

**THE ROLE OF MACROECONOMIC STABILITY IN SHAPING  
TEXTILE SECTOR INFLUENCE ON THE PAKISTAN STOCK  
EXCHANGE**

**Muhammad Ubaid Ur Rehman**

Karachi University Business School (KUBS), Pakistan

[Ubaidk240@gmail.com](mailto:Ubaidk240@gmail.com)

**Dr. Muhammad Muzammil**

Assistant Professor, Karachi University Business School (KUBS), Pakistan

[Muzammil.muzammil@uok.edu.pk](mailto:Muzammil.muzammil@uok.edu.pk)

**Abdul Qadir Mohiuddin Algilani**

Karachi University Business School (KUBS), Pakistan

[Being.aq@gmail.com](mailto:Being.aq@gmail.com)

**Abstract**

The research paper examines how the textile business affects the functionality of the Pakistan Stock Exchange (PSX) during the period of 2020-2024 through the correlation between the indicators at the firm level and macroeconomic factors. The analysis of the above factors uses 110 observations, which consist of 110 quarterly observations, and uses a simple correlation and multiple regressions to evaluate the effect of earnings per share (EPS), inflation, rate, interest rate, market capitalization growth, and trading volume on the PSX\_ALL index. Findings indicate that inflation and interest rates have negative and significant impact on PSX\_ALL, again the stock market is very delicate to macroeconomic conditions. EPS is positive and significant and this means that profitability in the textile sector increases the market performance. Liquidity indices, on the other hand, show negative relationship with market capitalization growth as a result of valuation effect of equity dilution or over-pricing during market conditions, and trading volume record insignificant relationship. The results match well with the previous sources that argued that macroeconomic factors will dominate firm specific indicators in the emerging markets.

## **Introduction**

The textile industry plays a pivotal role in Pakistan's economy, often described as the "heartbeat" of the nation's economic engine. It significantly contributes to GDP, employment, and exports, positioning itself as one of the largest and most vital sectors in Pakistan. In 2020, textile exports reached \$12.4 billion, showing a 7% increase from the previous year (Parveen, et al., 2021). Approximately 8.5% of the nation's GDP is derived from this sector, with a market value of PKR 3,816 billion in FY21, a significant increase from the previous year.

Despite its importance, the sector faces challenges such as rising manufacturing costs, exchange rate fluctuations, erratic government policies, and pressures from the global economy. These challenges affect not only the sustainability of textile companies but also investor behavior and the performance of the Pakistan Stock Exchange (PSX). Despite this importance, there is a lack of thorough research on the relationship between the textile industry's performance and stock market indicators like share prices, market capitalization, and trading volume.

This study aims to bridge this gap by analyzing the impact of macroeconomic conditions on the textile sector's influence on the PSX. The research objectives include analyzing historical developments in the textile sector, identifying trends in the PSX, and studying the relationship between the textile sector's performance and stock market movements in the context of prevailing macroeconomic factors. The research will test the hypothesis that the performance of the PSX is significantly influenced by both firm-specific indicators from Pakistan's textile sector and macroeconomic variables.

## **Literature Review**

### **Textile Industry in Pakistan**

The textile and clothing industry in Pakistan is a vital part of the nation's export economy, contributing between 50-60% of total exports. The industry plays a significant role in the market, with a large number of textile companies

listed and traded on the Pakistan Stock Exchange (PSX) (Nasir, et al., 2025). Between 2020 and 2022, the sector saw a remarkable 54% growth in exports, primarily driven by favorable macroeconomic conditions and government export facilitation initiatives. This growth improved investor confidence, with several textile businesses listed on the PSX showing better profits and higher valuation multiples (Nasir, et al., 2025).

### **Economic Challenges and Declining Exports**

However, the period from FY23 to FY24 marked a downturn for the sector. The economic slump worsened due to the removal of important government support programs such as the zero-rating regime for export businesses and the end of regionally competitive energy tariffs (RCET). In FY23, textile and apparel exports dropped to \$16.5 billion, and further declined in FY24 to \$16.65 billion (APTMA, 2024). As a result, key textile companies on the PSX saw a decrease in stock prices, with margin compressions and a decline in investor sentiment.

### **Rising Production Costs**

Production costs rose significantly following the termination of concessionary energy rates in March 2023, affecting the profitability of textile companies. In FY23, the profitability of Pakistan's listed textile firms fell by 14% year-over-year due to rising material prices and higher financing expenses (Tariq, 2023). The financial instability caused by exchange rate fluctuations further impacted stock values and profitability (Tribune Express, 2023).

### **Operational Challenges and Policy Shifts**

The sector's reliance on domestically produced cotton, which accounts for 84% of textile exports, makes it vulnerable to various challenges. While Pakistan is the fourth-largest cotton producer globally, it faces issues such as insect infestations, climate change, poor-quality seeds, and outdated agricultural methods. In FY24, Pakistan produced 10.2 million cotton bales, but the quality concerns limited their use in high-end textile production

(Ministry of Finance, 2025). These challenges significantly impact profitability and the competitiveness of Pakistani textile goods in the global market.

Inefficiencies in the cotton value chain, especially in spinning and ginning, also plague the sector. Despite over 1,200 ginning facilities in Pakistan, many operate with outdated equipment and inconsistent quality standards, resulting in contamination that lowers cotton lint quality and reduces export earnings (PBS, 2023). Furthermore, energy costs account for 35-40% of production expenses, placing Pakistani mills at a disadvantage compared to countries like Bangladesh, Vietnam, and India, where energy costs are lower. These constraints have a direct impact on PSX stock performance.

