



---

September 2022

## Working capital management of manufacturing companies in Bangladesh: What factors make significant impact?

Sumaiya Zaman

University of Liberal Arts Bangladesh, [sumaiya.zaman@ulab.edu.bd](mailto:sumaiya.zaman@ulab.edu.bd)

Follow this and additional works at: <https://digitalcommons.usf.edu/globe>

 Part of the [Corporate Finance Commons](#), and the [Finance and Financial Management Commons](#)

This Refereed Article is brought to you for free and open access by the M3 Center at the University of South Florida Sarasota-Manatee at Digital Commons @ University of South Florida. It has been accepted for inclusion in *Journal of Global Business Insights* by an authorized editor of Digital Commons @ University of South Florida. For more information, please contact [scholarcommons@usf.edu](mailto:scholarcommons@usf.edu).

---

### Recommended Citation

Zaman, S. (2022). Working capital management of manufacturing companies in Bangladesh: What factors make significant impact?. *Journal of Global Business Insights*, 7(2), 140-150. <https://www.doi.org/10.5038/2640-6489.7.2.1198>

### Corresponding Author

Sumaiya Zaman, University of Liberal Arts Bangladesh, 688 Beribadh Road, Mohammadpur, Dhaka-1207

### Revisions

Submission date: May 16, 2021; 1st Revision: Sep. 2, 2021; 2nd Revision: Nov. 9, 2021; 3rd Revision: Feb. 10, 2022; 4th Revision: July. 26, 2022; Acceptance: Jul. 26, 2022

# Working Capital Management of Manufacturing Companies in Bangladesh: What Factors Make Significant Impact?

Sumaiya Zaman

School of Business  
University of Liberal Arts Bangladesh, Bangladesh  
sumaiya.zaman@ulab.edu.bd

## Abstract

The paper aims to determine factors that make a significant impact on working capital management of a manufacturing company in Bangladesh. Of 221 service and manufacturing firms listed on the Dhaka Stock Exchange, 109 companies are chosen based on data availability for the five-year period 2014-2018. The study examines literature on working capital management and tests theory on manufacturing companies listed on the Dhaka Stock Exchange. Cash conversion cycle is used as a measurement of working capital efficiency. Financial ratios representing six aspects of company's financial performance are taken as explanatory variables. They represent company asset management, debt structure, growth, liquidity, profitability, and size. The paper runs multivariate regression and correlation on the 545 firm-year observations in the panel data. Multicollinearity among the final statistically significant explanatory variables has also been tested. It is observed that company growth, profitability, and leverage can significantly explain company working capital efficiency in the manufacturing industry of Bangladesh.

**Keywords:** financial ratios, cash conversion cycle, manufacturing industry, Dhaka Stock Exchange

## Introduction

Bangladesh has made its name in the world as the second largest exporter of garments worldwide, its share being 6.4%, according to the 2018 annual report of the World Trade Organization (The Daily Star, 2019). Its overall manufacturing industry plays a significant role on the growth of its economy with a contribution of about 19% to its GDP in 2019 (The Global Economy, n.d.). Before the COVID-19 pandemic hit, it was estimated that the contribution of the manufacturing industry to the GDP will keep showing an upward trend in future. One reason for it is the strong growth of capital goods for manufacturing. From 2012-13 to 2015-16, the capital goods for manufacturing increased at 19% per year approximately; it showed a growth of about 24% from the previous year in the year 2016-17. Availability of electricity in the industrial regions and the availability of credit are the key reasons behind the growth. Of the capital goods imported in 2019, 60% are linked to manufacturing (Cookson, 2018). Several studies have been done to understand the operation of the manufacturing industry of Bangladesh. These studies focus on waste management, sustainability, and supply chain of the industry. This paper aims to study the working capital management of the manufacturing industry, as it has been seen that the availability of credit is a vital factor behind its growth. The study does not deal with the data during the COVID-19 period because of

unavailability. However, it aims to create a foundation for further studies when COVID-19 data become available to study the trend. Objectives of the paper are:

- Studying the working capital management of the manufacturing companies listed on the Dhaka Stock Exchange (DSE) for the five-year period from 2014 to 2018.
- Determining the financial factors that have an impact on working capital of the select companies during the period of study.

The study aims to study the working capital management of the manufacturing industry of Bangladesh by comparing and contrasting it with the company working capital management of other countries of the world. For this reason, the article has reviewed the existing literature pertaining to the working capital efficiency of companies operating across the globe.

