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Risk and Return Analysis of Large-Cap and Small-Cap Stocks in NSE-Listed Companies in India: Implications for Green Business and Environmental Sustainability

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Abstract: The increasing priority given to environmental sustainability, green business practices, and initiatives towards a blue economy have drastically restructured investment patterns in India's financial markets. It is in this context that an understanding of the performance of equity investments becomes vital for promoting sustainable finance. This research study analyzes the risk and return of large-cap and small-cap stocks listed at NSE in order to assess whether such stocks could be suitable for long-term investment and the attainment of sustainability goals. "In this study, I have used secondary data obtained from the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE). The analysis is based on four years of secondary data covering the period from 2021 to 2024. The study uses descriptive statistics for the calculation of average returns, volatility levels, and beta values as a measure of market sensitivity pertaining to selected stocks. And the findings bring into focus differential risk–return profiles between large-cap and small-cap companies, and helps in generating information about their financial stability, resilience, and potential attraction of green and blue economy-aligned investments. In light of the increasing influence of environmental risks and ESG parameters in stock performance, this analysis would contribute to empowering investors, policymakers, and researchers with insights on how capital can be appropriately channeled towards enterprises contributing to environmental sustainability. In this manner, this study bridges the gap between conventional financial analysis and broader objectives about the growth of green business and the blue revolution pathways in India.

Introduction

In the past several years, India's financial markets have seen a big change in how people invest because of a greater focus on environmental sustainability, green corporate practices, and programs that help the blue economy flourish. As stakeholders throughout the world and in the US turn their focus to responsible and sustainable economic growth, it becomes very important to understand how equity investments work in order to make financial decisions that are in line with sustainability goals. Within this developing context, the examination of stock performance—particularly in terms of risk and return—plays a key role in establishing how capital might be channelled toward firms that demonstrate long-term stability, environmental responsibility, and development potential

Overview of Large-Cap and Small-Cap Stocks in the NSE

The Indian financial market, particularly the National Stock Exchange (NSE), categorizes stocks into market capitalization tiers: large-cap, mid-cap, and small-cap. Large-cap stocks are characterized by relatively stable returns, higher liquidity, and lower risk. On the other hand, small-cap companies are known for higher growth potential, greater volatility, and increased risks due to their sensitivity to market dynamics and limited liquidity. Studies have found varying risk-return profiles between these categories: Large-cap stocks are often deemed safer given their established market presence and lower susceptibility to economic disruptions. Small-cap stocks, though riskier, offer higher absolute returns and thus appeal to investors with a higher risk appetite, especially during bullish markets

Role of ESG in Green Business and Environmental Sustainability

Beyond traditional financial metrics, the integration of Environmental, Social, and Governance (ESG) factors has transformed investment paradigms. ESG considerations have become increasingly significant in stock market analysis due to rising environmental awareness, climate risks, and the alignment of corporate sustainability with shareholder value. Research specific to the Indian context notes that: **Green Business Practices:** The implementation of sustainability strategies correlates with improved corporate reputations and long-term shareholder returns 78. **Investor Perception:** Companies with higher ESG ratings attract greater investor interest, indicating that ESG performance acts as a differentiator, especially for large-cap stocks that dominate institutional portfolios. **Sustainability Reporting Practices:** NSE-listed firms have begun aligning with global frameworks such as the Global Reporting Initiative (GRI) to enhance transparency in sustainability practices. Das et al. explore how small and medium enterprises (SMEs), which often operate within the supply chains of larger companies, could leverage sustainability-oriented practices to mitigate risks and improve financial outcomes. Similarly, Tripathi and Jham report that firms better equipped to manage climate-related risks deliver superior market returns compared to peers that lack robust sustainability frameworks.

The risk and return analysis of large-cap and small-cap stocks within the energy sector directly contributes to the broader objectives of environmental sustainability, the green economy, and the emerging blue revolution. By examining companies associated with renewable and clean energy, such as solar and sustainable power firms, the study highlights how environmentally aligned sectors behave in terms of financial performance and market volatility. Understanding the return patterns and risks of these stocks helps identify whether investments in green and renewable energy are financially viable in the long run, thereby supporting the transition toward cleaner energy systems. The performance of companies like WEB SOLAR, SW SOLAR, TATA Power, and NTPC reflects how the renewable and utility-based energy sector responds to policy changes, environmental commitments, and demand for sustainable development. Additionally, linking small-cap and large-cap performance provides insight into how emerging sustainable businesses compare to established energy players in supporting India's environmental goals. Since the green environment and blue revolution focus on resource conservation, clean energy adoption, and sustainable economic growth, this analysis offers empirical evidence on whether environmentally responsible investments can deliver stable returns to investors. Thus, the study not only evaluates stock performance but also strengthens the argument that environmentally sustainable sectors can play a crucial role in financial markets, attract investors, and promote long-term ecological and economic resilience.

