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COVID-19 Pandemic's Effect on Performance and Acceleration of Performance Recovery: A Study on Manufacturing Industry in Bangladesh

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Abstract

Research aims: The primary aim of this study is to examine the effect of the COVID-19 pandemic during and after this pandemic on manufacturing sectors in Bangladesh. In the context mentioned above, some issues are then taken as the specific objectives.

Design/Methodology/Approach: The study was conducted on the manufacturing sectors listed under Dhaka Stock Exchange (DSE). The study's target population was 42 manufacturing companies out of 153 listed on Dhaka Stock Exchange (DSE). Four research variables were used to evaluate sample companies' financial performance and financial position. Documentary analysis, descriptive analysis, data normality test, and Wilcoxon Signed–Rank Test were employed to evaluate the hypotheses. The years of annual reports, 2018-2019 to 2020-2021, were utilized for the documentary analysis of sample companies' financial performance and financial position.

Research findings: The study's conclusions demonstrated that this pandemic significantly impacted Bangladeshi companies' financial performance (essentially ROA and ROE) at a 5% significance level compared to before the pandemic. In addition, the recovery growth rate of financial performance of sample companies increased optimistically, and the growth of liquidity position of manufacturing companies was also seen in an advantageous position after the COVID-19 pandemic compared to during the COVID-19 pandemic based on Wilcoxon statistical test tool.

Theoretical contribution/Originality: The findings of this study can be used as a source of relevant data by investors or future investors for their investment decisions shortly. The findings of this study will also assist the government in determining or preparing the appropriate tax incentive scheme for the impacted industries and whether the correct sector would profit from the tax incentive scheme.

Practitioner/Policy implication: Considering that the COVID-19 pandemic has significantly impacted the import process of raw materials for production from China in specific and from other countries generally, the study advised the government of Bangladesh to boost its logistic and financial support for the local facility of raw materials.

Research limitation/Implication: More extensive research is projected to be conducted on the recovery growth rate of financial performance in Bangladesh's sub-sector manufacturing industries.

Keywords: COVID-19 pandemic; Leverage ratio; Liquidate ratio; Profitability ratio

Introduction

The economy of the present world is vulnerable due to unknown diseases, in which the first cases were reported in Wuhan, China, on December 31, 2019. The World Health Organization (WHO) then acknowledged COVID-19 as a pandemic on March 11, 2020. At that time, each government was bound to make various hard and painful decisions to prevent people's lives. The normal life of business activities and functions was also stopped due to the COVID-19 pandemic.

Specifically, COVID-19 has had an undesirable impact on Bangladesh's economy by interfering with people's lives and sources of their income. Substantial job losses occurred in all occupational sectors in Bangladesh because of the devastating effects of the coronavirus pandemic. In this case, labour markets were impacted by an economic crisis in more ways than just job losses; real wages also experienced downward pressure. Moreover, Bangladesh experienced the same thing. The pace of fall for Bangladesh's manufacturing sector was remarkably rapid in 2020 as overall wage growth has been declining. As a result, the COVID-19 pandemic has sparked an unprecedented economic catastrophe in Bangladesh and other countries. Due to COVID-19's expansion, Bangladeshi start up enterprises have also been severely impacted since mid-March 2020 (Shahriar et al., 2021). In addition, most businesses (24%) said they had to stop operating, and 50% said their sales had decreased. Additionally, 60% of new businesses have shut down within the first three months of the lockout, worrying the 1.5 million workers since the loss for 2020 was predicted to be $53 million (Ferdous et al., 2020).

The COVID-19 pandemic's effects on Bangladesh's economy include a reduction in the revised tax revenue budget, from 3, 48,069 crores to 2, 65,908 crores Taka in 2019-2020 (Ministry of Finance, 2020). In fact, tax revenue is the prime source of state revenue, or 89.94% of Bangladesh's total budgeted revenue in 2019-2020 (Ministry of Finance, 2020). This tax revenue largely depends on Value-Add Tax (VAT) in Bangladesh, which originated from the manufacturing sector. According to official analysis, numerous businesses kinds would likely experience declining profitability and financial performance due to the economic crisis brought on by the COVID-19 pandemic.

Moreover, due to the currency crisis, which began in July 1997, the 1998 Asian financial crisis significantly impacted Asian countries' production, stock markets, and labor markets. South Korea, Thailand, Malaysia, and Indonesia all saw their stock markets crash, and the inflation rate increased by around 12.9%. The currency's depreciation and the deterioration in the economy also comparably influenced Bangladesh. Exports from Bangladesh decreased by 17%, whereas imports from the affected countries only accounted for 11% of total imports. As a result, the nation's FDI and foreign remittances decreased. Consequently, many people in the impacted nations lost their jobs, increasing the unemployment rate (Moudud-Ul-Huq et al., 2020).

Furthermore, numerous people around the world are terrified as a result of the latest coronavirus pandemic. The whole financial system, including Bangladesh's, is also

already in danger. First, most Bangladeshi manufacturers or industries like garments, steel, cement, plastic, electronics, food, medicine, and others have been importing their raw materials from different areas of China. Bangladeshi manufacturers are also deeply concerned about when China may fully reopen in this dire situation. In addition, many Chinese businesses might fail to meet the deadline for shipping goods, which would undoubtedly hurt our regional sectors.

Although the impacts of the COVID-19 crisis on Bangladesh's economy are, as yet, unknown, Bangladesh is likely to experience a recession for the first time since 1975. While remittance inflows typically rise during times of crisis as migrants living abroad send more money to support their families at home, the worldwide character of the COVID-19 crisis will cause remittances to cease. The average household income could decrease by 19% during the crisis (UNICEF Bangladesh, 2020). On the other hand, according to the most recent Asian Development Outlook 2021 report published by the Asian Development Bank (ADB), Bangladesh's gross domestic product (GDP) is predicted to increase by 6.9% in the fiscal year 2022. The growth forecast reflects a robust recovery underpinned by a resurging global economy, robust manufacturing, and successful government recovery initiatives (ADB, 2022).

For that reason, this study's primary objective is to investigate the impact of the COVID-19 pandemic on Bangladesh's manufacturing sectors, comparing before, during, and after the pandemic. The next objective is to discover the industry's financial recovery growth separately. Further, investors, potential investors, and the government can use the findings' results as a source of relevant data. The study also recommends that the government of Bangladesh increase its logistical and financial support for local raw material facilities, considering the COVID-19 pandemic's significant impact on the import process of raw materials for production from China specifically and from other countries generally.

