

# Impact of the COVID-19 on the Textile Industry of Bangladesh: Is there an Ensuing Disaster?

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## ABSTRACT

**Purpose:** The purpose of this study is to determine the financial health of the selected listed companies in the textile industry of Bangladesh during the first fiscal year of the COVID-19 pandemic.

**Methodology:** Financial health of 30 listed companies in the textile industry of Bangladesh has been determined through a popular bankruptcy model named the Altman Z Score model. The impact of a few variables of this model has also been further analyzed.

**Findings:** The study reveals that the financial health of the 30 companies deteriorated during the COVID year (2019-2020) than it was in the previous 3 fiscal years. Furthermore, to understand the changes in the factors related to the calculation of the Z-score we have analyzed Net Sales, EBIT, Current Assets, Current Liabilities, Net Working Capital, Non-Current Assets, Non-Current Liabilities, Retained Earnings, Total Liabilities, Debt to Asset Ratio, Total Asset & Market Value of the 30 sample firms across the FY 2016/17 to FY 2019/20, the result of which also shows the evidence of diminishing financial health of the companies during the COVID Year (2019-2020).

**Practical Implications:** The findings of this study can be useful for the investors to make investment decisions, for the managers and analysts to identify the significant variable for financial growth, and for other stakeholders to comprehend the financial health of the textile industry of Bangladesh.

**Originality:** No other contemporary study has used the Altman Z Score and analyzed the variables of the model further to determine the impact of COVID-19 on the financial health of the textile industry of Bangladesh. This study provides detailed quantitative results from the statistical analysis such as the T-test as well as the implication of the Altman Z Score Model.

**Limitations:** This study has used a quantitative model to measure the impact of COVID-19 on the textile industry of Bangladesh hence there are further scopes to explore the impact of the pandemic through analyzing a few qualitative aspects such as Government policies, Customer Behaviour, etc.

## 1. Introduction

The textile industry has been the most lucrative variable in Bangladesh's economy since the independence of the country. The growth of this industry has heavily leveraged the country's economy. The textile industry amounted to 84.21% of the total export earnings in 2019-20. In terms of monetary value, the amount is 34,133 million USD (Bangladesh Economic Review, 2020).

In February 2020, the World has seen the devastating spread of COVID-19, a novel strain of Corona virus and as a result, WHO has declared it a global pandemic. All the global economic activities came to a halt. Like many other countries, Bangladesh has also faced a devastating economic impact. The textile industry, particularly, the Ready-Made Garments sector was hit with

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negative consequences. BGMEA (Bangladesh Garment Manufacturers and Exporters Association) reported on 18th April 2020 about canceled orders worth \$3.16 billion that affected 1,142 factories having 2.26 million workers at the advent of the pandemic. The textile industry has also seen a 15%<sup>2</sup> increase in the price of yarns, which is one of the key raw materials, during the pandemic. China plays a major role in being the major supplier of raw materials, but the imports have been suspended due to COVID-19. According to an article published by the Bangladesh Institute of Labor Studies, about 400,000 workers lost their jobs during 2019-to 20 in the Ready-made garments industry (Islam, 2020).

The general scenario can be seen that the pandemic has affected the textile industry with the rising cost of materials, halted production due to forced lockdown, and cancellation of orders by the buyers among various other factors. No study has been conducted so far focusing on the Altman Z score of the firms in the textile industry of Bangladesh to get an exact view of the impact of the pandemic on the financial condition of the firms and hence, the overall industry. This study primarily intends to fill that gap.

The objectives of the study have been set: i) to determine the impact of COVID 19 on the financial health of the selected companies of the textile industry of Bangladesh through a popular bankruptcy model named Altman's Z- Score model and ii) to comprehend the changes in certain financial factors related to the calculation of Z- scores of the selected companies.

Our study investigates the financial health of the 30 companies in the Textile Industry that are listed on the Dhaka Stock Exchange (DSE) for the years 2019-20, 2018-19, 2017-18 & 2016-17. The sample covers 53.57% of the population. This study assesses the performance of the firms in the three (3) FYs before the pandemic (FY 2016/17, FY 2017/18 & FY 2018/19) and compares the metrics with the results from FY 2019/20 to understand the overall impact of the pandemic on the industry. For the comparison purpose, the Altman Z-score (metric to determine the bankruptcy risk of the firms and hence, a strong measurement of the financial strength of a firm) has been used. The Altman Z score of the firms have been grouped as Z score of pre-COVID years (average Z-score of the firms during - FY 2016/17, FY 2017/18 & FY 2018/19) and Z score of COVID affected year (Z -score of the firms during FY 2019/20). This study used Altman Z-score to compare the credit strength of the two groups (COVID Year & Pre-COVID Year). Specifically, the mean of the Z-scores has been used to prove the hypothesis. The variables of the Z-score were also probed to determine the financial strength of the sample. As Altman Z-score predicts the bankruptcy risk of a firm within the next 2 years, that is a firm's Altman Z score during the FY 2016-17 will be a predictor of a firm's bankruptcy risk within the FY 2017-18 and FY 2018-19, hence we have considered three FY years before the COVID impacted year (FY 2019-20) in our study.

