ANALYSIS OF FINANCIAL PERFORMANCE OF RENEWABLE ENERGY COMPANIES DURING PRE AND POST COVID-19

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Abstract

The renewable energy sector plays a significant role in promoting environmentally friendly business models and tackling climate change amid global efforts to shift towards sustainable practices. This study basically aims to analyse the financial performance of renewable energy companies in India before and after the COVID-19 pandemic. The spread of COVID-19 has had an unexpected impact on a vast range of sectors including renewable energy. Ratio analysis is used to examine financial data for the six-year period utilising a sample of the top ten renewable energy companies based on market capitalization. As a result of the study, it was determined that the sector displayed mixed financial performance showcasing resilience and adaptability during the pandemic despite all challenges. While certain areas such as profitability and operational efficiency saw gains after the pandemic, challenges remained in liquidity, inventory management, and receivables turnover. Higher debt levels indicate more financial risks; therefore, effective debt management techniques are required for long-term viability. In addition, authorities, investors, and industry stakeholders will find this research helpful in understanding the dynamics of the renewable energy sector amidst unexpected challenges and supporting sustainable business practices in a post-pandemic world.

Key-words*:*
COVID-19; renewable energy companies; financial performance; ratio analysis.

Introduction

There has been a considerable change in the area of green investment in recent years. The main goal of green investment is to promote sustainable and eco-friendly business practices and provide returns to investors at the same time. These investments, which prioritise sustainable development and the fight against climate change, are essential for the shift to a low-carbon economy. Through incentive programmes and legislative frameworks, governments and international organisations are playing critical roles in encouraging green investment. Types of green investments include renewable energy, energy efficiency and conservation, sustainable agriculture and forestry, recycling and waste management, and sustainable transport systems, which encompass electric vehicles, alternative fuel vehicles etc (Stein, 2023). Following the COVID-19 pandemic, there is a strong argument for policymakers to give green infrastructure first priority since it can contribute to both environmental resilience and economic recovery (D'Adamo & Rosa, 2020). This study basically aims to analyse the financial performance of renewable energy companies that comes under the type of green investment.

From its beginning in Wuhan, China, in December 2019, the COVID-19 outbreak rapidly spread to other countries, posing a massive threat to world health and this led to the loss of thousands of lives (Ather et al., 2020). The COVID-19 outbreak entered India through international travel; cases were first recorded in Kerala in January and February 2020. From March to May 2020, Prime Minister Narendra Modi imposed a lockdown across the nation. But despite efforts, the number of cases increased, surpassing 1 lakh by May 18 and over 8.5 lakhs by July 11. The epidemic had a devastating effect on the Indian economy, leading to reductions in productivity, job losses, and industry disruptions (Ghosh et al., 2020).

The Indian economy was badly affected by the COVID-19 pandemic, which caused disruptions in the manufacturing, agriculture, and service sectors. Agriculture was hampered by labour shortages

and transportation issues, while manufacturing was impacted by disruptions in supply chain and demand, particularly the automobile industry. The tourism and aviation industries were among the service sectors that suffered large losses. Social ills such as rising domestic violence, health inequalities, and gender inequity got worse. Reverse migration and job losses, especially in the unorganised sector, put an additional burden on the economy. India's economic problems were made worse by the COVID-19 pandemic, although there were several positive impacts on the environment (Aneja & Ahuja, 2021).

Due to a decrease in commercial and industrial activity, the COVID-19 pandemic caused a global fall in energy demand. Following the pandemic, governments prioritised investments in clean energy and pushed for the promotion of renewable energy in economic recovery plans. Renewable energy policies were viewed as more beneficial since they would create jobs and save money in the long run, helping to accelerate the shift to a low-carbon economy. The pandemic brought to light the significance of renewable energy sources in augmenting energy security, and facilitating its incorporation into sustainability practices (Hoang et al., 2021).

