Comparative Analysis of Profitability Performance in the Pharmaceutical Industry of Bangladesh: Pre and Post COVID-19

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ABSTRACT

Covid-19 was emerged as pandemic in the entire world during 2020 and 2021 causing death of huge number of life in the globe. Bangladesh was not an exception. Being a life-threatening disease, it has great impact on the pharmaceutical companies of any country. The study was aimed to find any difference in performance of some selected pharmaceutical companies due to Covid-19 pandemic. The medicine and vaccine related with Covid-19 was in peak of demand that caused to increase the profitability of the companies. However, the normal and avoidable treatments were deliberately delayed during the period. The study finds no significant difference in the performance of pharmaceutical companies during the pandemic and after the pandemic.

Keywords: Covid-19 pandemic, Bangladesh, Pharmaceutical companies, profitability performance.

Background of the Study

The emergence of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was officially declared a pandemic by the World Health Organization (WHO) on March 11, 2020. This virus has profoundly impacted public health systems worldwide, and Bangladesh, as one of the most densely populated countries with an estimated population of approximately 164 million (World Population Review, 2020), faced significant challenges in managing the outbreak. The first confirmed COVID-19 cases in Bangladesh were reported on March 8, 2020, involving returnees from Italy (Hossain, 2020). By September 18, 2020, global COVID-19 infections surpassed 30 million, with over 952,000 fatalities, while Bangladesh recorded more than 345,000 infections and 4,881 deaths (Worldometer, 2020).

The healthcare workforce bore a considerable burden during the pandemic, with significant numbers of healthcare providers infected; as of August 9, 2020, about 2,531 doctors and 3,011 health workers contracted the virus, with 73 specialist doctors succumbing to the disease (Hossain, 2020). In this context, the pharmaceutical industry of Bangladesh plays a crucial role. With approximately 257 licensed manufacturers, the sector has evolved significantly since the 1980s, establishing Bangladesh as a burgeoning hub for generic drugs (Faisal, 2019). The industry meets around 98% of local demand for medicines, with about 80% of its output being generic products (Bangladesh Association of Pharmaceutical Industries [BAPI], 2023).

During the pandemic, Bangladeshi pharmaceutical companies demonstrated their capability by swiftly launching COVID-19-related products, including Remdesivir, Favipiravir, and Ivermectin. The rapid availability of these medications garnered international attention, leading to increased exports (Sadek, 2020). The pandemic also accelerated the adoption of digital marketing and online engagement platforms for pharmaceutical companies, as traditional marketing practices were disrupted by social distancing measures. Webinars and social media campaigns became vital tools for maintaining engagement with healthcare professionals and promoting new products (Islam et al., 2021).

Despite the swift adaptability of the industry, it faces significant challenges due to its reliance on imported raw materials, particularly Active Pharmaceutical Ingredients (APIs), with approximately 95% sourced from countries like China and India. The pandemic disrupted global supply chains, threatening the stability of local medicine production (Mitra et al., 2020). However, through efficient demand management and strategic

sourcing, the industry successfully mitigated the potential for a medicine crisis that severely affected other nations (Sadek, 2020).

The purpose of this study is to analyze and compare the profitability performance of the pharmaceutical industry in Bangladesh before and after the COVID-19 pandemic. Understanding these dynamics is crucial for stakeholders in the industry to navigate future challenges and leverage growth opportunities in a post-pandemic environment.

LITERATURE REVIEW

The COVID-19 pandemic has triggered unprecedented disruptions across various sectors globally, with significant implications for the pharmaceutical industry. This literature review examines the effects of the pandemic on the profitability of Bangladesh's pharmaceutical sector, examining historical perspectives, industry responses, and emerging challenges.

Globally, the COVID-19 pandemic has reshaped the pharmaceutical landscape, forcing companies to adapt rapidly to maintain operational continuity. Research by Zhang et al. (2021) indicates that supply chain disruptions, primarily due to restrictions on transportation and trade, severely impacted drug availability and profitability in numerous countries. The pandemic underscored the importance of local production capabilities and supply chain resilience, particularly for Active Pharmaceutical Ingredients (APIs), the backbone of pharmaceutical manufacturing.

