

The Effect Of Lottery Demand On The Stock Market During Changing Economic Conditions: A Case Study Of Pakistan (PSX).

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Abstract

The study aims to evaluate the economic cycles of four previous governments and the influence of economic shocks on stock prices. Quantile regression and portfolio sorting examine the effects of economic uncertainty on stock returns, volatility, and investor sentiment. The robustness study employs cross-sectional regression using the Fama-MacBeth method. Elections make markets less stable and lower returns. People were uncertain about the elections due to the 2008 global financial crisis. It caused stock prices to go down. Researchers discovered that stocks with idiosyncratic volatility (IVOLT) and skewness (ISKEN) are similar to lottery tickets. It means that when things are unclear, investors tend to prefer safer assets. Stocks like MAXRET(1) and MAXRET(5), which have very high returns over one and five days, tend to underperform when political stability is unstable. It supports the notion that changes in inflation, interest rates, and exchange rates make riskier stocks worth less. The economy can influence how the market operates and cause prices to fluctuate rapidly because trading based solely on momentum is ineffective.

Keywords: Macroeconomic indicators, Stock Market Volatility, Idiosyncratic Volatility, Lottery Stocks, Momentum Strategies. Pakistan Stock Exchange, PSX.

Introduction

People from all walks of life invest in Pakistan's stock market, which is vital to the economy. Economic issues have long plagued the Karachi Stock Exchange (KSE), now the Pakistan Stock Exchange (PSX) (Tariq et al., 2021). Most equity prices depend on public perceptions of the economy, government policies, and the nation's future. Tauseef's 2020 study found that stock market investors in Pakistan are volatile

during economic policy transitions. Pakistani stock market investors use this approach. Wang et al. (2024) say it is hard to link lottery demand to the stock market, structural, and economic changes. The relationship is linked to macroeconomic changes. There are several plausible connections between these extremes. Economic instability may lead people to take risks, such as investing heavily in stocks or buying lottery tickets. Increased risk-taking may explain this. Although unknown, this may be an attempt to optimize financial resources (Perveen et al., 2020).

In a 2020 study, Salisu and colleagues found that investors may switch from safer options, such as stocks, which are vulnerable to macroeconomic instability, to more appealing options, such as gambling or lotteries, which offer faster returns during economic instability. In prolonged economic and financial downturns, stockless lotteries may be a safe investment. Lee et al.'s 2020 study found that stockless lotteries are less volatile during economic turmoil. Stockless lotteries do not require investors to possess firm shares. Liquidity and activity can show how lottery spending affects the stock market. It is because the stock market is constantly changing. Lottery participation may reduce capital flows in the stock market, according to Adil et al. (2023). These researchers' findings underpin this notion. This study examines how economic variations affect lottery ticket sales and the Pakistani stock market. Investors, economists, market participants, and strategic policymakers will benefit most from these meetings. It is due to economic uncertainty and non-institutional interest in the stock market. This study examines how good and negative economic changes affect financial market opinions. It will follow consumer thoughts and feelings. It will help us understand Pakistani retail investors' behavior during economic uncertainty, notably lottery activity, which may signal economic weakness or susceptibility. It illuminates the behavior of Pakistani retail investors under economic uncertainty. This study examined how economic developments affected Pakistan's stock market and lottery ticket sales. In conclusion, this inquiry has a clear goal. This strategy shows how emerging-country financial markets address social and economic issues.

Problem Statement

Investor sentiment substantially influences government and social issues that affect financial markets. Markets are affected by both causes. In times of economic turmoil, developing nations like Pakistan have more volatile stock markets. These nations have long-term economic concerns. Market volatility is forcing investors to switch positions. It affects the market and encourages the trading of psychologically volatile, speculative stocks. Understanding how speculative stock demand drives market volatility during economic transitions helps investors react when markets are stable. Trading on economic news during or after incidents sometimes swings markets. It occurs frequently throughout transitions. Investor confidence drops when market stability is endangered. Many people buying gambling-like equities could produce excessive speculation, asset bubbles, and depreciation. The value of other assets will decrease. Without a comprehensive strategy to manage hackers' sophisticated system weaknesses, retirees risk financial loss. Understanding complex strategy requires a

detailed plan. This speculation undermines market safety laws and strategies. A more complete economic solution to speculative lotteries could avert this issue. It may aid regulators and the public.

Research Objective

Demand for lottery tickets shifts in the event of significant economic instability. This movement is driven by a range of economic reasons and occurs during substantial economic instability. As this revolution unfolds, demand for lottery tickets will shift. It is impossible to overstate the importance of keeping this in mind, particularly during times of economic uncertainty. It cannot be stressed enough. This variance has arisen due to the significant economic instability occurring in recent times. This instability has persisted for the past few years. This research is being conducted to identify the key economic and political factors driving current volatility. As a result, it will be possible to determine the causes responsible for the oscillations observed continuously since the beginning of this process.

Significance of the Study

Even executives benefit from trend analysis. Uncertain investors may develop stock market standards using new business or economic data. Strategic marketing and investor relations may promote stock offers and speculation. Economics strongly impact finance. In the context of economic and financial instability, hyperinflation, currency depreciation, and unpredictable monetary policies, lottery ticket sales and economic growth are hurt. Even flawed lottery tickets empower people experiencing poverty. Economic Joe studies gold prices. Lottery and risky investment sales are driven by economic uncertainty. Investors can churn markets without government control. Though people prefer secure investments, economic uncertainty may help investors profit from stock market inefficiencies. Analysts must track investor sentiment and technological trust to comprehend disruptive technologies and integrators.

Pakistani case studies combine financial and economic aspects in marketing. Assess the country's or investment's economic progress. It affects society and the economy beyond money. Economic analysis shows that a stable economy boosts consumer and investor confidence. If uncertainty encourages irrational financial risk-taking, legislation may be needed. Polls demonstrate poor financial literacy. Lottery-like systems need economic and financial backing for ethical investing, planning, and asset management. Economic change and market risk appetite are rarely studied. Since lottery ticket demand, Pakistani stock market volatility, and economic instability affect investors, markets, banks, and institutions, this gap warrants exploration. Risk management, investment decisions, and regulatory efficiency improve with this knowledge. Scholarship and finance are promoted. Economic growth, financial institutions, and macroeconomic stability will suffer.

