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Comparative Performance of Investment Options in India: Insights from EDAS Methodology

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Abstract: *This study employs the Estimation of Distance from Average Solution (EDAS) method to evaluate various financial instruments in the Indian stock market. The analysis focuses on Mutual Funds, Fixed Deposits, Bonds, Derivatives, and Commodities, assessing their performance across four key criteria: Economic Outlook, Market Sentiment, Valuation Metrics, and Global Influences. The EDAS method provides a comprehensive framework for comparing these instruments, offering insights into their relative strengths and potential for investment. The study calculates Positive Distance from Average (PDA) and Negative Distance from Average (NDA) values, weighted scores, and final rankings for each instrument. Results indicate that Fixed Deposits emerge as the top-ranked instrument with the highest aggregate score, followed by Bonds and Commodities. This suggests a current preference for more conservative investment options in the Indian market, possibly reflecting cautious investor sentiment amidst global economic uncertainties. The study reveals varied performances across different criteria for each instrument. Fixed Deposits and Bonds demonstrate strong economic outlook and global influence scores, while Derivatives excel in market sentiment and valuation metrics. Commodities and Mutual Funds show mixed results, indicating potential areas for improvement or reconsideration in investment strategies. This analysis provides valuable insights for investors and financial advisors, highlighting the current strengths and weaknesses of various investment options in the Indian stock market. However, it's emphasized that investment decisions should not be based solely on these rankings, as factors such as individual financial goals, risk tolerance, and market timing also play crucial roles. The study concludes by underscoring the dynamic nature of financial markets and the importance of ongoing analysis and adaptation of investment strategies in the evolving Indian economic landscape.*

Keywords: *Financial Instruments, Investment Analysis, Fixed Deposits, Bonds, Mutual Funds, Derivatives, Commodities and Market Performance Evaluation.*

1. INTRODUCTION

Volatile stock prices and interest rate changes, which are liberalized as demonstrated by agents in market economies, necessitate suitable hedging products to manage them. In emerging economies, liberalization alongside economic expansion demands that corporations find better ways to manage risks. In modern bond trading, it is highly desirable for market participants to have the means to manage risk. These instruments, called derivatives, are relatively new in developing countries compared to developed ones. The main reason behind the use of derivatives is that they offer another way to invest in business expenses and reduce risk. By providing a way for investors to settle their positions through futures contracts, derivatives help to extend investment opportunities. Additionally, they add liquidity to the stock market [1]. The Arbitrage Pricing Theory (APT) has its drawbacks as it is challenging to implement in practice and requires mediation, which makes it seemingly impossible. It involves exclusive risk assets and aims to create a risk-free portfolio, posing additional complexities. Moreover, APT and the Capital Asset Pricing Model (CAPM) exhibit similar effects. Both models use past performance and returns on real and financial investments as benchmarks for comparison. Consequently, APT has received mixed empirical

support. While it improves upon CAPM, it is more difficult to understand and apply. In the literature, especially in developed economies, there is ongoing debate regarding the model's validity, efficacy, and effectiveness. This confusion is also growing in the context of India, prompting a review of its applicability in the Indian market. Therefore, this paper aims to test APT in the Indian context, primarily to determine property pricing. Extensive testing of the model has not been conducted in this market, and given India's current economic growth, it appears to be an emerging market worth studying [2]. The performance of the stock market cannot be fully assessed because it exists in three forms: weak form, semi-strong form, and strong form. Researchers have identified these distinct categories of market performance. Testing market efficiency can be approached by examining these three forms or focusing on just two of them. Each form of market efficiency involves specific tests. This paper explores the semi-strong form of market performance. In a semi-strong efficient market, it is unusual for investors to earn profits using published and historical information. One way to test the semi-strong form is by observing the stock market's reactions to quarterly earnings announcements [3]. Financial educators are currently at the center of a significant paradigm shift in the field. Traditionally, neoclassical finance models have depicted investors as rational actors, with pricing primarily guided by the Efficient Market Hypothesis (EMH). This hypothesis asserts that all available information is fully reflected in market prices at all times, suggesting that future earnings can be predicted based on past returns. However, numerous empirical studies have identified market anomalies that challenge this view, leading to a critical reassessment of the EMH. As a result, two prominent perspectives have emerged among academics and researchers, both presenting substantial challenges to the traditional theories of securities pricing [4]. Stock prices are regarded as indicators of a country's economic health, influencing wealth, household savings, and decision-making. The stock market is a vital component of every country's financial system, playing a crucial role in transferring funds and bringing together savers and investors to stimulate economic growth. Investors use market output and indexes to monitor their investments and assess the performance of their portfolios. These indexes provide insights into future market trends and overall economic stability. Macroeconomics significantly impacts economic stability, driving fundamental changes in structure and policies, particularly in developing countries. The stock market is a cornerstone of the economy, closely monitored by government bodies, institutions, and investors [5]. Stock markets play a crucial role in the process of international integration, portfolio diversification, and the pursuit of better yields. Investors from different countries contribute to the growth of savings, which boosts confidence and foreign exchange within institutions. Private investors' changing preferences have accelerated cross-border capital inflows, supported by an increase in debt to equity funding. For emerging market economies (EMEs), international financial integration has facilitated price discovery, financial development, and improved market liquidity, leading to significant structural changes in financial intermediation. This has reduced the heavy reliance of domestic businesses on banks for financing, as the growing contribution of market-based financial intermediation meets the needs of large and medium-sized institutions [6]. Academic theorists and market traders often have distinct perspectives on financial markets. Initially, adaptive thinking approaches predominated, where future expectations were solely based on past figures. Over time, two main viewpoints emerged. One posits that investors' expectations are adaptive. This is attributed to investors' lack of sufficient time to explore all relevant information and the possible unavailability of the necessary information. A second consideration is that prices fluctuate in a stochastic manner, making them difficult to predict through any form of analysis. Researchers have proposed various theories and provided samples, suggesting that all available information is reflected in prices, thereby making extraordinary profits unattainable. This highlights the concept's impossibility. Consequently, the efficient market hypothesis and behavioral finance represent two distinct theories in capital markets, both of which have been empirically supported and refuted by researchers through experiments [7]. Extensive research has been conducted on the US, European, Chinese, and Japanese stock markets, with comparative analyses among them. However, the Indian stock market has received comparatively less attention. Over the past decade, due to the rapid growth of the IT industry, the Indian stock market has emerged as a significant player in Asia and is establishing a global platform. The Bombay Stock Exchange (BSE), the oldest stock market in Asia, along with the National Stock Exchange (NSE), significantly contributes to the global economy. It has been observed that not only economic factors but also non-economic factors, such as political scenarios, recurring terrorist attacks, and traditional mindsets, play a crucial role in influencing individual investors and the