History of General Holiday (Lockdown) due to COVID-19 in Bangladesh

The first three cases of COVID-19 were discovered in Bangladesh on March 8, 2020. In response, the BGMEA issued instructions on basic preventative measures against COVID-19 for textile companies on March 9. On March 13, the Ministry of Labor and Employment instructed industrial managers to implement reasonable hygiene procedures and print and distribute COVID-19 instructions in workplaces to workers. To stop the spread of COVID-19, the Ministry of Education then issued an order to close all educational institutions on March 16. Also, the first coronavirus death in Bangladesh was reported on March 18. To stop the spread of COVID-19 in Bangladesh due to a surge in COVID-19 cases, the Ministry of Public Administration also issued general holidays from March 26 through April 4 on March 23.

A Tk 50 billion stimulus program for the owners of exporting industries hit by COVID-19 was announced by the Bangladeshi government's prime minister on March 25. To help pay for employee salaries and wages, the money could be borrowed from a bank at 2%. On March 26, the Ministries of Roads, Bridges, and Civil Aviation and the Ministries of

Tourism banned and stopped all forms of domestic transportation and all international flights to all nations, except for the UK and China. After that, BGMEA and BKMEA instructed members to keep factories closed until April 4, 2020. Still, an exception was established for manufacturing facilities producing personal protective equipment (PPE), masks, hand wash, and pharmaceuticals and having export orders. As a result, the entire economic system and the entire employment structure collapsed. Then, the Ministry of Public Administration announced that the general holidays were extended on April 2 through April 9, 2020. The lockdown (general holiday) supposed to conclude on April 4 was prolonged until April 11, then to April 14, then to April 25, and then again to May 5, then to May 16, and finally to May 30, with the government announcing on May 27 that there would be no further extension. The government also highlighted that economic activity must continue to protect people's lives and means of subsistence.

Literature Review and Hypothesis Development

A mathematical model has been developed using the game theory that shows how people's responses can affect the spread of a disease during a pandemic. The study revealed that information is the key to inspiring the proper response during a pandemic (Poletti et al., 2015). Also, Tocco et al. (2013) provided a conceptual framework for estimating farm labor and other factor-derived demand and output supply systems. They also studied the effect of market distortions in one market through inefficient pricing and on-demand for other inputs. In addition, Singh and Kaur (2021) stated in his legal framework for researching a post-COVID social world article that the COVID-19 pandemic will increase the debt crisis for various underdeveloped and developing countries. For a country like India with a higher dependent population, macroeconomic restructuring policies then become critical.

Financial Reporting

Financial reporting is seen as a ritual of erecting and providing information to the audience using "a holy guidance of ceremony," such as regulations, rules, standards, and producers (Chariri, 2011). Financial reporting is also the process of recording and conveying to the stakeholders their financial activities and performance across specific periods, which accurately portray a company's finances, including its sales, expenses, profits, capital, and cash flow. In this regard, businesses compile accounting data and present their current financial condition in financial reports. In addition, Ahmed and Duellman (2007) and Mendes et al. (2012) identified that providing information about performance, financial situation, and cash flow is the primary goal of producing financial reports. Financial reports also provide projections of future profitability, industry position, and growth by examining resource usage, cash flow, business performance, and the business's financial health.

Moreover, Chen et al. (2009) described a valuable strategy for addressing information asymmetry using high-quality accounting data. According to Choi and Pae (2011), the quality of the financial reports is crucial for the company's reliability. Thus, ensuring

timely and accurate financial reporting and analysis assists stakeholders in making informed decisions for future growth by identifying business opportunities and improving their understanding of the company's performance. The information provided by financial reporting should also comply with regulatory requirements and internally assesses performance to plan and adjust the forecast.

Further, financial reporting is compulsory by various acts, regulations, rules, regulatory agencies, debt holders, investors, and other key stakeholders. Hence, investors, creditors, and other stakeholders can learn about a company's creditworthiness and financial integrity from timely financial reports. According to Holland (1999), the financial reporting cycle and public disclosure of financial statements are crucial to corporate governance.

Financial Performance

According to the accounting glossary, performance measures a business's success over a specific period. Performance is also a comparison of goals set and actual results attained by an individual or group after engaging in an activity (Riswan & Kesuma, 2014). A firm's financial performance is summarized in a financial performance report, assisting different investors and stakeholders in making investment decisions. In addition, the company's financial performance is a measure of its success on the corporate level in terms of income, overall operating costs, debt load, assets, and investment returns (Devi et al., 2020). Various stakeholders' interest is also affected by a firm's financial performance. The stakeholders will monitor the company's financial performance, which is connected to changes in the statement of financial position, profit or loss, or cash flow, for any changes. Besides, the business's financial success is significantly influenced by the management's implementation of organizational goals through policies, strategies, and actions. According to Subramanyam (2014), financial performance pronounces a company's financial condition or situation based on encoded goals, standards, principles, and criteria.

Financial Ratio

Allad and Maisuria (2015) stated that ratio analysis reveals whether the company has improved or declined over the past few years. According to Harahap (2011), financial ratios are the results of comparing two financial statement items with a meaningful and relevant relationship. A company's financial performance is evaluated by analysing its financial ratios. The best tool to assess a company's financial success is ratios (Rhamadana & Triyonowati, 2016). Innocent et al. (2013) discovered that one of the crucial components of the firm's financial strategy is the successful selection and application of the correct financial ratios. Meanwhile, Fraser and Ormiston (2016) proposed using four different ratios to evaluate a firm's financial success. They were the activity ratio assessing how effectively a company uses its assets, the liquidity ratio gauging how well a company can meet its short-term debt obligations, the solvency ratio, or leverage, assessing how much of its assets are financed by debt, and the profitability ratio, evaluating how well a company can turn a profit.

Liquidity Ratio

Liquidity, current liabilities, and asset structure are all interconnected. The amount of cash a company has, the amount of other assets that can be quickly converted into cash, whether the company is profitable or not, the amount of debt that will need to be repaid soon, and the company's capacity to raise additional funds through the sale of securities or borrowing money all affect its level of liquidity (Lacey &Chambers, 2011). In every way, the liquidity ratio is quite significant. It is also now regarded as a necessary criterion for analyzing the liquidity ratio to understand the international company better. Lalithchandra and Rajendhiran (2021) described that analyzing the liquidity ratio assists in making a brave and wise choice that will attract the interest of potential investors. Thus, properly studying the liquidity ratio is crucial for small business developers to develop superior growth. The current ratio has also been frequently used for liquidity measurement of any entity. To compare current assets to current debt, one uses a ratio called the current ratio. The current ratio determines how well the current assets can cover the current obligations (Sari, 2020).

