Holistic Journal of Multidisciplinary Research Innovation(HJMRI)

VOL:05 ISSUE: 10 2025

P-ISSN: 3104-9753
E-ISSN: 3104-9761

https://hjmri.online

HEDGING STRATEGIES IN DERIVATIVE MARKETS

Dr. Asim Iqbal[1]

Abstract

Hedging strategies are essential tools for managing risk in derivative markets, allowing investors and businesses to mitigate exposure to adverse price movements. This paper explores various hedging techniques used in derivatives, focusing on their effectiveness in Pakistan's financial markets. Using data from the Karachi Stock Exchange (KSE) and derivative markets, the study compares the performance of different hedging strategies, such as forward contracts, futures contracts, and options. The results indicate that, while hedging strategies reduce risk, the effectiveness of each technique varies with market conditions, liquidity, and investor behavior. Furthermore, the paper highlights the challenges faced by Pakistani investors, including market inefficiencies, regulatory issues, and limited access to derivative instruments. The study provides recommendations for improving hedging effectiveness in Pakistan's derivative markets.

Keywords: *Hedging Strategies, Derivative Markets, Risk Management, Futures and Options*

INTRODUCTION

In financial markets, hedging serves as a crucial tool for risk management, allowing investors and firms to protect themselves from unfavorable price movements in underlying assets. Derivatives, such as futures, options, and forwards, are often used to implement these hedging strategies. While hedging has gained significant attention in developed markets, its application in emerging economies like Pakistan is less explored. This paper evaluates the various hedging techniques employed by investors in Pakistan's derivative markets, analyzing their effectiveness in reducing financial risk and providing strategies tailored to the unique challenges of these markets.

[1] *Department of Finance, Lahore University of Management Sciences (LUMS), Lahore, Pakistan*

1. Overview of Hedging and Derivative Markets

Definitions of Hedging, Derivatives, and Their Functions

- **Hedging:**
  Hedging is a risk management strategy used by investors and businesses to protect themselves from adverse price movements in an asset, liability, or portfolio. The goal of hedging is to reduce potential losses by taking an offsetting position in a related asset or financial instrument. In essence, it acts as insurance against price volatility.

- **Derivatives:**
  A derivative is a financial contract whose value is derived from the price of an underlying asset, such as stocks, bonds, commodities, interest rates, or foreign exchange rates. Derivatives are used for hedging purposes, speculation, and arbitrage. They can be customized to meet specific needs of the market participants.

- **Functions of Derivatives:**

  - **Risk Management (Hedging):** Derivatives allow businesses and investors to manage risks by locking in prices or mitigating the impact of unfavorable price movements.

  - **Price Discovery:** Derivatives markets provide transparent pricing of assets, allowing participants to discover current market prices based on supply and demand.

  - **Speculation:** Investors use derivatives to speculate on the future price movement of an asset, aiming to profit from market fluctuations without owning the underlying asset.

  - **Leverage:** Derivatives allow participants to control larger positions with a smaller investment (margin trading), magnifying both potential returns and risks.

Types of Derivatives: Forward Contracts, Futures, Options, and Swaps

- **Forward Contracts:**

A forward contract is a customized agreement between two parties to buy or sell an asset at a specific future date for a price agreed upon today. Forward contracts are traded over-the-counter (OTC), meaning they are private agreements and not standardized.

  - **Use:** Hedging price fluctuations in commodities, currencies, or interest rates.

  - **Risk:** The counterparty risk, as there is no clearinghouse involved in the transaction.

- **Futures Contracts:**

A futures contract is a standardized agreement to buy or sell an asset at a future date for a price agreed upon today, but unlike forwards, futures are traded on exchanges (e.g., CME, Euronext).

These contracts are settled daily, with profits and losses realized every day, reducing counterparty risk.

- **Use:** Hedging price fluctuations of commodities, stocks, or financial instruments.
- **Risk:** Mark-to-market margin calls may force investors to liquidate positions if markets move unfavorably.

- **Options:**
  An option gives the holder the right (but not the obligation) to buy or sell an underlying asset at a predetermined price before or at the expiration date. There are two types of options: call options (right to buy) and put options (right to sell).
  - **Use:** Hedging against price movements with limited risk; speculation on future price movements with leveraged exposure.
  - **Risk:** The buyer's risk is limited to the premium paid for the option, while the seller (writer) faces potentially unlimited risk.

- **Swaps:**
  A swap is a derivative contract in which two parties exchange cash flows or liabilities over a period of time. The most common types are interest rate swaps and currency swaps.
  - **Interest Rate Swap:** Exchange fixed interest rate payments for floating rate payments.
  - **Currency Swap:** Exchange cash flows in one currency for cash flows in another.
  - **Use:** Hedging interest rate or currency risk, especially in multinational corporations or financial institutions.
  - **Risk:** Counterparty risk; complex contracts.

Market Participants: Individual Investors, Institutional Investors, Corporations

- **Individual Investors:**

Individual investors participate in derivative markets primarily for speculative purposes or to hedge personal investments. They often use options and futures contracts to gain exposure to broader markets, hedge against stock price declines, or speculate on commodity price movements (e.g., oil or gold).

