ROOTINDEXING
JOURNAL ABSTRACTING AND INDEXING SERVICE
INTERNATIONAL ADVANCE JOURNAL OF ENGINEERING, SCIENCE AND MANAGEMENT (IAJESM)
January-June 2023, Submitted in January 2023, iajesm2014@gmail.com, ISSN -2393-8048
Multidisciplinary Indexed/Peer Reviewed Journal. SJIF Impact Factor 2023 =6.753

Navigating Turbulence: Unraveling the Increasing Causes of Volatility in the Current Scenario and Strategies for Resilience

Abhishek Shukla, Department of Computer Science & Engineering RDEC,Ghaziabad
abhishek.shukla@gmail.com

ABSTRACT

Crucial to economic development, the stock market is one of the most flexible enterprises in the economy. Investors may also use the stock market as a meeting place to trade bonds, stocks, and other financial products. Basically, the stock market might function as a platform where various assets and derivatives can be exchanged without any obstacles. Through communal difficulties, some firms publish their lucrative initiatives on the open market. Investors looking to profit from their shares are now putting their money into companies via the stock market. There are two stock exchanges in India that are listed: the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). Volatility is another name for the mathematical degree to which the returns of a certain asset or Market Index stretch out. A security's associated risk tends to rise in tandem with its level of volatility. A variety of reasons pertaining to several market participants need accurate uncertainty estimation. Developed markets maintain their offerings for a long time with higher earnings and less volatility. Readers will have a better understanding of the past, present, and future of the Indian stock market from the examination. The Indian market has been growing at a faster pace than other nations' markets.

KEYWORDS: Stocks, Indian stock market, BSE, NSE, unpredictability

INTRODUCTION

Recent signs point to heightened economic uncertainty, which has been mirrored in both intra-day and between-day volatility. News stories and a few of clinical research publications also provided figures to support this privilege. The Indian Securities and Exchange Board has conducted extensive research on the volatility. The volatility has not grown much in the last several years, as many studies show, contrary to common opinion. The Indian stock market has a very high return rate and a low level of volatility.

The efficiency of the financial system and the economy might both take a hit from unpredictability. Because of this, consumer spending changes, which in turn impacts the economy. Uncertainty in the stock market has an impact on consumer spending because of the wealth effect. Consumer spending rises as wealth rises. But if the stock market goes down, consumers will lose faith in the company and cut down on their purchasing. Businesses' willingness to invest and the rate of economic growth are both affected by the stock market. The rising dangers of equity investments or the flight of money to safer investments are two manifestations of the increased volatility of the stock market. Businesses will see a rise in their cost of funding due to this. Consequently, this effect can be felt by startups if more investors choose to purchase shares in established brands. While most people may agree on the definition and, to a lesser extent, the measurement of stock market unpredictability, there is far less consensus on the causes that impact these market swings.

One source of unpredictability, according to some experts, is fresh, unexpected information that alters the projected earnings of a company. Consequently, changes in market volatility would only reflect changes in the local or international market scenario. Some people think that changed macroeconomic policies, changes in investor risk tolerance, and increased uncertainty are the key causes of unpredictability, rather than differences in interchange capability, procedures, or designs. Both intra-day and inter-day unpredictability may be used to simplify the analysis of uncertainty. There is open-to-close, high-to-low, and open-to-open unpredictability in the former, and immediately adjacent unpredictability in the later. Using the BSE Sensex as an example, this research looks at the aforementioned features of volatility during the research period.

REVIEW OF LITERATURE

"Debjit Chakraborty" (2017) had to establish a link between crucial economic indicators and stock market activity in his research. Also covered is how the stock market reacted to overall economic climate changes. Reasoning is based on actions, resources, GDP growth, and the credit deposit ratio. This stock market trend regulation is based on the BSE National Index of Equity Prices (Natex), which comprises 100 businesses. In addition to political stability, the study found that the C/D ratio and broad funds also play significant roles in determining stock market fluctuations.

