

A Study on Relationship Between the Price Performance of Individual Stock and Nifty Fifty Index

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ABSTRACT:

Investors are looking for safe, low-risk, and highly profitable investment solutions in the erratic marketplace. The performance of the Nifty fifty Index may be studied to provide insight into potential investment opportunities and the direction of the market's future movement. The study's primary goal was to determine the link between the performance of the NIFTY fifty Index and the newly listed selected companies chosen from the NSE website. Secondary goals included analysing the effects of various individual stocks and correlating the NIFTY Index's direction of movement. Secondary sources of data were employed in this study for the correlation and causal research designs. The information, which includes indexes and closing share prices of particular firms, will be gathered over a ten-year period beginning on January 1, 2012 to 31st Dec, 2022 on yearly basis. The study concludes that there is no relationship between Nifty fifty Index and Individual selected stock prices. Also, the market performance is improving over the period of time. The Nifty fifty index is indulged to up rise with increase in Nifty fifty stock prices. (Patel & Surti, 2020)

Keywords: -NSE Index, Stock Prices and Nifty Fifty Index

1.INTRODUCTION:

Considering there are ups and downs in the stock market, investor's view equities investing as extremely hazardous. A study of the Nifty Fifty record provides insight into potential investment opportunities and the direction of the market's future movement. The National Stock Exchange (NSE) lists eleven distinct sectors that make up the NIFTY fifty Index with first 50 large capital stocks, which is intended to represent the performance and behaviour of several sectors. The majority of the Nifty Fifty firms include the price performance pattern on the basis of different factors. (Ka, 2017)

1.1 STOCK MARKET INDEX:

A stock index, sometimes known as a stock market index, is a metric that evaluates the stock market, or a segment of it, and aids investors in determining market performance by contrasting current and historical price levels. It is calculated by taking the weighted arithmetic mean and applying it to the prices of chosen equities. These days, stock market indicators are quite important. The NSE index is used to reflect the Indian stock market, and the impact of particular Asian stock market indexes on Nifty is examined. The calculation is based on Nifty the general market movements, and understanding the index value is crucial for those looking to benefit. Numerous worldwide concerns impact the various stock market indexes. Investors may better analyse the state of the Indian stock market by knowing how the Indian stock market correlates with other stock markets. (Kuvera, 2023)

1.2 NIFTY:

The total fourteen different index of the National Stock Exchange of India Ltd. (NSE) is the NIFTY 50. Today, the Nifty is utilized for index fund launches and portfolio and return comparisons of mutual fund schemes, much like the BSE benchmark Sensex. The index of the Nifty was introduced on April 22, 1996, starting on November 3, 1995, and having a base value of 1,000. At all times, live Nifty quotations are accessible on TV stations, NSEIndia.com, ETMarkets.com, and

a other websites. It is intended to serve as a gauge of the state of all listed Indian enterprises. The Nifty index is composed of fifty elite businesses from various industries.(Kuvera, 2023)

1.3 NIFTY FIFTY

The weighted average of 50 of the biggest Indian firms listed on the National Stock Exchange is represented by the benchmark NIFTY 50 index for the Indian stock market. NSE Indices, a fully owned subsidiary of the NSE Strategic Investment Corporation Limited, is the owner and manager of the Nifty 50 index. Up until 2013, NSE indexes and Standard & Poor's had a marketing and licensing arrangement for co-branding equity indexes.

The NIFTY 50 index provides investment managers with exposure to the Indian market inside a single portfolio by encompassing 13 sectors of the Indian economy.

2.REVIEW OF LITERATURE:

(Shen & Shafiq, 2020)The topics of stock market integration and cross-country stock price movements have garnered a lot of interest in economic research. A careful analysis of recent changes in the global stock market indicates that there is a significant level of interconnectedness between national stock markets.

(Shukla & Shaw, 2018)Investment in stocks, a vital component of the capital market, has essential role in funding, maximizing capital allocation, and raising asset values. Because stock investments are high-risk and high-income, stock price prediction has great practical value for investors. However, it should be emphasized that stock prices typically fluctuate randomly and are influenced.