The paper begins with a brief introduction to the manufacturing industry of Bangladesh and its contribution to the GDP. It, then, goes through a thorough review of recent and relevant literature on working capital management in the manufacturing industry of different countries worldwide with a focus on Bangladesh. The methodology applied by the study follows this. Empirical model and findings are presented in the subsequent sections. The paper ends with a conclusion and scope for further studies.

## **Literature Review**

Efficient working capital management is required to meet a company's daily financial obligations. Inefficiency in working capital management has disabled many companies from meeting their goals (Nwankwo & Osho, 2010). A study on over 116,000 Chinese firms from the period 2000-2007 shows efficient working capital management can reduce financing constraints on fixed investments (Ding et al., 2013). Another research on US firms during the 30-year period of 1982-2011 shows efficient working capital management results in superior firm performance. It enables a firm to re-use underutilized resources to greater use (Aktas et al., 2015).

Many studies have been conducted to understand the working capital management of manufacturing industries throughout the world. A study in Latin America covering five countries uses panel data analysis to look into factors that have an effect on working management of manufacturing companies of the select countries. Factors having an impact on working capital management are found to be industry cash conversion cycle, company market power, future sales, and country risk. Argentina, Brazil, Chile, and Mexico are found to be holding excess flows of cash which the study thinks decrease firm value over time (Mongrut et al., 2014).

A study conducted on firms listed on the Amman Stock Exchange of Jordan between 2000 and 2008 uses cash conversion cycle as a measurement of working capital management. The research finds that profitability shows a positive change with cash conversion cycle. It also shows that financial markets fail to penalize managers for their inefficiency in working capital management. The paper applies panel data analysis, fixed and random effects, and generalized methods of moments (Abuzayed, 2012).

A research done in Saudi Arabia studied the link between profitability and cash gap. Applying regression analysis, the companies show a negative relation between profitability and cash

conversion cycle (Eljelly, 2004). Another study conducted on companies listed on the Helsinki Stock Exchange uses a renewed measurement of working capital management. The modified cash conversion cycle reveals that the companies that receive advance payments show better operational efficiency in working capital management (Talonpoika et al., 2014). A paper studies the working capital management of 180 American manufacturing companies listed on the New York Stock Exchange from 2009 to 2011. The analysis finds that though corporate governance and working capital management seem to have no causal relationship, yet corporate governance plays some role in the working capital efficiency of manufacturing companies (Gill & Biger, 2013). Laghari and Chengang (2019) study the relationship between working capital and corporate performance of Chinese listed companies during the eleven-year period of 2005-2015. They find an inverted U-shaped relationship between the two factors. The same holds for firms with financial constraints. Another study on small and medium sized enterprises (SMEs) in Spain finds a non-linear relationship between profitability and working capital management. SMEs with an optimal working capital level show profitability maximization. However, profitability shows a decrease as working capital moves away from the optimal level (Baños-Caballero et al., 2012). Chauhan and Banerjee (2018) focus on optimal working capital level on manufacturing companies in India. They find that the manufacturing firms show no systematic target or optimal working capital level following behavior. They use cash conversion cycle as a measurement of working capital management. A study on 91 companies listed on the Tehran Stock Exchange during an eight-year period of 2009-2016 aims to find a link between company working capital and stock excess return. The paper, while sees a negative and significant link between change in cash and stock excess return, no such meaningful link is found between change in working capital and stock excess return (Salehi et al., 2019).

Relationship between working capital management and profitability is revisited in a study on SMEs in Vietnam, where Tran et al. (2017) suggests that profitability of SMEs can be increased by decreasing the number of days of accounts receivable and accounts payable to an optimal minimum. A similar study is conducted on 13,797 Swedish SMEs operating in four industries from 2008 to 2011. It finds that cash conversion cycle has a significant impact on profitability (Yazdanfar & Öhman, 2014). Better working capital management leads to higher profitability is found again in a study on 6,063 Portuguese SMEs during the eight years 2002-2009 (Pais & Gama, 2015). The finding that decreasing cash conversion cycle leads to higher profitability is echoed in a study on 21,075 Norwegian SMEs during the four-year period of 2010-2013 (Lyngstadaas & Berg, 2016).

