

IMPACT OF EXCHANGE AND INTEREST RATE FLUCTUATIONS ON STOCK MARKET VAR: A STUDY OF THE KSE-100 AND OTHER SOUTH ASIAN INDICES

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ABSTRACT

Purpose: The purpose of this study is to investigate the stock market risk determinants in South Asian economies. It analyzes the impact of exchange rate and interest rate fluctuations on Value at Risk (VaR). It also assesses how macroeconomic variables influence market volatility for investors and policymakers..

Design/Methodology: Annual panel data for five South Asian countries: Pakistan, Bangladesh, India, Nepal and Sri Lanka, for the years 2014-2024, have been analyzed. Parametric VaR was employed to measure the risk in the stock market, and fixed-effects panel regression was used to analyze the effect of selected macroeconomic variables.

Findings: The findings suggest that the impact of exchange rate and interest rate movements, GDP growth and oil prices are highly significant for the risk of the stock market, and also for the dynamics of the VaR. There is no significant direct effect of inflation, indicating that its effect may be indirect via other macroeconomic variables.

Practical implications: The study is useful to the policymakers for formulating stable monetary policies and to the investors for risk management in watching important macro-economic indicators which influence the volatility of the markets.

Originality: This study was a multi-country empirical evaluation of macroeconomic determinants of VaR in South Asia which was a parametric study. It emphasizes the

interrelationships between the roles of domestic macroeconomic factors and external price shocks. The results add to the body of literature on financial-risk in the region.

Keywords: *Value at Risk, macroeconomic variables, South Asian Stock markets, financial risk.*

Paper type: Research Paper

INTRODUCTION

The constant instability of the Pakistani rupee and frequent upward and downward adjustments in its interest rate have also affected the KSE-100 index greatly, making investors less confident and capturing significant changes in their market value (Reuters, 2025). Financial market react to variations of macroeconomic variables, which influence changes in the level of economic conditions and investor behavior. According to the Efficient Market Hypothesis, the stock prices and returns are quite sensitive to any alteration in variables like interest and exchange rates. Despite the fact that these relationships have been subjects of a number of studies, the contribution of uncertainty in the variables is poorly studied, especially in the economic climate that will arise after the COVID-19 pandemic. (Iania et al., 2023).

In Pakistan, the KSE-100 Index is used to measure economic activity and levels of investor sentiment, with the market movements highly sensitive to any changes in interest rates, inflation, and exchange rates. However, a combination of these factors on the financial risk of the Pakistani and other emerging markets has not been examined comprehensively yet (Saleem et al., 2025). Value-at-risk (VaR) is one of the most useful techniques that are utilized in estimating the possible market losses and are important in determining that macroeconomic shocks affect financial risk (Wang et al., 2024). With increasing global financial integration, the interest rate spillover effect by other major economies such as the United States has a major impact on the prices of assets and capital flow as well as financial stability in the South Asian markets (Saleem et al., 2024).

The study is theoretically based on the Portfolio Risk Theory (Markowitz, 1952), or the Modern Portfolio Theory (MPT). The theory points out that the overall risk of a portfolio is not defined by the risk of individual assets but by the aggregate variance and covariance of all the assets in the portfolio. This model emphasizes the diversification aspect and relation among the asset returns in the overall risk management of portfolios. Later innovations in the financial modeling enhanced the mean-variance model, which had been introduced by Markowitz. According to Baba and Diongue (2025), Bayesian procedures and factor models have assisted in ensuring that the process of analysis of pricing of assets and design of portfolios becomes more precise. Such developments also contribute to the influence of various market variables on the performance and risk of portfolio. Markowitz's structure and decision-making framework still contribute to the current trends in portfolio creation and risk management after over seventy years, as pointed out by Ślusarczyk and Ślepaczuk (2025). The fact that it is able to explain the way in which interactions

between variables of the market directly influence portfolio risk makes it an enduring theory to be utilized in the study of financial market volatility and Value-at-risk (VaR) mechanisms.

While there have been many studies that have used the Extreme Value Theory (EVT) to estimate the Value-at-risk (VaR), many of these studies have been limited in their number of macroeconomic variables, used older datasets, or used country-specific evidence. The need for incorporating macroeconomic variables in VaR models has been acknowledged, but the impact of volatility in exchange rates and interest rates on the risk of a portfolio has received relatively limited research attention, particularly in the context of stock market in South Asia, such as Pakistan. Also, the inclusion of macroeconomic indicators like oil prices and gross domestic product (GDP) in a comprehensive risk assessment framework is not always done. Previous research also tends to ignore recent economic changes and region's comparative context. Thus, the understanding of the effect of exchange rate and interest rate volatility on South Asian stock market VaR in the macroeconomic context is still lacking. To fill this gap, this study investigates the effect of exchange rate and interest rate changes on the VaR of the KSE-100 and other South Asian stock indices while considering some important macroeconomic factors (Aslam et al., 2025; Jakšić et al., 2025; Jehandad, 2025; Lyu et al., 2025; Matuku et al., 2025). The study addresses an important research gap in building a parametric VaR model with macroeconomic indicators for the Pakistan Stock Exchange (KSE-100) and other similar markets of South Asia.

