likely happens in emerging and frontier economies. The first important conclusion we draw is that an individual firm cannot set an amount or number of days that is efficient for them. Even if they have something in mind, it is practically impossible to stick to that. This does not mean that they should not try to operate efficiently. They should be aware of the costs, especially if the investment in working capital goes against what they want to do. Even when the ACP and AoI keep getting stretched, any success in the collection or reduction in investment in inventory will have a positive effect, even though it may not show up in efficiency measures. As the fluctuation in AoI is less than the fluctuation in the ACP, it is worthwhile paying greater attention to receivables management. We have seen plenty of discussions on the difficulty of reining in the ACP and managing receivables in the new European economies, the Southeast Asian economies, and frontier economies. We suspect that weak management will not be very successful in bringing down the ACP to a reasonable level, and governments may have to develop policies to stop the ACP stretching to an unreasonable extent. It is interesting to find some authors addressing important issues in working capital management studies. For example, financial reporting quality (Blenman, Pham, Dao, & Le, 2022) and the effect of corporate governance on working capital (Farhan, Almaqtari, Al-Faryan, & Tabash, 2022) offer intriguing topics for future studies. Clearly, there must always be some money that remains tied up in working capital, and we can identify that as permanent debt capital. Instead of identifying the bank borrowings to support this as short-term debt, lenders in Bangladesh could consider rewriting the loan agreements in a way that a certain proportion of bank financing dedicated to working capital can be classified as long-term debt. Bank borrowing, in this case, can be used by all companies to pay suppliers and shift the carrying costs away from manufacturers or buyers.

We could also formulate a model that identifies what total days of ACP and AoI are optimal in minimizing the carrying cost. However, since the interest rate is not static and the profit margin may change, the optimal point must also change. Mathematically, it will be easy to show that reducing investment and receivables will lower costs and improve profitability for many small businesses in emerging and frontier countries. Theoretically, the optimal number of days of the ACP plus AoI cannot be permanent, and the evidence is clear that, individually and overall, firms are increasing investments in receivables and inventory. The most likely reason is that the cost of losing a business outweighs the cost of financing investments in receivables and inventory.

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