The pandemic has led to a rise in renewable energy, with record levels of usage seen worldwide, especially in nations like India. Renewable energy proved resilient in the midst of project development challenges and became the main priority in attempts to revive the economy (Wang et al., 2022). The pandemic in India resulted in a significant decrease in the capacity factors of coal-fired power plants, accompanied with an increase in the solar and wind electricity generation, thereby accelerating the nation's shift towards renewable energy sources (Xu & Sharma, 2022).

During the pandemic, India's renewable energy sector faced disruptions in energy demand, impacting coal generation, and delays in project construction and financing due to supply chain disruptions and economic slowdown. Managing financial liquidity and economic contraction was one of the challenges. In spite of this, renewable energy sources proved resilient, supported along by government initiatives and competitive costs, enabling projects to go forward (Stephan et al., 2022).

Many research shows there is a shift towards renewable energy all around the world after the pandemic but at the same time, many others show challenges in the renewable energy sector due to disruptions to production and operations, supply chains, and market stability brought on by the pandemic. So, it is crucial to analyse the financial performance of the renewable energy sector to understand how the pandemic affected the same.

Therefore, this research focuses on the financial performance of renewable energy companies in the Indian context, during the COVID-19 pandemic. The research attempts to provide detailed insights into the challenges faced by renewable energy companies and how the sector performed before and after the pandemic. By analysing the financial performance of the companies, the study also tries to answer whether there is resilience is shown during the pandemic.

Review of Literature

Many authors have examined the significant body of literature that has explored the financial performance of different sectors in light of COVID-19. Zimon et al. (2022) examines the financial security management techniques used by SMEs in the renewable energy industry in the light of the COVID-19 pandemic and a trend towards conservative liquidity management is shown by the research, which also finds a decline in accounts receivable and an increase in short-term investments and inventory. Makki & Alqahtani (2023) analysed variations in the three-year financial performance of Saudi energy companies before, during, and after the COVID-19 outbreak, with profitability and efficiency standing out as critical factors.

Shaikh et al. (2022) investigated the effect of COVID-19 on the renewable energy sector compared to fossil fuels and revealed a shift towards green energy sources despite a short decline in revenue, as evidenced by increased capitalization among 45 international renewable energy companies. Furthermore, Dopierała et al. (2022) compared renewable and conventional energy producers from 2011 to 2019, finding that renewables perform similarly overall, but wind and solar excel. It also finds that company size has an unclear impact, electricity prices significantly affect both

ROA and ROE and private limited companies exhibit superior financial performance to public limited ones.

Many studies have been conducted to analyse the relationship between sustainability and financial performance. Santis et al. (2016) analysed that sustainability and financial performance are not correlated, but general liquidity ratios show some fluctuation. In light of climate change and the COVID-19 pandemic, D'Adamo & Rosa (2020) investigated the connections between sustainability, resilience, and infrastructure and proposed that adopting sustainable practices and green infrastructure can boost the economy and lessen environmental issues.

Similar to the extensive body of research examining the correlation between sustainability and financial performance, many studies have explored the relationship between Environmental, Social, and Governance (ESG) factors and financial performance. Hwang et al. (2021) examined ESG initiatives helped enterprises avoid a steep drop in profitability during the COVID-19 pandemic by improving financial performance. Moreover, El Khoury et al. (2022) argued that accounting-based indicators and ESG actions are positively correlated and debt has a negative impact on crisis performance. Yoo et al. (2021) observed a favourable relationship between ESG activities and stock returns, but GC scores had a negative effect during the COVID-19 crisis.

There are many more studies analysing the financial performance of many other sectors apart from renewable energy and sustainability in the light of COVID-19. Erol (2023) proposed significant insights for marine industry authorities worldwide by shedding light on the sector's financial resilience and suggesting the best financial solutions to employ during times of crisis using ratio analysis and they found an improvement in the cash ratio, stable leverage ratio, increase in long-term liabilities, and a slight decrease in shareholders' equity.

El-Chaarani et al. (2022) aimed to quantify how corporate governance affected the MENA region's banks' financial performance in the midst of the COVID-19 outbreak and revealed that certain aspects of corporate governance, such having an independent board and a high ownership concentration, had a beneficial impact on bank performance during the financial crisis. In addition, Gazi et al. (2022) examined how COVID-19 has affected Bangladesh's banking industry's financial performance, revealed that Islamic commercial banks based on Sharia performed worse than regular banks and regression analysis showed that some variables had substantial and negative effects on bank profitability during the pandemic.