(*Valuing-Growth-Stocks-Revisiting-the-Nifty-Fifty.Pdf*, n.d.)Accurately and effectively forecasting the market requires careful consideration of a number of elements, making stock prediction a particularly complicated process prognosticating the trajectory of forthcoming stock prgfistatistics is an extensively researched subject in several domains, such as trading, finance, cs, and computer science. whose innate purpose is to forecast the course of the future pricing that allow equities to be purchased and sold at profitable ratios.

(Bhowmik & Wang, 2020)It is discovered that the linear regression approach is successful in forecasting the business stock price and that basic sentiment research is helpful in projecting the Indonesian stock market.

(Sidhu, 2019)It is shown that stock marnhket indicators may be predicted using linear regression with Twitter data as an exogenous input. Additionally, using Twitter data as an exogenous input, it is shown that linear regression may be used to forecast stock market indicators. The results demonstrate a correlation between the daily number of tweets and certain stock market indicators at three distinct levels, ranging from the stock market to equities of certain companies and business sectors.

(.S & Vikas, 2022) For over a century, bankruptcy prediction has been a hot topic in economics, and it continues to be so today. The challenge in financial distress prediction is in creating a predictive model that incorporates several econometric measurements to anticipate a company's financial state. It has been shown that a prediction model for bankruptcy prediction that makes use of Extreme Gradient Boosting to train an ensemble of decision trees is effective.

(Baker & Wurgler, 2000)According to a different study, the S&P 500 index may be predicted using linear regression, and the prediction approach performs well when compared to actual quantities, allowing investors to make private investments.

(Pandey & Sharma, 2023)In order to analyze the possibility of concentration risk and its impact on index performance in various markets, the study that was presented looked at how index concentration affected component security and index variances. In order to determine potential concentration costs for investors, the study also looked at the 1/n index in conjunction with the market cap index. Using a variety of methods for concentration measurements and the mean-variance approach to calculate index volatility and returns, we conducted an analysis of BRICSU (BRICS plus USA). To grasp the sensitivity of connections, we ran a brief simulation.

3. OBJECTIVES

1. By using the NSE Nifty 50 index as a benchmark to represent the overall movement of stock prices, this study attempts to assess the effects of a market condition on the Indian stock market.

2. This study's main goal is to determine share prices pattern affect the Nifty 50. To examine the connection between the Nifty and individual share price pattern in short term .

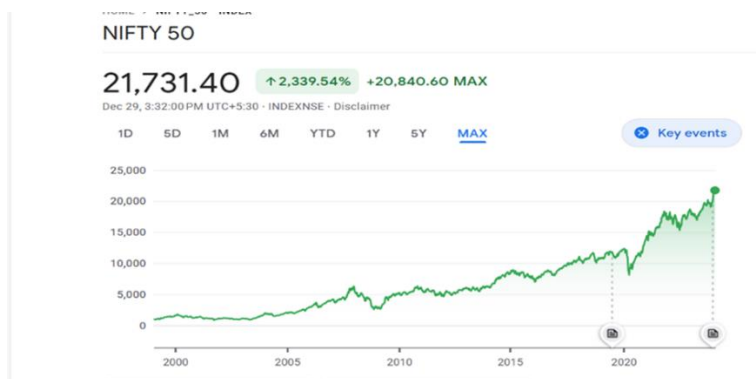
3. To understand the share price pattern and Nifty Fifty Index impact on price volatility.

4.RESEARCH METHODOLOGY:

The researcher used analytical type of research , by consideration of 10 years of Nifty fifty data on sample tool used in this research based on NSE website historical study, with that we found basic analysis and sample frame for this study is done on some criteria, we selected every year three stocks based on highest performance of stocks and lowest performance of stock , so collection of sample size is based on non-probability convenience sampling, consideration of total thirty individual stocks with their performance every year. For the study secondary data were used, data is also integrated with different financial websites.

