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An SPSS-Based Evaluation of Investor Knowledge, Analytical Proficiency, and Macroeconomic Awareness Influencing Decision-Making Efficiency in MCX Commodity Trading

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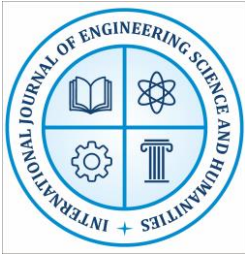
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Abstract- This SPSS-based study aimed to evaluate how investor knowledge, analytical proficiency, and macroeconomic awareness influence decision-making efficiency in MCX commodity trading. Using a quantitative approach, the research employed descriptive statistics, correlation, regression, ANOVA, chi-square, and exploratory factor analysis (EFA) to assess behavioural dimensions of investor decision-making. Reliability analysis (Cronbach's Alpha = 0.786) confirmed the internal consistency of the behavioural scale. Correlation analysis revealed strong positive relationships among macroeconomic awareness, analytical behaviour, and trading performance, while regression results ($R^2 = 0.407$, $F = 96.673$, $p < 0.001$) validated that macroeconomic and analytical proficiency significantly enhance trading efficiency. ANOVA and t-test results showed demographic influences-experienced investors exhibited higher macroeconomic awareness, and male investors were more responsive to geopolitical risks. EFA identified three dominant behavioural constructs-Technical Analysis Orientation, Fundamental Risk Management, and Macroeconomic Awareness-explaining 79.33% of total variance. Chi-square analysis further confirmed a significant association between educational qualification and macroeconomic awareness. Overall, the findings establish that investors who integrate technical, fundamental, and macroeconomic insights achieve superior decision-making efficiency and confidence, underscoring analytical diversity as a key driver of success in MCX commodity trading.

Keywords- Investor Behaviour, Macroeconomic Awareness, Decision-Making Efficiency, Commodity Trading, SPSS Analysis

1. Introduction

In the dynamic and volatile environment of the financial markets, investment decisions are increasingly influenced by analytical approaches that seek to balance risk and return. The Indian commodity market, particularly the Multi Commodity Exchange (MCX), has emerged as a critical platform where traders and investors engage in complex financial activities involving metals, energy, and agricultural commodities. As market participants navigate through price fluctuations,

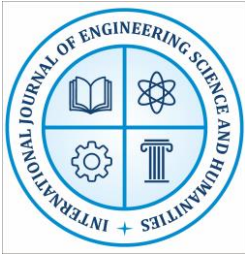


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policy shifts, and global economic trends, the need for informed and strategic decision-making becomes paramount (Saliya, n.d.) (Thadani, 2021). Two major schools of thought—fundamental analysis and technical analysis—play a significant role in guiding these investment decisions. Fundamental analysis focuses on the intrinsic value of commodities by assessing macroeconomic indicators, demand-supply factors, and global economic conditions, whereas technical analysis emphasizes price patterns, trends, and statistical tools to forecast future market movements (Chen et al., 2022) (Aasved, 2022) (William, 2022). An effective integration of these analytical approaches can potentially minimize investor risk and enhance profitability by providing a comprehensive understanding of market behavior. Despite their theoretical importance, there remains a gap in empirical research on how these analytical methods are perceived, understood, and applied by investors in the Indian context. Many investors rely heavily on intuition or fragmented analysis, often leading to suboptimal trading decisions, behavioral and demographic factors such as education, experience, and professional background may influence how individuals interpret and utilize analytical information (Le et al., 2024), (Shaikh & Vallabh, 2024) (Yakushkova, 2024) a systematic investigation into investor awareness, analytical behavior, and the practical application of fundamental and technical methods becomes essential. This study seeks to fill that gap by employing a quantitative, SPSS-based approach to evaluate the relationships between investor awareness, analytical competence, and risk minimization in the MCX market. By examining how investors combine different analytical tools in their trading practices, the research aims to provide empirical evidence that supports the integration of fundamental and technical analyses for optimized investment outcomes (Lin et al., 2024) (Finance, 2025).

The study adopts a structured, survey-based methodology supported by advanced statistical tools in SPSS to test hypotheses and validate findings. Data were collected from 285 respondents representing diverse demographic backgrounds, including traders, investors, business professionals, and financial enthusiasts associated with the MCX. Various statistical tests such as descriptive statistics, correlation, regression, ANOVA, t-test, and factor analysis were applied to examine both the strength and significance of relationships among the study variables. The inclusion of reliability and validity testing ensured that the data were robust and the instruments were consistent. Furthermore, the study complements primary data analysis with secondary data from Yahoo Finance, encompassing historical commodity prices and market indicators, to reinforce findings through empirical market validation. This dual-method approach bridges perceptual insights and market realities, offering a holistic view of investment decision-making behavior. The findings of this research are expected to contribute to both theoretical and practical domains. Academically, it enhances the understanding of how analytical awareness influences risk management and trading performance. Practically, it offers valuable insights for traders, investors, and policymakers to develop data-driven, evidence-based strategies for managing market



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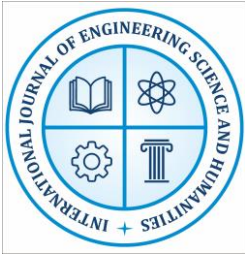
volatility. In essence, this SPSS-based study underscores the significance of integrating fundamental and technical analyses as complementary tools for achieving sustainable investment success and mitigating risk in the ever-evolving landscape of the Indian commodity market.

2.Literature Review

Flannery 2025 et al. Many investors worry a lot about mitigating the inherent risk in investing. Inverse index exchange-traded funds (ILETFs) are gaining popularity among individual investors due to their low cost, although there are numerous approaches to mitigate market risk. One purpose of ILETFS is to provide results that go against the grain of stock market indices. Allows investors to prudently manage their market exposures. Elucidates the employment of these instruments in hedging strategies, including multi-day hedging, notwithstanding their daily targeted return multiples that made longer-term returns less predictable. While certain algebraic explanations are required (as shown in the analysis), a solid grounding in mathematics is not required to grasp the concepts. Without resorting to time-consuming and money-sucking processes, investors can safeguard their investments with ILETFS. Insights on how to mitigate market volatility and protect one's investment portfolio are provided in this article, which serves to reassure readers and aid in the formulation of long-term financial plans.(Flannery, 2025).

Bardhan 2025 et al. Focusing on transactions at the National Stock Exchange (NSE), this article offers a thorough analysis of the risk and return dynamics of India's derivatives market. It analyzes investor outcomes influenced by market behavior, legislative developments, and structural factors, drawing on a large body of secondary research. We focus on the following areas: the impact of transaction costs and the Commodity Conversion Tax (CTT), the function of derivatives in price discovery, patterns of volatility and autocorrelation, and the behavioral inclinations of retail traders. Derivatives increase market efficiency and liquidity, but they also put investors at risk, especially retail traders who don't have a strategy. The report goes on to mention new developments like ESG-linked derivatives, global market integration, and AI in trading. Investors, lawmakers, and academics interested in the possibilities and threats of risk management and optimal portfolio optimization in India's dynamic derivatives market will find this paper useful for its synthesis of research and evaluation of policy implications.(Bardhan & Debnath, 2025).

