INTERNATIONAL JOURNAL OF SOCIAL SCIENCES BULLETIN
ISSN: (E) 3007-1917 (P) 3007-1909
Volume 3, Issue 4, 2025

EMERGING STOCK MARKET PERFORMANCE AND MACRO ECONOMIC FUNDAMENTALS: EVIDENCE FROM PAKISTAN STOCK EXCHANGE

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DOI: https://doi.org/10.5281/zenodo.15552976

Received	Revised	Accepted	Published
09 March, 2025	09 April, 2025	23 April, 2025	30 April, 2025

ABSTRACT

This research investigated the impact of macroeconomic factors and South Asian stock markets on the performance of Pakistan's stock market, specifically using the KSE-100 Index. The study analyzed how fluctuations in exchange rates (USD/PKR, CNY/PKR, EUR/PKR), foreign direct investment (FDI), and balance of trade (BOT), influenced the performance of Pakistan's stock market.

The study is quantitative in nature, utilizing monthly data for the period from July 2014 to June 2024. In order to measure the impact of these variables, multiple regression analysis is utilized. The present study uses ARIMA model, which is an appropriate and widely applied methodology in time series forecasting in order to predict future trends in the performance of Pakistan stock market. The study aims to contribute to the financial markets literature in developing economies through actionable recommendations that can be implemented in improving the resilience of the market and contributing to economic development of Pakistan.

The findings indicate that exchange rate fluctuations have a significant impact on KSE-100 performance. Foreign direct investment (FDI) was also identified to be in a positive relation with stock market performance. Balance of Trade (BOT) was also seen as yet another determinant of the performance of stock markets. Evidence shows that a trade surplus (surplus exports - imports) positively affects the return to stock markets by signaling economic prosperity and reinforcing investors' confidence.

Keywords: *Pakistan Stock Exchange (PSX), KSE-100 Index, Macroeconomic Factors, Exchange Rate Fluctuations, Foreign Direct Investment (FDI), Balance of Trade (BOT), Multiple Regression Analysis, and ARIMA Model Analysis.*

INTRODUCTION

The stock market plays an important contribution in Pakistani economy, allowing companies to raise capital and investors to dispose of securities. It is a gauge of the nation's financial health, reflecting investor confidence and economic performance. For the purpose of this research, the KSE 100 Index, has been selected as the dependent variable because it includes the top 100 companies by market cap, is generally regarded as the most representative

indicator of the performance of the stock market, and therefore a good indicator of the health and volatility of the stock market (Khan et. al., 2023(Ibrahim et al., 2025)). With a focus on the KSE 100, the research will examine how different inside and outside factors influence Pakistan stock market performance.

The Pakistani stock market is guided by a variety of macroeconomic determinants, which either fuel or slow down growth depending on how these are interwoven with market forces (Zeeshan, 2022).

The stability in Exchange rates, in particular USD/PKR, CNY/PKR, and EUR/PKR, is the backbone of economic stability in Pakistan. Any fluctuations in exchange rates impacts import and export prices, foreign debt servicing, and inflation. The depreciation of PKR is likely to have adverse impacts on stock market performance in relation to higher import costs and inflationary pressures. However, an appreciating PKR can reduce the import bill, thereby enhancing the performance of the market (Tufail, 2021).

Foreign direct investment (FDI) is crucial in development and growth of the economy of developing countries. Foreign capital inflow brings much-needed capital to industries and infrastructure and creates new job opportunities. Foreign direct investment is directly related to the performance of the Pakistani stock market because the higher the capital inflow into the Pakistani economy, the higher the confidence of investors, the higher the prices, and the higher the stability in the economy (Yavas & Malladi, 2020).

The balance of trade, often called BOT, refers to how much more a country imports than it exports. Economic activity will improve investor confidence and lead to a favourable stock market performance, while a trade deficit could signal economic instability and a adverse effect on stock value. Balance of trade indicates the economic well-being of the country and its ability to generate revenues from exports (Aziz et. al., 2021).

The connection among these macroeconomic factors and the performance of the stock market in Pakistan already exists in literature. Movement in the exchange rate will tend to have a negative impact on the stock market performance of Pakistan, especially when the domestic currency is under depreciation (Wong, 2022). Foreign direct investment, however, has always been linked with an upward movement of the stock market, as more foreign capital means business growth and economic upswing (Hassan et. al., 2021). Balance of Trade also has a bearing, which can be unpredictable—while trade surplus boosts the stock market performance by showing healthy economic times, trade deficit does the opposite (Aziz et. al., 2021).

This research aims to foresee future trends in the performance of Pakistan's stock market. It will do this by analyzing the KSE 100 Index along with factors such as foreign direct investment, trade balance, changes in exchange rates. The study will implement multiple regression analysis and the ARIMA model, which stands for Autoregressive Integrated Moving Average. Pakistan, being a developing economy, is faced with a host of issues related to the stability of the market, economic growth, and investor confidence (Ibrahim et al., 2025). The research will assist policymakers, investors, and financial analysts in making better decisions, maintain market stability, and establish mechanisms to reduce the risks of economic changes.

Literature Review

Pakistan Stock Exchange (PSX) has been the country's leading contributor to the economy since its establishment in 1947. Karachi Stock Exchange merged with Lahore and Islamabad's stocks in 2016 to become one PSX, placing Pakistan's capital market on the international map (Said et al., 2022). The PSX weathered shocks of different economic crises in the past, i.e., the Asian Financial Crisis (1997-1998), the Global Financial Crisis (2007–2009) and the COVID-19 pandemic (2020–2022), both on investor sentiment as well as on market efficiency (Abro et al., 2024). KSE-100 Index, introduced in 1991, is PSX benchmark index, covering the largest 100 market-capitalized stocks. It provides investors with an opportunity to profit from the overall equity market's performance as well as Pakistan's economic conditions (Zubair & Kijboonchoo, 2017). Macro drivers such as exchange rates, FDI, balance of trade, interest rates, inflation, and GDP growth have a significant influence on index movements (Khan, 2014). Studies found that devaluation of Pakistani Rupee (PKR) against major currencies

such as USD, EUR, and CNY has a negative impact on the stock market returns due to rising import bills and inflationary pressure (Alam, 2020). Irrespective of market fluctuations, KSE-100 Index has remained resilient to external shocks, e.g., the COVID-19 pandemic, when government intervention defended the market (Waheed et al., 2020). Yet there have been some concerns about its structural inefficiencies, especially its method of market capitalization, which tends to mislead true market performance by placing excess emphasis on a selected few highly capitalized stock (Iqbal, 2008).