A study on 33 firms listed on the Nairobi Stock Exchange during the 16 years from 1993-2008 finds that non-financial companies maintain a target cash conversion cycle. This target is adjusted at a slow rate. The determinants of cash conversion cycle are both company-specific and economy-specific. Older firms and companies with higher internal resources seem to have a longer cash conversion cycle. There is a positive relationship between inflation and company cash conversion cycle (Mathuva, 2014). A similar finding showing company-specific factors, macroeconomic factors, and industry type having an impact on working capital behavior is seen in a study on 68 listed Egyptian industrial companies during the 11-year period 2000-2010 (Moussa, 2019). Another study shows working capital measures vary significantly across industries over time. The measures also vary within each industry across time (Filbeck & Krueger, 2005).

A research on Chinese listed manufacturing companies during the eight-year period of 2010-2017 shows a negative relationship between cash conversion cycle and company performance. The negative relationship is significant between profitability and cash conversion cycle for non-state-owned companies, but not for state-owned companies (Ren et al., 2019).

## **Methods**

This section deals with methods applied for the study. Details on chosen sample and judgment behind sample selection are elaborated. Data source and method of data collection are explained. The section, finally, presents and explains empirical model derived from the research.

## **Sample**

The paper tests theory on working capital management on companies listed on the DSE. There are 221 service and manufacturing companies listed on the DSE. Of them, 109 firms are selected based on data availability during five-year period of 2014 through 2018. Number of companies chosen from each category is given in Table 1.

**Table 1.** Number of Sample Units From Each Category of Service and Manufacturing Companies Listed in DSE

| <b>Category</b>               | <b>Sample</b> | <b>Population</b> | <b>Representation of Category</b> |
|-------------------------------|---------------|-------------------|-----------------------------------|
| Cement                        | 3             | 7                 | 43%                               |
| Ceramic                       | 4             | 5                 | 80%                               |
| Engineering                   | 22            | 39                | 56%                               |
| Food and Allied               | 10            | 17                | 59%                               |
| Fuel and Power                | 11            | 19                | 58%                               |
| IT                            | 2             | 10                | 20%                               |
| Jute                          | 1             | 3                 | 33%                               |
| Miscellaneous                 | 3             | 13                | 23%                               |
| Paper and Printing            | -             | 3                 | -                                 |
| Pharmaceuticals and Chemicals | 17            | 32                | 53%                               |
| Services and Real Estate      | 3             | 4                 | 75%                               |
| Tannery                       | 3             | 6                 | 50%                               |
| Telecommunication             | 1             | 2                 | 50%                               |
| Textile                       | 26            | 56                | 46%                               |
| Travel and Leisure            | 3             | 5                 | 60%                               |
| <b>Total</b>                  | <b>109</b>    | <b>221</b>        | <b>49%</b>                        |

## **Data Collection**

Secondary data of DSE listed service and manufacturing companies are collected from audited documents published by the respective companies. Required data have also been collected from DSE. Recent and relevant literature has been collected and extensively studied as well.

## **Data Source**

DSE archive and audited published annual reports of listed service and manufacturing companies are the main source of data used by the study. Official websites of DSE listed companies prove to be another important source for data extraction. Literature pertaining to the research has been studied and collected from recently published journals and books.

### ***Empirical Model***

The research studies factors that explain annual cash conversion cycle of service and manufacturing companies listed on the DSE during the five-year period of 2014 through 2018. The explained variable, company annual cash conversion cycle, is broken down into three components that are measured by:

- Inventory conversion period = Inventory/Cost of goods sold x 360 (1)
- Receivable collection period = Accounts receivable/ Sales x 360 (2)
- Payable deferral period = Accounts payable/ Cost of goods sold x 360 (3)

Where, Inventory conversion period measures the average time a company requires to convert its inventory into finished goods. Receivable collection period, in other words, days sales outstanding, takes into account the average time required by a firm to collect cash from customers. Payable deferral period measures the time taken by a company to pay for its credit expenses. Company annual cash conversion cycle is composed of the three ratios as shown:

$$CCC_{it} = ICP_{it} + RCP_{it} - PDP_{it} \quad (4)$$

Where,  $CCC_{it}$  stands for annual cash conversion cycle of company “i” at year “t”,  $ICP_{it}$ ,  $RCP_{it}$ , and  $PDP_{it}$  stand for annual average inventory conversion period, annual receivable collection period, and annual payable deferral period for company "i" at year "t" respectively.

Financial ratios representing six aspects of company financial status (exhibited in Table 2) are taken as explanatory variables of company annual cash conversion cycle. The six features of company financial performance are company asset management, debt structure, growth, liquidity, profitability, and size. The research calculates the select ratios of each sample company for each year of the study period of 2014 through 2018.