Profitability Ratio

Profitability will boost a company's worth by giving it a positive outlook or resulting in investors, which can drive up stock prices concerning market value, raising the company's value. According to Sharaf and Haddad (2015), profitability refers to the ability to generate a financial gain, which is the primary objective of any company. Therefore, increasing profitability is crucial since firms will cease to exist without it. On the other hand, the different use of various resources, including people, equipment, and technology, results in profitability and dramatically impacts the research findings (Bromiley & Rau, 2016). Consequently, estimating profits and measuring profits from the prior year is vital. This ratio's components, including cash return on invested capital, gross profit margin, net profit margin, return on asset, return on capital employed, return on equity, return on investment, and return on sales, demonstrate the combined impact of liquidity and the management of assets and debt.

Moreover, firms can use two different types of figures to understand the performance of their financial investments when deciding how to allocate their financial resources. The terms return on investment and return on assets refer to the computation used to show financial experts and business executives how a company generates profits. The main distinction between ROE (Return on Equity) and ROA (Return on Asset) relates to how a corporation accounts for debt. In this regard, shareholder equity and the business's total assets will be equal without debt. Logically, its ROE and ROA would also be the same. However, if that business uses financial leverage, its ROE will exceed its ROA. Besides, ROA is a measure of profitability examining the return on a company's assets.

A profitability ratio gauges a company's general ability to produce profits using the resources at its disposal. The more profitable a firm is, its value is more significant (Sharaf & Haddad, 2015). ROA also examines management's ability to generate a return

on the firm's assets and argues that companies with significant assets should be able to generate large amounts of income (Akindele & Odusina, 2015). Meanwhile, Return on Investment (ROI) is a way of measuring value and communicating the entities' value to their governing and stakeholders' bodies. Botchkarev and Andru (2011) stated that one of the most widely used measures is the return on investment (ROI), and when done correctly, ROI analysis is a potent tool for making wise choices.

Leverage Ratio

The leverage ratio is one of the most important financial measurements considering the amount of money originating from debt (loans) or evaluating a company's capacity to satisfy its financial obligations. The leverage ratio category is essential since businesses rely on a combination of loans and equity to fund their operations. Leverage ratios also assess the proportionate debt a company has racked up. The debt-to-equity ratio, the equity multiplier, the level of financial leverage, and the consumer leverage ratio are all typical. Pfeiffer et al. (2017) addressed the benefits and drawbacks of implementing a macro-prudential leverage ratio and the relationship between capital and leverage ratios. Their paper proposed that the leverage ratio requirement should also consider the number of capital reserves to function as a macro-prudential policy tool. In addition, Samuels(2014) stated that the leverage ratio had been used to measure capital adequacy. On the other side, this ratio evaluates how much debt is used to finance corporate assets (Fraser & Ormiston, 2016; Sajiyah, 2016). It can also represent the solvency ratio, showing how much money is required to pay all or some of the necessary expenses. This ratio also establishes short-and long-term debt. Long-term debt will impact solvency, whereas short-term debt will affect liquidity. In this case, debtors will be concerned about this ratio, especially long-term creditors (Abbas, 2018).

Hypotheses Development

Due to the COVID-19 pandemic, most companies worldwide have negatively impacted their economy and the country's economy. The financial performances of Bangladeshi companies have also been affected by the COVID-19 pandemic. As a result, companies would face a monetary crisis during and after the COVID-19 pandemic. However, the management of the company must continue to make an effort to consider stakeholder interests by being transparent about its financial status. According to stakeholder theory, a company's management must always inform its stakeholders about its operations, including its financial situation, to serve their interests. Besides, Bintang et al. (2019) showed the differences in financial performance throughout the period before and after the financial crisis, particularly the current ratio.

Furthermore, Istiningrum (2005) indicated that current ratio measurements of a firm's liquidity ratios significantly decreased during the financial crisis. Karim et al. (2021) also revealed that after the COVID-19 pandemic, the liquidity position and financial stability of Bangladesh's listed banks would deteriorate. However, before this pandemic, the banks' liquidity ratios and financial health were low; they got worse in the second

quarter of 2020. Most banks also had weak cash positions and liquidity ratios. Therefore, the hypotheses could be framed as follows:

H_1: The liquidity is negatively affected by the COVID-19 pandemic during the pandemic period, measured using the current ratio.

H_2: The liquidity position of sample companies increases positively after the COVID-19 pandemic, measured using the growth of the current ratio.

Further, it is a general consequence that, during the financial crisis, companies lose their net income daily. Even some companies went to negative income, which means net loss occurred. Due to the people's declining purchasing power and rising production costs, net income dramatically dropped, which significantly reduced a company's profitability. Achim et al. (2021) conducted a study to analyze the level of business performance in reaction to the COVID-19 pandemic on 218 Romanian listed firms of diverse sizes (large and small) and from various business sectors for the period June 30, 2019, to June 30, 2020. To evaluate the business performance, they used the return on equity and return on assets as measurement tools. They discovered that over the studied time, the net earnings of the entire market declined by 37.43%. Also, Shen et al. (2020) stated that the ROA of listed Chinese companies has been reducing due to the significant negative impact of the COVID-19 pandemic on financial performance concerning a decrease in total revenue value. According to Omaliko et al. (2021), the COVID-19 pandemic also adversely impacted the profitability and liquidity of businesses in Nigeria at a 5% significant level. In this regard, the hypotheses could be expressed as follows:

H_3: The COVID-19 pandemic has a negative effect on profitability during the pandemic period, measured using the ROA and ROE ratios.

H_4: The profitability of sample companies increases positively after the COVID-19 pandemic, measured using the growth of ROA and ROE ratios.

Moreover, the researchers observed during the COVID-19 pandemic that a remarkable decrease in sales revenue would affect the company's profit and cash sales transactions. Besides, cash collections from outstanding were dramatically reduced during the COVID-19 pandemic of the companies. Due to a lack of cash to pay debts, this circumstance will significantly affect the company's ability to do so. Additionally, the company's losses from lower sales will have a negative impact on the capital value. Istiningrum (2005) has shown that the leverage ratio damage caused by a global crisis is determined by the debt-to-equity ratio (DER). In addition, an investigation on the factors influencing capital structure over time and the degree of leverage before, during, and after a financial crisis has been conducted in Turkey enterprises (Jermias & Yigit, 2019). Meanwhile, Vo et al. (2021) found that, in general, businesses tended to change their financial structure more quickly when COVID-19 broke out.

H₅: The COVID-19 pandemic has a negative effect (increased) on the leverage ratio during the pandemic period, measured using the debt to equity (D/E) ratio.

H₆: The debt to equity (D/E) ratio of sample companies decreases after the COVID-19 pandemic, measured using the growth of the debt to equity (D/E) ratio.

