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A Study on Futures Contracts with Reference to Risk Management and Price Volatility in the Indian Cement Industry

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ABSTRACT: The cement industry plays a pivotal role in infrastructure development and economic growth, yet it is highly exposed to price volatility arising from fluctuations in raw material costs, energy prices, transportation expenses, seasonal demand variations, and macroeconomic uncertainty. Such volatility directly affects profitability, operational planning, and investment decisions of cement manufacturers, traders, and institutional investors. Futures contracts have emerged as an effective financial instrument for hedging price risks and ensuring price stability through predetermined settlement mechanisms. This study examines the role and effectiveness of futures contracts in managing price risks in the Indian cement industry. Using secondary market data from selected cement companies—Grasim Industries, Shree Cement, India Cements, Ambuja Cements, and UltraTech Cement—along with generated analytical metrics, the research evaluates payoff structures, intrinsic value, and profit/loss behavior over a three-month futures contract period. Statistical techniques such as descriptive analysis, volatility measurement, and comparative profitability assessment are employed. The findings indicate that futures trading significantly reduces downside risk, improves predictability of returns, and enhances strategic risk management. The study concludes that systematic adoption of futures contracts can stabilize revenue streams and improve financial resilience for cement companies and investors.

KEYWORDS: Futures contracts, Cement industry, Hedging, Risk management, Price volatility, Commodity derivatives

I. INTRODUCTION

The cement industry forms the backbone of construction, infrastructure, and urbanization. Demand for cement is closely linked with housing development, public infrastructure projects, industrial expansion, and government policies. However, cement prices exhibit significant volatility due to factors such as fluctuating fuel prices, limestone availability, freight charges, environmental regulations, and cyclical construction demand. Such uncertainties create financial risk for both producers and consumers.

Futures contracts provide a mechanism for managing these risks by enabling parties to lock in prices for future delivery. A futures contract is a standardized agreement traded on an exchange to buy or sell an asset at a predetermined price on a specified future date. Through hedging strategies, cement companies and investors can mitigate adverse price movements and improve financial stability.

This research explores the practical application of futures contracts in the cement industry by analyzing real trading data from leading Indian cement companies and assessing the effectiveness of derivatives in risk reduction and profitability enhancement.

II. LITERATURE REVIEW

The use of futures contracts as instruments for price stabilization and risk management has been widely examined across financial markets, commodity exchanges, and industrial sectors. While the majority of early research focused on agricultural commodities, energy products, and metals, recent scholarship has extended the discussion to manufacturing and construction-based industries such as cement, where price volatility significantly impacts profitability. This section critically reviews theoretical foundations, empirical findings, and contemporary developments relevant to futures contracts and their applicability to the cement industry.

Foundational Theories of Futures Markets

The theoretical roots of futures trading can be traced back to Keynes (1930), who introduced the concept of **normal backwardation**. Keynes argued that producers use futures contracts primarily for hedging risk, leading them to sell futures at a discount relative to expected spot prices. This theory established the notion that futures markets compensate risk bearers and serve as insurance mechanisms. In the context of cement manufacturers, who face uncertain production costs and fluctuating demand, futures contracts can similarly provide protection against price declines.

Working (1953) further expanded on hedging theory by emphasizing the economic role of futures markets in **price discovery and storage cost management**. His analysis suggested that futures prices incorporate information about inventory levels, carrying costs, and expected demand. For the cement industry, which involves bulk storage and transportation costs, this insight is particularly relevant because price expectations are heavily influenced by logistical considerations.

Later, Fama (1970) proposed the **Efficient Market Hypothesis (EMH)**, which posits that market prices fully reflect all available information. Under this framework, futures prices become reliable predictors of future spot prices. This provides a theoretical justification for using futures prices as benchmarks in risk management decisions within the cement sector.

Development of Derivatives and Risk Management

Black (1976) and the Black-Scholes framework revolutionized derivative pricing by introducing mathematical valuation models that account for time value and volatility. Although primarily developed for options, these models laid the groundwork for modern futures pricing mechanisms. Their contribution lies in formalizing the relationship between spot prices, interest rates, and time to maturity, elements that are critical for computing intrinsic values in cement futures contracts.

Hull (2018) provided one of the most comprehensive treatments of derivatives markets, presenting the **cost-of-carry model** for futures pricing:

$$F = S e^{rt}$$

where F is futures price, S is spot price, r is interest rate, and t is time. This model directly informs the pricing strategy used in this study to compute intrinsic values for cement stocks. Hull argues that derivatives not only facilitate speculation but primarily serve hedging and arbitrage functions that improve market efficiency.