This study will pave the way for the investors, market analysts, and wholesale buyers of the textile industry in Bangladesh to identify the financial impact of COVID-19 and be prepared to take relevant decisions in the future. This research will also benefit the researchers, faculty members, and students to identify the implication of the Altman Z score in determining the financial health of the respective industry.

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<sup>2</sup> BGHA (Bangladesh Garment Buying House Association).

The article has been constructed in the following ways. After the introduction, the next section discusses the Altman Z score and its components. Section 3 covers Literature Review and Hypothesis development part and section 4 covers the methodology part. Section 5 covers the statistical findings of this study. Overall findings of the study have been discussed in Section 6 and section 7 presents the conclusion part.

## 2. Discussion about Altman Z score

### 2.1 Altman Z-score

Altman Z-score measures the bankruptcy risk of a firm for the next 2 years. Developed by NYU Stern Finance Professor Edward Altman in 1967, this financial metric is based on five financial ratios that use profitability, leverage, liquidity, solvency, and activity to predict how likely the firm is to become insolvent in the recent future. The formula is evaluated every few years to account for changes by studying the overall financial performance of the firms over a certain period (Altman, 2013). The one we have used in the study is the most recent iteration published in 2012, which is called Altman Z-score plus. The formula is as follows:

$$\text{Altman Z-score} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E \tag{1}$$

Where:

$$A = \frac{\text{Net Working Capital}}{\text{Total Assets}}$$

$$B = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$C = \frac{\text{Earnings before Interest and Tax}}{\text{Total Assets}}$$

$$D = \frac{\text{Market Value of the equity}}{\text{total Liabilities}}$$

$$E = \frac{\text{Net Sales}}{\text{Total Assets}}$$

The Altman Z-score is found to be highly effective for public companies in the manufacturing sector (Altman et al., 2017). A score above 3 is considered to be a good score and the firm is said to be in the “green zone” as they are not likely to go bankrupt. A score between 1.8 to 3.0 would indicate a firm to be in the “grey zone”, where the bankruptcy risk is not significant but still, investors need to be cautious. The firms scoring below 1.8 are in the “red zone” with significant bankruptcy risk. Investors should try to avoid investing in such companies.

**Table 1. Defining the scale of measurement of Altman Z-score**

<b>RED ZONE</b> Firms with a Z-score less than 1.8	<b>Grey ZONE</b> Firms with Z-score greater than 1.8 but less than 3.0	<b>GREEN ZONE</b> Firms with Z-score greater than 3
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Source: Authors formulated

## 2. Literature Review & Hypothesis Development

The pandemic caused by COVID-19 has impacted almost every sphere of our lives. It has essentially changed how we do business to how we interact with other people. To contain the situation and ensure public safety, the government has been forced to declare a countrywide lockdown in different phases. During the majority part of this lockdown, factories and all other businesses had to keep their production halted. It has been a very turbulent time and full of uncertainties. As per the sources of BGMEA, orders worth \$17 million were canceled at just 20 major factories due to the pandemic. Moreover, almost all the buyers negotiated for extended credit terms and reduced rates citing the economic downturn caused by the pandemic as the key reason (Kabir, Maple, and Usher, 2021).

Very few studies have been conducted on the impact of COVID 19 on the financial health of the textile sector of Bangladesh. For instance, Islam (2020) conducted a study on the impact of COVID 19 on the textile sector of Bangladesh where he showcased the growth of RMG export during the period (December 2019 – November 2020) and also conducted a time series analysis to find the RMG sector's growth trend. The negative slope of the time series analysis indicated a negative degrading export growth for the industry. Islam (2020) also reported that in the RMG sector alone, 10.5 million workers are at threat of losing jobs. BGMEA reported order cancellations worth 3.18 billion USD during the pandemic. It can be easily inferred that the firms need to be very cautious to survive the crisis.

Begum et al. (2020) researched the impact of COVID-19 on the socio-economic factors of Bangladesh. The study states that COVID-19 has affected the financial, agriculture, and education sector but RMG (Ready Made Garments) sector has been the worst victim of the pandemic.

Asian Development Bank (2020) reported a rapid escalation of the crisis in the economic sphere although the intensity of it will be lower. Addressing the extra-economic implications, it also emphasized the importance of on-crisis and post-crisis social measures. ADB indicated extra-economic efforts for on-crisis and post-crisis social measures.

Abu Sina et al. (2020) conducted a study to find the financial weakness of some selected garment factories in Bangladesh by using Altman's Z- Score model where they found the financial weakness of those factories was due to inefficient working capital management, inefficiency in managing current assets, etc. and all of these problems were determined through analyzing the variables of Altman's Z- Score model.