Net capital obligations, foreign direct investment, portfolio equity owes, and bond be indebtedness were considered by "Redel's (2017), an expert on the integration of growing Asian financial markets from 1990 to 2014. The central cause of the financial crises that followed the expanded coordination of the capital markets in many nations in the 1970s won't be repeated in the 2010s, according to the researcher, who noted that capital market coordination in Asian developing countries in the 2010s was due to extensive financial variations, mainly in the argument and financial partitions. The study's author concluded that developing nations in Asia must speed up and tighten their economic liberalisation efforts if they want to reap the benefits of increasing international capital market integration while limiting the negatives.

In order to determine the worth of the specific assets necessary for portfolio construction, "Avijit Banerjee" (2018) used both Fundamental Analysis and Technical Analysis. The optimal time to purchase or sell a share is determined by technical analysis. Its goal is to avoid the issues that come with making bad financial decisions. Additionally, he said that the most well recognised indication of scrip risk based on current portfolio research is the "beta" number P. When constructing a portfolio, it is recommended to use low P securities in order to reduce risk.

According to "Madhusudan," (1998) found that the BSE sensitivity and national indexes did not follow a stochastic process when they conducted a correlation research on monthly share return numbers from January 1981 to December 1992. The danger was real, according to "Arun Jethmalani" (1999), who assessed the complexities of taking part in corporate protections of offers and debentures. He was in favour of the possibility of return variation and lauded the fact that risk is generally assessed. It is more tough to match 80 risks within the same investing term. Despite doubts raised in the wake of the Asian crisis, he maintains that investors trust the risk assessments made by credit rating organisations. Risk, he remarked in the article's last paragraph, is impossible to quantify. However, risk is determined by looking at past unpredictability. The ability to handle risk, he said, should underpin investing decisions, as profits are directly proportionate to hazards.

In his 2019 article "Suresh G. Lalwani," the author emphasised the significance of value risk management in the stock market. The stock market, according to the expert, can be a "vicious animal" and there's a good chance that things can grow worse instead of better.

In their study, "Nath and Verma" (2003) used bivariate and multivariate co combination analysis to model the interdependence of the three main stock exchange indices in south Asia: NSE-Nifty in India, Taiex in Taiwan, and STI in Singapore. There was no co-integration throughout the ideal timeframe (daily data from 1994–2002). They arrived to the realisation that there is no end-of-day balance.

The primary work on the systematic and reliably positive returns of the Indian stock market records for the stochastic approach was done by "Bhanu Pant and Dr. T. R. Bishnoy" (2001) from April 1996 to June 2001. What they found was that the Indian stock market indices deviated from the stochastic process.

A company's worth in the New Delhi Market may be determined with the help of "Juhi Ahuja" (2012). According to reports, there has been a sea change in the New Delhi market throughout the last decade. The New Delhi market is now on par with the global capital markets thanks to the introduction of many upgrades and enhancements. An updated administrative component and a modern market architecture are present in the market at the moment, along with increasing capitalization of commercial segments, liquidity in showcases, and activation of assets. A new moral creation, the personal corporate debt market is advancing the banking concept of community finance. Even yet, the market has hit rock bottom due to the most recent global financial crisis, which originated in the US sub-prime hypothecation sector and then extended globally. The Indian stock market gave the impression of being dormant.

Objectives of the study

The specific aims of the research are as follows:

(i) Group the causes of stock market volatility into appropriate categories;
(ii) Assess the effects of volatility on investors; and
(iii) Analyse volatility strategies.

Data sources

All of the data used to draw conclusions in this research from secondary sources. Details are culled from the BSE site. The literature on economics, including books, journals, and magazines, is also considered. Research for the report was based on the daily Sensex indices for the years 2008–2018.