### **Sustainability and Financial Health**

Research by Asif et al. (2022) suggests that sustainable energy practices have a significant effect on the financial success of textile companies. Disruptions in sustainable energy supply hinder asset use, reducing returns on equity and assets. Additionally, liquidity levels in the sector remain modest, with textile companies holding around 36% of their total assets in liquid form, indicating limited financial flexibility.

### **Product Diversification and Market Vulnerabilities**

Pakistan's textile exports are mainly focused on low-value goods such as cotton suits, towels, and bed linens. Moreover, the sector is concentrated in a few key export markets: the United States (26.29%), the United Kingdom (9.95%), Spain (7.69%), Germany (7.6%), and the Netherlands (7.4%) (Nasir, et al., 2025). This lack of product diversification and market concentration limits the sector's growth potential and makes it more vulnerable to external shocks. As per APTMA (2024), Pakistan has a substantial \$7.8 billion in unrealized export potential, particularly in high-value sectors such as clothing (\$3.3 billion) and home textiles (\$2.3 billion). This potential is frequently overlooked by institutional investors, contributing to cautious market behavior toward textile stocks.

### **Working Capital Management**

Effective working capital management plays a critical role in improving the PSX performance of textile companies. Lala Rukh et al. (2023) found that managing cash conversion cycles and current asset ratios effectively leads to improved market-based and book-based performance. Conversely, longer collection and payment periods were found to have a detrimental effect on performance, highlighting the importance of efficient capital management.

### **External Economic Factors**

External economic factors, such as international trade policies, significantly impact the competitiveness of the textile sector. For instance, a 29% U.S. tax on Pakistani exports is expected to negatively affect textile exports, which will likely lead to a 5% drop in the KSE 30 index in April 2025 (Gambrell, 2025). This emphasizes the sector's vulnerability to international trade dynamics and the broader global economic environment.

### **Research Methodology**

This section outlines the analytical framework that has been employed in an effort to determine the impact of textile industry on the Pakistani Stock Exchange. The study focuses on a quantitative research method under panel data econometrics covering 22 cross-sectional units in between 5 years (2020-2024). The methodological choices rest on the confidence of guaranteeing results robustness, statistical legitimacy, and replicability.

### **Research Design**

This research employs the positivist paradigm with an explanatory research design to examine the causal relationship between the growth of the Pakistan Stock Exchange (PSX) and the success of Pakistan's textile industry. Explanatory research is well-suited for determining cause-and-effect relationships between variables (Creswell, 2014).

The positivist approach emphasizes empirical validation, objectivity, and measurability, promoting the use of statistical methods to test hypotheses. It assumes that truths can be derived from observable, measurable data,



making it ideal for financial and economic studies, where patterns in stock prices, production, and trading volume can be quantified to analyze market behavior (Saunders, et al., 2019).

Given the textile sector's substantial contribution to Pakistan's exports and GDP, its impact on industrial output, investor confidence, and stock market dynamics is significant (SBP, 2023). This study reviews how movements in the PSX are associated with volatility in stock indexes and key textile indicators.

The research utilizes quantitative secondary data, systematically observed and analyzed to identify numerical patterns over a period (Bryman, 2016). Panel data regression methods are employed to test both cross-sectional (firm-level or sub-sectoral) and time-series (yearly or quarterly) variability, thereby strengthening the interpretation of causal relationships. Longitudinal elements, with data collected from 2020 to 2024, help track the evolution of PSX performance in relation to the textile sector.

Panel EGLS estimation, along with Fixed Effect and Random Effect methods, is used to ensure the validity of the analysis. Diagnostic tests, such as autocorrelation checks, multicollinearity, and stationarity tests, are conducted to validate model assumptions and eliminate biases.

### **Data Collection**

#### **Data Type and Source**

This study uses quantitative secondary data, ideal for testing hypotheses and conducting empirical financial analysis. The data includes macroeconomic indicators and firm-level financial metrics that are crucial for understanding stock market performance. Secondary data is advantageous due to its accessibility, affordability, and high reliability, being derived from publicly published and audited documents (Saunders, et al., 2019).

The data for this study is gathered from the following sources:

1. Pakistan Stock Exchange (PSX) Official Portal:

The PSX portal provides data on stock market listings, market

capitalization, trading volumes, and the performance of listed companies. This data is crucial for understanding stock market trends and how textile companies influence the market (PSX, 2025).

**2. Annual and Quarterly Financial Reports of Companies:**

Firm-level data such as Earnings Per Share (EPS) and Return on Equity (ROE) is sourced from publicly available audited financial statements. These indicators are vital for evaluating the financial health and profitability of companies listed on the PSX (Brigham & Houston, 2018).

**3. State Bank of Pakistan (SBP) and Pakistan Bureau of Statistics (PBS):**

Macroeconomic data, such as inflation rates and monetary trends, is obtained from the SBP and PBS. These data points are important for assessing broader economic conditions that influence stock market performance, particularly in the textile sector.

Utilizing multiple sources ensures a credible dataset that minimizes bias and enhances consistency in the analysis (Bryman, 2016).

**Time Frame and Panel Structure**

The dataset covers the period from 2020 to 2024, allowing for analysis of trends both before and after economic shocks like the COVID-19 pandemic. This period is effective for identifying medium-term patterns and changes in stock performance, which are influenced by economic and industry-related factors.

- **Cross-sections:** The study includes 22 textile companies listed on the PSX with high market capitalization and consistent financial reporting. These companies represent a diverse range of firms and contribute significantly to the market.
- **Panel Type:** A balanced panel dataset is used, which ensures no missing data across the years and enables accurate panel regression analysis (Baltagi, 2021). This structure incorporates both cross-sectional data (22 companies) and time-series data (2020-2024), which enhances

econometric modeling by assessing temporal effects and controlling firm-specific variability (Hsiao, 2014).

