Possessions of Financial & Macroeconomic Variables On Pakistan Stock Market A Case from Pakistan

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Abstract:

Because it facilitates the transfer of funds and the accumulation of wealth, the stock market is a vital cog in the economic wheel. Investors, politicians, and academics would do well to study the stock market and their connection to financial and ecological aspects. This synopsis offers a thorough literature analysis on the topic of how financial and macroeconomic variables affect company performance. Rates of interest, dividends, yields that were and investment values are some of the financial factors that are examined in the research to determine their impact on economic performance. Dividend policy and the earnings from them per share impact business ideators, while modifications to the rates of interest can significantly affect stock prices, according to research. Quantitative measures that shed light on current and future company prospects include price-to-earnings and price-to-book ratios.

The research proposal continues by delving into the market's reaction to macroeconomic variables, such as company managers, managers decisions, and particular business situations. The importance of analysis of markets in stock research stems from the fact that stock prices are very sensitive to both general market trends and specific business circumstances. Price changes and changes in investor confidence can result from regulatory and policy actions. The research also looks at how the stock market is affected by financial and the macroeconomic factors that interact with each other. The article focuses on studies that use many characteristics to predict work success by combining them. Additionally, the course covers the most common models and methods utilized in empirical research, such as machine learning, regression analysis, and event monitoring. This method aids investors and policymakers in comprehending the nature and trajectory of the connection between banking in addition macroeconomic factors and economic activity.

As a conclusion, the analysis suggests directions for further study and stresses the need to integrate macroeconomic and a microeconomic one viewpoints when assessing behavioral results. With the financial market moving closer to a worldwide economy, it is crucial for policymakers and decision-makers to have a solid grasp of how various financial and micro-economic issues affect the stock market.

Keywords:

Interest rates, Inflation, Exchange Rates, Corporate Earnings, GDP Growth, Unemployment Rates, Government Policies Introduction:

Introduction:

When it comes to the distribution of wealth, the international financial market is a major player, and the market has a significant impact on both the growth and the fall of health. Many elements, including financial and macroeconomic variables, influence the stock market's behavior because the market is dynamic and complicated. Researchers interested in the evolution of financial markets, policymakers tasked with crafting company strategy, and investors seeking to master the stock market would do well to familiarize themselves with the effects of these shifts.

Academics and investors are starting to pay more attention to the stock market's relationship with financial and macroeconomic factors. Interest rates, inflation, currency exchange rates, and corporate earnings are all financial indicators that could shed light on the state of the market and businesses. The cost of borrowing money and the cost of capital are influenced by changes in inflation and interest rates, which have a domino effect on the price of the stock. The competitive position of exporting businesses and the advantages of foreign investment are both affected by fluctuations in exchange rates, which in turn have a substantial influence on multinational corporations and investors. Another factor that influences stock prices is a company's profitability; while making investments, investors closely monitor earnings and the rate of profit growth.

Money isn't the only thing that matters when it comes to revenue patterns; policies of the government, unemployment rates, and GDP growth are also major players. Investor confidence and mood are quite sensitive to macroeconomic indicators like GDP growth and the rate of employment. In a booming economy, people may feel optimistic, but in a collapsing one, they may sell up their assets and be risk averse. Furthermore, fiscal and monetary policies implemented by the government can greatly affect the stock market. Central bank decisions about income and interest rates, government expenditure and policies on taxes, and other economic factors might influence investors' perspectives on the stock market.

The stock market can also be affected by global events and financial crises. Past events, such as the global financial crisis of 2008 and more current geopolitical conflicts and outbreaks of disease, demonstrate that strict leadership styles and theories are effective. Managing risk and developing successful investing strategies requires knowledge of the stock market's reaction to such shocks.

Literature Review:

The correlation between affordability and company performance has been the subject of numerous research. A stock's price is sensitive to changes in interest rates. If companies and individuals are forced to pay more to borrow money, they would be less likely to spend and invest, which might hurt the economy. For instance, a combination of low interest rates and other stimuli will boost

expenditure, business confidence, and overall economic activity. Researchers Chen et al. (2014) and Ahmed et al. (2010) found the fact that interest rate reduction during recessions affected stock recoveries, and that there is a positive association between US savings rates alongside the labor market.

The rate of inflation is another key economic indicator that has an impact on the stock market. As the buying power of money declines due to rising prices, investors seek out assets like stocks that can maintain their worth. On the other hand, investors may be scared away from stocks if inflation gets too high. Evidence from studies like Mishra et al. (2018) and Theodore Kw (2020) demonstrates that low inflation benefits stock returns by reducing wealth disparity.

Interest Rates:

The interest rate is a crucial component of the financial system that impacts the stock market and has far-reaching effects on the economy, financial markets, and individual financial decisions. They are highly influential on governments, investors, enterprises, and consumers since they reflect the cost of borrowing or return on credit. The central bank often controls inflation and the growth of the economy through the use of interest rates, which it sets. As a tool for monetary management and economic policymaking, central banks establish interest rates (also called policy rates). Central banks can rein in inflation and rapid economic growth by limiting credit, spending, and investment through interest rate hikes. When the economy is in a slump, central banks often cut interest rates to revive spending, lending, and investment. The connection between those modifications in both the short and the long term is explained by financial theory (Ahmed et al., 2010). If all else remains the same, investors will be able to take advantage of the financial markets if the central bank raises the interest rate. The stock market is directly affected by Marko economic indicators. Because they do so little, scientists are frequently stereotyped as being ineffectual. Products from developing nations are of low quality. Paying a loan's interest is like picking up a percentage on a loan. Since stock prices decline when demand for stocks recovers, an increase in interest rates has a negative effect on stock prices. Interest is also crucial because it provides a foundation for long-term financial stability. Interest rate fluctuations are a concern for those who invest. If the interest rate goes up, potential investors will think twice before putting their money into the company. It is beneficial for investors to have a stake in both rising and falling stock markets. An abrupt shift in interest rates has a direct impact on the stock market's structure and the rate of return. Interest rate effects on investor returns and achievement have been studied by Blanchard (1981) and Lobo (2016), respectively. Lobo looked at how interest rate changes affect returns and operating. The market for shares and its inner workings were another area of study for him. Changes in revenue from governments are also examined in terms of the type of returns. Additionally, it finds that interest rates greatly affect stock returns. Interest rates and retail sales in both developing and developed economies were also examined in an investigation published in 2009 by Mohammad Alam and Muhammad Ghazi. They gathered monthly stock return data for fifteen years, performed regression analysis to predict interest rates, and found a positive correlation between the two. The correlation between stock market

performance and macroeconomic variables was examined by Ishan, Ahmed, Haq, and Sadia (2007). Based on their research into the Pakistan Stock Exchange, they came to the conclusion that interest rates and other financial variables affect the stock market.