Several researchers believe that the movement of exchange rates and interest rates have significant effects on the performances and risks in both developed and emerging markets (Belbali et al., 2024; Hussain et al., 2024). The connection between the two markets, currency and stock markets has grown tighter, and the influence of monetary policy, currency volatility, changes in capital flow and financial instability on both markets have increased in frequency among the economies (Ahmadian-Yazdi et al., 2025). The use of Value-at-risk (VaR) models and machine learning techniques in measuring and predicting investment risk is common, but there is not much clarity about how macroeconomic fluctuations are captured in VaR-based risk measurement in South Asian financial market (Dwi Puspitasari and Putri Zahra Helena, 2024; Melina et al., 2024). A few studies have investigated the effect of the fluctuations in international financial markets on the Pakistan stock market (Zaidi et al., 2023), and the sensitivity of Asian markets to exchange rate and interest rate shocks (Umoru et al., 2024), no systematic analysis on the impact of the shock on VaR of Asian stock markets, in particular KSE-100, has been conducted. Hence, it has become a critical challenge for investors, portfolio managers and policy-makers to grasp and forecast financial exposure in a volatile and interconnected South Asian market without having any solid and complete empirical evidence of the transmission of macroeconomic volatility to measurable portfolio risk.

The present research is informed by the following research questions: (1) To what extent do exchange and interest rate shocks impact Value-at-risk (VaR) in South Asian stock markets? (2) Are these effects regional index effects? (3) To what extent

do control variables, inflation, GDP growth, and oil prices impact VaR dynamics? To answer these questions, the research paper aims (1) to approximate the extent of the effect of fluctuations in exchange and interest rates on the VaR of the KSE-100 and similar South Asian indices, (2) to compare the magnitude and direction of the effects across markets, (3) to determine whether key macroeconomic control variables help explain the changes in VaR, and (4) to provide policy recommendations to enhance financial risk management and regulation.

This study makes three types of contributions to financial risk management literature: theoretical contribution, empirical contribution, and practical contribution. Theoretically, it is an extension of the Portfolio Risk Theory, indicating that the volatility of the exchange rate and the interest rate are important inputs to the measure of risk from a macroeconomic perspective. The inclusion of these variables in a Parametric VaR model defies the notion that market data is sufficient for estimating risk in emerging markets.

Empirically, the study will fill an important gap as it will provide evidence on the impact of macroeconomic conditions on market risk in the KSE-100 index, the most volatile market in South Asia. The cross-country comparison also helps in highlighting spillover effects and similarities in the South Asia markets. The results have real-world implications for investors, fund managers and policymakers to better assess risks and make decisions in times of economic uncertainty. The study offers insights to improve investment strategies and financial stability in emerging markets.

LITEARTURE REVIEW

Exchange rate and Stock Market VaR

The exchange rate fluctuations have a substantial effect on the economy and financial markets based on a broad collection of evidence. The measurement and prediction of this exchange rate risk is most important, especially at a time when the rates of various currencies are fluctuating as a result of globalization. Different researchers provide strong evidence of structural breaks in volatility (i.e., variability in financial markets). These volatility movements will be predicted to persist upwards when they are disregarded when estimating the volatility (Anjum and Malik, 2020). This indicates that exchange rate volatility is not just a fleeting market phenomenon but a long-term financial risk that can shape overall economic and stock market results. The empirical studies showed that exchange rate volatility significantly impacts trade balances and global competitiveness, which in turn influence domestic output and income, which are mostly affected by exchange rate volatility. Both institutional and individual investors are susceptible to exchange rate changes as they impact the stock returns and prices (Vadivel, 2025). Due to this, exchange rate fluctuations are considered a leading source of the transmission of macroeconomic uncertainty to equity markets.

During the COVID-19 pandemic, Chang et al. (2024) studied that the exchange rate changes had affected severely the returns of Taiwan's stock market. The research revealed that in the crisis period, the exchange rate volatility was an important factor in the movements of the stock market. The evidence in this paper is in line with the hypothesis that the impact of exchange rates on stock markets grows stronger under economic and financial stress. These exchange rate swings result in a response to the local stock market, which associates a variability of interest rates, future income, and investment decisions with the variability of stock prices and exchange rates (T, 2021). There is a close dynamic relationship between stock prices and exchange rates that has been compounded by the financial globalization and the current global financial crisis as well as the Asian financial crisis of 1997. Both increased market liberalization and liquidity affect currency fluctuations and the performance of stock markets in both directions, as well as exposure to exchange rate risks increases (Andriansyah and Messinis, 2019). On the back of these studies, recent research has moved away from just returns to a more comprehensive concept of downside risk, like the Value-at-Risk (VaR). This relationship is also confirmed by more recent empirical evidence. Based on a panel quantile regression involving MENA emerging markets for daily data from 2000 to 2024, the study finds that the volatility of exchange rates has a significant negative impact on stock returns, and a simultaneous increase in exchange rate instability and global economic policy uncertainty increases market downside risk (Umoru et al., 2025). Likewise, a global VAR (GVAR) study shows that global and domestic uncertainty shocks lead to a nearly instantaneous shock to exchange rate volatility and currency depreciation in emerging markets, which, in turn, worsens equity tail risk and VaR (Glebocki and Saha, 2024).