Company annual cash conversion cycle is regressed on sets of different combination of select financial ratios applying multivariate regression. The objective of running regression is to derive a statistically significant model that explains annual cash conversion cycle of sample service and manufacturing companies listed DSE during study period of 2014 through 2018. The regression equation is:

$$Y_{it} = \alpha_{it} + \sum_{i=1}^n \sum_{t=1}^n \beta_{it} X_{it} + \varepsilon_{it} \quad (5)$$

Where,  $Y_{it}$  is the annual cash conversion cycle of service and manufacturing company “i” at year “t”.  $\alpha_{it}$  represents equation slope.  $\beta_{it}$  stands for parameter of financial ratio “ $X_{it}$ ”, while  $\varepsilon_{it}$  is the error term of the econometric model.

Significance of the devised model is examined by applying statistical tools. Wald (z-statistic) and chi-square are applied to test significance of explanatory financial ratios and goodness of fit of the model. Karl Pearson’s coefficient of correlation ( $r$ ) is used to test multicollinearity among explanatory variables to rid the research of this matter.

**Table 2.** Financial Ratios and Their Formulae

| Ratios for Company “i” at Year “t”           | Formulae  |
|--|---|
| <b>Asset management</b>                      |   |
| Total assets turnover(it)                    | Sales(it)/ Total assets(it)   |
| <b>Debt structure</b>                        |   |
| Current liabilities to total liabilities(it) | Current liabilities(it)/ Total liabilities(it)                                  |
| <b>Log of liabilities(it)</b>                |   |
| Change in liabilities(it)                    | Log of total liabilities(it)  |
| Liabilities to assets(it)                    | [Total liabilities(it)- Total liabilities(it-1)]/ Total liabilities(it-1)       |
| <b>Growth</b>                                |   |
| Log of sales(it)                             | Log of sales(it)  |
| Change in sales(it)                          | [Sales(it)- Sales(it-1)]/ Sales(it-1)   |
| <b>Liquidity</b>                             |   |
| Current(it)                                  | Current assets(it)/ Current liabilities(it)                                     |
| Change in current assets(it)                 | [Current assets(it)- Current assets(it-1)]/ Current assets(it-1)                |
| Change in current liabilities(it)            | [Current liabilities(it)- Current liabilities(it-1)]/ Current liabilities(it-1) |
| <b>Profitability</b>                         |   |
| Profit margin(it)                            | Net income(it)/Sales(it)  |
| Return on assets(it)                         | Net Income(it)/ Total assets(it)  |
| Change in net income(it)                     | [Net income(it)- Net income(it-1)]/ Net income(it-1)                            |
| <b>Size</b>                                  |   |
| Log of assets(it)                            | Log of total assets(it)   |
| Change in assets(it)                         | [Total assets(it)- Total assets(it-1)]/ Total assets(it-1)                      |

## Findings

Descriptive statistics of explained and explanatory variables show that it takes for the service and manufacturing companies 81 days on average to convert cash outflow into cash inflow. On average, the sample companies have equal reliance on debt and equity finance as is reflected in the mean liabilities to assets ratio of .5. Bangladesh Services Limited, a company belonging in the travel and leisure industry, has the lowest profit margin of -2% over the study period, while Meghna Pet Industries Limited has the highest profit margin of 182%, a company specializing in pet food. The sample companies have a profit margin of 8% on average. Meghna Pet Industries Limited also has the lowest cash conversion cycle with a negative value among the sample service and manufacturing companies. The range between maximum and minimum values within the variables is vast. Companies in the food & allied and travel & leisure industries show the shortest cash conversion cycle, whereas, services & real estate industry shows the longest cash conversion cycle. Table 3 shows summary statistics of explained and explanatory variables of the select service and manufacturing companies during the period of study.