Literature Review

Lottery demand has been extensively studied in economics, investment theory, and behavioral finance. Consumers prefer assets with a slight chance of enormous rewards despite their average negative value (Jiang et al., 2024; Moaaz & Mansour, 2023). As with lottery tickets, the odds of winning big are significantly lower than the ticket price. Risk-taking attitudes, positive feedback loops, and biases that affect attitudes and perceptions create the illusion of chance when none exists (Kuldip Kaur & Sahni, 2023). Financial market lotteries are important because Kahneman and Tversky's prospect theory suggests that people are more likely to take risks when there is a potentially advantageous large payout, even if the likelihood of obtaining that reward is low (Zhang et al., 2021). Prospect theory holds that investors are more inclined to buy lottery-type assets when they overestimate small odds and underestimate moderate or high probabilities (Ziarko et al., 2024). This is why investors may hold stocks despite their intrinsic value, especially in uncertain or financially challenging times. Jong et al. (2017) observed that strongly skewed stocks underperform but can gain significantly.

Lottery stocks have low prices, significant idiosyncratic volatility, and extreme positive skewness because investors are willing to pay despite the poor odds (Akbar and Bhutto, 2023). These stocks are like lottery tickets; low odds of significant gains, high odds of failure. Lottery stocks have high return skewness and are avoided since they rarely perform well (Miersch et al., 2024). Their analysis also found that investors want uneven profits from these companies. Lottery-like stocks are cheap with a skewed yield distribution and erratic performance (Su, 2021). Though they could make significant gains, many stocks lose money. This group says irrational thinking and gambling cause investors to acquire these stocks. According to Kashif et al. (2023), lottery stocks exhibit low share prices, firm-specific volatility, and strong skewness in their return distributions. Speculators buy these companies despite poor returns. Personal biases affect stock demand more than behavioral heuristics or fundamental value, the study shows. Ziarko et al. (2024) argue that lottery stocks with low odds of large prizes are most likely gambling. Investors are willing to risk a "bet" on these stocks for significant gains. They claim that prospect theory and the exaggeration of small likelihoods drive investors to these stocks. Nasir et al. (2023) imply that lottery stocks are sought by risk-takers for short-term gains despite long-term underperformance. He finds that emerging economies with vigorous speculative investor activity are more likely to have these equities, contrary to fundamental research.

Jiang et al. (2024) say lottery stocks attract speculative investors willing to risk more to make more money. Similar to lottery tickets, these investments benefit some while underperforming for others. Volatility, psychological biases, and market intuition drive lottery stock purchases, not fundamental analysis (Rosa, et al., 2022). These unique methods explain the popularity of lottery stocks among high-risk investors (An et al., 2023). Perhaps the most unique trait of lottery stocks is their positively skewed return distribution (Bali et al., 2021). Similar to winning the lottery, they frequently yield low returns but sometimes high ones. Behavioral finance shows that investors

overestimate the likelihood of large profits and buy stocks with even the tiniest probability of disproportionate returns. Other research demonstrates that companies with high downside risk perform poorly over time, although typical investors like them (Ziarko et al., 2024).

Lottery stocks also have high idiosyncratic volatility, meaning firm-specific events cause price divergence (Mittal et al., 2020; Tariq, 2021). Many traders try to capitalize on market volatility for quick cash (Devulapally & Tripurana, 2023). However, volatility can cause instability and financial losses from rash actions.

Other characteristics of lottery stocks include their low prices, sometimes penny stocks under \$5 per share. Penny stocks attract investors who expect higher profits (Terutama, 2022). It is wrong because losses, poor company performance, and aggressive speculation lower stock values. Many small investors acquire these stocks in bulk due to their low cost, boosting trading volume and price volatility (Chen & Lin, 2025). In the long run, lottery stocks underperform. The speculative nature and weak fundamentals of many of these companies lower their average returns despite their short-term profit potential. Investors seeking a windfall may ignore these shares' empirically negative risk-adjusted returns. Fundamental and cautious investors should avoid these stocks due to declining returns (Index Investment Strategy, 2023; Nasir et al., 2023).

Lottery stocks exhibit greater kurtosis than "normal" equities, leading to larger price movements. Lottery stocks have short-term losses and high profits, while other stocks offer more consistent returns. Lottery stock investments entice gamblers despite most losing money (Lobo & Bhat, 2021). Lottery stocks trade often. Buyers and sellers earn from price swings by trading these stocks (Jiang et al., 2024). This method raises trade volume and creates price booms and busts, when stock prices rise owing to frantic speculation and plummet when it calms. Speculative trading is possible with these volatile, market-sensitive shares (Srivastava et al., 2022).

More lottery stocks are in developing countries than in sophisticated financial markets. Emerging nations have more speculative investors, inefficient stock markets, and lax financial rules. Poorly educated investors dominate these markets, which risk significant losses. These markets experience greater speculative trading due to economic uncertainty (Shruti Punj, 2023). Economic factors shape the complex market structure, driving fluctuations and trends. Interest rates, GDP growth, inflation, employment, exchange rates, and government policies affect investment decisions (Jui et al., 2024). Economic strength boosts consumer spending, market confidence, and demand for high-yield assets. In slow economies, investors buy stocks or bonds or prefer low-risk investments like gold and government bonds based on their purchasing power (Feder-Sempach et al., 2024). Government ambitions, policies, and geopolitical events affect asset values, while trade relations affect investor confidence and capital flow. The "less favorable" relationship between political and economic issues must be considered while investing (Omor & Faruq, 2023).

Changes impact investors' risk tolerance and economics. Gradual GDP and employment growth boost investor optimism (Maghdid et al., 2024; Rashid, 2024). The rising value of developing firms, the demand for riskier assets with higher yields,

and the stock market cash flood reflect this optimism. Evans describes self-fulfilling prophecies as "growth-oriented," meaning investors buy more across the market during economic expansion (Banner et al., 2018; Ziarko, 2024). Recessions lower investor morale by reducing corporate profitability, increasing economic instability, leading to unemployment, and slowing consumer spending. Investors prefer low-risk strategies, such as defensive equities, gold, and fixed-income products, during economic turbulence (Feder-Sempach et al., 2024). The economy always impacts investor and financial market behavior. The economy relies on financial markets (Alim et al., 2024). Macroeconomic factors affect investment, risk tolerance, capital flows, and market sentiment. Kang et al. (2022) note that these top issues significantly influence investor behavior and capital market activity. Regional economic health is measured by GDP and economic development. GDP growth boosts market growth, consumption, building, corporate earnings, and stocks. Growing economies have optimistic equity markets (Jui et al., 2024). Stock market investor confidence is growing. Positive folks take more risks than pessimists. Growth companies are more popular; therefore, investors buy them aggressively during periods of high GDP growth.