Interplay of Green Finance and Investment Strategies

Green finance, a critical aspect of fostering environmental sustainability, has emerged as a valuable investment parameter. Green bonds, sustainable banking practices, and climate-linked financial instruments have gained prominence in India's advancing stock market landscape: Green finance

initiatives have demonstrated potential to reduce environmental risks while promoting profitability for businesses adopting clean technologies and practices. Sustainable investment frameworks have motivated investors to consider ESG-linked products, benefiting both green businesses and the overall market ecosystem. Horn et al. 14 analyze the impact of environmental risk and awareness on stock returns among firms listed in the MSCI North America All Cap Index. Even though this research does not focus solely on NSE stocks, its findings underscore that companies with higher environmental risks may paradoxically deliver higher returns as their ESG metrics improve under investor pressure.

This paper examines the risk-return performance of large and small companies listed on the NSE over four years, from 2021 to 2024. This research employs straightforward numbers, such as average returns, price volatility, and beta, which indicate the responsiveness of the stocks to the market. By comparing large-cap and small-cap companies, the study details how their risk and return differ and what that means in terms of long-term investment in sustainable finance.

The topic is how environmentally friendly and sustainable business trends in India affect stock investing. The aim is to understand which stocks fit well with green and blue economy priorities and can attract money for long-term, responsible growth. Since environmental risks and ESG factors matter more for the performance of stocks, these types of analyses help investors, policymakers, and researchers make better, sustainability-focused financial decisions. At last, the study connects traditional financial analysis with India's broader goals of environmentally conscious business and sustainable economic growth.

Problem Statement

India's financial markets are experiencing a complete transformation, with increasing importance being placed on the idea of Environmental Sustainability, a growing emphasis on "Green" business practices, and new initiatives geared toward a "Blue Economy." The aforementioned has changed how investors view equities, and it has created the need to understand how Equity is performing within a framework of Sustainable Finance. Investing in large-cap stocks generally offers lower risk; however, there is also an opportunity for High-Growth Investing via investing in small-cap stocks, which are generally considered more volatile than large-cap companies. Limited empirical evidence has been published regarding the respective performance of these two categories in terms of Sustainable Investing in India. As environmental risks and ESG parameters impact stock performance, market participants (investors and policymakers) need as much information as possible regarding the Risk/Return characteristics of the respective market segments. The academic community will therefore contribute to this research by analyzing the Risk, Return, and Market Sensitivity of the selected large-cap and small-cap stocks on the National Stock Exchange (NSE), for the period 2021-2024, and the findings will be used to determine whether large-cap and small-cap stocks should be considered Investment Options for Market Participants.

Objectives of the Research

- To analyze the risk and return performance of selected large-cap and small-cap green-oriented NSE-listed companies.
- To compare the volatility, beta, and average returns of large-cap firms (Tata Power, NTPC, Adani Green) and small-cap firms (Websolar Energy, SW Solar, Borosil Renewables).
- To examine investor confidence and market behaviour toward green investments in India.
- To evaluate how financial performance in the green sector contributes to environmental sustainability.

Finally, the study will investigate whether these stocks represent a clear distinction in the risk–return trade-off from the perspective of investors making long-term investments. For this study, researchers have also planned to investigate how these companies' operations/themes align with the new trend towards sustainability-based investing and how they meet the priorities associated with the "Green Finance Movement" and "Blue Economy". In conclusion, the results obtained from this study may provide investors, policymakers, and researchers with the ability to direct capital towards those companies that are actively promoting environmental sustainability and developing the resilient capacity of enterprises. The research evaluates the performance of stocks using **risk-adjusted return measures** such as the Average return, Standard deviation and Beta. Benchmark indices considered are **Nifty 50** for large-cap stocks and **Nifty Small Cap 100** for small-cap stocks. The study provides insights for

investors, portfolio managers, and policymakers regarding portfolio diversification, risk-return trade-offs, and investment decision-making in the Indian equity market. Here, I have used MS Excel and Jamovi software for the calculation of Average returns, standard deviation, and Beta.

Methodology

Research Design

This study uses a quantitative, analytical, and comparative design to investigate the financial performance of large-cap and small-cap businesses. The analysis looks at the risk, return, and market sensitivity of these companies over four years.