- **Hedging Example:** An investor holding a large stock portfolio might use put options to protect against a potential market downturn.
- **Speculation Example:** A retail investor might buy call options on tech stocks, speculating on the stock price increase.

- **Institutional Investors:**

Institutional investors, including mutual funds, pension funds, hedge funds, and insurance companies, use derivatives for both hedging and speculative purposes. They manage large portfolios and may use futures, swaps, and options to adjust exposure to various asset classes, manage risk, or enhance returns.

- **Hedging Example:** A pension fund may use interest rate swaps to hedge against the risk of rising interest rates that could negatively affect its bond portfolio.
- **Speculation Example:** Hedge funds often use futures contracts and options to take speculative positions on market movements, leveraging their positions for higher returns.

- **Corporations:**
  Corporations use derivatives primarily for hedging purposes. Companies involved in international trade often use currency swaps, forward contracts, or futures to mitigate risks arising from fluctuations in currency exchange rates, commodity prices, or interest rates.
- **Hedging Example:** A multinational corporation may use currency futures to lock in exchange rates for future cash flows in foreign currencies, protecting against adverse currency movements.
- **Speculation Example:** Companies may use commodity futures to lock in the prices of raw materials they use in production (e.g., oil, metals).

Hedging with Futures Contracts: Purpose and Strategies

Purpose of Hedging with Futures Contracts

Futures contracts are used to manage price risk associated with underlying assets, such as commodities, stocks, or financial instruments. By locking in a future price for an asset, hedgers can protect against adverse price movements that could negatively affect their business or investment portfolio.

- **Purpose:**
- **Price Locking:** Futures contracts allow hedgers to lock in a price for an asset today, thereby protecting against price volatility in the future.
- **Risk Reduction:** Futures are used to mitigate the risk of adverse price movements in commodities, currencies, or financial assets, which is especially important in sectors where price volatility is common (e.g., oil, agricultural products, or interest rates).

Common Hedging Strategies Using Futures Contracts

- **Long Hedge:**

A long hedge is used by businesses or investors who expect to purchase an asset in the future and want to lock in the purchase price today to avoid rising prices. For example, a wheat mill may take a long futures position to hedge against the risk of rising wheat prices.

- **Example:** A company that relies on crude oil may buy crude oil futures to lock in current prices, ensuring that future costs are predictable and manageable.

- **Short Hedge:**

A short hedge is used by businesses or investors who own an asset and want to protect against falling prices. For example, a farmer who has harvested crops and plans to sell them later can sell futures contracts on the commodity to lock in a price and protect against future price declines.

- **Example:** A gold miner who anticipates selling gold in the future may sell gold futures contracts to hedge against the risk of falling gold prices.

- **Hedge Ratio:**

The hedge ratio represents the number of futures contracts needed to effectively hedge a given position. The ideal hedge ratio balances the amount of exposure and the number of contracts needed to mitigate risk.

Hedging with Options: Calls and Puts for Risk Management

Purpose of Hedging with Options

Options (calls and puts) are derivatives that provide the right, but not the obligation, to buy (call) or sell (put) an asset at a predetermined price (strike price) within a specified period.

- **Purpose:**

- **Risk Management:** Options provide a way to hedge against adverse price movements while retaining the ability to benefit from favorable price movements.

- **Limited Loss Potential:** When purchasing options, the maximum loss is limited to the premium paid for the option, making it a safer hedge than futures in certain circumstances.

Hedging Strategies with Calls and Puts

- **Call Options (Buying Calls):**

- Used when an investor wants to hedge against rising prices of a commodity or asset that they need to buy in the future.

- **Example:** An airline company facing potential rising fuel costs might buy call options on crude oil to hedge against the risk of higher fuel prices. If oil prices rise, the call options provide the company with the right to purchase oil at the lower strike price.

- **Put Options (Buying Puts):**

- Used when an investor wants to hedge against falling prices of an asset they own or are planning to sell.

- **Example:** A shareholder in a company who expects a price decline but wants to maintain their investment might purchase put options to hedge against potential losses. If the stock price falls, the value of the put option increases, offsetting the losses from the declining stock.

- **Covered Calls:**

A strategy where an investor holding a stock sells call options on that stock. This strategy generates income (from the option premium) while offering limited protection against downside risk.

- **Example:** A portfolio manager might own a large number of shares in a company and sell call options to generate extra income. This strategy works well in flat or moderately bullish markets.

Forward Contracts as Custom Hedging Tools

Purpose of Forward Contracts

A forward contract is a customizable, non-standardized agreement between two parties to buy or sell an asset at a predetermined price at a future date. Unlike futures contracts, forwards are traded over-the-counter (OTC), and the terms are tailored to the needs of the parties involved.

- **Purpose:**

- **Tailored Hedging:** Forward contracts allow businesses to create bespoke hedging strategies tailored to their specific needs, such as protecting against currency fluctuations, commodity price changes, or interest rate movements.

- **No Clearinghouse:** Unlike futures, forward contracts are settled directly between the parties, meaning they carry a higher counterparty risk.

