

EXPLORING THE NEXUS BETWEEN MACROECONOMIC VARIABLES AND STOCK MARKET PERFORMANCE IN PAKISTAN: EVIDENCE FROM ARDL BOUNDS TESTING

Dr. Syeda Anam Hassan^{*1}, Inayatul Haq², Altaf Hussain³, Amina Imdad⁴

¹Asst. Profesor of Economics, Government Girls Degree College, Nawansher Abbottabad. KPK, Pakistan.

²SS.Economics GHSS, No.1 Abbottabad

^{3,4}Economics Department, Hazara University, Mansehra

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Corresponding Author: *

Dr. Syeda Anam Hassan

Abstract

Stock market is the most important economic indicator through which the stability of the country is determined since it enables and ensures long return to economy. The good performance of stock market organize the investors move the investment to saving that leads to increase the development of the country. This study examines the dynamic relationship between key macroeconomic variables and stock market returns in Pakistan from 1990 to 2025. The Autoregressive Distributed Lag (ARDL) model is employed to investigate the impact of inflation, exchange rate, money supply, GDP, balance of payments, and interest rate on stock market performance. Our findings indicate that in the short run, inflation and GDP have a negative relationship with stock market returns, while exchange rate, money supply, balance of payments, and interest rate have a positive relationship. In the long run, inflation, money supply, balance of payments, GDP, and interest rate have a positive impact on stock market returns, except for exchange rate. The Error Correction Term (ECT) reveals that the model converges to equilibrium at a rate of 58%, with a goodness of fit of 90%. The model is stable, with no autocorrelation and heteroscedasticity. Our results suggest that policymakers should maintain a constructive monetary policy, controlling inflation and stabilizing interest rates to promote stock market growth.

INTRODUCTION

The country economic growth depends upon the financial sector development, stock market gives the programmed to users and suppliers for the purpose of investment of different companies. These return through trading in the form of dividend given to its shareholders from time to time by the company and company earning depends on economic activity (Hakim, 2012). In the short period of time the stock market show volatile behavior as the share prices move bullish and bearish. As experienced in the past, financial market significantly affects the economy so the investors not shift their investing in riskier's assets and invest in the risk free assets. Therefore, it is

important for financial analysis, policy makers and macroeconomist to understand the stock market behavior.

The investment spending of stock market behavior is guided by volatility patterns. The country economic activity influences the stock market return. According to the State Bank of Pakistan (SBP), the Karachi Stock Exchange (KSE-100) index has shown significant growth, reaching an all-time high of 57,817 points in 2021, however, it has also experienced fluctuations due to global economic trends and domestic challenges (SBP, 2021). Inflation creates uncertainty in the stock market, decrease the value of money investors tend

to buy stocks, foreign currency. Circle of Inflation and stock market return move the same direction in long run (Ouma, 2014). A stock exchange provide platform for buyers and sellers of different securities trading at the specified price. Stock market plays a major role in the social control of capital in initial and developed countries, leading to the growth of industry and trade of the country, as a consequence of globalized policies and liberalized adopted by most emerging and developed government. Many participants of the stock market expect a higher return when investing in stock. Stock market plays a chief role in overall economic conditions of the country. Improved stock market performance is an indicator of higher profitability of the growing of the economy and industrial firms as well (Nazir and Gilani, 2010). According to the World Bank, Pakistan's stock market capitalization has increased to 27% of GDP in 2022, indicating a growing and developing financial sector (World Bank, 2022). The major macroeconomic variables that derive the economy are income (GDP), employment, rate of inflation, rate of interest and technological progress, balance of payment, balance of trade, foreign direct investment, population growth, money supply etc. (Mankiw, 2005). To identify the impact of money supply, GDP, inflation, interest rate on stock market return is the great interest for the investor, researcher and government bodies etc. (Alam, 2014). Stock prices are determined and linked with rate of inflation, money supply, interest rate, exchange rate, Gross Domestic Product (Muradoglu et al., 2011). In the stock market the shareholder invest their saving with the expectation of future profit in the form of shares, profit may be paid to shareholders by quarterly, half quarterly, and yearly. Performance of stock market is normally measure in the form of market index.

According to the Pakistan Bureau of Statistics, the Consumer Price Index (CPI) has shown an average annual growth rate of 8.5% from 2015 to 2025, indicating a moderate inflationary environment (PBS, 2025). The interest rate, as set by the State Bank of Pakistan, has ranged from 5.75% to 14% from 2015 to 2025, influencing borrowing costs

and investment decisions (SBP, 2025). The exchange rate has also fluctuated significantly, with the Pakistani Rupee (PKR) depreciating against the US Dollar (USD) by approximately 30% from 2015 to 2025 (SBP, 2025). These macroeconomic variables have a significant impact on the stock market return in Pakistan, making it essential for investors, researchers, and policymakers to understand their relationships.