H1: There is a positive relationship between interest rates and Pakistan Stock Exchange (PSX) returns.

Everyone from individuals to government is impacted by interest rates when it comes to the cost of taking out a loan Mortgage rates rise in tandem with interest rates, which in turn makes borrowing money, purchasing a vehicle, or making personal payments more costly for customers. A company's bottom line could take a hit if interest rates were to rise since capital expenditures and growth finance expenses would rise. On the flip side, when interest rates are low, borrowing money becomes more affordable for both individuals and businesses. This, in turn, boosts spending and investment. Returns on deposits and fixed income are influenced by interest rates as well. Savings accounts, CDs, and government bonds all benefit from increased returns when interest rates are high. Those who put money aside with the intention of earning interest on that money may find this useful. On the flip side, investors may seek out more capital from asset risks like products if interest rates are low because returns on deposits and fixed income are lower.

Bonds and equities, among other financial assets, are susceptible to interest rate fluctuations. A change in interest rates can have a disproportionately large impact on bonds with fixed interest rates. An increase in interest rates causes the yield on newly issued bonds to climb while the yield on older bonds falls. The result is a loss of cash for owners as the value of current bonds declines. On the flip side, lenders gain when interest rates decrease since their bonds' value increases. Interest rates also have an impact on stock prices. When investors observe low interest rates, they may seek larger returns on assets like stocks, which could lead to a spike in stock prices. In contrast, as interest rates rise, investors may seek out more secure income sources, which could cause a decline in stock demand. An integral part of the housing market is interest rates. The cost of financing to buy a house is also affected by fluctuating house values. Mortgage rates are more affordable when the rates of interest are low, which increases demand for housing and could cause property prices to rise. On the flip side, a slowdown in the housing market could result from a decline in demand for homes caused by increased loan rates.

Analysts and investors look to interest rates as a barometer of consumer and company confidence in the economy. The present and future of the economy were taken into account when the central bank decided whether to raise or lower interest rates. Market volatility is a natural response from investors to fresh choices regarding money, such as interest rate announcements from banks. Exchange rate swings also impact a wide range of countries and investors from around the world.

A decrease in competitiveness when it comes due to the home currency's advantage over foreign currencies might have an impact on the stock price and profitability of export-oriented businesses. Several industries show signs of bidirectional causation in the correlation underlying currency volatility and economic growth

within nations, according to research by Baur and Lucey (2010).

Macroeconomic Variables and

Stock Market Performance

Inflation

Rates:

According to US economic data compiled by (Heinz Herrmann et al., 2006), income depreciation suggests a short-term downturn but no long-term recession. Financial experts are beginning to question the group's future predictions in light of the fact that the currency rate decrease has caused inflation to rise. Consequently, commodities prices started to decline. Returns and macroeconomic variables were studied by Dinniah and Mansor (2009). In six big Asia-Pacific countries, they get paid in product form. In this model, productivity, inflation, and stock returns all function as independent variables. From 1993 through 2002, monthly values were utilized for all macro variables. Fewer things can be bought with the same amount of money, leading to a decline in purchasing power parity. Inflationary tendencies are frequently associated with purchasing power, they discovered. When looking at the state of the economy as a whole, macroeconomic variables provide valuable insight. Growth in gross domestic product (GDP), inflation, interest rates, unemployment, and government policies are among the economic and financial indicators that have changed. Investors, economists, and lawmakers who want to study the effects of economic financial research on financial markets and investment choices would do well to understand the connection between stock returns and macroeconomic variables.

In economics, a country's GDP is the total value of all final products and services provided inside its borders over a certain time frame, usually a year. The growth of GDP is a measure of an economy's expansion or decrease. The study found that stock gains are positively connected with increases in GDP. Optimism in business, increased consumer spending, and strong GDP growth all contribute to higher commodity prices when economic circumstances are good. In contrast, as investor profits increase and confidence decreases, stock values may decline during economic downturns or downturns.

"Inflation" describes the gradual but noticeable increase in a country's general cost of living. Inflation reduces the purchasing power of money, which impacts both businesses and consumers. Inflation and stock returns are positively correlated, according to the study. The practice of companies raising prices in order to raise their profit margins often results in a typical inflation and returning goods. On the other side, stock prices could fall if consumers lose faith in the product due to excessive inflation.

The interest rates set by central banks have an effect on the cost of taking out debts, the cost of capital generally, and the availability of credit. Costs of borrowing and stock returns are intricately related, although this relationship is affected by many economic circumstances. Low interest rates may boost lending and commerce, which in turn can help the economy recover. In addition, stock prices might increase when rates of return are low because investors are looking for better returns regarding assets like stocks. However, as interest rates rise, it becomes more costly to borrow money for both consumers and businesses, which

reduces the profits of entrepreneurs and dampens job prospects.

The fraction of the labor force that is neither employed nor actively seeking employment is represented by the unemployment rate. Economic recovery is aided by low unemployment rates, which are typically linked to robust economies, increased spending, and corporate profitability. Unemployment has the opposite effect of what it claims: it reduces consumer spending and business earnings, which in turn reduces productivity.

The budget of the government and monetary policy are two factors that can greatly affect stock returns. Borrowing costs, income, and investor mood can all be influenced by monetary policy, which includes interest rates and changes to interest rates. Stock prices tend to rise in response to deflationary policies and interest rate reduction, which are examples of expansionary monetary policy. Taxes and government spending have an impact on business profitability and economic growth, which in turn influences the market.

Exchange rate:

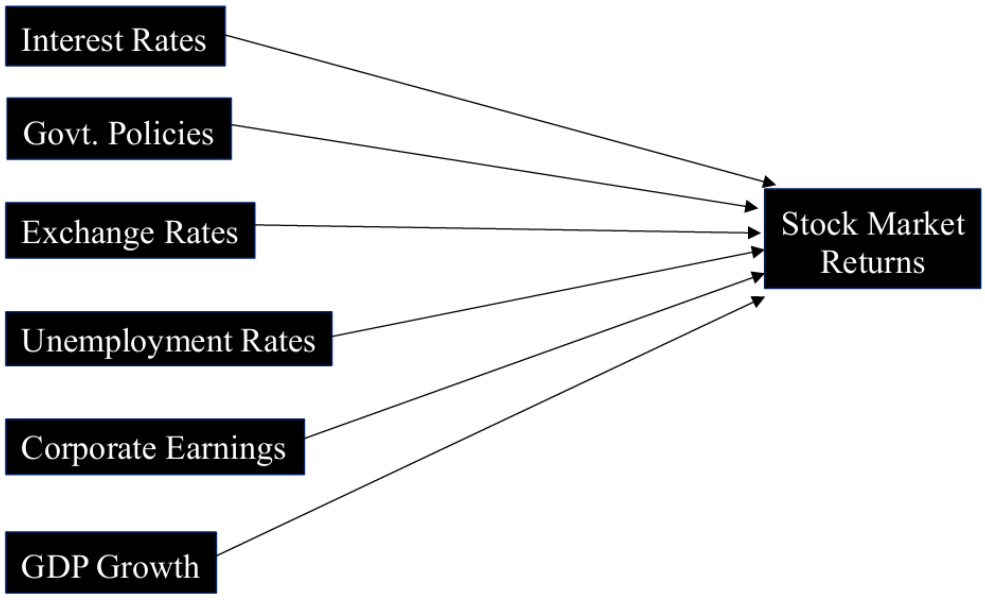
Given that they reflect how changes in the value of the Malaysian currency affect prices (Habib-Ullah and Law, 2006). They do assessments using Granger's non-causation test in the case of a financial disaster. At roughly the same time, the value of the dollar increased while the Malaysian ringgit fell. After considering this, they came to the conclusion that the Malaysian stock market is quite sensitive to changes in currency. Major backers of Pakistan decided to stop supporting the country after it became the seventh nuclear power in the world and exploded an atomic bomb on Mount Chachi on May 28, 1998. As a result, Pakistan's commerce with other countries fell. Taking into account the liquid interbank swap size and the standard definition, which are components of the bilateral swap size regulation that has been in effect since 22 July 1998, the exchange rate has contributed to fortifying the basis for stock trading. Preventing mismanagement requires stringent control of current exchange rates. If the currency rate is affected by repatriation, the government must move quickly to restore economic stability. Exporting businesses become more efficient as a consequence of reduced profits, which in turn attracts investment from outside the country and lowers consumer costs.

The extent to which changes in the macroeconomy impact returns is proportional to changes in the exchange rate. Plenty of things, both internal and external, may affect returns. The exchange rate is favorably associated with product price and market growth, but it has a negative impact on total pricing levels. Results demonstrate that the currency rate is a long-term covariable influencing returns. Findings from the empirical study conducted by Johnson (2008) indicate a relationship between the price of shares and currency rates. Changes in exchange rates impact lawmakers and economists, but they also benefit investors by changing the potential return on their stock investments. There are a number of components of a country's international trade policy that could affect the exchange rate, including its policies regarding imports and exports. When stock prices rise, the value of the dollar falls because the exchange rate rises. Both of these difficulties will have an impact on the organization down the road.

H2: There is a positive relationship between exchange rate and Pakistan Stock Exchange (PSX) return rate. Efficiency:

With an emphasis on financial development in recent years, Pakistan's stock market remained South Asia's most cheapest in 2016, according to Robert (2016). While the US and Malaysia have studied ways to halt economic recovery, Pakistan's stock market is completely unregulated (Kheradyar, Ibrahim, and Nor, 2011). Professionals are attempting to replicate this study in order to predict the upkeep of market returns according to the amount of cash engagement. According to research on the economic recovery, the most adaptable and practical issue is the integration of businesses (Fama and French, 2004). It is impossible to predict the exact size of any shift in the macroeconomy, but any change, favorable or bad, will have an effect on stock income. Returns are susceptible to a wide variety of internal and external influences. How big of a change it is depends heavily on the results of the securities markets and the gains or losses that come with it. Like commodity pricing, conversions are crucial. Policymakers and financial experts aren't the only ones who feel the effects of major stock markets; temporary workers aren't immune either, as the product business's success hinges on the public's ignorance of the law and the growth of major stock exchanges. The country's tax and shipping rates affect the exchange rate, which goes up and down. The renovation's scope and budget will grow in proportion to the rise or fall in commodities prices. Cash discounts hurt a company's bottom line in the long run.

THEORETICAL MODEL



John Beirne (2009) investigated the deal and went to the exchange to study it; they calculated the market return on fortifications using the appropriate funds and used that information to gauge the offering's efficacy and risk. Investigate the expenses and the likelihood of a monetary gain. Due to the pliable nature of currency exchange rates, they pose a threat to stock market participants. The effect of macroeconomic variables (value ratio) on stock returns was discovered by Manish Kumar (2008). The State Bank of Pakistan's daily movement data was also examined by him. He employs correlations and empirical methodologies to discover long-term linkages in data and is a participant in e-views projects. In 2012, Aurangzeb found and studied the correlation between stock performance and macroeconomic variables. When it comes to product returns and exchange rates, he thinks they're great. Additionally, they detail the ways in which returns are impacted by interest rate and inflation fluctuations. In 2008, Granger, Husang, and Young looked at discount rates and stock returns as well. Profits are influenced by how a country's currency is doing right now. A determination to devalue another currency is signaled by investing in the currency of one country.

H3: There is a positive relationship between productivity and return value of Pakistan Stock Exchange (PSX).

Lack of interest, however, will have a detrimental impact on savings and investments in addition to people's regular wages and pensions. Similarly, hoarding goods by households might drive up prices to the point where hunger is inevitable in the future if inflation is too high. The CPI, which measures the general increase in the cost of living, is a useful indicator of inflation in economic research. The need to spend more money to get the same object is known as inflation, which can act as either a demand pull or a price push. It is believed by researchers that inflation impacts the risk and volatility of the job market. One might classify inflation as either beneficial or bad. Producers and consumers might factor in inflation forecasts when planning their future expenditures. People prefer to hold assets other than cash when inflation is expected. If people don't take the time to properly arrange their finances, the economy will be less effective and wealth will be unevenly distributed among the population. Considering the current state of India's power generation, tariffs, loan rates, etc., as well as the perceived reliability gap between the country's democratic and commercial sectors (Padhi and Naik, 2012). All things related to the stock market and macroeconomics were investigated. Our analysis of 97 documents spanning 1994–2010 using the vector error link model leads us to the conclusion that daily creation and cash supply positively affect Indian stock markets. Indian stock market, business growth, financial worth, deal size, etc. Elements like are subject to intentional manipulation. Consequently, prospective investors' investment choices will be impacted by inflation, as it will have a negative impact on the total return of the stock. Nevertheless, capital development in crucial industries has been hit hard by the crisis that Pakistan's economy is currently experiencing.

H4: There is a positive relationship between inflation and Pakistan Stock Market (PSX) returns.