Industrial, consumer discretionary, and technology stocks grow (Eboigbe & Modugu, 2018). Strong GDP growth boosts global and domestic investment. When GDP falls, consumers worry, prompting a market sell-off, lower prices, and weaker investor confidence in the markets and themselves (Mouneer et al., 2023). Financial markets and investors are affected by inflation (Kumar, 2009; Kahneman & Tversky, 1979; Bali, Cakici, & Whitelaw, 2011).

Inflation lowers investment profits and purchasing power (James & Chin, 2022). Gold and real estate outperform low-yielding fixed-income products as inflation rises. Price increases raised interest rates, affecting borrowing costs and corporate profits. Central banks must cut expenditure to lower the money supply when inflation rises. Market corrections lower industrial output (Suresh & Kumar, 2021). Central banks dominate interest rates and market investment plans (Lastauskas & Nguyen, 2023). Because central banks adjust interest rates to boost or slow growth or inflation. Low interest rates allow banks to borrow reserves and boost business and consumer spending. It boosts stocks (Jahnvi & Devi, 2023). However, rising interest rates reduce the availability of money, lowering stock market earnings and raising borrowing costs. As interest rates rise, investors are turning to bonds, which are stable and offer limited returns. Rising interest rates limit stock and corporate investment. Declines in the latter boost stock prices, value caps, and assessments (Ziarko et al., 2024).

The extent to which a market allows asset purchases or sales at defined prices is called liquidity. Banking and monetary policy affect credit availability, which impacts loan eligibility for individuals and enterprises. Increased liquidity streamlines transactions, boosting investor trust. Finance encourages businesses and individuals to invest and take on risk. Increased trading volumes reduce volatility in liquid markets. In financial crises, liquidity may evaporate, prompting steep losses and panic selling (Punj, 2023; Wang et al., 2024). Consumer spending and the economy depend on jobs. The economy is thriving despite challenges and high unemployment (Barello & Hugie,

2023). Employment is strongly linked to consumer spending and investment. The economy declines as unemployment grows, and overspending makes investors risk-averse. Strong labor markets often accompany high stock markets, especially in consumer-driven industries. Increased unemployment can induce recessions and stock market drops (David et al., 2023).

Changes in exchange rates affect international trade and investment. A strong native currency may attract international investment, whereas a weak one may cause capital flight. Converting a depreciating asset into its local currency may result in a loss (Anwar et al., 2023). International investors flee stock markets for those with stable currencies and lower exchange rates. Strong currencies damage export-led enterprises by raising export prices. A weaker currency weakens competitiveness and may raise import prices and inflation (Hassan et al., 2022; Younis, 2020).

Customs, foreign aid, and balance of payments influence a nation's financial strategy. Expanding government spending and decreasing taxes boost economic growth, whereas contractionary policies reduce the budget deficit (Makohon, 2021). Economic growth, employment, stock appeal, and company earnings gain from fiscal expansion. Tule et al. (2020) predict lower disposable incomes and company profitability due to fewer discretionary expenditures. Infrastructure and government subsidies would boost the economy and stock prices. Government expenditure increases inflation and debt, hurting the market (Garg et al., 2024). In an integrated economy, the finances of major global economic giants heavily affect market investors. Tariffs, trade, and international relations affect investment. Tariffs make markets unpredictable; therefore, investors shun them (Maghdid et al., 2024). Economic alliances and free trade agreements better protect investors. Trade wars, global recessions, and geopolitical unrest can disrupt supply chains, decreasing corporate earnings and increasing market volatility (Wang et al., 2024).

The economy, market expectations, and earnings affect investor sentiment and stock prices. Overpriced markets correct, but inexpensive markets attract long-term investment. Investors will speculate in pricey markets (Sipley, 2021). Defensive equities safeguard investors in weak markets. Market bubbles result from overconfidence in stock prices. Jabeen et al. (2022) state that market collapses lead to significant falls and financial disasters. Oil and other commodities impact global finance. Gold, crude oil, and agricultural prices affect industrial production and inflation. To hedge against inflationary expectations from high commodity prices, investors buy gold or energy equities (Zakaria et al., 2021). Raw material firms profit from lower prices. As oil prices rise, the economy may stagnate, spend less, and inflate. However, declining oil prices can suggest weak global demand and economic contraction (Mukhtarov et al., 2021; Sia, 2023).

Corporate success drives stocks. Strong profit growth announcements boost investor spending and stock prices. Good earnings boost stock sales and spending, while bad ones depress them. Earnings analysis is essential for portfolio planning. Strong corporate earnings fuel bull markets, while earnings declines trigger corrections and recessions (Akbar & Bhutto, 2023). Investor psychology affects market swings. Fear, greed, and panic cause market volatility. Investors' overconfidence and herd mentality

often produce asset bubbles or market crashes. Concern about the economy can drive market sell-offs, while exhilaration can cause reckless speculation (Alamsyah et al., 2023).

Interest rates, inflation, and exchange rates affect the tastes and behavior of lottery stock investors. Lottery stocks attract investors willing to assume unnecessary financial risks for the potential of significant gains (Kashif et al., 2023). It is generally recognized that macroeconomic conditions affect perceptions of risk and reward, as well as capital market allocation. These qualities and their consequences on investor sentiment and corporate trust must be examined to measure market health and financial stability (Ghani & Ghani, 2024; Salim, 2020).

H1: Investor preferences for lottery stocks are significantly influenced by macroeconomic factors such as inflation, interest rates, and exchange rates.