Bangladesh's pharmaceutical sector has evolved significantly since the 1980s, becoming a prominent hub for generic drug production. According to the Bangladesh Association of Pharmaceutical Industries (BAPI), approximately 257 licensed manufacturers operate within the country, supplying around 98% of local medicine needs (Faisal, 2019). This historical context is crucial for understanding the industry's readiness to respond to the challenges posed by the pandemic. The industry's capacity to produce a diverse array of pharmaceuticals, including generics and specialized products, has positioned it uniquely in the region (Chaudhuri, 2020).

The swift response of Bangladeshi pharmaceutical companies in launching COVID-19-related products, such as Remdesivir and Ivermectin, highlights the sector's adaptability (Sadek, 2020). The ability to rapidly produce these essential drugs not only served domestic needs but also attracted international interest, boosting exports to countries facing shortages. This adaptability is a testament to the industry's technological capabilities and regulatory framework, enabling quick approval processes for new products (Rahman & Islam, 2022).

The transition from pre-pandemic to pandemic conditions has necessitated a detailed analysis of profitability metrics within the industry. Initial studies suggest that while some companies experienced growth due to increased demand for COVID-19 treatments, others faced significant challenges, particularly those reliant on imports for raw materials (Limbong, 2022). The profitability performance of local manufacturers is linked to their ability to navigate supply shortages and adapt marketing strategies in response to social distancing regulations.

Despite its successes, the Bangladeshi pharmaceutical industry confronted significant challenges during the pandemic. The heavy reliance on imported APIs—approximately 95%—complicated the supply chain, leading to potential threats to production stability (Hossain, 2020). Moreover, the marketing landscape shifted dramatically, as traditional methods were hampered by lockdowns, prompting companies to pivot to digital marketing strategies. This shift, while innovative, exposed gaps in digital engagement and regulatory compliance (Islam et al., 2021).

Looking ahead, the pandemic offers valuable lessons for the pharmaceutical industry in Bangladesh. There is a pressing need for investment in local API production to reduce dependency on imports, enhancing both resilience and profitability (Mitra et al., 2020). Additionally, firms are encouraged to continue leveraging digital channels for marketing and distribution, integrating these strategies into their long-term business models. Future research should focus on longitudinal studies assessing the lasting impacts of COVID-19 on profitability in the

pharmaceutical sector.

This literature review underscores the complex dynamics that have shaped the pharmaceutical industry in Bangladesh during the COVID-19 pandemic. While the industry demonstrated remarkable resilience and adaptability, substantial challenges remain, particularly concerning supply chain dependencies. This study aims to provide a comparative analysis of the profitability performance of the Bangladeshi pharmaceutical sector before and during the pandemic, contributing to a deeper understanding of the industry's evolution in a crisis context.

METHODOLOGY OF THE STUDY

Research Design

This study employs an analytical research design, which involves the use of existing facts and data to perform a critical evaluation. Analytical research is characterized by the application of critical thinking skills to analyze information and derive new insights or interpretations. It is widely utilized across various fields, including academia, medicine, and psychology, to develop a deeper understanding of the subject matter and generate innovative ideas.

Sample and Sampling Method

There are twenty seven pharmaceutical companies listed in Dhaka Stock Exchange and Chittagong Stock Exchange. Though there are a number of pharmaceutical companies in Bangladesh, a huge number of them are either not in operation or not doing well. Data of these companies are not available. Even there are some but not reliable. So we confined our population to these listed companies only.

To select the sample, the simple random sampling method was employed. This approach ensures that each member of the population has an equal chance of being selected, thereby minimizing bias and providing a representative subset. However, any deviation from population representation is acknowledged as sampling error.