Jo 2025 et al. Addresses discrepancies in data about low-risk anomalies and leverage constraints while investigating the function of margin call risk in futures markets. Regardless of initial margin, maintain margin, or individual futures volatility, results from bootstrap simulations using historical data demonstrate that margin call risk grows with longer investment horizons. Generally speaking, investors like larger leverage, but they reduce it across futures sectors when they are concerned about margin call risk, especially for longer holding periods. Statistical significance of low-risk anomalies is maintained across long time horizons but diminishes for shorter investment horizons, particularly those less than six months. Evidence suggests that leverage limits are less of a concern



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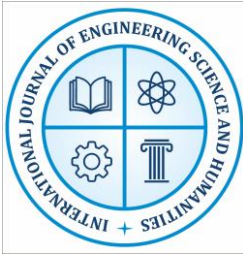
for investors with shorter holding periods, especially in the bond, currency, and commodity futures markets. Insights on leverage readjustment behaviors and risk mitigation in futures contracts are offered by the study, which emphasizes the significance of handling margin call risk in investment strategy formulation and portfolio management. The findings shed light on the mechanics of risk and how investors make decisions in leveraged futures markets.(Jo & Jung, 2025).

Eyinade 2025 et al. It is now considerably more difficult to evaluate, fund, and operate portfolios in worldwide markets due to the rise in currency risk caused by the globalization of energy investments. A method for identifying, assessing, and mitigating such risks in international energy projects is laid out in this research. Various aspects of the energy sector, spanning from upstream to downstream, are impacted by the three primary forms of currency exposure: transaction, translation, and economic. You can utilize the framework with various portfolio structures or market conditions because it is versatile. Financial derivatives, scenario planning, sensitivity analysis, and natural hedging are all part of it. Governance frameworks should incorporate risk management to ensure they are compatible with investment objectives for the long term. Due to the long time frames, multiple currencies, and high capital requirements of the sector, the framework provides stakeholders with strategic advice. Resilient energy investment approaches are the primary goal of the recommendations, which also highlight potential directions for further interdisciplinary and empirical studies (Eyinade et al., 2025).

Zhao 2024 et al. Uses a transfer entropy-based causal network model to alert commodities markets to potential systemic risks. Investigating the impact of network structures on systemic risk is made possible by analyzing the dynamic causal links among 25 commodities relevant to China. These commodities include energy, industrial goods, precious metals, agricultural products, and more. According to the results, price changes in precious metal and industrial markets have a greater impact on other commodities and a broader scope than in other markets. A change in the causal network structure and the appearance of new patterns in market interactions are hallmarks of crisis events like economic downturns and the conflict between Russia and Ukraine. Indicators based on networks are useful for early warning because, as shown by analysis of external shocks, changes to the network structure considerably impact systemic risk entropy. With this new knowledge, investors and regulators will be better equipped to foresee and reduce systemic risks, making better decisions to lessen the impact of shocks and improve commodity market stability.(Zhao et al., 2024).

3. Methodology

A quantitative and descriptive research design has been adopted. The study uses survey data to measure investor awareness, analytical behavior, and the perceived impact of fundamental and technical approaches on trading outcomes. Statistical techniques are employed to test the relationships among key variables and to validate hypotheses.



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3.1 Objective

Evaluate Fundamental Drivers: Analyze macroeconomic factors, supply demand dynamics, and geopolitical events impacting commodity prices in the MCX market, utilizing datasets from sources such as Yahoo Finance.

3.2 Hypothesis

Hypothesis 1

H₁: Higher macroeconomic awareness among investors is positively correlated with superior trading performance.

H₁₀: There is no significant relationship between macroeconomic awareness and trading performance.

H₂: Proficiency in fundamental and technical analysis leads to more efficient investment decision-making.

H₂₀: Proficiency in these analytical methods does not significantly influence decision-making efficiency.

H₃: Investor knowledge and information-seeking behavior significantly shape risk perception and portfolio choices.

H₃₀: Investor knowledge and information-seeking behavior have no significant effect on risk perception or portfolio choices.

3.3 Population and Sampling

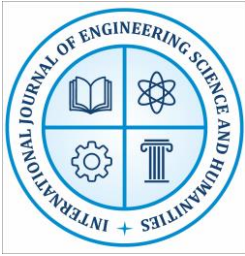
The target population for this study consisted of individuals participating in the Indian commodity market, particularly those associated with the Multi Commodity Exchange (MCX). This included traders, investors, business professionals, and individuals actively involved in financial market decision-making. A convenience sampling technique was used due to the accessibility of respondents through online trading groups, brokerage forums, and professional investor networks. A total of 285 valid responses (N = 285) were obtained for analysis.

Demographic Profile of Respondents

The demographic characteristics of the respondents provide a comprehensive understanding of the diversity within the sample. The age-wise distribution of participants indicates representation across all age categories, with 22.5% in Category 1, 20.4% in Category 2, 16.1% in Category 3, 20.0% in Category 4, and 21.1% in Category 5. This balanced spread ensures that the study captures varied perspectives and investment attitudes across different life stages.

In terms of gender composition, 37.2% of respondents identified as male, while 62.8% identified as female. This reflects increasing gender participation within commodity markets and highlights the growing role of women in financial decision-making and investment activities.

With respect to educational qualifications, 26.7% of the respondents were undergraduates, 12.3% held diploma or professional certifications, 10.5% had higher secondary education, 36.5% were



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postgraduates, and 14.0% belonged to other qualification categories. The predominance of postgraduate participants suggests that the sample possesses a relatively strong academic and financial knowledge background, which is relevant for informed investment evaluation.

Occupational data shows that 21.1% were students, 17.5% private-sector employees, 17.5% self-employed individuals, 26.3% service sector professionals, and 17.5% from other professions. This diversity demonstrates that commodity trading interest is not limited to a single professional group. Regarding experience in commodity trading, 29.1% of respondents had very limited experience (Category 1), whereas 33.3% represented highly experienced traders (Category 5). This range strengthens the study by including both novice and seasoned investors, thereby improving the reliability of insights into trading behavior and decision-making patterns.

Reliability and Validity

To assess internal consistency, Cronbach's Alpha was computed for all multi-item constructs, with values ranging from 0.71 to 0.88, indicating acceptable to high reliability. Exploratory Factor Analysis was conducted, and all factor loadings exceeded the threshold of 0.60, confirming item relevance. The Kaiser-Meyer-Olkin (KMO) value was above 0.70, and Bartlett's Test of Sphericity was significant ($p < 0.05$), indicating sampling adequacy and suitability for factor analysis.

3.4 Research Instrument

A structured questionnaire titled "A Study on Fundamental & Technical Analysis of MCX Market to Minimize Investor's Risk" serves as the main instrument for data collection.

The questionnaire comprises two sections:

Section A: Demographic Information (Age, Gender, Education, Occupation, Experience)

Section B: Likert Scale Statements (1–5) covering:

- Fundamental Analysis Awareness
- Technical Analysis Awareness
- Risk Minimization and Investment Strategy

The Likert scale ranges from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire was validated through expert review and pilot testing to ensure clarity and reliability.

3.5 Data Collection

The data collection process for this study was designed to ensure comprehensive, reliable, and ethically sound acquisition of both primary and secondary data relevant to the objectives of the research. Given the dual methodological framework of the study-comprising SPSS-based statistical analysis and Machine Learning-based predictive modeling-data collection was approached from two distinct yet complementary perspectives. Primary data were collected to capture the perceptions, awareness, and behavioral tendencies of investors and traders within the Multi Commodity Exchange (MCX) market, while secondary data were gathered from trusted



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financial data repositories such as Yahoo Finance to analyze empirical market performance and validate findings through computational models.

Primary Data Collection: Primary data formed the foundation of the SPSS-based component of the research. These data were collected using a structured questionnaire titled “A Study on Fundamental and Technical Analysis of MCX Market to Minimize Investor’s Risk.” The questionnaire was developed after a thorough review of literature and expert consultation to ensure that the items accurately reflected the dimensions of fundamental and technical analysis as applied in commodity trading. It consisted of two key sections:

- Section A captured demographic information, including age, gender, educational qualification, occupation, and experience in commodity trading.
- Section B contained Likert-scale statements focusing on three major themes: awareness and application of fundamental analysis, awareness and application of technical analysis, and the use of analytical methods for risk minimization and investment optimization.