Nifty Fifty Index and their Performance Data for Analysis From 2012-2022

2023 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Dec-23	21,445.70	20,194.10	21,593.00	20,183.70	4,981,368	6.52%
Nov-23	20,133.15	19,064.05	20,158.70	18,973.70	4,423,328	5.52%
Oct-23	19,079.60	19,622.40	19,849.75	18,837.85	4,248,518	-2.84%
Sep-23	19,638.30	19,258.15	20,222.45	19,255.70	5,666,418	2.00%
Aug-23	19,293.80	19,784.00	19,795.60	19,223.65	6,253,998	-2.53%
Jul-23	19,753.80	19,246.50	19,991.85	19,234.40	5,802,278	2.94%
Jun-23	19,189.05	18,579.40	19,201.70	18,464.55	5,144,198	3.53%
May-23	18,534.40	18,124.80	18,662.45	18,042.40	5,737,408	2.60%
Apr-23	17,695.00	17,427.95	18,099.15	17,312.75	4,459,768	4.06%
Mar-23	17,359.75	17,360.10	17,799.95	16,828.35	5,622,288	0.32%
Feb-23	17,303.95	17,811.60	18,134.75	17,255.20	5,685,638	-2.03%
Jan-23	17,662.15	18,131.70	18,251.95	17,405.55	5,632,818	-2.45%
2023	Highest	Lowest	Difference	Average	Chg. %	
	21,593.00	16,828.35	4,764.65	18,951.55	18.45	
2022 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Dec-22	18,105.30	18,871.95	18,887.60	17,774.25	4,741,448	-3.48%
Nov-22	18,758.35	18,130.70	18,816.05	17,959.20	5,257,008	4.14%
Oct-22	18,012.20	17,102.10	18,022.80	16,855.55	4,539,968	5.37%
Sep-22	17,094.35	17,485.70	18,096.15	16,747.70	6,896,518	-3.74%
Aug-22	17,759.30	17,243.20	17,992.20	17,154.80	5,589,518	3.50%
Jul-22	17,158.25	15,703.70	17,172.80	15,511.05	5,475,278	8.73%
Jun-22	15,780.25	16,594.40	16,793.85	15,183.40	5,514,208	-4.85%
May-22	16,584.55	16,924.45	17,132.85	15,735.75	6,343,318	-3.03%
Apr-22	17,102.55	17,436.90	18,114.65	16,824.70	5,658,258	-2.07%
Mar-22	17,464.75	16,593.10	17,559.80	15,571.45	7,959,718	3.59%
Feb-22	16,793.90	17,529.45	17,794.60	16,203.25	5,620,298	-3.15%
Jan-22	17,339.85	17,387.15	18,350.95	16,836.80	5,435,458	-0.08%
Summary	Highest	Lowest	Difference	Average	Chg. %	
2022-dec	18,887.60	15,183.40	3,704.20	17,329.47	4.33	
2020 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Dec-20	13,981.75	13,062.20	14,024.85	12,962.80	12,077,488	7.81%
Nov-20	12,968.95	11,697.35	13,145.85	11,557.40	13,112,438	11.39%
Oct-20	11,642.40	11,364.45	12,025.45	11,317.05	11,602,478	3.51%
Sep-20	11,247.55	11,464.30	11,618.10	10,790.20	13,446,188	-1.23%
Aug-20	11,387.50	11,057.55	11,794.25	10,882.25	14,035,518	2.84%
Jul-20	11,073.45	10,333.80	11,341.40	10,299.60	14,640,038	7.49%
Jun-20	10,302.10	9,726.85	10,553.15	9,543.55	16,778,748	7.59%
May-20	9,580.30	9,533.50	9,598.85	8,806.75	13,675,698	-2.84%
Apr-20	9,859.90	8,584.10	9,889.05	8,055.80	12,736,488	14.68%
Mar-20	8,597.75	11,387.35	11,433.00	7,511.10	21,302,938	-23.25%
Feb-20	11,201.75	11,938.00	12,246.70	11,175.05	11,191,058	-6.36%
Jan-20	11,962.10	12,202.15	12,430.50	11,929.60	11,994,468	-1.70%
2020-summary	Highest	Lowest	Difference	Average	Chg. %	
	14,024.85	7,511.10	6,513.75	11,150.46	14.49	
2019 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Dec-19	12,168.45	12,137.05	12,293.90	11,832.30	12,549,778	0.93%
Nov-19	12,056.05	11,886.60	12,158.80	11,802.65	13,177,768	1.50%
Oct-19	11,877.45	11,515.40	11,945.00	11,090.15	15,622,878	3.51%
Sep-19	11,474.45	10,960.95	11,694.85	10,670.25	12,210,018	4.09%
Aug-19	11,023.25	11,060.20	11,181.45	10,637.15	11,152,908	-0.85%
Jul-19	11,118.90	11,839.90	11,981.75	10,999.40	9,988,478	-5.69%