Equipment for analysis

In this study, the researcher examined the sensex's returns both within and between trading days. Share prices often experience fluctuations at constant intervals (daily, weekly, or monthly), but data are produced in the form of a time series. In order to determine the level of uncertainty in this study, the researcher has used the method outlined below. To calculate the log of relative returns, one uses the following equation (1).

$$u_i = \ln(S_i) - \ln(S_{i-1}) = \ln\left(\frac{S_i}{S_{i-1}}\right) \quad (1)$$

The share price at the end of the i-th interval is denoted by St, and the natural logarithmic function is represented by ln (1). This leads us to believe that there are n stock prices in our sample. Looking at the price movement of a stock over a longer period of time reveals its historical unpredictability. Previous discussion established that the standard deviation is the go-to metric for assessing variability. The purpose of specifying ui in Equation (1) was to evaluate the historical unpredictability.

$$\sigma = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(u_i - \bar{u})^2} \quad (2)$$

Where $\bar{u}$ is the mean defined by

$$\bar{u} = \frac{1}{n}\sum_{j=1}^{n} u_j .$$

Equation provides the expected uncertainty for each interval (2). As a general rule, we express uncertainty in terms of yearly values so that we may compare volatility across different interval lengths. In order to do this, the researcher takes the yearly break count (h) and uses it as a normalising constant (annualization factor) to scale the estimate.

$$\sigma_{an} = \sigma * \sqrt{h}. \quad (3)$$

If the interval is one trading day, the researcher uses h = 252 for daily data, h = 52 for weekly data, and h = 12 for monthly data. The standard deviation of the sampled series, uj, is the sole variable used in Equation (2).

REASONS FOR INDIA'S STOCK MARKET VOLATILITY

A host of additional macroeconomic, social, and political factors, including but not limited to: corresponding impacts, firm pay, profit-return methodology, security costs, and general business circumstances, credit framework, spending plans, economic cycles, and advancement. Among the many typical issue structures, the market is one that works best across the board. Variations in goliath worth may be theoretically explained by the extraordinary models. As the irrational risk linked with financial stars is diminished, low instability is maintained. As a result, market carriers will have to refocus their efforts on areas that do not need goliath-worthy changes.

Given the prevalence of uncertainty in many cash-related operations, such as the present evaluation of assets by chiefs and risk assessments by boards, it is crucial to take anomalies into account. Small industrial economies may find it difficult to attract the capital they need in lawful financial markets due to their inability to preserve their profits. A manufactured market is characterised by very high profits and extremely low levels of inclination. China and India both have well sculpted landscapes, therefore they will both make a big impact. There is a bigger shortage in the United States and the United Kingdom, contrary to what the markets there would have you believe. The inconsistency of the stock exchanges might be found in two areas:

1. Inconsistencies are growing as a result of price changes based on data; 2. Inaccuracies are growing as a result of the nature of tumultuous trading and market speculation, or destabilising volatility.

The destiny market is a nightmare for masters and hedgers alike. Here, they barter for updates on the worth of their subordinates, much like the main market, but with all the nuts and bolts removed. There is debate about how futures contracts impact the fragility of the spot market. Numerous research have been conducted to ascertain the impact of fate on the traditional course of action. A range of results might have been possible due to the testing. While some studies find a rise of abnormalities with time, others demonstrate destruction or little effect on deficiencies. According to the results, there are three shocking ways in which views about the American family and economy have endured:

Figure 1. US and India Stock Market Performance, Dec. 2015-Jan. 2018

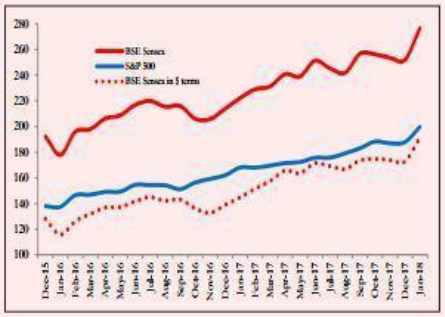
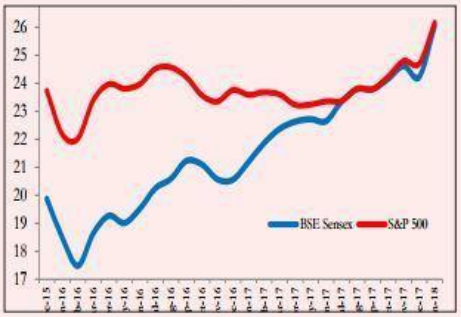


Figure 2. US and India Price-Earnings Ratios, Dec. 2015-Jan. 2018



Source: BSE, Yahoo finance, Survey Calculations.