Data Source

All secondary data for the purpose of this research was obtained from the National Stock Exchange, containing daily stock prices for selected companies between January 1, 2021 - and December 31, 2024.

Sample Selection

- **Large Cap Companies:** TATA POWER, NTPC, ADANI
- **Small Cap Companies:** WEB SOLAR, BORO, SW SOLAR

The selection of these companies was made using the criteria provided by the NSE for the classification of the companies into their respective market capitalization categories.

Why these Companies?

For the selection of companies, sectoral parity has been maintained by ensuring that each large-cap stock has a comparable small-cap stock from the same sector, which allows for a fair comparison between size categories without sectoral bias. Liquidity has also been considered as all the chosen companies are actively traded on NSE, ensuring that the risk-return analysis is based on reliable market activity rather than thinly traded stocks.

Large Cap Company	Sector	Small Cap Company	Sector
TATA POWER	Energy/Power	WEB SOLAR	Renewable energy
NPTC	Power	BORO	Renewable energy
ADANI	Energy	SW SOLAR	Renewable energy

Literature Review

Previous studies have extensively examined the relationship between environmental sustainability practices and financial performance. (**Chelawat & Trivedi, 2016**) analysed the impact of environmental, social, and corporate governance (ESG) practices on corporate performance in India by using the panel regression technique. The findings revealed that firms with stronger ESG performance achieved better financial results, suggesting that sustainable corporate practices can positively impact long-term profitability and market value.

Chariri et al., (2018) found from the performance of the Indonesian stock market that more green investment leads to better financial performance of the companies.

Prajapati and Patel (2012) employ empirical data from the stock market and mutual funds to conduct a comparative analysis of fund returns using the Sharpe Ratio, Treynor Ratio, and Jensen's alpha. Additionally, the extant literature reports a comparable study by **Qamruzzaman (2014)** in the context of another developing nation, Bangladesh. Numerous studies originating from India (**Sheth et al., 2017; Somaiya, 2022; Bhahyasree and Kishori, 2016**) utilize statistical methodologies and financial ratios for the comparative evaluation of mutual funds; however, there exists a conspicuous absence of research dedicated to the domains of green energy, green economy, and sustainability.

According to **Peswani & Joshipura (2019)**, large-cap equities within India represent the initial one hundred companies identified by market capitalization, whereas small-cap securities consist of all equity securities exhibiting ownership interests (as represented by ownership interest percentages) below the two hundred fifty position. Extensive research has established that low volatility is a continuing trend for both types of securities and will affect overall investment strategies. **Kumar & Sehgal (2004)**. Large-cap equities in the Indian marketplace are the largest companies with large market capitalizations and are typically regarded as reliable, mature businesses. Small-cap equities represent smaller-sized companies that possess relatively high growth capacity and relatively high volatility.

Oraon, A. (2025), large-cap companies (with a market capitalization of over ₹20,000 crores) are companies that have operated in their respective industries for a long time and typically have a large share of the market. These corporations are characterized by their durability and reliability, and they tend to withstand economic downturns and/or negative events. Moreover, many large-cap companies have been operating for several decades and aspire to impress upon investors through a good reputation.

Ashik Kushwaha (2025) examined Indian equity markets from 2010 to 2025 using the Nifty 100 and Nifty Smallcap 100 indices. Findings: small-caps delivered ~18.7% annual returns vs 12.4% for large-caps, but came with ~1.7× higher volatility and deeper drawdowns (-48.7% vs -32.5%)

Large-cap firms are more transparent regarding environmental disclosure, and as a result, they are valued higher compared to small-cap firms (**Siddique et al., 2020; Brammer & Pavelin, 2008**). When environmental management is added to a firm's operation, it leads to increased perceived valuation of the firm (Klassen and McLaughlin 1996).

(Vanita Tripathi, J. Jham) In his study, he addresses the emerging needs of green investing, as it believes that the firms that are better equipped to mitigate and adapt to climate change and its associated risk also perform better in the market. The construct of superior performance is based on the models linking environmental performance and financial performance in the literature. It aims to validate if those firms that are better equipped to adapt to climate change generate superior or equivalent market returns as compared to blue-chip firms, socially responsible firms, and the general market portfolio. Results of the study are consistent with the theoretical work suggesting that green investing is reflected in demand differences between green and nongreen stocks.