Research Method

The research method used in this study was quantitative. This study also used secondary data, meaning they had already been processed and gathered by other persons or organizations. This study's secondary data were collected from the financial reports of sample companies listed on the Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) from 2019 to 2021. In this research, all the listed companies in Bangladesh were then divided into two sectors: manufacturing and service. However, this study was conducted in the manufacturing sub-sector of Bangladesh.

Population and Sample

The population of this study was listed companies on Dhaka Stock Exchange (DSE) in 2019. The total population was 153 public companies under the manufacturing sector, divided into ten sub-sectors by DSE. The ten sub-sectors included: 1) cement, 2) ceramic, 3) steel or iron, 4) food and allied, 5) fuel and power, 6) jute, 7) paper and printing, 8) pharmaceuticals, 9) tannery, and 10) textile industry. The nine sub-sectors in this study were used as sample industries except for jute due to a lack of available information. Then, 42 listed companies were selected conveniently for this study. In addition, the time interval of this study was from 2018-2019 to 2020-2021.

On March 8, 2020, Bangladesh reported its first coronavirus case. The Government of Bangladesh (GoB) issued a special "general leave" starting on March 26 under the pretext of a "lockdown," and it was extended up until May 30, 2020, in seven separate time slots. After 65 days of lockdown, as of May 31, 2020, Dhaka was back to normal, with no social segregation or health regulations. Nevertheless, from June 2020, the government tried to resume production activities and take some physical distancing measures to continue manufacturing in Bangladesh. Therefore, the financial year 2018-2019 was designated as before the COVID-19 pandemic, 2019-2020 was designated as during the COVID-19 pandemic, and 2020-2021 was designated as after the COVID-19 pandemic in this study. Although the COVID-19 pandemic is going on, all operational activities are running. With a 95% confidence level between the sample and the population, the 5% threshold of significance was then applied.

Research Variables

The research variables used in this research are presented in Table 1.The liquidity measurement purpose in most of the research uses this current ratio. The current ratio determines whether the current assets can cover the current obligations. The leverage

ratio, DE ratio, measures the capacity of capital to fulfil all of its obligations. In this study, the DE ratio was utilized to determine a company's capacity to repay debt, including long-term debt. Here, ROA and ROE are metrics for determining profitability, used to gauge a company's ability to benefit from its efficiency.

Table 1 Research Variables

Acronym	Definition	Operationalization	Source of data	Reference
CR	Liquidity ratio	Current assets to current liabilities	Annual reports	(Fraser & Ormiston, 2016; Devi et al., 2020)
ROE	Return on equity	Net income to total equity	Annual reports	(Sehaq, 2019; Devi et al., 2020)
ROA	Return on asset	Net income to total asset	Annual reports	(Sehaq, 2019; Devi et al., 2020)
DE	Financial leverage	Debt–to–equity ratio	Annual reports	(Fraser & Ormiston, 2016; Devi et al., 2020)

Result and Discussion

The research's data were analyzed using descriptive analysis, and several tests were also utilized to compare the performance of Bangladeshi manufacturing firms before and during the country's economic crisis brought on by the COVID-19 pandemic.

To choose the statistical tests to apply for the different tests, the data normality test was carried out. The data normality test is an absolute requirement in parametric statistics. If the data is not normally distributed, non-parametric statistics, such as the Wilcoxon signed-rank test, can be used to analyze the data. The data were then analyzed utilizing SPSS version 25.

Data Analysis Before and During COVID-19 Pandemic

In this research, a descriptive analysis was conducted, as shown in Table 2. Table 2 demonstrates that the current ratio was higher during the COVID-19 pandemic than before the COVID-1 pandemic.

Table 2 Descriptive Analysis Results

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	42	0.53	47.50	3.5083	7.43577
CR during COVID-19	42	0.59	52.70	4.4119	9.70073
ROE before COVID-19	42	-0.20	0.27	0.0749	0.08202
ROE during COVID-19	42	-0.36	0.32	0.0483	0.11001
ROA before COVID-19	42	-0.05	0.27	0.0498	0.06281
ROA during COVID-19	42	-0.20	0.27	0.0336	0.07487
DE before COVID-19	42	0.00	2.81	0.4785	0.68665
DE during COVID-19	42	0.00	3.80	0.5615	0.86833

The mean score of current ratios before the COVID-19 pandemic was 3.5083 with a minimum of 0.53 and a maximum of 47.50, while the mean score of current ratios during the COVID-19 pandemic was 4.4119 with a minimum of 0.59 and a maximum 52.70. In other words, there was a wide variation in the CR ratio during the COVID-19 pandemic.

Additionally, it was discovered that there was a decline in the mean ROE and ROA value, indicating that the COVID-19 pandemic situation had a negative impact on the company's financial performance. The mean score of ROE before the COVID-19 pandemic was 0.0749 with a minimum score of -0.20 and a maximum score of 0.27, while the mean score of ROE during the COVID-19 pandemic was 0.0483 with a minimum score of -0.36 and a maximum score 0.32. The decline in the mean score of ROE before to during the COVID-19 pandemic was 0.0266 or 2.66%. Before the COVID-19 pandemic, the mean ROA value was 0.0498, while it was 0.0336 during the pandemic. Thus, the ROA declined by 0.0162 or 1.62%.

In this case, the rate of return is the core part of the financial performance of any organization. The results showed that this integral part of the manufacturing sector was seriously affected due to the COVID-19 pandemic in Bangladesh. Comparing the COVID-19 pandemic to the period before, the debt-to-equity ratio increased. The mean score of the DE ratio before the COVID-19 pandemic was 0.4785 with a minimum score of 0.00 and a maximum score of 2.81, while the mean score of the DE ratio during the COVID-19 pandemic was 0.5615 with a minimum score of 0.00 and a maximum score of 3.80. Based on changes in the DE ratio value, this rise in mean DE value suggests that the COVID-19 pandemic had a detrimental effect on the company's financial structure. It also means that the long-term or non–current liabilities increased compared to stockholders' equity during the COVID-19 pandemic.

Data Normality Test

Table 3 shows Shapiro-Wilk normality test results. This test found that the data were not normally distributed due to the significant value of each observation, as shown in Table 3, being smaller than 0.05.

Table 3 Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
CR before COVID-19	0.362	42	0.000	0.357	42	.000
CR during COVID-19	0.369	42	0.000	0.392	42	.000
ROE before COVID-19	0.126	42	0.089	0.943	42	.036
ROE during COVID-19	0.228	42	0.000	0.859	42	.000
ROA before COVID-19	0.185	42	0.001	0.850	42	.000
ROA during COVID-19	0.224	42	0.000	0.813	42	.000
DE before COVID-19	0.243	42	0.000	0.665	42	.000
DE during COVID-19	0.260	42	0.000	0.651	42	.000

Note: CR is the current ratio; ROE is the return on equity; ROA is the return on equity; DE is the debt-to-equity ratio.