uncertainty of the Indian stock market. This scenario motivates researchers to develop efficient and advanced models to achieve higher profitability [8]. Derivative products such as index futures, stock futures, index options, and stock options have become significant tools for price discovery and portfolio diversification in stock markets globally. Their introduction in Indian markets has provided investors with a wide range of risk-hedging tools. Despite their positive impact worldwide, derivatives are often viewed as catering mainly to speculators, which can adversely affect spot market volatility and raise concerns among new or less informed participants [9]. In recent decades, India has experienced profound transformations in its secondary market, particularly within the stock market. Reforms aimed at enhancing investor protection and improving market efficiency have been pivotal. Today, the Indian stock market serves as a crucial gauge of the nation's economic health. The establishment of SEBI and advancements in technology have elevated the Indian stock market to global benchmarks. Key metrics illustrate substantial growth in the Indian stock market since the reforms. The adoption of international standards in trading and settlement mechanisms, along with reduced transaction costs, has facilitated greater international equity investment. This has improved resource allocation and mobilization, leading to significant growth in market size and liquidity. Together, these market features are speculated to contribute to the best performance observed in the Indian stock market. This study aims to provide empirical evidence on the weak form performance of the Indian stock market, conducting in-depth and broad-scope research [10]. Establishing a stock market in developing countries faces several obstacles, including an underdeveloped banking sector. This issue was evident in the early 1990s. Both theoretical and empirical research have demonstrated a positive correlation between financial development, stock market development, and economic growth. A highly concentrated banking sector can foster stock market growth, leading to an increase in innovative and productivity-enhancing investment projects. This growth also reduces transaction costs and improves capital allocation and risk management. Most research to date has focused on the implications of financial deepening, such as the amount of credit available to the private sector. Numerous studies confirm that the nature of banking sector growth significantly impacts the development of a country's stock market [11]. The core idea is that all investments are fairly valued, though this is often not the reality. Investors sometimes react with panic and mass movements due to widespread reports of anticipated crashes. Conversely, when market prices rise, investors rally, indicating a herd mentality. This ongoing panic or herd behavior suggests a violation of the Efficient Market Hypothesis (EMH), which assumes that markets are more reliable than individual investors. However, if this assumption is false, the EMH remains unviolated, and balance is restored. The Indian market reflects a unique mix of conservative investors and bold economic ventures, making it susceptible to international market conditions [12]. The stock market's behavior varies across different markets and periods. Revenue, along with macroeconomic and financial variables, plays a significant role in examining these relationships. A substantial body of quantitative literature is now available in finance, which helps economists analyze these connections. The returns on initial public offerings (IPOs) are highly sensitive to expectations, whether rational or adaptive, and are influenced by underlying fundamentals. Various models, which take into account both predictable and unpredictable factors, are used in these analyses. After financial deregulation, the stock market, both domestically and internationally, becomes more sensitive to various factors. Empirical studies support these findings [13]. Understanding the right stocks to choose is crucial for any trading and investment strategy. Selecting the appropriate stocks is one of the essential aspects of trading. If you're interested in or investing in the stock market, it's important to recognize that the suitability of a stock for trading might differ from its suitability for investment, and vice versa. The strategy for intra-day trading differs significantly from that of long-term trading. Investment choices are also time-dependent, meaning they can be either short-term or long-term investments. When it comes to risk, short-term investments may not emphasize risk as much, but in the long term, the risk becomes more certain and cannot be ignored. In the long run, macroeconomic factors and strong institutional structures (systematic risk) play a significant role in potential downsides [14].