1.1 SIGNIFICANCE OF THE STUDY:

This study examines the relationship between key macroeconomic variables, including Balance of Payments (BOP), interest rate, money supply, Gross Domestic Product (GDP), exchange rate, and inflation, and the performance of the stock market in Pakistan from 1990 to 2025. The objective is to contribute to the prediction of stock market returns by analyzing the impact of macroeconomic shocks, such as changes in money supply, exchange rate, BOP, inflation, and GDP, on the stock market. This research aims to provide valuable insights for investors, policymakers, and financial analysts to make informed decisions and achieve financial development.

The study covers a period of 35 years, from 1990 to 2025, allowing for an in-depth analysis of the relationships between these macroeconomic variables and the stock market. The findings of this study are expected to be useful for investors, policymakers, and financial analysts in understanding the factors influencing stock market performance in Pakistan.

1.2 OBJECTIVE OF THE STUDY:

PRIMARY OBJECTIVE:

The primary objective of this study is to investigate the impact of external determinants on the stock market return of Pakistan from 1990 to 2025.

SECONDARY OBJECTIVES:

1. To examine the relationship between Balance of Payments (BOP) and stock market return in Pakistan.
2. To analyze the impact of exchange rate fluctuations on the stock market return in Pakistan.

3. To investigate the influence of foreign direct investment (FDI) on the stock market return in Pakistan.
4. To identify the impact of global economic indicators on the stock market return in Pakistan.2.

LITERATURE REVIEW:

Mukit and Safiullah (2012) investigated the relationship of stock market return exchange rate in Dhaka Stock Exchange by apply Granger Causality test, error correction model and co integration for short and long run relation. The effect of exchange rate for long run leads to increase 1.04% change in stock prices, capital inflow due to foreign investment in country's stock leads to appreciation in domestic currency while capital outflow result depreciation of currency. They find long run significant effect between stock market return and exchange rate.

Umar et al., (2014) checked the association between GDP, inflation, money supply, exchange rate, and stock market return on KSE 100 index Pakistan from period of 1991 to 2013. By employing different test which are Descriptive Analysis, Granger causality test and Regression Analysis. The Regression Analysis result shows that the inflation, GDP per capita and GDP saving, money supply, and exchange rate has significant impact on KSE 100 index Pakistan. Hakim vena (2014) conducted the study to interpret the effect of inflation on stock prices at the Nairobi securities exchange from the period of 1998 to 2013 by using GARCH to examine the effect of inflation on stock market return and show that stock market return was positively connection at 7.9% to the rate of inflation.

Ouma (2014) to investigated the impact of key macroeconomic variables(exchange rate, money supply, inflation) on stock market return in Kenya by applying ordinary least square (OLS) techniques for period 2003 to 2013. This result show that inflation and money supply are found to be positive impact of the return at NSE, while exchange rate show a negative impact on stock return at NSE.

Zoa et al.,(2014) studied the dynamic relationship between macroeconomic variables includes real

exchange rate, inflation, government debt, real interest rate, industrial production index , and stock market in Japan Nikkei 255 during the period January 2000 to 2012.They applied Augmented Dickey Fuller test, Unit root test ,Philip Peron test ,Johansen integration test, Granger causality test and ECM. This result shows that all variables are significantly impacted on Nikkei 255 in long run, during post Asian financial crises.

Vanita and khuhboo (2015) studied the long run linked between stock prices and exchange rate of three different nations Russia India and South Africa from 1997 to 2004 and apply Johansen integration test and result shows that for all three nations exchange rate is highly significant to stock return of Russia, India and South Africa.

Nijam et al.,(2015) examined the association between key macroeconomic factors(WPI, interest rate, GDP, balance of payment, exchange rate) and stock market return in Srilanka from period 1980 to 2012 by apply OLS model and Durbin Watson Statistics. This result show that stock market positively related to GDP, exchange rate, interest rate while it negatively inflation of Srilanka. The balance of payment is negatively affecting the stock market performance in Srilanka. Hamid (2016) studied the impact of key macroeconomic variables (interest rate, inflation rate, exchange rate, growth rate, urbanization rate) on Karachi stock market efficiency by using Regression OLS technique for period 1980-2015. The dependent variables are stock market return while independent variables are inflation rate, growth rate, urbanization rate, interest rate, exchange rate. This study included that demographic variable which is urbanization rate and found that exchange rate and urbanization rate shows positive relationship while inflation rate, interest rate, and growth rate show negative relationship with stock market return.

Khalid and Khan (2017) studied the effect of interest rate and inflation rate on stock markets from 1991 to 2017 for Pakistan by using ARDL and ECM. The result shows that interest rate is negative while exchange rate and inflation rate have a positive and significant effect over stock market return.