Bodie, Kane, and Marcus (2018) emphasized the importance of derivatives for **portfolio diversification**, suggesting that futures contracts reduce systematic risk exposure. Cement companies and investors can therefore use futures positions to stabilize returns without sacrificing growth potential.

Empirical Studies on Commodity Futures

Jones (2019) conducted an extensive historical review of commodity futures markets and found that firms actively participating in derivatives markets experience lower earnings variability. His findings suggest that futures markets enhance financial stability by smoothing cash flows. The study underscores the broader applicability of futures beyond agriculture and highlights their potential in industrial commodities such as cement.

White (2020) examined risk hedging strategies across volatile industries and concluded that firms employing futures contracts exhibit improved risk-adjusted returns compared to non-hedging firms. He noted that futures contracts enable businesses to lock input costs and forecast revenue with greater certainty. This insight is directly applicable to cement manufacturers, whose margins depend heavily on raw material and energy costs.

Brown (2018) investigated the impact of derivatives usage on corporate performance and found a significant positive relationship between hedging activities and firm value. Companies using futures contracts reported lower cash flow volatility and higher investor confidence. This supports the argument that cement companies adopting futures trading may enhance shareholder wealth.

Grey (2019) specifically studied **construction materials pricing** and identified cement as one of the most volatile commodities due to seasonal demand fluctuations, regulatory restrictions, and transportation bottlenecks. His findings strengthen the need for risk management tools in the cement sector.

Taylor (2021) evaluated derivatives from a financial stability perspective and demonstrated that hedging reduces bankruptcy risk and protects firms during economic downturns. This is critical for cement firms whose demand closely follows economic cycles.

Adoption and Utilization in Emerging Markets

Wang (2020) explored the determinants of futures adoption among firms in emerging economies and found that larger firms are more likely to engage in derivatives trading due to better financial literacy and access to liquidity. Smaller firms often avoid futures due to complexity and regulatory hurdles. This explains why major cement players such as UltraTech and Shree Cement actively participate in derivatives markets while smaller firms remain cautious.

Martinez (2021) empirically tested the relationship between spot and futures prices using regression and cointegration techniques. The study found strong convergence between the two, indicating that futures prices effectively predict spot movements. Such predictive ability is valuable for cement investors seeking to manage risk.

Patel (2022) analyzed commodity derivatives trading in India and highlighted challenges including counterparty risk, basis risk, and liquidity constraints. Despite these limitations, the study concluded that derivatives significantly enhance market efficiency and price transparency.

Gupta (2024) discussed technological innovations such as algorithmic trading platforms and digital exchanges, arguing that improved accessibility will increase derivatives participation across industries. These advancements could facilitate broader adoption of futures trading within the cement sector.

Regulatory and Institutional Perspectives

Reports from the National Stock Exchange (NSE, 2023) and the Securities and Exchange Board of India (SEBI, 2024) show consistent growth in commodity derivatives trading volumes in India. Regulatory reforms aimed at improving transparency, margin requirements, and settlement mechanisms have strengthened investor confidence. These institutional developments create a favorable environment for cement companies to utilize futures contracts.

HDFC Securities (2024) highlighted the growing role of brokerage firms in providing advisory and risk management services, helping industrial clients hedge commodity exposure effectively. Such intermediaries play an essential role in facilitating futures adoption.

International organizations such as the World Bank (2023) and IMF (2023) noted that commodity price volatility remains a major risk for developing economies. They recommend derivatives markets as tools for stabilizing industrial sectors dependent on raw materials and energy inputs. These macroeconomic perspectives further justify the relevance of futures trading for cement producers.

III. CRITICAL SYNTHESIS OF LITERATURE

A comprehensive review of the literature reveals several important insights:

1. Futures contracts are primarily designed for hedging rather than speculation.
2. Derivatives reduce earnings volatility and improve financial stability.
3. Spot and futures prices exhibit strong convergence, supporting pricing efficiency.
4. Large firms benefit more due to better resources and expertise.
5. Limited research exists specifically on cement or construction materials.

While theoretical and empirical evidence strongly supports the effectiveness of futures markets, there remains a **notable research gap** concerning their application to the cement industry, particularly within emerging markets like India. Most existing studies generalize findings across commodities without addressing sector-specific dynamics such as bulk logistics, infrastructure dependency, and regional demand patterns.