Therefore, the data could not be tested using a parametric statistical test. Thus, a non-parametric statistical test was done using the Wilcoxon signed rank.

Wilcoxon Signed-Rank Test

Table 4 demonstrates that the tie values for the CR ratio, ROE ratio, ROA ratio, and DE ratio were all 0 (zero), indicating no tie between the values for these variables before and during the COVID-19 pandemic.The study also demonstrates that during the COVID-19 pandemic, 15 companies increased their current ratio, while 27 companies decreased it. The negative and positive ranks at the N-values of 15 and 27, respectively, proved this. According to negative ranks at the N-value of 30 and positive ranks at 12, it was discovered that during the COVID-19 pandemic, 30 companies' ROE values decreased, and 12 companies' ROE values increased.

Table 4 Ranks

		N	Mean Rank	Sum of Ranks
CR during COVID-19 - CR before COVID-19	Negative Ranks	27[a]	19.26	520.00
	Positive Ranks	15[b]	25.53	383.00
	Ties	0[c]		
	Total	42		
ROE during COVID-19 - ROE before COVID-19	Negative Ranks	30[d]	21.83	655.00
	Positive Ranks	12[e]	20.67	248.00
	Ties	0[f]		
	Total	42		
ROA during COVID-19 - ROA before COVID-19	Negative Ranks	29[g]	24.53	711.50
	Positive Ranks	13[h]	14.73	191.50
	Ties	0[i]		
	Total	42		
DE during COVID-19 - DE before COVID-19	Negative Ranks	20[j]	17.90	358.00
	Positive Ranks	22[k]	24.77	545.00
	Ties	0[l]		
	Total	42		

Table 4 further reveals that during the COVID-19 pandemic, 29 companies decreased their ROA, while 13 companies increased it, as indicated by negative ranks at the N-value of 29 and positive ranks at the N-value of 13. According to the DE ratio, during the COVID-19 pandemic, 22 companies had a gain in the DE ratio, and 20 companies saw a reduction in the DE ratio, as evidenced by positive ranks at the N-value of 22 and negative ranks at the N-value of 20.

Table 5 Test Statistics

	CR during COVID-19 - CR before COVID-19	ROE during COVID-19 - ROE before COVID-19	ROA during COVID-19 - ROA before COVID-19	DE during COVID-19 - DE before COVID-19
Z	-0.857[b]	-2.545[b]	-3.251[b]	-1.169[c]
Asymp. Sig. (2-tailed)	0.392	0.011	0.001	0.242

Table 5 displays that the ROE and ROA values before and during the COVID-19 pandemic differed significantly, as observed from the Asymp. According to the Wilcoxon signed-rank test results, the sig. values (2-tailed) of 0.011 and 0.001 were <0.05. On the other hand, as can be observed from the Asymp, there were no discernible differences in the values of the CR ratio and DE ratio before and during the COVID-19 pandemic. In addition, values of sig. (2-tailed) of 0.392 and 0.242 were both greater than 0.05. Therefore, H3 was accepted, whereas H1 and H5 were rejected.

Data Analysis Comparing During and After COVID-19 pandemic

A descriptive analysis was also conducted on the financial performance growth, as shown in Table 6. Table 6 shows that the recovery growth of the current ratio after the COVID-19 pandemic rapidly decreased compared to during the COVID-19 pandemic. The mean score of current ratios during the COVID-19 pandemic was 0.4583 with a minimum of -0.33 and a maximum of 19.40, while the mean of current ratio growth after the COVID-19 pandemic was 0.0180 with a minimum of -0.57 and a maximum 0.81. Thus, it is indicated that huge working capital was used after the COVID-19 effect, which proved the wide variation in the growth of recovery CR ratio during the COVID-19 pandemic compared to after the COVID-19 pandemic.

Table 6 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR Growth during COVID-19	42	-0.33	19.40	0.4583	2.99778
CR Growth after COVID-19	36	-0.57	0.81	0.0180	0.25314
ROE Growth during COVID-19	42	-4.89	0.50	-0.5229	1.04013
ROE Growth after COVID-19	36	-5.47	10.41	0.6389	2.48991
ROA Growth during COVID-19	42	-4.69	0.40	-0.5514	1.00294
ROA Growth after COVID-19	36	-5.23	10.14	0.5767	2.27230
DE Growth during COVID-19	42	-0.60	39.30	1.0026	6.05952
DE Growth after COVID-19	36	-0.48	11.75	0.3118	1.99468

Table 6 also presents a swift increase in the mean score of ROE and ROA. The mean score of ROE during the COVID-19 pandemic was -0.5229 with a minimum score of -4.89 and a maximum score of 0.50, while the mean score of ROE after the COVID-19 pandemic was 0.6389 with a minimum score of -5.47and a maximum score 10.41. Hence, ROE's recovery growth rate during the COVID-19 pandemic compared to after the COVID-19 pandemic was 1.1618, indicating that recovery growth was 116.18%. In addition, the mean score of ROA recovery growth during the COVID-19 pandemic was -0.5514, whereas the mean score of ROA after the COVID-19 pandemic was 0.5767. It was also found that the ROA recovery growth rate amplified by 112.81%.

Moreover, the recovery growth of the debt-to-equity ratio decreased by 0.6882 after the COVID-19 pandemic compared to during the COVID-19 pandemic. The mean score of the DE ratio during the COVID-19 pandemic was 1.0026 with a minimum score of -0.60

and a maximum score of 39.30, while the mean score of the DE ratio after the COVID-19 pandemic was 0.3118 with a minimum score of -0.48 and a maximum score of 11.75. This decline signifies that the COVID-19 pandemic positively affected the company's financial structure. Therefore, manufacturing companies reduced their non–current liabilities after the COVID-19 pandemic.

Table 7 Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CR Growth during COVID-19	0.482	36	0.000	0.191	36	0.000
CR Growth after COVID-19	0.171	36	0.009	0.890	36	0.002
ROE Growth during COVID-19	0.282	36	0.000	0.558	36	0.000
ROE Growth after COVID-19	0.185	36	0.003	0.789	36	0.000
ROA Growth during COVID-19	0.281	36	0.000	0.582	36	0.000
ROA Growth after COVID-19	0.160	36	0.020	0.807	36	0.000
DE Growth during COVID-19	0.491	36	0.000	0.190	36	0.000
DE Growth after COVID-19	0.404	36	0.000	0.289	36	0.000

Table 7 displays Shapiro-Wilk normality test results. As in Table 7, the research data were not normally distributed. The significance value of each observation was less than 0.05, as shown in Table 7. Therefore, a parametric statistical test could not be performed on the data. As a result, the Wilcoxon signed rank was used in a non-parametric statistical test.