Two regions are reportedly taking a major beating, according to the Economic Survey. More people in India have access to the basics that are necessary for economic growth. At the outset of the stock market impact, it was common practice to mislead. Indicators indicating the long-term fall in the corporate profits/GDP ratio could be ending started to materialise in the middle of 2016–17.

Figure 3: US and India, Real GDP Growth end-Dec. 2015-end-Dec. 2017

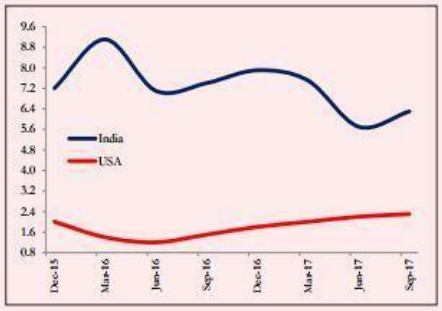
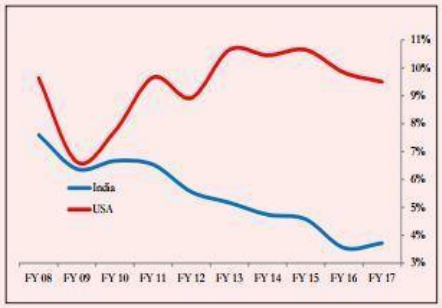
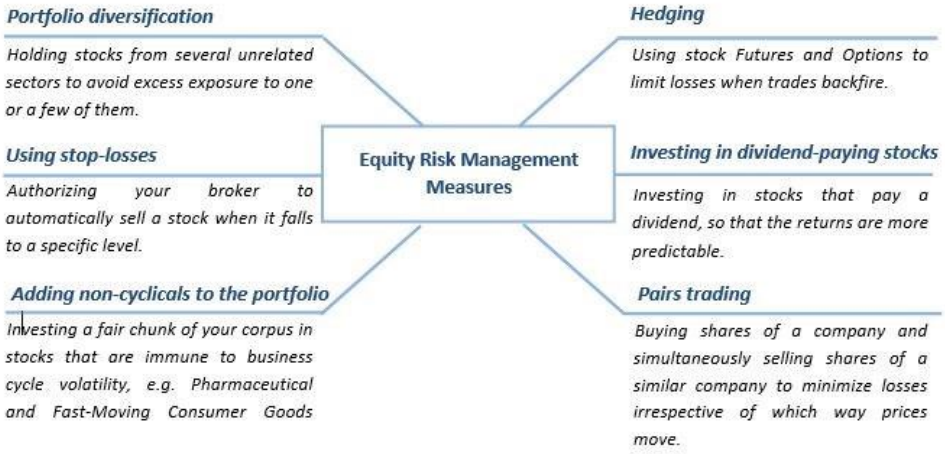


Figure 4. US and India Corporate Profits (% of GDP)



Source: RBI, Survey calculations.