Research Methodology

This research utilizes a quantitative framework to examine the nexus between lottery-like stock demand, stock market volatility, and political regime change in Pakistan. The research employs a panel data framework spanning 21 years, from 2002 to 2023, to accommodate a broad array of economic and financial differences. A pivotal aspect of the research design is its event-driven nature, which enables the examination of investor behavior before, during, and after economic policy changes. The research ensures a robust empirical analysis by using tercile-based quantile regression (low, middle, and high terciles) to examine how sentiment-based trading varies with changes in investor risk tolerance. The study categorizes lottery-like stocks based on three basic traits: maximum daily return (MAXRET), idiosyncratic volatility (IVOL), and low stock prices (below PKR 10 per stock). By grouping investors into terciles (lower 33%, middle 33%, and upper 33%), the study thoroughly analyzes the diverse responses of various investor groups to stock market volatility, macroeconomic shocks, and political tensions. The applied quantile regression method captures heterogeneous effects, showing that risk-taking behavior increases during periods of high market volatility.

The dependent variable is stock returns, defined as the ratio of total trading volume of lottery-like stocks. The independent variables are idiosyncratic volatility (Fama-French six-factor), economic factors (inflation, unemployment, and economic uncertainty). Using tercile-based quantile regression, this research design provides a precise examination of investor sentiment across different levels of risk exposure, thereby offering a thorough study of behavioral finance in uncertain economic markets. This study uses a quantitative method to examine the impact of economic events on the returns of shares listed on the Pakistan Stock Exchange (PSX).

The primary dependent variable in this research is stock return, while the primary independent variable is the years of economic transition in 2002, 2008, 2013, and 2018. These years of transition are marked by primary elections and regime changes in Pakistan, historically linked to shifts in market stability and investor sentiment. To ensure robust and reliable findings, this study employs the Fama-MacBeth regression as an alternative empirical technique. The research design is structured into three

phases: i) exploratory data analysis and descriptive statistics, ii) quantile regression for the primary analysis, and iii) Fama-MacBeth regression for cross-sectional robustness checks. Combining quantile regression with Fama-MacBeth estimation, this research provides a conclusive analysis of the impact of economic uncertainty on stock market behavior in an emerging market such as Pakistan. This research design ensures that investor sentiment, risk aversion, and macroeconomic factors are systematically controlled and that the findings are robust and policy-relevant. The study population comprises all publicly listed companies on the Pakistan Stock Exchange (PSX) between 2002 and 2023. The sampling process is standardized so that the sample comprises firms from various industries with different risk exposures. The most significant sample selection criterion is that companies must have been continuously listed on the PSX throughout the study period (2002–2023) to allow for consistent return calculations. Second, trading activity in low-frequency stocks or those with illiquidity is avoided to prevent selection bias. Third, the last sample is primarily composed of companies with long records of stock return data, precise financial measures, and pertinent macroeconomic variables. Fourth, an appropriate mix of large-, mid-, and small-cap stocks is used to ensure that significant institutional investments do not skew results. Finally, the research focuses on stock returns, using evidence from pre-event, event, and post-event periods to measure changes in investor sentiment.

The final sample is a panel dataset of PSX-listed firms with daily and monthly stock returns, volatility indicators, and firm-level financial variables. The study ensures sufficient stocks across all sectors, thereby allowing a broad representation of how different industries respond to political instability. The sample size is expected to fluctuate from year to year due to de-listings, new IPOs, and changes in market structure, but a minimum number of firms is guaranteed to ensure statistical completeness. The sampling method adopted is purposive sampling, as companies are selected based on market representation, trade volume, and data availability, rather than randomly. Using this method, the dataset becomes more effective in capturing the effect of economic uncertainty on stock returns, making the inference generalizable to the entire Pakistani equity market. The paper also uses tercile-based quantile regression, in which stocks are segmented into low-, medium-, and high-return terciles, and analyzes how different investor segments respond to economic shocks.

Stock market data, including daily and monthly stock returns, is sourced from the Pakistan Stock Exchange (PSX) and DataStream. Firm-specific financial features, trading volume, and risk factors are available in the dataset, supporting a robust examination of how stocks with different risk profiles react to economic shifts. Macroeconomic variables, including inflation, unemployment, and economic uncertainty, are sourced from the State Bank of Pakistan (SBP) and the World Bank's World Development Indicators (WDI).

Stock return, used as a dependent variable in the study, is defined as:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

where $R_{i,t}$ is the return on stock i at time t , and $P_{i,t}$ refers to the price of stock at time t . Stock returns are estimated at daily and monthly horizons to examine the effect of economic uncertainty on short- and long-run stock market performance.

Economic transitions are defined as the years 2002, 2008, 2013, and 2018 that coincide with large general elections in Pakistan. The transitions are measured with a binary variable:

Economic Transition _{t}

$$= \begin{cases} 1, & \text{if the period corresponds to an economic policy transaction year} \\ 0, & \text{if the period does not correspond to an economic policy transaction year} \end{cases}$$

This encapsulates how economic instability affects investor sentiment and stock market performance (Pastor & Veronesi, 2013).

Fama and French (2018) expanded their five-factor model (FF-2015) by adding a momentum factor, creating the six-factor model. The authors contrasted several nested models in their research, including the CAPM, the three-factor model, the five-factor model, and the six-factor model. They also contrasted non-nested models to test robustness in factor structure. By employing the Sharpe ratio in twelve iterations of the six-factor model with different sets of factors, they determined the most efficient model with the highest squared Sharpe ratio.

In their work, three important issues were faced: (1) the profitability factor was measured by two proxies, cash profitability and operating profitability; (2) variations between long-short spreads and excess returns; and (3) variations in factor selection depending on firm size. Numerous academic works have examined expected returns and cross-sectional tests. Harvey et al. (2016) identified 316 candidate factors in asset pricing models through a careful literature review of 313 academic works, though numerous other factors may prove significant. Factor choice and model competition remain grand challenges.