Accordingly, hypothesis 1 is as under:

Hypothesis 1: *There is a positive relationship between the exchange rate and stock market VaR, where a high exchange rate (currency depreciation) increases VaR.*

Interest rate and Stock Market VaR

Interest rates and stock markets have a very significant relationship, as they are both crucial in economic growth. The findings on the numerous studies that have been conducted to examine this relationship are inconsistent due to the variations in sample groupings and models. The sensitivity and volatility of interest rates often change with the market, so scholars have differing views on whether they play a significant role in stock prices or not (Gu et al., 2022). While these lines of thinking diverge, the vast majority of studies recognize that the interest rate can have an impact on stock markets through its impact on the cost of capital and portfolio choices of investors. The performance of the stock market is profoundly affected by the change in interest rates as it affects investment decisions. When the rate is low, it stimulates risk-taking which will lead to an increase in market activity, but high rates will prevent the equity from being invested in the market because the cost of borrowing is high. Consequently, the change in interest rates affects the stocks indirectly and demonstrates the overall economic stability (Alshubiri, 2021). Thus, fluctuations in

money supply are associated with fluctuations in the stock market volatility and risk-taking.

Studies show that high dividend and savings interest rates can advantage the stock market performance, but conversely, their reduction leads to negative results. Conversely, an increase in interest rates and dividends on loans has a negative impact on the market, and a reduction in loan rates and payouts has a positive impact on the market (Hasan et al., 2022). The results are broadly consistent with the hypothesis that investors' allocation from equity to fixed income positions is very sensitive to interest rates. Interest rates and performance of the stock market are related inversely. Due to the increase in the cost of borrowing, when the interest rates are increased, the investors opt to invest in fixed-income-based instruments and savings in the bank at the expense of stocks, thereby reducing the value of stocks. Conversely, when interest rates fall, borrowing becomes cheaper, which increases investment in stock markets and raises the price of stocks because money is transited out of bonds to stocks (Abu Aljarayesh et al., 2018). The direction of this relationship is fairly well known, but the recent literature has been turning a new focus towards the implications for market volatility and downside risk. A recent GARCH-MIDAS study on the Malaysian economy (2013–2023) revealed that an increase in monetary policy interest rates was found to lead to an increase in the volatility of the stock market, while money supply conditions were found to have long-run effects on conditional volatility in emerging economies (Zuo, 2025). Interest rate changes exhibit significant “asymmetry” in their effects on the returns of the stock market in South Africa (NARDL-based evidence). The impact of interest rates movements on returns is greater when the return is negative than when it is positive, marking the asymmetry of monetary policy (Pamba, 2025). Accordingly, hypothesis 2 is as under:

Hypothesis 2: *There is a positive relationship between interest rates and stock market VaR, where higher interest rates increase VaR.*

GDP and Stock Market VaR

The stock market performance appears to be on a similar path just like that of GDP growth, implying a positive and strong relationship. Some purely observational arguments suggest that a long-term rise or fall in the stock market can indicate various factors; however, not all changes in the stock market are related to changes in GDP. Economic conditions through GDP growth determine the future of the stock market by influencing investor expectations and market trends. In line with this, high GDP growth is likely to reduce volatility and long-term investment risk and enhance the performance of the stock market (Bunjaku, 2024). This correlation indicates that a more favorable investment climate is brought about by economic growth, as it enhances the expectations of future corporate performance. Correspondingly, empirical evidence has shown that the market returns, as well as volatility, is often influenced by macroeconomic announcements related to GDP. It has been found that GDP and share prices are correlated both positively and negatively, which means that

share performance and economic growth reinforce each other. The significance of the overall economic performance on investor behavior and the changes in asset prices is also indicated by the fact that in the traditional financial markets there is a tendency to respond aggressively to the news related to GDP (Bouzgarrou et al., 2023). GDP is thus a measure of economic performance as well as being a valuable source of information that influences market sentiment and risk perceptions. The stock price movements are responsive to movements in the GDP announcements, and there is an evident relation between the market performance and the economic growth statistics. The GDP releases affect the market expectations and lead to stock price fluctuations because they give an understanding of the economic state (Keswani, 2024).