Jamal.ul.Din et al., (2017) examined the relationship between money supply, inflation rate and exchange rate stock market return of three ASIAN countries (Singapore, Malaysia, Indonesian) during January 2005 to December 2015 by employing multiple regression model. This result indicates that stock market returns are significantly affected by exchange rate and inflation rate while insignificant by money supply. Finally, study shows that inflation rate is highly insignificant and inversely related to stock market return.

Allah et al., (2017) interpreted the linkage of key macroeconomic variables (inflation, exchange rate, foreign exchange reserve and interest, money supply) and stock market performance of SAARC countries during 2005 - 2017 by using multiple regression OLS technique. The result shows positive relationship between stock market performance of SAARC countries and exchange rate, foreign exchange reserve and interest, while negative relationship with inflation and money supply. Balagobei (2017) studied the impact of key variables on Sri Lanka stock market. Dependent variable is stock market return and independent variables are money supply, exchange rate, factory industry production index (FIPI), interest rate and inflation for period 2006 to 2015. The result of this study show that all the factor except money supply affected the stock return and interest rate and factory industry production have insignificant impact on Colombo stock exchange while inflation rate and exchange rate have significant effect.

A study by Khan et al. (2017) found that inflation and exchange rates have adverse effects on stock market development, while GDP growth and money supply have a positive impact. Another study by Ahmed and Ahmed (2018) revealed that interest rates and exchange rates have a significant negative relationship with stock market returns, whereas money supply and GDP growth have a positive relationship. Furthermore, research by Javed et al. (2020) found that balance of payments and exchange rates have a significant impact on stock market performance, while inflation and interest rates have a negative impact. A study by Shah et al. (2022) examined the impact of

macroeconomic variables on stock market performance and found that GDP growth, money supply, and exchange rates have a positive impact, while inflation and interest rates have a negative impact. Recent studies have also explored the impact of political instability and economic policy uncertainty on stock market performance. A study by Ali et al. (2021) found that political instability has a negative impact on stock market performance, while another study by Khan et al. (2022) found that economic policy uncertainty has a significant impact on stock market volatility. Overall, the literature suggests that macroeconomic variables such as inflation, exchange rates, interest rates, GDP growth, money supply, and balance of payments have a significant impact on stock market performance in Pakistan. Investors, policymakers, and financial analysts can use these findings to make informed decisions. The previous studies focus on key macroeconomic factors and most of the studies indicates the relationship between stock market return and macroeconomic factors, but this study focuses on most important key macroeconomic factors (inflation, GDP, money supply, exchange rate, BOP, interest rate) which play very important role in the financial stability of the country.

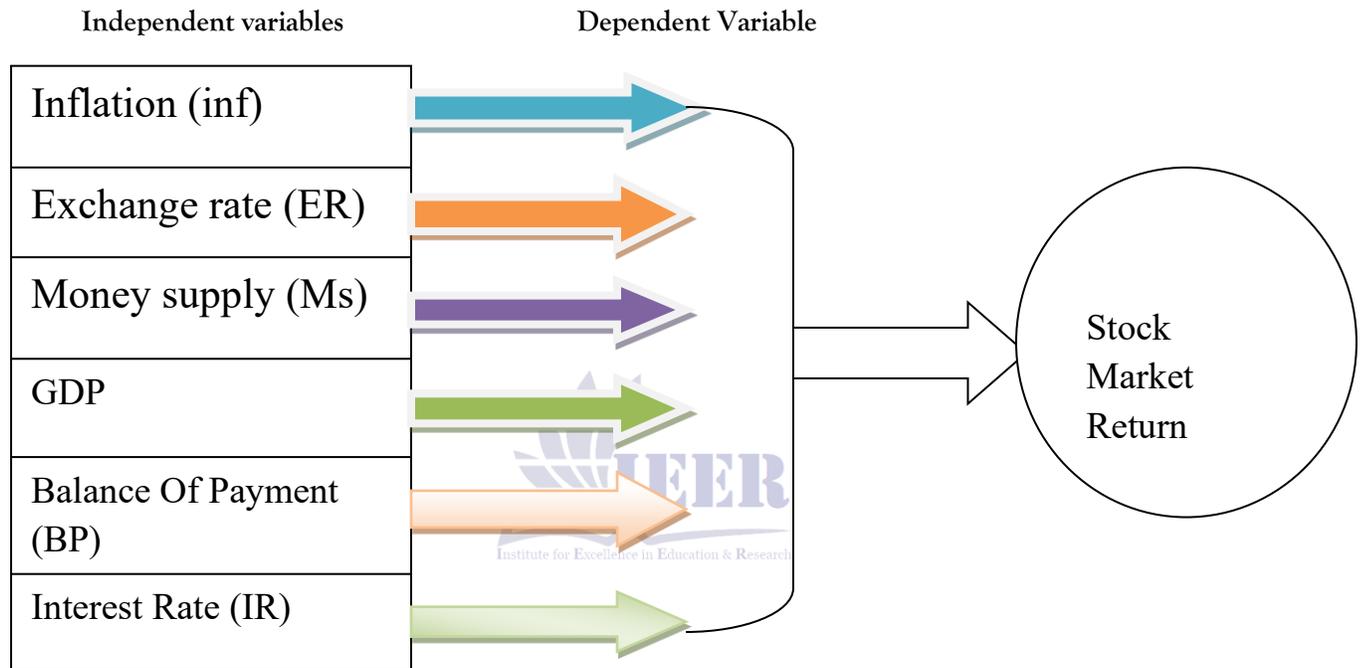
2.1 RESEARCH GAP:

The research gap in existing literature is addressed by this study, which focuses on the most critical macroeconomic factors influencing Pakistan's economy. Unlike previous studies that have examined the association between stock market return and macroeconomic factors, this study concentrates on key variables such as inflation, GDP, interest rate, money supply, exchange rate, and BOP. These factors play a vital role in shaping the country's economic landscape and have a significant impact on stock market performance. This study adopts a mixed-methods approach, combining qualitative and quantitative techniques to provide a comprehensive understanding of the relationship between macroeconomic variables and stock market return. The qualitative aspect includes an introduction, literature review, objective of the study, and significance of the study, while the quantitative aspect employs the

ADF test and ARDL test to empirically examine the impact of macroeconomic variables on stock market return. By addressing this research gap, this study provides valuable insights for investors, policymakers, and financial analysts, enabling them to make informed decisions and develop effective strategies to promote economic growth and stability in Pakistan.

3. DATA SOURCE AND METHODOLOGY:
The data has been collected from World Development Indicator (WDI, 2025) and Thomas Rulers EIKON (2018) for 1990 - 2025. The dependent variable is stock market return (% of GDP). And independent variables are; Inflation (annual %), Exchange rate (2010 = 100), Money supply (% of GDP), GDP (annual %), Balance of payment (current US\$), and Interest rate (%).

3.1 CONCEPTUAL FRAMEWORK:



The conceptual framework depicted in the picture posits that the independent variables—*inflation, exchange rate, money supply, gross domestic product (GDP), and balance of payments*—directly influence the interest rate, which serves as an intermediary independent variable. The interest rate, in turn, exerts both positive and negative effects on the dependent variable, the stock market of Pakistan. Specifically, higher inflation, depreciation in the exchange rate, changes in money supply, variations in GDP, and imbalances

in the balance of payments can alter the interest rate; an increased interest rate may raise borrowing costs and depress stock prices (negative relationship), yet it can also attract capital inflows and boost market confidence, thereby raising stock prices (positive relationship). Thus, the framework captures the dual-direction impact of the interest-rate channel on Pakistan’s stock market performance.

3.2 HYPOTHESIS:

- H₁: There is statistically negative relation between inflation rate and Stock market return.
- H₂: There is statistically negative relation between exchange rate and Stock market return.

- H₃: There is statistically positive relation between money supply and Stock market return.
- H₄: There is statistically negative relation between GDP and Stock market return.

• H₅: There is statistically positive relation between balance of payment and Stock market return.

• H₆: There is statistically positive relation between interest rate and Stock market return.

4. RESULT AND DISCUSSION:

4.1 DESCRIPTIVE STATISTICS:

Table: 01

	SR	INF	ER	MS	GDP	BP	IR
Mean	14.054	8.516	106.651	48.635	4.214	-3.109	2.328
Maximum	117.708	20.281	125.591	60.933	7.705	3.809	10.522
Minimum	-154.564	2.539	2.539	38.594	1.0143	-1.510	-6.774
Skewness	-1.286	0.593	0.254	0.112	0.189	-1.116	-0.645
Kurtosis	6.711	3.426	1.830	2.341	2.412	5.241	3.188
Jarque-Bera	23.799	1.854	1.889	0.565	0.569	11.683	1.985

This table shows that the average stock return (SR) of 14.054 with a wide range from minimum -154.564 to maximum 117.708 while skewness is negative (-1.286), kurtosis is leptokurtic (6.711) and Jarque-Bera of 23.799. The average inflation rate (INF) of 8.516 with a wide range from minimum 2.539 to maximum 20.286 while the skewness of inflation is positive (0.593), kurtosis is meso-kurtic (3.426) and Jarque -bera of 1.854. The average exchange rate (ER) of 106.651 with a wide range from minimum 93.489 to maximum 125.591 while skewness is positive (0.254), kurtosis of exchange rate is platy-kurtic (1.830) and Jarque -bera of 1.897. The average money supply (MS) of 48.635 with a wide range from minimum