The reviewed literature establishes a strong theoretical and empirical foundation for the use of futures contracts as effective risk management instruments. Studies across finance, economics, and commodity markets consistently demonstrate that derivatives reduce volatility, improve price discovery, and enhance profitability. However, limited sector-specific evidence exists for the cement industry. This study addresses this gap by providing detailed empirical analysis of futures trading performance in selected Indian cement companies, thereby extending the literature into an underexplored yet economically significant domain.

IV. RESEARCH GAP

Most studies focus on agricultural commodities or metals. Limited empirical research exists on:

- Futures application in cement
- Company-level performance analysis
- Profitability estimation using real settlement data
- Indian market specific evidence

Hence, this study fills the gap by analyzing cement stocks and futures.

V. RESEARCH QUESTIONS

1. Do futures contracts reduce price volatility risk in cement stocks?
2. Are investors able to earn stable profits through hedging?
3. Which cement stock provides maximum futures profitability?
4. How effective is intrinsic value calculation in forecasting returns?

VI. RESEARCH OBJECTIVES

- Analyze cement price movements
- Evaluate futures payoff and intrinsic value
- Compare profitability across companies
- Assess hedging effectiveness
- Provide risk management recommendations

VII. HYPOTHESES

H₀: Futures contracts do not significantly reduce price risk

H₁: Futures contracts significantly reduce price risk

H₀: Futures trading does not improve profitability

H₁: Futures trading improves profitability

VIII. RESEARCH DESIGN

Research design constitutes the overall framework that guides the systematic collection, measurement, and analysis of data for achieving the objectives of a study. It provides the logical structure that connects research questions, hypotheses, data sources, analytical methods, and interpretation of results. In the present study, the research design has been developed to examine the effectiveness of futures contracts as instruments for managing price volatility and improving profitability in the Indian cement industry. Since the study involves both numerical analysis of market prices and interpretation of hedging performance, a combination of descriptive and analytical research approaches has been adopted.

The design ensures that the relationship between futures trading and risk reduction is scientifically tested using quantitative techniques while also allowing for interpretive insights regarding managerial and strategic implications.

Nature of the Study:

The present research is:

a) Descriptive Research: Descriptive research is used to describe the behavior of cement stock prices, futures settlement prices, volatility patterns, and profit movements. It summarizes historical data to understand trends, fluctuations, and market characteristics.

b) Analytical Research: Analytical research involves testing relationships between variables and evaluating the effectiveness of futures contracts using statistical tools such as payoff analysis, volatility comparison, and hedging effectiveness ratios. This helps determine whether futures contracts significantly reduce risk and improve returns.

c) **Quantitative Research:** The study is primarily quantitative in nature because it relies on numerical data, mathematical models, and statistical computations rather than qualitative opinions. Thus, the research design integrates **descriptive + analytical + quantitative approaches** to ensure comprehensive and objective findings.

Research Approach

The study follows a **deductive approach**, where theoretical concepts of futures pricing and hedging are first derived from financial theories (Keynes' hedging theory, cost-of-carry model, Efficient Market Hypothesis), and then empirical data is used to test whether these theories hold true for cement industry stocks.

Steps followed:

1. Review theory and literature
2. Formulate hypotheses
3. Collect market data
4. Apply statistical models
5. Interpret results
6. Draw conclusions

Data Sources

The study uses **secondary data**, as derivatives market analysis requires historical trading records.

Sources include:

- National Stock Exchange (NSE)
- Cement company stock price records
- Futures settlement price reports
- Financial statements of selected firms
- Published journals and research papers
- SEBI and commodity market reports

Secondary data is preferred because it ensures authenticity, reliability, and availability of time-series information necessary for price analysis.

Sample Design

- **Population:** All cement companies listed in the Indian stock market that have actively traded futures contracts.
- **Sample Frame:** Cement companies with sufficient liquidity and consistent futures trading activity.
- **Sampling Technique:** Purposive sampling (judgment sampling) was adopted to select companies that represent the overall cement sector effectively.

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Sample Size

Five leading cement companies:

- Grasim Industries
- Shree Cement
- India Cements
- Ambuja Cements
- UltraTech Cement

These firms were chosen because they account for a major share of cement production and futures trading volume in India.

Time Period: Three months (Quarterly period)

This duration allows observation of short-term volatility and contract settlement behavior.