Previous studies mostly used the left-hand-side (LHS) approach, testing models to see whether they could explain unexplained average returns using time-series regressions on LHS portfolios. Fama and French (2018) proposed a right-hand-side (RHS) setup, in which each factor was regressed on all other factors to assess its explanatory power. Interestingly, the momentum factor played a crucial role in the five-factor model (Fama & French, 2015), an extension of the three-factor model (Fama & French, 1993). The six-factor model equation is:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i(R_{m,t} - R_{f,t}) + s_iSMB_t + h_iHML_t + r_iRMW_{O,t} + c_iCMA_t + m_iUMD_t + \varepsilon_{i,t}$$

This thesis is an extension of the previously developed FF-1993 and FF-2015 models by adding a very important additional factor referred to as the momentum

factor(UMD_t). This particular factor is the observed difference between high- and low-momentum stocks. The development and progression of these nested models clearly reflect the ongoing advancements in asset pricing theories over the years. The Capital Asset Pricing Model (CAPM) initially focused solely on the concept of market excess returns, offering a straightforward perspective on asset pricing. However, the FF-1993 model improved this initial model by incorporating important size and value factors into its considerations. Further additions to these models included other important factors, such as the momentum factor (discovered by Novy-Marx in 2013) and investment- and profitability-linked factors. These progressive developments eventually led to the six-factor model, which Fama and French found, in their 2018 study, to be the most efficient and effective of the alternatives in asset pricing models.

Idiosyncratic volatility (IVOLT) is approximated by residual standard deviation in six-factor regression (Fama & French, 2018), following Ang et al. (2006). IVOLT of stock *i* in month *t* is approximated based on the lagged month's daily stock returns:

$$IVOLT_{i,t} = \sqrt{\sum_{t=1}^T \frac{(\epsilon_{i,t} - \bar{\epsilon}_i)^2}{(T - t)}}$$

For Pakistani stocks, this method replicates Fama and French (2018) and requires at least 15 non-zero-volume trading days for IVOLT computation (Fu, 2009). Harvey and Siddique (2000) introduced systematic co-skewness into asset pricing on the premise that investors prefer right-skewed portfolios. The model integrates co-skewness into CAPM:

$$R_{i,t} - R_{f,t} = \alpha_i + (R_{m,t} - R_{f,t}) + \gamma_i (R_{m,t} - R_{f,t})^2 + \epsilon_{i,t}$$

Idiosyncratic skewness (ISKN) refers to the skewness of the residual component.

Bali et al. (2011) researched extreme positive-return stocks, their lottery-like nature, and low odds of massive gains in U.S. stocks. Their firm-level cross-sectional and portfolio regression results indicated a strong negative relationship between the previous month's maximum daily return (MAXRET) and subsequent-month returns. Annaert et al. (2013), Fong and Toh (2014), and Walkshäusl (2014) also obtained similar results in European markets. Fong and Toh (2014) also concluded that the MAX effect is mainly driven by investor sentiment and is stronger in companies with high cash-flow volatility or low profitability (Walkshäusl, 2014; Fama, 1970).

Drawing on existing literature, this thesis defines lottery-type stocks using four main variables: idiosyncratic volatility (IVOLT), idiosyncratic skewness (ISKN), stock price (PR), and maximum daily return (MAXD). MAXRET (1) is the maximum daily return for a month, while MAXRET (5) is the average of the top five highest daily returns for the month. Bali et al. (2011) found that MAXRET (5) has a greater impact on separating high- and low-MAXRET stocks.

These four independent lottery-feature variables — IVOLT, ISKN, PR, and MAXRET — are used to derive the Lottery-Features Index (LFI) (Doran et al., 2011; Han & Kumar, 2013). For any stock $IVOLT_{i,t}$ is derived from the residual term standard deviation of stock I during month t , through multiple asset pricing models, i.e., the Fama and French (1993) three-factor model, Carhart (1997) four-factor model, Fama and French (2015) five-factor model, and Fama and French (2018) six-factor model. The idiosyncratic volatility is further annualized through multiplication. Firm-specific control variables to account for stock-specific drivers of returns: the study incorporates the inflation, interest rate, and exchange rate as the macroeconomic variables.

Results

While OLS regression focuses on modeling the conditional mean of a dependent variable, quantile regression provides a robust analytical framework for investigating how different explanatory variables influence various points of the conditional distribution of the dependent variable. This framework provides a better understanding of heterogeneous effects across the quantiles of stock returns and captures lower-tail underperformance and upper-tail outperformance. For financial markets, it is good at identifying asymmetries in investor responses to prevailing economic conditions, such as inflationary pressures, interest rate fluctuations, and exchange rate volatility. Analysis of the impact of these macroeconomic factors across different quantiles depicts how economic transitions affect speculative and risk-taking behavior differently across market segments. By allowing such nuanced exploration of market dynamics, this approach yields deeper insight into risk heterogeneity and behavioral asymmetry that has been overlooked by traditional mean-based estimations (Koenker & Bassett, 1978; Hao & Naiman, 2007; Yu, Lu & Stander, 2003).

Results for idiosyncratic volatility show a negative, significant impact of inflation at the lower quantile: $\beta = -0.1182^{***}$ for equal-weighted and -0.1469^{***} for value-weighted portfolios, suggesting that higher inflationary pressure discourages speculation in highly volatile stocks in search of stability. Nevertheless, this turns positive at the upper quantile, indicating that inflation is positively associated with speculative behavior ($\beta = 0.0671^{**}$, 0.0958^{***}), suggesting that rising, yet predictable, inflation renews risk-taking in speculative stocks. Moreover, interest rate outcomes also show overt asymmetry. That is, when monetary conditions are tight, coefficients are negative ($\beta = -0.2455^{***}$, -0.2817^{***}), reflecting reduced participation in volatility-based speculation. When interest rates stabilize, however, coefficients become positive ($\beta = 0.0527$, 0.0619), indicating that investors re-enter volatile assets as liquidity improves. Similarly, a depreciated exchange rate decreases speculation ($\beta = -0.1983^{**}$, -0.2261^{***}), while a stable one heightens gambling-type risk preferences ($\beta = 0.0736^{**}$, 0.1185^{***}). These results are consistent with the liquidity and sentiment channel of Kumar (2009) and risk-aversion dynamics as reported in emerging markets (Naeem et al., 2020).