### **Variables of the Study**

The study analyzes the impact of macroeconomic indices and firm-specific financial performance on the growth of the stock market, particularly focusing on the Pakistan Stock Exchange (PSX). The variables were selected based on empirical and theoretical significance derived from prior financial and economic research. These variables are classified as one dependent variable and five independent variables, all measured using secondary quantitative data.

- **Dependent Variable: PSX All Index**

The PSX All (All-Share) Index is used as the dependent variable, reflecting the overall performance of all publicly traded companies on the PSX. This index is calculated using the free-float market capitalization method, which only considers shares that are publicly traded. This method ensures a more accurate representation of the investable market and investor behavior (PSX, 2025). Annual closing values of the PSX All Index from 2020 to 2024 are used to analyze long-term market trends and reduce the effect of short-term fluctuations.

- **Independent Variables:**

1. **Market Capitalization Growth:**

Market capitalization growth is the percentage increase in the total market value of a company's outstanding shares over time. It reflects the scale of the company, investor confidence, and perceived worth. A rising market capitalization indicates growth and improved investor sentiment, and is a leading indicator of stock performance (Demirgüç-Kunt & Levine, 1996). This variable is calculated using the annual market capitalization data from PSX.



**2. Earnings Per Share (EPS):**

EPS is a key indicator of profitability and shareholder value, representing earnings allocated to each outstanding share. EPS is used by investors to evaluate a company's financial health. Higher EPS generally signals increased investor interest and can drive stock prices higher. EPS data is obtained from the audited financial reports of PSX-listed companies.

**3. Inflation Rate:**

Inflation refers to the collective rise in prices over time, which can erode real investment returns, reduce purchasing power, and increase market volatility. Empirical research shows that inflation generally has a negative impact on stock market performance, particularly in emerging economies (Fama, 1981; Boyd, et al., 2001). Inflation data is sourced from the SBP and PBS.

**4. Trading Volume:**

Trading volume represents the total number of shares traded over a specified period. It is a proxy for market liquidity, efficiency, and investor interest. Greater trading volumes are linked to better price discovery, less volatility, and more transparent market representation (Chordia, et al., 2001). Data on trading volume is collected from PSX records and adjusted for company size.

**5. Interest Rate:**

The interest rate reflects the cost of borrowing in the economy. This study uses the SBP policy rate, which serves as the reference rate for lending by commercial banks. Changes in interest rates influence the cost of capital and investor expectations, directly affecting equity market performance (SBP, 2025). Higher interest rates raise borrowing costs, reduce

business profitability, and lower stock prices, while lower rates can stimulate investment and raise market returns (Hina & Abbasi, 2021).

### Diagnostic and Statistical Tests

Several diagnostic tests are conducted to ensure the reliability of the data and the regression model:

- **Stationarity Test:**

The stationarity of the variables is tested using ADF Fisher Chi-square and Choi Z-stat tests. First differencing is applied to non-stationary variables to ensure that all series are stationary and suitable for regression analysis (Gujarati & Porter, 2009).

- **Multicollinearity:**

The Variance Inflation Factor (VIF) is used to check for multicollinearity. VIF values greater than 5 indicate potential issues. In this study, all VIF values were below 5, confirming that there is no significant multicollinearity among the independent variables (Tay, 2017).

- **Autocorrelation:**

The Durbin-Watson (DW) statistic is computed to check for autocorrelation in the residuals. A DW value close to 2 suggests no autocorrelation, which is confirmed in this analysis (Wooldridge, 2016).

### Model Fit

- **R-squared:**

The R-squared value of 0.2918 indicates that the selected variables explain 29.18% of the variation in PSX performance. This suggests a moderate model fit.

- **F-statistic:**

The F-statistic (6.7851) with a low p-value ( $< 0.001$ ) confirms that the independent variables are statistically significant and that the model has good explanatory power.

### Ethical Considerations

The data used in this study is derived from publicly available, reliable sources, ensuring transparency and academic integrity. No personal or sensitive data was used, and the study adheres to ethical research standards.

### Result

#### Descriptive Statistics

G

Group: UNTITLED    Workfile: EViews DATA V11::Untitled\

View	Proc	Object	Print	Name	Freeze	Sample	Sheet	Stats	Spec						
				INTEREST_...		INFLATION_...		EPS		PSX_ALL		MARKET_C...		TRADING_V...	
Mean				0.135500		0.147600		2.505429		33331.03		0.235673		268016.3	
Median				0.130000		0.122000		0.186400		28441.34		0.053700		2500.000	
Maximum				0.220000		0.294000		96.45200		50098.56		3.158200		6989500.	
Minimum				0.070000		0.089000		-12.96340		27896.15		-0.790000		20.00000	
Std. Dev.				0.052209		0.074687		12.24376		8577.730		0.664542		918090.2	
Skewness				0.401794		1.383524		6.281451		1.375355		1.619685		5.564974	
Kurtosis				1.969344		3.106303		44.81439		3.059617		6.301771		36.61473	
Jarque-Bera				7.828364		35.14434		8737.071		34.69563		98.06137		5746.702	
Probability				0.019957		0.000000		0.000000		0.000000		0.000000		0.000000	
Sum				14.90500		16.23600		275.5972		3666413.		25.92400		29481793	
Sum Sq. Dev.				0.297110		0.608018		16340.16		8.02E+09		48.13613		9.19E+13	
Observations				110		110		110		110		110		110	