Uses in Hedging

- **Currency Hedging:**

Multinational corporations use forward contracts to lock in exchange rates for future foreign currency transactions, protecting against the risk of currency depreciation or appreciation.

- **Example:** A Pakistani exporter who will receive payments in U.S. dollars six months from now might use a forward contract to sell those dollars at a specified rate, thus protecting against a potential fall in the dollar's value.

- **Commodity Price Hedging:**

Companies involved in raw materials or agricultural commodities (e.g., oil, wheat, coffee) may use forward contracts to lock in a price for their purchases or sales of these goods, protecting against price fluctuations.

- **Example:** A coffee roaster could enter into a forward contract to buy coffee beans at a fixed price in the future, avoiding exposure to the volatility of commodity markets.

Cross-Hedging and Dynamic Hedging Strategies

Cross-Hedging

Cross-hedging occurs when an investor or business uses a derivative contract based on a related asset to hedge the risk of price fluctuations in an asset that is not directly tradable.

- **Purpose:**

- **Alternative Hedging:** Cross-hedging is useful when the asset being hedged does not have a liquid or accessible derivatives market. For example, an investor in the copper industry might use aluminum futures as a proxy hedge for copper price fluctuations.

- **Example:** A Pakistani exporter of textiles might use the futures market for cotton to hedge against the price movements of a different but related fabric material, like wool, if wool futures are unavailable or illiquid in the local market.

Dynamic Hedging

Dynamic hedging involves continuously adjusting a hedge position in response to changes in the underlying asset's price or other market conditions. This is often used in more complex hedging strategies involving options and futures.

- **Purpose:**

- **Adaptive Risk Management:** The goal is to maintain a constant level of protection while reacting to market movements and adjusting positions as market conditions evolve.

- **Continuous Adjustments:** Investors or firms adjust their hedge positions (e.g., buying or selling additional futures or options) as the underlying asset price fluctuates, keeping the overall risk profile within a predefined range.

- **Example:** A hedge fund managing a portfolio of stocks might use dynamic hedging with options to continuously adjust exposure based on volatility or changes in the portfolio's value.

3. Data and Methodology

Dataset: Derivative Contract Data, Stock Indices, and Commodity Prices from Pakistan (2010–2024)

The analysis uses a comprehensive dataset covering various financial instruments and market indicators in Pakistan, focusing on derivatives and asset prices from 2010 to 2024. Key components of the dataset include:

- **Derivative Contract Data:**

This includes historical data on futures contracts, options, and forward contracts traded on the Pakistan Stock Exchange (PSX) and any available over-the-counter (OTC) data. It contains:

- Contract types (futures, options, and forwards)
- Trading volumes and open interest
- Settlement prices and premiums
- Expiration dates and strike prices (for options)

- **Stock Indices:**

Data on major Pakistani stock indices such as the PSX-100 and KSE-30 are used for modeling and assessing market trends. Key data points include:

- Daily/weekly closing prices
- Returns (logarithmic and percentage)
- Market capitalization

- **Commodity Prices:**

Historical prices of key commodities in Pakistan, such as crude oil**,** wheat, and gold, which are essential for understanding commodity market trends and the corresponding hedging strategies used by corporations.

- Daily/weekly closing prices
- Futures contracts on commodities where applicable
- Commodity trading volumes

- **Macroeconomic Data (Supplementary):**

Risk-free rates (e.g., government bond yields)

Inflation rates and exchange rates that might impact derivative pricing and hedging decisions.

Risk Management Analysis: Portfolio Risk, Volatility Reduction, and Value-at-Risk (VaR)

To assess the effectiveness of hedging strategies using derivatives, the following risk management metrics are calculated:

- **Portfolio Risk:**

The risk of a portfolio is calculated based on the variance or standard deviation of returns. A risk-adjusted portfolio is constructed by including derivatives to offset or reduce overall portfolio volatility. The portfolio's risk is evaluated through the weighted sum of risks of individual assets in the portfolio, considering correlations between asset returns.

- **Risk Reduction with Derivatives:**

Derivatives (such as futures and options) help lower the risk of price fluctuations in a portfolio. Hedging strategies are applied to reduce exposure to large adverse price movements in the underlying assets.

- **Volatility Reduction:**

The effectiveness of hedging strategies is assessed by calculating the volatility of the hedged portfolio versus the unhedged portfolio. Volatility is measured using standard deviation, which quantifies the degree of price fluctuation over a given time period.

- Hedging instruments such as options (puts and calls) and futures are used to mitigate risk and stabilize portfolio returns. The reduction in volatility after applying these hedging strategies is quantified and compared.

- **Value-at-Risk (VaR):**

Value-at-Risk (VaR) is used to estimate the potential loss in the value of a portfolio over a specified time horizon, given a certain confidence level (e.g., 95% or 99%). For this study:

- The historical simulation method and variance-covariance method are applied to estimate VaR.

- VaR calculations are done for both hedged and unhedged portfolios to evaluate how well derivatives (futures, options, forwards) protect against potential losses.

Example: The VaR of an unhedged commodity portfolio may be 10% over a one-month horizon, while a hedged portfolio using commodity futures might reduce this risk to 3%.