The findings suggest that during periods of high inflation, investors tend to shun

stocks with negative skewness—those with limited upside and greater downside risk. This fact emerges from the bottom quantile coefficients: $\beta = -0.1512^{***}, -0.1769^{***}$. However, when the inflation growth rate normalizes, demand shifts toward positively skewed (lottery-like) stocks: $\beta = 0.0867^{***}, 0.1191^{***}$, indicating that after uncertainty declines, investors favor such stocks for their potential returns. A similar pattern emerges with interest rate changes: a rise in rates discourages skewness-driven speculation ($\beta = -0.2683^{***}, -0.2457^{**}$), while stable rates rekindle mild speculative activity ($\beta = 0.0483, 0.0762^{**}$). Under exchange rate movements, depreciation leads to weaker investor confidence ($\beta = -0.1758^{**}, -0.2045^{***}$), and appreciation or stability revives "hope-driven" preferences ($\beta = 0.0669^{**}, 0.1015^{***}$). These results reflect prospect theory's loss aversion principle, which holds that macroeconomic volatility reduces risk-seeking tendencies within a given environment of uncertainty (Barberis & Shleifer, 2003).

The one-day maximum return feature, MAX(1), captures short-run speculative preferences. Inflation significantly dampens enthusiasm for high-risk stocks at the lower quantile ($\beta = -0.1345^{***}, -0.1612^{***}$), but as inflation expectations turn positive, speculative optimism rises sharply ($\beta = 0.0956^{***}, 0.1248^{***}$). Interest rates also follow a similar dynamic. The coefficients for the restrictive policy period are strongly negative ($\beta = -0.2834^{***}, -0.3189^{***}$), evidencing that costly borrowing decreases speculative trading. Once rates ease up or stabilize, coefficients become positive: $\beta = 0.0575, 0.0794^{**}$. Exchange rate depreciation dampens speculative appetite: $\beta = -0.2149^{***}, -0.2435^{***}$, while appreciation fuels speculative momentum: $\beta = 0.0814^{**}, 0.1337^{***}$. This corroborates the momentum trading hypothesis, which posits that improved macro stability leads to speculative surges in money flows (Gao & Lin, 2015). The five-day maximum return measure shows that there are some consistent behavioral cycles. Inflationary shocks deter speculation in high-return stocks, while optimistic inflation expectations reverse the move: $\beta = -0.1472^{***}$ and -0.1635^{***} , and $\beta = 0.1019^{***}$ and 0.1342^{***} , respectively. Similarly, tight interest rate regimes restrain speculative short-term trades, but a relaxation of rates motivates reentry: $\beta = -0.2598^{***}, -0.3096^{***}$, and $\beta = 0.0726^{**}, 0.0911^{**}$, respectively.

While exchange rate volatility limits exposure to MAX(5) stocks, $\beta = -0.2189^{***}, -0.2564^{***}$, exchange stability revives speculative inflows, $\beta = 0.0832^{**}, 0.1289^{***}$. These results reflect the recency bias phenomenon whereby investors extrapolate recent high returns in stable macro conditions into the future (Shefrin, 2007). Low-priced stocks, commonly referred to as "penny stocks" in the speculative literature, exhibit the greatest behavioral sensitivity to macroeconomic transitions. Inflation diminishes the participation in low-priced, high-risk equities, whereas rising costs and uncertainty deter speculative demand. However, during the stable phases of inflation, the coefficients become positive, reflecting a rebound in gambling-like behavior: $\beta = -0.1784^{***}, -0.2047^{***}$; $\beta = 0.0938^{***}, 0.1265^{***}$. High interest rates dampen investment in low-value shares ($\beta = -0.2417^{***}, -0.2884^{***}$), but stable rates see the beginning of mild speculative recoveries ($\beta = 0.0631^{*}, 0.0867^{**}$). The depreciation of the exchange rate reduces investor confidence ($\beta = -0.2032^{***}, -0.2479^{***}$), while

stability or appreciation enhances investor sentiment ($\beta = 0.0794^{**}, 0.1128^{***}$). In support, these findings show that low-priced stocks receive disproportionately high attention during periods of macroeconomic tranquillity, in line with theories of lottery preference in emerging economies (Batten et al., 2021; Huang et al., 2020).

Robustness Analysis (Fama-MacBeth Regression)

The Fama-MacBeth regression estimates in Table 2 provide a robustness check of the relationship between the macroeconomic variables—namely, inflation, interest rates, and exchange rates—and the lottery-like features of the PSX stock market. The adjusted R-squared range of 0.53 to 0.61 shows strong explanatory power, while statistically significant F-statistics in all models at $p < 0.01$ confirm the overall validity and strength of the fitted models. The VIFs are below 2.0, indicating no multicollinearity, making the results reliable and stable.

Results from model (1) show that the interaction between inflation and IVOLT is negative and significant ($\beta = -0.111, p < 0.01$), suggesting that increasing inflation is associated with decreasing speculative and riskier trading in volatile stocks. Furthermore, as shown by the negative coefficient of IVOLT, investor preference shifts toward low-risk options over high-risk during periods of high inflation ($\beta = -0.068, p < 0.01$). These findings are consistent with behavioral finance, which suggests that inflationary uncertainty deters speculative trading (Ang et al., 2006; Bekaert & Engstrom, 2010). Model (2) adds interest rates with IVOLT, and the coefficient is negative and highly significant ($\beta = -0.132, p < 0.01$), which suggests that monetary policy tightening dampens risk-seeking behavior in speculative stocks. However, IVOLT remains positive ($\beta = 0.053, p < 0.05$), suggesting that once rates stabilize, some speculative activity may resume. This dual pattern supports the view that short-term monetary shocks constrain risk-taking, while medium-term normalization encourages partial recovery in high-volatility segments.

In Model (3), the exchange rate significantly and positively influences stock behavior, with $\beta = 0.083$ at $p < 0.01$, indicating that exchange rate stability or appreciation increases investor confidence and appetite for risk. The positively significant IVOLT, $\beta = 0.061, p < 0.05$, suggests that capital inflows and currency stability can lead to speculative participation. This result is consistent with the emerging-market literature, which suggests that currency stability signals macroeconomic confidence and therefore encourages risk-taking (Aggarwal et al., 1999). Model (4) combines inflation and idiosyncratic skewness, where both variables keep negative signs (Inflation; $\beta = -0.094, p < 0.01$; ISKEN; $\beta = -0.101, p < 0.05$). The findings suggest that inflationary pressures dampen investor appeal for asymmetrically risky "lottery-type" assets. Skewness is hence less desirable in an unstable price environment, corroborating empirical evidence from risk-aversion theory (Bali et al., 2011).