38.594 to maximum 60.933 while skewness of MS is positive (0.112), kurtosis of MS is platy-kurtic (2.341) and Jarque -bera of 0.565. The average GDP of 4.214 with a wide range from minimum 1.014 to maximum 7.705 while a skewness is positive (0.189), kurtosis is platy-kurtic (2.412) and Jarque -bera of 0.569. The average BOP of -3.109 with a wide range from minimum -1.570 to maximum 3.859 while a skewness is negative (-1.116), kurtosis is leptokurtic (5.241) and Jarque-bera of 11.683. The average interest rate (IR) of 2.328 with a wide range from minimum -6.774 to maximum 10.522 while skewness is negative (-0.645), kurtosis is meso-kurtic (3.188) and Jarque-bera of 1.985.

4.2 CORRELATION ANALYSIS:

Table: 02

	SR	INF	ER	MS	GDP	BOP	IR
SR	1						
INF	-0.0058	1					
ER	-0.0972	-0.111	1				
MS	-0.091	0.032	-0.031	1			
GDP	-0.081	-0.298	0.158	0.1293	1		
BP	0.174	-0.443	-0.165	-0.670	-0.081	1	
IR	-0.142	-0.504	0.250	0.201	-0.1209	0.028	1

This table shows the correlation analysis to find out the affiliation and direction of selected key macroeconomic variables. This table proof that the hypothesis of our study is match with the

correlation table. There exist negative relationship of stock return to inflation (-0.005), exchange rate (-0.097), money supply (-0.091), GDP (-0.081), interest rate (-0.142) and positive relationship to

balance of payment (0.174). There exist negative relationship of inflation to stock return(-0.005), exchange rate(-0.111), GDP(-0.298), balance of payment(-0.443), interest rate(-0.504) and positive relationship to money supply(0.032).There exist negative relationship of exchange rate to stock return(-0.097), inflation(-0.111), money supply(-0.031), balance of payment(-0.165) and positive relationship to GDP(0.158), interest rate(0.250). There exist negative relationship of money supply to stock return(-0.091), exchange rate(-0.031), balance of payment(-0.670) and positive relationship to inflation(0.032), GDP(0.129), interest rate(0.201).There exist negative

relationship of GDP to stock return(-0.081), inflation rate(-0.298), balance of payment(-0.081), interest rate(-0.120) and positive relationship to exchange rate(0.158), money supply(0.129).There exist negative relationship of balance of payment to inflation (-0.443), exchange rate (-0.165), money supply (-0.670), GDP(-0.081) and positive relationship to stock return(0.174), interest rate(0.028). There exist negative relationship of interest rate to stock return (-0.142), inflation (-0.504), GDP (-0.120) and positive relationship to exchange rate (0.250), money supply (0.201), balance of payment (0.028).

4.3 UNITROOT:

Table: 03- ADF Unit Root Test:

Variables	LEVEL				1 ST DIFFERENCE				Decision
	Intercept		Trend and intercept		Intercept		Trend and intercept		
	t-stats	Prob.	t-stats	Prob.	t-stats	Prob.	t-stats	Prob.	
SR	-7.088	0.000	-7.133	0.000	-11.680	0.000	-11.494	0.000	I(0)
INF	-2.214	0.206	-2.241	0.449	-6.460	0.000	-6.314	0.000	I(1)
ER	-0.697	0.831	0.130	0.995	-3.840	0.007	-5.007	0.002	I(1)
MS	-1.020	0.731	-3.089	0.129	-3.865	0.007	-3.788	0.033	I(1)
GDP	-3.686	0.011	-3.590	0.053	-6.102	0.000	-6.035	0.000	I(1)
BoP	-1.899	0.327	-2.263	0.438	-4.910	0.000	-4.872	0.003	I(1)
IR	-1.385	0.573	-1.676	0.732	-11.122	0.000	-11.085	0.000	I(1)

The ADF is applied in order to check the stationary of the variables. The dependent variable stock return is integrated at level while all the independent variables are integrated at

first difference. Hence, shows the mix results. Therefore, ARDL-Bound test approach is applied in order to quantify the long and short run relations.

4.4 VAR LAG ORDER SELECTION CRITERIA:

Table: 05

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1100.499	NA	2.35e+28	85.1922	85.530	85.289
1	-994.070	147.363*	3.28e+26	80.774	83.484*	81.554
2	-931.931	52.578	3.20e+26*	79.763*	84.844	81.227*

AIC is used to check the quality of model and means of model selection. Before applying Bound

test approach no of lag shall be find by AIC and SC as data are yearly estimated by lag length

criterion along with LM test of serial correlation. The AIC (Akaike information criterion) shows the 4.5 BOUND TEST APPROACH:

lag length at 2, while SC (Schwarz information criterion) shows at 1.

