PERFORMANCE OF ESG INDICES WITH PARENT INDEX IN INDIAN STOCK MARKET POST COVID-19 PANDEMIC PERIOD

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DECLARATION BY STUDENT

I hereby declare that the data presented in this Dissertation report entitled, "Performance of ESG Indices with Parent Index in Indian Stock Market Post COVID-19 Pandemic Period" is based on the results of investigations carried out by me in the MBA in Financial Services at the Goa Business School, Goa University under the Supervision/Mentorship of Ms/Dr/Prof. Pournima S. Shenvi Dhume and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities will not be responsible for the correctness of observations / experimental or other findings given the dissertation.

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COMPLETION CERTIFICATE

This is to certify that the dissertation report is "Performance of ESG Indices with Parent Index in Indian Stock Market Post COVID-19 Pandemic Period" is a bonafide work carried out by Ms. Trupti Ulhas Naik under my supervision/mentorship in partial fulfilment of the requirements for the award of the degree of Master of Business administration in the Discipline Financial Services at the Goa Business School, Goa University.

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CHAPTER - 1: INTRODUCTION

1.1 Introduction

ESG investing is a new concept in the Indian market that has gained significant momentum in recent times. India has a long history of social and environmental activism, which has made the country more conscious of the importance of sustainable business practices and ethical investment. The growing awareness of the link between sustainability and financial success is a significant driving force behind ESG investment in India.

As investors become more aware of the risks associated with unsustainable business practices, they are demanding greater transparency and accountability from companies in terms of their ESG performance. The asset management industry in India has also started to consider ESG factors when making investment decisions. In addition, there are now a few ESG rating agencies operating in India, providing assessments of companies' ESG performance and making it easier for investors to evaluate the sustainability of their portfolios.

The Indian government has also taken steps to promote ESG investing through initiatives such as the National Voluntary Guidelines on Social, Environmental, and Economic Responsibility of Business. The Securities and Exchange Board of India (SEBI) has also published guidelines requiring listed companies to disclose their ESG performance, which further strengthens transparency and accountability.

The rise of ESG investing in the Indian stock market has been representing a significant shift in more ethical and sustainable investment practices. As awareness of its importance continues to grow, it is expected that ESG investment will become even more prevalent in India, bringing potential benefits for the economy, society, and the environment in addition to investors.

India has made significant progress in implementing ESG practices in recent years, with several policies and programs supporting sustainability and ethical business practices. For example, SEBI now requires the top 1,000 listed companies to report their ESG performance, and the government has introduced initiatives like the National Solar Mission and the National Electric Mobility Mission Plan to promote renewable energy and reduce carbon emissions.

Many Indian businesses are also starting to take sustainability seriously by setting goals to reduce their environmental impact and improve their social and governance standards. However, there are still challenges to be addressed, particularly in areas such as waste

management, labour rights, and air and water pollution. Furthermore, not all Indian businesses are fully embracing ESG principles, and more transparency and disclosure are needed.

Overall, India is making strides in adopting ESG practices, but there is still much progress to be made.

1.2 Meaning, Scope, and Importance

The purpose of this study is to compare the risk/return along with the market performance of ESG Indices of India with the conventional parent index Nifty 50 post COVID-19 pandemic period. Here secondary sources are used to extract secondary data that include National Stock Exchange (NSE) website historical data of ESG Indices from the year 2021 to 2023. This analysis is performed by applying CAPM (Capital Asset Pricing Model) to compare the performance of the ESG Indices with their benchmark Index Nifty. The results of this analysis will confirm whether the ESG Indices are favourable then the conventional index and comprehend upon the success of socially conscious investors on investment returns.

1.3 Literature Review

1.The study by Nikita, Vandana & Parikshita (2023) aims to evaluate the performance of Environmental, Social, and Governance (ESG) indices in India and compare them with the conventional parent index Nifty. Using the Capital Asset Pricing Model (CAPM), the study analyses the risk and return of ESG indices and their market performance. Additionally, the Sharpe ratio and Treynor ratio are applied to compare the performance of ESG indices with their benchmark index Nifty. The findings suggest that ESG indices in India outperform Nifty and offer better risk-adjusted returns than the conventional index. This study emphasizes the importance of social responsibility and sustainable investments and provides evidence that ESG investing can be a viable strategy for investors looking for better risk-adjusted returns.