Table 1 Quantile Regression Results

Idiosyncratic Volatility	Quantile	Equal Weighted	Value Weighted	Interpretation
Inflation	Bottom	- 0.1182***	- 0.1469***	Inflationary pressures reduce speculative risk-taking in volatile stocks.
Inflation	Top	0.0671**	0.0958***	Rising inflation uncertainty increases gambling-type activity.
Interest Rate	Bottom	- 0.2455***	- 0.2817***	Tight monetary policy curbs volatility-driven speculation.
Interest Rate	Top	0.0527	0.0619	Investors re-enter speculative stocks when rates stabilize.
Exchange Rate	Bottom	-0.1983**	- 0.2261***	Currency depreciation discourages speculative exposure.
Exchange Rate	Top	0.0736**	0.1185***	Exchange rate stability enhances risk-taking incentives.
Idiosyncratic Skewness	Quantile	Equal Weighted	Value Weighted	Interpretation
Inflation	Bottom	- 0.1512***	- 0.1769***	Negative skewness is unattractive during periods of high inflation.
Inflation	Top	0.0867***	0.1191***	Positive skewness drives lottery-like demand when inflation stabilizes.
Interest Rate	Bottom	- 0.2683***	-0.2457**	Rising rates reduce asymmetric return seeking.
Interest Rate	Top	0.0483	0.0762**	Slightly higher skewness motivates risk-seeking under a stable policy.
Exchange Rate	Bottom	-0.1758**	- 0.2045***	Depreciation increases uncertainty, discouraging skewness-based speculation.
Exchange Rate	Top	0.0669**	0.1015***	Exchange rate stabilization fuels "hope-driven" stock preferences.
MAX (1)	Quantile	Equal Weighted	Value Weighted	Interpretation
Inflation	Bottom	- 0.1345***	- 0.1612***	Inflation reduces optimism, leading to withdrawal from high-risk stocks.
Inflation	Top	0.0956***	0.1248***	Positive inflation expectations encourage short-term speculative surges.
Interest Rate	Bottom	- 0.2834***	- 0.3189***	High rates dampen speculative MAX-return trading.
Interest Rate	Top	0.0575	0.0794**	Speculators return once interest-rate risk declines.
Exchange Rate	Bottom	- 0.2149***	- 0.2435***	Depreciation raises import costs and reduces speculative appetite.
Exchange Rate	Top	0.0814**	0.1337***	Stabilization or appreciation sparks optimism among speculators. Stocks.

MAX (5)	Quantile	Equal Weighted	Value Weighted	Interpretation
Inflation	Bottom	- 0.1472***	- 0.1635***	Inflation shocks cause traders to withdraw from highly volatile MAX-return stocks.
Inflation	Top	0.1019***	0.1342***	Optimistic inflation outlook boosts short-term speculative bets.
Interest Rate	Bottom	- 0.2598***	- 0.3096***	Tight monetary policy suppresses gambling-type trading behavior.
Interest Rate	Top	0.0726**	0.0911**	Stable interest rates encourage short-term lottery trading.
Exchange Rate	Bottom	- 0.2189***	- 0.2564***	Volatile exchange markets limit investor exposure to MAX(5) stocks.
Exchange Rate	Top	0.0832**	0.1289***	Exchange stability or appreciation triggers speculative inflows into extreme-return stocks.
Low-Price	Quantile	Equal Weighted	Value Weighted	Interpretation
Inflation	Bottom	- 0.1784***	- 0.2047***	Inflation increases risk aversion, reducing speculative trading in low-priced stocks.
Inflation	Top	0.0938***	0.1265***	Price stabilization revives speculative appetite for penny-type stocks.
Interest Rate	Bottom	- 0.2417***	- 0.2884***	High policy rates discourage investment in cheap, high-risk shares.
Interest Rate	Top	0.0631*	0.0867**	Lower rates or stable conditions enhance small-stock trading activity.
Exchange Rate	Bottom	- 0.2032***	- 0.2479***	Depreciation increases uncertainty, dampening speculation in low-priced stocks.
Exchange Rate	Top	0.0794**	0.1128***	Exchange rate stabilization improves sentiment toward speculative stocks.

In Model 7, the interaction between inflation and low-priced stocks shows a significant negative impact ($\beta = -0.123$, $p < 0.01$), suggesting that inflation uncertainty forces investors to retreat from low-priced, speculative stocks. The low-price variable itself ($\beta = -0.142$, $p < 0.05$) reveals that such assets are susceptible to macroeconomic shocks. Control variables perform similarly across all models and are consistent with theoretical expectations. Momentum and reversal are negative and highly significant ($p < 0.01$) across the board, suggesting a tendency toward market corrections. Firm size (Ln Size) and book-to-market ratio (Ln BM) are negatively related to returns, consistent with the size and value effects of the Fama–French (1993) models. Conversely, illiquidity and turnover yield mixed results, given different liquidity dynamics across economic conditions.

Models (5) and (6) discuss the interest rate and exchange rate effects on extremes in

return behaviors, proxied by the variables MAX(1) and MAX(5), respectively. Both of these macroeconomic variables feature contrasting yet logical effects: While interest rates in Model (5) feature a positive impact, with a β of 0.089 and $p < 0.01$, reflecting the fact that moderate stability in rates encourages speculation in pursuit of short-term returns, MAX(1) is negative at $\beta = -0.019$ and $p < 0.01$, suggesting excessive volatility in interest rates suppresses lottery-like investment behavior. Notably, the exchange rate in model (6) reveals a positive coefficient, $\beta = 0.071$, and $p < 0.01$, consistent with the notion that currency stabilization favors optimism in the short term, whereas MAX(5) remains negative at $\beta = -0.177$ and $p < 0.01$, reflecting extreme volatility in currency markets that discourages gambling-type investment behavior.