Hamid et al. (2016) explored the growth of Non-Bank Financial Institutions (NBFIs) to predict the distress of 15 publicly traded NBFIs of Bangladesh for the period 2011 to 2015 and they used Altman's Z- Score model to do so. The results indicate that majority of the sampled NBFIs are in the "Distress" zone, threatened with probable bankruptcy within the next few years.

Mizan & Hossain (2014) explored the financial soundness of the cement industry of Bangladesh using Altman's Z – score model. Among the five firms they had studied, two firms (Heidelberg Cement & Confidence Cement) were financially sound since they had mean Z- scores above 2.99. On the other hand, Aramit Cement & Lafarge Cement had mean Z – scores that were lower than 1.80 and that is why they tended to be bankrupt. Meghna Cement fell into the grey zone since it had

a mean z score of more than 1.80 but less than 2.99 so, it was unlikely that Meghna Cement will be bankrupt within the next few years. The study also analyzed the impact of a few variables of Z- The score model to identify the key ingredients of financial soundness.

This research is based on the numeric impacts caused by COVID 19 on the key financial soundness indicators of the textile industry of Bangladesh. Altman Z score has been implicated in to use of the financial soundness indicators to determine the financial health of the textile industry of Bangladesh, No other study has used Altman Z score model in determining the financial health of the textile industry of Bangladesh considering the years affected by COVID-19.

Based on the objective of this study, a hypothesis has been constructed to compare the mean of the Z score of the companies in the COVID impacted year FY 2019/20 and the average of the three FYs (FY 2018/19, FY 2017/18, FY 2016/17) before the COVID year as Pre-COVID year's Z score.

*H<sub>0</sub>: There is a non-negative difference in the Z-scores between the Z score of the firms in the COVID impacted period and the Z-score of the Pre- COVID period or the difference is positive or  $\mu Z\text{-COVID} - \mu Z\text{ pre-COVID} \geq 0$*

*H<sub>A</sub>: There is a negative difference in the Z-scores between the Z score of the firms in the COVID impacted period and the Z-score of the Pre- COVID period or the difference is negative or  $\mu Z\text{- COVID} - \mu Z\text{ pre-COVID} < 0$*

The maximum limit set for the Type-I error is 5%. Hence, the significance level selected for the test statistics is  $\alpha = 5\%$

$\mu Z\text{-COVID}$  = Mean Z score of the companies in the FY 2019/20

$\mu Z\text{ pre-COVID}$  = Mean Z score of the companies in the Pre-COVID period, calculated as the average of the FY 2018/19, FY 2017/18, and FY 2016/17

### 3. Data and Methodology

#### 3.1 Components of Altman Z-score

##### 3.1.1 Net Sales

A firm offers its products and services to the customers that will add value to them by fulfilling the customers' needs. In exchange for these products and services, the customer pays the firm which is the firm's revenue. The demand for the products among other factors is also influenced by economic factors. Primarily, the demand-and-supply curve gives us an idea about the demand for certain products and services (Cachon and Terwiesch, 2008). When customers make more purchases, the sales revenue of a firm goes up. The sales revenue can also go up if the price increases. Generally, a price increase will decrease the demand for normal goods. Hence, we can consider the changes in the net sales of the firms on average are driven by an external factor.

##### 3.1.2 Earnings before Interest and Tax

Generally, when the net sales of a firm decrease, the earnings before interest and tax also decrease. The operating income comes from the core operation of the company, other incomes and losses are irregular and hence, considered to be non-sustainable income. On average, the EBIT of the firms of a particular industry follows the same trend as the operating income of the industry. In the

calculation of the Altman Z-score, the third ratio is (the EBIT/Total Assets) of the firm. So, we have used EBIT as the financial metric to study the changes.

### **3.1.3 Retained Earnings**

A firm accumulates its income in the retained earnings and subsequently would pay dividends from the retained earnings. Hence, retained earnings generally increase with the increase of net income and decrease when the dividends are paid in cash. If a firm pays more cash dividends than its net income, the retained earnings can decrease in comparison to the prior period. Companies can pay cash dividends more than their net income for the period for many reasons. They can do so to boost the shareholders' confidence (Al-Yahyaee et al., 2011).

### **3.1.4 Current Assets**

The current assets are those assets that a firm expects to sell, consume, use or exhaust in course of its core operation within the accounting period. The current assets of a firm generally include cash and cash equivalents, marketable securities, inventory, accounts receivables, and other trade receivables, prepayments, and accounts receivables. Current assets are highly liquid.

### **3.1.5 Current Liabilities**

The short-term obligations of a firm are represented as the current liabilities of a firm. The obligations are expected to become due within the accounting period (one year or one operating cycle). The current liabilities of a firm might include accounts payable, notes payables, short-term debt, tax payables, etc. Current liabilities are generally settled with the current assets.

### **3.1.6 Net Working Capital**

The working capital is calculated as the difference between the current liabilities and the current assets. The net working capital is a good metric to measure the liquidity of a firm, its operational efficiency, and short-term financial health. A positive net working capital indicates that a company has enough resources to meet its current obligations and can take advantage of new opportunities as they arise (Afrifa, 2016).