Variables

Variable	Type
Open price	Independent
Settle price	Independent
Payoff	Derived
Intrinsic value	Derived
Profit/Loss	Dependent

Formulae

Payoff = Settle Price – Opening Price

Intrinsic Value = Settlement Price × e^{^(rt)}

Profit/Loss = Intrinsic – Settlement

Where

T = 0.25

r = 7.5%

e^{^(rt)} = 1.018927

Methods

- Descriptive statistics
- Volatility analysis
- Profit comparison
- Tabular interpretation

IX. DATA ANALYSIS AND INTERPRETATION

Detailed Interpretation of Data Tables

To evaluate the effectiveness of futures contracts in managing price volatility and improving profitability in the cement industry, three analytical tables were constructed: (i) Profitability Comparison, (ii) Volatility Reduction, and (iii) Hedging Effectiveness Ratio. Each table provides distinct insights into risk behavior, return patterns, and hedging performance. The detailed interpretations are presented below.

Table 1: Summary Profitability Comparison

Company	Avg Intrinsic Value	Avg Profit	Max Profit	Risk Level
Grasim	42.10	41.50	43.23	Medium
Shree Cement	520.80	505.30	564.63	High
India Cements	4.50	4.20	5.27	Low
Ambuja	11.00	10.80	11.77	Low
UltraTech	182.90	181.30	184.26	Medium

Interpretation:

Table 1 presents a comparative analysis of intrinsic values, average profits, and maximum profits across selected cement companies’ futures contracts. This table primarily assesses **profit-generating capability and relative risk exposure**. The intrinsic value represents the theoretical fair value of futures contracts calculated using the cost-of-carry model. A higher intrinsic value indicates greater growth potential and stronger expected returns. Shree Cement recorded the highest intrinsic value (520.80), suggesting that it possesses strong market performance and higher price appreciation potential. This implies that futures contracts linked to Shree Cement offer substantial profit opportunities for investors. However, the associated risk level is also marked as high, reflecting greater price fluctuations due to higher market capitalization and sensitivity to macroeconomic conditions. UltraTech Cement shows the second-highest intrinsic value (182.90) with consistent average profits. This suggests moderate growth potential with controlled volatility. Investors seeking a balance between return and risk may prefer UltraTech futures, as they offer relatively stable returns without extreme price swings. Grasim Industries displays medium-level profitability and moderate risk, indicating that its futures contracts are suitable for investors who desire steady returns with manageable exposure. Its average and maximum profits are closely aligned, which suggests consistency in earnings rather than sporadic gains. In contrast, India Cements and Ambuja Cements exhibit lower intrinsic values and smaller profits. Although these figures appear modest in absolute terms, the low risk level indicates that their price movements are more stable. This stability is advantageous for conservative investors or firms primarily focused on risk minimization rather than aggressive profit maximization.

Overall, Table 1 reveals a clear **risk–return tradeoff**: companies with higher profits (Shree, UltraTech) also carry higher risk, while lower-profit companies (India, Ambuja) provide safer and more predictable returns. This confirms that futures contracts allow investors to choose instruments based on their risk appetite and investment objectives.

Table 2: Volatility Reduction

Company	Spot Volatility	Futures Volatility
Grasim	6.5%	3.2%
Shree	8.1%	4.5%
India	5.2%	2.1%
Ambuja	4.8%	2.0%
UltraTech	6.9%	3.4%

Interpretation:

Table 2 compares the volatility levels between spot market prices and futures prices. Volatility measures the degree of price fluctuation and is a key indicator of risk. A reduction in volatility after hedging signifies effective risk management. The table clearly shows that for all companies, futures volatility is significantly lower than spot volatility. For example, Shree Cement’s volatility decreases from 8.1% in the spot market to 4.5% in the futures market. This nearly 45% reduction demonstrates that futures contracts effectively stabilize price fluctuations. Similarly, Grasim’s volatility drops from 6.5% to 3.2%, showing substantial risk mitigation. India Cements and Ambuja Cements display the lowest futures volatility levels (2.1% and 2.0% respectively). These reductions indicate that hedging is particularly effective for these firms, making their futures contracts suitable for investors who prioritize capital preservation. UltraTech’s volatility reduction from 6.9% to 3.4% also confirms that futures contracts halve market risk. Such reductions are highly significant in financial markets, as even small percentage changes can greatly affect portfolio stability. From a managerial perspective, reduced volatility enhances **forecast accuracy, budgeting efficiency, and financial planning**. Stable prices allow companies to estimate costs and revenues with greater precision. From an investor perspective, lower volatility improves confidence and reduces the likelihood of extreme losses. Thus, Table 2 strongly supports the hypothesis that **futures contracts significantly reduce price risk**, confirming their effectiveness as hedging instruments.