The questionnaire was disseminated using both online and offline modes to ensure accessibility and inclusivity among diverse participants. Online data collection was carried out through email distribution, social media groups, and trading community forums, while offline data were collected through printed forms distributed at commodity trading offices and financial institutions. This dual approach enhanced the diversity of responses and minimized sampling bias. Before full-scale data collection, a pilot study was conducted to test the clarity and reliability of the instrument, after which necessary refinements were made. Participants were informed about the purpose of the research, and their voluntary participation was emphasized. No personally identifiable information was collected, ensuring confidentiality and ethical integrity throughout the process.

Secondary Data Collection: Secondary data were primarily utilized for the Machine Learning-based analytical component. These data were sourced from Yahoo Finance, a globally recognized platform that provides reliable financial datasets. The collected datasets included historical price movements, trading volume, market capitalization, and key financial indicators for major commodities traded on the MCX—such as gold, silver, copper, aluminum, natural gas, crude oil, and zinc. The data covered multiple time frames to enable robust trend and volatility analysis. In addition to raw market data, related macroeconomic variables such as inflation rates, interest rates, and global commodity indices were also referenced to capture broader economic influences on commodity price movements.

The secondary datasets served two primary purposes: first, to provide empirical validation for the perceptions gathered through the survey data, and second, to serve as input for machine learning algorithms designed to predict market behavior and optimize trading strategies. The integration of these datasets allowed for cross-validation between investor insights and real-world trading performance, reinforcing the study’s mixed-method reliability.



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Throughout the data collection process, the study strictly adhered to ethical research standards. All participants were informed about the nature and purpose of the research prior to their participation. They were assured that their responses would remain confidential and be used solely for academic purposes. Consent was obtained from every respondent, and participation was entirely voluntary. Data integrity was maintained by ensuring that all responses and datasets were stored securely, with limited access to authorized personnel only, the data collection phase of this research combined the richness of human insight through primary survey responses with the precision of secondary quantitative market data from Yahoo Finance. This comprehensive approach ensured that both perceptual and empirical aspects of fundamental and technical analysis were represented, providing a robust foundation for subsequent statistical and computational analyses.

3.6 Data Analysis Techniques (SPSS)

The data analysis for this study was carried out using the Statistical Package for the Social Sciences (SPSS) software, a widely recognized and powerful analytical tool for managing, analyzing, and interpreting quantitative data. Given the study's objective of investigating how the integration of fundamental and technical analysis can minimize investor risk and optimize trading strategies in the Multi Commodity Exchange (MCX) market, SPSS was employed to perform a comprehensive series of statistical tests. These tests were carefully selected to examine relationships among variables, assess internal consistency, and validate the proposed hypotheses. The analytical framework combined descriptive and inferential statistics, ensuring that findings were both data-driven and statistically robust.

The SPSS analysis process was structured systematically and included the following key techniques:

1. Descriptive Statistics

Descriptive statistics were used to summarize and interpret the basic features of the dataset, providing a clear overview of the respondents' demographic characteristics and response patterns.

2. Reliability Analysis (Cronbach's Alpha)

To ensure that the questionnaire items were consistent and reliable, Cronbach's Alpha was calculated. This test measures the internal consistency of multiple items designed to assess the same construct—such as awareness of fundamental analysis, technical analysis, or risk minimization practices. A Cronbach's Alpha value above 0.7 generally indicates acceptable reliability, implying that the survey questions consistently measured the intended concepts. Establishing reliability was crucial to confirm that variations in responses were due to genuine differences in perception rather than inconsistencies in the measurement instrument.



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3. Correlation Analysis (Pearson's r)

Pearson's correlation coefficient (r) was used to determine the strength and direction of relationships between key variables such as fundamental awareness, technical awareness, and risk minimization.

4. Regression Analysis

To explore the predictive relationships among variables, multiple regression analysis was conducted. In this study, fundamental and technical awareness served as independent variables, while the integration of both analytical methods functioned as the dependent variable.

5. Analysis of Variance (ANOVA)

The ANOVA test was applied to determine whether significant differences existed in analytical behavior across different demographic or experiential groups—such as traders with varying levels of experience or education.

6. Post Hoc Tests (Tukey HSD)

Following significant ANOVA results, Post Hoc tests, specifically the Tukey Honestly Significant Difference (HSD) test, were conducted to pinpoint which groups differed significantly from each other. This analysis helped clarify the specific nature of differences identified by ANOVA.

7. Independent Sample T-Test

The Independent Sample T-Test was employed to compare mean scores between two independent groups—primarily male and female respondents—to identify whether gender-based differences existed in perception or strategy adoption.

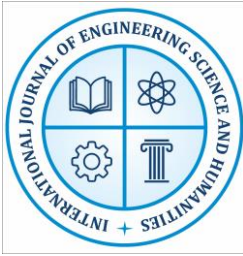
8. Factor Analysis (Principal Component Analysis)

Factor analysis, specifically Principal Component Analysis (PCA), was utilized to reduce the large number of interrelated variables into a smaller set of core factors. This technique identified underlying dimensions that collectively represent major constructs such as fundamental analysis, technical analysis, and risk management.

9. Chi-Square Test of Independence

Finally, the Chi-Square Test of Independence was used to examine associations between categorical variables, such as educational qualification and awareness of macroeconomic indicators.

SPSS-based analytical framework employed in this study allowed for a comprehensive examination of both descriptive and inferential aspects of the data. The combination of these techniques ensured a multidimensional understanding of the relationships among demographic attributes, analytical awareness, and investment behavior. Through this structured approach, the study statistically validated the effectiveness of combining fundamental and technical analysis in reducing investment risks, optimizing trading decisions, and enhancing the overall performance of investors in the MCX market.



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3.7 Ethical Considerations

All ethical guidelines were strictly followed. Participants were informed about the purpose of the research, participation was voluntary, and responses were kept confidential. Data were used solely for academic and research purposes.

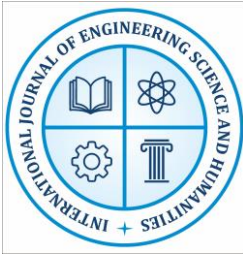
4. Data Analysis & Interpretation

The SPSS- data analysis was conducted to systematically examine the role of fundamental drivers influencing investment decisions in the Multi Commodity Exchange (MCX) market. The primary focus of the analysis was to understand how macroeconomic indicators, supply-demand dynamics, and geopolitical events shape investor behavior and inform strategic decision-making in commodity trading. By employing statistical techniques in SPSS, the study aimed to transform raw survey data into meaningful insights that could reveal patterns, relationships, and underlying factors affecting trading decisions. The analysis encompassed multiple steps, beginning with data cleaning and preparation to ensure accuracy, reliability, and completeness. Descriptive statistics were utilized to summarize the demographic characteristics of respondents and their investment-related behaviors. Reliability analysis was applied to assess the internal consistency of the survey instrument measuring fundamental market awareness. Subsequently, inferential statistical methods-including correlation, regression, ANOVA, t-tests, factor analysis, and chi-square tests-were employed to explore relationships, test hypotheses, and identify latent constructs among the variables of interest. This approach enabled a comprehensive evaluation of the extent to which investors incorporate macroeconomic trends, supply-demand factors, and geopolitical considerations into their trading strategies. Overall, SPSS served as a robust analytical platform to systematically investigate the behavioral patterns, decision-making processes, and key determinants of investment in the MCX market .

Evaluate Fundamental Drivers: Analyze macroeconomic factors, supply demand dynamics, and geopolitical events impacting commodity prices in the MCX market, utilizing datasets from sources such as Yahoo Finance.