There's a positive correlation between GDP growth and stock market performance. Gross domestic product (GDP), GDP growth (GDP), and stock returns are positively correlated with one another because an expanding economy is associated with increased company profits, expenditure, and investor confidence. A favorable correlation between GDP growth and business activities was discovered in a thorough investigation by Fischer and Ritter (2012) across a number of nations. Another key indicator of economic health is the unemployment rate. Declining consumer spending, brought on by rising unemployment, can have an impact on company revenue and, in the long run, stock values. Economic growth will be boosted as a result of unemployment. Unemployment has a detrimental impact on stock returns, according to research by Bartov and Bodnar (2006). The stock market is quite sensitive to changes in both money supply and monetary policy. Borrowing costs, income, and the economy are all susceptible to the interest rate and bank policy decisions. Public spending and taxation are two examples of policies that have an impact on market performance via their effects on economic growth and profitability. Based on their analysis of how monetary policy affects company returns, Gromb and Vayanos (2019) conclude that an expansion of monetary policy is associated with an increase in stock returns.

DATA AND METHODOLOGY

Interaction Between Financial and Macroeconomic Variables

When monetary and macroeconomic variables interact, the result is the stock market. The study's overarching objective is to model and comprehend the impact of these components' interactions on returns. In their research, Chen and Cheng (2020) used a vector autoregressive (VAR) model to examine the relationship between mortgage rates, rising prices, increase in GDP, and the whole stock market. Their findings highlight the need of acknowledging the symbiotic relationship between financial and macroeconomic variables.

Impact of the Financial Crisis and Global Events

The first major events to affect the stock market were financial crises and global catastrophes like epidemics and regional crises. Two recent events that exemplify how unexpected events can disrupt economies and companies are the financial crisis of 2008 and the COVID-19 pandemic. The strengths and weaknesses of merchants during times of stress can be better understood by analyzing these factors. A study by Huang and Zhou (2022) examined the effects of the COVID-19 pandemic on the world economy; the results demonstrated the immediate effects and the significance of emotions in influencing economic behavior.

Methodology Approaches

To analyze how different financial and macroeconomic factors affect the stock market, researchers employ a variety of approaches. Among these, you can find machine learning algorithms, case studies, real-time analysis, and panel data processing. In order to examine the linkages and variables, the researchers employed GARCH models, cointegration analysis, and Granger causality tests. To find nonlinearities in the relationship between variables and increase prediction accuracy, machine learning approaches like random forests and neural networks have been utilized.

Stock Market Returns:

The term "stock return" is used to describe the gain or loss that investors experienced while trading stocks over a given time frame. Investment decisions, data management, and financial analysis all rely on this return as a key performance indicator for the product or the whole product. If lawmakers, financial experts, and investors want to know how the market and businesses are doing, they need to know how stocks are doing. What constitutes a stock return is often the percentage change in the price of a marketable stock over a given time frame. One of the most popular ways to figure out how much money you made from your stock investment is to multiply the difference between the starting price and the end price by 100.

To illustrate, the stock price is Rs = 50. Return on investment (ROI) for an investment of Rs 60 when Rs = 50 at year's start is 20% (calculated as [(60 - 50) / 50] x 100). The two primary parts of a product return are:

Price Appreciation: Here you can see how much the stock's price changed during the time you held it. Company performance, business sentiment, business trends, and general business conditions are some of the variables that generate price hikes.

a) **Dividend:** A cash distribution made to a company's shareholders on a usual basis is called dividend. Overall, dividend income contributes a lot to the total returns and hence for the investors with a long time horizon in search of attractive returns, dividends should not be overlooked.
Total investment return simply then is equal to the total of dividend plus interest.

Obviously, the return has information as to the risk and variability of an investment undertaking. Relative to a selected time frame, the volatility of a definite stock defines its rate of fluctuation. When market volatility is strong investors are exposed greater risk and greater reward. One approach that investors use in an evaluation of the risk level of an investment is through inspection of intensity fluctuations of the investment and several ratios such as standard deviation.

Research Methodology:

Research Design: The purpose of this quantitative study is to investigate the interplay between monetary policy and the effect of various monetary variables on the stock market. From an epistemological stance, this research was carried out. Knowledge and its acquisition are both clarified by this theory. Theoretical and scientific explanations and understandings of omens are explicitly stated in epistemology.

Participants: A wide range of stakeholders, including financial and macroeconomic institutions, firms, researchers, analysts, entrepreneurs, lawmakers, and senior-level financial specialists, are involved in this study. To guarantee that different departments and levels of departments were represented, the participants were chosen using a mix of convenience and stratified random sampling.

Data collection: Data collection was done through self-administered questionnaires: The following variables were regarded in the study: interest rates, inflation, exchange rates, corporate profits, GDP growth, being unemployed, laws and

regulations, and the market for Pakistani stocks. We tested the questionnaire in advance to ensure its validity and reliability.

Cognition:A pre-designed questionnaire examined the participants' mental acuity in relation to digital asset management (both their own and others'). Things like general knowledge, analytical thinking, self-awareness, and self-regulation are all part of these questions.

Pakistan Stock Exchange Performance:A variety of factors, including performance, target attainment, and overall success in reaching the Pakistan Stock Exchange, objectives, are assessed using an interview that is administered to role players.

Data analysis:of data analysis, we will be using SPSS 23.0. Data analysis software for the social sciences. In order to gather info, descriptive statistics were computed, including a variance and mean. To find out how monetary rates and returns on the PSX, or Pakistan Stock Exchange, relate to one another, researchers conduct correlation analyses. Here is the formula that is most commonly used to calculate returns:

Stock Return (%) = [(End Price - Starting Price) / Starting Price] x 100

Both deductive and inductive reasoning have been used to investigate the link between emotional intelligence and organizational success. According to Bryman and Bell (2011). Cutting will be the method of choice for this task. By taking this tack, we can better understand how shifting viewpoints on macroeconomic issues impact the value of assets. Quantitative study using the CAPM model and the idea of arbitrage pricing can reveal the effect of the macroeconomic factors on Pakistani stock market returns and provide light on the interplay between various stock market return determinants. Because it relies on secondary sources, this study draws from a variety of academic fields. The research here is both quantitative and descriptive in nature. There is a correlation between stock returns and macroeconomic parameters, according to studies. Twelve years of monthly data, spanning July 2010 through June 2022, are utilized in the study. The information is compiled from a variety of Pakistan Stock Exchange (PSX) sources. The SBP and the FBS are the sources used to compile data on macroeconomic factors in Pakistan. Due to the impact of financial when macro economic factors, stock returns could be more unpredictable. There are two dangers that stock market investors must confront.