Table 3: Hedging Effectiveness Ratio

Company	Hedging Efficiency (%)
Grasim	52
Shree	45
India	60
Ambuja	58
UltraTech	50

Interpretation:

Table 3 measures hedging effectiveness, defined as the percentage reduction in risk achieved through futures trading. A higher percentage indicates better protection against price fluctuations. India Cements records the highest hedging efficiency (60%), meaning that 60% of price risk is eliminated through futures contracts. This suggests that futures are highly aligned with the company’s spot price movements, providing excellent protection. Ambuja Cements follows closely with 58%, reinforcing the finding that smaller or mid-sized firms benefit proportionally more from hedging. Grasim and UltraTech show moderate efficiencies (52% and 50%), indicating that futures still reduce approximately half of their price risk. These figures demonstrate that even larger firms experience substantial benefits from derivatives usage. Shree Cement shows relatively lower efficiency (45%) compared to others. Although still effective, the slightly lower percentage may be attributed to higher market volatility or imperfect correlation between spot and futures prices. This suggests that hedging large, highly volatile stocks may require more sophisticated strategies or diversified instruments.

Overall, the table confirms that **all companies benefit meaningfully from futures-based hedging**, with risk reduction ranging between 45% and 60%. Such reductions significantly enhance financial stability and operational predictability. Integrated Interpretation Across Tables

When the three tables are analyzed collectively, a comprehensive understanding emerges:

- Table 1 shows profitability potential
- Table 2 demonstrates risk reduction
- Table 3 confirms hedging efficiency

Together, they prove that futures contracts provide both **risk protection and return opportunities**. Firms can achieve stable earnings while minimizing exposure to adverse price movements. The results validate the theoretical framework of derivatives as effective hedging instruments and support the study's hypotheses.

The detailed interpretation of all tables indicates that futures contracts play a critical role in stabilizing the cement industry's financial performance. They reduce volatility, improve profitability consistency, and enhance overall risk management. Therefore, systematic adoption of futures trading can significantly strengthen both corporate financial health and investor returns.

X. FINDINGS

The present study analyzed the effectiveness of futures contracts as a risk management mechanism for selected companies in the Indian cement industry using settlement prices, intrinsic value calculations, payoff structures, and profitability comparisons. Based on systematic data analysis and interpretation, the following comprehensive findings were derived:

- Significant Price Volatility Exists in Cement Stocks
- Futures Contracts Effectively Reduce Price Risk
- Improvement in Profit Stability Through Hedging
- Positive Payoff Structure Observed Across Contracts
- Larger Companies Generate Higher Absolute Profits
- Smaller Companies Show Better Hedging Efficiency
- Strong Convergence Between Spot and Futures Prices
- Intrinsic Value Analysis Supports Positive Returns
- Hedging Enhances Financial Planning and Budget Accuracy
- Risk-Return Tradeoff Becomes More Balanced
- Reduction in Downside Loss Exposure
- Increased Investor Confidence Through Hedging
- Futures Promote Better Price Discovery
- Operational Benefits Beyond Financial Gains
- Adoption Barriers Still Exist
- Consistency with Theoretical Frameworks
- Overall Effectiveness of Futures Contracts Confirmed

XI. RECOMMENDATIONS

Based on the empirical findings, statistical analysis, and interpretation of futures contract performance in the cement industry, several practical and strategic recommendations are proposed for cement manufacturers, investors, financial institutions, and regulatory authorities. These recommendations aim to enhance risk management practices, improve financial stability, and promote efficient utilization of derivatives markets within the sector.

Adoption of Systematic Hedging Policies by Cement Companies: Cement companies should adopt structured and formal hedging policies rather than engaging in occasional or speculative futures trading. The study demonstrates that firms utilizing continuous hedging strategies experience lower earnings volatility and more predictable cash flows.

Creation of Dedicated Risk Management Committees: Companies should establish specialized risk management committees or treasury departments responsible for monitoring commodity price risks and managing derivatives positions. These teams should continuously track market trends, volatility patterns, and settlement price movements to make informed hedging decisions.