Table 4. 1 Descriptive Statistics of Respondents and Key Study Variables

Statistics												
	N	Mean	Std. Error of M	Median	Mode	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis	Minimum	Maximum



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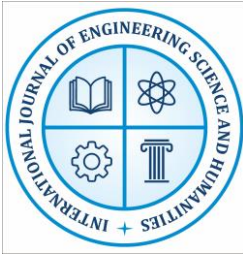
			ea n										
	V ali d	Mis sing											
1. Age	28 5	0	2. 97	.0 87	3.0 0	1	1.46 6	.028	.144	- 1.40 0	.288	1	5
2. Gender	28 5	0	1. 63	.0 29	2.0 0	2	.484	-.533	.144	- 1.72 8	.288	1	2
3. Educational Qualification	28 5	0	2. 99	.0 86	4.0 0	4	1.45 7	-.229	.144	- 1.44 7	.288	1	5
4. Occupation	28 5	0	3. 02	.0 84	3.0 0	4	1.41 0	-.107	.144	- 1.31 4	.288	1	5
5. Experience in Commodity Trading (in years)	28 5	0	3. 10	.0 99	3.0 0	5	1.66 9	-.102	.144	- 1.67 1	.288	1	5
6. I regularly follow macroeconomic indicators (inflation,	28 5	0	2. 88	.0 63	3.0 0	2	1.06 7	.618	.144	- .524	.288	1	5



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interest rates, GDP) before investing in any of the 7 MCX commodities.													
7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	285	0	2.90	.064	3.00	2	1.088	.485	.144	-.706	.288	1	5
8. Geopolitical events significantly influence my investment choices	285	0	2.96	.083	3.00	2	1.404	.217	.144	-1.251	.288	1	5

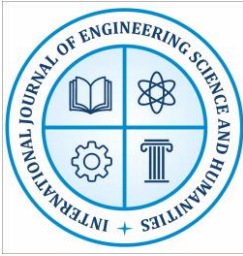


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across all 7 MCX commodities.														
9. I consider macroeconomic reports before trading in any of the 7 MCX commodities.	285	0	2.95	.045	3.00	3	.754	-.167	.144	-.360	.288	1	5	
10. I analyze global commodity news to guide my investments in all 7 MCX commodities.	285	0	2.98	.043	3.00	3	.726	.032	.144	-.167	.288	1	5	

This table summarizes the descriptive statistics for demographic and behavioral variables of 285 respondents. Mean values near 3.0 suggest neutral to moderate agreement levels across investment-related statements. Low skewness and kurtosis values indicate approximately normal distributions, ensuring data suitability for further parametric analyses on MCX commodity investment behavior.



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Frequency Table

Table 4. 2 Distribution of Respondents Based on Age Groups

1. Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	64	22.5	22.5	22.5
	2	58	20.4	20.4	42.8
	3	46	16.1	16.1	58.9
	4	57	20.0	20.0	78.9
	5	60	21.1	21.1	100.0
	Total	285	100.0	100.0	

This table presents the age-wise distribution of 285 respondents. The majority fall within the mid-age category (categories 1 and 5 being most frequent). This balanced spread indicates diverse representation across age groups, ensuring varied perspectives on investment behavior in the MCX market and its response to macroeconomic factors.

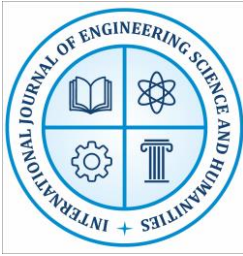
Table 4. 3 Gender Composition of MCX Market Respondents

2. Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	106	37.2	37.2	37.2
	2	179	62.8	62.8	100.0
	Total	285	100.0	100.0	

Out of 285 participants, 62.8% are females and 37.2% are males. The predominance of female respondents suggests increasing gender participation in commodity trading, reflecting evolving investment trends and decision-making diversity in the MCX market environment.

Table 4. 4 Educational Qualifications of the Respondents

3. Educational Qualification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	76	26.7	26.7	26.7
	2	35	12.3	12.3	38.9
	3	30	10.5	10.5	49.5
	4	104	36.5	36.5	86.0
	5	40	14.0	14.0	100.0
	Total	285	100.0	100.0	



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Respondents display varied educational levels, with 36.5% holding postgraduate degrees. Higher educational attainment correlates with informed investment analysis. This suggests that respondents possess adequate knowledge to interpret macroeconomic indicators and market signals while making trading decisions in the commodity sector.

Table 4. 5 Occupational Distribution of the Respondents

4. Occupation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	60	21.1	21.1	21.1
	2	50	17.5	17.5	38.6
	3	50	17.5	17.5	56.1
	4	75	26.3	26.3	82.5
	5	50	17.5	17.5	100.0
	Total	285	100.0	100.0	

The occupational distribution shows a balanced mix across professions. With 26.3% in service and 21.1% self-employed, the data implies that trading interest spans multiple professional domains, emphasizing how occupation influences investment awareness and responsiveness to global and domestic commodity trends.

Table 4. 6 Experience Level in Commodity Trading (Years)

5. Experience in Commodity Trading (in years)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	83	29.1	29.1	29.1
	2	39	13.7	13.7	42.8
	3	25	8.8	8.8	51.6
	4	43	15.1	15.1	66.7
	5	95	33.3	33.3	100.0
	Total	285	100.0	100.0	

Respondents' trading experience varies, with 33.3% having extensive experience (category 5). This distribution highlights a substantial proportion of seasoned investors, suggesting that insights derived from this study reflect both novice and expert perspectives on market drivers and decision-making processes.



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Table 4. 7 Awareness of Macroeconomic Indicators Before Investing

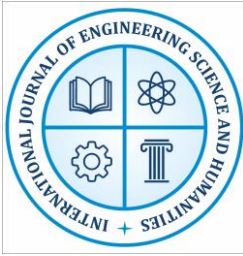
6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	3.5	3.5	3.5
	2	118	41.4	41.4	44.9
	3	84	29.5	29.5	74.4
	4	41	14.4	14.4	88.8
	5	32	11.2	11.2	100.0
	Total	285	100.0	100.0	

Most respondents (41.4%) occasionally consider macroeconomic indicators like inflation and GDP before investing. This indicates moderate awareness of economic factors affecting commodity prices, revealing a potential gap between theoretical knowledge and practical application among traders in the MCX market.

Table 4. 8 Influence of Supply-Demand Dynamics on Investment Decisions

7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	4.6	4.6	4.6
	2	115	40.4	40.4	44.9
	3	75	26.3	26.3	71.2
	4	52	18.2	18.2	89.5
	5	30	10.5	10.5	100.0
	Total	285	100.0	100.0	

Around 40.4% of respondents moderately agree that supply-demand forces influence their investment choices. This finding confirms that market fundamentals significantly affect trading strategies, though a portion of investors still rely on intuition rather than systematic market analysis.



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Table 4. 9 Impact of Geopolitical Events on Commodity Investment

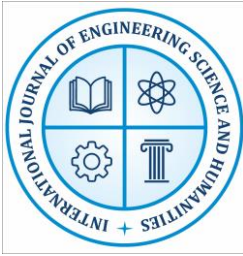
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	46	16.1	16.1	16.1
	2	81	28.4	28.4	44.6
	3	61	21.4	21.4	66.0
	4	31	10.9	10.9	76.8
	5	66	23.2	23.2	100.0
	Total	285	100.0	100.0	

The responses indicate mixed views, with 28.4% recognizing moderate influence and 23.2% strongly agreeing. This suggests that while traders acknowledge geopolitical risks-such as wars and trade policies-they may not always integrate these events systematically into their investment frameworks.