1. **Systematic risks**
2. **Idio centric risks.**

Although risks can be mitigated, the individual's central risk remains unaffected by the volatility of macroeconomic and financial shifts. The Pakistani stock market is studied and evaluated using Mishkin Monetary Network Transformation Theory in relation to financial and macroeconomic variables. Both the Money Release Pipeline and Tobin's approach of examining the stock market's negative consequences are utilized to demonstrate the effects of the financial market. For the purpose of assessing the market and its impacts, Mishkin used the financial transfer theory to the US financial market in 1996. How interest rates and the stock market are related. Multiple regression, correlation, root-cause, and true vector error models are all parts of the quantitative econometric toolbox used in these investigations. The following definition of the equation is provided by this study, which

pertains to the objective and outcomes of these tests:

Here is the formula for PSX (Y): Bo + B1(CPI) + B2(EXR) + B3(TBR) + B4(IP) + E. Now, let's acquire: Parameters Bo = B1, B2, B3, and B4 are equal to coefficients Bo = Constant.

Pakistan Stock Exchange, abbreviated PSX.

The acronym for " customer price index" is CPI.

The symbols for the exchange rate (EXR) and the interest rate on treasury bills (TBR) are I. P stands for manufacturing output and E for factors that cause disturbance.

Publication for Data Analysis

We will analyze the Pakistan Stock Exchange data and trends in the macroeconomy. The Pakistani State Bank.

Software used

To assess the connection and influence of macroeconomic variables on stock returns, we utilized E-views and SPSS software for data analysis and management, and we employed a battery of tests.

Tests	Purpose
Testing the Roots of a Unit	Data Stability
Analyzing Correlations	Interaction between independent and dependent factors
Analysis of Co-integration Establishing a lasting bond	Analysis of Co-integration Establishing a lasting bond
Vehicle Correctional Model (VECM) Interaction in the Near Future	Vehicle Correction of Errors (VECM) Interaction in the Near Future

Findings and Results

Inflation, currency exchange, unemployment, and government spending are some of the macroeconomic factors analyzed in this research. For both the short and long term, the PSX 100 index takes into account policy, interest rates, and productivity as independent factors. Monthly data is sourced from July 2010 all the way through June 2022. Experimental setup with combination and VECM analysis.

Unit root test (stationary analysis of data)

There is no static data used in the unit root test, and the data comes from a trustworthy source. Monthly data over the last twelve years is used to calculate all changes in the PSX 100 index, inflation, exchange rate, unemployment, and government statistics. A discussion about politics, interest rates, and production. There are surprises and subjective judgments in the numbers since macroeconomic factors are so unpredictable. The results were examined using the standard testing apparatus in accordance with the Augmented Dickey Fuller Test (ADFT).

Ho = There is no unit root in the time series (the time series is stationary). Test for unit roots (Table 1)

Augmented Dicky Fuller Test (ADFT)

Variable	At Level	Critical value at 5%	Decision of Null Hypothesis	At 1st Difference	Decision of Hypothesis
EX Rates	-2.09	-2.88	Rejected	-9.59	Accepted
TBR Rates	-0.336	-2.88	Rejected	-10.57	Accepted
Industrial Production	-0.61	-2.88	Rejected	-9.69	Accepted
Govt. Policies Rates	-0.86	-2.88	Rejected	-8.78	Accepted
Unemployment Rates	-0.74	-2.88	Rejected	-7.94	Accepted
Inflation Rates	-1.14	-2.88	Rejected	-6.46	Accepted
PSX-100 index	-0.18	-2.88	Rejected	-12.87	Accepted

The unit root test rejected the null hypothesis at the 5% significance level; subsequent analyses relied on the initial difference across all variables to establish their stationary nature. In order to reject the null hypothesis, the values at Level are much higher, as seen in the table. Thus, the data included a unit root; to rectify this, normal Stationary Data was produced by applying the first difference ADFT. The majority of the time, issues with empirical analysis arise from non-stationary time series data. All data must be steady in order to do the analysis. We used ADFT to make sure the data was stationary. The variables being discussed do not have a unit root, hence the null hypothesis was accepted.

Descriptive Statistics

Table 2: Descriptive Analysis

	Exchange Rates	**Inflation Rates**	**TBR Rates**	**Unemployment Rates**	**Industrial Production**	**PSX 100 Index**
Mean	93.91296	9.045687	9.654824	6.345687	1138.256	20267.78
Median	96.64000	8.652543	9.480000	6.450000	1149.153	15153.82
Maximum	111.43000	26.35867	14.01202	8.425867	2098.262	39514.31
Minimum	61.750000	1.354000	5.882540	3.185243	389.0215	5393.352
Standard Deviation	16.365840	5.542154	2.789524	2.924825	462.4531	10409.64
Skewness	-0.744973	1.095842	-0.049459	1.658524	0.122641	0.352454
Kurtosis	2.4689242	4.254876	1.8412510	5.685471	1.932568	1.487562
Probability	0.0003830	0.000002	0.0156422	0.125684	0.024565	0.018452
Sum	142568.68	1392.350	1388.2500	1394.256	186524.43	3026584
Sum square deviation	35474.52	1056.252	1012.2620	1025.365	32569874	1.57E+10
Observations	176	176	176	176	176	176

Table 2 displays the results of the central tendency assessment. This study relies on data pertaining to means and variances. Over the last twelve years, the average PSX

100 index value has been 20267.78. The average rates of inflation, total business revenue, unemployment, industrial output, and exchange rate are 9.045687, 9.654824, 6.345687, and 93.91296, respectively.

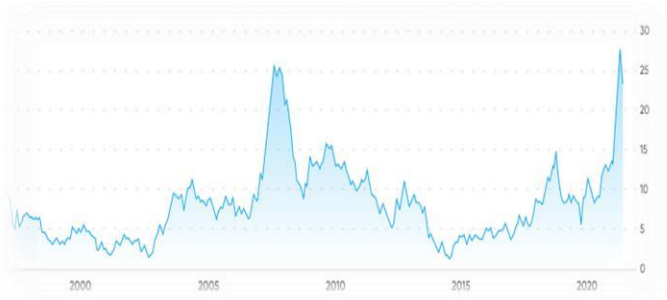
An essential part of statistical analysis, descriptive analysis reveals outliers. Both central tendency and variability metrics are part of descriptive analysis. When assessing central tendency, the Mean, Median, and Mode are computed. Using the mean, we can acquire a single numerical number that represents all of the data, while the mode gives us the value that appears most often and the median gives us the value that appears in the center of the data set. We compute kurtosis, standard deviation, and variance to quantify data variations. The outliers are measured using the standard deviation. Kurtosis is a useful tool for determining the height or limits of a data collection.