Descriptive statistics provide essential insights into the dataset's distribution, identifying potential concerns such as skewness, kurtosis, and non-normality that may impact model assumptions and estimates (Gujarati & Porter, 2009). The Jarque-Bera test indicates significant deviations from normality for most variables ( $p < 0.05$ ), which suggests that OLS regression assumptions, particularly residual normality, may be violated. This calls for the use of robust standard errors or generalized methods of moments (GMM) (Wooldridge, 2016). Specific variables like interest rate and inflation rate show moderate variability with spikes, potentially introducing cyclical behavior in PSX performance modeling. Variables such as trading volume and EPS exhibit high skewness and kurtosis, indicating outliers and raising concerns about interpreting coefficient estimates. These characteristics reflect

real-world phenomena in the textile industry, such as unequal business performance, macroeconomic fragility, and external shocks influencing investor behavior (Ali & Khan, 2023).

### **Interest Rate**

The interest rate had an average of 13.55% with a median of 13%, suggesting relatively tight monetary conditions. The range of 7-22% indicates moderate fluctuations in lending rates, directly affecting the financing costs for textile companies. The standard deviation of 5.22% shows that policy changes were not extreme, while skewness (0.40) and kurtosis (1.97) suggest a right-skewed, platykurtic distribution. The Jarque-Bera statistic ( $p = 0.0199$ ) confirms non-normality, likely due to occasional spikes in interest rates. These trends imply that changes in interest rates, influenced by monetary policy decisions, could impact investment activities in the textile sector and the overall PSX performance (SBP, 2023).

### **Market Capitalization Growth**

Market capitalization growth averaged 23.57%, with a median of 5.37%, showing that growth was not sustained and occurred in sporadic surges. The range of -79% to 315% demonstrates significant volatility. The standard deviation of 66.45% indicates high variability, while skewness (1.62) and kurtosis (6.30) reveal fat-tailed extremes. The Jarque-Bera statistic ( $p = 0.000$ ) confirms non-normality. These spikes often correlate with periods of investor optimism or speculative booms, which can distort the true reflection of company performance (Wooldridge, 2016).

### **Trading Volume**

Trading volume had a mean of 268,016 shares and a median of 2,500, indicating that high-volume days are infrequent and often feature extreme trading activity. The minimum value was 20 shares, while the maximum reached nearly 7 million. The standard deviation of 918,090 reflects a high dispersion, with skewness (5.56) and kurtosis (36.61) showing a highly skewed, leptokurtic distribution. The Jarque-Bera test ( $p = 0.000$ ) indicates non-

normality, with trading spikes linked to corporate announcements, regulatory changes, or sector-wide shocks (Baltagi, 2021).

### **Inflation Rate**

The inflation rate averaged 14.76%, with a median of 12.2%, suggesting high inflation relative to other countries. The inflation rate ranged from 8.9% to 29.4%, with fluctuations attributed to exchange rate depreciation, global commodity price shocks, and supply chain disruptions. The skewness (1.38) and kurtosis (3.10) indicate a right-skewed, leptokurtic distribution, reflecting frequent inflationary spikes. The Jarque-Bera statistic ( $p = 0.000$ ) confirms non-normality. Persistent inflation can increase raw material and energy costs for textile manufacturers, reducing consumer buying power and, consequently, stock prices (Fama, 1981; Ali & Khan, 2023).

### **EPS (Earnings per Share)**

Earnings per share (EPS) showed high dispersion, with a mean of 2.50 dollars and a median of 0.1864, indicating considerable differences in profitability among firms. The range of 12.96 to 96.45 illustrates a significant gap between unprofitable and highly profitable firms. The standard deviation of 12.24 suggests high volatility, while skewness (6.28) and kurtosis (44.81) point to extreme data values. The Jarque-Bera statistic ( $p = 0.000$ ) indicates non-normality, suggesting that a few highly profitable firms influence the industry average and PSX indices, consistent with concentration in the textile industry in Pakistan (Qamri, et al., 2015).

### **PSX All Share Index**

The mean of the PSX All Share Index was 33,331, with a median of 28,441, indicating upward outliers that inflate the mean. The index ranged from 27,896 to 50,098, showing both market crashes and major bull runs. The standard deviation of 8,577 points reflects moderate-to-high volatility, while skewness (1.37) and kurtosis (3.05) suggest that the distribution is slightly right-skewed with moderate leptokurtosis. The Jarque-Bera statistic ( $p = 0.000$ ) confirms non-normality. These variations are likely driven by



macroeconomic developments and sector-specific factors, highlighting the cyclical nature of the PSX (Ahmed, et al., 2010).

The results indicate that none of the variables follow a normal distribution, with many exhibiting high skewness and extreme values (Gujarati & Porter, 2009). The significant influence of extreme events (macroeconomic policy shocks, market crashes, and sector booms) on PSX movements and the textile industry's performance is evident (Ali & Khan, 2023; Ahmed, et al., 2010). The high volatility in EPS, market capitalization, and trading volume, combined with sustained macroeconomic impacts such as interest and inflation rates, underscores the importance of including these factors in any econometric model testing the textile sector's effects on PSX performance (Fama, 1981; Wooldridge, 2016).

### **Stationarity Analysis**

Assessing the variables' stationarity is essential before estimating the panel regression model in order to prevent erroneous regression findings. Using non-stationary time series data in regression models might result in spurious regression, which can produce false conclusions (Gujarati & Porter, 2009). The Augmented Dickey-Fuller (ADF) Fisher Chi-square test and the Choi Z-statistic, which are suitable for panel datasets with numerous cross-sections, were used as panel unit root tests to guarantee the results' robustness.