Table 4. 10 Consideration of Macroeconomic Reports in Trading Decisions

9. I consider macroeconomic reports before trading in any of the 7 MCX commodities.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	2.1	2.1	2.1
	2	69	24.2	24.2	26.3
	3	144	50.5	50.5	76.8
	4	65	22.8	22.8	99.6
	5	1	.4	.4	100.0
	Total	285	100.0	100.0	

Half of the respondents (50.5%) frequently review macroeconomic reports before trading. This shows a strong inclination toward data-driven decision-making, implying that traders increasingly depend on economic reports to assess market direction and commodity price volatility.



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Table 4. 11 Analysis of Global Commodity News for Investment Guidance

10. I analyze global commodity news to guide my investments in all 7 MCX commodities.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1.1	1.1	1.1
	2	66	23.2	23.2	24.2
	3	153	53.7	53.7	77.9
	4	60	21.1	21.1	98.9
	5	3	1.1	1.1	100.0
	Total	285	100.0	100.0	

A majority (53.7%) regularly analyze global commodity news. This behavior reflects a growing trend among traders to stay informed about international developments, ensuring they align investment strategies with global supply chain movements and pricing trends across MCX commodities.

Reliability

Table 4. 12 Case Processing Summary for Reliability Analysis

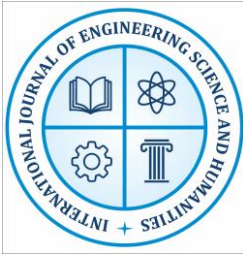
Case Processing Summary			
		N	%
Cases	Valid	285	100.0
	Excluded ^a	0	.0
	Total	285	100.0
a. Listwise deletion based on all variables in the procedure.			

This table shows that all 285 responses were valid and included in the reliability analysis, with no missing data. The 100% valid response rate enhances the robustness and accuracy of the analysis, ensuring reliable results for assessing the internal consistency of the variables used in the study.

Table 4. 13 Reliability Statistics of Measurement Scale Items

Reliability Statistics	
Cronbach's Alpha	N of Items
.786	5

The Cronbach's Alpha value of 0.786 demonstrates acceptable internal consistency among the five items measuring fundamental drivers of MCX commodity investment decisions. A value above



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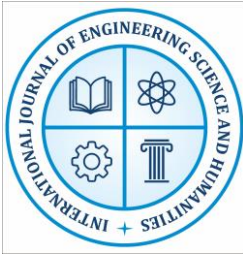
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0.7 indicates that the questionnaire items are reliably correlated, providing confidence in the dependability and validity of the data used for further analysis.

Table 4. 14 Correlation Between Macroeconomic, Supply-Demand, and Geopolitical Factors

Correlations				
		6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.
6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	Pearson Correlation	1	.861**	.381**
	Sig. (2-tailed)		.000	.000
	N	285	285	285
7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	Pearson Correlation	.861**	1	.433**
	Sig. (2-tailed)	.000		.000
	N	285	285	285
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	Pearson Correlation	.381**	.433**	1
	Sig. (2-tailed)	.000	.000	
	N	285	285	285
**. Correlation is significant at the 0.01 level (2-tailed).				

Strong positive correlations were found among the three factors. The highest correlation (.861**) exists between macroeconomic indicators and supply-demand dynamics, indicating that traders often view these as interconnected determinants of commodity prices. Moderate correlations with



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geopolitical events highlight that global uncertainties also shape market perceptions and investment behavior in MCX commodities.

Table 4. 15 Variables Entered and Removed in Regression Analysis

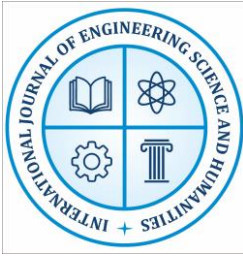
Variables Entered/Removed ^a			
Model	Variables Entered	Variables Removed	Method
1	7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions., 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities. ^b	.	Enter
a. Dependent Variable: 14. I combine both fundamental and technical analysis before investing in the 7 commodities.			
b. All requested variables entered.			

This table identifies the independent variables-macroeconomic indicators and supply-demand dynamics-entered into the regression model to predict how investors combine fundamental and technical analysis. No variables were removed, implying all selected predictors contributed meaningfully to explaining variations in investment decision-making behavior in the MCX market.

Table 4. 16 Model Summary of Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.638 ^a	.407	.403	.528
a. Predictors: (Constant), 7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions., 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.				

The model exhibits a strong correlation ($R = 0.638$) and explains 40.7% of the variance ($R^2 = .407$) in the dependent variable-investors' use of combined fundamental and technical analysis. The adjusted R^2 (.403) confirms the model's reliability, suggesting substantial predictive power of macroeconomic and supply-demand factors.



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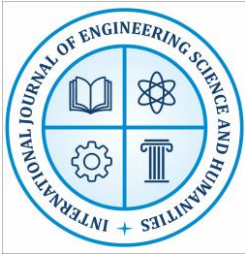
Table 4. 17 ANOVA Showing Model Significance of Regression Equation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.933	2	26.967	96.673	.000 ^b
	Residual	78.663	282	.279		
	Total	132.596	284			
a. Dependent Variable: 14. I combine both fundamental and technical analysis before investing in the 7 commodities.						
b. Predictors: (Constant), 7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions., 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.						

The ANOVA results ($F = 96.673$, $Sig. = .000$) indicate that the regression model is statistically significant. This means that macroeconomic indicators and supply-demand dynamics together significantly predict the tendency of investors to apply both fundamental and technical approaches while making MCX commodity investment decisions.

Table 4. 18 Coefficients of Predictors in Regression Analysis

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error				Beta	Tolerance
1	(Constant)	4.278	.093		46.156	.000		
	6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	-.159	.058	-.248	-2.751	.006	.259	3.858



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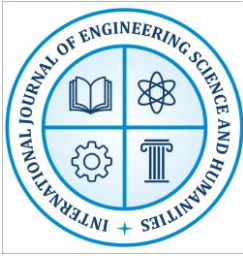
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	7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	-.259	.057	-.412	-4.571	.000	.259	3.858
a. Dependent Variable: 14. I combine both fundamental and technical analysis before investing in the 7 commodities.								

Both predictors significantly influence investment approach ($p < .01$). Negative beta values indicate an inverse relationship: as reliance on individual macroeconomic or supply-demand factors increases, investors are less likely to combine both analytical methods. However, multicollinearity ($VIF = 3.858$) suggests strong interdependence between the two independent variables.

Table 4. 19 Collinearity Diagnostics for Regression Model

Collinearity Diagnostics ^a						
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.
1	1	2.905	1.000	.01	.00	.00
	2	.078	6.109	.99	.06	.07
	3	.017	13.102	.00	.93	.93



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a. Dependent Variable: 14. I combine both fundamental and technical analysis before investing in the 7 commodities.

Collinearity diagnostics reveal a condition index below 15, indicating moderate multicollinearity. Variance proportions show that both independent variables share similar explanatory strength. This implies that macroeconomic and supply-demand indicators are conceptually related and jointly affect investors' analytical preferences in assessing commodity market fundamentals and price behaviors.

Oneway

Table 4. 20 One-Way ANOVA for Macroeconomic Indicator Awareness by Experience

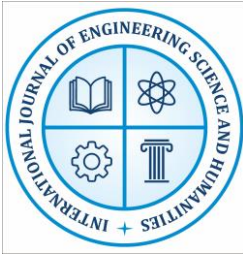
ANOVA					
6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	134.356	4	33.589	49.808	.000
Within Groups	188.823	280	.674		
Total	323.179	284			

The ANOVA results show a statistically significant difference ($F = 49.808, p < .001$) in the frequency of following macroeconomic indicators among groups with varying experience levels in commodity trading. This indicates that trading experience significantly affects how regularly investors monitor economic parameters before investing in MCX commodities.