Method

The sample size of the analysis is top ten renewable energy companies in India on the basis of market capitalisation. The data set used in this study are collected from the yearly financial reports of the selected companies. Additional data are gathered from official websites, periodicals, publications and journals. Year based data are taken into consideration. The study period is of 6 years from 2017-18 to 2022-23.

There are different methods to analyse the financial performance of companies. The method used in this study is ratio analysis. Ratio analysis is an effective analytical tool with predictive capability used for assessing a company's financial status. In comparison to other methods, ratio analysis is simpler and can be useful for investors, managers, financiers and credit institutions (Erol, 2023; Horrigan, 1968). The financial performance of a firm or an industry can be measured using a variety of metrics (Erol, 2023). Ratio analysis is therefore divided into four major categories as shown in Table 1 below.

Table 1 Financial ratios and its formulas (Erol, 2022; Erol, 2023; Solongo, 2017)

Group	Ratio	Formula
Profitability Ratios	Gross Profit Margin	(Sales-COGS)/Sales
	Net Profit Margin	Net Income/Sales
	Return on Equity (ROE)	Net Income/Shareholder's Equity
	Return on Assets (ROA)	Net Profit/Total Assets

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Liquidity Ratios	Current Ratio Quick Ratio Cash Ratio	Current Assets/Current Liabilities (Current Assets-Inventory)/Current Liabilities Cash & Cash Equivalents/Current Liabilities
Financial Leverage Ratios	Debt Ratio Short-term Debt Ratio Long-term Debt Ratio Debt-to-equity Ratio	Total Liabilities/Total Assets Short-term Debt/Total Assets Long-term Debt/Total Assets Total Liabilities/Shareholder's Equity
Turnover Ratios	Stock Turnover Ratios Total Asset Turnover Ratios Receivable Turnover Ratios Payable Turnover Ratios	COGS/Average Stock Sales/Total Assets Sales/Average Receivables COGS/Average Payables

Results and Discussion

The profitability ratios calculated using the companies' financial statements are shown in Table 2. It reveals that the relevant sector's profitability ratios, including gross profit margin, net profit margin, ROE, and ROA for pre and post COVID-19 are all -6.3%, 93.4%, 82%, and 44.5% respectively. The decrease in the gross profit margin (-6.3%) suggests that the company's ability to generate profit from its core business activities declined after the pandemic, possibly due to increased costs or decreased revenue. Net profit margin represents the proportion of income that remains after all expenses, such as taxes and interest are subtracted. An increase of 93.4% indicates that, despite the decline in gross profit margin, the company managed its expenses effectively or experienced an increase in revenue post-COVID-19. Similar changes apply to both ROA and ROE. Return on Equity (ROE) measures a company's profitability relative to its shareholders' equity. The increase of 82% suggests improved profitability per unit of shareholder investment, reflecting positively on the company's post-COVID-19 performance. Return on Assets (ROA) evaluates a company's efficiency in generating profit from its assets. The increase of 44.5%, indicates that the company was able to generate more profit per unit of asset post-COVID-19, which could be due to improved operational efficiency or asset utilization.

Table 2 Profitability Ratios

Ratios	Pre-COVID-19(Q)	Post-COVID-19(Q)	Percentage Change (%)
Gross Profit Margin	4.9	4.6	-6.3%
Net Profit Margin	1.7	3.2	93.4%
Return on Equity (ROE)	0.4	0.7	82%
Return on Assets (ROA)	0.2	0.4	44.5%