Jun-19	11,788.85	11,853.75	12,103.05	11,625.10	6,788,088	-1.12%
May-19	11,922.80	11,725.55	12,041.15	11,108.30	6,645,738	1.49%
Apr-19	11,748.15	11,665.20	11,856.15	11,549.10	6,516,828	1.07%
Mar-19	11,623.90	10,842.65	11,630.35	10,817.00	6,857,098	7.70%
Feb-19	10,792.50	10,851.35	11,118.10	10,585.65	7,461,368	-0.36%
Jan-19	10,830.95	10,881.70	10,987.45	10,583.65	7,433,208	-0.29%
2017 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Dec-17	10,226.55	10,390.35	10,490.45	10,094.00	4,794,418	-1.05%
Oct-17	10,335.30	9,893.30	10,384.50	9,831.05	4,639,718	5.59%
Sep-17	9,788.60	9,937.65	10,178.95	9,687.55	4,294,098	-1.30%
Aug-17	9,917.90	10,101.05	10,137.85	9,685.55	4,296,608	-1.58%
Jul-17	10,077.10	9,587.95	10,114.85	9,543.55	3,848,068	5.84%
Jun-17	9,520.90	9,603.55	9,709.30	9,448.75	3,667,948	-1.04%
May-17	9,521.25	9,339.85	9,649.60	9,269.90	4,882,368	3.41%
Apr-17	9,304.05	9,220.60	9,367.15	9,075.15	3,154,378	1.42%
Mar-17	9,173.75	8,904.40	9,218.40	8,860.10	4,984,938	3.31%
Feb-17	8,879.60	8,570.35	8,982.15	8,537.50	4,534,668	3.72%
Jan-17	8,561.30	8,210.10	8,672.70	8,133.80	4,132,838	4.59%
2015 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Nov-15	7,935.25	8,054.55	8,116.10	7,714.15	3,158,728	-1.62%
Oct-15	8,065.80	7,992.05	8,142.50	7,930.85	3,468,268	1.47%
Sep-15	7,948.90	7,907.95	8,055.00	7,539.50	3,542,718	-0.28%
Aug-15	7,971.30	8,510.65	8,621.55	7,667.25	4,060,748	-6.58%
Jul-15	8,532.85	8,376.25	8,654.75	8,315.40	3,193,888	1.96%
Jun-15	8,368.50	8,417.25	8,467.15	7,940.30	3,254,318	-0.77%
May-15	8,433.65	8,230.05	8,489.55	7,997.15	3,489,478	3.08%
Apr-15	8,181.50	8,483.70	8,844.80	8,144.75	3,372,938	-3.65%
Mar-15	8,491.00	8,953.85	9,119.20	8,269.15	3,843,018	-4.62%
Feb-15	8,901.85	8,802.50	8,941.10	8,470.50	3,776,668	1.06%
Jan-15	8,808.90	8,272.80	8,996.60	8,065.45	3,487,148	6.35%
2013 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Nov-13	6,176.10	6,289.75	6,342.95	5,972.45	3,017,398	-1.95%
Oct-13	6,599.15	6,308.90	6,398.05	6,035.20	3,840,828	9.83%
Sep-13	5,735.30	5,480.25	6,142.50	5,318.90	4,485,955	4.82%
Aug-13	5,471.80	5,776.90	5,808.50	5,118.85	5,011,688	-4.71%
Jul-13	5,742.00	5,834.10	6,093.35	5,675.75	3,519,608	-1.72%
Jun-13	5,842.20	5,997.35	6,011.00	5,568.25	2,981,848	-2.40%
May-13	5,935.95	6,229.45	6,910.95	5,904.95	3,084,678	0.94%
Apr-13	5,930.20	5,697.35	5,962.30	5,477.20	7,725,238	4.36%
Mar-13	5,682.95	5,702.45	5,971.20	5,604.85	2,879,008	-0.18%
Feb-13	5,693.05	6,040.95	6,052.95	5,671.90	3,081,258	-5.66%
Jan-13	6,034.75	5,937.65	6,111.80	5,935.20	3,075,378	2.20%
2011 Nifty-50 Data						
Date	Price	Open	High	Low	Volume	Chg%
Nov-11	6,176.10	6,289.75	6,342.95	5,972.45	3,017,398	-1.95%
Oct-11	6,599.15	6,308.90	6,398.05	6,035.20	3,840,828	9.83%
Sep-11	5,735.30	5,480.25	6,142.50	5,318.90	4,485,955	4.82%
Aug-11	5,471.80	5,776.90	5,808.50	5,118.85	5,011,688	-4.71%
Jul-11	5,742.00	5,834.10	6,093.35	5,675.75	3,519,608	-1.72%
Jun-11	5,842.20	5,997.35	6,011.00	5,568.25	2,981,848	-2.40%
May-11	5,935.95	6,229.45	6,910.95	5,904.95	3,084,678	0.94%
Apr-11	5,930.20	5,697.35	5,962.30	5,477.20	7,725,238	4.36%
Mar-11	5,682.95	5,702.45	5,971.20	5,604.85	2,879,008	-0.18%
Feb-11	5,693.05	6,040.95	6,052.95	5,671.90	3,081,258	-5.66%
Jan-11	6,034.75	5,937.65	6,111.80	5,935.20	3,075,378	2.20%