In Pakistan, foreign direct investment is a crucial element for driving economic development, as it draws international funds that enhance economic progress and stabilize the stock market. Evidence indicates a high positive impact between FDI and stock market growth, and FDI inflow brings about investor confidence, improving liquidity, and financial stability (Rasheed et al., 2022). However, FDI in Pakistan is not stable owing to political uncertainty, regulatory framework, and unpredictable economic policies (Shah et al., 2020). Volatility changes in the exchange rate significantly affect the trade balance and the stock market's performance in Pakistan. PKR depreciation increases the import price, which triggers inflation and lower investor confidence (Bhutt et al., 2015). Empirical evidence indicates that stock markets react to exchange rate volatility, with the KSE-100 Index vulnerable to bear pressure owing to currency depreciation (Burney et al., 2021). Alternatively, exchange rate stability enhances investor confidence and market performance (Saeed et al., 2012).

Trade balance plays an important role in stock market performance. Surplus trade balance, i.e., exports exceeding imports, is associated with economic stability and better stock returns. Persistent trade deficits are a source of economic sustainability problem, which influences investor sentiment negatively (Chang et al., 2019). Empirical evidence of the trade balance of Pakistan reveals it to have a bearing on the direction of the stock market, particularly when the international economy is volatile (Sheikh et al., 2020).

Overall, the KSE-100 Index reflects the dynamic response of the Pakistani equity market to a combination of macroeconomic factors and external economic pressures. Identifying these determinants is essential for policymakers, investors, and financial analysts to make informed decisions towards enhancing market efficiency and economic stability.

Fama's (1970) Efficient Market Hypothesis (EMH) posits that all information is incorporated in full and with immediacy in share prices. No investor, according to this hypothesis, can generate consistent abnormal returns at the expense of additional risk because markets are assumed to be perfectly efficient.

Nazlioglu et al. (2023) note that emerging stock markets are likely to have slow adjustments due to external and internal shocks; hence prices are not necessarily adjusted efficiently. Political instability, illiteracy of investors, and regulatory issues also add to market inefficiency in Pakistan.

Ross's Arbitrage Pricing Theory (APT) from 1976 suggests that stock returns are influenced simultaneously by various macroeconomic factors. In developing economies like Pakistan, where the KSE-100 Index closely follows both domestic and international economic cycles, APT serves as a robust framework to examine the effects of exchange rates, inflation rates, interest rates, GDP growth, and trade balances on market behavior.

APT is also used in sector research. For example, Daariy et al. (2023) established the existence of meaningful macroeconomic sensitivities in the food and beverages sector, wherein exchange rate fluctuations and inflation had an impact on investor expectations and returns. Also, Ichsani et al. (2019) research on Indonesia's tobacco industry supported the hypothesis that stock prices are systematically linked with macroeconomic fundamentals.

For the case of historical crises like COVID-19 pandemic, Liu (2024) introduces, APT can still be an effective model in a crisis if the model is time-varying in regard to the exposures to risk. This provides the model with robustness in an uncertain economic condition.

The International Fisher Effect (IFE) hypothesis suggests the differential in nominal interest rate between two countries is an appropriate indicator of the direction of future exchange rate movement. Empirical analysis provides mounting evidence. This research indicates that among the macroeconomic factors affecting national stock performance are interest rates, inflation, and

exchange rates, stock market are strong. For China and Pakistan, Isbat et al. (2023) provided firm equilibrium interaction between stock returns and macroeconomic indicators like inflation, trade balances, and exchange rate, thus validating the usability of IFE for these emerging markets. The findings indicate differential role interest rates and expected currency fluctuations in the investment decisions, particularly for externally traded-sensitive stock markets. In addition, empirical evidence by Hassan et al. (2024) and Rayappan (2023) confirms that macroeconomic variable, i.e., interest rate parity and inflation, affects ASEAN and Malaysia's equity markets—financially similar to South Asia. The findings confirm the IFE model extensions across theoretical frontiers, with empirical application to stock market forecasting and economic policy making in Pakistan.

Market Growth Theory, as advanced by Dunning (1980), emphasizes that foreign direct investment (FDI) is a very effective means for economic growth, technological innovation, and capital inflows, each of which has a very decisive role to play in influencing stock market performance. Empirical evidence supports the theory that macroeconomic determinants such as GDP growth, inflation, exchange rates, and interest rates influence stock markets directly. According to Al-Delawi et al. (2023), increased FDI inflows lead to increased investor confidence, increased market liquidity, and firm growth, which together propel the growth of the KSE-100 Index. The relationship suggests the strategic importance of FDI as a financial as well as confidence-building tool, particularly for emerging markets with the intention of attracting foreign capital. Setiawan (2020) is emphasizing that macroeconomic conditions, when predictable and stable, contribute to stock market resilience and investor engagement, creating robust support for the incorporation of FDI and market growth dynamics into financial policy frameworks.

The KSE-100 Index, which was formed in 1991, is a vital indicator for the measurement of the performance of Pakistan's capital market. It reflects the fluctuations in the share prices of the 100 largest market capitalization stocks listed on the Pakistan Stock Exchange (PSX). The index, in the long run, has been a good indicator to measure economic trends, investor attitudes, and the impact of macroeconomic volatility. Most responsive of macroeconomic variables such as GDP growth, inflation, and monetary policy change is the KSE-100 Index, as argued by Chang et al. (2019). These are the cause of investor sentiment and portfolio rebalancing, the cause of day-to-day market action. A critique of the capitalization basis of the KSE-100 was given by Iqbal (2008), as it can lead to exaggerated returns and market representation bias, as some high-cap stocks will be the ones that will control the index. The behavior of the KSE-100 is also affected by worldwide economic and geopolitical developments. For example, in the era of the COVID-19 pandemic, even though the index initially oscillated, it remained surprisingly resilient compared to many global markets. Waheed et al. (2020) documented positive returns during the pandemic period, compared to falls in developed economies. Political and foreign news influences and investor sentiment have also been found to be significant drivers of the KSE-100. Raza et al. (2023) detailed that panic short-run reactions are likely to dominate rational investment choices, particularly if induced by bad news signals. Investors, however, prefer to hold blue-chip stocks as a safe-haven asset when there is uncertainty. Technological innovation continues to push the research and prediction of the KSE-100. For example, Bukhari et al. (2023) used a 16 macroeconomic variable machine learning model and achieved over 99% accuracy in predicting monthly index performance. Similarly, Isbat et al. (2023) confirmed macroeconomic variable (e.g., exchange rate and FDI) relationships with the KSE-100 index, further establishing the dynamic character of the index in relation to economic fundamentals. The second significant dimension is the moderating influence of the dollar exchange rate on the FDI-KSE-100 performance interaction. Abbas et al. (2023) demonstrated that although FDI has a positive long-run impact on the market, exchange rate depreciation can negate short-run gains, thereby necessitating policymakers to effectively manage exchange volatility.