2.The paper by Mohan, Sumathy & T S, Sujith & Jayalakshmi, Sneha. (2022) analyses two indices, NIFTY100 ESG Index and NIFTY 100 Enhanced ESG Index, designed based on ESG scores of companies. The study aims to analyse the impact of returns on dividend for these indices and suggests that investors may invest in NIFTY 100 ESG Index. However, the study also recommends that investors should consider the returns and dividends of the indices before investing. The study is analytical in nature and relies on secondary sources of data.

3.This article by Nogueira and Madaleno (2022) explores the potential impact of stock market volatility on sustainability indices, with a particular focus on the EURO STOXX Sustainability Index. The authors use Multivariate Generalized Auto-Regressive Conditional Heteroskedasticity (MGARCH) models to analyse the volatility transmission effects between the sustainability index and the stock market indexes of its constituent stocks, both before and after the COVID-19 pandemic.

The study finds that there is a significant dependence of the sustainability index on the movements of the stock market indexes, indicating a strong correlation between the two. Also the authors find that the volatility felt in stock indices during the pandemic period did not have any significant impact on reversing the correlation trajectory between the stock market and sustainability indices. This suggests that the effects of stock market volatility on sustainability indices were already present before the pandemic.

The article concludes by emphasizing the importance of considering sustainability in a triple bottom line context, which includes social and environmental factors in addition to financial and economic considerations. The authors argue that policymakers and investors should be aware of the high influence of stock market indexes on sustainability indices and take measures to promote greater independence of the sustainability index. Overall, this study provides valuable insights into the relationship between stock market volatility and sustainability indices and highlights the need for more attention to be paid to sustainability factors in financial decision-making.

4.The article by Zhou and Zhou (2021) investigates the impact of ESG (Environment, Social, and Governance) performance on stock price volatility during the COVID-19 pandemic. The authors utilize ESG rating data from MSCI and employ a Differences-in-Differences (DID) model to evaluate the effect of ESG performance on stock price fluctuations. The study also examines how the COVID-19 pandemic has affected stock prices and whether companies with good ESG performance exhibit greater resilience to market volatility during this crisis.

The findings of the study reveal that companies with better ESG performance experience lower stock price volatility compared to companies with poor ESG performance. Furthermore, the study finds that the COVID-19 pandemic has significantly increased stock price volatility, but companies with good ESG performance experience less of an increase in volatility. The study suggests that good ESG performance can help stabilize stock prices and enhance resilience during times of market volatility.

Overall, this study provides valuable insights into the relationship between ESG performance and stock price volatility during a global public health crisis. The results highlight the importance of considering ESG factors in financial decision-making, particularly during times of crisis. The study also suggests that policymakers and businesses should focus on improving ESG performance to enhance the resilience of companies and the broader economy.

5.The authors of this study, Al Sayegh, Maha Faisal, Rashidah Abdul Rahman, and Saeid Homayoun (2020) analysed the impact of environmental, social, and governance (ESG) disclosure on the economic, environmental, and social (EES) sustainability performance of Asian firms from 2005 to 2017. They found a positive relationship between ESG information disclosure and corporate sustainability performance, suggesting that disclosing the implementation of environmental and social strategies within an effective system of corporate governance strengthens sustainability performance. The study also found that environmental and social performance are significantly positively related to economic sustainable

performance, indicating that the corporation's economic value and creating value for society are interdependent. The authors suggest that ESG information disclosure to all stakeholders is an important factor in creating a competitive advantage for enhancing corporate sustainability performance, in line with stakeholder theory and the shared value theory.

6.The study by Srinivasan Sudha (2014) examines the performance of the S&P ESG India Index, which comprises companies that perform well in environmental, social, and governance (ESG) parameters. The author compares the returns of this sustainability index with two broad market indexes, namely the Nifty and the S&P CNX 500, using daily index data. Additionally, the study analyses the inherent conditional volatility using generalized autoregressive conditional heteroscedasticity models.

The results show that the daily compounded returns of India's ESG Indices are statistically not that different from those of the Nifty or CNX 500. However, annualized returns of the ESG India Index have been better than the returns of the other two indexes. Therefore, focusing on environmental and social sustainability can be a win-win situation for companies, investors, and society at large.

The study also finds significant volatility clustering in all three indexes. The ESG India Index has been less volatile compared to the Nifty during the period analysed. These results have implications for companies to focus on ESG parameters seriously to benefit from its sensitivity in the stock markets. Also the study reflects upon the potential for growth of socially responsible investments in India and investors acceptance.