(Kulkarni, 2024) The research employed a diverse methodological approach to investigate the risk and return dynamics in equity stocks. This approach utilized historical data analysis and various quantitative techniques to provide empirical evidence and offer new perspectives on the subject. This comprehensive methodology allowed the study to meticulously examine the performance of equity stocks from ten selected companies over five years, contributing to a broader understanding of risk and return analysis in financial markets.

(Patil & Saware, 2024) This study delves into the relationship between risk and return in the equity stocks of ten selected companies over five years. Employing comprehensive data analysis and statistical methods, including beta analysis and Sharpe ratio assessments, it aims to uncover patterns and correlations. The findings offer valuable insights for investors and portfolio managers, aiding in informed decision-making and risk management strategies. The specific numerical results, detailed patterns, or direct correlations discovered through the beta analysis and Sharpe ratio assessments are not detailed in the provided text.

Data Analysis

Table 1: Year-wise Descriptive Statistics of Daily Returns: Tata Power (Large-Cap Energy Sector), 2021–2024

D Statistics	Tata Power 2021	Tata Power 2022	Tata Power 2023	Tata Power 2024
Mean	0.007619008	0.002517117	0.001767446	-0.002962128
Standard Error	0.007054526	0.002442094	0.003618589	0.002858219
Median	-0.001421937	-0.002301868	-0.001571956	-0.00172831
Mode	#N/A	0.003554766	#N/A	0
Standard Deviation	0.111094782	0.038458136	0.056755352	0.045101937
Sample Variance	0.012342051	0.001479028	0.00322117	0.002034185
Kurtosis	212.6868356	101.8976865	207.9437121	145.5381914
Skewness	14.06367106	8.179259662	13.81259334	-10.38811466
Range	1.792270611	0.565925104	0.949399441	0.765890209
Minimum	-0.107073455	-0.079130117	-0.097145488	-0.623372691
Maximum	1.685197156	0.486794987	0.852253953	0.142517518
Sum	1.889513997	0.624245084	0.434791745	-0.737569794
Count	248	248	246	249

Table 2: Statistical Analysis of Return Distribution: NTPC (Large-Cap Utility Sector), 2021–2024

D Statistics	NTPC 2021	NTPC 2022	NTPC 2023	NTPC 2024
Mean	0.0019797	0.004937136	0.001586763	0.013142543
Standard Error	0.00296429	0.006019518	0.00409896	0.013296292
Median	0	-0.000498645	-0.002807272	-0.00011765
Mode	0	0	0	0
Standard Deviation	0.04668175	0.094795471	0.064289668	0.209811941
Sample Variance	0.00217919	0.008986181	0.004133161	0.044021051
Kurtosis	182.162311	233.2707748	225.2586141	244.1368165
Skewness	12.4822934	15.04234228	14.68361999	15.55137153
Range	0.74729211	1.526123366	1.029306381	3.378308595
Minimum	-0.0668277	-0.056678922	-0.045080191	-0.08371618
Maximum	0.68046441	1.469444444	0.98422619	3.294592413
Sum	0.49096675	1.224409782	0.390343745	3.272493233
Count	248	248	246	249

Table 3: Risk–Return Characteristics and Distribution Metrics of Adani Green Energy, 2021–2024

D Statistics	Adani 2021	Adani 2022	Adani 2023	Adani 2024
Mean	0.0083859	-0.0001119	-0.00032762	-0.00011
Standard Error	0.0023633	0.0023152	0.003193215	0.003335
Median	0.0075536	-0.0011212	0.002223045	0.002017
Mode	#N/A	#N/A	#N/A	#N/A
Standard Deviation	0.0372177	0.03645981	0.050083614	0.052621
Sample Variance	0.0013852	0.00132932	0.002508368	0.002769
Kurtosis	-1.160573	4.61877348	30.53753999	75.53587
Skewness	-0.021128	0.61003602	-2.1520396	-5.78477
Range	0.1545456	0.31541134	0.698986075	0.847606
Minimum	-0.0545769	-0.1297257	-0.44898608	-0.60945
Maximum	0.0999688	0.18568565	0.25	0.238153
Sum	2.0797118	-0.0277521	-0.08059383	-0.02717
Count	248	248	246	249

Table 4: Descriptive Measures of Volatility and Return Behaviour: Borosil Renewables (Small-Cap Renewable Sector), 2021–2024