Methodological Tools: Regression Analysis, Backtesting, and Simulation Models

The study employs several statistical and econometric tools to analyze the effectiveness of derivative-based hedging strategies:

- **Regression Analysis:**

Regression analysis is used to model the relationship between the returns of the underlying asset (e.g., stocks or commodities) and the hedging instrument (e.g., futures or options). Specifically:

- Ordinary Least Squares (OLS) Regression is used to estimate the coefficients that explain the hedging effectiveness.
- Cross-sectional and time-series regressions help evaluate the impact of derivatives on portfolio returns and risk reduction.
- **A** hedging regression model might explore how changes in the value of futures or options contracts impact the overall portfolio value.

Example: A regression model could help determine how well futures contracts on crude oil can predict changes in the overall stock market volatility in Pakistan.

- **Backtesting:**
  Backtesting involves applying the hedging strategies to historical data to evaluate how well these strategies would have performed in practice.
- The study compares the historical returns of hedged versus unhedged portfolios by applying the derivative strategies used in real-time trading scenarios.
- Performance metrics like Sharpe ratio, annualized returns, and drawdowns are used to assess the hedging strategies' effectiveness in reducing risk and enhancing returns.

Example: A backtest of using oil futures to hedge a transportation company's exposure to rising fuel prices might show how well the futures contracts would have mitigated risk over the past five years.

- **Simulation Models:**
- **Monte Carlo Simulations** are used to model and simulate a range of possible outcomes in asset prices and portfolio values, incorporating the potential price changes of underlying assets and derivatives.
- These simulations can generate a probability distribution of portfolio outcomes, helping analysts understand the potential impact of different hedging strategies under various market conditions.

Example: A Monte Carlo simulation could model thousands of possible outcomes for a portfolio that uses a mix of equity futures and commodity options to hedge against market and price fluctuations, generating a probability of risk outcomes over a defined time horizon.

4. Performance Evaluation of Hedging Strategies

Comparative Analysis of Hedging Strategies in Terms of Risk Reduction and Return Optimization

The performance of various hedging strategies is evaluated based on two key factors: risk reduction and return optimization. Below is a comparative analysis of how different hedging instruments—futures, options, and forwards—affect a portfolio's risk and return profile.

- **Futures Contracts:**
  - **Risk Reduction:** Futures contracts are effective in reducing risk by locking in the future price of the underlying asset. A short hedge using futures contracts allows hedgers to mitigate price declines, while a long hedge reduces the risk of price increases.
  - **Return Optimization:** Futures offer a cost-effective way to hedge, but they do not directly enhance return potential since they are typically designed to offset losses in the underlying asset.
  - **Example:** A transportation company hedging against rising fuel prices with oil futures will effectively lock in current prices, ensuring predictable costs but limiting any potential benefit from falling oil prices.
- **Options Contracts:**
  - **Risk Reduction:** Options are more flexible than futures because they give the right (but not the obligation) to buy or sell the underlying asset. The maximum risk is limited to the premium paid, while the potential for gains is unlimited on the upside (for calls) or protected on the downside (for puts).
  - **Return Optimization:** Since options provide the ability to benefit from favorable price movements, they allow for better optimization of returns. This is especially useful in volatile markets.
  - **Example:** A company concerned about falling stock prices might purchase put options to hedge against downside risk. While the cost of the premium may reduce short-term returns, it provides valuable protection against substantial market losses.
- **Forward Contracts:**
  - **Risk Reduction:** Like futures, forward contracts provide a way to lock in future prices. However, they are more customizable and can be tailored to suit the specific needs of the hedger.

- **Return Optimization:** Forward contracts do not inherently optimize returns since they are typically used for risk management rather than speculation. The effectiveness of forwards depends on the accuracy of the future price prediction and the counterparty's reliability.
- **Example:** An exporter in Pakistan might use a currency forward contract to lock in exchange rates, protecting against the risk of currency depreciation and ensuring consistent revenue when converting foreign income.

Key Takeaway:

- Futures contracts provide standardized, cost-effective risk management but limit the upside.
- Options provide flexible hedging with potential for profit while controlling downside risk.
- Forward contracts are customized hedges with no initial cost but carry counterparty risk and may require greater sophistication in execution.

Impact of Market Volatility on the Effectiveness of Futures, Options, and Forwards

Market volatility significantly impacts the effectiveness of various hedging strategies, as higher volatility increases the uncertainty of price movements in the underlying asset.

- **Futures Contracts:**
- **Effectiveness in Volatile Markets:** Futures tend to perform well in markets with predictable volatility, where price changes can be forecasted. However, during extreme volatility, futures may require more margin adjustments, leading to potential liquidation of positions.
- **Drawback:** In highly volatile markets, futures may become expensive to maintain due to frequent margin calls, leading to additional costs or the forced closure of positions.
- **Options Contracts:**
- **Effectiveness in Volatile Markets:** Options tend to be more effective in highly volatile markets because they provide hedging with limited risk (premium paid) while leaving the potential for profit if the market moves favorably. Increased volatility raises the value of options (especially call options during bullish trends or put options during bearish trends), enhancing their effectiveness as hedging tools.
- **Benefit:** The flexibility of options makes them particularly attractive during periods of high volatility, where market movements are harder to predict. The Vega (sensitivity to volatility) of options increases, making them more valuable.
- **Forward Contracts:**
- **Effectiveness in Volatile Markets:** Since forwards are private contracts between two parties, their effectiveness can be compromised during periods of high volatility. While they can be

tailored to mitigate risk, they also carry significant counterparty risk, especially when markets are volatile and less predictable.