Inflation and Stock Market VaR

The connection between the stability of the financial market and macroeconomic variables has been a subject of extensive academic study. To investors, and policymakers, the issue of the correlation between inflation and stock market volatility, or Value-at-Risk in particular, is a problem of great complexity in this broad area. This dynamic has to be understood so that it is possible to control portfolios and develop effective monetary policies that can minimize systemic financial risks. Inflation will probably affect the price of shares directly when the level of prices varies or indirectly when it is influenced by the system of regulations created by the government (Agarwalla et al., 2025). This volatility level is often exacerbated by monetary policy responses and uncertainty in equities markets presented by inflation, and hence requires increased attention to the impact it has on quantifiable risk metrics such as Value-at-Risk (Chiang and Chen, 2023). Inflation can affect investor risk beyond just its impact on prices, as it can affect economic fundamentals. Many researchers have argued that inflation significantly affects the risk and volatility of the stock market. The increase in the value-at-risk levels is due to the increase in inflation, which in turn lowers the buying power, increases the uncertainty in the market, and increases the fluctuation of the stock returns. There was a greater volatility in inflation during the COVID-19 that amplified the risk of the stock market, and the impact was more harmful to the investment performance (Shittu and Adaramola, 2025). The results suggest that inflation may exacerbate market uncertainty, especially when times get tough in the economy and financial stresses are growing. Moreover, the relationship between the inflation risk and stock returns can be complex to make clear correlations due to the way it usually changes with time. The comprehensive analysis of VaR dynamics also demands that one understand how exactly inflation can lead to augmented stock market risk, such as how it can influence the cash flows and discount rates of a company (Boons et al., 2020).

Oil Prices and Stock Market VaR

Oil and stock price shocks have been demonstrated to considerably affect most of the economies in the world. Due to its negative implications on the net oil-importing

economies, a shift in the price of oil, specifically, has an economic implication and often makes policymakers across the globe raise serious concerns (Yaya et al., 2016). This is especially important for oil-importing economies, where energy price volatility can easily impact domestic financial markets. The oil prices are constantly fluctuating, which affects the investor confidence, the production costs, and the profit of the companies in Pakistan significantly. Such changes in the oil prices lead to uncertain and volatile financial markets, which directly affect the risk of stock markets and consequently the Value-at-Risk (VaR) of equity portfolios. The same trends have been observed in other developing economies, which include India, where oil and crude oil can be defined as one of the major driving forces in the economic growth and industrialization. The fact that the capital markets continue to depend on imported oil and that the prices are constantly fluctuating makes the capital markets unstable and risky (Agarwalla et al., 2021). As a result, the volatility of oil prices has been the subject of growing research interest as a key factor affecting stock market risk and uncertainty. Scholars found out that positive oil price shocks and increased volatility affect industrial production, real stock returns, and investment decisions when the uncertainty and the option value of investment delay are raised (Sonenshine and Cauvel, 2017). These impacts reveal the many ways oil shocks can impact financial markets, both through changes in the profitability of firms and in their investment activity, as well as in investor sentiment. Given the effect of rising oil prices that increase the cost of production and inflationary pressures, they affect the stock market's Value-at-risk (VaR) significantly since they increase volatility and uncertainty. In addition, oil shocks can have different impacts on VaR, with demand-related shocks related to economic growth having only a transiently beneficial impact on downside risk, whereas supply-related or speculative shocks have an adverse impact. The relationship between the oil prices and the stock value is negative when taking into consideration the cost of production. As oil is an essential factor of production, the increase in oil prices may lead to higher production costs, thereby reducing the expected cash flows of businesses and increasing their sensitivity to financial risks in terms of VaR (Dong et al., 2024). Increasing focus on downside risk measures has further emphasized the relevance of looking at movements of the oil price in the context of the stock market VaR. The VAR-GARCH analysis of G7 economies (2003-2023) shows that the sensitivity of oil prices to the volatility of the stock market is well-documented in a number of the G7 countries, including the UK, Canada, and Japan (Cadena-Silva et al., 2025).

Summary of Literature Review:

As discussed in the literature, macroeconomic variables are known to have a significant impact on the risk and volatility of the stock market. The impact of exchange rates on trade competitiveness, capital flows, and investor sentiment can lead to market uncertainty and downside risk. Moreover, changes in interest rates influence the riskiness of the stock market because they affect the costs of borrowing, investment decisions, and portfolio allocation. Generally, an increase in GDP leads to

an increase in market stability and a decrease in risk because of more solid economic fundamentals and investors' confidence. Conversely, inflation and oil price uncertainty contribute to market uncertainty by impacting purchasing power, production costs, corporate profits, and expectations of cash flow. Overall, the literature suggests that these macroeconomic factors are important determinants of stock market volatility and Value-at-Risk (VaR).