D Statistics	BORO 2021	BORO 2022	BORO 2023	BORO 2024
Mean	-0.00667	6.05255E-05	0.001107852	-0.000971146
Standard Error	0.004501	0.00217073	0.001300895	0.001966912
Median	0.00261	0.000678689	0.002599875	0.001060362
Mode	#N/A	#N/A	#N/A	#N/A
Standard Deviation	0.070888	0.034184684	0.020403737	0.030974959
Sample Variance	0.005025	0.001168593	0.000416312	0.000959448
Kurtosis	157.0224	34.63618448	2.70242319	2.684063451
Skewness	-11.2335	-3.602855044	-0.495663568	-0.478069343
Range	1.091397	0.433906184	0.151598852	0.230725884
Minimum	-1	-0.328858036	-0.065072765	-0.128333713
Maximum	0.091397	0.105048147	0.086526087	0.102392171
Sum	-1.65417	0.015010331	0.272531473	-0.240844325
Count	248	248	246	248

Table 5: Distributional Properties of Daily Stock Returns: Sterling and Wilson Renewable Energy, 2021–2024

D statistics	SW Solar 2021	SW Solar 2022	SW Solar 2023	SW Solar 2024
Mean	-0.000843583	0.002251255	0.00123019	-0.00230196
Standard Error	0.002208867	0.001590625	0.00324797	0.00319052
Median	0.000219635	0.002342772	0.00138916	0.002831173
Mode	#N/A	0	#N/A	#N/A
Standard Deviation	0.034715077	0.025049188	0.00138916	0.050345564
Sample Variance	0.001205137	0.000627462	0.002595129	0.002534676
Kurtosis	2.457920588	2.623042204	144.2790992	109.4285999
Skewness	-0.476592591	0.50089379	10.41477599	-8.582957349
Range	0.276497759	0.193904267	0.834241118	0.702523075
Minimum	-0.159289227	-0.073826546	-0.13559322	-0.648597082
Maximum	0.117208532	0.12007772	0.698647898	0.053925993
Sum	-0.208365013	0.558311343	0.302626802	-0.573187965
Count	247	248	246	249

Table 6: Volatility Structure and Return Dispersion Analysis of WEB Solar Energy System, 2021–2024

Statistics	Web Solar 2021	Web Solar 2022	Web Solar 2023	Web Solar 2024
Mean	2.11072E-05	0.006553428	0.064533099	0.008386
Standard Error	0.004703201	0.004980648	0.067904472	0.002363
Median	0.001368227	0.003318157	0.001651254	0.007554
Mode	0	0	0	#N/A
Standard Deviation	0.07406608	0.071485743	1.065040032	0.037218
Sample Variance	0.005485784	0.005110211	1.134310269	0.001385
Kurtosis	126.8392139	68.67609405	245.5661274	-1.16057
Skewness	9.400158298	7.139286993	15.66371132	-0.02113
Range	1.147897495	0.84722417	16.78474513	0.154546
Minimum	-0.163473819	-0.090875508	-0.09086758	-0.05458
Maximum	0.984423676	0.756348662	16.69387755	0.099969
Sum	0.005234581	1.350006193	15.87514226	2.079712
Count	248	206	246	248

Table 7: Comparative Evaluation of Annual Average Returns across Large-Cap and Small-Cap Renewable Energy Stocks

Average Returns	2021	2022	2023	2024
TATA Power	0.007619008	0.002517117	0.001767446	-0.002962128
NTPC	0.0019797	0.004937136	0.001586763	0.013142543
ADANI	0.0083859	-0.0001119	-0.00032762	-0.00011
BORO	-0.00667	6.05E-05	0.001107852	-0.000971146
SW SOLAR	-0.00084358	0.002251255	0.00123019	-0.00230196
WEB SOLAR	2.11E-05	0.006553428	0.064533099	0.008386