Behavioral Trends of Data

Figure 1: Graph of monthly Data of Exchange Rates

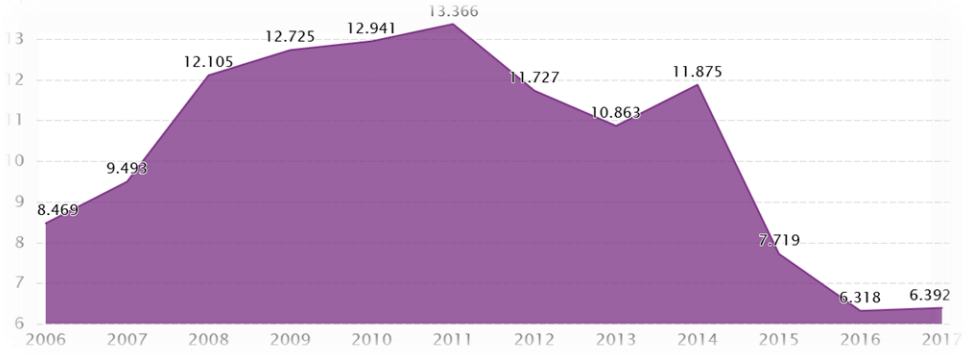
Sana Batool is the original. Fluctuations in rates of Pakistan have been moderate to high in the last 75 years only if we had the chance to look at the above graph. From the graph up above, one can identify a trend in the form of an upward sloping line in which the X-axis depicts a number of years while the Y-axis depicts the values of the exchange. Thus, the rate of change in their behaviour as well as the extent to which they are influenced by the trajectory of the exchange rate also increases with the increase in the number of years. This has made the rate of exchange grow annually because of the country's solid position since 1947. It actually affects the stocks' movements in the short run and the long run because it is a major macroeconomic factor. As the analysis of the favourable effect of the exchange rate on the stock returns' performance is depicted in this graph, this exchange rate of 1$= Rs. 302. 57 in the upcoming year of 2023 will have a tremendous impact on the Pakistani economy. A slight change took place halfway through year 2022 and a slight depreciation of the value of the exchange rate; however, until the end of year 2022, the exchange rate served as a boost to stock returns.

Figure 2: Graph of monthly Data of Inflation Rates



Data sourced from the Pakistan Bureau of Statistics. The below graph provides a concise overview of the 22-year volatility of Pakistan's inflation rates. You can see the fluctuations in the graph above, which shows the rate of inflation on the Y-axis and the number of years on the X-axis. The rate of inflation is 7 percent in 2006 and is rapidly increasing in 2009, which is having a negative effect on our stock returns due to the fact that prices fluctuate over time in proportion to inflation. As a whole, people feel bad for the economy if inflation spikes suddenly. Unfortunately for investors, the graph starts to rise in 2013, which bodes poorly for the stock market as a whole.

Figure 3: Graph of monthly TBR Rates

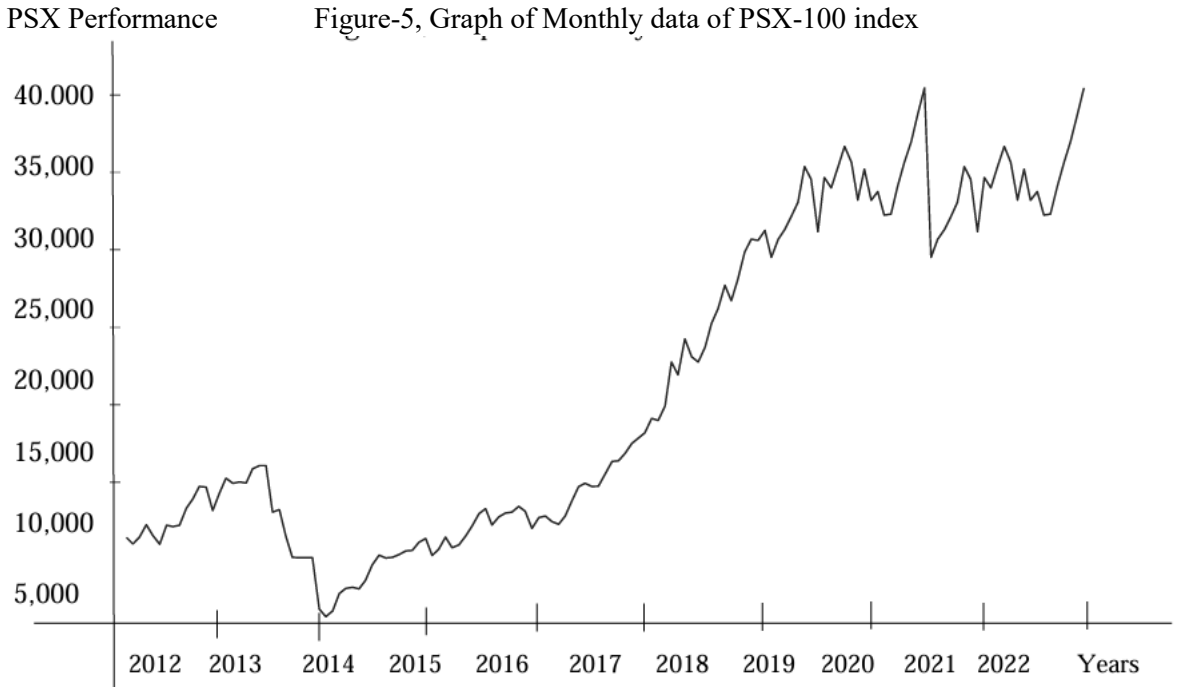


Original: WWW.CBCDATA.COM You can see the fluctuation in Pakistan's TBR Rates over the last thirteen years in the graph up above. We can see that the interest rate on Treasury notes is 8.3% in 2006 and rises sharply as we approach 2008, which is terrible news for the corporation, when we plot the Y-axis against the number of years on the X-axis in the accompanying graph. We can make informed financial judgments with the help of graphs. A fundamental component and lynchpin of the Marco economics factors are interest rates. Since interest rates tend to fall in tandem with rising stock market returns, we may say that the two variables are indirectly proportional. The interest rate remains unchanged for both 2017 and 2018.

Figure 4: Graph of monthly Data Industrial Production

As excerpted from The Global Economy. Com, Reflected in the graph above is a general perspective of the industrial production in Pakistan during the last nineteen years or so. The dip marks a shifting trend in the graph which is made on the basis of X-axis – number of years and Y-axis – positive and negative industrial production in decades. The nominal industrial production begins for the first time at 400 in 2006 and rises to 500 in units in 2007 and then shifts to a higher level of 1400 in units in 2011 and has a positive influence on the stock market.