**Table 3.** Descriptive Statistics of Variables

| Variable                     | <i>M</i> | <i>SD</i> | <i>Min.</i> | <i>Max.</i> | Count |
|------------------------------|----------|-----------|-------------|-------------|-------|
| <b>Explained variable</b>    |          |           |             |             |       |
| Cash conversion cycle        | 81       | 1308      | -15040      | 2918        | 545   |
| <b>Explanatory variables</b> |          |           |             |             |       |
| Liabilities to assets        | 0.5      | 0.39      | 0.02        | 4.96        | 545   |
| Log of sales                 | 9        | 1.01      | 3.43        | 11.26       | 545   |
| Profit margin                | 0.08     | 0.27      | -2.06       | 1.82        | 545   |

Source. Annual reports of service and manufacturing companies of Bangladesh for years 2014-2018

Multivariate regression is applied to regress explained variable on sets of various combinations of explanatory variables to compose a statistically significant model that would explain company cash conversion cycle in the service and manufacturing industry of Bangladesh. The probability of chi-square statistic, the *p*-value, is computed for each model taking combinations of company

financial ratios representing six aspects of company performance. The model with  $p$ -value (.0000) less than  $\alpha$  (.05) is taken to be statistically significant. Output of the model is summed up in Table 4.

**Table 4.** Output of Multivariate Regression Model

| Cash Conversion Cycle | Coefficient | Standard Error | $z$   | $P> z $ | [95% Confidence Interval] |       |
|-----------------------|-------------|----------------|-------|---------|---------------------------|-------|
| Liabilities to assets | -489        | 151            | -3.23 | .001    | -786                      | -193  |
| Log of sales          | 424         | 91             | 4.64  | .000    | 245                       | 602   |
| Profit margin         | -547        | 181            | -3.02 | .003    | -902                      | -192  |
| Constant              | -3440       | 831            | -4.14 | .000    | -5069                     | -1810 |

Note.  $R^2$ : within = .0715      Number of obs = 545  
 between = .0758       $X^2(3)$  = 38.32  
 overall = .0722      Prob >  $X^2$  = .0000

Wald statistics ( $z$ -values) is computed by dividing coefficients of regressors by their respective standard errors.  $P$ -values of the regressors are less than  $\alpha$  (.05) and, therefore, are statistically significant. The derived econometric model holds statistically significant as well, as indicated by probability of chi-square being less than  $\alpha$ . The  $R$ -squared statistic indicates that the select financial ratios can explain 7% of cash conversion cycle of sample service and manufacturing companies listed on the DSE of Bangladesh from 2014 to 2018. The model is summarized as:

$$\text{Company cash conversion} = -3440 - 489 \text{ Liabilities to assets} + 424 \text{ Log of sales} - 547 \text{ Profit margin} + \varepsilon$$

(831)                      (151)                                      (91)                                      (181)

$$n = 545; R^2 = .0722 \tag{6}$$

Regression model shows that the higher the company leverage, the lower would be its cash conversion cycle *ceteris paribus*. A unit increase in log of sales brings about an almost four-hundred-unit increase in cash conversion cycle *ceteris paribus*, indicating that a company with a higher growth takes a longer period of time to convert cash outflow into cash inflow. However, the parameter of profit margin indicates that the higher the company profitability, the lower its time for cash conversion, given other variables remain constant. Input of the select financial ratios of a service or a manufacturing company into the derived econometric model would tend to give indication of working capital management of the given company. Regression is run for individual industries and no statistically significant result is generated.

Multicollinearity is tested between and among the statistically significant regressors. Table 5 shows that the explanatory variables share low correlation between and among themselves and, therefore, make the research free of multicollinearity issues.

**Table 5.** Correlation among Regressors of the Derived Multivariate Regression Model

| Correlation matrix    | Liabilities to assets | Log of sales | Profit margin |
|-----------------------|-----------------------|--------------|---------------|
| Liabilities to assets | 1                     |              |               |
| Log of sales          | -.0025                | 1            |               |
| Profit margin         | -.1536                | .0357        | 1             |

From the results, it is understood that higher leverage and higher profitability give lower cash conversion cycle and, therefore, better working capital management of a service and manufacturing firm. A growing company, however, has a longer cash conversion cycle. Time has

been taken as a dummy variable to test the impact of macroeconomic factors and the National Industrial Policy 2016 of Bangladesh. No statistically significant change has been observed.