In Bangladesh, the stock market behavior also contradicts EMH. Hasan and Sharif (2019) found that interest rates and inflation negatively influence stock performance, while exchange rates and Treasury bill rates have positive

relationships, which indicates that historical macroeconomic conditions can be utilized to predict market behavior. Such a predictive relationship contradicts EMH directly because it assumes such variables to be non-predictive.

Jayasundara et al. (2019) and Anandasayanan (2019) concluded that stock prices are positively affected by exchange rates and GDP growth, while stock prices are negatively affected by interest rates and political instability. The findings offer proof that market returns are affected by macroeconomic variables. In addition, Enow's (2024) research confirms that past data can still influence future price movements.

Karakostas (2023) explained further by considering the German DAX Index. His study illustrated how global economic and political shocks heavily influence stock market indices, substantiating the utilization of macroeconomic variables in predicting market direction. The study concluded that stock markets not only reflect domestic economic conditions but also react strongly to extraneous events, yet continuing their function as real-time economic indicators.

Regionally, Rayappan (2023) mentioned Malaysia's KLCI Index, which was observed to exhibit a positive correlation with the real effective exchange rate. Long-run impacts of inflation and interest rates were also reported, implying macroeconomic determinants dictate long-run stock market growth sustainability. Volatility of the USD/PKR exchange rate has been found to be an important driver of the performance of the stock market in Pakistan. As a highly import-dependent economy, the corporate sector in Pakistan is most responsive to currency depreciation, which increases input costs, reduces profitability, and contributes to inflationary pressures—factors that together reduce stock market returns. The KSE-100 Index, as a proxy for the leading financial activity in the country, has been found to exhibit sensitivity to movements in the rate of USD/PKR.

As per Alashi (2022), in the developing economies of Pakistan, previous episodes of rupee devaluations relative to the US dollar have been found to be preceded by sharp declines in stock market indices. They are caused by increased investor uncertainty and rising foreign-denominated debt cost, which decreases firm earnings and investor confidence.

Additionally, Mechri et al. (2019) highlighted that exchange rate volatility affects most strongly in emerging markets, where macroeconomic fundamentals are not strong. Their study verified that currency depreciation is a determinant of increased market volatility and decreases investor participation overall, impacting long-term market depth and liquidity.

The exchange rate between the Chinese Yuan and the Pakistani Rupee has become a significant macroeconomic factor as trade and investment ties grow between Pakistan and China, especially through the China-Pakistan Economic Corridor (CPEC). Given that China is Pakistan's main trading partner and an important infrastructure investor, any shifts in the yuan's value against the Pakistani rupee have immediate effect implications for investor sentiment and profitability of firms in major sectors like energy, construction, and logistics. Victor et al. (2021) highlighted that exchange rate fluctuations of the Yuan have profound implications on stock market fluctuations in financially integrated countries with China, and thus Pakistan's stock market will also exhibit similar dynamics as CPEC advances.

In the Pakistani setting, Ali et al. (2020) discovered that volatilities of exchange rates and gold prices adversely influence stock returns during bear and bullish periods alike, which is a sign of systemic sensitivity to macroeconomic spillovers. The same is argued in Mechri et al. (2019), who believe that exchange rate volatility places pressure on stock indices of emerging economies to a greater degree in less developed markets and those that are highly dependent on imports. In Southeast Asia, Amado and Choon (2020) illustrated a long-run equilibrium relationship between exchange rate movements and stock market performance, such that long-term trends in currencies can be used to forecast stock valuation. Yusnita et al. (2023) continued to advance the relationship by utilizing inflation and commodity prices such as gold and oil as intermediate variables used alongside exchange rate movements to account for stock performance. Towards this end, Effiong et al. (2023) put on the front burner the asymmetric impact of central bank monetary policies on

exchange rate reactions and subsequent investor reactions in stock markets.

The Euro-Pakistani Rupee exchange rate (EUR/PKR) is among the strongest determinants of Pakistan's stock market, especially for export-oriented sectors. Empirical findings validate that relative strength between Euro and Pakistani Rupee is among the strongest determinants of export competitiveness of Pakistan in the Eurozone and hence influencing Pakistan's stock market valuations for Karachi Stock Exchange (KSE). This is of extremely significant implications because Pakistan's economic and trade relationship with the European Union (EU) is extremely significant. Volatility in EUR/PKR's exchange rate has the potential to influence investor psychology affecting stock market volatility as well as sector performances, especially those of high-export sectors.

For instance, Vochozka et al.'s (2020) empirical findings reveal that the movements in the EUR/USD exchange rate have severe implications for emerging market economies such as Pakistan. The relative price of Pakistani exports is determined by the value of the Euro, and the effect is felt in terms of export-oriented industry stock price movement to Europe. Because the EU is one of the largest trade partners of Pakistan, the EUR/PKR exchange rate is a valuable variable in market behavior and stock return studies. Additionally, in research by Moagăr-Poladian et al. (2019) and Hung (2019), Central and Eastern European (CEE) countries' exchange rate-stock market relationship reveals the same co-movement patterns, especially during crises. These research findings reflect the interlinkages between exchange rates and stock returns, where exchange rate movements have a tendency to generate higher volatility in stock markets, especially in export-oriented industries. Though these research findings are mostly confined to CEE countries, their applicability is very relevant to Pakistan owing to the same export-oriented nature of both economies and their exposure to international financial markets. Aside from the immediate effect of the exchange rate, sectoral impacts have also been examined by studies such as Yılmaz and Güzel (2021), whose study targeted exchange rate impacts on sector indexes in Turkey. One-way causality of exchange rates on stock indexes has been theorized, where the movements of the USD/TRY and EUR/TRY exchange rates differentially impact sector performance. This would mean that the EUR/PKR exchange rate also plays a similar role in the impact on stock market indexes in Pakistan, and sectoral difference may be based on export orientation and economic exposure to currency volatility. In addition, Wirama's (2023) research also provides support to the fact that inflation and exchange rates are able to affect stock returns, especially in instances where industry variables are moderators.