The final sample consists of 10 companies (N=10), listed below:

- ACI Limited
- BEXIMCO Pharmaceuticals Limited
- Renata Limited
- Wata Chemicals Limited
- Square Pharmaceuticals Limited
- Orion Pharma Limited
- Advent Pharma Limited
- BEACON Pharmaceuticals Limited
- IBN SINA Pharmaceutical Industry Limited
- Orion Infusion Limited

Sources of Data

This study relies exclusively on secondary data sources to collect the necessary information. Secondary data refers to information that is collected and documented by other individuals or organizations and later utilized for analysis. The specific sources of secondary data for this study include:

- Annual reports of the selected companies
- Official company websites
- Third-party websites and databases containing information relevant to the selected companies

Study Period

The study compare the financial performance of selected pharmaceutical companies pre-pandemic and post-pandemic. Financial data of the selected companies for period of 2017, 2018, and 2019 were considered as pre pandemic. On the other hand data for the period of 2020, 2021 and 2022 were considered for pandemic data.

Hypotheses Development

The hypotheses aim to evaluate the impact of the COVID-19 pandemic on key financial performance indicators—**Return on Assets (ROA)**, **Return on Equity (ROE)**, and **Profit Margin**—of the pharmaceutical industry. The null (H0) and alternative (HA) hypotheses are as follows:

1. **Effect on Return on Assets (ROA):**
   - **H0**: There is no significant difference in ROA between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.
   - **HA**: There is a significant difference in ROA between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.
2. **Effect on Return on Equity (ROE):**
   - **H0**: There is no significant difference in ROE between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.
   - **HA**: There is a significant difference in ROE between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.
3. **Effect on Profit Margin:**
   - **H0**: There is no significant difference in profit margins between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.
   - **HA**: There is a significant difference in profit margins between the pre-COVID-19 and post-COVID-19 periods for the pharmaceutical industry.

Statistical Methods Used

The hypothesis developed were tested using the paired sample t-test. As the **paired sample t-test** (also known as the **dependent t-test**) is used when **two sets of observations are related or come from the same subjects measured at two different times**, this test was used in this study (Cressie & Whitford 1986).

Comparison of Return on Asset (ROA) of Pre and Post COVID-19 Situation;

Data of Return on Asset (ROA) of Pre and During COVID-19 Situation are stated below;

Particulars	Pre COVID-19 (%)	Post COVID-19 (%)
ACI Limited	2.63	-0.62
BEXIMCO Pharma Ltd	6.99	8.41
Renata Limited	17.57	14.10
Wata Chemicals Ltd	3.92	4.14
SQUARE Pharma Ltd	19.37	16.51
Orion Pharma Ltd	2.88	2.01
Advent Pharma Limited	12.65	8.00
BEACON Pharma Ltd	2.06	7.71
IBN SINA Pharma Ind. Ltd	13.25	12.07
Orion Infusion Ltd	7.55	4.19

Source: Author's calculation based on annual report.

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre COVID-19	8.88	10	6.41	2.02
	Post COVID-19	7.65	10	5.42	1.71

The above table indicates that the Return on Asset (ROA), Mean (M) of Pre COVID-19 is 8.88 with a standard deviation of 6.41. Again, the Return on Asset (ROA), Mean (M) of During COVID-19 is 7.65 with a standard deviation of 5.42.

Paired Samples t-test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Pre COVID-19 - Post COVID-19	1.23	3.06	.97	-.95	3.42	1.27	9	0.23

The above table includes the result of Paired T-Test. The Mean (M) is 1.23 with a Standard Deviation of 3.06. It also contain the value of T i.e. 1.27 and value of P i.e. 0.23

Decision: As P value in 0.23 i.e. above 5.00 % or 0.05, the null Hypothesis is accepted. Therefore, there is no difference in the return on asset (ROA) between Pre and post COVID-19 situation of Pharmaceutical industry.