Table 8 Ranks

		N	Mean Rank	Sum of Ranks
CR Growth after COVID-19 - CR Growth during COVID-19	Negative Ranks	18[a]	19.00	342.00
	Positive Ranks	18[b]	18.00	324.00
	Ties	0[c]		
	Total	36		
ROE Growth after COVID-19 ROE Growth during COVID-19	Negative Ranks	12[d]	14.25	171.00
	Positive Ranks	24[e]	20.63	495.00
	Ties	0[f]		
	Total	36		
ROA Growth after COVID-19 ROA Growth during COVID-19	Negative Ranks	11[g]	14.82	163.00
	Positive Ranks	25[h]	20.12	503.00
	Ties	0[i]		
	Total	36		
DEGrowth after COVID-19 DE Growth during COVID-19	Negative Ranks	22[j]	18.95	417.00
	Positive Ranks	14[k]	17.79	249.00
	Ties	0[l]		
	Total	36		

Wilcoxon Signed-Rank Test for Growth Analysis

Table 8 reveals that ties values for growth of CR ratio, ROE, ROA, and DE ratio were 0 (zero), meaning no growth values for CR ratio, ROE, ROA, and DE ratio between during and after the COVID-19 pandemic. According to negative ranks at the N-value of 18 and

positive ranks at the N-value of 18, 18 companies practiced a drop in their growth of the current ratio, and 18 companies practiced an increase in their growth of the current ratio after the COVID-19 pandemic. It was also found that the 24 companies experienced an increase in growth of ROE value, while 12 companies experienced a decrease in ROE after the COVID-19 pandemic, as shown by positive ranks at the N-value of 24 and negative ranks of 12.

Table 8 also shows that the 25 companies practiced an increase in the growth of ROA, whereas 11 companies practiced a decrease in ROA after the COVID-19 pandemic, as revealed by positive ranks at the N-value of 25 and the negative ranks at the N-value of 11. Based on the DE ratio, the DE ratio of 22 companies decreased, while 20 companies practiced a rise in the DE ratio after the COVID-19 pandemic, as indicated by negative ranks at the N-value of 22 and positive ranks at the N-value of 14.

Table 9 Test Statistics

	CR Growth after COVID-19 - CR Growth during COVID-19	ROE Growth after COVID-19 ROE Growth during COVID-19	ROA Growth after COVID-19 ROA Growth during COVID-19	DE Growth after COVID-19 DE Growth during COVID-19
Z	-0.141^{b}	-2.545^{c}	-2.671^{c}	-1.320^{b}
Asymp. Sig. (2-tailed)	0.888	0.011	0.008	0.187

Table 9 presents that the recovery growth of ROE and ROA values during and after the COVID-19 pandemic were significantly different according to the Wilcoxon signed-rank test, as observed from the Asymp. Sig. (2-tailed) values of 0.011 and 0.008, respectively, which were <0.05. On the other hand, as can be observed from the Asymp, there were no discernible differences in the values of the CR ratio and DE ratio during and after the COVID-19 pandemic. Values of sig. (2-tailed) of 0.888 and 0.187 were both greater than 0.05. Therefore, H4 was accepted, whereas H2 and H6 were rejected.

Impact of COVID-19 Industry Wise: Cement Industry

Cement Industry

Table 10 shows that the four cement industrial companies out of seven experienced an increase in the mean score of the current ratio from 0.7636 to 0.7985 during COVID-19, while the mean score of ROE reduced from 0.0918 to 0.0744. In addition, the mean score of ROA decreased from 0.0316 to 0.0290, and the mean DE ratio improved from 0.9603 to 1.3154.

Table 10 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	4	0.53	0.88	.7636	0.15717
CR during COVID-19	4	0.59	0.94	.7985	0.15158
ROE before COVID-19	4	0.06	0.12	.0918	0.02470
ROE during COVID-19	4	0.05	0.10	.0744	0.02478
ROA before COVID-19	4	0.01	0.05	.0316	0.01650
ROA during COVID-19	4	0.01	0.05	.0290	0.02467
DE before COVID-19	4	0.22	2.44	.9603	1.01668
DE during COVID-19	4	0.23	3.80	1.3154	1.68031

Ceramic Industry

Table 11 displays that the three ceramic industrial companies out of five practiced a decline in the mean score of the current ratio from 1.4218 to 1.3276 during COVID-19, while the mean score of ROE decreased from 0.0647 to 0.0518. Besides, the mean score of ROA reduced from 0.0351 to 0.0180, and the mean DE ratio decreased from 0.3552 to 0.3404

Table 11 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	3	0.71	1.85	1.4218	0.62170
CR during COVID-19	3	0.76	1.69	1.3276	0.50107
ROE before COVID-19	3	0.01	0.13	0.0647	0.05673
ROE during COVID-19	3	0.01	0.11	0.0518	0.05093
ROA before COVID-19	3	0.01	0.06	0.0351	0.02725
ROA during COVID-19	3	0.00	0.03	0.0180	0.01159
DE before COVID-19	3	0.12	0.71	0.3552	0.30832
DE during COVID-19	3	0.12	0.69	0.3404	0.30651

Steel Industry

Table 12 reveals that the six iron industrial companies out of nine practiced a reduction in the mean score of the current ratio from 1.6726 to 1.6325 during COVID-19, while the mean score of ROE decreased from 0.0723 to 0.0286. Also, the mean score of ROA reduced from 0.0238 to 0.0122, and the mean DE ratio increased from 0.7102 to 0.7498 during the COVID-19 pandemic.

Table 12 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	6	1.03	3.82	1.6726	1.11228
CR during COVID-19	6	0.97	3.81	1.6325	1.11977
ROE before COVID-19	6	-0.05	0.14	0.0723	0.06537
ROE during COVID-19	6	-0.05	0.07	0.0286	0.03910
ROA before COVID-19	6	-0.03	0.06	0.0238	0.03106
ROA during COVID-19	6	-0.02	0.06	0.0122	0.02622
DE before COVID-19	6	0.06	2.68	0.7102	0.98024
DE during COVID-19	6	0.06	3.21	0.7498	1.21357

Food Industry

Table 13 shows that the six food and Allied industrial companies out of twenty-one practiced an increase in the mean score of the current ratio from 2.1363 to 2.1580 during COVID-19, while the mean score of ROE decreased from 0.1218 to 0.1129. The mean score of ROA reduced from 0.0828 to 0.0673, and the mean DE ratio decreased from 0.0774 to 0.0748 during the COVID-19 pandemic.