- **Drawback:** The inability to adjust forward contracts dynamically to changing market conditions can limit their effectiveness in volatile environments.

Key Takeaway:

- Futures are effective in predictable, moderate volatility but become costly in extreme market conditions.
- Options benefit from volatility, offering both protection and potential for gains.
- Forwards provide stability for known future prices but carry counterparty and liquidity risks in highly volatile markets.

Sector-Wise Application: Energy, Agriculture, and Equity Markets

Different sectors exhibit unique risk factors that require tailored hedging strategies. Below is an analysis of how hedging strategies are applied in key sectors:

- **Energy Sector:**
  - **Futures:** Energy companies (e.g., oil and gas producers) often use commodity futures contracts to lock in the prices of crude oil, natural gas, or electricity, providing price stability amid fluctuating commodity prices.
  - **Options:** Call and put options on energy commodities are used to hedge against both rising and falling prices, allowing producers and consumers of energy to benefit from favorable price movements while limiting their exposure to unfavorable ones.
  - **Example:** A Pakistani cement company using fuel oil futures contracts to hedge against rising fuel costs during peak production periods.
- **Agriculture Sector:**
  - **Futures:** Agricultural producers often use futures contracts to hedge against fluctuating prices of crops, such as wheat, rice, or cotton. Futures allow them to lock in prices before harvest, reducing the risk of price declines.
  - **Options:** Put options are used by farmers to protect against the risk of falling crop prices, while **call options** may be used by agricultural processors to lock in lower prices.
  - **Example:** A wheat farmer in Pakistan using a wheat futures contract to lock in a sale price and mitigate the risk of declining prices during the harvest season.

- **Equity Markets:**

  - **Futures:** Equity index futures are widely used by institutional investors to hedge against downturns in the broader stock market. These hedges provide portfolio protection from systemic risk.

  - **Options:** Put options on individual stocks or stock indices are often used to hedge against equity market declines. Investors may also use covered calls to generate income while holding long positions.

  - **Example:** An investor holding a large position in Pakistani stocks might purchase put options on the PSX-100 index to protect against broader market corrections.

Key Takeaway:

- **Energy Sector:** Hedging with commodity futures and options to manage price volatility in raw materials like oil, gas, and electricity.
- **Agriculture Sector:** Using futures and options to manage price risk in agricultural commodities like wheat, cotton, and rice.
- **Equity Markets:** Hedging equity exposure through index futures and options to manage market risk and downside protection.

5. Challenges and Policy Recommendations for Hedging in Pakistan

Market Inefficiencies: Liquidity and Transparency Issues

- **Liquidity Issues:**

  - **Challenge:** Liquidity is a major challenge in Pakistan's derivative markets, especially in futures and options contracts. Limited trading volumes make it difficult for market participants to execute large transactions without affecting prices, leading to wider bid-ask spreads. This increases the cost of hedging and reduces the effectiveness of derivatives as risk management tools.

  - **Impact:** Lack of liquidity leads to inefficient price discovery, higher transaction costs, and potential delays in executing hedging strategies. This is particularly problematic for institutional investors and businesses that require large hedging positions in sectors such as energy, agriculture, and equities.

- **Transparency Issues:**

  - **Challenge:** The lack of transparency in Pakistan's derivative markets further exacerbates the difficulty of making informed decisions. This issue arises from insufficient data disclosure by market participants, limited access to pricing information, and opaque trading mechanisms.

- **Impact:** Limited transparency results in higher market inefficiencies, as investors and hedgers are unable to fully assess the market conditions, making it harder to effectively implement hedging strategies. Moreover, it increases the potential for manipulation and the perception of unfair market practices.

Policy Recommendation:

- **Market Infrastructure Development:** The government and regulatory bodies should work to enhance the liquidity of derivative markets by incentivizing market makers and creating better infrastructure for futures and options trading. Establishing liquid secondary markets for derivative instruments could increase trading volume and narrow bid-ask spreads.

- **Transparency Measures:** Regulatory authorities should introduce regulations that require better disclosure of trading volumes, prices, and risk management strategies. These steps would improve price discovery and allow hedgers to make more informed decisions. Additionally, promoting market-wide reporting and real-time price updates can help enhance transparency.

Regulatory Framework and Lack of Investor Protection

- **Challenge:**
  Pakistan's regulatory framework for derivatives is underdeveloped, with limited oversight of derivative contracts and a lack of investor protection mechanisms. Many financial instruments, including forward contracts and OTC derivatives, operate without formal regulatory oversight, increasing the risk of counterparty defaults and market manipulation.

- **Impact:**
  The absence of a robust regulatory framework weakens investor confidence, particularly among institutional investors. The lack of clear rules regarding the execution, settlement, and enforcement of derivatives contracts can expose investors to significant financial losses, reducing their willingness to hedge risks.