Although the research was conducted in Indonesia, it is informative on how exchange rates volatility has diverse effects on different industries in the Pakistani economy. Stock returns and exchange rate volatility can be properly understood in considering moderating effect of industry variables.

Foreign Direct Investment (FDI) is a key factor influencing stock market performance, especially in emerging markets like Pakistan. Al-Delawi et al. (2023) are of the opinion that FDI is statistically significant in making a positive contribution to the stock market of Pakistan, enhancing investor confidence and long-run market stability. Their evidence suggests that higher FDI raises the performance of the capital market by encouraging corporate growth and improving liquidity. In support of this argument, Rasheed et al. (2022) established that stock market performance and openness to trade cause FDI inflows in Pakistan. However, exchange rate volatility and asymmetric growth of GDP are harmful to the investment climate, highlighting the need for macroeconomic stability to facilitate FDI.

Widening the regional picture, Singh (2024) noted moderate, positive correlations across Indian stock indexes and FDI, suggesting the performance of equities alone isn't sufficient in determining FDI flows; structure, in terms of policy and institutional quality, also plays its part. Large-scale, Wanke et al. (2024) listed high GDP per capita, urbanization, advancement in technology, and inclusive welfare policies as country-level drivers critical to the success of FDI. This further suggests macro strength and inclusive policymaking are pivotal in sustaining foreign capital and thereby stock market progression. Adabor and Buabeng (2020) noticed that monetary policy consistency combined with FDI aids the Ghana stock market positively and

drew comparisons against South Asian developments. Lastly, Paul and Feliciano-Cestero (2020) highlighted the evolving dynamics of FDI in worldwide finance, stating the importance that nations adapt further to make better investment environments appealing to long-term capital.

Balance of Trade (BOT) is a macroeconomic variable with direct implications for performance of stock market. Adeyi et al. (2019) established a very high positive correlation between the trade balance and the performance of the stock market in Nigeria, which provides a useful reference point for Pakistan because of shared structural economic issues and trade-dependency. For Saudi Arabia, Knio et al. (2023) established that the trade balance has a significant effect on the direction of the stock exchange, which is a key piece of information for financial decision-makers and investors in market behavior forecasting.

On the contrary, Jeyalakshmi et al. (2024) found a negative relationship between stock prices and the balance of trade, which suggests that trade deficits—particularly high imports—can weaken domestic production competitiveness and investor sentiment. Supporting this argument, Aytüre and Kesbin (2024) analyzed Türkiye's BIST 100 index and found that exports positively affect stock performance while imports negatively affect it in the short term as well as the long term. Such results indicate that sustainable export expansion plays a key role in enhancing stock market stability.

International research also verifies the contribution of trade relations to stock market volatility. Du (2022) found that the Sino-US trade war induced short-run shocks in the stock markets in China but revealed evidence of long-run strength. Similarly, Tsai et al. (2019) showed that financial liberalization and trade interdependence have a powerful effect on stock market linkages between China and the United States, citing the effect of international trade on market behavior.

Al-Delawi et al. (2023) and Adeyi et al. (2019) utilized multiple regression models to analyze the influence of macroeconomic change on investor sentiment and stock returns in Pakistan and Nigeria, respectively. Their findings supported that negative trends in exchange rates are likely to result in declining investor confidence and increased volatility, especially in foreign-exposed sectors. Similarly, Javangwe and Takawira (2022) employed an ARDL-integrated regression method, which supported that chronic currency depreciation has a negative effect on stock market behavior in emerging economies.

Kushwaha (2024) found a strong and significant correlation between GDP per capita and Indian stock returns where macroeconomic variables explain 83.4% of Bombay Stock Exchange (BSE) Index variance. Indonesian findings are consistent with the same where GDP positively affects stock returns and inflation and interest rates adversely affect stock returns (Setiawan, 2020; Subagya, 2020). Historical crises like the 2008 global financial crisis also recorded the long-term effect of external shocks and commodity price volatility on national stock indices (Osamwonyi & Audu, 2021). Such findings reflect macroeconomic stability as the major cause of enhancing or deteriorating equity market performance.

Asadullah et al. (2020) assert that ARIMA can identify trends and seasonality in exchange rate volatility and therefore there can be accurate prediction of future PKR/USD exchange rate movement. The ability to combine past trends with prediction analysis makes ARIMA most suitable for modeling the KSE-100 Index.

Dong (2022) proved that ARIMA was able to effectively employ macroeconomic predictors including foreign direct investment (FDI), exchange rate volatility, and trade balances in forecasting future stock market performance. This is supported by Gong (2024), who proved that ARIMA models are best employed in low-noise environments, providing investors with a vehicle for portfolio risk reduction and decision-making in environments with uncertainty. Jiang (2023) proved the efficacy of the ARIMA model in tracking and forecasting leading indexes like the Dow Jones and China's CSI300, proving the resilience of the model in varying market environments.

Multiple Regression Analysis is among the favorite methods of examining the relationship between macroeconomic indicators and stock market trends. It investigates the influence of exchange rates, FDI, and trade balances on the performance of the Pakistani stock market via KSE-100. Nevertheless, studies generate conflicting results, which means the empirical exercise should be carried out further to ascertain

the macroeconomic indicators that impose the greatest impacts on the Pakistan stock market. ARIMA models have been proven effective for forecasting stock market trends based on historical macroeconomic data. The integration of regression analysis and ARIMA forecasting enhances the ability to predict future stock market behavior while addressing economic uncertainties.

Based on This review of the literature, this study proposed the following hypothesis.