References: Table 1.1 Nifty-Fifty Data: NSE website..... 5

4.1 ANALYSIS AND INTERPRETATION:

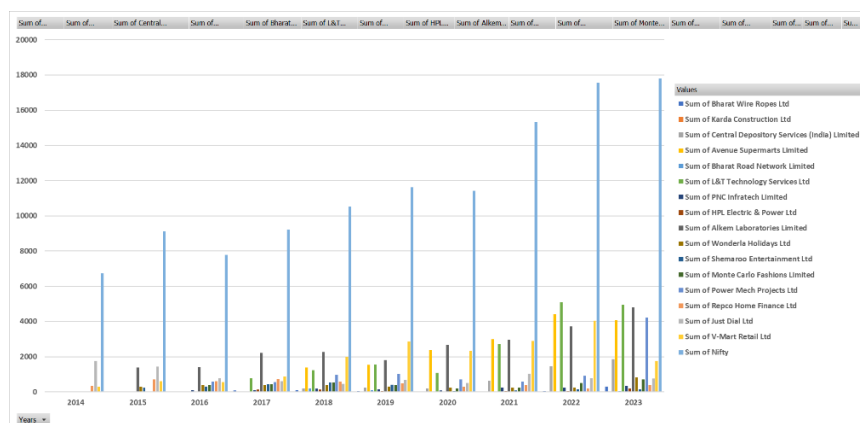
We considered the NIFTY50 index from 2012 to 2022 as an indicator for calculations of market returns. Chart 1.1 illustrates how the index fluctuated throughout the pandemic's early stage (Year 2019-2020). When the outbreak initially started in March (2020), the Nifty suffered the worst collapse in Indian history, plunging between 15 and 17 percent. The market attempted to rebound from its low points in March in April, and the market began to move higher from 2021 to 2023 (up to now).

Company Price Correlation with Nifty Fifty with Selected Individual Stocks

Year	Sum of Bharat Wire Ropes Ltd	Sum of Karda Construction Ltd	Sum of Central Depository Services (India) Limited	Sum of Avenue Supermarts Limited	Sum of Bharat Road Network Limited	Sum of L&T Technology Services Ltd	Sum of PNC Infratech Limited	Sum of HPL Electric & Power Ltd	Sum of Alkem Laboratories Limited	Sum of Wonderla Holidays Ltd	Sum of Shemaroo Entertainment Ltd	Sum of Monte Carlo Fashions Limited	Sum of Power Mech Projects Ltd	Sum of Repco Home Finance Ltd	Sum of Just Dial Ltd	Sum of V-Mart Retail Ltd	Sum of Nifty
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	343	1769	290	6730.05
2015	0	0	0	0	0	0	0	0	1381.45	287	230	0	0	710	1429	607	9119.2
2016	0	0	0	0	0	0	97.84	0	1421	398	311	398	590	617	778	550	7777.6
2017	96.75	0	0	0	0	778	117.5	124	2227	387	430	427	559	728	619	883	9218.4
2018	111	0	210	1385	198	1235	175	130	2272	382	535	539	965	586	470	1992	10525
2019	57.05	0	242	1530	97.9	1572	153.2	58.7	1816	314	411	378	1021	482	677	2863	11630
2020	11.3	0	209	2392	36.7	1100	90.9	22.4	2670	225	64	211	714	295	504	2335	11433
2021	35	0	645	3000	29.6	2720	254.1	52	2961	234	81	240	587	378	1047	2884	15336.3
2022	68.4	4.2	1473	4413	32.05	5100	244.45	66.75	3724	250.45	151	519	920	207	789	4036	17559.8
2023	309.7	2.04	1875.15	4075.4	48	4947.5	328.85	200.85	4794.25	837.2	168.25	708.1	4219.2	391	764.45	1763.55	17799.95
Grand Tot	689.2	6.24	4654.15	16795.4	442.25	17452.5	1461.84	654.7	23266.7	3314.65	2381.3	3420.1	9575.2	4737	8846.45	18203.55	117129.3