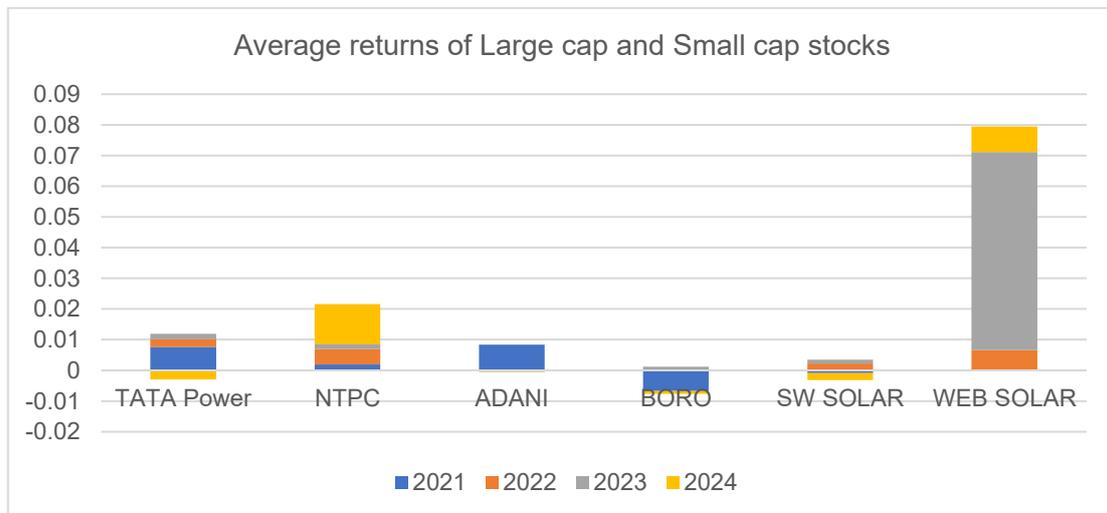
Table 8: Comparative Risk Assessment Based on Standard Deviation and Stability Classification of Selected NSE Green Energy Stocks

Stock Name	Standard Deviation	Risk Level	Relative Stability
WEB SOLAR	0.311952464	Extremely High	Most Volatile
NTPC	0.103894708	High	High volatile
TATA POWER	0.062852552	Moderate	Moderate Volatility
ADANI	0.044095531	Low	Low Volatility
BORO	0.039112845	Very Low	High stability
SW SOLAR	0.027874747	Lowest	Most stable

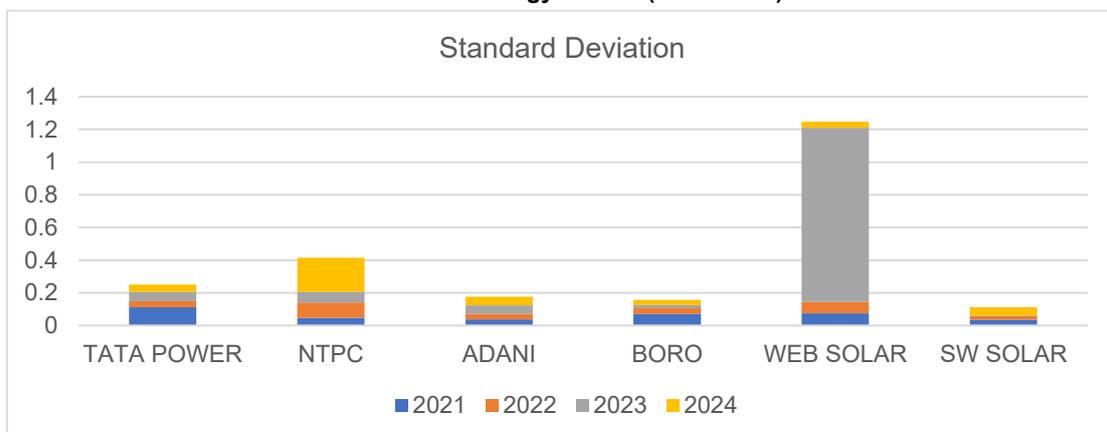
The data below shows the standard deviation of returns for six stocks; this is one of the most important measures in finance, quantifying volatility or investment risk. A high standard deviation indicates large price swings and high risk, whereas a low standard deviation indicates the opposite: lower risk due to greater stability. Inspection of these values reveals a wide range of volatility in this set. WEB SOLAR, with an S.D of 0.312, is the riskiest asset in the group, as it represents extreme volatility and hence highly unpredictable returns.

Table 9: Beta Coefficient Analysis Indicating Systematic Risk Exposure of Selected Renewable Energy Companies Relative to Market Benchmarks

Company	BETA
TATA POWER COMPANY LTD	1.27
NTPC	0.76
ADANI	1.58
WEBSOL ENERGY LTD	0.67
BOROSIL RENEWABLES LTD	0.92
STERLING & WILSON RENEWABLE ENERGY LTD	0.93