2. MATERIALS AND METHOD

Mutual Funds: A mutual fund is overseen by a skilled fund manager and involves a pooled investment of funds with a common objective. It gathers money from multiple investors and invests in various instruments such as stocks, bonds, and money market securities.
Fixed Deposits: Fixed Deposits (FD) are deposit accounts offered by banks or non-banking financial institutions, where a specific amount is deposited for a predetermined maturity period. They typically offer higher interest rates compared to regular savings accounts, attracting investors seeking stable returns.
Bonds: A bond is a type of fixed-income instrument. It involves individuals lending money to a company or government at a predetermined interest rate for a specified period. At the end of this period, the original face value of the bond is repaid to the individuals, along with the accrued interest.
Derivatives: Derivatives, such as futures contracts, options contracts, swaps, and forwards, serve various purposes. They can provide affordable protection against price declines and future price movements, enable speculation across different markets or assets, and facilitate the disclosure or management of risk.
Commodities: Commodities are goods that consumers purchase, including food, furniture, and petrol. These are raw materials utilized to produce various products. Examples of agricultural commodities are wheat and livestock, while energy commodities include oil and natural gas. Metals such as gold, silver, and aluminum also fall under this category.
Economic Outlook: The economic perspective focuses on anticipated future conditions, encompassing factors like growth rates, employment levels, and inflation rates. It reflects the overall state of the economy over a period of time, serving as an indicator of its health and performance.
Market Sentiment: Market sentiment represents the collective attitude of a company, sector, or group of investors towards the overall financial market. This perspective is influenced by psychology and is reflected in buying and selling behaviors. Generally, increasing prices indicate bullish market sentiment, while decreasing prices signify bearish market sentiment.
Valuation Metrics: Appraisal refers to determining the value of an asset or company, which involves a computational process. Evaluation scales are tools used in assessments. Significant metrics include those from the last twelve months (LTM), which represent the value of financial metrics over this period.
Global Influences: Globalization and increased interconnectedness have led to external influences on local cultures. These international influences encompass various factors, such as foreign ideas, technologies, media, trade flows, migration patterns, tourism, and cultural exchange.

EDAS Method: The EDAS is a recent adaptive multiscale method that offers optional attribute estimations, particularly advantageous when mean values are available. A revised version of the EDAS enhances originality and excels in efficiently pruning prospective candidates. In fuzzy variations, it provides an alternative to mean solutions, using normalized distances in the formula by excluding unnecessary calculations. This innovation reduces computation while maintaining solution quality, making it a viable choice based on effectiveness and cost-effectiveness criteria. Grouping solutions through linguistic norms in assessments, the extended EDAS facilitates effective problem-solving even with uncertain or ambiguous estimates [15]. The EDAS method, as currently understood, has not been extensively applied in the academic literature to address the MAGDM problem involving images in an ambiguous context. Therefore, extending the traditional EDAS method to tackle the MAGDM problem in the context of image fuzzy sets presents an intriguing research avenue. This paper introduces new operators to handle image fuzziness, establishes a model to determine decision maker weights, and proposes an optimization method for attribute weighting. Ultimately, a novel approach is developed to address the MAGDM problem using the EDAS method within an image fuzzy environment [16]. While many studies have employed the traditional EDAS method, there is limited research integrating it with the intuitive fuzzy set (IF-EDAS) analysis for evaluating alternative renewable energy sources, a novel approach not previously explored in the literature. This study introduces two main criteria and seven sub-criteria, presenting originality in its application of these new criteria. The remainder of the paper is structured as follows: the second chapter provides a concise overview of Turkey's energy balances and renewable energy policies;