Table 1, Individual selected stock price and nifty fifty performance

Graphical Relationship with Nifty Fifty and Individual Stock Price performance



Own Source / Table: 2

Through the table no.2 data analysis and interpretation, we found that there is no direct relationship between individual stocks and there year wise performance with market performance of Nifty Fifty.

We found that Nifty fifty is independent variable and stocks performance considered to be dependent variables, the closing price values in the month of march of every year with the stock price performance, there is a no relationship with the nifty fifty index.

5.FINDINGS:

The analysis indicates that there is a no direct relationship between the dependent and independent variables. This indicates that the different directional proportionality would be obtained from a change in the Nifty Fifty index. Shift in the price values of the chosen various company stock and the Nifty Fifty index. According to the analysis, the applied model is not practical for the study since the significance F value is higher than 0.05 for every study analysis output.

The Nifty fifty has outperformed the NSE index Nifty 50, as can be shown with specific equities. When comparing the firms' share values to Nifty Fifty indexes, it was discovered that there was no correlation between the two variables. Nevertheless, the stock market is rising and also outperformed on individual basis. The individual companies outperform the selected equity stocks with Nifty fifty indices going with the different trend in upward direction or downward direction where consideration of selected companies.

6.CONCLUSION:

The investigation comes to the conclusion that some stocks and the Nifty 50 have no association. Additionally, over time, the market's performance has improved. Although the Nifty 50 index is rising, the performance of individual stocks' prices varies. According to the comparison study, several individual stocks have significantly surpassed market followers made by other firms. This has caused the market indices to rise over time. The study's overall goal was to determine whether the performance of the Nifty Fifty and individual stock prices were related, however the findings indicate that they are not related or there is no relationship between each other stock price performance.

BIBLIOGRAPHY:

- [1] hommandru, A., Espinoza-Maguiña, M., Ramirez-Asis, E., Ray, S., Naved, M., & GuzmanAvalos, M. (2023). Role of tourism and hospitality business in economic development. *Materials Today: Proceedings*, 80, 2901-2904.
- [2] Voumik, L. C., Islam, M. A., Ray, S., Mohamed Yusop, N. Y., & Ridzuan, A. R. (2023). CO2 emissions from renewable and non-renewable electricity generation sources in the G7 countries: static and dynamic panel assessment. *Energies*, 16(3), 1044.
- [3] Bhargava, A., Bhargava, D., Kumar, P. N., Sajja, G. S., & Ray, S. (2022). Industrial IoT and AI implementation in vehicular logistics and supply chain management for vehicle mediated transportation systems. *International Journal of System Assurance Engineering and Management*, 13(Suppl 1), 673- 680.
- [4] Rakhra, M., Sanober, S., Quadri, N. N., Verma, N., Ray, S., & Asenso, E. (2022). Implementing machine learning for smart farming to forecast farmers' interest in hiring equipment. *Journal of Food Quality*, 2022.
- [5] Al Ayub Ahmed, A., Rajesh, S., Lohana, S., Ray, S., Maroor, J. P., & Naved, M. (2022, June). Using Machine Learning and Data Mining to Evaluate Modern Financial Management TechniquesIn *Proceedings of Second International Conference in Mechanical and Energy Technology: ICMET 2021, India* (pp. 249-257). Singapore: Springer Nature Singapore.
- [6] Pallathadka, H., Leela, V. H., Patil, S., Rashmi, B. H., Jain, V., & Ray, S. (2022). Attrition in software companies: Reason and measures. *Materials Today: Proceedings*, 51, 528-531.
- [7] Sharma, A., Kaur, S., Memon, N., Fathima, A. J., Ray, S., & Bhatt, M. W. (2021). Alzheimer's patients detection using support vector machine (SVM) with quantitative analysis. *Neuroscience Informatics*, 1(3), 100012.
- [8] Mehbodniya, A., Neware, R., Vyas, S., Kumar, M. R., Ngulube, P., & Ray, S. (2021). Blockchain and IPFS integrated framework in bilevel fog-cloud network for security and privacy of IoMT devices. *Computational and Mathematical Methods in Medicine*, 2021.