### **3.1.7 Non-current Assets**

The long-term investments of a firm are reported as non-current assets. These items are not expected to be realized within the accounting period. These items, in general, are not liquid, that is a firm cannot readily convert its non-current assets into cash. However, generally, the non-current assets are more profitable to a firm and provide an extra safety net. During a period of financial stress, a firm is less likely to invest in a noncurrent asset (Lubyana et al., 2016).

### **3.1.8 Non-current liabilities**

Non-current liabilities are the long-term obligations of a firm. They have a maturity date greater than one reporting period from the ending date of the current reporting period. The non-current liabilities of a firm might include long-term loans, lease obligations, bonds payables, mortgages, and various others. Non-current liabilities of a firm increase when a firm takes in additional long-term loans and decrease as the firm settles them. Generally, non-current liabilities are cheaper than

current liabilities. Hence, firms prefer long-term debts in place of short-term debts (Laurens and Tampang, 2018).

### **3.1.9 Total Liabilities**

A firm's total liabilities are the sum of its present obligations arising from past events, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits. Quite simply, the liabilities of a firm are the claims of the stakeholders other than the shareholders. When the company is heavily dependent on debt, the total liabilities of the firm constitute the majority portion of its total asset.

### **3.1.10 Debt-to-asset Ratio**

The debt-to-asset ratio of a firm indicates the portion of the total asset of a firm that is financed by the creditors. A lower debt to asset ratio is considered to indicate that a firm is in a better position to pay off its total debts. However, there are various examples where companies with a high debt-to-asset ratio have successfully kept afloat and performed better than the competing firms.

### **3.1.11 Total Assets**

In the accounting formula, we define the total assets of a firm as a summation of total liabilities and equity. A firm utilizes its assets to create value for the shareholders. Hence, the objective of a firm is to enhance its assets such that the shareholders' wealth is maximized. However, even an increase in the liabilities can lead to an increase in the asset. Hence, understanding the reason for changes in the asset is insightful to understanding how effectively a firm is fulfilling its objective to maximize the shareholders' wealth.

### **3.1.12 Market Value of the Equity of the Firm**

The market value of the equity of a firm indicates the shareholders' interest to invest in the firm. Generally, when the prospect of a firm is better, its share price rises and when the prospect is low, the share price shrinks. In a perfectly efficient market, the share price reflects all the publicly available information about the firm. However, for practicality, as per the efficient market hypothesis, it is more appropriate to assume that our capital market is semi-strong efficient. Here the share price is not driven by publicly available information only. However, through proper analysis, even amid uncertainties, investors can get their desired outcomes in the long run. A bullish market would indicate high confidence of the investors, while a bearish market would reflect a shareholder's reluctance to invest (Jacobs et al., 2010).

## **3.2 Defining the sample**

Currently, there are 56 textile firms enlisted on Dhaka Stock Exchange. Out of these 56 firms, required data have been collected from the 30 companies' annual statements for the FY 2019/20, and 2018/19, 2017/18 and FY 2017/16 from their website and annual reports. The argument behind taking 30 as the sample size is that for a sample greater than or equal to 30, the sample distribution reaches normality as per the central limit theorem (Kwak and Kim, 2017).

## **3.3 Statistical tools and techniques used**

Historical financial data has been collected from the annual reports of the companies. The Altman Z score for the firms has been calculated using the following formula:

$$\text{Altman Z-score} = 1.2 * \frac{\text{Net Working Capital}}{\text{Total Assets}} + 1.4 * \frac{\text{Retained Earnings}}{\text{Total Assets}} + 3.3 * \frac{\text{EBIT}}{\text{Total Assets}} + 0.6 * \frac{\text{Market Value of the firms}}{\text{total Debt of the firm}} + 1 * \frac{\text{Net Sales}}{\text{Total Assets}}$$

After the Z score for each company, each year has been calculated, the authors have segmented the data into two groups, group 1: Z score of the COVID year (Z score of the FY 2019/20) and group 2: Average Z score of the Pre-COVID years (Average Z-score of each firm for FY 2018/19, FY 2017/18 and FY 2016/17). Taking the average of the Z score for FY 2018/19, FY 2017/18, and FY 2016/17 has helped us to account for the fluctuation of the Z-score during the period. Finally, a paired t-test (tested the observations of two dependent variables) has been conducted to the set hypothesis.

To conclude the impact of the pandemic on the firms' the Net Sales, EBIT, Current Assets, Current Liabilities, Net Working Capital, Retained Earnings, Non-current Assets, Non-current Liabilities, Total Liabilities, Debt-to-asset Ratio, Total Assets, and the Market Value of the firms the authors have observed the pattern of the variables and compared with the past data.