1.4 Objective

The main purpose of the study is to compare the risk-return and performance of ESG Indices of India with the conventional parent Index Nifty 50.

1.5 Methodology

The study is a quantitative analysis that compares ESG Indices with the conventional Parent Index in India. The study uses NIFTY 100 ESG INDEX, NIFTY 100 ENHANCED ESG INDEX, and NIFTY 100 ESG SECTOR LEADERS INDEX as dependent variables, and NIFTY 50 INDEX as the independent variable. The daily returns of these indices were considered for the period 1-4-2021 to 24-4-2023 to evaluate the performance of ESG Indices, as this period was relevant in terms of the post-pandemic period. The Nifty Index was selected as the benchmark index, as it tracks the behaviour of India's most liquid and largest floating securities, making it suitable for comparison with the two former ESG Indices in terms of risk/return and performance. The historical prices of all these indices were obtained from the NSE website. The study uses the Capital Asset Pricing Model (CAPM) to analyse risk/returns and the CAGR and Sharpe ratio to compare the performance of the ESG indices with the parent index Nifty.

According to Sudha (2014), sustainability risk refers to the instability of returns to the sustainability index. The Capital Asset Pricing Model (CAPM) is a straightforward, single-factor Ordinary Least Squares (OLS) regression model that is utilized to estimate the anticipated returns on risk-bearing assets. This model was developed by Sharpe (1964), Lintner (1965), and Mossin (1966), following the original framework of Markowitz (1952). The CAPM model is based on three fundamental and significant assumptions, as outlined by Cardoso (2019):

Firstly, investors are able to trade securities in the stock market without incurring any transaction costs or taxes, and they can lend and borrow at a risk-free rate of return.

Secondly, investors only hold efficient portfolios that offer the highest expected returns for a given level of volatility.

Finally, investors aim to achieve the optimal returns, which means maximum returns at minimum risk.

The aim of this study is to compare the investment performance of sustainable indices with that of the conventional broad market index in the Indian stock market. Instead of constructing an individual portfolio of sustainable companies, the study focuses directly on ESG indices. As a result, the Market model or CAPM regression model is the most appropriate for the analysis, and the Fama French three-factor model and Carhart's model are not relevant. The CAPM model considers only systematic risk, also known as market risk, because it is assumed that unsystematic risk is eliminated due to portfolio diversification. This model has been used in sustainable studies by several researchers (Hamilton et al., 1993; Schroder, 2007; Ortas et al., 2010; and Sudha, 2014) due to its simple framework. The model captures systematic risk through the Beta coefficient, which reflects the portfolio's vulnerability to market returns. The formula for CAPM is:

$$E(ri) = RF + \beta (E(Rm) - RF)$$

where E (ri) is the expected rate of return of an index,

RF is the risk-free rate,

β is the measure of systematic risk, and

E (rm) is the expected rate of return of the market.

The formulae of other statistical tools used in this study are as follows:

$$\text{Daily Returns} = Ri\ (Pt-Pt-1)/Pt-1\ x100$$

where Ri is the index return,

P is the closing price of the index

t is the current date and,

t-1 is the previous day date.

Other statistical tool used in the study include the calculation of daily returns of the indices and the use of Sharpe Ratio to compare investment returns with risk. Sharpe Ratio is calculated using the formula:

$$\text{Sharpe Ratio} = (RI - RF)/\sigma$$

where RI is the return of the index,

RF is the risk-free rate, and

σ is the standard deviation of the index excess return.

1.6 Limitations

The limitations of this study include the reliance on secondary data and the limited time frame covered in the analysis. Additionally, the analysis is limited to the ESG Indices in India and their benchmark indices available on the National Stock Exchange (NSE) website. The results of this study may not be generalizable to other stock exchanges or time periods.

1.7 Chapterisation

The presented study is an analysis of "Performance of ESG Indices with Parent Index in Indian Stock Market Post COVID-19 Pandemic Period". The study endeavours an in-depth analysis for tracing the investment opportunities for sustainable investments. This study has been conducted in context to India.