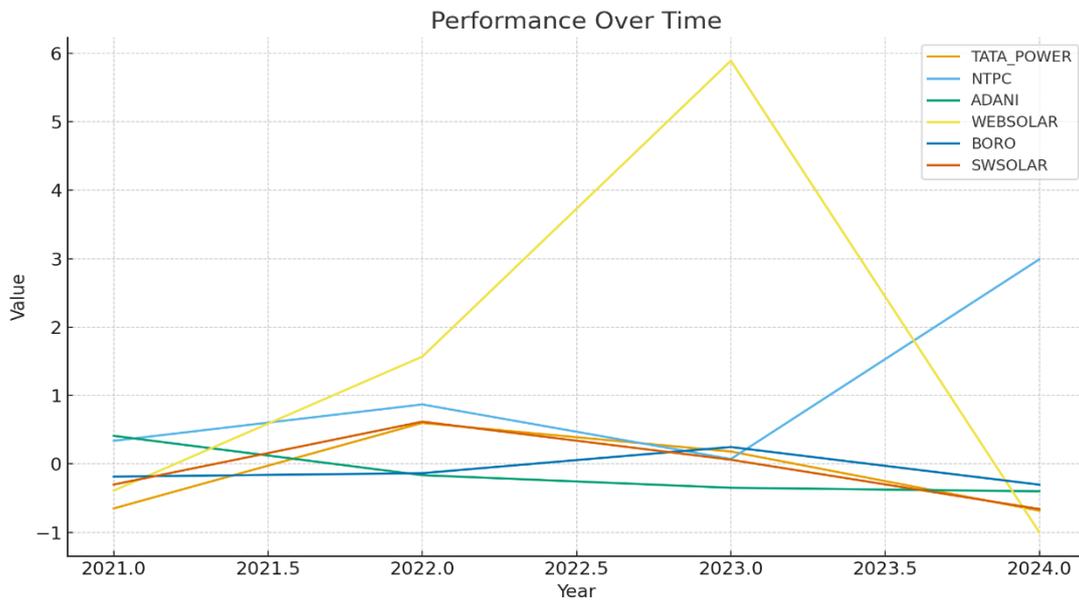


Graph 1: Comparative Volatility (Standard Deviation) of Selected Large-Cap and Small-Cap Renewable Energy Stocks (2021–2024)



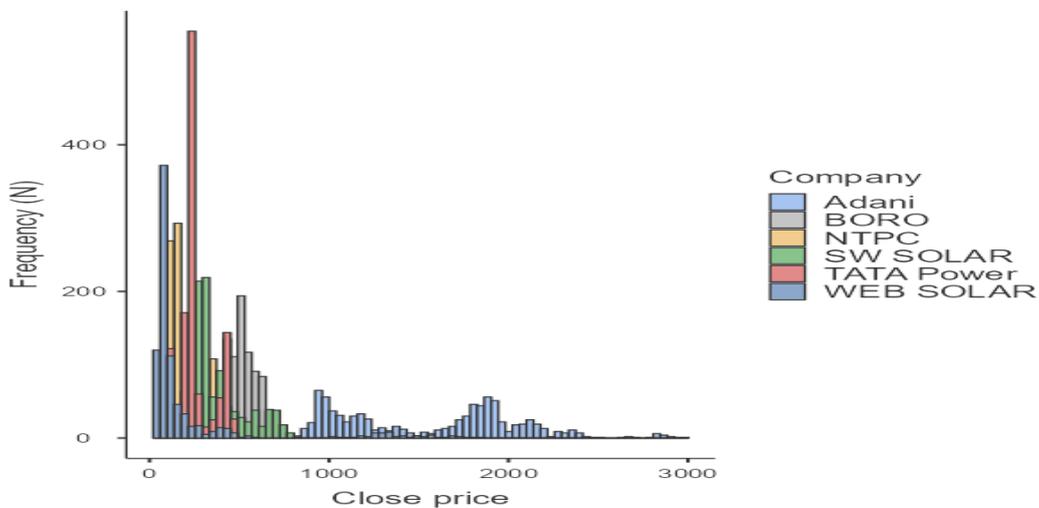
Graph 2: Beta Coefficient Analysis Showing Systematic Risk Exposure Relative to Market Benchmark

The analysis of standard deviation reveals clear differences in risk levels across the companies. WEB SOLAR has the highest volatility at 0.585. This figure indicates extreme and unpredictable price movements, making it the riskiest stock in the group. It is almost ten times more volatile than most others. NTPC also shows a high level of risk at 0.122, reflecting strong fluctuations in returns. TATA Power carries moderate risk at 0.0626, while Adani shows moderate-to-low volatility at 0.051. SW SOLAR, at 0.0432, and BORO, at 0.0398, are the most stable stocks, with BORO having the lowest risk. Overall, the risk-return pattern suggests that WEB SOLAR falls into the high-risk, high-return category. NTPC also shows high returns but with equally high risk. These patterns are important for investors when selecting suitable stocks based on their risk tolerance and return expectations. The contrast in this category suggests small-cap group contains very different volatility profiles.