Table: 04
ARDL Bounds Test
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	9.097368	6

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

The above table shows that the calculated F-statistic is greater than upper bound i.e. F-stats > critical values bound 9.097 > 3.23, 3.61, 3.99, 4.43 So, rejecting the null hypothesis and it indicates that there exists long run relation.

4.5.1 Short and Long Run Coefficients:

Table: 06

Variables	Short Run Coefficients		Long Run Coefficients	
	Coefficient	t-stats	Coefficient	t-stats
D(INF)	-2.982	-2.688	6.263**	1.934
D(ER)	1.942*	3.648	-1.1205*	-3.745
D(MS)	0.509***	1.731	0.321**	1.952
D(GDP)	-1.642*	-2.427	5.047*	2.288
D(BP)	0.034*	5.110	0.231*	3.558
D(IR)	3.412*	2.394	7.722*	2.053
ECM	-0.584* (0.232)	-6.814	Durbin-Watson stat	2.120
Constant (long run)	41.984* (1.3005)	32.281	F-statistic: (Prob(F-statistic)):	6.232 (0.004)
R-square	0.906		Adjusted R-square	0.761

Note: *shows the significant at 1%, **shows the significant at 5% and ***shows the significant at 10%.

The long run and short run association between dependent variable (stock market return) and independent variables (Inflation, GDP, Exchange

rate, Interest rate, BoP, Money supply) .All data are taken in log form.

$$SMR = \alpha_0 + \alpha_1 inf + \alpha_2 ER + \alpha_3 MS - \alpha_4 GDP + \alpha_5 BP + \alpha_6 IR \text{ (short run equation)}$$

$$SMR = \alpha_0 - 2.982inf + 1.942ER + 0.509MS - 1.642GDP + 0.034BP + 3.412IR$$

SMR= $\beta_0 + \beta_1 \text{inf} - \beta_2 \text{ER} + \beta_3 \text{MS} + \beta_4 \text{GDP} + \beta_5 \text{BP} + \beta_6 \text{IR}$ (long run equation)

SMR= $\beta_0 + 6.263 \text{inf} - 1.120 \text{ER} + 0.321 \text{MS} + 5.047 \text{GDP} + 0.23 \text{BP} + 7.722 \text{IR}$

The relationship between inflation and stock returns exhibits a statistically significant negative correlation in the short run, whereas it turns positive in the long run. Specifically, a 1% increase in inflation leads to a 2.982% decrease in stock returns in the short run, significant at the 1% level. In contrast, a 1% increase in inflation results in a 6.263% increase in stock returns in the long run, significant at the 5% level. These findings align with the studies conducted by Jamal-up-din et al. (2017) and Allah et al. (2017), underscoring the complex dynamics of inflation's impact on stock market performance. This suggests that investors and policymakers should consider the time horizon when assessing the impact of inflation on stock market performance, as the effects can vary significantly between short-term and long-term periods.

The exchange rate exhibits a statistically significant relationship with stock market returns, with contrasting effects in the short and long runs. In the short run, a 1% increase in the exchange rate leads to a 1.942% increase in stock returns, significant at the 1% level. Conversely, in the long run, a 1% increase in the exchange rate results in a 1.120% decrease in stock returns, significant at the 5% level. These findings are consistent with the studies conducted by Iqbal et al. (2013) and Mukit and Safiullah (2012), highlighting the complex dynamics of exchange rate fluctuations on stock market performance. This implies that investors and policymakers should consider the time horizon when assessing the impact of exchange rate movements on stock market returns, as the effects can vary significantly between short-term and long-term periods.

In both the short and long runs, there is a statistically positive relationship between money supply and stock returns. Specifically, a 1% increase in money supply leads to a 0.509% increase in stock returns in the short run, significant at the 10% level, whereas in the long run, a 1% increase in money supply results in a 0.321% increase in stock returns, significant at the

5% level. These findings are consistent with Ouma's (2014) study, suggesting that an expansion in money supply has a favorable impact on stock market performance, with the effect being more pronounced in the short run. This implies that monetary policy decisions influencing money supply can have a significant impact on stock market returns, highlighting the importance of considering money supply dynamics in investment and policy decisions.

GDP and stock returns exhibit a statistically significant negative correlation in the short run, whereas it turns positive in the long run. A 1% increase in GDP leads to a 1.642% decrease in stock returns in the short run, significant at the 1% level, whereas in the long run, a 1% increase in GDP results in a 5.047% increase in stock returns, significant at the 1% level. These findings are consistent with Hamid's (2016) study. On the other hand, the balance of payments (BOP) has a statistically positive relationship with stock returns in both the short and long runs. A 1% increase in BOP leads to a 0.034% increase in stock returns in the short run, significant at the 1% level, whereas in the long run, stock returns increase by 0.23%, significant at the 1% level. These results are consistent with Nijam et al.'s (2015) study, highlighting the complex dynamics of GDP and BOP on stock market performance.