## 4. Findings of the study

### 4.1 Descriptive Statistics

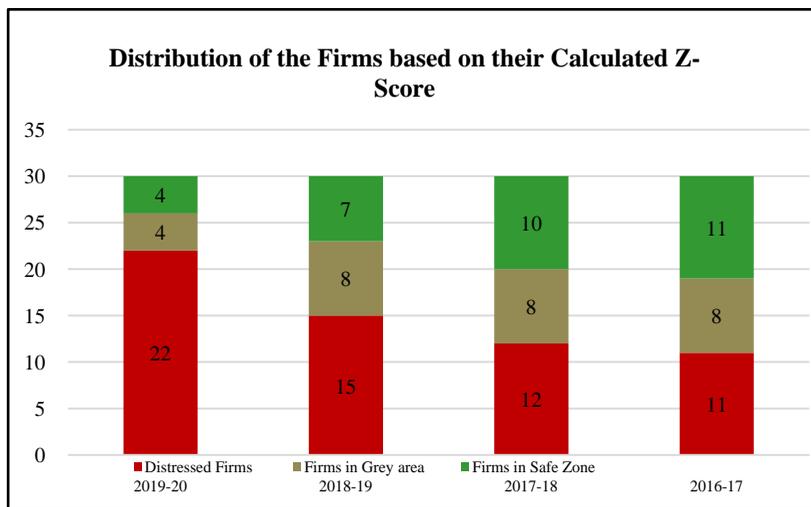
The table provides a summary of the average Z scores of the industry for the FY 2019/20, FY 2018/19, FY 2017/18, and FY 2016/17 calculated based on the Z scores of the 30 firms. The average Z-score of the Pre-COVID year has been calculated as the average of the Z score of the firms during the FY 2018/19, FY 2017/18, and FY 2016/17.

**Table 2. Output of the Descriptive Statistics using SPSS for the Observed Data.**

Descriptive Statistics							
Particulars	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Z score of the Firms for FY 2019-20 (COVID Impacted Year)	30	14.7606	-7.0970	7.6636	1.3381	2.2664	5.137
Avg. Z score of the Firms for Pre-COVID Years	30	10.8355	-3.1818	7.6537	2.6483	2.2420	5.027
Z score of the Firms for FY 2018-19	30	11.1416	-5.0590	6.0826	2.0104	2.0895	4.366
Z score of the Firms for FY 2017-18	30	12.3526	-4.1451	8.2075	2.4731	2.2409	5.022
Z score of the Firms for FY 2016-17	30	12.6105	-0.3414	12.2691	3.4612	3.0941	9.573
Valid N (listwise)	30						

Source: Authors calculation

The Z score of firms varies between -7.0970 to 7.6636 for the FY 2019/20 (which is also considered the COVID impacted year) with a mean value of 1.3381. Z score of firms varies between -5.0590 to 6.0826 for the FY 2018/19 with a mean value of 2.0104, between -4.1251 to 8.2075 for the FY 2017/18 with a mean value of 2.4731, between -0.3414 to 12.2691 for the FY 2016/17 with a mean value of 3.4612. The Average Z score of the firms during the Pre-COVID years has a minimum value of -3.1818 and a maximum value of 7.6537 with a mean value of 2.6483. The maximum and the minimum values are relevant to understanding the dispersion of the data. Hence, it can be seen that the maximum dispersion can be seen during the FY 2019-20 which is the COVID Impacted year and the least dispersion in the Z score of the firms was when we considered the average Z score of each firm during the Pre-COVID years.



**Figure 1.** Distribution of the Firms Across the Bankruptcy Risk Zones based on their calculated Z-Score

From the above figure it is evident that in FY 2019/20, more firms are in the distressed zone in comparison to FY 2018/19, FY 2017/18, and FY 2016/17. Conversely, it can also be seen that the number of firms in the Safe Zone has decreased from 12 in the FY 2016/17 to just 4 in the FY 2019/20.

**4.1.1 Hypothesis testing through T-test**

We have taken the average Z-score calculated for each of the sample companies for their three financial years before the pandemic (FY 2016/17, FY 2017/18, and FY 2018/19) and compared the value with the Z score of the FY 2019/20 for same companies to reach to the conclusion whether there is any deviation in the mean value of the Z score for the COVID year and the pre-COVID years. The significance level selected for the test statistics is  $\alpha = 5\%$

**Table 3. Output of paired sample t-Test**

Paired Samples Test									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Z score of the Firms for FY 2019-20 (COVID Impacted Year) - Avg. Z score of the Firms for Pre-COVID Years	-1.3101	1.9410	0.3544	-2.0349	-0.5854	-3.697	29	.001

Source: Authors calculation

So, we can see that as the P-value (0.001/2) is less than  $\alpha = 5\%$  and so,  $H_0$  is rejected. That is, it can be said that the “ $H_A$ : There is a negative difference in the Z-scores between the Z score of the firms in the COVID impacted period and the Z-score of the Pre- COVID period or the difference is negative or  $\mu_Z$ - COVID -  $\mu_Z$  pre-COVID < 0” is accepted.