## **Conclusions**

The research aims to compose a statistically significant model that explains change in annual cash conversion cycle in manufacturing companies listed on the DSE during the five-year period 2014-2018. Studies conducted in different countries show a link between profitability and working capital management. Company growth is also an important factor in influencing its working capital management, as is shown in a study on all non-financial companies listed on the Abu Dhabi Securities Exchange (Naser et al., 2013). A study on 2,976 Brazilian public companies during 2001-2008 shows company size, growth rate, and debt level have a significant impact on their working capital management (Palombini & Nakamura, 2012). This paper also indicates that profitability as well as leverage has impact on the company working capital efficiency. The growing stage of a company also influences its working capital management. The National Industrial Policy 2016 focuses on sustainable and inclusive economic development through women empowerment (Finance Division, Ministry of Finance, Government of the People's Republic of Bangladesh, 2017). Since the paper shows that a higher leveraged company tends to have a lower cash conversion cycle, the National Industrial Policy should focus on easy access to finance to provide support to the manufacturing industry and cottage industry especially supported by woman entrepreneurs. Public-private partnerships can further boost up the system.

## ***Theoretical Implications***

The paper makes a direct contribution to literature pertaining to working capital management. Numerous researches on working capital efficiency conducted in different parts of the world have been studied. Well-tested literature on the working capital management of firms operating in Bangladesh is rare. The current paper attempts to establish theory to fill this gap. Academics will be able to use the paper for classroom teaching of company cash conversion cycle in the context of Bangladesh. The study will also serve as a foundation for future research on company working capital efficiency in Bangladesh.

## ***Practical Implications***

Bangladesh is the second largest exporter of garments in the world. With its economic growth relying heavily on its manufacturing industry, it, therefore, becomes crucial to ensure sustainable growth of this industry. This paper shows that high leveraged manufacturing firm operating in Bangladesh enjoys low cash conversion cycle. The findings serve as a base for the financial institutions to facilitate easy credit access to the manufacturing companies in Bangladesh. Faster conversion of cash outflow into cash inflow will result in more rapid growth of the manufacturing industry, which in turn will contribute to the growth of the financial institutions providing credit facilities. The ultimate result will be the sustainable economic growth of the country.

## **Future Research**

The paper creates a foundation for future studies that will address:

- Does the statistically significant model proposed in the paper hold true during COVID-19 pandemic?
- Can the proposed model be replicated in industries of Bangladesh other than the manufacturing industry?
- Can the model be replicated to study the working capital management of companies operating in different parts of the world?

Bangladesh has gained eligibility to be a developing country. The COVID-19 pandemic, as well as the new status, adds pressure to show sustainable growth in its economy. The backbone of its economy relies on the performance of its manufacturing industry. This prompts academics, researchers, and policymakers to come together to study the operation of the manufacturing industry to facilitate it with services that would enhance its performance and growth in the long run.

## **References**

- Abuzayed, B. (2012). Working capital management and firms' performance in emerging markets: The case of Jordan. *International Journal of Managerial Finance*, 8(2), 155–179. <https://doi.org/10.1108/17439131211216620>
- Aktas, N., Croci, E., & Petmezas, D. (2015). Is working capital management value-enhancing? Evidence from firm performance and investments. *Journal of Corporate Finance*, 30, 98–113. <https://doi.org/10.1016/j.jcorpfin.2014.12.008>
- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2012). How does working capital management affect the profitability of Spanish SMEs? *Small Business Economics*, 39(2), 517–529. <https://doi.org/10.1007/s11187-011-9317-8>
- Chauhan, G. S., & Banerjee, P. (2018). Financial constraints and optimal working capital – Evidence from an emerging market. *International Journal of Managerial Finance*, 14(1), 37–53. <https://doi.org/10.1108/IJMF-07-2016-0131>
- Cookson, F. (2018, April 11). Manufacturing sector key to economic growth. *The Financial Express*. <https://www.thefinancialexpress.com.bd/views/manufacturing-sector-key-to-economic-growth-1523461442>
- Ding, S., Guariglia, A., & Knight, J. (2013). Investment and financial constraints in China: Does working capital management make a difference? *Journal of Banking and Finance*, 37(5), 1490–1507. <https://doi.org/10.1016/j.jbankfin.2012.03.025>
- Eljelly, A. M. A. (2004). Liquidity - profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management*, 14(2), 48–61. <https://doi.org/10.1108/10569210480000179>
- Filbeck, G., & Krueger, T. M. (2005). An analysis of working capital management results across industries. *American Journal of Business*, 20(2), 11–20. <https://doi.org/10.1108/19355181200500007>
- Finance Division, Ministry of Finance, Government of the People's Republic of Bangladesh, 2017. *Bangladesh Economic Review 2017*. Dhaka: Bangladesh Government Press.
- Gill, A. S., & Biger, N. (2013). The impact of corporate governance on working capital management efficiency of American manufacturing firms. *Managerial Finance*, 39(2), 116–132. <https://doi.org/10.1108/03074351311293981>
- Laghari, F., & Chengang, Y. (2019). Investment in working capital and financial constraints: Empirical evidence on corporate performance. *International Journal of Managerial Finance*, 15(2), 164–190. <https://doi.org/10.1108/IJMF-10-2017-0236>
- Lyngstadaas, H., & Berg, T. (2016). Working capital management: Evidence from Norway. *International Journal of Managerial Finance*, 12(3), 295–313. <https://doi.org/10.1108/IJMF-01-2016-0012>