Source: The Authors

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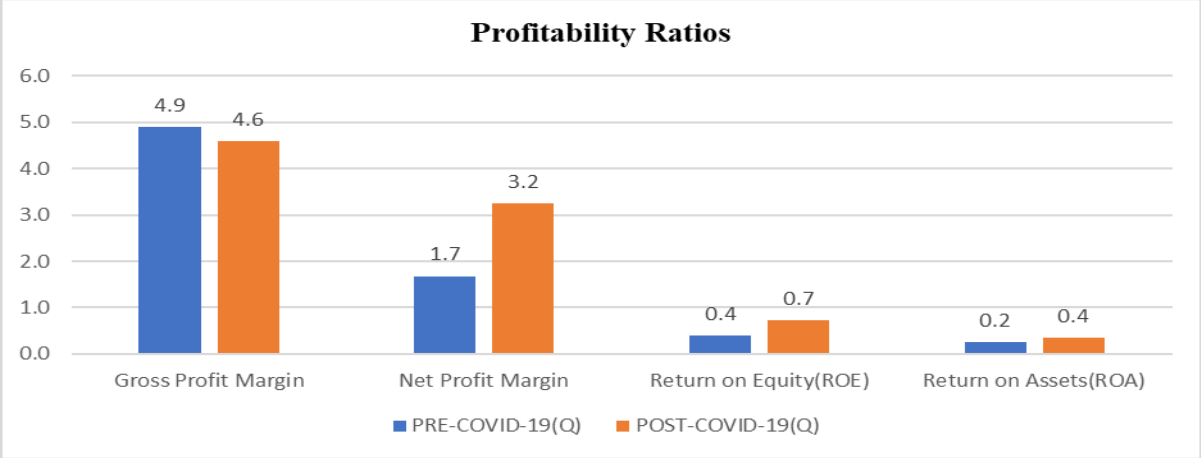

Fig. 1. Profitability ratios before and after COVID-19

Liquidity ratios such as cash ratio, current ratio, and quick ratio are shown in Table 3. It measures a company's ability to pay short-term liabilities without selling long-term assets or borrowing fresh capital. Particularly, the current ratio measures a company's capacity to pay current liabilities by its current assets. The decrease from 13.0 to 12.0 (-7.8%) suggests a weakened liquidity position post-COVID-19, potentially due to increased liabilities or decreased assets. Like the current ratio, the quick ratio can also be used to measure liquidity, which calculates how well its current assets may cover its current liabilities. The decrease of -13.7% in the quick ratio indicates a more significant decline in liquidity than the current ratio, possibly due to reduced cash reserves or increased short-term liabilities. Unlike the other two liquidity ratios, the cash ratio shows an increase of 82.7% which suggests an improvement in the company's ability to meet short-term obligations with cash during post-COVID-19.

Table 3 Liquidity Ratios

Ratios	Pre-COVID-19(Q)	Post-COVID-19(Q)	Percentage Change (%)
Current Ratio	13.0	12.0	-7.8%
Quick Ratio	12.7	11.0	-13.7%
Cash Ratio	0.2	0.4	82.7%