As we found,  $\mu_Z$ - COVID -  $\mu_Z$  pre-COVID < 0 (from table 5), it can be inferred that the Altman Z -score of the industry has decreased in the FY 2019/20 and the companies have a weaker financial position. Next, we analyze the factors affecting the calculation of Z – score to identify which factors have changed significantly resulting in a lower Z score for the companies.

#### 4.2 Impact of COVID-19 on an individual component of Altman Z score:

##### 4.2.1 Net Sales of the Firms

From the data in the table-6, it is evident that the mean value of net sales of the firms across the industry has declined significantly in FY 2019/20 (COVID -Year) from FY 2018/19, FY 2017-18. However, it is slightly higher than FY 2016/17. It is also evident from the year-to-year change that in FY 2019/20 the industry witnessed a sharp decline in net sales. One reason for this can be, that as the pandemic hit the global economies, many buyers were forced to cancel their orders resulting in the firms' lost momentum.

**Table 4. Changes in the Net Sales of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	2,373,120,276.37	2,690,802,865.47	2,531,371,503.37	2,284,492,435.53
As % of FY 2016/17	104%	118%	111%	100%
Change in % (in compare to prior year)	(11.81)	6.30	10.81	
STDEV	2,649,298,383.07	2,803,540,815.76	2,205,237,365.87	1,915,595,178.56

| Lowest Value Highest Value |

Source: Authors calculation

### 4.2.2 EBIT of the Firms

From table 7, it is evident that on average the EBIT of the firms in the textile industry is the lowest in the FY 2019/20 among the selected FYs. Across the industry, EBIT has drastically decreased in FY 2019/20 (COVID -Year) than the FY 2018/19, FY 2017-18, and FY 2016/17. This can be due to the lower sales of the firms and higher fixed costs.

**Table 5. Changes in the EBIT of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	111,258,815.67	224,131,937.10	251,251,761.47	246,048,616.97
As % of FY 2016/17	45%	91%	102%	100%
Change in % (in compare to prior year)	(50.36)	(10.79)	2.11	
STDEV	273,873,937.37	316,735,015.44	275,124,278.82	242,367,541.85

Source: Authors calculation

### 4.2.3 Current Assets of the Firms

From the data given in table-8, it is evident that on average the current assets of the firms across the industry have improved in the FY 2019/20 (COVID -Year) than the FY 2018/19, FY 2017-18, and FY 2016/17 and it has been the highest. The most notable current assets of the firms include cash and cash equivalents, trade receivables, advance payments, deposits and prepayment, and inventory.

**Table 6. Changes in the current assets of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	2,509,909,667.97	2,364,892,328.33	2,216,998,112.57	2,014,542,990.47
As % of FY 2016/17	125%	117%	110%	100%
Change in % (in compare to prior year)	6.13	6.67	10.05	
STDEV	2,312,273,466.00	2,027,515,891.00	1,854,332,651.82	1,619,059,138.53

Source: Authors calculation

### 4.2.4 Current Liabilities of the Firms

From the above data, it is evident that on average the current liabilities of the firms across the industry have been the highest in the FY 2019/20 (COVID -Year) when compared to the data of FY 2018/19, FY 2017/18 and FY 2016/17. The current liabilities of the firms were the lowest during the FY 2016/17.

**Table 7. Changes in the current liabilities of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	1,880,070,443.60	1,676,950,714.27	1,590,240,292.93	1,328,844,202.97
As % of FY 2016/17	141%	126%	120%	100%
Change in % (in compare to prior year)	12.11	5.45	19.67	
STDEV	2,111,159,494.89	1,790,300,231.28	1,725,827,695.02	1,392,645,393.88

Source: Authors calculation

#### 4.2.5 Net Working Capital of the Firms

The net working capital of a firm is calculated as the difference between the current assets and the current liabilities. From the data presented above, it is evident that the average net working capital of the firms in FY 2019/20 is better than the average net working capital of the firms in FY 2017/18. However, the net working capital is lower than FY 2018/19 and FY 2016/17. From the earlier part, we can connect it to the fact that during the FY 2019/20, we have found evidence that the current assets of the firms have increased slightly but the current liabilities of the firms have increased significantly. However, the difference between the current assets and the current liabilities of the firms has been the highest during FY 2017/18.

**Table 8. Changes in the NWC of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
<b>MEAN</b>	629,839,224.37	687,941,614.07	626,757,819.63	686,831,189.40
<b>As % of FY 2016/17</b>	92%	100%	91%	100%
<b>Change in % (in compare to prior year)</b>	(8.45)	9.76	(8.75)	
<b>STDEV</b>	872,103,470.44	776,350,815.04	882,842,111.49	858,997,716.51
	Lowest Value			Highest Value

Source: Authors calculation

#### 4.2.6 The non-current asset of the Firms

From the table-11 data, it is evident that on average the non-current assets of the firms across the industry are the highest in the FY 2019/20 (COVID -Year) compared to FY 2018/19, and FY 2017/18, and FY 2016/17. The non-current assets of the firms were the lowest during the FY 2016/17.