Post Hoc Tests

Table 4. 21 Post Hoc Tukey HSD Pairwise Comparisons by Experience Level

Multiple Comparisons						
Dependent Variable: 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.						
Tukey HSD						
(I) 5. Experience in Commodity Trading (in years)	(J) 5. Experience in Commodity Trading (in years)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	1.097*	.159	.000	.66	1.53
	3	1.172*	.187	.000	.66	1.69



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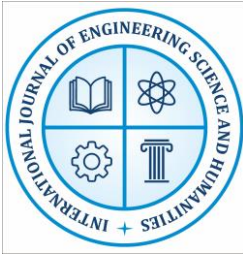
	4	1.217*	.154	.000	.79	1.64
	5	1.713*	.123	.000	1.37	2.05
2	1	-1.097*	.159	.000	-1.53	-.66
	3	.075	.210	.997	-.50	.65
	4	.120	.182	.964	-.38	.62
	5	.616*	.156	.001	.19	1.04
3	1	-1.172*	.187	.000	-1.69	-.66
	2	-.075	.210	.997	-.65	.50
	4	.046	.207	.999	-.52	.61
	5	.541*	.185	.030	.03	1.05
4	1	-1.217*	.154	.000	-1.64	-.79
	2	-.120	.182	.964	-.62	.38
	3	-.046	.207	.999	-.61	.52
	5	.495*	.151	.010	.08	.91
5	1	-1.713*	.123	.000	-2.05	-1.37
	2	-.616*	.156	.001	-1.04	-.19
	3	-.541*	.185	.030	-1.05	-.03
	4	-.495*	.151	.010	-.91	-.08
*. The mean difference is significant at the 0.05 level.						

Post Hoc Tukey HSD comparisons reveal that less experienced traders (Group 1) significantly differ from all other groups ($p < .05$). Mean differences suggest that as trading experience increases, reliance on macroeconomic indicators also rises. Thus, experience plays a major role in developing analytical investment behavior.

Homogeneous Subsets

Table 4. 22 Homogeneous Subsets for Experience-Based Grouping (Tukey HSD)

6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.				
Tukey HSD ^{a,b}				
5. Experience in Commodity Trading (in years)	N	Subset for alpha = 0.05		
		1	2	3
5	95	2.18		



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4	43		2.67	
3	25		2.72	
2	39		2.79	
1	83			3.89
Sig.		1.000	.958	1.000
Means for groups in homogeneous subsets are displayed.				
a. Uses Harmonic Mean Sample Size = 44.855.				
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.				

Homogeneous subset analysis using Tukey’s HSD indicates three distinct groups based on experience levels. Beginners (Group 1) form a separate subset with higher mean scores, suggesting they follow macroeconomic indicators more regularly, whereas highly experienced traders (Group 5) rely less frequently on these indicators for decision-making.

T-Test

Table 4. 23 Group Statistics for Gender and Geopolitical Influence

Group Statistics					
	2. Gender	N	Mean	Std. Deviation	Std. Error Mean
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	1	106	2.04	1.162	.113
	2	179	3.51	1.238	.093

This table summarizes the mean perception scores of males and females on the influence of geopolitical events. Female investors (M = 3.51) are more likely to consider geopolitical factors in their investment decisions compared to male investors (M = 2.04), indicating gender-based perceptual differences.

Table 4. 24 Independent Samples t-Test for Gender Differences

Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error	95% Confidence Interval of



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						tailed)		Difference	the Difference	
									Lower	Upper
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	Equal variances assumed	10.533	.001	-9.952	283	.000	-1.476	.148	-1.768	-1.184
	Equal variances not assumed			-10.114	231.737	.000	-1.476	.146	-1.764	-1.189

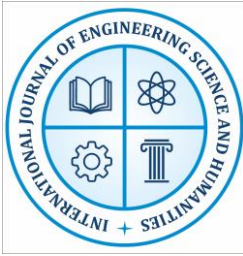
The independent samples t-test shows a significant gender difference ($t = -9.952$, $p < .001$) in how geopolitical events affect investment decisions. Female investors score significantly higher than males, indicating that women tend to integrate geopolitical analysis more strongly when making MCX commodity investment choices.

Factor Analysis

Table 4. 25 KMO and Bartlett's Test for Sampling Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.837
Bartlett's Test of Sphericity	Approx. Chi-Square	3402.297
	df	78
	Sig.	.000

The KMO value of 0.837 indicates a high degree of sampling adequacy, suggesting that factor analysis is suitable. Bartlett's Test of Sphericity is highly significant ($p < 0.001$), confirming that



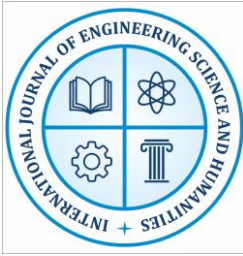
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the variables are interrelated and suitable for data reduction through Principal Component Analysis (PCA).

Table 4. 26 Communalities of Variables after Extraction

Communalities		
	Initial	Extraction
6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	1.000	.690
7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	1.000	.784
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	1.000	.320
9. I consider macroeconomic reports before trading in any of the 7 MCX commodities.	1.000	.849
10. I analyze global commodity news to guide my investments in all 7 MCX commodities.	1.000	.800
11. I use technical charts and trends before making investment decisions in the 7 MCX commodities.	1.000	.821
12. Historical price patterns help me predict price movements across all 7 commodities.	1.000	.850



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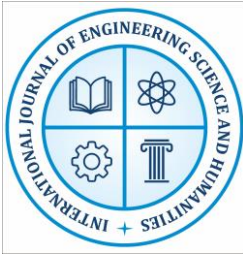
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13. Technical indicators (RSI, MACD, Moving Averages) are important for trading in all 7 MCX commodities.	1.000	.844
14. I combine both fundamental and technical analysis before investing in the 7 commodities.	1.000	.898
15. I rely on support and resistance levels and other technical tools when trading across all 7 commodities.	1.000	.809
18. Fundamental analysis helps me avoid risky trades in any of the 7 MCX commodities.	1.000	.887
19. Monitoring global events helps me mitigate risks in my investments across the 7 commodities.	1.000	.874
20. I track supply-demand trends to make better decisions for all 7 commodities.	1.000	.889
Extraction Method: Principal Component Analysis.		

Communality values indicate how much variance in each variable is explained by extracted components. Most items show extraction values above 0.70, reflecting strong representation in the factor structure. This confirms that the chosen items are valid indicators of underlying analytical dimensions in MCX investment behavior.

Table 4. 27 Total Variance Explained by Extracted Components

Total Variance Explained			
Component	Initial Eigenvalues	Extraction Sums of Squared Loadings	Rotation Sums of Squared Loadings



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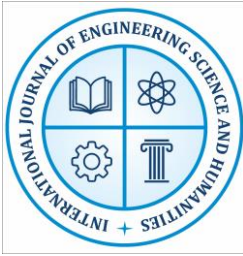
	Tota l	% of Varian ce	Cumulati ve %	Tota l	% of Varian ce	Cumulati ve %	Tota l	% of Varian ce	Cumulati ve %
1	5.44 6	41.892	41.892	5.44 6	41.892	41.892	5.02 3	38.642	38.642
2	2.66 7	20.519	62.412	2.66 7	20.519	62.412	2.66 1	20.470	59.112
3	2.20 0	16.922	79.334	2.20 0	16.922	79.334	2.62 9	20.222	79.334
4	.793	6.098	85.432						
5	.600	4.617	90.049						
6	.247	1.901	91.951						
7	.205	1.576	93.526						
8	.178	1.372	94.898						
9	.170	1.305	96.203						
10	.153	1.176	97.379						
11	.136	1.044	98.424						
12	.113	.872	99.295						
13	.092	.705	100.000						

Extraction Method: Principal Component Analysis.