- [9] Ray, S. (2020). How COVID-19 changed dimensions of human suffering and poverty alleviation: economic analysis of humanitarian logistics. Вестник Астраханского государственного технического университета. Серия: Экономика, (4), 98-104.
- [10] Akbar, A., Akbar, M., Nazir, M., Poulova, P., & Ray, S. (2021). Does working capital management influence operating and market risk of firms?. *Risks*, 9(11), 201.
- [11] Dutta, A., Voumik, L. C., Ramamoorthy, A., Ray, S., & Raihan, A. (2023). Predicting Cryptocurrency Fraud Using ChaosNet: The Ethereum Manifestation. *Journal of Risk and Financial Management*, 16(4), 216.
- [12] Polcyn, J., Voumik, L. C., Ridwan, M., Ray, S., & Vovk, V. (2023). Evaluating the influences of health expenditure, energy consumption, and environmental pollution on life expectancy in Asia. *International Journal of Environmental Research and Public Health*, 20(5), 4000.
- [13] Sajja, G. S., Jha, S. S., Mhamdi, H., Naved, M., Ray, S., & Phasinam, K. (2021, September). An investigation on crop yield prediction using machine learning. In 2021 Third International Conference on Inventive Research in Computing Applications (ICIRCA) (pp. 916-921). IEEE.
- [14] Ali, N. G., Abed, S. D., Shaban, F. A. J., Tongkachok, K., Ray, S., & Jaleel, R. A. (2021). Hybrid of KMeans and partitioning around medoids for predicting COVID-19 cases: Iraq case study. *Periodicals of Engineering and Natural Sciences*, 9(4), 569-579.
- [15] Gupta, S., Geetha, A., Sankaran, K. S., Zamani, A. S., Ritonga, M., Raj, R., ... & Mohammed, H. S. (2022). Machine learning-and feature selection-enabled framework for accurate crop yield prediction. *Journal of Food Quality*, 2022, 1-7
- [16] Gupta, S., Geetha, A., Sankaran, K. S., Zamani, A. S., Ritonga, M., Raj, R., ... & Mohammed, H. S. (2022). Machine learning-and feature selection-enabled framework for accurate crop yield prediction. *Journal of Food Quality*, 2022, 1-7.
- [17] Ma, W., Nasriddinov, F., Haseeb, M., Ray, S., Kamal, M., Khalid, N., & Ur Rehman, M. (2022). Revisiting the impact of energy consumption, foreign direct investment, and geopolitical risk on CO2 emissions: comparing developed and developing countries. *Frontiers in Environmental Science*, 1615.
- [18] Shukla, S. (2017). Innovation and economic growth: A case of India. *Humanities & Social Sciences Reviews*, 5(2), 64-70.
- [19] Soham, S., & Samrat, R. (2021). Poverty and financial dearth as etiopathogen of psychotic and neurotic diseases. *Заметки ученого*, (4-1), 568-578.
- [20] Park, J. Y., Perumal, S. V., Sanyal, S., Ah Nguyen, B., Ray, S., Krishnan, R., ... & Thangam, D. (2022). Sustainable marketing strategies as an essential tool of business. *American Journal of Economics and Sociology*, 81(2), 359-379.
- [21] Роков, А. И., Дубаневич, Л. Э., & Рэй, С. (2021). Повышение экономической эффективности труда за счет изменения системы оплаты. *E-Scio*, (9 (60)), 53-62.
- [22] Ray, S. (2021). How Emotional Marketing can help better understand the Behavioral Economic patterns of Covid-19 pandemic: Economic Judgments and Falsifications from India Samrat Ray-Alagappa University, Tamil Nadu, India. samratray@rocketmail.com. Вестник МИРБИС, (2), 26-34.
- [23] Ravi, S., Kulkarni, G. R., Ray, S., Ravisankar, M., krishnan, V. G., & Chakravarthy, D. S. K. (2023). Analysis of user pairing non-orthogonal multiple access network using deep Q-network algorithm for defense applications. *The Journal of Defense Modeling and Simulation*, 20(3), 303-316.
- [24] Priya, P. S., Malik, P., Mehbodniya, A., Chaudhary, V., Sharma, A., & Ray, S. (2022, February). The relationship between cloud computing and deep learning towards organizational commitment. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 21-26). IEEE.
- [25] Ray, S., & Leandre, D. Y. (2021). How entrepreneurial university model is changing the Indian COVID–19 Fight?. *Путеводитель предпринимателя*, 14(3), 153-162.