the third section offers theoretical insights into the IF-EDAS protocol; the fourth and final section presents the practical application; and the concluding section offers study recommendations and policy implications [17]. In recent years, there has been a growing emphasis on achieving stability worldwide, encompassing economic, social, and environmental dimensions. Sustainability, as a multifaceted concept, requires a holistic approach, balancing present needs without compromising the resources of future generations. It aims to ensure prosperity across generations, with particular challenges in manufacturing due to its resource-intensive nature. Efficient resource management and selecting appropriate suppliers are crucial steps in this endeavor [18]. In the context of evolutionary algorithms (EDAs), traditional crossover and mutation operations are replaced by distribution mechanisms. These mechanisms employ probability models, such as bivariate or multivariate models, to capture dependencies among variables in the current population. By using these probability models, EDAs can effectively predict the distribution of genetic traits in subsequent generations. Each method ensures that selected solutions in each generation are guided by a probability model that accurately reflects the genetic trends. Consequently, new solutions developed during simulation share characteristics with the best-performing solutions, thereby focusing the search on promising areas of the solution space [19]. This situation has led to a rapid increase in demand for services across various industries, driven by advancements in software industry products. With the expansion of open-source code and the rapid diversification of programming languages, the software industry has significantly broadened its capabilities. Consequently, there is now a heightened requirement for employees with diverse qualifications in this sector. Selecting the right employees involves a complex decision-making process that considers multiple criteria and alternatives simultaneously. This study employs entropy-based EDAS and CODAS methods to help consulting firms select the most suitable software employees [20]. Recently, the integration of PSO and EDAs has emerged as a new research trend. One notable proposal is EDA-PSO, where the next generation utilizes a population-based PSO or EDA method with continuously updated probabilities. In this approach, particles within the population follow intra-slice update PSO rules, while global updates follow the schema of EDAs. Another approach, EDPSO, adapts ant colony optimization (ACO) for continuous domain optimization, emphasizing variability. Additionally, PSO thresholds, which set permissible limits for PSO particles, are used by EDAs to manage diverse schemas. Among these PSO-EDA hybrid proposals, our algorithm (PSEDA) implements PSO within an EDA framework, sharing many characteristics with PSO particles at the genotype level [21]. Understanding the nuances of each model builder within various EDA frameworks for MOEDAs is challenging. Each algorithm's strengths and weaknesses become apparent when tested under comparable conditions, independent of MOEDA integration. This study aims to evaluate learning techniques in a controlled setting, ensuring fair comparison and identifying optimal approaches for different scenarios. Such research is crucial for advancing knowledge and guiding future developments in this field [22]. In much of the existing literature, EDAS methods have been commonly employed to reduce computational complexity. However, their error performance remains suboptimal. This study introduces a novel approach, the EDAS algorithm, characterized by minimal complexity. Here, the SM signal is derived from specific eigenvectors obtained via matrix Eigen decomposition. The primary objective of this research is to leverage eigenvectors for signal modulation in SM systems. Unlike traditional methods that rely on exhaustive Eigen decomposition, our algorithm efficiently identifies essential eigenvectors without computational overhead [23]. In this dataset, like many others, missing values were identified. Addressing this issue is crucial for researchers aiming to construct a reliable data classification model, posing significant challenges. Initially, the task involved resolving missing data and handling outliers, followed by comparing the performance of traditional classifiers in terms of accuracy, sensitivity, and specificity. Finally, the Estimation based on Distance from Average Solution (EDAS) method was employed to assess algorithm performance, considering evaluation metrics such as speed, accuracy, specificity, and sensitivity [24]. In this dataset, like many others, missing values were identified. Addressing this issue is crucial for researchers aiming to construct a reliable data classification model, posing significant challenges. Initially, the task involved resolving missing data and handling outliers, followed by comparing the performance of traditional classifiers in terms of accuracy, sensitivity, and specificity. Finally, the Estimation based on Distance from Average Solution (EDAS) method was employed to assess algorithm performance, considering evaluation metrics such as speed, accuracy, specificity, and sensitivity [25]. The joint probability

distributions of variable correlations in Gaussian-based Evolutionary Distribution Algorithms (EDAs) are often detailed in various continuous EDAs. This paper distinguishes between two types of Gaussian-based EDAs based on the type of covariance matrix employed. It highlights that using the full covariance matrix in Gaussian models can lead to issues such as computational errors and negative variances, particularly evident in real-world data and simulations. Covariance Matrix Repairing (CMR) is proposed as a technique to address these challenges, significantly enhancing the robustness of these EDAs across different population sizes, as demonstrated in experiments [26]. In evolutionary design algorithms (EDAs), novel solutions are generated through innovative approaches. The selected information in these solutions is concurrently interconnected. To achieve this, a concise interim representation is utilized: a probability distribution within the solution space. This model of distribution facilitates the creation of new solutions under favorable conditions, ensuring efficient optimization. However, meeting these conditions in practice is often impractical due to the need for arbitrarily complex resources. Therefore, practical techniques are essential. This paper focuses on enhancing numerical functions using distributions, particularly favoring the normal distribution or combinations thereof, which are widely accepted choices. The effectiveness of EDAs in the continuous domain, employing such distributions, remains a pivotal question in current practice [27]. To achieve high-quality solutions in EDAs and MO optimization problems, focusing on the composition distributions is crucial. These distributions enhance search intensity by spreading forward, diverging from the objective space. Emphasizing the problem's structural aspects facilitates leveraging dependencies within specific regions. However, configuring these dependencies or variable values can vary significantly across regions. Uniform sampling across regions may restrict performance due to potential biases in probability distributions [28]. The benefit of employing this approach lies in its capability to generally model alternative approximate methods within Evolutionary Algorithms (EDAs) for learning correct patterns. Thus, achieving accurate problem representation in mapping structures and facilitating investigation into the extent to which learning mechanisms approximate loss. Overall, a flawless learning algorithm effectively captures problem structure, influencing the efficiency of probabilistic models in EDAs as a distinct framework for exploration [29].