Although much research has been conducted on the relationship between individual macroeconomic variables and stock market performance, certain gaps exist. Most of the studies that are done rely on stock returns or volatility instead of VaR itself as a direct measure of downside market risk. Second, existing works have looked at these macroeconomic variables separately, with limited evidence regarding the joint impact on stock market VaR. Third, empirical evidence is fairly extensive within developed economies or in single-country settings, and there is limited evidence on South Asian stock markets. This study thus tries to close these gaps by looking at the combined effect of exchange rates, interest rates, GDP, inflation, and oil prices on stock market VaR across the major stock indices of South Asia and offer a more complete picture of the way macroeconomic factors can transmit risk to the stock market in emerging markets.

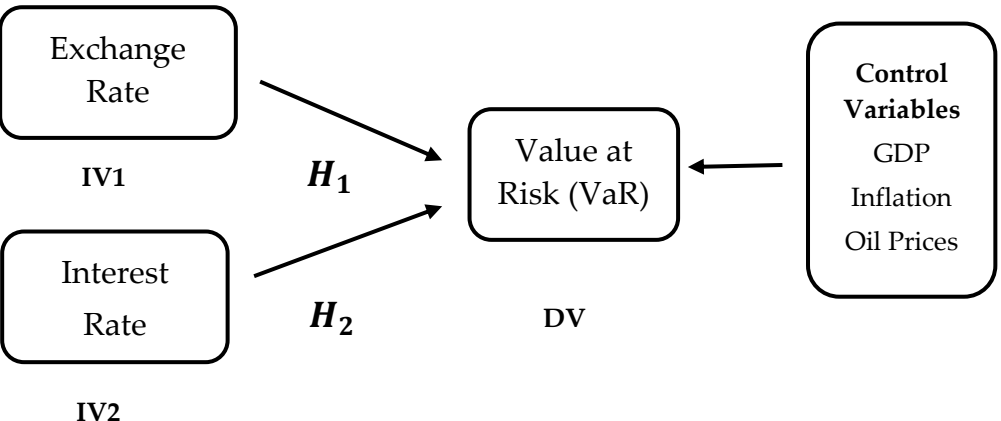


Figure 1. Research Framework

The conceptual framework of this study is shown in Figure 1. The model investigates the effect of Exchange Rate (IV1) and Interest Rate (IV2) as independent variables on Value-at-risk (VaR) as the dependent variable and a measure of stock market risk. The framework suggests that the variations in exchange and interest rates have a considerable impact on the risk and volatility of the chosen South Asian stock markets. It also includes GDP, Inflation and Oil Prices as control variables to capture the impact of other macroeconomic factors that can also influence the stock market risk. Expected relationships between independent variables and Value-at-risk (VaR) are denoted by the letters H1 and H2. The framework is developed based on prior

empirical literature highlighting the importance of macroeconomic factors in determining financial market risk and volatility.

METHODS

The research adopts a quantitative design based on secondary data to determine the impact of major macroeconomic variables on the risk of stock markets in the chosen South Asian economies.

Research Design

The study is based on a quantitative, panel data design that examines causal and correlational relationships. It seeks to find out how the exchange rate and interest rate changes have impacted the Value-at-risk (VaR) of the stock market, using inflation, GDP growth, and oil prices as control factors. The paper uses Stata software, which enables the implementation of both cross-country and time-based regression models in a panel data study.

Population/Sample

Its population comprises major South Asian stock markets, and the sample used is the KSE-100 (Pakistan), DSEX (Bangladesh), NIFTY 50 (India), CSE (Sri Lanka), and NEPSE (Nepal). The period covered in the data collection is 2014-2024. All variables are averaged monthly to annual values in order to remove short-run variations and put the focus on long-run macroeconomic relationships.

Data Collection

VaR, the dependent variable, will be estimated at a 95 percent confidence level by use of the Variance-Covariance method. Various formulas are used in this research as a measurement tool for each variable so that each variable is quantified accurately, such as the exchange rate changes, interest rate changes, and the control variables of inflation, GDP, and oil prices. In this research, the secondary data is based on credible and publicly available databases like the World Bank, IMF, Investing.com, and official websites of certain stock exchanges.

Measurement of Variables

Table 1: Operationalization of Variables

Variables	Measurement tools	Author(s)	Year	Data Source
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Exchange Rate (IV1)	$r_{i,t}^{ER} = \ln\left(\frac{ER_{i,t}}{ER_{i,t-1}}\right)$	Doaa El-Diftar	2023	IMF – International Financial Statistics
Interest Rate (IV2)	$\Delta r_{i,t} = r_{i,t} - r_{i,t-1}$	Miguel A. Ferreira and Jose A. Lopez	2004	SBP, RBI, BB, CBSL, NRB/
Value-at-risk (DV)	$VaR = -(\mu + (Z\alpha \times \sigma))$	Yulong Xie	2025	Yahoo Finance, Investing.com
Control Variables				
Inflation	$\Delta CPI_{i,t} = \log\left(\frac{CPI_{i,t}}{CPI_{i,t-1}}\right)$	Tarun K. Mukherjee and Atsuyuki Naka	1995	World Bank (WDI), IMF
GDP	$\Delta GDP_{i,t} = \ln(GDP_t) - \ln(GDP_{t-1})$	Rajesh Sharma	2018	World Bank (WDI), IMF
Oil Prices	$Oil_ret_{i,t} = \frac{Crude\ oil\ price_t}{Crude\ oil\ price_{t-1}}$	Theophilus Teye Osah and Andre Varella Mollick	2023	World Bank (WDI), IMF