- Mongrut, S., Darcy, F., Zavaleta, C., & Zavaleta, J. (2014). Determinants of working capital management in Latin American companies. *Innovar*, 24(51), 5–17. <https://doi.org/10.15446/innovar.v24n51.41235>
- Moussa, A. A. (2019). Determinants of working capital behavior: Evidence from Egypt. *International Journal of Managerial Finance*, 15(1), 39–61. <https://doi.org/10.1108/IJMF-09-2017-0219>
- Mutua Mathuva, D. (2014). An empirical analysis of the determinants of the cash conversion cycle in Kenyan listed non-financial firms. *Journal of Accounting in Emerging Economies*, 4(2), 175–196. <https://doi.org/10.1108/JAEE-10-2011-0045>
- Naser, K., Nuseibeh, R., & Al-Hadeya, A. (2013). Factors influencing corporate working capital management: Evidence from an emerging economy. *Journal of Contemporary Issues in Business Research*, 2(1), 11–30.
- Nwankwo, O., & Osho, G. S. (2010). An empirical analysis of corporate survival and growth: Evidence from efficient working capital management. *International Journal of Scholarly Academic Intellectual Diversity*, 12(1), 1–13.
- Pais, M. A., & Gama, P.M. (2015). Working capital management and SMEs profitability: Portuguese evidence. *International Journal of Managerial Finance*, 11(3), 341–358. <https://doi.org/10.1108/IJMF-11-2014-0170>
- Palombini, N.V. N., & Nakamura, W. T. (2012). Key factors in working capital management in the Brazilian market. *Revista de Administração de Empresas*, 52(1), 55–69. <https://doi.org/10.1590/S0034-75902012000100005>
- Ren, T., Liu, N., Yang, H., Xiao, Y., & Hu, Y. (2019). Working capital management and firm performance in China. *Asian Review of Accounting*, 27(4), 546–562. <https://doi.org/10.1108/ARA-04-2018-0099>
- Salehi, M., Mahdavi, N., Zarif Agahi Dari, S., & Tarighi, H. (2019). Association between the availability of financial resources and working capital management with stock surplus returns in Iran. *International Journal of Emerging Markets*, 14(2), 343–361. <https://doi.org/10.1108/IJoEM-11-2017-0439>
- Talonpoika, A. M., Monto, S., Pirttilä, M., & Kärri, T. (2014). Modifying the cash conversion cycle: Revealing concealed advance payments. *International Journal of Productivity and Performance Management*, 63(3), 341–353. <https://doi.org/10.1108/IJPPM-12-2012-0130>
- The Daily Star. (2019, August 9). Bangladesh second in export growth: WTO. *The Daily Star*. <https://www.thedailystar.net/business/export/news/bangladesh-second-export-growth-wto-1783945>
- The Global Economy. (n.d.). *Bangladesh: Share of manufacturing*. The Global Economy. Retrieved January 9, 2020, from [https://www.theglobaleconomy.com/Bangladesh/Share\\_of\\_manufacturing](https://www.theglobaleconomy.com/Bangladesh/Share_of_manufacturing)
- Tran, H., Abbott, M., & Jin-Yap, C. (2017). How does working capital management affect the profitability of Vietnamese small- and medium-sized enterprises? *Journal of Small Business and Enterprise Development*, 24(1), 2–11. <https://doi.org/10.1108/JSBED-05-2016-0070>
- Yazdanfar, D., & Öhman, P. (2014). The impact of cash conversion cycle on firm profitability: An empirical study based on Swedish data. *International Journal of Managerial Finance*, 10(4), 442–452. <https://doi.org/10.1108/IJMF-12-2013-0137>

## Appendix: DSE Listed Service and Manufacturing Companies Selected for the Study and Their Respective Categories

### Cement:

- Heidelberg Cement Bangladesh Limited
- Meghna Cement Mills Limited
- M.I. Cement Factory Limited