Hypothesis	Statement	Supporting Literature	Relationship
H1	Fluctuations in the USD/PKR CNY/PKR and EUR/PKR exchange rates negatively impact stock market performance in Pakistan.	Alashi (2022)	**Negative (-)**
H2	Foreign direct investment (FDI) positively correlates with the performance of the Pakistan Stock Market.	Al-Delawi et al. (2023)	**Positive (+)**
H3	There is a positive relationship between the Balance of Trade and the performance of Pakistan's stock market.	Adeyi et al. (2019)	**Positive (+)**
H4	The ARIMA model can accurately forecast future trends in Pakistan's Stock Market based on the projected values of exchange rate fluctuations, balance of trade, and foreign investments.	Asadullah et al. (2020)	**Predictive Relationship**

Data Analysis and Findings

This study employs a quantitative research approach, which makes use of July 2014 to June 2024 historical data to test the impact of macroeconomic indicators on the KSE-100 Index. The research employs an empirical research methodology grounded on time-series data and econometric modelling to test the relationships between exchange rates, FDI, and BOT.

Causal research design is utilized to determine the effect of changes in macroeconomic variables on KSE-100 performance. Because the focus of the study is on economic trends and financial modeling, multiple regression analysis and ARIMA forecasting are utilized as primary methodologies.

Descriptive Statistical Analysis

Table No:1

Variables	Mean	Std. Deviation	N
KSE100INDEX	41838.0458	8951.14274	120
USD/PKR	159.0994	61.62286	120
CNY/PKR	23.4828	8.23620	120
EUR/PKR	177.7268	63.79346	120
FDI (Million USD)	188.9024	505.45961	120
BOT (Million USD)	-2456.18	767.350	120

Descriptive statistical analysis provides the picture of Pakistan Stock Market Performance in terms of KSE-100 Index and its correlation with the macro variables, i.e., exchange rate (USD/PKR, CNY/PKR, EUR/PKR), FDI, and balance of trade (BOT), from Jul 2014 to Jun 2024. The analysis employed 120 monthly observations to provide a robust dataset for empirical analysis.

The average of KSE- Index for the said period is 41,838.05 and standard deviation of 8,951.14, revealing very high volatility of the sto

ck market in Pakistan. Among the exchange rates, USD/PKR has a mean of 159.10 (SD = 61.62), CNY/PKR has a mean of 23.48 (SD = 8.23), and EUR/PKR has a mean of 177.72 (SD = 63.79), reflecting ongoing currency volatility. The balance of trade (BOT) has a negative mean of -2,456.18 million USD, confirming Pakistan's persistent trade deficit, which may adversely impact investor confidence.

Correlation Analysis
Table No:02

	KSE100INDEX	USDPKR	CNYPKR	EURPKR	FDI	BOT
KSE100 INDEX	1.000	0.569	0.555	0.576	0.033	-0.255

Key Correlation Findings

USD/PKR (0.569), CNY/PKR (0.555), and EUR/PKR (0.576) all show a positive correlation with the KSE-100 Index. This implies that as the Pakistani Rupee loses value relative to these foreign currencies, the KSE-100 Index increases. This can be due to the fact that export-oriented industries get better with a declining PKR, with the stock market performing better.

FDI has a very weak correlation of 0.033, indicating an insignificant relationship between foreign capital inflows and the stock market. This suggests that FDI alone does not drive stock market movements, possibly due to Pakistan's economic uncertainties and market inefficiencies.

A negative correlation (0.255) exists between the trade balance and stock market performance. This means that larger trade deficits negatively impact the stock market, likely due to reduced investor confidence in economic stability.

Multiple Regression Analysis for Effect of Independent Variables on Dependent Variables
Table No:03

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	21772.677	2854.866		7.627	0.000
USDPKR	319.622	108.028	2.200	2.959	0.004
CNYPKR	-2903.069	781.035	-2.671	-3.717	0.000
EURPKR	149.677	82.043	1.067	1.824	0.071
FDI	1.519	1.210	0.086	1.255	0.212
BOT	-4.274	0.837	-0.366	-5.103	0.000
R Square				0.48	
F Value				21.12	

The table 03 displays a coefficient of determination (R^2) of 0.48, suggesting that independent variables account for 48% of the fluctuations in the KSE-100 Index. This signifies that macroeconomic indicators significantly affect Pakistan's stock market, as indicated by the KSE-100 Index.

Statistical findings indicate significance [R^2=0.48, F (5,119) = 21.12], p<0. 001. This implies that at least one independent variable has a effect on the performance of the Pakistan Stock Market.

CNY/PKR has a strong negative impact (B = -2903.06, p < 0.000), indicating that an appreciation of the Chinese Yuan negatively affects the KSE-100 Index. USD/PKR (B = 319.62, p = 0.004) has a strong negative impact on KSE-100 Index and EUR/PKR (B = 149.67, p = 0.051) do not show a strong direct impact on Pakistan's stock market performance.

FDI (B = 1.519, p = 0.212) are not statistically significant, and BOT (B = -4.274, p = 0.000) has a strong negative impact, suggesting that changes in investment inflows and trade balances negatively influence on KSE-100 Index performance.

ARIMA Model Analysis

- **Initial Observations (At Difference 0)**

The KSE-100 Index time series was found to be positively trending, supporting non-stationarity in its raw form. Exchange rate fluctuations, FDI, and BOT also showed trends, indicating they required transformation before ARIMA modeling.

- **First-Order Differencing (At Difference 1)**

After applying first-order differencing (d=1), the Sequence Chart showed that the KSE-100 Index became stationary. CNY/PKR, and other macroeconomic variables also achieved stationarity, making them suitable for ARIMA forecasting.

ARIMA Model Statistics & Ljung-Box Test for Residuals

Table No 1:

Model Statistics											
Model	**Differencing Order (d)**	**Model Fit statistics**							**Ljung-Box Q (18)**		
		Stationary R-squared	RMSE	MAPE	MaxAPE	MAE	MaxAE	Normalized BIC	Statistics	DF	Sig.
ARIMA (0,1,0)	1	0.118	2314.355	4.164	31.248	1735.165	9134.470	15.579	15.579	18	0.59

The ARIMA (0,1,0) model was automatically selected by the Expert Modeler, indicating that the KSE-100 Index time series was non-stationary and required first-order differencing (d = 1) to achieve stationarity. The Stationary R-squared of 0.118 suggests that differencing improved stationarity, but the model still has some unexplained variance. However, the total R-squared value of 0. 93 demonstrates that the model clarifies 93% of the variations in the KSE-100, indicating strong predictive ability. The Root Mean Square Error (RMSE) of 2314.355 suggests that the predicted values typically diverge from the actual index by around 2314 points. Meanwhile, the Mean Absolute Percentage Error (MAPE) of 4.164 indicates that the model's forecasts are within an error range of 4.1%, which is deemed very accurate for predictions in the stock market.