In both the short and long runs, there is a statistically significant positive relationship between interest rates and stock returns. A 1% increase in interest rates leads to a 3.412% increase in stock returns in the short run, significant at the 1% level, whereas in the long run, a 1% increase in interest rates results in a 7.722% increase in stock returns, significant at the 1% level. These findings are consistent with Zoa et al.'s (2014) study, suggesting that interest rate changes have a substantial impact on stock market performance, with the effect being more pronounced in the long run.

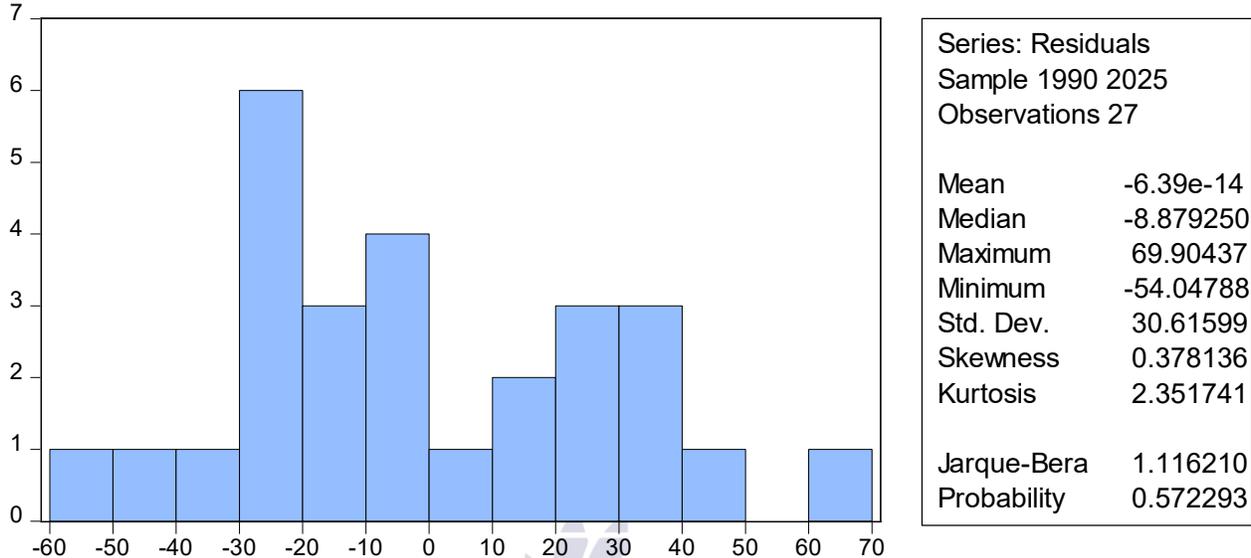
The Error Correction Model (ECM) value of -0.584 indicates that the variables will converge to equilibrium at a rate of 58% in the event of a shock, suggesting a moderate speed of adjustment. The model's goodness of fit is 90%, indicating that the independent variables collectively explain 90%

of the variation in the dependent variable. Diagnostic tests confirm that the model is free from autocorrelation and heteroscedasticity issues. The F-statistic of 6.232 with a probability of 0.004

indicates that the overall model is statistically significant, underscoring the reliability of the estimated relationships between the variables.

4.6 DIAGONISTIC TEST

4.6.1 Normality Test:



The diagnostic residuals test results indicate that the Jarque-Bera statistic is 1.116 with a p-value of 0.57, which is statistically insignificant. This leads to the acceptance of the null hypothesis, suggesting that the residuals are normally distributed. The insignificant p-value confirms that there is no issue of heteroscedasticity, implying that the variance of the residuals is

constant. Furthermore, the Jarque-Bera test result indicates that the model is normally distributed, providing evidence of normality in the residuals. Overall, these results suggest that the model's residuals meet the assumptions of normality and homoscedasticity, lending credibility to the estimated relationships and inferences drawn from the model.

4.6.2 Serial Correlation and Heteroscedasticity

	F-statistic	Prob. F(2,12)	Obs*R-squared	Prob. Chi-Square(2)
Breusch-Godfrey Serial Correlation LM Test:	0.398	0.679	1.683	0.431
Heteroscedasticity Test: Breusch-Pagan-Godfrey	1.141	0.401	13.354	0.343

The diagnostic tests conducted on the model examine the presence of serial correlation, normality, and heteroscedasticity. The results indicate that the probability of the F-statistic is 0.679, which is statistically insignificant, leading to the acceptance of the null hypothesis. This implies that the model is free from serial correlation and heteroscedasticity, suggesting that the residuals are

randomly distributed and the variance of the residuals is constant. These results provide evidence that the model's assumptions are met, increasing the reliability and validity of the estimated relationships and inferences drawn from the model. Overall, the diagnostic tests confirm that the model is well-behaved and suitable for analysis.