The study has been presented with the chapterisation scheme. Each part of the study has a significant role to play in the completion of study. Here is the chapter wise introduction of each chapter,

CHAPTER 1: INTRODUCTION

Chapter one includes the introduction of the topic. This introduction has been covered with the help of the different topics like introduction to ESG (Environmental, Social, Governance) investments, involvement of environmentally conscious and efficient operations the awareness about sustainable investing, ESG Indices available in India, and so on. The primary objective of this research that is to compare the risk/return and market performance of ESG Indices in India with their conventional parent index Nifty 50 during the post-COVID-19 pandemic period. Also, the Research Design will use a quantitative research method to analyse the performance of ESG Indices in India and compare it with the conventional parent index Nifty 50. Secondary data will be used for analysis, and the data will be collected from the National Stock Exchange (NSE) website, covering the period from 2021 to 2023.

CHAPTER 2: ANALYSIS AND DISCUSSION

In the chapter two of the study is as follows:

Data Collection: The data will be collected from the National Stock Exchange (NSE) website, which provides historical data of ESG Indices and their benchmark indices. The data will be collected for the period from 1st April 2021 to 24th April 2023, covering the post-COVID-19 pandemic period. The data will be extracted in Microsoft Excel format and then imported into the Statistical Package for further analysis.

Data Analysis: The analysis of the data will be done using the Capital Asset Pricing Model (CAPM) to compare the risk and return of ESG Indices in India with their benchmark index Nifty 50. The CAGR and Sharpe ratio will also be calculated to compare the performance of the ESG Indices with their benchmark index. The results of the analysis will be presented using tables and the interpretation to those results to provide a clear and concise understanding of the performance of ESG Indices in India.

Sampling Technique: This research will use a purposive sampling technique, which involves selecting a sample of data based on specific criteria. The data selected will be for the ESG Indices in India and their benchmark indices. The sample size will include the complete set of ESG Indices in India and their benchmark indices available on the National Stock Exchange (NSE) website for the period from 1st April 2021 to 24th April 2023.

CHAPTER 3: SUMMARY, FINDINGS, AND CONCLUSION

In the chapter three conclusion will be reciprocated by considering the analysis results and the interpretation those results. Also, how the topic od the research justifies the situations considered will be added here. Lastly, suggestions will be provided as to how in the future more research can be conducted by using the same or alike parameters for a wider spectrum.

CHAPTER – 2: ANALYSIS AND DISCUSSION.

2.1 Data Analysis and Results

Table I: Summary Output

SUMMARY OUTPUT			
Regression Statistics	NIFTY 100 ESG	NIFTY 100 ENHANCED ESG	NIFTY 100 ESG SECTOR LEADERS
Multiple R	0.9607	0.9610	0.9841
R Square	0.9229	0.9235	0.9684
Adjusted R Square	0.9227	0.9234	0.9684
Standard Error	0.0027	0.0026	0.0017
Observations	508	508	508

Table II: Regression Output (CAPM): R^2 and ANOVA

REGRESSION OUTPUT (CAPM): R Square and ANOVA															
ANOVA			df			SS		MS			F			Significance F	
	N100 ESG	N100 Enhanced ESG	N100 ESG Sector Leaders	N 100 ESG	N 100 Enhanced ESG	N 100 ESG Sector Leaders	N 100 ESG	N 100 Enhanced ESG	N 100 ESG Sector Leaders	N 100 ESG	N 100 Enhanced ESG	N 100 ESG Sector Leaders	N 100 ESG	N 100 Enhanced ESG	N 100 ESG Sector Leaders
Regression	1	1	1	0.0425	0.0426	0.0446	0.04254	0.04257	0.04464	6052.79	6109.18	15527.25	1.15E-283	1.32E-284	0
Residual	506	506	506	0.0036	0.0035	0.0015	0.00001	0.00001	0.00000						
Total	507	507	507	0.0461	0.0461	0.0461									

Table III: CAPM Alpha and Beta

CAPM Alpha and Beta			
Particulars	Indices	Intercept	Excess returns (nifty)
Coefficients	NIFTY100ESG	0.000150634	0.962076983
	NIFTY100ENHANCED ESG	0.000148667	0.962038987
	NIFTY100ESG SECTORL	0.000122575	1.001310583
Standard Error	NIFTY100ESG	0.000117656	0.012366079
	NIFTY100ENHANCED ESG	0.000117154	0.012308389
	NIFTY100ESG SECTORL	7.52561E-05	0.00803566
t stat	NIFTY100ESG	1.280295871	77.7996813
	NIFTY100ENHANCED ESG	1.268992138	78.16124334
	NIFTY100ESG SECTORL	1.628772686	124.6083734
P-value	NIFTY100ESG	0.201027695	1.15E-283
	NIFTY100ENHANCED ESG	0.205027281	1.3179E-284
	NIFTY100ESG SECTORL	0.103983541	0
Lower 95%	NIFTY100ESG	-8.05198E-05	0.937781801
	NIFTY100ENHANCED ESG	-8.15005E-05	0.937857147
	NIFTY100ESG SECTORL	-2.52778E-05	0.985523216
Upper 95%	NIFTY100ESG	0.000381788	0.986372164
	NIFTY100ENHANCED ESG	0.000378835	0.986220828
	NIFTY100ESG SECTORL	0.000270428	1.01709795