- [26] Inthavong, P., Rehman, K. U., Masood, K., Shaukat, Z., Hnydiuk-Stefan, A., & Ray, S. (2023). Impact of organizational learning on sustainable firm performance: Intervening effect of organizational networking and innovation. *Heliyon*, 9(5).
- [27] Rajendran, R., Sharma, P., Saran, N. K., Ray, S., Alanya-Beltran, J., & Tongkachok, K. (2022, February). An exploratory analysis of machine learning adaptability in big data analytics environments: A data aggregation in the age of big data and the internet of things. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 32-36). IEEE.
- [28] Elkady, G., & Samrat, R. (2021). An analysis of Blockchain in Supply Chain Management: System Perspective in Current and Future Research. *International Business Logistics*, 1(2).
- [29] Korchagina, E., Desfontaines, L., Ray, S., & Strekalova, N. (2021, October). Digitalization of Transport Communications as a Tool for Improving the Quality of Life. In International Scientific Conference on Innovations in Digital Economy (pp. 22-34). Cham: Springer International Publishing.
- [30] Kumar, A., Nayak, N. R., Ray, S., & Tamrakar, A. K. (2022). Blockchain-based Cloud Resource Allocation Mechanisms for Privacy Preservation. In *The Data-Driven Blockchain Ecosystem* (pp. 227-245). CRC Press.
- [31] Wawale, S. G., Bisht, A., Vyas, S., Narawish, C., & Ray, S. (2022). An overview: Modeling and forecasting of time series data using different techniques in reference to human stress. *Neuroscience Informatics*, 2(3), 100052.
- [32] Batool, A., Ganguli, S., Almashaqbeh, H. A., Shafiq, M., Vallikannu, A. L., Sankaran, K. S., ... & Sammy, F. (2022). An IoT and Machine Learning-Based Model to Monitor Perishable Food towards Improving Food Safety and Quality. *Journal of Food Quality*, 2022.
- [33] Verma, K., Sundararajan, M., Mangal, A., Ray, S., & Kumar, A. (2022, April). The Impact of COVID-19 to the Trade in India Using Digital, IOT and AI Techniques. In 2022 2nd International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE) (pp. 01-05). IEEE.
- [34] Bangare, J. L., Kapila, D., Nehete, P. U., Malwade, S. S., Sankar, K., & Ray, S. (2022, February). Comparative Study on Various Storage Optimisation Techniques in Machine Learning based Cloud Computing System. In 2022 2nd International Conference on Innovative Practices in Technology and Management (ICIPTM) (Vol. 2, pp. 53-57). IEEE.
- [35] Kiziloglu, M., & Ray, S. (2021). Do we need a second engine for Entrepreneurship? How well defined is intrapreneurship to handle challenges during COVID-19?. In *SHS Web of Conferences* (Vol. 120, p. 02022). EDP Sciences.
- [36] Samajpaty, S., & Ray, S. (2020). Innovation strategies in health economics: a force that makes blood move and game of gravity in it-futuristic economic plans. *Московский экономический журнал*, (9), 397-409