Comparison of Return on Equity (ROE) of Pre and post COVID-19:

Particulars	**Pre COVID-19**	**Post COVID-19**
ACI Limited	9.52	-5.01
BEXIMCO Pharma Ltd	10.32	12.33
Renata Limited	25.65	19.06
Wata Chemicals Ltd	8.76	11.91
SQUARE Pharma Ltd	20.81	17.40
Orion Pharma Ltd	4.82	4.37
Advent Pharma Limited	22.67	9.82
BEACON Pharma Ltd	3.42	12.17
IBN SINA Pharma Ind. Ltd	26.02	22.44
Orion Infusion Ltd	20.29	10.99

Source: Author's calculation

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre COVID-19	15.22	10	8.71	2.75
	Post COVID-19	11.54	10	7.74	2.44

The above table indicates that the Return on Equity (ROE), Mean (M) of Pre COVID-19 is 15.22 with a standard deviation of 8.71. Again, the Return on Equity (ROE), Mean (M) of During COVID-19 is 11.54 with a standard deviation of 7.74.

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	Pre COVID-19 - post COVID-19	3.68	7.34	2.32	-1.57	8.93	1.58	9	0.14

The above table includes the result of Paired T-Test. The Mean (M) is 3.68 with a Standard Deviation of 7.34. It also contain the value of T i.e. 1.58 and value of P i.e. 0.14

Decision: As P value in 0.14 i.e. above 5.00 % or 0.05, the null Hypothesis is accepted. Therefore, there is no difference in the return on Equity (ROE) between Pre and post COVID-19 situation of Pharmaceutical industry.

Comparative Analysis of Profit Margin of Pre and Post COVID-19:

Particulars	Pre COVID-19 (%)	Post COVID-19 (%)
ACI Limited	2.05	-0.55
BEXIMCO Pharma Ltd	14.17	15.55
Renata Limited	20.36	16.57
Wata Chemicals Ltd	11.59	15.73
SQUARE Pharma Ltd	26.78	30.28
Orion Pharma Ltd	9.48	8.69
Advent Pharma Limited	18.96	22.43
BEACON Pharma Ltd	2.97	9.47
IBN SINA Pharma Ind. Ltd	6.94	6.49
Orion Infusion Ltd	7.14	3.92

Source: Author's calculation

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre COVID-19	12.04	10	8.01	2.53
	Post COVID-19	12.85	10	9.15	2.89

The above table indicates that the Profit Margin, Mean (M) of Pre COVID-19 is 12.04 with a standard deviation of 8.01. Again, the Profit Margin, Mean (M) of post COVID-19 is 12.85 with a standard deviation of 9.15.

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	Pre COVID-19 - post COVID-19	-0.81	3.51	1.11	-3.32	1.70	-0.72	9	0.48

The above table includes the result of Paired T-Test. The Mean (M) is -0.81 with a Standard Deviation of 3.51. It also contain the value of T i.e. -0.72 and value of P i.e. 0.48

Decision: As P value in 0.48 i.e. above 5.00 % or 0.05, the null Hypothesis is accepted. Therefore, there is no difference in the return on Equity (ROE) between Pre and post COVID-19 situation of Pharmaceutical industry.

CONCLUSION AND IMPLICATION

This is first time Bangladesh economy is facing a global pandemic after the independence. It's obvious that the individual, firms and organization are experiencing a different scenario and enforced to execute different restriction in public interaction and trade & commerce. The restriction forced to bring a change in the day to day life and trade & commerce within different sector of the economy. Bangladesh economy was badly affected by the COVID-19. Almost every industry faced a financial crisis during this situation and Pharmaceutical Industry is one of them. The country was facing a global pandemic for first time, healthcare & pharmaceutical sector was initially in lack of availability of raw materials and expertize to face the evolving challenges. But, later on those industries worked hard to overcome the shortage and fulfill the national demand of the healthcare products. Taking an advantage of this situation, many companies with unethical behavior involved themselves in price hiking of medicine and other healthcare products and corruption regarding vaccine and COVID reports etc. This scenario forced to build an assumption that the pharmaceutical industry was boosted during the pandemic situation. But, the above study includes paired sample T-Test which revealed that there is no difference in the profitability performance between Pre and post COVID-19 situation of Pharmaceutical industry of Bangladesh. It also exhibits the growth of Total asset, Total equity & Revenue of the sample companies within the pharmaceutical industry of Bangladesh.

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