Figure 5: Graph of monthly data of PSX-100 index



Reference: Writers Data from the Pakistan Stock Exchange for the past twelve months, from July 2010 to June 2022, has been used for this project. The investor's investment graph is shown by the graph. Speculators and investors use the stock market to test their hypotheses, and this graph aids them in doing just that—estimating the future risk and return on investment. It is important that stock market investors understand how

macroeconomic factors impact stock returns so they may make informed decisions.

Using the X-axis for years and the Y-axis for stock market performance, we can see that there are variances in the above figure. The PSX sat at 10,000 in 2012, but it fell precipitously in 2014 and 2015, hurting the economy. Our analysis for 2020 shows that the index is heading in the direction of 40,000, which bodes well for the Pakistani economy, returns, and investors.

Correlation Analysis

Correlation Matrix

		Inflation Rate	Interest Rate	Industrial Prod.	Exchange Rate	DPSX-100
Inflation Rate	Pearson	1	0.785***	-0.401***	-0.557***	-0.726***
	Sig. (Two tailed)		0.000	0.000		0.000
Interest Rate	Pearson	0.785***	1	-0.129***	-0.455***	-0.753***
	Sig. (Two tailed)	0.000		0.000		0.000
Industrial Prod.	Pearson	-0.401***	-0.129***	1	0.732**	-0.621***
	Sig. (Two tailed)	0.000	0.174		0.000	0.000
Exchange Rates	Pearson Correlation	-0.557***	-0.455***	0.732**	1	-0.837**
	Sig. (Two tailed)	0.000	0.000	0.000		0.000
DPSX-100	Pearson	-0.726***	-0.753***	-0.621***	-0.837**	1
	Sig. (Two tailed)	0.000	0.000		0.006	

The link between dependent and independent variables has been noticed in correlation analysis. For this case, the PSX-100 index serves as the dependent variable, while the DLNINF rate is the independent variable. Three independent variables are industrial production (LM3), interest rate (DTBR), and exchange rate (LEX). Given that all explanatory factors have substantial negative associations with the PSX-100 index. The hypothesis is accepted at a 95% confidence interval, with a 5% margin of error (Level of Significance). Furthermore, we found a negative association between inflation rate (DLNINF) and the dependent variable PSX-100 in our correlation study. Interest rate (DTBR), industrial production (LM3), and exchange rate (LEX). The negative The rate of interest and inflation have relationships with stock returns. There is a 73.2% positive correlation between industrial output and the currency rate. Karl Pearson correlation calculates the dimension and trend of the data in correlational modeling, whereas Sig. 2 tailed is used to evaluate the chances of the data and error.

Since the interest rates, inflation, currency exchange rates, and industrial output are four (4) important independent variables in the Pakistan Stock Market, we have used a two-tailed hypothesis testing stat with a 5% level of significance. We may

accept the null hypothesis and continue with the investigation if the independent variables are strongly correlated negatively with the variable that is the dependent one, as stated in the study hypothesis. Since the correlation test's result is less than 0.05, we support the research hypothesis (H1) that, in connection to the PSX-100 index, the pace of inflation has a considerably negative influence. Interest rates have a negative relationship with the PSX-100 index. Hypotheses (H2) and (H3) are both borne out by the statistics and literature, which show that the PSX-100 index has a positive relationship with industrial output and the exchange rate.

Hypothesis Testing

(Correlation Hypothesis)

Table 4: Alternative Hypothesis

Alternative Hypothesis	Accepted / Rejected	Significance Level 05 Two Tailed
The Pakistan Share Exchange (PSX) and the value of currency are strongly associated, according to Hypothesis 1.	Accepted	0.000
H_2: There is significant relationship of Exchange rates with Pakistan stock Exchange (PSX) returns.	Accepted	0.000
Hypothesis 3: The returns of the Pakistan Stock Exchange, or PSX for are significantly related to Industries Production.	Accepted	0.000
Hypothesis 4: The returns of the Pakistan Stock Exchange (PSX) are significantly correlated with inflation.	Accepted	0.006

Co-integration Analysis

Co-integration Rank Test

Table 5: Co-integration Test PKR and PSX

Date: 09/12/2022 Time: 14:31
Sample (adjusted): 2010M12 2022 M07
Included observations: 140 after adjustments
Trend assumption: Linear deterministic trend
Series: PSX_EX_INFLATION RATES_INTEREST RATES_M3
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.223281	76.29466	69.81889	0.0154
At most 1	0.154231	41.52036	47.85613	0.2109
At most 2	0.081475	21.01723	29.79707	0.5047
At most 3	0.050124	9.025481	15.49471	0.3816
At most 4	0.014587	2.325478	3.841466	0.1328

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Max-eigenvalue test indicates 1, co-integrating equation(s) at the 0.05 level

The basic form of the Econometric Multiple Regression Test is the Econometric Simple Regression Test. To evaluate the degree of association between the predictor or the variables and the predictand or the variables in the long-term, the co-integration technique was used. Two, there are two fundamental necessities that are not Eigen and Trace Statistics. CoIntegration exits if the 'p' value is less than 0. 05 and the 'trace statistics' less than or equal to the 'Alpha'. Perhaps, a non-stationary time series with a different variance and mean may be analyzed in regards to the co integration rank test. The information in the time series form is analyzed using co-integration. You will recall that we are using data that has a time span of 12 years, and this tells us of co-integration,

that is the direction and relation of long term data between many variables.

Where the most critical value is 47. 85613, maximum trace value is 41. 52036 and probability value is 0. 2109 which is more than 0. 05 but not considerable. In line with this trend, values of at least 2, 3, and 4 Applying VECM (Vector Error Correction Model)

of the trace statistics are at the foot of the critical levels, whilst just the probability statistics are higher than 0. 05, and hence we could rule out co-integration.

Table 14: VECM Model Analysis

Vector Error Correction Estimates
Date 12/31/2022 Time: 02:52
Sample (adjusted): 2010M12 2022M07
Included observations: 164 after observations
Standard errors ( ) & T _ Statistics in [ ]

Co - Integrating Equation	Conint Eq (1)
PSX_100 (-1)	1.000000
Money_Supply (-1)	-70.39516 (20.7574) [3.35461]
EX_Rate (-1)	1025.124 (507.256) [2.03452]
CP_Inflation (-1)	-5414.125 (1029.32) [-5.2158)
T_Bills (-1)	6318 .325 (2135.147) [-2.98929]

The VECM is a limited model in that is works with known covariance vectors. This test is intended for the short-term relationship between two explainatory variables. According to the test, the condition that has to be met is the probability value is less than 0. 05 as well the trace value more than 1. 96. Since T for exchange rate is higher than 1. 96 and for inflation is -5. 2158 which is also greater than 1. 96, this test may be used. Again after the most recent adjustment number shown under the interest rate is -2. 989 and the T value of the stock is 3. 35 which is even greater than 1. 96. Looking at this indicator, the complete test establishes whether discretionary macroeconomic factors influence Pakistan stock returns within the short term.