Source: The Authors

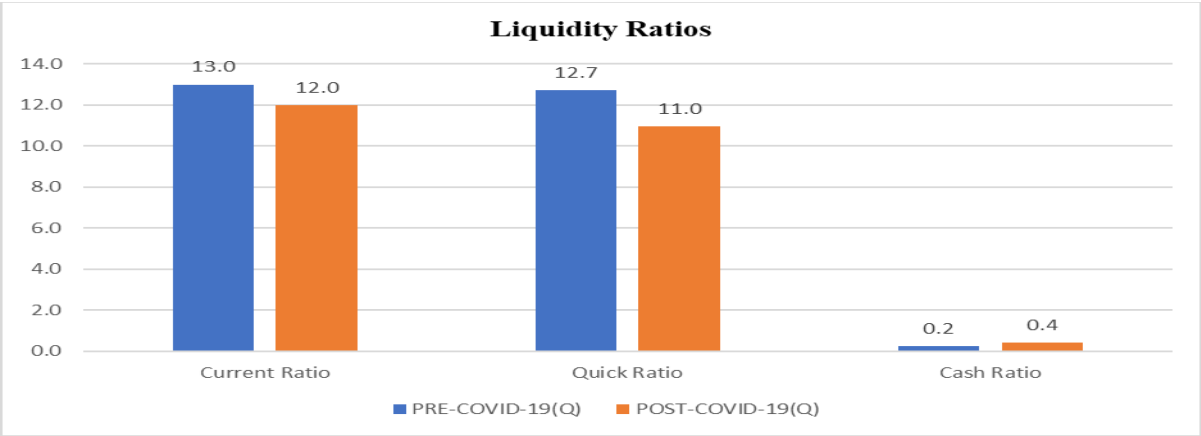

Fig. 2. Liquidity ratios before and after COVID-19

On the other hand, Table 4 reveals the financial leverage ratios, including debt ratio, short-term debt ratio, long-term debt ratio, and debt-to-equity ratio. Debt/asset ratio, also known as the leverage ratio compares a company's total debt to its total assets, indicating its financial leverage. The increase of 8.6% indicates higher reliance on debt financing post-COVID-19, potentially to manage cash flow and finance operations during the pandemic. The debt-to-equity ratio estimates the proportion of debt relative to shareholders' equity, indicating the company's financial leverage and risk. The increase from 11.4 to 18.5 (61.7%) suggests higher financial risk post-COVID-19 due to increased debt relative to equity. As compared to the pre pandemic the long-term debt ratio and short-term debt ratio climbed by

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8.3% and 3.2% respectively. Companies are tending to be more likely depending on long-term debt to fund its operations and expansion if its long-term debt ratio rises over time. On the other side, rise in short term debt ratio over time depicts that companies in the renewable energy sector are depending more and more on short-term debt to cover its short-term demands for funding after the covid-19 pandemic. These could be a sign of financial stress or liquidity challenges faced by the companies.

Table 4 Financial Leverage Ratios

Ratios	Pre-COVID-19 (Q)	Post-COVID-19 (Q)	Percentage Change (%)
Debt Ratio	5.2	5.6	8.6%
Short-Term Debt Ratio	0.2	0.2	3.2%
Long-Term Debt Ratio	2.6	2.9	8.3%
Debt to Equity Ratio	11.4	18.5	61.7%