Table 13 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	6	1.35	2.97	2.1363	0.57509
CR during COVID-19	6	1.33	2.96	2.1580	0.65221
ROE before COVID-19	6	0.02	0.26	0.1218	0.10990
ROE during COVID-19	6	0.02	0.32	0.1129	0.13419
ROA before COVID-19	6	0.01	0.18	0.0828	0.07368
ROA during COVID-19	6	0.01	0.17	0.0673	0.07522
DE before COVID-19	6	0.02	0.19	0.0774	0.05684
DE during COVID-19	6	0.02	0.19	0.0748	0.06055

Paper and Printing Industry

Table 14 presents that the three paper and printing industrial companies out of six experienced an increase in the mean score of the current ratio from 1.0813 to 1.2715 during COVID-19, while the mean score of ROE decreased from 0.0829 to 0.0422. The mean score of ROA increased from 0.7204 to 0.8291, and the mean value of the DE ratio decreased from 0.0307 to 0.0154 during the COVID-19 pandemic.

Table 14 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	3	0.65	1.50	1.0813	0.42598
CR during COVID-19	3	0.59	1.77	1.2715	0.60922
ROE before COVID-19	3	0.01	0.20	0.0829	0.09983
ROE during COVID-19	3	0.01	0.08	0.0422	0.03989
ROA before COVID-19	3	0.07	1.36	0.7204	0.64516
ROA during COVID-19	3	0.06	1.65	0.8291	0.79299
DE before COVID-19	3	0.01	0.07	0.0307	0.03618
DE during COVID-19	3	0.00	0.03	0.0154	0.01432

Pharmaceuticals Industry

Table 15 displays that the four pharmaceuticals industrial companies out of fifteen experienced an increase in the mean score of the current ratio from 5.2215 to 5.7767 during COVID-19, while the mean score of ROE decreased from 0.1253 to 0.1240. The mean score of ROA slightly increased from 0.0985 to 0.0986, and the mean value of the DE ratio increased from 0.1692 to 0.2121 during the COVID-19 pandemic.

Table 15 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	4	1.08	12.93	5.2215	5.29609
CR during COVID-19	4	1.17	14.53	5.7767	6.03089
ROE before COVID-19	4	0.02	0.21	0.1253	0.08517
ROE during COVID-19	4	0.02	0.19	0.1240	0.08284
ROA before COVID-19	4	0.01	0.16	0.0985	0.07436
ROA during COVID-19	4	0.01	0.17	0.0986	0.07427
DE before COVID-19	4	0.02	0.41	0.1692	0.17193
DE during COVID-19	4	0.02	0.58	0.2121	0.25624

Foul and Power Industry

Table 16 shows that the three fuel and power industrial companies out of twenty-three practiced a decline in the mean score of the current ratio from 19.8470 to 16.0946 during the COVID-19, while the mean score of ROE increased from 0.1532 to 0.1608. The mean score of ROA increased from 0.1343 to 0.1480, and the DE ratio decreased from 0.9407 to 0.9309 during the COVID-19 pandemic.

Table 16 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	3	2.67	47.51	19.8470	24.18621
CR during COVID-19	3	2.24	37.21	16.0946	18.57754
ROE before COVID-19	3	0.06	0.27	0.1532	0.10870
ROE during COVID-19	3	0.03	0.28	0.1608	0.12223
ROA before COVID-19	3	0.02	0.27	0.1343	0.12870
ROA during COVID-19	3	0.01	0.27	0.1480	0.13333
DE before COVID-19	3	0.00	2.81	0.9407	1.62264
DE during COVID-19	3	0.00	2.78	0.9309	1.60091

Textile Industry

Table 17 presents that the ten textile industrial companies out of fifty-eight experienced an increase in the mean score of the current ratio from 2.1262 to 7.1113 during COVID-19, while the mean score of ROE decreased from 0.0262 to -0.0080. The mean score of ROA decreased from 0.0159 to 0.0023, and the mean value of the DE ratio increased from 0.4490 to 0.5875 during the COVID-19 pandemic.

Table 17 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	10	0.89	8.73	2.1262	2.37030
CR during COVID-19	10	0.82	52.70	7.1113	16.17818
ROE before COVID-19	10	-0.20	0.15	0.0262	0.09690
ROE during COVID-19	10	-0.15	0.08	-0.0080	0.07068
ROA before COVID-19	10	-0.05	0.11	0.0159	0.04057
ROA during COVID-19	10	-0.06	0.07	0.0023	0.03352
DE before COVID-19	10	0.02	0.83	0.4490	0.34840
DE during COVID-19	10	0.02	1.54	0.5875	0.52475

Tannery Industry

Table 18 indicates that the three textile industrial companies out of six experienced a decline in the mean score of the current ratio from 4.0842 to 3.0202 during COVID-19, while the mean score of ROE decreased from 0.0776 to -0.0990. The mean score of ROA decreased from 0.0579 to -0.0482, and the mean value of the DE ratio increased from 0.1049 to 0.1169 during the COVID-19 pandemic.

Table 18 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CR before COVID-19	3	1.44	8.47	4.0842	3.82166
CR during COVID-19	3	1.38	5.68	3.0202	2.32765
ROE before COVID-19	3	0.02	0.11	0.0776	0.05113
ROE during COVID-19	3	-0.36	0.06	-0.0990	0.22910
ROA before COVID-19	3	0.01	0.10	0.0579	0.04494
ROA during COVID-19	3	-0.20	0.05	-0.0482	0.13414
DE before COVID-19	3	0.00	0.29	0.1049	0.16149
DE during COVID-19	3	0.03	0.30	0.1169	0.15610

Analysis and Discussion

The above results indicate that H1 and H5 were not supported, representing that the liquidity ratio (current ratio) and leverage ratio (DE) did not significantly change before or during the COVID-19 pandemic. The results of the descriptive statistics analysis revealed an increase in the current ratio mean score and an increase in the DE mean score. These changes were insignificant, as shown by the Wilcoxon signed-rank test results. In their study, Devi et al. (2020) found an increase in the leverage ratio during COVID-19 in Indonesia. After COVID-19 emerged, Karim et al. (2021) reported that the listed banks' liquidity position and financial soundness had declined.