**Table 9. Changes in the Non-current Asset of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
<b>MEAN</b>	3,017,905,023.73	2,861,152,264.93	2,319,302,283.30	2,090,071,248.40
<b>As % of FY 2016/17</b>	144%	137%	111%	100%
<b>Change in % (in compare to prior year)</b>	5.48	23.36	10.97	
<b>STDEV</b>	2,713,582,128.56	2,676,940,898.72	2,324,804,715.99	2,169,231,605.77
	Lowest Value			Highest Value

Source: Authors calculation

#### 4.2.7 Non-current liabilities of the Firms

From table -12 it is evident that on average the non-current liabilities of the firms across the industry have been the highest in the FY 2019/20 (COVID -Year) compared to FY 2018/19, FY 2017/18, and FY 2016/17. The non-current liabilities of the firms have been the lowest during the FY 2016/17.

**Table 10. Changes in the Non-current liabilities of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	1,271,568,844.79	1,033,640,749.52	591,269,077.93	563,282,872.76
As % of FY 2016/17	166%	143%	115%	100%
Change in % (in compare to prior year)	23.02	74.82	4.97	
STDEV	1,959,458,054.57	1,417,252,663.88	799,203,612.57	752,978,291.12
	Lowest Value		Highest Value	

Source: Authors calculation

#### 4.2.8 Retained Earnings of the Firms

From the table-13 it is evident that the average retained earnings of the firms across the industry have been the lowest during FY 2019/20 (COVID -Year) compared to FY 2018/19, FY 2017/18, and FY 2016/17. This is also consistent with our finding of lower average net sales of the industry in 2019/20 and the lowest EBIT of the firms during the same period when compared to the data of the prior years.

**Table 11. Changes in the Retained Earnings of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	472,079,813.70	561,881,904.67	713,894,019.07	660,836,531.53
As % of FY 2016/17	71%	85%	108%	100%
Change in % (in compare to prior year)	(15.98)	(21.29)	8.03	
STDEV	1,051,793,933.42	1,062,001,267.58	1,118,843,799.65	1,105,589,646.40
	Lowest Value		Highest Value	

Source: Authors calculation

#### 4.2.9 Total Liabilities of the Firms

From the table-14 it is evident that on average total liabilities of the firms across the industry have been the highest during FY 2019/20 (COVID -Year) when compared to that of FY 2018/19, FY 2017/18, and FY 2016/17. This is because companies had lower sales in the FY 2019/20, and the lowest EBIT, which might have forced them to look for debt financing to finance their expenses, ultimately resulting in increased liabilities for the firms. This is also consistent with our findings that the average current liabilities and the non-current liabilities of the firms have been the highest during FY 2019/20.

**Table 12. Changes in the Total Liabilities of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	3,111,077,530.90	2,677,404,242.27	2,161,800,401.60	1,872,218,578.07
As % of FY 2016/17	166%	143%	115%	100%
Change in % (in compare to prior year)	16.20	23.85	15.47	
STDEV	3,393,281,516.97	2,762,159,186.69	2,338,510,190.50	1,999,175,960.86
	Lowest Value		Highest Value	

Source: Authors calculation

#### 4.2.10 Debt to Asset ratio of the Firms

The average debt to asset ratio of the firms has been the highest during FY 2019/20 when compared to the value during FY 2018/19, FY 2017/18, and FY 2016/17. It can be said that the proportion of the debt of the firms has been the highest during FY 2019/20. The debt to asset ratio is considered a metric for the solvency of a firm. Hence, it can be concluded that the solvency of the firms has deteriorated during FY 2019/20. From FY 2017/18, Dulamia Cotton Mills Limited has negative shareholder equity and hence, their debt-to-asset ratio has been above 1.

**Table 13. Changes in the Debt-to-asset ratio of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	0.61	0.57	0.56	0.48
As % of FY 2016/17	128%	120%	116%	100%
Change in % (in compare to prior year)	6.85	2.70	16.44	
STDEV	0.58	0.51	0.45	0.19



Source: Authors calculation

#### 4.2.11 Total Assets of the Firms

From the table-16 it is evident that on average, the total assets of the firms across the industry have been the highest during FY 2019/20 (COVID -Year) when compared to that of FY 2018/19, FY 2017/18, and FY 2016/17. This is also consistent with our findings that the average total liabilities of the firms have been the highest during the FY 2019/20, and the average EBIT, Retained Earnings of the firms have been the lowest while the average debt to asset ratio has been the highest in 2019/20.