Source: The Authors

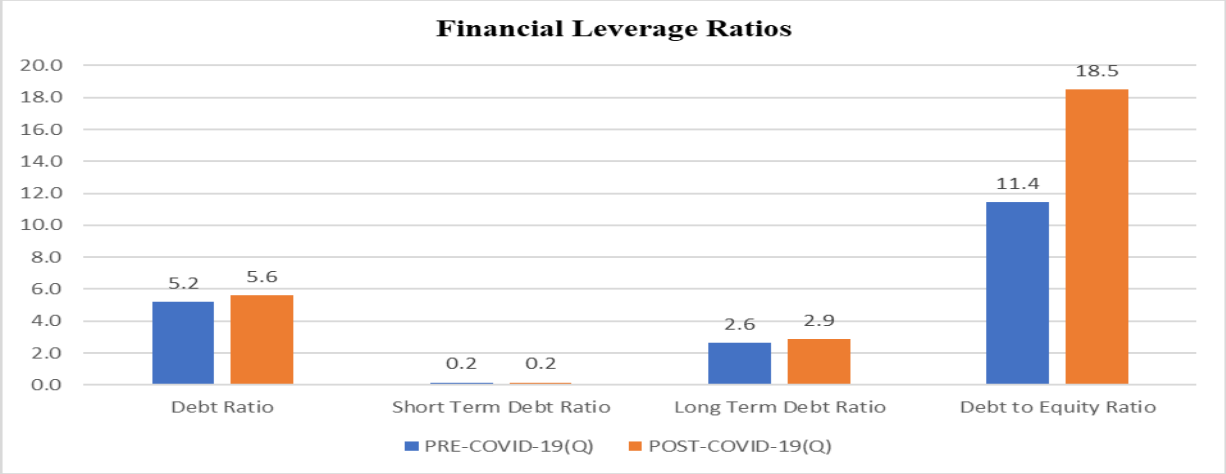

Fig. 3. Financial leverage ratios before and after COVID-19

In Table 5, all turnover ratios are represented in which payable turnover ratios and total asset turnover ratio have increased while stock turnover ratio and receivables turnover ratio shows a decrease. The significant decrease of -32.2% in stock turnover ratio suggests a substantial decline in sales or inventory management efficiency after COVID-19, which could indicate challenges in demand or supply chain disruptions. Like stock turnover ratio, the receivables turnover ratio shows a decrease of -21.4% which indicates a slower rate of receivables turnover post-COVID-19, suggests potential challenges in collecting debt. Unlike the above-mentioned ratios, payable turnover ratio shows an increase. This ratio measures how efficiently companies settle their debts. The increase of 8% suggests improved efficiency in managing payables post-COVID-19, possibly due to renegotiated payment terms or better cash management. On the other hand, the total asset turnover ratio measures the efficiency with which the companies use their assets to produce sales. It shows a 12.5% increase which indicates improved asset utilization post-COVID-19, reflecting positively on the company's operational efficiency.

Table 5 Turnover Ratios

Ratios	Pre-COVID-19 (Q)	Post-COVID-19 (Q)	Percentage Change (%)
Stock Turnover Ratio	691.5	468.5	-32.2%
Total Asset Turnover Ratio	1.4	1.5	12.5%
Receivable Turnover Ratio	151.6	119.1	-21.4%
Payable Turnover Ratio	164.7	178.0	8%

Source: The Authors

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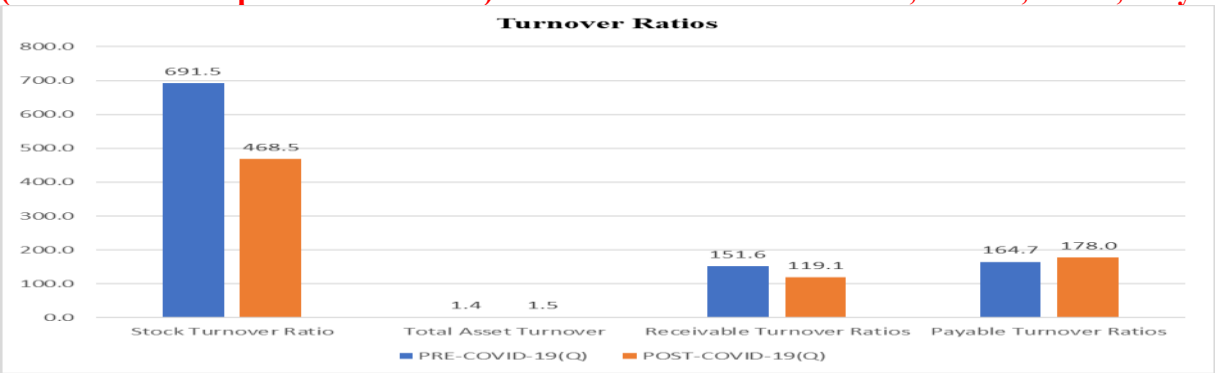

Fig. 4. Turnover ratios before and after COVID-19

Overall, the companies experienced a mixed financial performance post-COVID-19, with profitability and operational efficiency improvements in some areas but challenges in liquidity, inventory management, and receivables turnover. Increased debt levels also indicate higher financial risk, requiring careful management to ensure long-term sustainability.

Conclusion and Suggestions

The research conducted is in an effort to determine the economic and financial consequences faced by the companies in the renewable energy sector during the COVID-19 pandemic. It also sought to reveal their attempts to resist these challenges both during and after the pandemic. The companies in the sector have had to implement measures to retain operational agility and financial resilience in order to efficiently operate in the face of changing environmental circumstances like the pandemic. The top 10 companies in the renewable energy sector were selected based on their market capitalization. The consolidated financial statements of these companies were studied by ratio analysis. Examining the financial performance of the renewable energy companies before and after COVID-19 reveals a setting marked by growth as well as difficulties. The industry witnessed a range of financial outcomes once the epidemic broke out. While some areas saw progress, others revealed weaknesses that call for proactive management and deliberate attention.