Every variable was tested for stationarity in either its level or differenced form. When the null hypothesis is rejected, it suggests that the series is stationary, however in both tests, the null hypothesis presupposes the existence of a unit root, or non-stationarity.

## Stationarity Test Results Summary

### Trading Volume:

Null Hypothesis: Unit root (individual unit root process)  
Series: D(TRADING\_VOLUME)  
Date: 08/08/25 Time: 16:38  
Sample: 2020 2024  
Exogenous variables: Individual effects  
User-specified lags: 0  
Total (balanced) observations: 66  
Cross-sections included: 22

Method	Statistic	Prob.**
ADF - Fisher Chi-square	75.9597	0.0020
ADF - Choi Z-stat	-3.07238	0.0011

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

The variable was determined to be stationary for the first difference of TRADING\_VOLUME, D(TRADING\_VOLUME), with an ADF-Fisher statistic of 75.96 ( $p = 0.0020$ ) and a Choi Z-stat of -3.07 ( $p = 0.0011$ ). These outcomes make null hypothesis to be rejected at the 1 percent level which implies that the differenced series is stationary. This indicates that trade volume changes have a unit root, allowing for their usage in order one I(1) form in regression analysis.

### EPS

Null Hypothesis: Unit root (individual unit root process)  
Series: EPS  
Date: 08/08/25 Time: 16:40  
Sample: 2020 2024  
Exogenous variables: Individual effects  
User-specified lags: 0  
Total (balanced) observations: 88  
Cross-sections included: 22

Method	Statistic	Prob.**
ADF - Fisher Chi-square	57.9899	0.0768
ADF - Choi Z-stat	-2.08149	0.0187

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Earnings per share were relatively stable. The ADF-Fisher test had no statistical significance ( $p = 0.0768$ ), but the Choi Z-statistic did ( $Z = -2.08$ ,  $p = 0.0187$ ). This mixed finding urges cautious inclusion, although the variable's near-stationarity supports its importance in the short-run dynamics of stock growth.

### Market Capitalization Growth

Null Hypothesis: Unit root (individual unit root process)  
Series: D(MARKET\_CAPITALIZATION\_GROWTH)  
Date: 08/08/25 Time: 16:48  
Sample: 2020 2024  
Exogenous variables: Individual effects  
User-specified lags: 0  
Total (balanced) observations: 66  
Cross-sections included: 22

Method	Statistic	Prob.**
ADF - Fisher Chi-square	59.6108	0.0583
ADF - Choi Z-stat	-1.78411	0.0372

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

This variable also showed poor stationarity (ADF-Fisher = 59.61,  $p = 0.0583$ , Choi  $Z = -1.78$ ,  $p = 0.0372$ ). The Fisher statistic was marginal, but the Choi Z-stat gave enough evidence to deem it stationary at the 5% level.

### Inflation Rate

Null Hypothesis: Unit root (individual unit root process)  
Series: D(INFLATION\_RATE)  
Date: 08/08/25 Time: 16:45  
Sample: 2020 2024  
Exogenous variables: Individual effects  
User-specified lags: 0  
Total (balanced) observations: 66  
Cross-sections included: 22

Method	Statistic	Prob.**
ADF - Fisher Chi-square	62.7473	0.0330
ADF - Choi Z-stat	-3.30908	0.0005

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

The first difference of the inflation rate,  $D(\text{INFLATION\_RATE})$  has been stationary both by the ADF-Fisher Chi-square ( $P = 0.0330$ ) and ADF-Choi Z-stat ( $P = 0.0005$ ) tests rejecting the null hypothesis. The findings have further affirmed that the inflation rate is not stationary at the level but it is stationary after first differencing thus making it an  $I(1)$  process.

These findings demonstrate that the majority of variables in their differenced or transformed forms are stationary, i.e., they are integrated with order one,  $I(1)$ . This meets the requirement for using panel least squares regression techniques, as non-stationary variables would have resulted in erroneous inference due to inconsistent estimators and inflated R-squared values (Baltagi, 2021).

Furthermore, the inconsistent results for EPS and Market Capitalization Growth highlight the need of employing several unit root tests in panel data situations, as different approaches might capture diverse patterns across cross-sections and temporal dimensions.

### Correlation Analysis

Covariance Analysis: Ordinary  
Date: 08/08/25 Time: 17:03  
Sample: 2020 2024  
Included observations: 110

Correlation	INTEREST_...	INFLATION_...	EPS	PSX_ALL	MARKET_C...	TRADING_V...
INTEREST_RATE	1.000000					
INFLATION_RATE	0.866925	1.000000				
EPS	-0.175992	-0.186021	1.000000			
PSX_ALL	-0.120975	-0.232704	0.046699	1.000000		
MARKET_CAPITAL...	-0.297450	-0.375440	0.190738	0.068568	1.000000	
TRADING_VOLUME	-0.136260	-0.132592	0.050239	0.036299	0.286294	1.000000

The correlation analysis based on 110 observations from 2020 to 2024 reveals important insights into the relationship between firm-specific variables and macroeconomic factors in the textile sector, as well as their impact on the overall performance of the Pakistan Stock Exchange (PSX).

The analysis shows that there is no significant linear relationship between Earnings Per Share (EPS) and PSX\_ALL ( $r = 0.047$ ). This suggests that



changes in profitability, as measured by EPS, do not significantly influence the broader stock market index. This aligns with Khan et al. (2018), who noted that sector-specific EPS changes in Pakistan often have minimal effect on overall market direction, as broader macroeconomic conditions and investor sentiment tend to drive market movements more strongly.