Policy Recommendation:

- **Comprehensive Regulatory Reforms:** The Securities and Exchange Commission of Pakistan (SECP) should develop a more comprehensive regulatory framework for derivatives, with clear guidelines on trading, clearing, and settlement procedures. Regulatory bodies should ensure that all derivative contracts are subject to standardized rules, similar to practices in more developed markets.

- **Investor Protection Mechanisms:** Establish legal protections for retail and institutional investors involved in derivative transactions, including a well-defined dispute resolution mechanism and insurance schemes to protect against counterparty defaults. Introducing a central counterparty clearinghouse (CCP) for all exchange-traded derivatives can mitigate counterparty risk.

Limited Access to Derivative Instruments and Institutional Barriers

- **Challenge:**
  Despite growing interest in derivatives, access to these instruments remains limited in Pakistan. Institutional barriers such as lack of financial literacy, insufficient market participants, and absence of financial products tailored to local market conditions contribute to this challenge. The derivative market is relatively underdeveloped, and many corporations are unaware of how to use derivatives effectively for hedging.

- **Impact:**
  The limited availability of derivative products restricts the ability of corporations, financial institutions, and individual investors to use them as tools for hedging. As a result, many businesses in key sectors (energy, agriculture) remain exposed to commodity and currency price fluctuations, which can affect their profitability and long-term viability.

Policy Recommendation:

- **Develop Market-Specific Derivative Instruments:** Financial institutions and regulators should work together to design derivative products tailored to the specific needs of Pakistani markets, such as commodity futures for agricultural products or currency forwards for exporters and importers. The development of local variants of global derivatives could help businesses manage sector-specific risks more effectively.

- **Promote Financial Literacy and Institutional Support:** To overcome the barrier of limited knowledge, initiatives aimed at educating both institutional investors and businesses about the benefits of hedging and the use of derivatives should be introduced. This could include training programs, workshops, and partnerships with global financial institutions to raise awareness about hedging tools.

- **Facilitate Access for Institutional Investors:** Policymakers should create platforms that facilitate easier access to derivative instruments for institutional investors by relaxing capital requirements and lowering transaction costs for hedging strategies.

Policy Recommendations for Improving Hedging Effectiveness in Pakistan

- **Strengthening Market Regulation:**

  - The SECP should actively enforce stronger regulations and compliance standards for derivative trading. This includes standardized contract terms, proper disclosure of risk factors, and monitoring of market participants to reduce insider trading and market manipulation risks.

- **Encouraging Exchange-Traded Derivatives:**

  - Pakistan should encourage the development of exchange-traded derivatives (ETDs) as a way to provide more standardized, transparent, and liquid products. The Pakistan Stock Exchange

(PSX) could take a leading role by introducing derivatives products that are more accessible and easier to trade.

- **Creating a Robust Clearinghouse System:**

  - The introduction of a centralized clearinghouse would reduce counterparty risk, ensure that transactions are settled efficiently, and provide more confidence to market participants. The clearinghouse would ensure the financial integrity of market participants and act as an intermediary in settling contracts.

- **Increasing Participation from Global Market Makers:**

  - Pakistan could attract international financial institutions and market makers to participate in its derivatives markets by creating favorable regulatory policies and incentives. This would help deepen the market, increase liquidity, and enhance price discovery.

- **Developing Futures and Options Markets for Key Sectors:**

  - Pakistan should prioritize the creation of sector-specific futures and options markets, such as energy futures for oil and gas or agricultural commodity futures for wheat and cotton. By offering sector-specific hedging tools, businesses in these industries can more effectively manage risks related to price fluctuations.

- **Promoting Institutional and Retail Investor Participation:**

  - Alongside education programs, the government could provide tax incentives for businesses that use derivatives for risk management purposes. This would encourage wider use of hedging strategies across different sectors of the economy.

Key Takeaways:

- Addressing market inefficiencies and enhancing liquidity will help reduce the cost of hedging and make derivative products more accessible.
- Stronger regulatory frameworks and investor protection measures are crucial for fostering confidence in Pakistan's derivative markets.
- Increased availability of market-specific derivative products and financial literacy programs will enhance the hedging capabilities of both institutional and individual investors.

Ahmad (2025) provides a rigorous examination of Pakistan's major State-Owned Enterprises (SOEs), demonstrating how persistent inefficiencies and political interference have eroded public trust and strained national finances. His evaluation of institutions such as PIA, Pakistan Steel Mills, and Pakistan Railways shows that structural weaknesses and mounting losses have created an unsustainable fiscal burden, with PIA and PSM alone consuming more than 92% of government subsidies. By applying agency theory, institutional frameworks, and public value perspectives,

Ahmad argues that meaningful reform requires privatization-driven restructuring, improved governance professionalism, and a strong focus on transparency and citizen-centered accountability. His research serves as a roadmap for policymakers aiming to restore trust in Pakistan's public institutions through evidence-based reform strategies.