In summary, the companies in the renewable energy sector that were operating during the COVID-19 pandemic showed both positive and negative effects. Therefore, it shows a mixed trend in their financial performance after the pandemic. The analysis highlights the sector's resilience and adaptability during the crisis despite all challenges. COVID-19 which originated from China affected all around the world and interrupted the operation of many industries. Like other sectors, it also affected the renewable energy sector, especially financial challenges and supply chain disruptions. But at the same time, the pandemic had some positive impacts on the sector, such as increased focus on clean energy and sustainability and also policy support from the government.

In order to effectively navigate pandemic hurdles like COVID-19, renewable energy companies should prioritise cautious debt management, careful cash flow planning, and technology investments to enhance productivity. To remain financially stable in unpredictable times, they should also diversify their funding sources and put effective risk management techniques into place. These steps will support their sustainability and financial resilience in the face of the pandemic's concerns.

While the analysis offers a detailed picture of the renewable energy sector both before and after COVID-19, it is crucial to place these findings with the broader research landscape. Recent studies by (Zimon et al., 2022) and (Shaikh et al., 2022) suggest that renewable energy showed resilience and even growth during the pandemic, pointing to a promising future for the sector. When the results of this paper are merged with those, it was found that renewable energy is still progressing in a favourable way, despite the fact that it shows some challenges. This indicates that renewable energy is still growing and has a promising future way ahead even in the phase of adversity.

The research also has some limitations. Primarily the sample size of the research is an issue as it focuses only on 10 companies that are based on market capitalization. So other companies in the sector, especially smaller companies, are not considered for the study. The second limitation is that

only ratio analysis is used for the study. Third, the time period of this study is limited to 6 years. Future research could focus on more companies operating in the renewable energy sector which gives a broader picture and landscape about the sector. Apart from ratio analysis, other methods can also be used for the study. The time period can be considered a much longer period to find out the long-term implications of COVID-19 over the renewable energy sector.

Glossary

- Q: Weighted average of the ratios of companies in the sector according to assets
-ROE: Return on equity
-ROA: Return on assets
-COGS: Cost of goods sold

References

1. Aneja, R., & Ahuja, V. (2021). An assessment of socioeconomic impact of COVID-19 pandemic in India. Journal of Public Affairs, 21(2). https://doi.org/10.1002/pa.2266
2. Ather, A., Patel, B., Ruparel, N. B., Diogenes, A., & Hargreaves, K. M. (2020). Coronavirus Disease 19 (COVID-19): Implications for Clinical Dental Care. In Journal of Endodontics (Vol. 46, Issue 5, pp. 584–595). Elsevier Inc. https://doi.org/10.1016/j.joen.2020.03.008
3. D'Adamo, I., & Rosa, P. (2020). How do you see infrastructure? Green energy to provide economic growth after COVID-19. In Sustainability (Switzerland) (Vol. 12, Issue 11). MDPI. https://doi.org/10.3390/su12114738
4. Dopierała, Ł., Mosionek-Schweda, M., Laskowicz, T., & Ilczuk, D. (2022). Financial performance of renewable energy producers: A panel data analysis from the Baltic Sea Region. Energy Reports, 8, 11492–11503. https://doi.org/10.1016/j.egyr.2022.09.009
5. El Khoury, R., Nasrallah, N., Harb, E., & Hussainey, K. (2022). Exploring the performance of responsible companies in G20 during the COVID-19 outbreak. Journal of Cleaner Production, 354. https://doi.org/10.1016/j.jclepro.2022.131693
6. El-Chaarani, H., Abraham, R., & Skaf, Y. (2022). The Impact of Corporate Governance on the Financial Performance of the Banking Sector in the MENA (Middle Eastern and North African) Region: An Immunity Test of Banks for COVID-19. Journal of Risk and Financial Management, 15(2). https://doi.org/10.3390/jrfm15020082
7. Erol, S. (2022). Financial and economic impacts of the COVID-19 pandemic on aquaculture in Türkiye and financial policy recommendations. Marine Policy, 146. https://doi.org/10.1016/j.marpol.2022.105313
8. Erol, S. (2023). Assessing the impact of the Covid-19 pandemic on the financial and economic structure performance of Turkish sea freight transport sector. Regional Studies in Marine Science, 57. https://doi.org/10.1016/j.rsma.2022.102749
9. Gazi, M. A. I., Nahiduzzaman, M., Harymawan, I., Al Masud, A., & Dhar, B. K. (2022). Impact of COVID-19 on Financial Performance and Profitability of Banking Sector in Special Reference to Private Commercial Banks: Empirical Evidence from Bangladesh. Sustainability (Switzerland), 14(10). https://doi.org/10.3390/su14106260
10. Ghosh, A., Nundy, S., & Mallick, T. K. (2020). How India is dealing with COVID-19 pandemic. Sensors International, 1. https://doi.org/10.1016/j.sintl.2020.100021
11. Hoang, A. T., Sandro Nižetić, Olcer, A. I., Ong, H. C., Chen, W. H., Chong, C. T., Thomas, S., Bandh, S. A., & Nguyen, X. P. (2021). Impacts of COVID-19 pandemic on the global energy system and the shift progress to renewable energy: Opportunities, challenges, and policy implications. Energy Policy, 154. https://doi.org/10.1016/j.enpol.2021.112322
12. Horrigan, J. O. (1968). A Short History of Financial Ratio Analysis. In Source: The Accounting Review (Vol. 43, Issue 2).
13. Hwang, J., Kim, H., & Jung, D. (2021). The effect of esg activities on financial performance during the covid-19 pandemic—evidence from korea. Sustainability (Switzerland), 13(20). https://doi.org/10.3390/su132011362