**Table 14. Changes in the Total Assets of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	5,527,814,691.70	5,226,044,593.27	4,536,300,395.87	4,104,614,238.87
As % of FY 2016/17	135%	127%	111%	100%
Change in % (in compare to prior year)	5.77	15.20	10.52	
STDEV	4,623,450,508.04	4,307,066,556.92	4,012,277,073.96	3,610,620,954.17



Source: Authors calculation

#### 4.2.12 Market Value of the Firms

From table 17 it is evident that on average the market value of the firms across the industry has been the lowest during the FY 2019/20 (COVID -Year) when compared to that of the FY 2018/19, FY 2017/18, and FY 2016/17. This can be driven by the poor financial performance of the firms and investors reluctant to invest in this sector due to the pandemic. The firms' liquidity (net working capital), profitability (EBIT), and solvency (debt to asset) have all decreased during the FY 2019/20. These explain the investors' reluctance to invest in the industry.

**Table 15. Changes in the Market Value of the firms across the period**

	FY 2019/20	FY 2018/19	FY 2017/18	FY 2016/17
MEAN	1,669,604,956.40	2,431,778,856.92	2,581,320,441.48	3,386,599,689.45
As % of FY 2016/17	49%	72%	76%	100%
Change in % (in compare to prior year)	(31.34)	(5.79)	(23.78)	
STDEV	1,607,851,899.26	2,104,012,467.20	2,557,368,327.37	4,006,010,799.22
	Lowest Value		Highest Value	

Source: Authors calculation

## 5. Discussion of the Results

The findings of the paper can be summarized as;

- The **average Z score** of the firms in the textile industry of Bangladesh *has decreased* in FY 2019/20 as the COVID affected the industry. Hence, the risk of bankruptcy in the next two years for the firms has increased. In other words, the **financial condition of the firms has deteriorated** in FY 2019/20. The result of the t-test test showed the evidence of the depleted financial condition of the firms on average.
- The **average increase in net sales** of the firms has *dropped significantly* in FY 2019/20. The industry has lost its growth momentum. From the graph and the table, it can be seen that the situation looks quite bleak for the industry.
- The **average EBIT of the firms** has also *dropped drastically* in the FY 2019/20 which is consistent with decreased net sales during the same period. In fact, during the FY 2019/20, the **average EBIT of the firms has been the lowest**. This means that the operational efficiency of the firms has deteriorated on average. FY 2019/20 has been the worst year in comparison to the recent years in terms of performance of the companies.
- On average, the **current assets** of the firms have *increased* during the FY 2019/20 in comparison to the prior years. However, from the data of the current asset, we could not comment on the trend of the specific elements of the current assets like cash and cash equivalent, accounts receivables, inventory, etc. These elements can be studied in-depth in the future.
- The average **current liabilities** of the firms have *increased to the highest* during FY 2019/20 in comparison to the prior years. Like the current assets, our data set was also insufficient to comment on the trend of the specific elements of current liabilities which can be explored in the future.
- The average **increase in net working capital** of the firms has been lower in the FY 2019/20 compare to the prior years. This is consistent with the *slight increase in the current assets* and the *significant increase in current liabilities* during the same period.
- The average **retained earnings** of the firms in the textile industry *have been the lowest* during FY 2019/20 which is also consistent with lower average net sales and the lowest average EBIT of the firms when compared to the data of the prior years.
- The average **total liabilities** of the firms in the textile industry *have been the highest* in FY 2019/20 in comparison to prior years.
- The **average total assets** of the firms *have been the highest* in FY 2019/20 when compared to the prior years. However, the increase in debt can be considered as the driving factor to increase

the average total assets as we have found evidence that the **average debt to asset ratio** of the firms *has been the highest* during the FY 2019/20.

- The **average market value** of the firms in the textile industry has *been the lowest* in FY 2019/20 which is consistent with the fact that in FY 2019/20, the financial positions of the firms have deteriorated.

It needs to be mentioned that we cannot say that the only causal factors of the findings were the pandemic caused by the COVID-19. We focused on identifying the trends in the industry after the pandemic hit the industry.

## 6. Conclusion

The textile industry has been the prized possession of Bangladesh's economy for decades. In this study, we have investigated the financial health of the textile industry in Bangladesh for the COVID year (2019-2020) comparing it with the previous three fiscal years. The pandemic caused by COVID-19 has affected almost every sphere of our lives. To contain the situation and ensure public safety, governments around the world have been forced to take measures like lockdowns that have halted economic activities. Hence, most industry has been negatively affected.

From the study, it is evident that the financial health of the textile firms in Bangladesh has deteriorated significantly during FY 2019/20. The average Z-score has decreased signifying the rising risk of bankruptcy for the firms. The net sales, EBIT, and retained earnings of the firms have decreased, signifying the drop in liquidity of the firms during the FY 2019/20; liabilities, and the debt-to-asset ratio has increased, signifying the financial risk of the firms have increased during the FY 2019/20. Finally, the study also found that the market value of the firms has decreased sharply during the FY 2019/20 which can be related to investors' lower confidence to invest in this industry.

In the coming days, the firms need to come up with a holistic and resilient plan to come out of this difficult situation. Proper planning and execution of the plans will be a major challenge for the management. Government and regulators also need to extend their support so that the industry can recover within the earliest possible time. The contribution of the textile industry to the economy of Bangladesh is undeniable. Hence, quick recovery will benefit all.

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