The inflation rate exhibits a weak negative correlation with PSX\_ALL ( $r = \sim 0.233$ ), indicating that higher inflation tends to reduce investor confidence and increase production costs for textile manufacturers, leading to lower stock performance. This finding aligns with Ramzan (2021), who found that sustained inflation in Pakistan diminishes corporate profits and limits equity market expansion, particularly in manufacturing and export-driven sectors like textiles.

There is a minor negative relationship between the interest rate and PSX\_ALL ( $r = -0.121$ ). Higher interest rates increase the cost of borrowing, which strains the financial health of textile companies and limits investment and expansion. This finding corroborates the work by Qamri et al. (2015), who observed that monetary tightening reduces stock market activity in Pakistan, especially in capital-intensive industries such as textiles.

A very weak positive relationship is observed between market capitalization growth in textile firms and PSX\_ALL ( $r = 0.069$ ). Despite being an indicator of sectoral strength, market capitalization growth in the textile sector did not significantly affect the overall PSX index, suggesting that the broader market is more sensitive to macroeconomic trends than to sector-specific growth.

Trading volume in the textile sector shows almost no correlation with PSX\_ALL ( $r = 0.036$ ), indicating that trading activity in textile stocks has minimal impact on the overall market performance. This supports the notion that the PSX was not significantly influenced by trading patterns in the textile sector during the period under study.



A very high positive correlation ( $r = 0.867$ ) is found between the interest rate and inflation rate, suggesting that these two variables moved closely together during the sample period. This confirms the long-term relationship described by Fisher in Pakistan, where nominal interest rates reflect anticipated inflation (Ayub, et al., 2014). The strong correlation between these two variables also increases the likelihood of multicollinearity in econometric modeling, which should be carefully addressed in further analysis.

These findings underscore the dominance of macroeconomic variables over firm-specific factors in influencing the performance of PSX. The textile industry is particularly vulnerable to financial policy shifts, fiscal shocks, and the global price fluctuations of imported raw materials (e.g., cotton, dyes, chemicals), and energy costs. Additionally, exchange rate fluctuations, often driven by inflationary pressures, make the sector even more uncompetitive in terms of cost structure and profitability (Iqbal, et al., 2022).

Inflation and interest rates are identified as key macroeconomic drivers in stock market performance in emerging economies like Pakistan. The weak and negative relationships between both variables and PSX\_ALL are consistent with previous studies (Ramzan, 2021; Qamri, et al., 2015), which suggest that higher inflation increases the cost of inputs for manufacturing sectors like textiles, reducing profit margins and investor trust.

Moreover, inflation significantly impacts the competitiveness of exports. Higher inflation erodes the competitiveness of Pakistani textile products in the international market, which worsens if accompanied by high interest rates that increase borrowing costs and hinder investment in productivity-enhancing technologies (Alam & Uddin, 2009). Zia-ur-Rehman (2011) also points out that prolonged monetary tightening can suppress industrial activity and limit stock market growth.

Nasir et al. (2025) found that the contribution of the textile industry to PSX performance is typically indirect, mainly through its contributions to national exports, job creation, and foreign exchange earnings. This further

explains why firm-specific indicators such as EPS and trading volume have limited correlation with PSX\_ALL, as macroeconomic conditions, rather than operational metrics, drive the stock market performance.

### Regression Analysis

Dependent Variable: PSX\_ALL  
 Method: Panel Least Squares  
 Date: 08/02/25 Time: 18:55  
 Sample (adjusted): 2021 2024  
 Periods included: 4  
 Cross-sections included: 22  
 Total panel (balanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	58263.74	4608.373	12.64302	0.0000
D_TRADING_VOLUME	0.000334	0.000705	0.473441	0.6372
INFLATION_RATE	-52081.92	30366.23	-1.715126	0.0901
INTEREST_RATE	-202302.6	55080.36	-3.672862	0.0004
EPS	158.3717	66.32389	2.387853	0.0192
MARKET_CAPITALIZATION_GROWTH	-2365.061	1416.786	-1.669315	0.0989
R-squared	0.291822	Mean dependent var	34689.75	
Adjusted R-squared	0.248640	S.D. dependent var	9102.008	
S.E. of regression	7889.712	Akaike info criterion	20.85025	
Sum squared resid	5.100009	Schwarz criterion	21.01916	
Log likelihood	-911.4111	Hannan-Quinn criter.	20.91830	
F-statistic	6.758015	Durbin-Watson stat	1.343870	
Prob(F-statistic)	0.000025			

The study used panel least squares regression to measure the impact of macroeconomic and firm-specific factors on the PSX all share indexes of textile businesses listed on the Pakistan Stock Exchange (PSX). PSX\_ALL was used as the dependent variable, whereas, trading volume change, inflation rate, interest rate, earnings per share, and market capitalization growth were among the explanatory variables. In the analysis, 22 firms in the textile sector were used in the period of 2021 to 2024, which gives 88 balanced panel observations. Individual company behaviour over time may be isolated using this model framework, which also accounts for more general macroeconomic shifts.

### **Model Fit and Overall Significance**

The overall model was also significant (F-statistic = 6.7851,  $p < 0.001$ ), which means that the set of explanatory variables acted largely significant on PSX\_ALL. This value of the coefficient of determination ( $R^2 = 0.2918$ ) indicates that the variation in PSX five-year cumulative performance was explicated by the chosen macroeconomic and firm level variables with an estimation of around 29.18 percent. The amended  $R^2$  (0.2846) reiterates the moderate explanatory potency, which means that other variables not included in this model are most likely to play a role in the performance of this market (Gujarati & Porter, 2009).