4.6.3 Ramsey Reset Test:

Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.911	13	0.778
F-statistic	3.655	(1, 13)	0.778

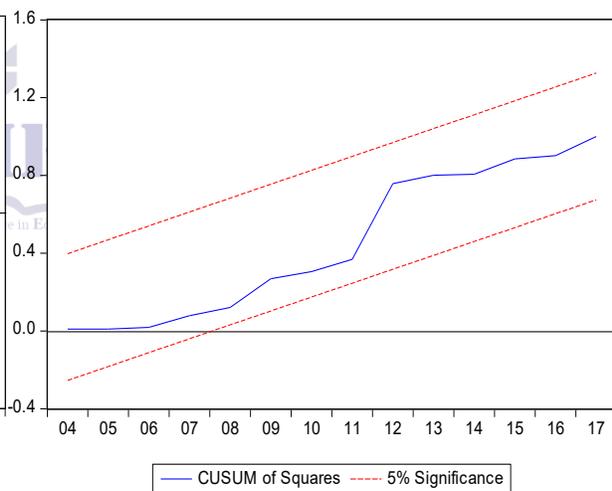
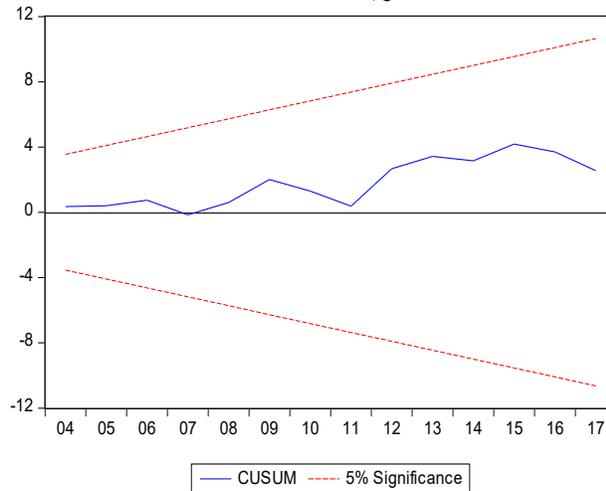
F-test summary:

	Sum of Sq.	Df	Mean Squares
Test SSR	5348.906	1	5348.906
Restricted SSR	24370.81	14	1740.772
Unrestricted SSR	19021.90	13	1463.223

The Ramsey RESET test result indicates that the model is correctly specified and there are no omitted variables, suggesting that the functional form of the model is appropriate. This, combined with the previous results, provides further

evidence of the model's normality and robustness, increasing confidence in the accuracy of the estimated relationships and predictions made by the model.

3.6.4 CUSUM and CUSUM SQUARE TEST:



The CUSUM and CUSUM square tests confirm the stability of the model, as the plots of the test statistics lie within the critical regions at the 5% significance level. This indicates that the model's parameters are stable over time, suggesting that the relationships estimated by the model are reliable and can be used for forecasting and policy analysis. The stability of the model provides further evidence of its robustness and suitability for analyzing the relationships between the variables.

5. Conclusion And Recommendations:

An efficient stock market plays a pivotal role in fostering economic growth and prosperity, as it facilitates the allocation of resources, mobilizes savings, and promotes investment. In this context, the present study examines the impact of inflation, exchange rate, GDP, money supply, balance of payment, and interest rate on stock market returns in Pakistan from 1990 to 2019. The empirical results, based on the ARDL-Bound test model, reveal a complex and nuanced relationship between these macroeconomic variables and stock

market performance. In the short run, inflation and GDP exhibit a negative relationship with stock market returns, whereas money supply, exchange rate, balance of payment, and interest rate display a positive association. Conversely, in the long run, inflation, money supply, GDP, balance of payment, and interest rate are positively related to stock market returns, while exchange rate shows a negative relationship.

The error correction term, ECT(-1), indicates that any deviations from the long-run equilibrium are corrected at a rate of 58%, suggesting a moderate speed of adjustment. The model's goodness of fit is satisfactory, with the independent variables collectively explaining 90% of the variation in stock market returns. The findings suggest that policymakers can stimulate the stock market by lowering interest rates, as higher interest rates are likely to dampen market efficiency. To achieve this, government authorities should implement effective monetary policies aimed at controlling inflation and stabilizing interest rates at a lower level, thereby fostering a conducive environment for stock market growth and overall economic prosperity.

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