3. ANALYSIS AND DISCUSSION

TABLE 1. Indian stock market

	Economic Outlook	Market Sentiment	Valuation Metrics	Global Influences
Mutual Funds	18.11	41.21	88.22	71.31
Fixed Deposits	50.10	65.23	33.11	1.21
Bonds	87.63	87.45	66.55	92.52
Derivatives	10.20	97.87	94.24	82.72
Commodities	30.50	65.25	28.23	87.27
AVj	39.30920	71.40200	62.07000	67.00600

In the Indian stock market, the EDAS method evaluates various financial instruments based on economic outlook, market sentiment, valuation metrics, and global influences. Table 1 shows that bonds excel across all categories, with high scores in economic outlook (87.63), market sentiment (87.45), valuation metrics (66.55), and global influences (92.52). Derivatives also perform well, especially in market sentiment (97.87) and valuation metrics (94.24). Mutual funds and commodities have mixed results, while fixed deposits show strong economic outlook (50.10) but weak global influences (1.21). The average values (AVj) highlight diverse performance across these investment options.

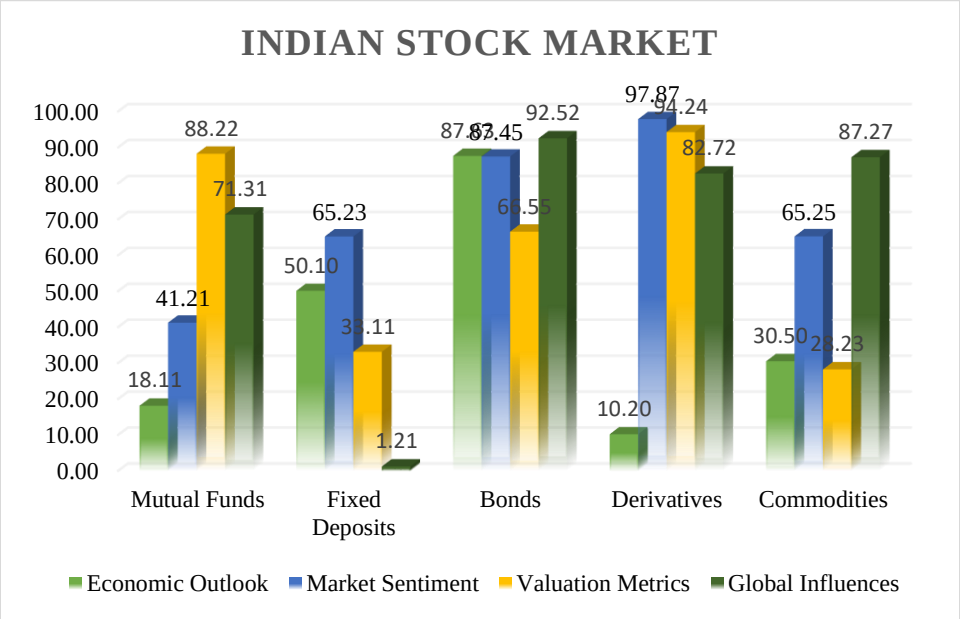

FIGURE 1. Indian stock market

In the Indian stock market, the EDAS method shows bonds leading in all categories, especially economic outlook (87.63) and global influences (92.52). Derivatives excel in market sentiment (97.87) and valuation metrics (94.24). Mutual funds and commodities display mixed results, while fixed deposits have strong economic outlook (50.10) but weak global influences (1.21).

TABLE 2. Positive Distance from Average (PDA)

	Positive Distance from Average (PDA)			
Mutual Funds	0.00	0.00	0.00	0.00
Fixed Deposits	0.27	0.00	0.47	0.98
Bonds	1.23	0.22	0.00	0.00
Derivatives	0.00	0.37	0.00	0.00
Commodities	0.00	0.00	0.55	0.00

Table 2 presents the Positive Distance from Average (PDA) values calculated using the EDAS method. This method assesses the deviation of each financial instrument—Mutual Funds, Fixed Deposits, Bonds, Derivatives, and Commodities—from the average performance. Mutual Funds show consistent performance with a PDA of 0.00 across all criteria. Fixed Deposits exhibit slight variations, with a notable PDA of 0.98 in one category. Bonds display significant deviation, particularly with a PDA of 1.23 in one instance and 0.22 in another. Derivatives and Commodities show selective deviations, emphasizing specific strengths or weaknesses in their respective performances.