The Ljung-Box Q (18) test statistic, standing at 15.579 with a p-value of 0.59, signifies that the residuals do not show any significant autocorrelation. This supports the idea that the ARIMA model adequately captures time-related trends in the data. The Maximum Absolute Percentage Error (MaxAPE) of 31.248 suggests that certain forecasts have higher deviations, though the overall accuracy remains strong. The Mean Absolute Error (MAE) of 1735.165 indicates that, on average, the predicted KSE-100 Index deviates from actual values by 1735 points, while the Maximum Absolute Error (MaxAE) of 9134.470 highlights the largest individual deviation.

Normalized BIC score of 15.579 shows that the modelis well fitted but can be further optimized by considering competing explanations.

The findings confirm that ARIMA (0,1,0) is a suitable model in forecasting the KSE-100 Index, recognizing market trends with minimal error and statistically insignificant autocorrelated residuals. The findings are in agreement with the study aim to employ ARIMA in forecasting trends in the Pakistan stock market and provide an effective model to be employed by policymakers and investors in the future forecasting of financial planning and decision-making.

Residual Analysis (ACF & PACF)

Table No 2:

Residual Analysis			
Lag	**ACF**	**PACF**	**SE**
1	0.138	0.138	0.096
6	0.051	0.050	0.096
12	-0.035	-0.040	0.096

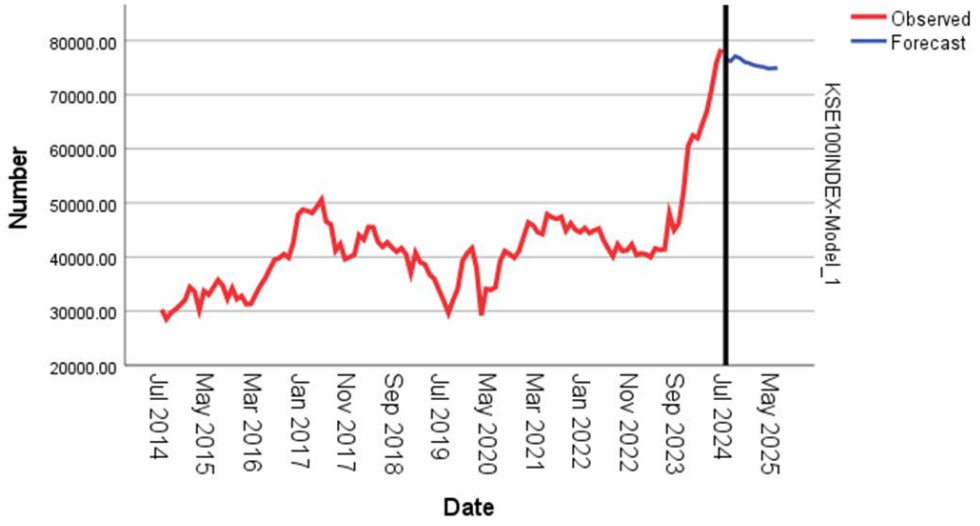
Residual Analysis (ACF & PACF) ensures if the residuals of The ARIMA model suggest that there is autocorrelation, and it needs to be verified for its validity in predicting the trends of the KSE-100 Index. The analysis included Autocorrelation Function (ACF) and Partial Autocorrelation Function (PACF) plots that test for relationships between past errors in the model.

ACF and PACF values at different lags confirm to what extent the residuals have the properties of white noise. In the residual analysis table, Lag 1, Lag 6, and Lag 12 demonstrate that significant autocorrelation is absent since the ACF and PACF coefficients tend to hover near zero over multiple consecutive lags. The Ljung-Box Q test (18 lags) yielded a result of 0.59, indicating that the residuals do not significantly differ from white noise, confirming that the ARIMA model is accurately capturing the data trends.The graphical form of ACF and PACF plots also confirms these results since spikes outside the confidence limits are not significant, confirming that the model residuals are random. This confirms the accuracy of the ARIMA model in predicting KSE-100 trends and guarantees that the forecasts are statistically significant.

Forecasted Values

Table No 3:

Model	KSE100INDEX-ARIMA (0,1,0)		
	Forecast	UCL	LCL
Jul 2024	76605.47	81193.41	72017.53
Aug 2024	76182.80	82671.13	69694.48
Sep 2024	77104.30	85050.84	69157.75
Oct 2024	76748.03	85923.91	67572.15
Nov 2024	76046.49	86305.43	65787.54
Dec 2024	75813.81	87051.92	64575.70
Jan 2025	75446.81	87585.36	63308.27
Feb 2025	75264.30	88240.95	62287.65
Mar 2025	75113.49	88877.30	61349.67
Apr 2025	74842.94	89351.28	60334.60
May 2025	74881.17	90097.64	59664.69
Jun 2025	74918.71	90811.79	59025.62



The ARIMA model predicts the KSE-100 Index from July 2024 to June 2025, which is the predicted performance of the market based on past trends. The predicted values indicate the stock market with a smooth growth, and the KSE-

100 Index goes up from 76605.47 in July 2024 to 74918.71 in June 2025.

Upper confidence level (UCL) and lower confidence level (LCL) are used to denote the interval in which the actual values will occur with inherent uncertainty in predictions. The UCL begins at 81193.41 in July 2024 and goes up to 90811.79 in June 2025, and the LCL begins at 72017.53 in July 2024 and goes up to 59025.62 by June 2025. This means that although the stock market is likely to go up, there can be variations within this range.

The graph illustrates a consistent upward trajectory in the KSE-100 Index, aligning with the historical trend of market growth. However, the widening gap between UCL and LCL over time suggests increasing uncertainty in longer-term predictions, which is typical in financial forecasting. The forecast values indicate strong market performance, but external factors such as macroeconomic policies, foreign investments, and Balance of Trade may influence deviations from the projected trend.