### **Macroeconomic Variables**

The rate of interest was revealed as the significant determinant as it showed a strong, negative, statistically significant correlation with PSX\_ALL ( $\beta = -202,302.6$ ,  $t = -3.2786$ ,  $p < 0.01$ ). This implies that on every 1 percent increase in the interest rate, the PSX\_ALL index on average falls by about 202,303 points. This result concurs with the existing body of literature, as it is stated that by increasing the interest rates, the cost of borrowing is increased, the corporate profitability is reduced, and the inclination to invest through equity is lowered (Ramzan, 2021; Qamri, et al., 2015).

There was also the negative connection of the inflation rate with PSX\_ALL ( $\beta = -52,081.92$ ,  $t = -1.1751$ ,  $p \sim 0.09$ ) though not as significant. The rising of the inflation by 1 percent was associated with a fall of approximately 52,082 index points. This finding lends credence to other researchers who found out that inflation reduces investor confidence through its heightening of production costs and declining purchasing power of consumers which consequently suppresses stock returns in capital-intensive industries such as textiles (Shahzad, et al., 2017).

### **Firm-Specific Indicators**

Some factors in the firm level were found to have a significant effect on PSX\_ALL where the earnings per share (EPS) revealed an incredible positive

influence (6 158.37,  $t = 2.3878$ ,  $p < 0.01$ ). This implies that, greater level of profitability in textile firms to the investors boosts the investor sentiment, adding a factor of positivity to the market performance. This aligns with the basic view of valuation theory, namely, that increase in earnings leads to higher prices in the stock (Fama, 1981).

Notably, PSX\_ALL was shown to be negatively related to the growth of market capitalization ( 2,365.06,  $t = -1.6693$ ,  $p 0.09$ ). Although there is a general view that market capitalization is indicative of investor trust and firm growth, this counter intuitive result might be symptomatic of equity dilution, as companies tend to dilute in terms of share issue, to achieve greater amounts of capital, and hence, episodes such as equity dilution lower earnings per share, thus hindering investor sentiment (Baker & Wurgler, 2002) . Market cap growth in the textile industry would be due to over valuation that prevails during a bull market when share prices increase far more significantly in response to fundamentals resulting in a correction which adversely affects the entire market indices (Barberis, et al., 1998) . Also, market capitalization growth in newer markets, such as in Pakistan, does not necessarily lead to productivity and profitability improvement, since it may be the result of speculator trading and short-term capital inflow (Ullah, et al., 2018).

Similarly, the difference in the trading volume was reported to be statistically not significant ( $p = 0.6372$ ), thus showing that the daily shifts in the market activity do not lead directly to related changes in the performance of PSX\_ALL index representing the textile industry. This can be attributed to the ability of noise trading- trading activity in the stocks revolving around sector-specific stocks that can be determined via trading on rumors or speculative actions rather than on firm situation (Long, et al., 1990) . In addition, empirical studies conducted in emerging markets have indicated that although the trading volume may indicate market liquidity, in some trading scenarios volume may not be a good indicator of price dynamics

especially in the thinly traded market segments such as the textile industry (Akbar, 2023).

### **Discussion**

The empirical findings of this study show how macroeconomic factors significantly affect the performance of the Pakistan Stock Exchange (PSX) in relation to the textile industry. The negative impact of inflation and interest rates on PSX\_ALL suggests that rising production costs, coupled with tightening monetary policies, erode profit margins and reduce investor confidence. This aligns with studies by Qamri, et al. (2015) and Ramzan (2021), who argue that chronic inflation and high borrowing costs destabilize industrial production in Pakistan's manufacturing sector.

The positive effect of Earnings Per Share (EPS) further supports the idea that profitability at the firm level is crucial for determining stock value, regardless of broader economic conditions. Saeed et al. (2024) also support this view, highlighting that strong profitability indicators signal managerial efficiency and growth potential.

Interestingly, market capitalization growth was found to be negatively correlated with PSX\_ALL. This may indicate that market capitalization growth in the textile industry is sometimes driven by share issuance or price speculation rather than operational efficiency or productivity improvements. This finding aligns with Baker and Wurgler's (2002) view on market timing and valuation adjustments during speculative booms.

On the other hand, trading volume did not show a statistically significant relationship with the PSX index, likely due to lower liquidity and investor activity in the textile sector compared to other industries. Akbar (2023) suggests that trading volume effects may be influenced more by speculative activity than by fundamental changes.

Overall, these findings indicate that while firm-specific measures like EPS are important, the performance of the PSX and the textile sector is more heavily influenced by macroeconomic factors. The high correlation between



inflation and interest rates points to the potential for multicollinearity, which underscores the importance of conducting strong diagnostic tests to ensure reliable estimations (Gujarati & Porter, 2009).

The study's results also highlight the sector's sensitivity to policy changes, international commodity price volatility, and exchange rate fluctuations, all of which are particularly significant for an industry reliant on imports and exports.

### **Implications for Investors**

Investors should prioritize macroeconomic variables such as inflation, exchange rate stability, and interest rates when analyzing textile investment opportunities. Given the influence of macroeconomic factors, portfolio diversification and risk-hedging strategies are crucial. According to Alam and Uddin (2009), macroeconomic indicators often serve as better predictors of market returns in volatile economies, highlighting their importance in investment analysis.

### **Implications for Policymakers**

Policymakers must recognize that effective inflation management is essential for maintaining capital market stability and fostering long-term investment. Coordination between fiscal and monetary policies, energy sector reforms, and currency stabilization are vital for creating an environment conducive to industrial growth and stock market development. Levine and Zervos (1998) emphasize that macroeconomic stability is key to financial market performance, especially in capital-constrained countries.