### Ceramic:

- Monno Ceramic Industries Limited
- RAK Ceramics (Bangladesh) Limited
- Shinepukur Ceramics Limited
- Standard Ceramic Industries Limited

### Engineering:

- Aftab Automobiles Limited
- Anwar Galvanizing Limited
- Appollo Ispat Complex Limited
- Bangladesh Building Systems Limited
- Bangladesh Lamps Limited
- Bengal Windsor Thermoplastics Limited
- Bangladesh Steel Re-Rolling Mills Limited
- BSRM Steels Limited
- Deshbandhu Polymer Limited
- Eastern Cables Limited
- IFAD Autos Limited
- Kay & Que (Bangladesh) Limited
- Navana CNG Limited
- National Polymer Industries Limited
- National Tubes Limited
- Quasem Industries Limited
- Rangpur Foundry Limited
- Ratanpur Steel Re-Rolling Mills Limited
- S. Alam Cold Rolled Steels Limited
- Shurwid Industries Limited
- Singer Bangladesh Limited
- Western Marine Shipyard Limited

### Food and Allied:

- Agricultural Marketing Company Limited (PRAN)
- British American Tobacco Bangladesh Company Limited
- Fine Foods Limited
- Fu Wang Food Limited
- Gemini Sea Food Limited
- Golden Harvest Agro Industries Limited
- Meghna Condensed Milk Industries Limited
- Meghna Pet Industries Limited
- Olympic Industries Limited
- Rangpur Dairy & Food Products Limited

### Fuel and Power:

- Baraka Power Limited

- CVO Petrochemical Refinery Limited
- Dhaka Electric Supply Company Limited
- Eastern Lubricants Limited
- GBB Power Limited
- Khulna Power Company Limited
- Linde Bangladesh Limited
- Meghna Petroleum Limited
- Padma Oil Co. Limited
- Power Grid Company of Bangladesh Limited
- Summit Power Limited

### IT Sector:

- Aamra Technologies Limited
- BDCOM Online Limited

### Jute:

- Northern Jute Manufacturing Co. Limited

### Miscellaneous:

- Aramit Limited
- Khan Brothers PP Woven Bag Industries Limited
- Miracle Industries Limited

### Pharmaceuticals and Chemicals:

- ACI Formulations Limited
- The ACME Laboratories Limited
- Active Fine Chemicals Limited
- Ambee Pharmaceuticals Limited
- Beacon Pharmaceuticals Limited
- Beximco Synthetics Limited
- Central Pharmaceuticals Limited
- Far Chemical Industries Limited
- The IBN SINA Pharmaceutical Industry Limited
- JMI Syringes & Medical Devices Limited
- Kohinoor Chemicals Company Limited
- Orion Infusion Limited
- Pharma Aids
- Reckitt Benckiser(Bd.)Limited
- Renata Limited
- Salvo Chemical Industry Limited
- Square Pharmaceuticals Limited

### Services and Real Estate:

- Eastern Housing Limited
- SAIF Powertec Limited
- Samorita Hospital Limited

### Tannery:

- Apex Footwear Limited
- Apex Tannery Limited
- Bata Shoe Company (Bangladesh) Limited

### Telecommunication:

- Grameenphone Limited

### Textile:

- Al-Haj Textile Mills Limited
- Alltex Industries Limited
- Anlimayarn Dyeing Limited
- Argon Denims Limited
- Dulamia Cotton Spinning Mills Limited
- Far East Knitting & Dyeing Industries Limited
- Generation Next Fashions Limited
- Hamid Fabrics Limited
- H.R.Textile Limited
- Maksons Spinning Mills Limited
- Malek Spinning Mills Limited
- Matin Spinning Mills Limited
- Metro Spinning Limited
- Mozaffar Hossain Spinning Mills Limited
- Mithun Knitting and Dyeing Limited
- Nurani Dyeing & Sweater Limited
- Prime Textile Spinning Mills Limited
- Paramount Textile Limited
- Rahim Textile Mills Limited
- R.N. Spinning Mills Limited
- Saiham Cotton Mills Limited
- Saiham Textile Mills Limited
- Stylecraft Limited
- Tallu Spinning Mills Limited
- Tosrifa Industries Limited
- Zaheen Spinning Limited

### Travel and Leisure:

- Bangladesh Services Limited
- The Peninsula Chittagong Limited
- Unique Hotel & Resorts Limited
- Unique Hotel & Resorts Limited