Equity Risk mitigation strategies



Approaches to managing stock market volatility

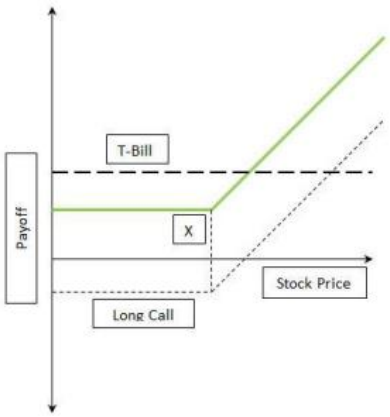
Arbitrage possibilities with stock options

Fairness in PUT-CALL pairings

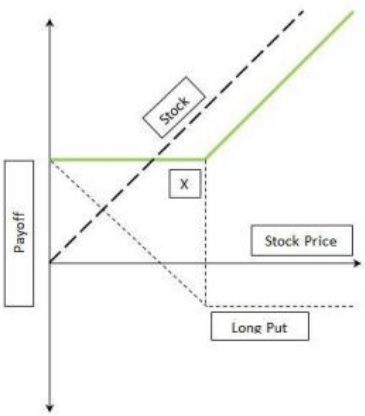
In one portfolio, an investor has a put option on stock A with a strike price of X. In the other, there is a bond with a yield of X at maturity and a call option on the stock with a new strike price of X. Regardless of the stock's price on the maturity date in the future, the two portfolios will have equal payoffs since the maturity dates of the call and put options are the same. One way to see this is by comparing the portfolios' reward graphs.

PUT + STOCK and CALL + BOND portfolio payoff diagrams

CALL + BOND:



PUT + STOCK:



We may stand to gain if, when the two portfolios reach maturity, their total values are different from each other yet will be equal. To reduce risk while still reaping the benefits, the investor might buy the cheaper portfolio and sell the more costly one.