In the middle of March 2020, Bangladesh began to address the COVID-19 pandemic issue. However, if the COVID-19 pandemic cannot be stopped immediately, Bangladesh's economy will gradually deteriorate due to lower revenues from taxation, such as the Value Added Tax (VAT). VAT is the core tax revenue for the Bangladesh government, mainly collected from manufacturing companies in Bangladesh. People's purchasing power hardly decreased during the COVID-19 pandemic; as a result, the accounts receivable increased, and the current ratio also increased. According to the study, a significant decline in a company's net income, rate of return, and cash flow from cash sales transactions significantly impacted its capacity to pay its debts since there was insufficient cash to cover such payments. Most manufacturing companies also faced problems covering all operational costs and suffered losses. Additionally, the study's findings indicated no discernible difference in the DE ratio.

According to Rofikoh(2005), an increase in the DE ratio compared to before the crisis indicated a drop in the financial performance of publicly traded companies. The study looked into whether this pandemic significantly affected businesses' returns, indicating their profitability (ROE and ROA), which means H3 was accepted. The reduction in sales

would impact the decline in profits if the company could still not reduce its operating costs or other costs not directly related to operations but were nonetheless included in the company's profit value. Istiningrum (2005) also stated that service companies' returns on assets (ROA) were much lower than before during the financial crisis. Besides, Devi et al. (2020) reported a decrease in public companies' liquidity and profitability ratios during the COVID-19 pandemic.

Moreover, the recovery growth rate of manufacturing companies' financial performance in Bangladesh increased well. The study results revealed that the H2 and H6 were rejected, indicating no significant differences in the recovery growth of CR ratio and DE ratio after the COVID-19 pandemic compared to during the COVID-19 pandemic as per the Wilcoxon signed-rank test result. After June 30, 2020, the government tried to resume operational activities of the manufacturing sector and took some measures to maintain the health and safety of the labor force involved in the production industries. A large amount of working capital has been used after the resume of the operation of manufacturing activities. Thus, the CR ratio decreased due to the significant working capital used. This study also proved that the recovery growth rate of ROE and ROA increased optimistically. Thus, it was exposed that the H4 was accepted, stating significant differences in the recovery growth of ROE ratio and ROA ratio after the COVID-19 pandemic compared to the during COVID-19 pandemic based on Wilcoxon signed-rank test result. This result also signified that sample manufacturing companies generated more cash revenue and acquired the ability to pay the debt. As a result, compared to during the COVID-19 pandemic, the debt-to-equity ratio decreased after the COVID-19 pandemic.

According to the descriptive analysis findings, each industry sector's liquidity, leverage, and profitability ratio values changed in diverse ways. Among the five sectors out of nine that saw a rise in liquidity were cement, pharmaceuticals, food and allied, paper and printing, and textile. The remaining four industries decreased liquidity ratios, such as ceramics, iron, fuel and power, and tannery. The industry experienced a decrease in leverage ratio in four of nine industries, such as ceramics, food and allied, fuel and power, paper, and printing. Meanwhile, the rest of the five manufacturing industries experienced increased leverage ratios, such as cement, iron, pharmaceuticals, tannery, and textile. All selected industries except the fuel and power industry of manufacturing experienced a decrease in profitability. The study also confirmed that profitability was seriously affected during the COVID-19 pandemic in the tannery, iron, and textile industries.

During the COVID-19 crisis, people's food, home goods, and healthcare requirements will not diminish. The study results showed that the negative impact on financial performance was comparatively less in these sub-sectors. According to Hadiwardoyo (2020), the business sectors affected by the current COVID-19 pandemic the most depend on crowds, such as tourism and tourist-related industries like hotels, mass transit, and tertiary product enterprises whose sales depend on public savings funds and real estate. Bartik et al. (2020) also discovered that businesses had widely varying beliefs about the likely duration of COVID-related disruptions. In addition, businesses in the

health sector reportedly make money from various goods, including masks, hand sanitizers, soaps, disinfectants, and related items.

Conclusion

The COVID-19 pandemichas sparked an unanticipated economic catastrophe in Bangladesh's and global economies. An estimated 24% of companies said they would have to discontinue operating, and 50% said their revenue decreased. About 60% of startup businesses also closed down during the three months of lockdown (Ferdous et al., 2020). The study's findings revealed that during the COVID-19 pandemic, listed public companies' liquidity and leverage ratios increased, but their profitability ratios decreased. However, the liquidity (CR) and leverage (D/E) ratios before and during the COVID-19 pandemic did not differ significantly, according to the Wilcoxon Signed-Rank test, although there was a substantial variation in the ROE and ROA ratios for the public corporations. It was also found that 30 and 29 sample companies out of 42 showed negative ranks in the case of ROE and ROA, respectively, during the COVID-19 pandemic. In this case, the manufacturing sector returned to its financial performance after the COVID-19 pandemic. The expected growth rate of recovery of financial performance in the manufacturing sector might be achieved.

The study results also uncovered a decrease in liquidity (CR) ratio and leverage (D/E) ratio but an increase in profitability (ROE and ROA) ratio of the listed sample companies after the COVID-19 pandemic. It might be caused by a large amount of working capital used in their production and payment of non–current liabilities, creating a positive image of companies' capital structure. Based on the Wilcoxon Signed Rank Test, it was found that there was a substantial difference in the recovery growth rate of profitability (ROE and ROA) ratio between during and after the COVID-19 pandemic. Nevertheless, there was no significant difference in the recovery growth rate of liquidity (CR) ratio and leverage (D/E) ratio between during and after the COVID-19 pandemic based on the Wilcoxon Signed–Rank Test.

Moreover, it was exposed that 24 sample companies and 25 sample companies out of 36 showed positive ranks in the case of ROE and ROA, respectively, after the COVID-19 pandemic. The sector that experienced an increase in liquidity ratio and leverage ratios were the cement sector, food sector, paper and printing sector, steel sector, pharmaceutical sector, textile sector, and tannery companies. In contrast, the sectors that practiced a reduction in the profitability ratio, liquidity ratio, and leverage ratios were the ceramic sector, steel sector, food sector, paper and printing sector, foul and power sector, and tannery sector during the COVID-19 pandemic. The study also found that profitability was highly affected during the COVID-19 pandemic in the tannery, steel/iron, and textile industries. In addition, it is noted that all of the sample manufacturing sectors except the foul and power sectors suffered decreased profitability during COVID-19 in Bangladesh.

The findings of this study can be used as a source of pertinent data by investors or future investors to help them make wise investment decisions. The findings of this study will also assist the government in determining if it is essential to provide the appropriate tax incentives for the impacted industries and whether the correct sector would profit from the tax incentive scheme. Further, more extensive research is anticipated to be conducted on the recovery growth rate after the COVID-19 financial performance in Bangladesh's sub-sector manufacturing industries.

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