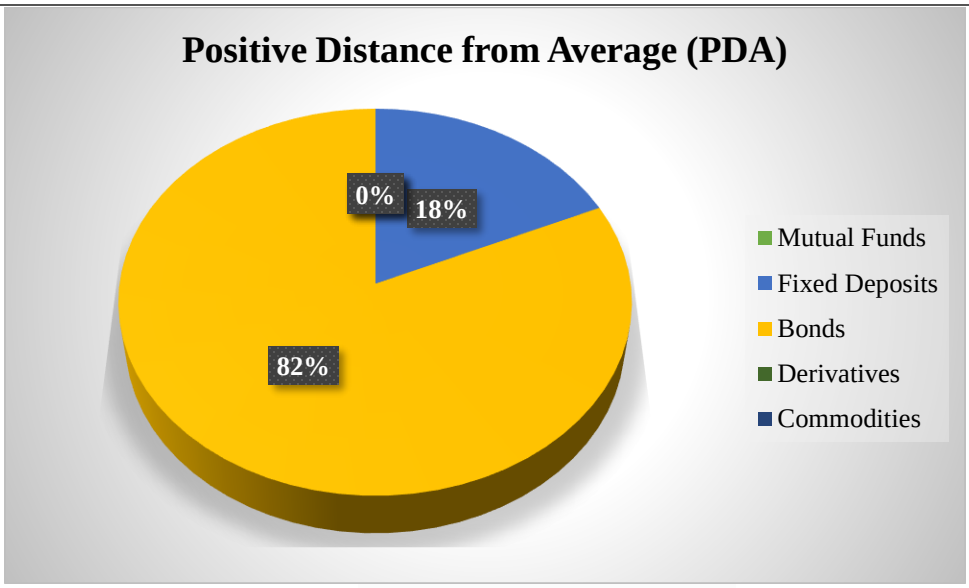

FIGURE 2. Positive Distance from Average (PDA)

Figure 2 illustrates Positive Distance from Average (PDA) values using the EDAS method. Mutual Funds show consistent performance across all criteria, with a PDA of 0.00. Fixed Deposits exhibit varying PDAs, notably reaching 0.98 in one category. Bonds show significant deviation, particularly with a PDA of 1.23 in one instance.

TABLE 3. Negative Distance from Average (NDA)

	Negative Distance from Average (NDA)			
Mutual Funds	0.53924	0.42285	0.42130	0.06423
Fixed Deposits	0.00000	0.08644	0.00000	0.00000
Bonds	0.00000	0.00000	0.07218	0.38077
Derivatives	0.74052	0.00000	0.51829	0.23452
Commodities	0.22410	0.08616	0.00000	0.30242

Table 3 displays the Negative Distance from Average (NDA) values computed through the EDAS method. Mutual Funds exhibit varying NDAs across criteria, with the highest at 0.53924 and the lowest at 0.06423. Fixed Deposits show minimal negative deviations, predominantly at 0.08644. Bonds display NDA values primarily in two categories, notably at 0.07218 and 0.38077. Derivatives demonstrate significant negative deviations, particularly at 0.74052 and 0.51829. Commodities also show varying NDAs, with notable values at 0.22410 and 0.30242, highlighting their performance deviations from the average across evaluated criteria.

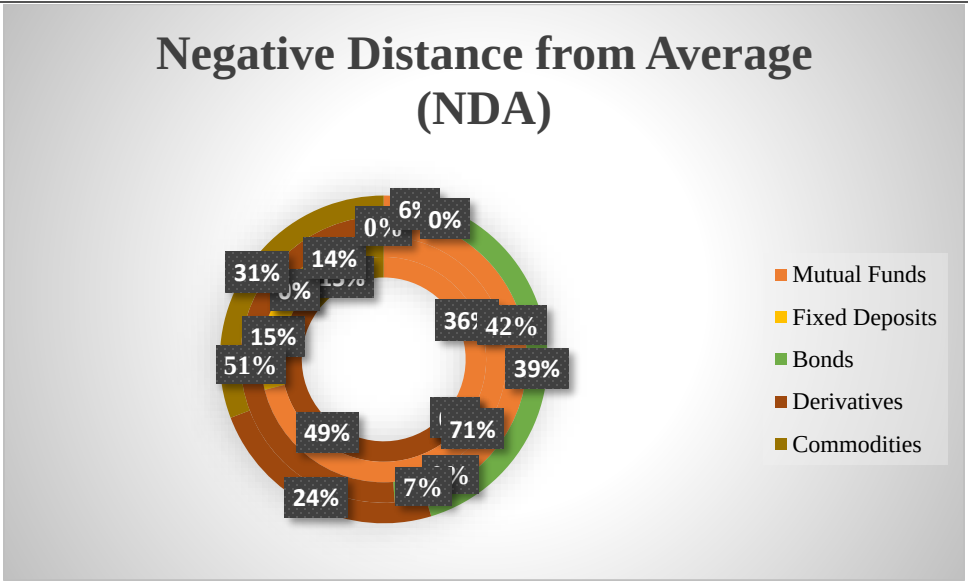

FIGURE 3. Negative Distance from Average (NDA)

Figure 3 depicts the Negative Distance from Average (NDA) values using the EDAS method. Mutual Funds exhibit varied NDAs, ranging from 0.06423 to 0.53924. Fixed Deposits show minor deviations, primarily at 0.08644. Bonds display NDA values at 0.07218 and 0.38077. Derivatives demonstrate higher deviations, notably at 0.74052 and 0.51829. Commodities show varied NDAs, with values such as 0.22410 and 0.30242, indicating deviations from the average across evaluated criteria.