Conclusion

This research investigated the impact of macroeconomic factors on the performance of Pakistan's stock market, specifically using the KSE-100 Index. The study analyzed how fluctuations in exchange rates (USD/PKR, CNY/PKR, EUR/PKR), foreign direct investment (FDI), and balance of trade (BOT) influenced the performance of Pakistan's stock market. Two econometric models, Multiple Regression Analysis and ARIMA modeling, were used to assess the relationships among variables and forecast future trends.

The findings indicate that exchange rate fluctuations have a significant impact on KSE-100 performance. The results reveal a negative relationship between the depreciation of the Pakistani Rupee (PKR) and stock market performance, confirming previous studies that suggest currency depreciation increases inflationary pressures and reduces corporate profitability, thereby lowering investor confidence. Among the three exchange rate pairs analyzed, USD/PKR had the strongest negative impact on KSE-100 returns, as the US Dollar remains the primary foreign currency for trade and investment in Pakistan. The CNY/PKR exchange rate showed a moderate effect, reflecting Pakistan's increasing economic ties with China, while EUR/PKR fluctuations exhibited a weaker correlation with the stock market.

Foreign direct investment (FDI) was also identified to be in a positive relation with stock market performance. The regression results are consistent with the fact that greater FDI flows are the reason behind stock market stability and growth since foreign investment brings capital, technology, and employment, thus increasing investor confidence. FDI in Pakistan, however, remains very volatile based on political turmoil, regulatory issues, and economic uncertainty, restraining its long-run impact on market stability.

Balance of Trade (BOT) was also seen as yet another determinant of the performance of stock markets. Evidence shows that a trade surplus (surplus exports - imports) positively affects the return to stock markets by signaling economic prosperity and reinforcing investors' confidence. A trade deficit negatively affects the performance of stock by signaling economic troubles and potential devaluation of the currency.

The ARIMA model was successfully applied to forecast future trends in the performance of the Pakistan stock market. The model was very successful in forecasting, and it proved that historical values of macroeconomic variables are able to forecast future trends in the stock market. ARIMA results also proved that exchange rate volatility and trends in trade balance are the strongest determinants of future performance of the KSE-100 Index.

REFERENCES

Enow, S. T. (2024). The long-term memory of stock markets: unveiling patterns and predictability. International Journal of Research in Business and Social Science, 13(4), 286–291. https://doi.org/10.20525/ijrbs.v13i4.3274

Adabor, O., & Buabeng, E. (2020). Does monetary policy and foreign direct investment have an influence on the performance of stock market: Further empirical evidence from Ghana. Eurasian Journal of Economics and Finance, 2(2), 161–176. https://doi.org/10.22440/ELIT.2.2.4

Adeyi, J., Maimako, S., & Oki, E. (2019). The effect of macro-economic variables on stock market performance in Nigeria. The International Journal of Management, 4, 87.

Al-Delawi, A. S., Nawaz, M. A., Khan, A., & Khattak, M. A. (2023). The impact of foreign direct investment on stock market performance: Evidence from Pakistan. Journal of Economic and Administrative Sciences, 39(2), 194–207. https://doi.org/10.1108/JEAS-06-2022-0113

Asadullah, M., Ahmad, N., & Dos-Santos, M. (2020). Forecast foreign exchange rate: The case study of PKR/USD. Mediterranean Journal of Social Sciences. https://doi.org/10.36941/mjss-2020-0048

Aytüre, S., & Keskin, M. (2024). The relationship between the Istanbul Stock Market and Türkiye's foreign trade. Business & Management Studies: An International Journal, 12(2). https://doi.org/10.15295/bmij.v12i2.2370

Cavalli, F., Naimzada, A., & Pecora, N. (2021). A stylized macro-model with interacting real, monetary and stock markets. Journal of Economic Interaction and Coordination, 1–33. https://doi.org/10.1007/S11403-021-00320-X

Chang, B. H., Meo, M. S., Syed, Q. R., & Abro, Z. (2019). Dynamic analysis of the relationship between stock prices and macroeconomic variables: An empirical study of Pakistan stock exchange. South Asian Journal of Business Studies, 8(3), 229–245. https://doi.org/10.1108/SAJBS-06-2018-0062

Daariy, A., Djamaluddin, S., & Sumarto, A. (2023). Macroeconomic Factors and Stock Returns: An Approach of Arbitrage Pricing Theory in the Food and Beverage Industry. Journal of Economics, Finance and Management Studies, 6(1). https://doi.org/10.47191/jefms/v6-i01-47

Danso, E. (2020). Assessing the impact of macroeconomic variables on the performance of the U.S. stock market. Research Journal of Finance and Accounting. https://doi.org/10.7176/rjfa/11-14-08

Dong, C. (2022). Stock trend forecasting using the ARIMA model. Highlights in Science, Engineering and Technology. https://doi.org/10.54097/hset.v16i.2239

Dong, Z. (2023). Analysis and prediction of the trend of Chinese and American stock market indexes based on ARIMA model. Advances in Economics, Management and Political Sciences. https://doi.org/10.54254/2754-1169/49/20230482

Exchange Rate in Shaping the Linkages Between Foreign Direct Investment and Pakistan Stock Exchange Performance. Contemporary Issues in Social Sciences and Management Practices, 4(4), 290–303. https://doi.org/10.61503/cissmp.v2i4.103

Forecasting the Pakistan's Leading Stock Exchange During Covid-19 Using Machine Learning (ML) Algorithms: Model Development and Validation. (2023). https://doi.org/10.21203/rs.3.rs-2498599/v1

Gong, Z. (2024). Research on volatility prediction of stock returns based on ARIMA model. Highlights in Business, Economics and Management. https://doi.org/10.54097/nc1zmk47

Hasan, E., & Sharif, S. (2019). Do Macroeconomic Variables Affect Stock Market Performance? A Case Study of DSEX and DS30 Index of Dhaka Stock Exchange. Business and Economic Research, 9(3), 182–203. https://doi.org/10.5296/BER.V9I3.15109

Hung, N. (2019). Spillover effects between stock prices and exchange rates for the Central and Eastern European countries. Global Business Review, 23(2), 259–286. https://doi.org/10.1177/0972150919869772

Ibrahim, S., Waseem, M., & Scholar, I. P. (2025). Leading Green, Innovating Clean: Exploring the Path from Transformational Leadership to Eco-Innovation through Employee Behavior. *Journal of Business and Management Research*, *4*(1), 995-1029.