Data Analysis

The analysis of the data will be performed using Stata software to determine the correlation between the macroeconomic variables and the Value-at-risk (VaR) of the stock market. It starts with the calculation of descriptive statistics and a correlation matrix to summarize the nature of the data and point out the possible correlations

between the variables. The panel data regression models that are Fixed Effects and Random Effects are then estimated to capture differences between countries and time. The Hausman test is then used to decide on the best model to use for analysis. The ultimate findings are explained with reference to the statistical significance, direction of relationship, and economic implications with reference to the South Asian financial markets.

Model Specification

The econometric model that is used in the study to test the effect of fluctuation of the exchange rate and interest rate on the stock market VaR is as below:

$$\text{Econometric model: } VaR_{95,i,t} = \beta_0 + \beta_1 ER_{i,t} + \beta_2 IR_{i,t} + \beta_3 INF_{i,t} + \beta_4 GDP_{i,t} + \beta_5 OP_{i,t} + \varepsilon_{i,t}$$

Where:

VaR = Value-at-risk

ER = Exchange Rate

IR = Interest Rate

INF = Inflation

GDP =Gross Domestic Product

OP = Oil Prices

$\varepsilon_{i,t}$ = Error term

Validity and Ethical considerations

Validity is achieved by using verified, consistent, and publicly available sources of data. Control variables (inflation, GDP, and oil prices), which represent the external macroeconomic factors, are added to the research to improve internal validity since no human participants are involved in the study since it is based on secondary data only. Data sources have been cited adequately, and ethical research standards have been adhered to by being transparent, accurate, and having integrity in data handling.

DATA ANALYSIS AND RESULTS

Descriptive Analysis

Table 2: Descriptive and Psychometric Properties of Scales

Variable	Obs	Mean	Std. Dev.	Min	Max
VAR 95	55	.083	.05	.014	.268
Exchange Rate	55	127.866	66.126	61.03	327.507
Interest Rate	55	7.216	4.977	.43	24.409
GDP	55	4.449	3.728	-7.349	9.69
Inflation	55	7.588	7.436	-.429	49.721
Oil Prices	55	69.301	18.149	42.279	97.824

The descriptive statistics summarize or describe the features present in the dataset. Table 2 presents statistics of 55 observations. Financial risk, calculated as VAR 95, is 0.083 on average, which means that the risk levels in the sample are low or moderate. The exchange rate mean is 127.866, indicating a high level of variation in currency values across the observations with values of the rates being between 61.03 and 327.507. The average interest rate is 7.216, which indicates a moderate level of the cost of borrowing in the sample countries, and the range of interest rates ranges from 0.43 to 24.409. The economic output represented by GDP is averaged at 4.449, with certain countries recording negative growth (-7.349) and others to the highest level of 9.69. The level of inflation (Inflation) has a mean of 7.588 which reflects an average of moderate inflation, though the extreme values are as high as 49.721. Lastly, the average of the Oil Prices is 69.301, the minimum is 42.279, and the maximum is 97.824, which is a difference in the prices of the global commodity in the period under observation. On the whole, these descriptive statistics indicate that there is a high level of variation in financial and macroeconomic and risk indicators across the sample observations.

Correlation

Table 3: Correlation Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) VAR_95	1.000					
(2) Exchange Rate	0.547***	1.000				
(3) Interest Rate	0.404***	0.771***	1.000			
(4) GDP	-0.722***	-0.561***	-0.411***	1.000		
(5) Inflation	0.443***	0.602***	0.740***	-0.509***	1.000	
(6) Oil Prices	-0.057	0.221	0.352***	0.162	0.339**	1.000