Derivatives trading in Stock Market

Figure 1

Number of Index option contracts traded on NSE for last 10 years

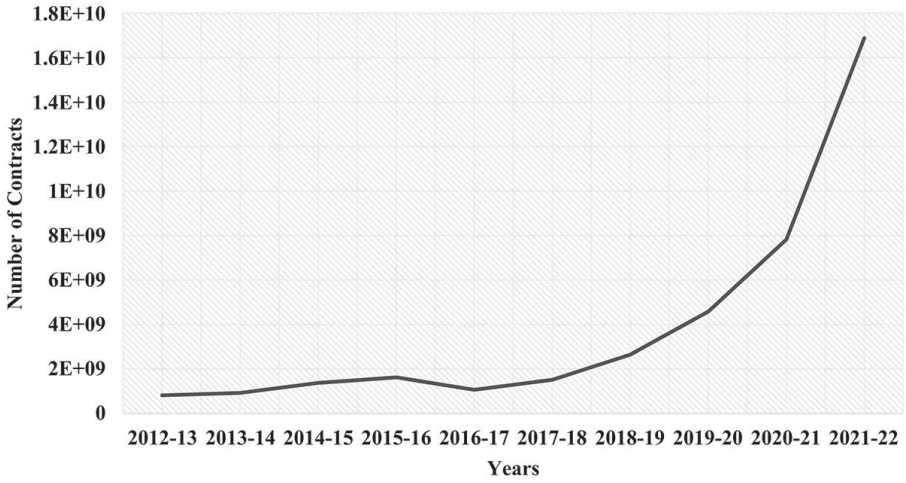


Figure 2

Number of Stock option contracts traded on NSE for last 10 years

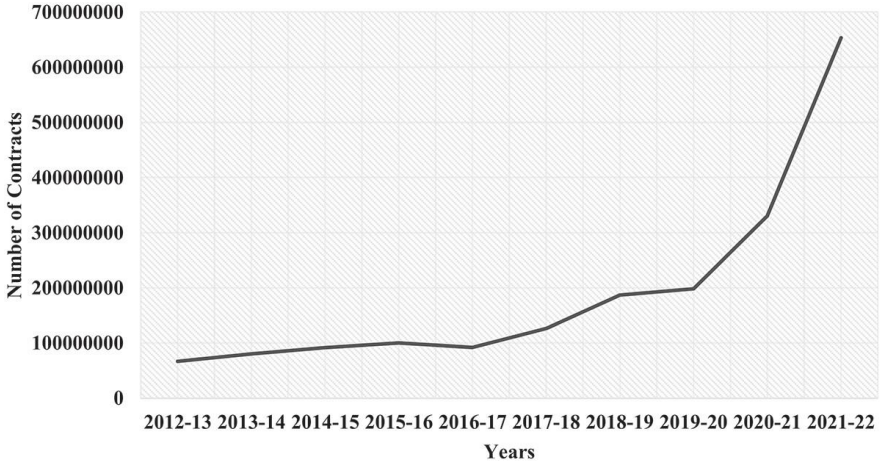


Table 1. The aggregate premium turnover and number of index and stock option contracts traded on the US stock market period 2012–2022.

Year	Index Options		Stock Options	
	No. of Contracts	Premium Turnover (Rs. crore)	No. of Contracts	Premium Turnover (Rs. crore)
2012-13	820,877,149	184,383.24	66,778,193	34,288.56
2013-14	928,565,175	244,090.71	80,174,431	46,428.41
2014-15	1,378,642,863	265,315.63	91,479,209	61,732.59
2015-16	1,623,528,486	351,221.01	100,299,174	61,118.39
2016-17	1,067,244,916	350,021.53	92,106,012	95,570.09
2017-18	1,515,034,222	460,653.71	126,411,376	148,217.50
2018-19	2,652,457,487	654,099.95	186,986,542	200,010.31
2019-20	4,586,692,584	1,082,514.05	198,377,569	229,034.28
2020-21	7,824,035,680	2,629,426.05	330,394,648	579,351.62
2021-22	16,875,505,904	5,605,923.72	653,038,720	1,012,991.90

Traders are always on the lookout for new ways to lower the equity risk and unpredictability of their investments. Derivatives are one asset class that helps investors control their exposure to risk. Speculation has also made use of derivatives, despite hedging being their primary purpose. Options have grown in popularity due to their unique qualities and their capacity to be used for risk management of any underlying financial asset; nonetheless, forwards, futures, swaps, and options are all derivative products. You are not obligated to actually purchase or sell the underlying financial asset at the price and period indicated in these options, but you do have the right to do so. Table 1, Figure 1, and 2 show that the Indian capital market has seen options trading's premium turnover and contract volume soar in recent years, thanks to options' ability to help investors mitigate portfolio risk by hedging underlying assets. But keep in mind that individual investors lose a lot of money on stocks because of how the market is. Consequently, investors may limit the share price risk using effective hedging approaches using option options.

Conclusion

The possibility of using options strategies to hedge stock is the primary focus of the study. Covered put and covered call strategies outperform other hedging approaches in the study. Investors may make minor returns in both market circumstances by using a covered call strategy. The covered put strategy is a viable hedging tool for equities positions, as shown by the study. There are less effective hedging options available, such as collar and synthetic long call, even when it comes to stock price risk. By comparing the returns of option hedging approaches, the study also found out whether the groups had similar means. While there were no statistically significant mean differences in the payoff of other strategies with the synthetic long call strategy, there were huge mean disparities with the covered put and collar strategies with the covered call approach. As a result, the research establishes a standard to help retail investors choose and implement a more effective market-specific hedging approach while trading. There is also potential for more study in this area in this paper. Neither the end strategy's repayment nor the brokerage or commission fees owing to the brokering firm are included in this research. Research in the future may determine the strategy's ROI by factoring in other variables, such as taxes paid and brokerage or fee.

References

[1] Husam Ahmed Al Hamad "Use an Efficient Neural Network to Improve the Arabic Handwriting Recognition" International Conference on Systems, Control, Signal Processing and Informatics, Page no 269-274, 2013

[2] Jayanta Kumar Basu, Debnath Bhattacharyya and Taihoon Kim "Use of Artificial Neural Network in Pattern Recognition" International Journal of Software Engineering and Its Applications Vol. 4, No. 2, April 2010

[3] FajiriKurniawan, Mohd. ShafryMohd. Rahim, NimatusSholihiah, AkmalRakhmadi and DzulkifliMohamad "Characters Segmentation of Cursive Handwritten Words based on Contour Analysis and Neural Network Validation" ITB J. ICT, Vol. 5, No. 1, 2011

[4] Le Dung and Mizukawa M. "A Pattern Recognition Neural Network Using Many Sets of Weights and Biases", Computational Intelligence in Robotics and Automation, Page no 285-290,2007.