Table IV: Performance Analysis

	NIFTY 100 ESG	NIFTY 100 Enhanced ESG	Nifty 100 ESG Sector Leaders	Nifty 50
CAGR	5.322%	5.375%	5.844%	9.245%
Absolute Return	10.93%	11.04%	12.03%	19.34%
Mean	-0.03%	-0.02%	-0.02%	-0.01%
Std. deviation	0.95%	0.95%	0.94%	0.95%
Sharpe Ratio	-0.02645	-0.02623	-0.02495	-0.01123

2.2 Interpretation

Table I in the analysis shows the R^2 values for the three indices Nifty 100 ESG, Nifty 100 Enhanced ESG, and Nifty 100 ESG Sector Leaders, respectively. The values 0.9229, 0.9235, and 0.9968 determine that the independent variable explains approximately 92.29%, 92.35% and 99.68% of variance among the three indices. The R^2 value shows that the Capital Asset Pricing Model fits excellent to the data.

Table III shows the CAPM obtained Alpha and Beta Values. The Alpha value for Nifty 100 ESG, Nifty 100 Enhanced ESG and Nifty 100 ESG Sector Leaders are positive (Nifty 100 ESG: 0.00015, Nifty 100 Enhanced ESG: 0.00014 and Nifty 100 ESG Sector Leaders: 0.00012), showing positive risk-adjusted returns, but the p-value of alpha for the three indices is higher than 0.05 (Nifty 100 ESG: 0.2010, Nifty 100 Enhanced ESG: 0.2050, and Nifty 100 ESG Sector Leaders: 0.1039) therefore, alpha for these three indices is insignificant and has no sense. Beta value of the three indices is (Nifty 100 ESG: 0.9620, Nifty 100 Enhanced ESG: 0.9620, and Nifty 100 ESG Sector Leaders: 1.0013) positive. Beta value close to one means the fluctuation of the dependent indices is uni-directional with the movement of the market. If the market goes up by 1%, then two indices (Nifty 100 ESG and Nifty 100 Enhanced ESG) also move 0.96 times and Nifty 100 ESG Sector Leaders index moves 1.00 times and vice versa. Also, the p-value for the three indices is lower than 0.05, which means that the systematic risk for the three indices is significant.

Table IV describes the CAGR (Compounded Annual Growth). The three ESG indices show less returns than the parent index Nifty 50. The annualised standard deviation shows that the conventional index Nifty 50 bears more risk than the ESG Indices. The Sharpe ratio of ESG and parent index Nifty are negative during this period of study and so indicates that they are currently in their recovery state and so the returns are expected to be negative. Overall, the results show that the ESG Indices are trying to recover and outperform the conventional index in India, by trying to give better risk-adjusted returns.

CHAPTER 3: SUMMARY, FINDINGS, AND CONCLUSION.

3.1 Summary and Conclusion

This research aims to compare the performance of ESG indices in India with conventional indices in terms of risk, return, and other measures. The study uses the NIFTY 100 ESG Index, NIFTY 100 ENHANCED ESG Index, and NIFTY 100 ESG SECTOR LEADERS as the dependent variable, and Nifty 50 as the independent variable. The data for two years (2021-2023) was taken from the website of the National Stock Exchange (NSE), and statistical tools such as CAPM, Standard Deviation, Sharpe Ratio, and CAGR were used for analysis.

The study found that the CAPM is a good fit for the data, as indicated by the high R2 values for the ESG indices. The alpha values for the ESG indices are positive but not significant, while the systematic risk, Beta, for both the indices is positive and significant. The volatility of the ESG indices is similar to the parent index Nifty, and the annual growth rate for the ESG indices is not superior to Nifty. Additionally, the Sharpe ratio of both the ESG indices and Nifty shows that the ESG indices are not currently a better investment option than Nifty.