Note: *** p<.01, ** p<.05, * p<.1

The results of the correlation show that there are a number of statistically significant relationships between the variables. There is a significant positive correlation between Exchange rate ($r = 0.547$, $p < 0.01$), Interest rate ($r = 0.404$, $p < 0.01$), and Inflation ($r = 0.443$, $p < 0.01$) with VAR 95 (financial risk), which indicates that financial risk rises as the currency depreciates, as the interest rate is higher, and as the inflation is higher. Conversely, the relationship between GDP and VAR95 is negative ($r = -0.722$, $p < 0.01$), which shows that the low financial risk decreases with a stronger economic growth. A comparison of VAR 95 and the Oil Prices shows a weak negative correlation ($r = -0.057$), implying that the oil price fluctuations do not have a direct impact on financial risk in this data. Interest Rate ($r = 0.771$, $p < 0.01$) and Inflation ($r = 0.602$, $p < 0.01$) have a positive correlation with Exchange Rate, as high exchange rate volatility is linked to restrictive monetary policies and high inflation. Interest rates also correlates strongly positively with Inflation ($r = 0.740$, $p < 0.01$), which shows that higher inflation rates are usually accompanied by high rates of interest. Exchange rate ($r = -0.561$, $p < 0.01$), Interest rate ($r = -0.411$, $p < 0.01$), and Inflation ($r = -0.509$, $p < 0.01$) are negatively correlated with GDP, indicating that a stronger macroeconomy is linked to lower rates and exchange rate stability. Oil Prices exhibit moderate positive correlations with Exchange Rate ($r = 0.221$), Interest rate ($r = 0.352$, $p < 0.01$), GDP ($r = 0.162$), and Inflation ($r = 0.339$, $p < 0.05$), which implies that the trend in the oil prices is more or less correlated with other macroeconomic variables.

The correlation coefficients are less than 0.80, and hence, the multicollinearity is not an issue in the dataset.

Hausman Fixed Random Test

Table 4: Hausman Fixed Random Test

Hausman (1978) specification test

	Coef.
Chi-square test value	.446
P-value	.994

Random Effect Result

Table 5: Random Effect

Regression results

d_VAR_95	Coef.	St. Err.	t-value	p-value	[95% Conf	Interval]	Sig
log_ExRate	-.043	.018	-2.32	.02	-.079	-.007	**

d_Interest Rate	.008	.002	3.57	0	.004	.013	***
GDP	-.009	.002	-4.24	0	-.013	-.005	***
Inflation	-.001	.001	-0.70	.483	-.004	.002	
log_OilPrices	-.045	.022	-2.05	.04	-.087	-.002	**
Constant	.248	.088	2.83	.005	.076	.42	***
Mean dependent var	0.002	SD dependent var				0.058	
Overall r squared	0.582	Number of obs				50	
Chi-square	61.286	Prob > chi2				0.000	
R-squared within	0.584	R-squared between				0.530	

Note: *** p<.01, ** p<.05, * p<.1, Ex Rate=Exchange Rate

DISCUSSION

This study aims to examine how the exchange rate and interest rate fluctuations affect the risk of the stock market, expressed in the Value-at-risk 95 confidence interval (VAR_95) of both the KSE-100 index and other South Asian indices. The study aims at giving insights on the impact of variation of macroeconomic levels on market volatility and market risk so that investors, regulators, and policymakers can make informed decisions on how to control the financial stability.

Our research study indicates that exchange rate fluctuations are quite negative to influence VAR_95, which is supported by our first hypothesis (H1: $\beta = -0.43$, $t = -2.32$, $p = 0.02$). Hence, H1 is accepted. This means that when the currency is depreciated (low exchange rate), the stock market risk is high. This finding is consistent with the previous research that indicated that exchange rate volatility brings some uncertainty to investors and impacts the stability of the market, which increases the risk levels.

Furthermore, it can be seen that interest rates positively affect VAR_95 significantly, which is supported by hypothesis H2 ($\beta = -.045$, $t = 3.57$, $p = 0.000$), which is expected to happen. Therefore, H2 is accepted. This indicates that the rise in interest rates can raise the price of funds and lead to liquidity problems in the market, which is related to the increased risk in the stock market, which is not surprising to the economic theory and earlier empirical studies.

Moreover, GDP as a control variable has a negative and significant effect on VAR_95 ($\beta = -0.009$, $t = -4.24$, $p = 0.000$), which means that higher economic growth is likely to decrease risk on a stock market. This provides the overall view that a stable and expanding economy can cushion markets against too much volatility. Oil Price also has a statistically significant impact on VAR_95 ($\beta = -0.009$, $t = -2.05$, $p = 0.04$). This

means that the external price shocks are significant in determining the market risk in the sampled economies.

Although inflation was also taken as a control variable, it did not significantly affect VAR_95. In particular, the statistical significance of inflation ($p > 0.05$) was non-significant, which can be due to the fact that in the short term, the risk in a stock market is more affected by such variables as exchange rates and interest rate changes than it is affected by inflation. This result is consistent with the previous studies, which also noted a negative correlation between inflation and the price of stocks but concluded that the existing rate of inflation does not cause an instant response of a market, but the market responds to any fluctuations in the inflation rate with some time lag (Pervaiz et al. 2018). The inflation was however, included in the model, as it is one of the most important economic variables that affect the interest rates and the exchange rate. Although inflation may not be of direct importance within this model, its elimination may biased the findings of other variables. Thus, the fact that the rates of inflation are included makes the estimates of the exchange rates and interest rates accurate and reliable.

Theoretical implications

The findings in this study make a significant contribution to the current body of literature relating to the macroeconomic determinants of financial risk in emerging markets, since they shows that financial risk is determined by the interaction between major macroeconomic variables such as exchange rates, interest rates, GDP, and oil prices. The results support the theories of the financial risk in South Asian emerging economies as systemic and multidimensional instead of having a single economic factor affecting the risk alone.