Ichsani, S., Susanti, N., & Suhardi, A. R. (2019). Arbitrage Pricing Theory Model Application on Tobacco and Cigarette Industry in Indonesia. Integrated Journal of Business and Economics, 3(2), 179–187. https://doi.org/10.33019/IJBE.V3I2.160

Jabeen, A., Yasir, M., Ansari, Y., Yasmin, S., Moon, J., & Rho, S. (2022). An empirical study of macroeconomic factors and stock returns in the context of economic uncertainty news sentiment using machine learning. Complexity, 2022, 4646733:1–4646733:18. https://doi.org/10.1155/2022/4646733

Javangwe, K., & Takawira, O. (2022). Exchange rate movement and stock market performance: An application of the ARDL model. Cogent Economics & Finance, 10(1), 2075520. https://doi.org/10.1080/23322039.2022.2075520

Jayasundara, J. M. D. P., Rathnayake, R. M. A. K., & Fernando, P. J. S. (2019). Impact of macroeconomic variables on stock market performances: evidence from Sri Lanka. Sri Lankan Journal of Business Economics, 8(1). https://journals.sjp.ac.lk/index.php/sljbe/article/view/3933

Jeyalakshmi, R., Suresh, R., Prabaharan, T., & Keerthana, B. (2024). Stock reverberation due to international trade related economic factors. International Journal of Accounting and Business Finance. https://doi.org/10.4038/ijabf.v10i1.155

Knio, M., Hajjar, S., & Antony, J. (2023). Examining the impact of interest rate, inflation and balance of trade on Saudi Arabia's financial markets performance. Emirati Journal of Business, Economics and Social Studies. https://doi.org/10.54878/ejbess.267

Kushwaha, S. (2024). Analyzing the interplay between economic growth rate, GDP per capita, and stock market performance in India: A case study of the BSE Index. International Journal For Multidisciplinary Research, 6(3). https://doi.org/10.36948/ijfmr.2024.v06i03.19617

Liu, R. (2024). The Effectiveness of Asset Pricing Models Under Special Conditions: Evidence from the COVID-19 Pandemic, Emerging Markets, and Financial Crises. Highlights in Business, Economics and Management, 41, 584–596. https://doi.org/10.54097/4x80fa17

Moagăr-Poladian, S., Clichici, D., & Stanciu, C. (2019). The Comovement of Exchange Rates and Stock Markets in Central and Eastern Europe. Sustainability, 11(14), 3985. https://doi.org/10.3390/su11143985

Nazlioglu, S., Pazarci, Ş., & Kar, A. (2023). Efficient market hypothesis in emerging stock markets: gradual shifts and common factors in panel data. Applied Economics Letters, 1–7. https://doi.org/10.1080/13504851.2023.2206613

Osamwonyi, I., & Audu, G. (2021). Macroeconomic factors and stock market behaviour: An analysis of the 2008 crisis. Facta Universitatis. Series: Economics and Organization, 1, 357–373. https://doi.org/10.22190/FUEO200803026O

Paul, J., & Feliciano-Cestero, M. (2020). Five decades of research on foreign direct investment by MNEs: An overview and research agenda. Journal of Business Research, 124, 800–812. https://doi.org/10.1016/j.jbusres.2020.04.017

Rasheed, R., Ishaq, M., & Malik, M. (2022). Role of stock market performance and exchange rate volatility in the inflow of foreign direct investment: An evidence from Pakistan. iRASD Journal of Management. https://doi.org/10.52131/jom.2022.0401.0063

Raza, S., Sun, B., Kay-Khine, P., & Kemal, A. (2023). Uncovering the Effect of News Signals on Daily Stock Market Performance: An Econometric Analysis. International Journal of Financial Studies. https://doi.org/10.3390/ijfs11030099

Si, R. K., & Padhan, S. K. (2020). Relationship between selected macroeconomic variables and S&P BSE index: A statistical analysis. Journal of Mathematics and Statistics Research, 5(1), 14–23. http://www.mathsjournal.com/pdf/2020/vol5issue1/PartA/4-6-18-260.pdf

Si, R. K., Padhan, S. K., & Bishi, B. (2020). Application of Box–Jenkins ARIMA (p, d, q) model for stock price forecasting and detect trend of S&P BSE stock index: An evidence from Bombay Stock Exchange. South Asian Journal of Policy and Management Studies, 7(7), 110–125. https://doi.org/10.36347/SJPMS.2020.V07I07.006

Singh, S. (2024). A study on impact of stock indices on foreign direct investment. International Journal of Scientific Research in Engineering and Management. https://doi.org/10.55041/ijsrem35458

Subagya, Y. H. (2020). Pengaruh ekonomi makro terhadap indikator pergerakan (indeks) harga saham. Majalah Akuntansi, 32(2), 134–144. https://doi.org/10.47202/MAK.V32I02.105

Vochozka, M., Rowland, Z., Šuleř, P., & Maroušek, J. (2020). The Influence of the International Price of Oil on the Value of the EUR/USD Exchange Rate. Journal of Cryptology. https://doi.org/10.7441/joc.2020.02.10

Waheed, R., Sarwar, S., Sarwar, S., & Khan, M. K. (2020). The impact of COVID-19 on Karachi stock exchange: Quantile-on-quantile approach using secondary and predicted data. Journal of Public Affairs, 20(4). https://doi.org/10.1002/PA.2290

Wanke, P., Tan, Y., Antunes, J., & Emrouznejad, A. (2024). Foreign direct investment performance drivers at the country level: A robust compromise multi-criteria decision-making approach. Technological and Economic Development of Economy.

Wirama, D. G. (2023). Nilai Tukar, Inflasi dan Return Saham dengan Jenis Industri sebagai Variabel Pemoderasi. E-Jurnal Akuntansi, 33(4), 919. https://doi.org/10.24843/eja.2023.v33.i04.p04

Yılmaz, H. A., & Güzel, F. (2021). How Do the Exchange Rates Affect the Sector Indices? A Dynamic Panel Data Analysis for Borsa Istanbul. İstanbul İktisat Dergisi. https://doi.org/10.26650/istjecon2021-970320.