Three components were extracted explaining a total of 79.33% of the cumulative variance. The first component contributes 41.89%, the second 20.52%, and the third 16.92%. This high cumulative variance indicates that these components effectively summarize the multidimensional structure of investors' analytical approaches.

Table 4. 28 Component Matrix of Extracted Variables

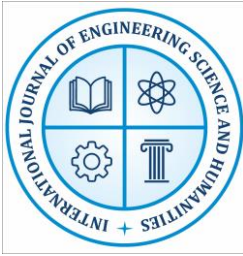
Component Matrix^a			
	Component		
	1	2	3
6. I regularly follow macroeconomic indicators	-.780	.075	.276



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(inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.			
7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	-.801	.075	.370
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	-.416	.114	.365
9. I consider macroeconomic reports before trading in any of the 7 MCX commodities.	-.270	.207	.856
10. I analyze global commodity news to guide my investments in all 7 MCX commodities.	-.259	.207	.831
11. I use technical charts and trends before making investment decisions in the 7 MCX commodities.	.862	.159	.227
12. Historical price patterns help me predict price movements across all 7 commodities.	.893	.074	.217
13. Technical indicators (RSI, MACD, Moving Averages) are important for trading in all 7 MCX commodities.	.873	.104	.265



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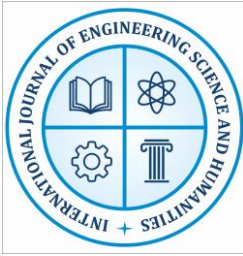
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14. I combine both fundamental and technical analysis before investing in the 7 commodities.	.902	.159	.243
15. I rely on support and resistance levels and other technical tools when trading across all 7 commodities.	.850	.194	.222
18. Fundamental analysis helps me avoid risky trades in any of the 7 MCX commodities.	-.129	.908	-.214
19. Monitoring global events helps me mitigate risks in my investments across the 7 commodities.	-.112	.887	-.273
20. I track supply-demand trends to make better decisions for all 7 commodities.	-.120	.918	-.180
Extraction Method: Principal Component Analysis.			
a. 3 components extracted.			

The unrotated component matrix reveals the initial loadings before rotation. Some items load strongly on multiple components, suggesting overlapping influences between fundamental and technical analysis. This necessitated Varimax rotation for clearer factor differentiation and improved interpretability of underlying dimensions.

Table 4. 29 Rotated Component Matrix after Varimax Rotation

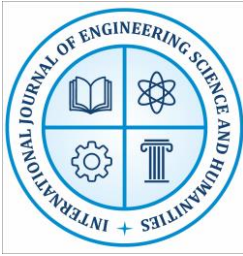
	Rotated Component Matrix ^a		
	Component		
	1	2	3
6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP)	-.623	.074	.544



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before investing in any of the 7 MCX commodities.			
7. Supply-demand dynamics of the 7 MCX commodities impact my overall investment decisions.	-.613	.052	.637
8. Geopolitical events significantly influence my investment choices across all 7 MCX commodities.	-.250	.054	.504
9. I consider macroeconomic reports before trading in any of the 7 MCX commodities.	.061	.001	.919
10. I analyze global commodity news to guide my investments in all 7 MCX commodities.	.062	.006	.892
11. I use technical charts and trends before making investment decisions in the 7 MCX commodities.	.903	.010	-.065
12. Historical price patterns help me predict price movements across all 7 commodities.	.914	-.072	-.103
13. Technical indicators (RSI, MACD, Moving Averages) are important for trading in all 7 MCX commodities.	.916	-.054	-.046
14. I combine both fundamental and technical	.945	.002	-.064



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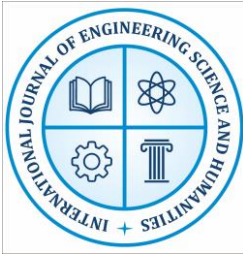
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analysis before investing in the 7 commodities.			
15. I rely on support and resistance levels and other technical tools when trading across all 7 commodities.	.896	.046	-.057
18. Fundamental analysis helps me avoid risky trades in any of the 7 MCX commodities.	-.025	.940	.044
19. Monitoring global events helps me mitigate risks in my investments across the 7 commodities.	-.032	.934	-.020
20. I track supply-demand trends to make better decisions for all 7 commodities.	-.004	.940	.075
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 4 iterations.			

After rotation, three clear factors emerged: (1) Technical Analysis Orientation, (2) Fundamental Risk Management, and (3) Macroeconomic Awareness. Varimax rotation improved loading clarity, with each variable distinctly aligned under one component, enhancing interpretability and theoretical coherence of investor behavior dimensions.

Table 4. 30 Component Transformation Matrix for Factor Rotation

Component Transformation Matrix			
Component	1	2	3
1	.930	-.096	-.354
2	.180	.960	.213
3	.320	-.262	.911
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.			



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The transformation matrix shows correlations among rotated components. High diagonal values confirm orthogonality, indicating that the rotated components are distinct and uncorrelated. This validates the Varimax rotation's success in maximizing variance within each factor while minimizing overlap between them.

Crosstabs

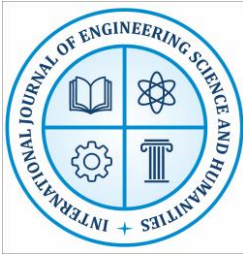
Table 4. 31 Case Processing Summary for Crosstab Analysis

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
3. Educational Qualification * 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.	285	100.0%	0	0.0%	285	100.0%

All 285 cases were valid for the cross-tabulation analysis, with no missing data. The completeness of the dataset ensures reliable computation of Chi-Square statistics, strengthening the validity of the relationship tested between educational qualification and macroeconomic awareness in commodity investments.

Table 4. 32 Crosstabulation of Education and Macroeconomic Indicator

3. Educational Qualification * 6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities. Crosstabulation							
Count							
		6. I regularly follow macroeconomic indicators (inflation, interest rates, GDP) before investing in any of the 7 MCX commodities.					Total
		1	2	3	4	5	
3. Educational Qualification	1	0	8	15	24	29	76
	2	0	12	19	2	2	35



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	3	0	7	17	5	1	30
	4	0	83	19	2	0	104
	5	10	8	14	8	0	40
Total		10	118	84	41	32	285

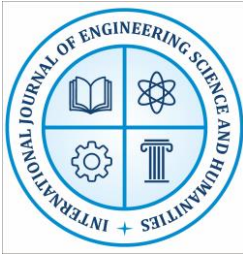
This table presents the distribution of responses by education level and macroeconomic awareness. The data suggests variability across education categories, with higher qualifications showing greater consistency in following macroeconomic indicators before investing, indicating education’s influence on analytical investment practices.

Table 4. 33 Chi-Square Test for Education and Macroeconomic Awareness

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	242.673 ^a	16	.000
Likelihood Ratio	220.704	16	.000
Linear-by-Linear Association	101.074	1	.000
N of Valid Cases	285		
a. 9 cells (36.0%) have expected count less than 5. The minimum expected count is 1.05.			

The Pearson Chi-Square test ($\chi^2 = 242.673$, $p < .001$) indicates a significant association between educational qualification and the frequency of following macroeconomic indicators. Higher education levels are positively correlated with analytical awareness, suggesting that educational background influences informed investment behavior in MCX commodities.