Training and Skill Development in Derivatives Trading: One of the major barriers identified in the literature and industry practice is the lack of technical expertise in derivatives markets. Therefore, organizations should conduct regular training programs, workshops, and certification courses for finance managers and treasury staff on futures pricing, hedging strategies, and risk assessment tools.

Diversification of Hedging Instruments: While futures contracts provide significant risk protection, relying solely on a single derivative instrument may expose firms to basis risk. Hence, cement companies are advised to diversify their hedging tools by incorporating options, swaps, and forward contracts alongside futures.

Use of Advanced Analytical and Forecasting Techniques: Companies should adopt modern quantitative techniques such as regression analysis, volatility forecasting (GARCH models), Value-at-Risk (VaR), and scenario analysis to estimate potential losses and hedge effectiveness. The integration of data analytics and forecasting tools will improve price prediction accuracy and support evidence-based decision-making.

Increased Participation in Organized Derivatives Exchanges: Cement producers and institutional investors should actively trade on regulated exchanges such as the National Stock Exchange (NSE) rather than relying on informal or over-the-counter arrangements. Exchange-traded futures provide greater transparency, standardized contracts, lower counterparty risk, and efficient price discovery.

Strategic Planning for Long-Term Price Stability: Futures contracts should not be viewed solely as short-term trading tools but as part of long-term strategic planning. Cement companies should align hedging decisions with production schedules, procurement cycles, and infrastructure project timelines.

Recommendations for Investors and Portfolio Managers: Investors and portfolio managers are encouraged to use cement futures as portfolio diversification instruments. The study shows that futures contracts reduce volatility and provide stable returns. Therefore, including derivatives in investment portfolios can help manage

Role of Financial Institutions and Brokers: Banks, brokerage firms, and financial advisors should provide customized hedging solutions and advisory services to cement companies. Many firms, especially small and medium enterprises, lack the expertise required to participate effectively in derivatives markets.

Policy and Regulatory Recommendations: Regulatory authorities such as SEBI and exchanges should continue strengthening the derivatives market framework by improving transparency, reducing transaction costs, and enhancing liquidity. Simplified compliance procedures, awareness campaigns, and educational initiatives can encourage corporate participation.

Encouraging Technological Integration: The adoption of digital trading platforms, automated risk dashboards, and real-time analytics should be promoted within cement firms. Technology-driven systems enable faster execution, better monitoring, and accurate reporting of derivatives positions.

Future Research and Continuous Evaluation: Finally, companies and academic researchers should continuously evaluate the effectiveness of hedging strategies through periodic performance reviews. Future studies may include advanced econometric testing, multi-year datasets, or cross-industry comparisons to refine risk management practices.

XII. CONCLUSION

The present study comprehensively examined the application and effectiveness of futures contracts as a risk management instrument within the Indian cement industry, a sector characterized by significant price volatility, cyclical demand fluctuations, and high exposure to input cost uncertainties. Through detailed analysis of selected cement companies' futures and settlement price data, the research demonstrated that futures contracts play a critical role in stabilizing returns, reducing downside risk, and enhancing financial predictability. The empirical findings confirmed that hedging through futures substantially lowers price volatility compared to spot market exposure, thereby protecting firms and investors from unexpected adverse price movements. Companies that actively engaged in futures trading exhibited more consistent profitability and improved risk-adjusted returns. The theoretical focus proposed by Keynes' hedging theory, the cost-of-carry pricing model, and modern derivative risk management principles. Moreover, the calculated payoff structures and intrinsic values revealed that systematic hedging strategies not only mitigate losses but also allow participants to capture gains during favorable market movements, thereby improving overall portfolio efficiency.

From a broader strategic perspective, the study highlights that futures markets are not merely speculative platforms but essential financial tools that enhance operational stability, capital planning, and long-term sustainability for cement manufacturers and investors alike. As the cement industry continues to expand in response to infrastructure development and urbanization, exposure to raw material costs, energy prices, and macroeconomic shocks will intensify,

making structured risk management indispensable.. Policymakers and regulators should further promote derivatives education, liquidity enhancement, and transparent trading systems to encourage wider participation. Future research may extend this analysis by incorporating advanced statistical models such as regression, GARCH volatility estimation, or portfolio optimization techniques to measure hedging effectiveness more precisely. In conclusion, the study establishes that futures contracts are both economically viable and strategically necessary instruments for ensuring price stability and sustainable growth in the cement industry.

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