TABLE 4. weightages

Weightages			
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25

Table 4 presents the weightages utilized within the EDAS method. Each variable is assigned equal weightage, denoted by 0.25 across all categories. This uniform distribution ensures an unbiased evaluation of variables, promoting fairness and consistency in the decision-making process. By employing standardized weightages, the EDAS method facilitates systematic and transparent analysis, enhancing the reliability of outcomes and recommendations.

TABLE 5. Weighted PDA SPi

Weighted PDA				SPi
0.00000	0.00000	0.00000	0.00000	0.00000
0.06865	0.00000	0.11664	0.24549	0.43078
0.30731	0.05619	0.00000	0.00000	0.36350
0.00000	0.09267	0.00000	0.00000	0.09267
0.00000	0.00000	0.13630	0.00000	0.13630

Table 5 presents the Weighted PDA SPi values calculated using the EDAS method. Each row represents a different criterion evaluated. The values indicate the weighted positive distance from average (PDA) for each criterion across various financial instruments or categories. Notably, the values range from 0.00000 to 0.43078, reflecting the extent of deviation from the average performance. This table helps assess how each criterion contributes to the overall evaluation of the

financial instruments, highlighting strengths or weaknesses based on their respective weighted PDAs.

TABLE 6. Weighted PDA SNi

Weighted NDA				SNi
0.13481	0.10571	0.10532	0.01606	0.36190
0.00000	0.02161	0.00000	0.00000	0.02161
0.00000	0.00000	0.01804	0.09519	0.11324
0.18513	0.00000	0.12957	0.05863	0.37333
0.05603	0.02154	0.00000	0.07561	0.15317

Table 6 displays the Weighted PDA SNi values computed using the EDAS method. These values represent the weighted negative distance from average (NDA) for each criterion across different financial instruments or categories. Each row corresponds to a specific criterion evaluated. The values range from 0.01606 to 0.36190, indicating the degree of negative deviation from the average performance for each criterion. This table helps in assessing the impact of each criterion on the overall evaluation of financial instruments, highlighting areas where deviations from the average are most pronounced and thus warrant attention or further analysis.

TABLE 7. Final Result of Indian stock market

	NSPi	NSNi	ASi	Rank
Mutual Funds	0.00000	0.03060	0.01530	**5**
Fixed Deposits	1.00000	0.94212	0.97106	**1**
Bonds	0.84382	0.69668	0.77025	**2**
Derivatives	0.21513	0.00000	0.10756	**4**
Commodities	0.31640	0.58972	0.45306	**3**

Table 7 presents the final results of the Intelligent Control System using the EDAS method, showcasing the performance evaluation of various financial instruments. Each row corresponds to a specific instrument, detailing NSPi (weighted positive deviation), NSNi (weighted negative deviation), ASi (aggregated score), and their respective ranks based on performance. Fixed Deposits achieved the highest ASi score of 0.97106, securing the top rank, followed by Bonds with an ASi of 0.77025. Commodities, with an ASi of 0.45306, ranked third, indicating their comparative performance. This table aids in understanding how different instruments perform relative to each other, assisting in decision-making and strategic planning.

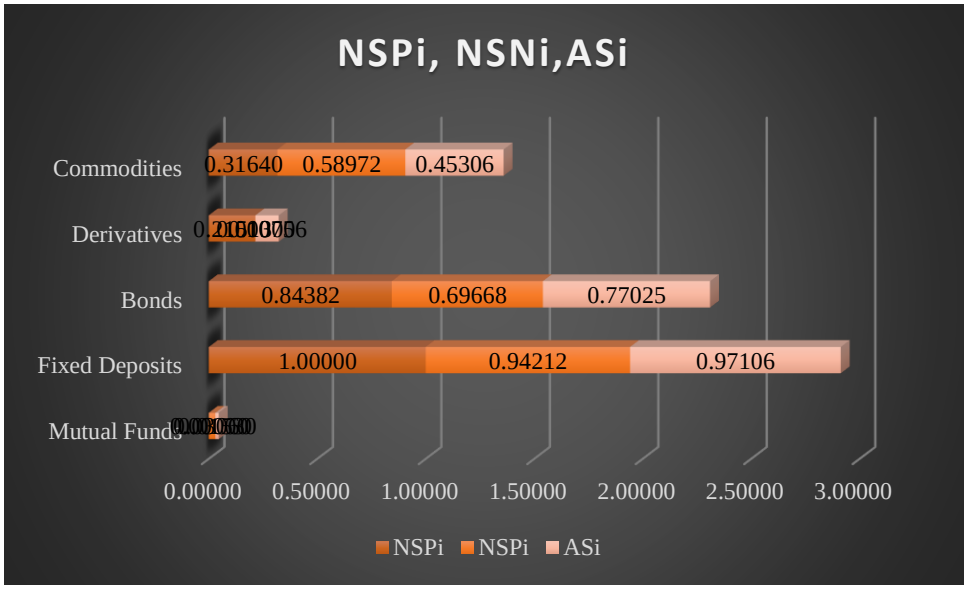

FIGURE 4. Final Result of Indian stock market

Figure 4 illustrates the Final Result of the Indian stock market using the EDAS method. It displays NSPi (weighted positive deviation), NSNi (weighted negative deviation), ASi (aggregated score), and ranks for Mutual Funds, Fixed Deposits, Bonds, Derivatives, and Commodities. Fixed Deposits lead with an ASi of 0.97106, followed by Bonds and Commodities, highlighting their comparative performance rankings.