14. Makki, A. A., & Alqahtani, A. Y. (2023). Capturing the Effect of the COVID-19 Pandemic Outbreak on the Financial Performance Disparities in the Energy Sector: A Hybrid MCDM-Based Evaluation Approach. Economies, 11(2). https://doi.org/10.3390/economies11020061
15. Santis, P., Albuquerque, A., & Lizarelli, F. (2016). Do sustainable companies have a better financial performance? A study on Brazilian public companies. Journal of Cleaner Production, 133, 735–745. https://doi.org/10.1016/j.jclepro.2016.05.180
16. Shaikh, Z. A., Datsyuk, P., Baitenova, L. M., Belinskaja, L., Ivolgina, N., Rysmakhanova, G., & Senjyu, T. (2022). Effect of the COVID-19 Pandemic on Renewable Energy Firm's Profitability and Capitalization. Sustainability (Switzerland), 14(11). https://doi.org/10.3390/su14116870
17. Solongo, G. (2017). Financial Resources Management for SME`S of Mongolia. International Business Research, 10(6), 145. https://doi.org/10.5539/ibr.v10n6p145
18. Stein, Z. (2023, October 10). Green Investments | Definition, Types, Risks & Strategies. Www.carboncollective.co. https://www.carboncollective.co/sustainable-investing/green-investments
19. Stephan, T., Al-Turjman, F., Ravishankar, M., & Stephan, P. (2022). Machine learning analysis on the impacts of COVID-19 on India's renewable energy transitions and air quality. Environmental Science and Pollution Research, 29(52), 79443–79465. https://doi.org/10.1007/s11356-022-20997-2
20. Wang, Q., Huang, R., & Li, R. (2022). Towards smart energy systems – A survey about the impact of COVID-19 pandemic on renewable energy research. Energy Strategy Reviews, 41. https://doi.org/10.1016/j.esr.2022.100845
21. Xu, Y., & Sharma, T. (2022). Explaining expedited energy transition toward renewables by COVID-19 in India. Energy Policy, 165. https://doi.org/10.1016/j.enpol.2022.112986
22. Yoo, S., Keeley, A. R., & Managi, S. (2021). Does sustainability activities performance matter during financial crises? Investigating the case of COVID-19. Energy Policy, 155. https://doi.org/10.1016/j.enpol.2021.112330
23. Zimon, G., Tarighi, H., Salehi, M., & Sadowski, A. (2022). Assessment of Financial Security of SMEs Operating in the Renewable Energy Industry during COVID-19 Pandemic. Energies, 15(24). https://doi.org/10.3390/en15249627