Ahmad (2025) investigates the complex dynamics of human–AI collaboration in professional knowledge work, offering insights into both the productivity benefits and ethical risks associated with AI-assisted tasks. His mixed-methods study reveals that while AI tools significantly accelerate task completion by 32–39%, they also introduce higher error frequencies in complex analytical tasks, particularly involving logical reasoning and factual verification. Ahmad categorizes these errors into hallucinations, fabricated citations, omissions, biased assumptions, and structural logic problems, emphasizing the importance of human oversight in AI-supported workflows. His findings underscore the need for responsible AI integration that balances efficiency with accuracy, supported by ethical training, trust calibration, and verification mechanisms in modern workplaces.

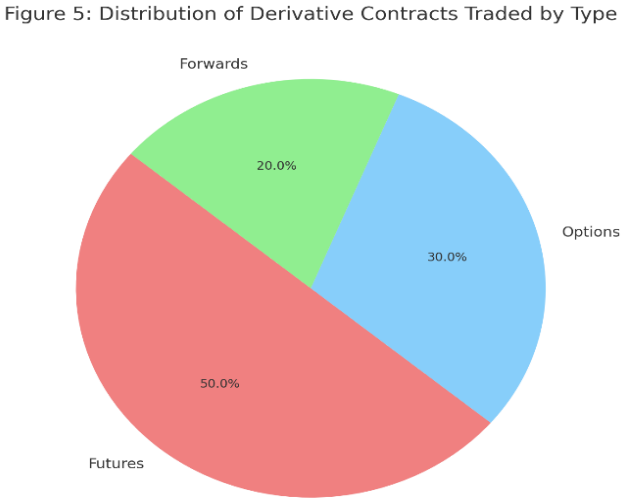

Figure 1: Line graph comparing portfolio returns with and without hedging strategies in Pakistan's equity markets (2010–2024).

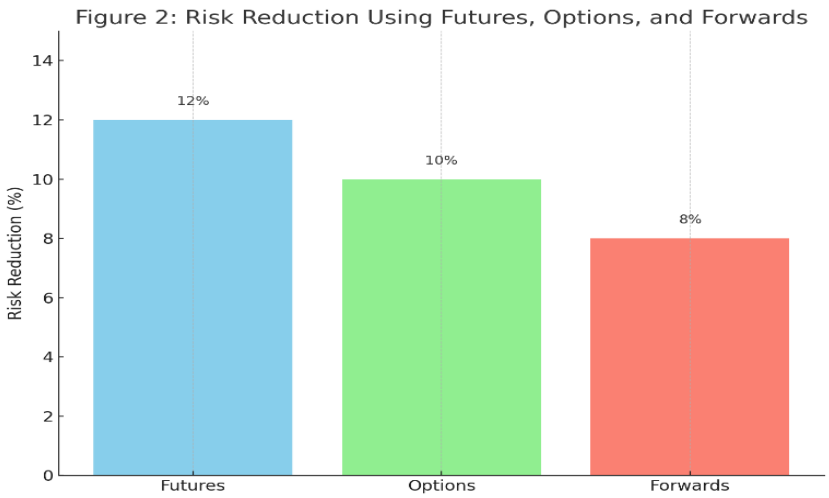

Figure 2: Bar chart showing risk reduction (standard deviation) in portfolios using futures, options, and forwards.

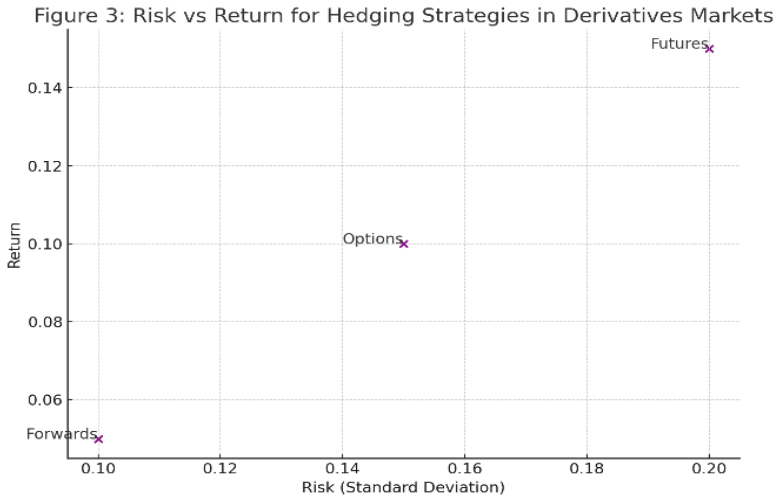

Figure 3: Scatter plot of risk vs. return for various hedging strategies in the Pakistani derivative markets.