Discussion:

Athens and Poshakwale (2006) also found comparable results when they studied the correlation between macro variables and the Athens Stock Exchange's Composite Index. Some of the topics that were used were inflation, currency rates, productivity, and returns. According to the findings, the current study confirms that the short-term return of the Athens Stock Exchange is significantly affected by inflation productivity and volume of transactions. Günsel and Çukur (2007) used analytics in their research on the correlation between macrovariables and the return on the capital stock from 1980 to 1993. They looked at the correlation between each of the seven macroeconomic variables and the LSE markets return, and they found that each of the components significantly affected the return of the LSE market. Inflation, productivity, interest rates, currency exchange rates, and stock returns are all part of the macroeconomic indicators covered in this study. Stock market investment has a

favorable effect on macroeconomic indicators. A number of macro and financial variables, such as interest rates, production costs, investment opportunities, and currency exchange rates, influence product returns. Several studies concerning the correlation between the economy, rates of interest, exchange rates, oil prices, and the PSX 100 Index have shown that this ratio has a positive effect on inflation and the PSX 100 Index. These studies are given in the literature review. The decline in the PSX 100 index has diminished Pakistan's export market share. Noon on Sunday.

Importance of the Study:

In this analysis, we see how the unemployment rate, interest rate, inflation rate, currency rate, and output all interact with stock returns. A positive correlation exists between stock market performance and macroeconomic indicators. Utilizing SPSS Version-23, we conducted analyses on the data retrieved from the Pakistan Stock Exchange and the State Bank of Pakistan. These analyses included regression and correlation, as well as t-statistic evaluations and hypothesis testing. The effect and correlation of macroeconomic factors on stock returns may be quantified using these parametric tests. Additionally, the research discovered that stock market values were positively correlated with macroeconomic indicators. Investors start to lose faith in the company's future performance and the market price starts to fall as exchange rates fall, which is seen as a sign of impending inflation.

More Research Areas:

Besides the analysis of the impact of fiscal and monetary policies on returns for the commodity futures, this study establishes the correlation between the actual return rate for the stocks listed in Pakistan Stock Exchange and the macro factors. The motivations for this study include integration and correlation; integration seeks to establish the link between macroeconomic factors while correlation is aimed at examining the relationship of these variables and stock returns through cointegration analysis. As for the methods, these studies may also be carried out quantitatively in order to measure the trend of financial and macroeconomic factors that may influence stock returns and test the significance of various financial and macroeconomic variables with regards to stock returns using tests such as regression analysis. For a greater insight at how investment choices influence the Pakistani company’s returns and models, there is need for subsequent research that investigates the consequences of other risk aspects from financial together with business portfolio perspective.

Conclusion:

The following paper aims to establish the link between stock market performances as well as macroeconomic data. As a rule, various factors like changes in the interest rates, inflation, currency rates, companies’ revenues, GDP growth rates, unemployment rates, governmental measures and people’s preferences concerning the investment and savings all affect the returns on stocks. Several studies referred to in the literature study suggests that the PSX 100 stock market index has a direct correlation with improvement in the output, oil prices, interest rate and currency rate. Today, the PSX 100 index could be reduced in the morning. As documented earlier in literature review, the results of this study corroborate the existing literature in the context of positive

relationship between macroeconomic variables and ATSETPI (Patra and Poshakwale, 2006). These composite measures include growth rates, productivity, interest rates, yields, numbers of and currency rates. Total inflation, productivity, and commerce all contribute positively towards the Athens Stock Exchange's return based on short-term analyses. On the basis of this process, Günsel and Çukur revealed that available data collected for international stocks like London stock evidences the macroeconomic relationship between 1980 and 1993. Further, they based their conclusions on the seven most relevant macroeconomic indicators that impact the LSE market's return. features By using the secondary data collected by the State Bank of Pakistan and Pakistan Stock Exchange during the last twelve years, this quantitative study was conducted. To establish the relationship of macroeconomic variables with the stock returns, techniques such as correlation analysis are applied. This made volatileness in the Pak currency rate a way of life and the government cracked down on protests.

REFERENCES

M Hussain · 2023, Exchange Rate and Stock Prices Volatility Connectedness and Spillover during Pandemic Induced-Crises: Evidence from BRICS Countries

Pallegedara, Asankha (2021). Dynamic Relationships between Stock Market Performance and Short Term Interest Rate - Empirical Evidence from Sri Lanka.

Aggarwal, Priyanka/Saqib, Najia (2022). Impact of Macro Economic Variables of India and USA on Indian Stock Market. International Journal of Economics and Financial Issues

Wong, H.T. (2022), "The impact of real exchange rates on real stock prices", Journal of Economics, Finance and Administrative Science.

Batool, K. (2021). Impact of Interest Rates on Stock Index: Case of Pakistan Stock Exchange. International Journal of Business and Economic Affairs.

MFH Khan (2023), The effects of macroeconomic factors on the London Stock returns: a sectoral approach. International Research Journal of Finance and Economics

L Glawe (2021) ·Convergence or Divergence in Europe? Growth and Business Cycles in France, Germany and Italy. Springer Science & Business Media.

Peng Huang (2019), Influences of Macroeconomic Variables on Stock Market in China: An Empirical Analysis

Tripathi, V Seth, R. (2014). Stock Market Performance and Macroeconomic Factors: The Study of Indian Equity Market. Global Business Review

Jaradat, M Khrawish, H.A Siam & W. Z (2010). The relationships between stock market capitalization rate and interest rate: Evidence from Jordan. BEH - Business and Economic Horizons

Ake B. & Ognaligui, R. (2010). Financial Stock Market and economic growth in developing countries the case of DOUALA Stock Exchange in Cameroon. International Journal of Business and Management,

Aslam, W. (2014). Relationship between Stock Market Volatility and Exchange Rate: A Study of PSX. Journal of Public Administration, Finance and Law,

Masood & Triki, R. (2012). Economic forces and stock exchange prices: pre and post impacts of global financial recession of 2008.

Bryman & Bell, E. (2011). Business research methods. Oxford: Oxford University Press. Creswell,