Table 2: Robustness Analysis FAMA-MACBETH

Variable	Model (1) Inflation + IVOLT	Model (2) Interest Rate + IVOLT	Model (3) Exchange Rate + IVOLT	Model (4) Inflation + ISKEN	Model (5) Interest Rate + MAX(1)	Model (6) Exchange Rate + MAX(5)	Model (7) Inflation + Low Price
Constant	-0.086	-0.067	-0.074	0.021	0.071	0.045	-0.152
Inflation	- 0.111* **			- 0.094* **			- 0.123* **
Interest Rate		- 0.132* **			0.089* **		
Exchange Rate			0.083** *			0.071** *	
IVOLT	- 0.068* **	0.053* *	0.061**				
ISKEN				- 0.101* *			
MAX(1)					- 0.019* **		
MAX(5)						- 0.177** *	
LnPrice							- 0.142*

							*
TSKEN	0.059	-0.066	-0.051	-0.173	-0.048	-0.189	0.022
TVOL	-	0.034*	-	-	-	-	-
	0.019*	*	0.171**	0.095*	0.089*	0.097**	0.026*
	*			*	*		*
Market Beta	0.012*	-	-	0.066*	-	-	0.029*
		0.127*	0.132**	*	0.079*	0.085**	
		*			*		
Momentum	-	-	-	-	-	-	-
	0.185*	0.041*	0.043**	0.113*	0.115*	0.118**	0.048*
	**	*		**	**	*	*
Ln Illiquidity	0.082*	-0.022	-0.009	-0.004	0.043*	0.048*	-0.039*
	*						
Ln Turnover	0.045	-	-	-	-	-	-0.067*
		0.167*	0.175**	0.094*	0.087*	0.091**	
		*		*	*		
Ln BM	-	-0.014	-0.017	-0.043*	-	-	-
	0.129*				0.109*	0.117**	0.178*
	*				*		*
Ln Size	-	-	-	-	-	-	-
	0.142*	0.139*	0.146**	0.036*	0.034*	0.038**	0.157*
	*	*		*	*		*
Reversal	-	-	-	-	-	-	-
	0.141*	0.172*	0.177**	0.139*	0.146*	0.152**	0.183*
	**	**	*	**	**	*	**
Adjusted R ²	0.59	0.57	0.55	0.53	0.61	0.58	0.56
F-Statistic	29.82*	28.63*	27.11**	30.25*	31.49*	28.02**	29.36*
	**	**	*	**	**	*	**
Observations	3,200	3,200	3,200	3,200	3,200	3,200	3,200
Multicollinearity	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Conclusion

This method shows that economic transitions affect stock market behavior, supporting previous research on economic uncertainty and financial markets (Pastor & Veronesi, 2013; Bialkowski, Gottschalk, & Wisniewski, 2008) According to the Fama-MacBeth cross-sectional regression model, uncertainty, market volatility, and investor risk aversion lower stock returns in election years (2002, 2008, 2013, and 2018). All models had a negative coefficient for the economic transition variable, especially in 2008 (-0.178), suggesting that macroeconomic shocks, such as the global financial crisis, can worsen economic instability. According to Pástor and Veronesi (2013), elections generate policy uncertainty; therefore, risk-averse investors hoard risky

assets. We agree with Bialkowski et al. (2008) that economic cycles affect equity markets, especially in emerging and vulnerable economies.

This study suggests that high-volatility stocks underperform during economic transition. It aids quantile regression and portfolio sorting. IVOLT was -0.07 and -0.047 in 2013 and 2018, indicating a good association with stock performance. Bali, Brown, and Tang (2017) found that high-idiosyncratic-volatility stocks underperform following economic shocks. Economic uncertainty hurt lottery-like idiosyncratic skewness (ISKEN) stocks in 2008 and 2013 (-0.113 and -0.109). It supports the behavioral finance notion that investors overpay for speculative stocks in some markets but buy safer ones in others (Kumar, 2009). Extreme return stocks MAXRET (1) and (5) underperform (-0.198 and -0.167) in 2008 and 2018. It suggests that election uncertainty decreases short-term speculative trading (Bali et al., 2011).

This study also found that elections impair momentum-based investment. The 2002 and 2008 momentum coefficients (-0.04) imply economic uncertainty influences market sentiment, making it hard for victors to hold gains. Momentum strategies fail during market corrections and periods of uncertainty (Antoniou, Doukas, & Subrahmanyam, 2013). The negative reversal coefficients, especially in 2008 (-0.09), suggest that investors respond more to economic announcements and macroeconomic surprises during periods of economic uncertainty (Chordia & Shivakumar, 2002). Short-term price corrections are more likely during elections, thus traders may need more flexibility.

This study helps investors, fund managers, and economical negotiate stock market elections. Risk aversion and uncertainty hurt volatile, speculative stocks during economic uncertainty. Investment managers may buy safer equities before elections. In controlling economic risk, liquidity is studied, and high-turnover shares perform better during election years, suggesting that investors favour shares that can be updated quickly after policy changes. Officials should maintain transparent and predictable economic policies during elections to protect investor confidence and the stock market. Government policies and efforts to reduce uncertainty can calm financial markets and boost long-term investment.

This study extends the economic uncertainty and financial markets model and supports the ideas of economic risk, investor sentiment, and market strangeness. The data corroborate the Economic Uncertainty Hypothesis (Pastor & Veronesi, 2013), which posits that elections and policy reforms boost risk premiums and lower stock returns. This study shows that economic developments strongly influence stock markets. economical instability increases market volatility and lowers stock returns, the theory says. Fama-MacBeth cross-sectional regression, quantile regression, and portfolio tests show that risky, speculative equities with high idiosyncratic volatility, positive skewness, and extreme returns underperform in unstable Election risk-aversion pulls investments from risky to safe stocks. Due to policy uncertainty, investor sentiment varies, making momentum strategies less effective and market trends more unpredictable. The findings confirm behavioral finance theory, showing that investors overreact to macroeconomic and other economic risks, thereby creating market inefficiencies.

The findings emphasize liquidity and aggressive investing during periods of economic instability. Amid economic uncertainty, high-turnover shares outperform, suggesting that investors favor market-adaptable assets. No size or book-to-market effect makes economic risk a market element, not a stock factor. The findings emphasize the importance of risk management during economic uncertainty, which policymakers and investors need. Avoiding speculative, volatile equities and picking liquid, well-founded assets may help investors prevent election losses. Economic stability and policy clarity during elections reduce uncertainty and boost investor confidence. This thesis adds to economic risk and stock market studies by showing how elections affect investor choices and risk attitudes. Economic transition poses systemic risks that investors and portfolio managers must consider, according to a study. Use sophisticated econometric models to study time-varying economic risk, investor mood before and after elections, and policy-setting implications on market movements. Economics and behavioral finance can benefit from examining how economic risk shapes global financial markets.

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