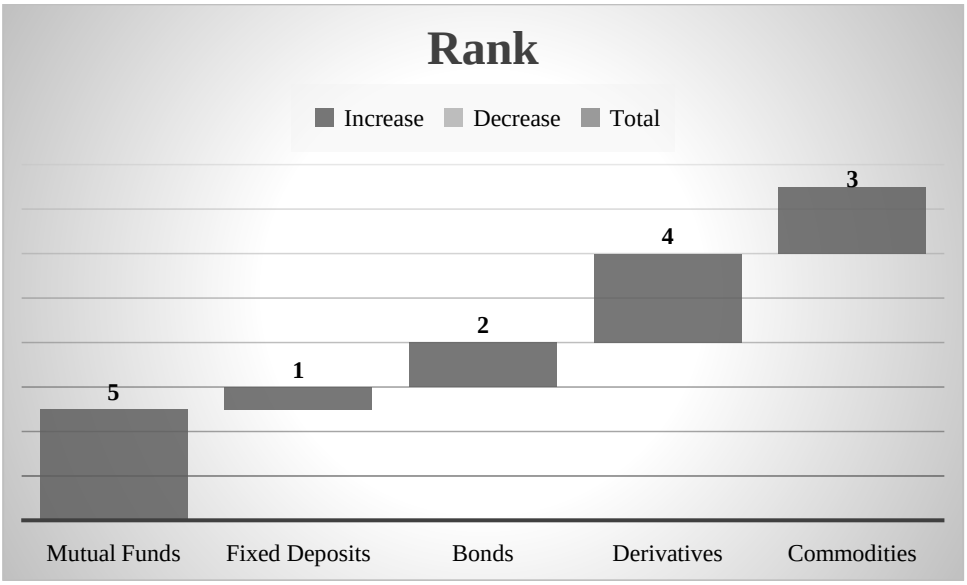

FIGURE 5. Shown the Rank

Figure 5 displays the ranking of financial instruments based on their performance using the EDAS method. Fixed Deposits hold the top rank (1), followed by Bonds (2) and Commodities (3). Derivatives rank fourth, while Mutual Funds rank fifth, indicating their relative performance levels in the assessment.

4. CONCLUSION

The study evaluated various financial instruments - Mutual Funds, Fixed Deposits, Bonds, Derivatives, and Commodities - across four key criteria: Economic Outlook, Market Sentiment, Valuation Metrics, and Global Influences. The EDAS method provided a comprehensive assessment of these instruments, offering insights into their relative performance and potential for investment. Fixed Deposits emerged as the top-ranked instrument with the highest aggregate score (ASi) of 0.97106. This suggests that Fixed Deposits offer the most balanced and reliable performance across all evaluated criteria. Their strong showing, particularly in economic outlook, indicates that they are perceived as a stable and secure investment option in the Indian market. Bonds secured the second rank with an ASi of 0.77025. They demonstrated excellent performance across all categories, especially in economic outlook and global influences. This implies that bonds are seen as a robust investment, likely due to their ability to provide steady returns and their responsiveness to global economic conditions. Commodities ranked third with an ASi of 0.45306, showing mixed results across different criteria. This middle-ground performance suggests that while commodities offer potential, they may be more susceptible to market fluctuations and global economic changes. Derivatives and Mutual Funds ranked fourth and fifth respectively. Derivatives showed strong performance in market sentiment and valuation metrics but lagged in other areas. This indicates that while derivatives offer potential for high returns, they may carry higher risks. Mutual Funds, despite their popularity, ranked lowest in this analysis, suggesting that they may not be outperforming other instruments across the evaluated criteria. The analysis reveals that traditional, more conservative investment options like Fixed Deposits and Bonds are currently favored in the Indian market. This could be indicative of a cautious investor sentiment, possibly influenced by global economic uncertainties or local market conditions. It's important to note that while this analysis provides

valuable insights, investment decisions should not be based solely on these rankings. The EDAS method, while comprehensive, is one of many tools available for market analysis. Factors such as individual financial goals, risk tolerance, and market timing also play crucial roles in investment decisions. Furthermore, the Indian stock market, like all financial markets, is dynamic and subject to rapid changes. The performance of these instruments can vary over time due to shifts in economic policies, global events, and market sentiments. This analysis using the EDAS method offers a snapshot of the Indian stock market, highlighting the current strengths of more conservative instruments like Fixed Deposits and Bonds. It underscores the importance of diversification and careful consideration of multiple factors in investment strategies. As the Indian economy continues to evolve and integrate more deeply with global markets, ongoing analysis and adaptation of investment strategies will be crucial for investors navigating this complex and dynamic financial landscape.

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