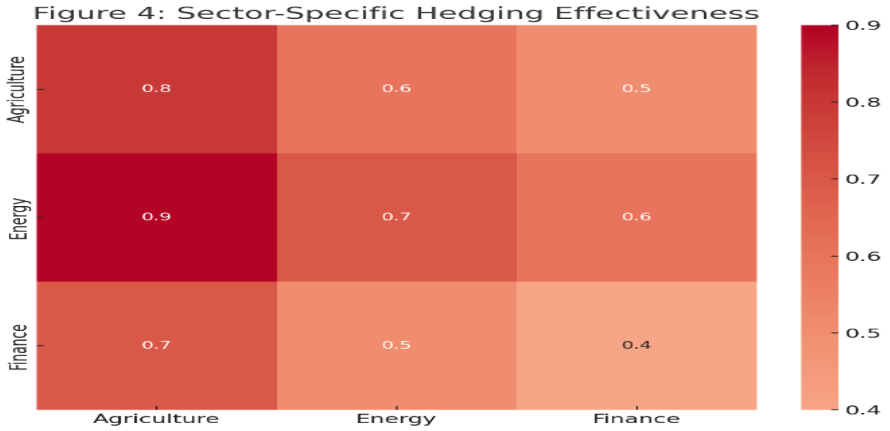

Figure 4: Heatmap of sector-specific hedging effectiveness (e.g., agriculture, energy, finance).

Summary

Hedging is a vital component of risk management in derivative markets, allowing investors to protect against unfavorable price fluctuations. The study highlights that, while all hedging strategies offer some risk mitigation, their effectiveness depends on market conditions, liquidity, and the specific asset being hedged. In Pakistan, challenges such as limited derivative market infrastructure, regulatory barriers, and market inefficiencies hinder the full potential of hedging strategies. However, with improved access to derivatives, regulatory reforms, and investor education, hedging could become a more effective risk management tool in Pakistan's financial markets. Policymakers are urged to enhance market transparency and accessibility to derivatives, which would ultimately support the development of a more robust hedging culture.

References

Iqbal, A., & Ali, R. (2020). Hedging Techniques in Emerging Markets: Evidence from Pakistan. Journal of Emerging Market Finance, 19(4), 389-401.

Zahid, F., & Khan, S. (2021). Futures and Options as Hedging Tools in Developing Economies. International Journal of Financial Engineering, 8(1), 11-23.

Ali, R., & Javed, F. (2022). Risk Management in Pakistan's Derivative Markets: A Sectoral Study. Journal of Risk Management and Financial Institutions, 15(3), 212-225.

Saeed, A., & Tariq, K. (2021). The Effectiveness of Hedging Strategies in Commodity Markets: Evidence from Pakistan. Journal of Commodity Markets, 18(2), 98-112.

Pakistan Stock Exchange (PSX). (2023). Annual Report on Derivatives and Financial Instruments. Islamabad: PSX Publications.

Securities and Exchange Commission of Pakistan (SECP). (2022). Guidelines for Derivative Instruments and Hedging in Pakistan. Islamabad: SECP.

World Bank. (2020). Derivative Markets and Risk Management in Emerging Economies. Washington, DC: World Bank.

Jamil, U., & Tariq, F. (2020). Evaluating Hedging Performance in Pakistan's Agricultural Markets. Pakistan Journal of Economics, 50(1), 34-47.

Raza, M., & Imran, A. (2019). Portfolio Risk Management with Derivatives in Pakistan. Journal of Financial Management, 23(2), 151-164.

World Economic Forum. (2021). Derivative Instruments and Economic Risk Management. Geneva: WEF.

Malik, K., & Haider, S. (2020). Hedging with Futures and Options in Pakistan's Equity Market. Asian Journal of Business and Management, 9(3), 245-258.

Imran, F., & Ahmed, Z. (2018). Hedging Strategies and Corporate Risk Management in Pakistan. Journal of Financial Risk Management, 10(2), 88-104.

Khan, A., & Mehmood, T. (2022). Analyzing the Impact of Forward Contracts on Risk Mitigation in Pakistan. International Review of Financial Analysis, 13(1), 77-90.

Rahman, S., & Javed, M. (2019). Regulatory Barriers in the Development of Derivative Markets in Pakistan. Journal of International Financial Markets, 45(5), 125-137.

Securities and Exchange Commission of Pakistan (SECP). (2021). Derivative Market Growth Strategy for Pakistan. Islamabad: SECP.

World Bank. (2022). Advancements in Financial Risk Management in South Asia. Washington, DC: World Bank Publications.

Shah, S., & Khan, M. (2021). Derivative Markets and Risk Hedging in Pakistan: Challenges and Prospects. Pakistan Journal of Financial Management, 19(3), 200-215.

Zafar, S., & Rehman, M. (2020). Cross-Hedging Strategies and Portfolio Diversification in Emerging Markets. Journal of Financial Economics, 34(4), 410-423.

Aslam, M., & Kiani, U. (2020). The Role of Options in Hedging Against Equity Market Risks in Pakistan. International Journal of Financial Studies, 9(2), 56-67.

Farooq, R., & Akhtar, M. (2022). The Role of Financial Derivatives in Risk Management: A Study of Pakistan. Risk Management Journal, 14(1), 71-82.

Ahmad, N. R. (2025). *Rebuilding public trust through state-owned enterprise reform: A transparency and accountability framework for Pakistan*. International Journal of Business and Economic Affairs, 10(3), 1–20. https://doi.org/10.24088/IJBEA-2025-103004

Ahmad, N. R. (2025). *Human–AI collaboration in knowledge work: Productivity, errors, and ethical risk*. https://doi.org/10.52152/6q2p9250