[5] Dilruiba, R.A., Chowdhury, N.Liza, F.F. and Kiarmakar "Data Pattern Recognition using Neural Network with BackPropagation Training ", Electrical and Computer Engineering, ICECE, Page no 451-455, 2006

[6] Zaheer Ahmad, Jehanzeb Khan Orakzai and InamShamsher, "Urdu compound Character Recognition using feed forward neural networks,", International Conference on Computer Science and Information Technology, IEEE, pp.457-462, 2009.

[7] Kauleshwar Prasad, Devvrat C. Nigam, AshmikaLakhotiya and DheerenUmre "Character Recognition using Matlab's Network Toolbox" International journal service, Science and Technology Vol. 6, No. 1, page 13 February 2013

[8] Binu P, Chacko, Vimal Krishnan and G. Raju "Handwritten character recognition using wavelet energy and extreme learning machine" springer, International Journal of Machine Learning and Cybernetics, Volume 3, Issue 2, Page no. 149-161, June 2012

[9] Dawei Qi, Peng Zhang, Xuejing Jin and Xuefei Zhang "Study on Wood Image Edge Detection Based on Hopfield Neural Network", Proceedings of the International Conference on Information and Automation, IEEE, Page no 1942-1946, 2010

[10] Mingai Li, Jun-feiQiao and Xiao-gang Ruan "A Modified Difference Hopfield Neural Network and its application" IEEE, Vol 1, Page 199-203, 2005

[11] Dharamveer, Samsher. Comparative analyses energy matrices and enviro-economics for active and passive solar still. materialstoday:proceedings. 2020.https://doi.org/10.1016/j.matpr.2020.10.001.

[12] Dharamveer, SamsherKumar A. Analytical study of N^{th} identical photovoltaic thermal (PVT) compound parabolic concentrator (CPC) active double slope solar distiller with helical coiled heat exchanger using CuO Nanoparticles. Desalination and water treatment.2021;233:30-51.https://doi.org/10.5004/dwt.2021.27526

[13] Dharamveer,Samsher, Kumar A. Performance analysis of N-identical PVT-CPC collectors an active single slope solar distiller with a helically coiled heat exchanger using CuO nanoparticles. Water supply. 2021.https://doi.org/10.2166/ws.2021.348

[14] Dharamveer Singh, Ashok Kumar Yadav, Anil Kumar, Samsher, "Energy matrices and life cycle conversion analysis of N-identical hybrid double slope solar distiller unit using Al_2O_3 nanoparticle". *Journal of Water and Environmental Nanotechnology*, http://doi:10.22090/jwent.2023.03.006

[15]Dharamveer Singh, Satyaveer Singh, Ashok Kumar Yadav, Osama Khan, Ashish Dewangan, Saiful Islam, Meshel Q. Alkahtani, Saiful Islam "From Theory to Practice: A Sustainable Solution to Water Scarcity by Using Hybrid Solar Distiller with Heat Exchanger and Aluminum Oxide Nanoparticles" Journal ACS Omega, https://doi.org/10.1021/acsomega.3c03283

[16]Dharamveer Singh, Satyaveer Singh, Aakersh Chauhan, Anil Kumar "Enviroeconomic analysis of hybrid active solar desalination system using nanoparticles" Journal of Environmerntal engineering and Science, Vol. 18 (3) 1-10, July 2023, **ESCI Index,** Emerald Publishing Ltd. https://doi.org/10.1680/jenes.23.00045