The findings also provide support for the ongoing macro-finance theories by introducing the importance of the domestic and global economies in market risk. Moreover, global commodity prices, in addition to domestic macroeconomic indicators, have impacts on financial instability and point to an emerging market risk being exposed to global financial integration and external economic shocks.

The dynamics of inflation in the model is another relevant theoretical result. These findings imply that, once all the macroeconomic factors are taken into account, inflation does not have a direct significant effect on financial risk. This means that the impact of inflation could be indirect via other macroeconomic mechanisms, such as the adjustment of exchange rates or monetary policy, and not directly affect market risk.

Overall, this work contributes to theory by focusing on the fact that financial risk in emerging markets is the result of interacting macroeconomic factors operating concurrently, with both domestic fundamentals and global factors playing their part in shaping the dynamics of risk.

Practical implications

This study has several practical implications for policymakers, investors, and market participants in emerging economies. The findings highlight the need for broad macroeconomic stability for policymakers, especially central banks and ministries of finance. All exchange rates, interest rates, GDP, and oil prices turn out to be significant determinants of financial risk, so if any of these factors is unstable, financial markets are vulnerable. In the practical sense, this implies that a monetary policy and a fiscal policy should not be made in isolation. Rather, a more integrated approach is required with the alignment of interest rates, exchange rate management, and growth paths to limit excessive market volatility and enhance financial system resilience.

For investors and portfolio managers, the study provides useful guidance for improving risk management and investment strategies. Financial risk is closely related to macroeconomic fluctuations, so it may be necessary to consider only the indicators of the firm level or the market. When considering the allocation of investments, investors should be conscious of the macroeconomic trends like fluctuations in currency, inflationary pressures, growth patterns, and the global oil price trends. This may allow for better timing of investments, better diversification and better hedging against possible losses in volatile emerging markets.

The findings are relevant to financial institutions and risk managers, as they underscore the importance of incorporating macroeconomic indicators into their internal risk monitoring and stress-testing programs. The analysis of the impact of changes in some major economic variables on market risk can help to enhance the early warning and strengthen the capital planning system. This is especially important for banks or investment companies dealing in a macroeconomic environment that is volatile and in which unforeseen outside events are frequent.

Last, the results highlight the importance of multinational firms and foreign investors to undertake a thorough risk-benefit analysis of domestic and international economies before entering and/or expanding in emerging markets. Global commodity prices and external economic conditions play a major role in financial risk, meaning that international commodity market cycles should be considered in addition to local economic conditions when making investment decisions. This can help firms minimize exposure to unforeseen financial shocks and enhance their investment sustainability in the long term.

Limitations and Future Research

Regardless of these insights, the research has number of limitations. The research can be limited by the sample size of 55 observations, which can limit its applicability to the whole population, and the measurement of Exchange Rate in domestic currency per USD does not necessarily measure all the facets of currency risk. The study does

not consider other important variables like political risk, capital flows, or monetary policy uncertainty that were not incorporated.

Future studies would benefit from the inclusion of more developed and emerging economies and a longer period of time to extend the findings and make them more generalizable. Alternative financial risk measures, such as Expected Shortfall (ES) and Conditional Value-at-risk (CVaR), can also be used by researchers in extreme market conditions. Furthermore, in the future, models such as GARCH-family models and dynamic volatility models, which take into account asymmetric effects and time-varying relationships between the macroeconomic variables and risk in the financial market, can be used. Other macroeconomic financial, and institutional drivers like inflation, political instability and uncertainty, foreign direct investment, and policy uncertainty can be included to increase the model's ability to capture the financial risk in emerging markets and to help understand its drivers. The implications for future research could also cover the comparison of the stock market in the respective markets with the impact of macroeconomic shocks and financial volatility in the respective sectors.

CONCLUSION

In conclusion, this paper demonstrates that financial risk (VAR₉₅) is a major factor in emerging and lower-middle-income countries influenced by macroeconomic variables, the primary one being Exchange Rate. The driving factors behind financial risk include currency fluctuations, interest rate fluctuations, economic growth, and oil price fluctuations, and as such, there is the need to ensure that such factors are closely monitored by policymakers and investors to keep the markets stable. Although Inflation was not identified as an important predictor, it could have an indirect effect on risk via its effect on other macroeconomic variables. The findings of the fixed effect regression model suggest that a significant level of variation in VAR₉₅ has been explained by the combination of these variables, and it is important to note that financial risk is defined by several economic and financial factors. The results can be helpful in creating appropriate policies, investments, and risk management strategies. Besides, the research highlights the necessity to know the conditional and dynamic impacts of macroeconomic variables, which will provide the basis of future studies to investigate further aspects, policy interventions, and regional spillovers that may facilitate further financial stability in emerging markets.

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