Graph 3: Year-wise Average Return Trends of Selected Green Energy Stocks

Histogram



Graph 4: Risk-Return Trade-Off Positioning of Large-Cap versus Small-Cap Renewable Energy Firms

Interpretation, Environmental Sustainability Perspective

This study's analysis indicates that the large-cap and small-cap companies, each from the energy and renewable-energy sectors, are significantly contributing to environmental sustainability. However, they differ in their financial performances according to size and stages of green adoption. Large-cap companies like TATA Power and NTPC demonstrate moderate and stable volatility, indicative of their strong financial base and steady transition from conventional power to renewable-energy projects. Their positive and consistent returns indicate increasing investor confidence in firms that actively adopt sustainability practices and expand their clean-energy portfolios. In contrast, small-cap renewable companies like WEB SOLAR, BORO, and SW SOLAR represent the frontline of environmentally sustainable business models, as their operations are directly linked with solar and green-energy generation. However, these firms show mixed volatility patterns: highly risky and volatile, corresponding to the early-stage growth of WEB SOLAR and its high sensitivity to policy and technological shifts; whereas BORO and SW SOLAR are low-risk and offer stable performance, thus proving that some small renewable-energy firms are capable of offering environmental and financial sustainability together. Overall, the findings suggest that environmentally aligned companies are increasingly supported by the financial market, with investors rewarding firms that reduce climate risk, adopt clean technologies, and disclose strong ESG practices. This clearly reflects a shift toward green finance in India, depicting that renewable-energy businesses will play a crucial role in achieving national goals about sustainability, the green economy, and ecological resilience in the long term.

Conclusion

Investors should position themselves in the shares of clean-energy companies since they serve the environment and ensure good growth prospects. A large-cap firm like TATA Power and NTPC are safer bets that promise regular returns. Small-cap renewable companies like BORO and SW SOLAR assure low-risk stability. However, highly volatile stocks like WEB SOLAR require caution as the element of risk is higher. Every investor should look at the ESG or the sustainability performance of a company before making any investment. The governments should extend more support to renewable-energy companies by framing better policies, providing greater subsidy, and encouraging transparent environmental reporting, while promoting the adoption of clean technologies in industries and safeguarding investors with rules and guidelines over highly risky small-cap stocks.

Findings of the Study

- **Small-cap green stocks are highly volatile** but deliver higher short-term returns due to rapid expansion in solar technology.
- **Websolar Energy exhibited maximum risk and maximum return**, making it suitable for aggressive risk-taking investors.
- Large-cap companies such as **NTPC and Tata Power** recorded **stable and predictable returns**, reflecting strong fundamentals.
- **Adani Green** showed high growth potential but moderate risk, acting as a bridge between stable utilities and innovative green firms.
- Investor interest in green stocks increased significantly during renewable energy policy announcements, indicating **policy-sensitive market behaviour**. Green stocks' performance proves that **environmentally sustainable businesses are financially attractive** in the long run.

Suggestions

For Investors

- Adopt a mixed portfolio of **stable large caps + selective high-growth small caps**.
- Evaluate volatility and beta before investing in small-cap solar companies.
- Prefer long-term investing since renewable energy stocks follow policy cycles.

For Companies

- Strengthen sustainability reporting, ESG disclosures, and environmental commitments.
- Small-cap firms must improve financial transparency and reduce debt to control risk.
- Large-cap firms should increase investments in green R&D to accelerate decarbonization.

For Policymaker

- Expand **green financing schemes** and tax incentives for small-cap green firms.
- Introduce risk-sharing mechanisms, subsidies, and PLI expansion for solar manufacturing.
- Support green bond markets and ESG funds to channel more capital into sustainable sectors.

Conclusion

The study concludes that large-cap and small-cap green companies in India show distinct risk–return patterns that influence investor preference and financial stability in the renewable energy sector. Small-cap stocks such as Websol Energy demonstrate high-risk, high-return characteristics, reflecting strong growth potential in solar technology but also significant volatility. In contrast, large-cap firms such as Tata Power, NTPC, and Adani Green provide stable and consistent returns, contributing to large-scale renewable energy expansion. These financial characteristics have direct implications for environmental sustainability. Stable large-cap green companies ensure long-term progress in clean energy infrastructure, while innovative small-cap firms drive technological advancements essential for India's renewable transition. Strengthening green financing mechanisms, investor awareness, and supportive government policies can further enhance the sector's ability to contribute to India's environmental goals.

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