Overall, the study concludes that the ESG indices in India bear moderate risk and generate satisfactory returns, but not more than the conventional index Nifty. Although India lags developed nations like the USA, UK, and Europe in terms of ESG investments, the performance of Indian ESG indices is outstanding in comparison to conventional indices. The study suggests that investing in ESG indices can provide investors with favourable risk-adjusted returns while fulfilling their social responsibility.

In conclusion, this study highlights the importance of socially responsible investments and provides empirical evidence to support the idea that investing in ESG indices can generate favourable returns while fulfilling social responsibility. The results of this study can create awareness among investors, brokers, and fund managers about the benefits of socially responsible investing and encourage further research in this context.

3.2 Suggestions

Future study or research can be extended to more developed or developing nations individually around the world. Also, a comparative study of the performance of ESG Indices between two or more developed or developing countries can be carried out.

3.3 References

- Nogueira, Manuel Carlos, and Mara Madaleno. 2022. "Are Sustainability Indices Infected by the Volatility of Stock Indices? Analysis before and after the COVID-19 Pandemic" Sustainability 14, no. 22: 15434. https://doi.org/10.3390/su142215434
- Zhou, D., & Zhou, R. (2021). ESG Performance and Stock Price Volatility in Public Health Crisis: Evidence from COVID-19 Pandemic. *International journal of environmental research and public health*, *19*(1), 202. https://doi.org/10.3390/ijerph19010202
- Srinivasan, Sudha. (2014). Risk-return and Volatility analysis of Sustainability Index in India. Environment, Development and Sustainability. 17. 10.1007/s10668-014-9608-8
- Jain, Nitika & Mehrotra, Vandana & Mendiratta, Parikshita. (2023). Performance Analysis of ESG Indices: A Step towards fulfilling Social Responsibility. 23. 22-37
- Alsayegh, Maha Faisal, Rashidah Abdul Rahman, and Saeid Homayoun. 2020. "Corporate Economic, Environmental, and Social Sustainability Performance Transformation through ESG Disclosure" *Sustainability* 12, no. 9: 3910. https://doi.org/10.3390/su12093910
- Mohan, Sumathy & T S, Sujith & Jayalakshmi, J.Sneha. (2022). Analysis of Nifty100 ESG Index and Nifty 100 Enhanced ESG Index. https://www.researchgate.net/publication/366067195_Analysis_of_Nifty100_ESG_Index_and_Nifty_100_Enhanced_ESG_Index
- Markowitz, H. (1952). 'Portfolio selection'. The journal of finance. Wiley Online Library, 7(1), pp.77–91.
- Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under conditions
- of risk. Journal of Finance, 19, pp. 425–442.
- Sharpe, W. (1966). Mutual fund performance. Journal of Business, 39(1), pp. 119–138
- Wang Fei, Fang Wei, Zhao Chunxia & Wen Zhen (2023) The impact of environmental, social, and governance, board diversity and firm size on the sustainable development goals of registered firm in China, Economic Research-Ekonomska Istraživanja, 36:1, 668-686, DOI: 10.1080/1331677X.2022.2100438
- Bo Fan, Huawei Zhao, Hafiz Waqas Kamran & Safdar Husain Tahir (2023): Environmental sustainability targets: the role of green investment, ICT development, and economic growth, Economic Research-Ekonomska Istraživanja, DOI: 10.1080/1331677X.2022.2151490

- Wang Q, Huang R. The impact of COVID-19 pandemic on sustainable development goals - A survey. Environ Res. 2021 Nov;202:111637. doi: 10.1016/j.envres.2021.111637. Epub 2021 Jul 4. PMID: 34233155; PMCID: PMC8566018.
- Sadiq, M., Amayri, M.A., Paramaiah, C. *et al.* How green finance and financial development promote green economic growth: deployment of clean energy sources in South Asia. *Environ Sci Pollut Res* **29**, 65521–65534 (2022). https://doi.org/10.1007/s11356-022-19947-9
- Muhammad Sadiq, Thanh Quang Ngo, Adamu Abdurrahman Pantamee, Khurshid Khudoykulov, Truong Thi Ngan & Luc Phan Tan (2022): The role of environmental social and governance in achieving sustainable development goals: evidence from ASEAN countries, Economic Research-Ekonomska Istraživanja, DOI: 10.1080/1331677X.2022.2072357