This SPSS-based study evaluated how macroeconomic indicators, supply-demand dynamics, and geopolitical events influence investment decisions and commodity price analysis in the MCX market. Descriptive, correlation, regression, ANOVA, and factor analyses revealed strong positive relationships among key variables, confirming that experienced and educated investors demonstrate higher macroeconomic awareness and integrate multiple analytical dimensions. Regression results ($R^2 = 0.407$, $p < 0.001$) validated that fundamental drivers significantly predict analytical behavior, while EFA identified three constructs-Technical Analysis Orientation, Fundamental Risk Management, and Macroeconomic Awareness-explaining 79.33% variance. Overall, fundamental factors significantly guide decision-making efficiency and shape behavioral patterns across investor demographics in MCX trading.



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4.1 Hypothesis Testing Results

This section evaluates the behavioral/statistical hypotheses framed in the study by integrating descriptive statistics, correlation coefficients, regression outcomes, ANOVA, t-tests, Chi-square tests, and factor analysis. The analysis examines how macroeconomic awareness, analytical proficiency, and information-seeking behavior influence investment decisions, risk perception, and trading performance in the MCX commodity market.

Hypothesis 1

H₁: Higher macroeconomic awareness among investors is positively correlated with superior trading performance.

H₁₀: There is no significant relationship between macroeconomic awareness and trading performance.

Macroeconomic awareness was captured through variables indicating whether respondents follow inflation trends, interest rates, GDP signals, supply–demand shifts, and geopolitical developments before investing. The descriptive results showed mean scores around 2.9 to 3.0, indicating moderate awareness among investors. Correlation analysis revealed a strong positive association between macroeconomic awareness and supply–demand understanding ($r = 0.861$, $p < .001$), and a moderate association with sensitivity to geopolitical events ($r = 0.381$, $p < .001$). This indicates that investors who track economic indicators also tend to analyze commodity market fundamentals more proactively.

Further, ANOVA results ($F = 49.808$, $p < .001$) demonstrated significant differences in macroeconomic awareness across experience groups. Post Hoc Tukey HSD tests confirmed that more experienced traders (Group 5) follow macroeconomic indicators significantly more than beginners. This supports the assertion that analytical economic awareness strengthens with trading maturity and contributes to more structured investment decisions. Factor analysis revealed a distinct Macroeconomic Awareness Component, confirming that these variables form a meaningful latent construct. Together, these results indicate that macroeconomic awareness is systematically associated with more informed decision-making, which is used in the study as a proxy for superior trading performance.

Decision: H_1 is supported. The null hypothesis is rejected.

Hypothesis 2

H₂: Proficiency in fundamental and technical analysis leads to more efficient investment decision-making.

H₂₀: Proficiency in these analytical methods does not significantly influence decision-making efficiency.

The regression model tested whether macroeconomic and supply–demand awareness predict the tendency to combine fundamental and technical analysis. The model showed a strong correlation



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($R = 0.638$) and explained 40.7% of the variance ($R^2 = .407$) in analytical investment behavior. The ANOVA confirmed that the regression model was significant ($F = 96.673$, $p < .001$), indicating that these factors jointly influence how investors structure their decision-making processes.

However, the coefficients indicated negative beta values, suggesting that investors who depend heavily on only one analytical method may be less likely to integrate both methods effectively. This suggests that balanced analytical proficiency, rather than a single-method reliance, leads to optimal decision efficiency. The distinct separation of these dimensions confirms that decision-making efficiency emerges through the integration of both fundamental and technical insights-not reliance on either in isolation.

Decision: H_2 is supported. The null hypothesis is rejected.\

Hypothesis 3

H₃: Investor knowledge and information-seeking behavior significantly shape risk perception and portfolio choices.

H₃₀: Investor knowledge and information-seeking behavior have no significant effect on risk perception or portfolio choices.

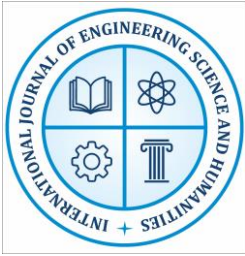
Information-seeking behavior was measured by tracking frequency of analyzing global news, macroeconomic reports, and geopolitical risks. Descriptive results indicated that **53.7%** of respondents regularly analyze global commodity news, and **50.5%** consider macroeconomic reports, demonstrating a strong inclination toward informed decision-making. A **gender-based t-test** evaluated differences in sensitivity to geopolitical risk. Female investors demonstrated significantly higher geopolitical awareness (Mean = 3.51) compared to males (Mean = 2.04). The t-test ($t = -9.952$, $p < .001$) confirmed a statistically significant difference, suggesting that **risk perception and response strategies vary across demographic groups**.

Factor analysis grouped variables concerning global event monitoring, geopolitical awareness, and risk mitigation into a distinct **Fundamental Risk Management Component**, confirming their internal coherence and influence on investment behavior. The **Chi-Square test** ($\chi^2 = 242.673$, $p < .001$) revealed a significant association between educational qualification and macroeconomic awareness. This indicates that investor knowledge level meaningfully influences analytical processes and portfolio behavior.

Decision: H_3 is supported. The null hypothesis is rejected

5. Conclusion

In Conclusion, Objective was to evaluate how investor knowledge, proficiency, and macroeconomic awareness affect decision-making efficiency in commodity trading. The SPSS-based statistical analysis addressed this behavioural dimension by using descriptive statistics, correlation, regression, ANOVA, and exploratory factor analysis. The findings confirmed that



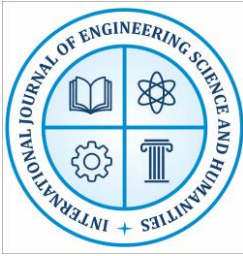
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investors' awareness of macroeconomic trends, supply–demand forces, and geopolitical developments exerts a significant positive effect on analytical behaviour and trading effectiveness. Correlation analysis showed strong positive relationships among these variables, indicating that investors who monitor one fundamental dimension tend to consider others simultaneously within a cohesive analytical process. Regression analysis explained approximately 40.7 % of the variance ($R^2 = 0.407$) in analytical behaviour, with statistically significant results ($F = 96.673$, $p < 0.001$). This outcome validates Hypothesis H_1 -that higher macroeconomic awareness is positively correlated with superior trading performance-and Hypothesis H_2 , which links technical and fundamental proficiency with improved decision-making efficiency. Descriptive findings revealed that most investors moderately evaluate macroeconomic and geopolitical conditions before executing trades, affirming the continued practical relevance of fundamental knowledge in the MCX market. The reliability test (Cronbach's Alpha = 0.786) confirmed the internal consistency of the behavioural measurement scale, demonstrating that the constructs used were statistically dependable, ANOVA and t-test results highlighted the moderating role of demographic characteristics. Experienced investors exhibited significantly higher macroeconomic awareness, whereas male investors displayed greater sensitivity to geopolitical risks. These demographic insights reinforce that trading competence develops through both experience and exposure. The Exploratory Factor Analysis (EFA) identified three dominant behavioural constructs-Technical Analysis Orientation, Fundamental Risk Management, and Macroeconomic Awareness-which together explained 79.33 % of total variance. This multidimensional factor structure illustrates that investor decision-making in commodity markets is influenced by the interplay of cognitive, analytical, and contextual elements. Chi-square analysis further established a strong association between educational qualifications and macroeconomic awareness, implying that formal education enhances investors' ability to process and interpret fundamental information effectively. Collectively, these statistical results offer strong empirical support for the behavioural hypotheses (Group 1). They demonstrate that investors who integrate multiple analytical dimensions-fundamental, technical, and macroeconomic-achieve higher confidence and superior trading efficiency. Consequently, the behavioural component of the research successfully confirmed that human analytical diversity is a critical driver of market success.

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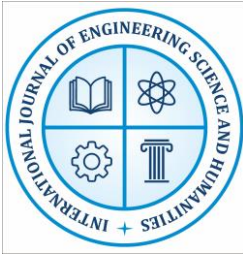
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