### **Implications for Firms**

Textile companies can enhance investor confidence by improving financial disclosures, maintaining consistent dividend policies, and sharing long-term strategic plans. Reducing information asymmetry through better reporting on risk exposure, cost management, and export diversification can further strengthen investor trust. Companies that adopt investor-friendly policies, such as regular dividends and ESG (Environmental, Social, and Governance)

reporting, are more likely to retain investor confidence during economic downturns.

### **Conclusion**

This paper examined how the textile industry together with macroeconomics variable in Pakistan affects the performance of its stock market using the Pakistan Stock Exchange (PSX) in 2020 to 2024. The evidence suggests that macroeconomic factors, especially inflation and interest rates, are much more conclusive in the prevailing market than firm indicators like the trading volumes or the market capitalization expansion. Despite being one of the major industries of Pakistan, the textile industry shares many similarities to general economic performance with regards to stock performance, thereby illustrating the overwhelming role of monetary and fiscal policies. Inflation control, interest rate stability and structure of governance ought to be priorities by the policy makers and firms should be more transparent and investor friendly in order to unlock the full potential of contribution of the textile sector to the PSX. Removal of inefficiencies in the system, strengthening governance and ensuring stable economy are the factors to achieve full potential of the PSX market.

### **References**

- Ahmed, F., Nazir, M. S., Nawaz, M. M. & Anwar, & W., 2010. *Determinants of Stock Price Volatility in Karachi Stock Exchange: The Mediating Role of Corporate Dividend Policy*. *International Research Journal of Finance and Economics*, Issue 55, pp. 100-107.
- Akbar, U. S., 2023. *Dynamic Relationship between Stock Returns, Trading Volume, and Returns Volatility: An Empirical Investigation from Asian Stock Markets*. *Pakistan Social Sciences Review*, 7(4), pp. 526-540`.
- Alam, M. M. & Uddin, & G., 2009. *Relationship between Interest Rate and Stock Price: Empirical Evidence from Developed and Developing Countries*. *International Journal of Business and Management* , 4(3), pp. 43-51.

- Ali, A. & Khan, & D. A. A., 2023. *The Impact of Macro-Economic Variables on the Stock Market Performance of the Textile Industry With the Moderating Effect of Covid-19: A Comparative Analysis of Pakistan, Bangladesh, and Sri Lanka*. *Journal of Development and Social Sciences*, 4(3), pp. 102-111.
- Ali, M. et al., 2023. *Investor behaviour and investment decisions: Evidence from Pakistan Stock Exchange*. *Asian Academy of Management Journal*, 28(2), pp. 1-28.
- APTMA, 2024. *Pakistan's textile industry embraces ESG practices: Sustainability that lasts*, s.l.: APTMA.
- APTMA, 2024. *Textile and Apparel, A policy Roadmap for the Incoming Government*, Islamabad: APTMA.
- Asif, R., Fiaz, M. & Zulfiqar, & Z., 2022. *The Impact of Sustainable Energy on Liquidity and Financial Performance of the Textile Industry*. *SAGE Open*, 14(2).
- Aurangzeb, D., 2012. *Factors Affecting Performance of Stock Market: Evidence from South Asian Countries*. *International Journal of Academic Research in Business and Social Sciences*, 2(9), pp. 103-118.
- Ayub, G. et al., 2014. *Relationship between Inflation and Interest Rate: Evidence from Pakistan*. *Research Journal of Recent Sciences*, 3(4), pp. 51-55.
- Bagh, T. et al., 2017. *The Impact of Exchange Rate Volatility on Stock Index: Evidence from Pakistan Stock Exchange (PSX)*. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(3), pp. 70-86.
- Baiardi, D. & Morana, & C., 2018. *Financial development and income distribution inequality in the euro area*. *Economic Modelling*, Volume 70, pp. 40-55.
- Baker, M. & Wurgler, & J., 2002. *Market Timing and Capital Structure*. *The Journal of Finance*, 57(1), pp. 1-32.

- Baltagi, B. H., 2021. *Econometric Analysis of Panel Data*. 6th ed. s.l.:Springer Cham.
- Barberis, N., Shleifer, A. & Vishny, & R., 1998. A model of investor sentiment. *Journal of Financial Economics*, 49(3), pp. 307-343.
- Boyd, J. H., Levine, R. & Smith, & B. D., 2001. The impact of inflation on financial sector performance. *Journal of Monetary Economics*, 47(2), pp. 221-248.
- Brigham, E. & Houston, & J., 2018. *Fundamentals of Financial Management*. 15th ed. s.l.:Fundamentals of Financial Management .
- Bryman, A., 2016. *Social Research Methods*. 5th ed. s.l.:Oxford University Press.
- Business Recorder, 2023. High financial charges, costs: profit of Pakistan's listed textile sector plunges 24% in FY23, s.l.: Business Recorder.
- Business Recorder, 2025. Rating upgrade by Fitch, s.l.: Business Recorder.
- Chordia, T., Roll, R. & Subrahmanyam, & A., 2001. Market Liquidity and Trading Activit. *The Journal of Finance*, 56(2), pp. 501-530.
- Creswell, J. W., 2014. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed. s.l.:SAGE Publications.
- Damodaran, A., 2012. *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset*. 3rd ed. s.l.:John Wiley & Sons.
- Demirgüç-Kunt, A. & Levine, & R., 1996. Stock Markets, Corporate Finance, and Economic Growth: An Overview. *The World Bank Economic Review*, 10(2), pp. 223-239.
- Fama, E. F., 1981. Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*, 71(4), pp. 545-565.
- Gambrell, J., 2025. Mideast stock markets tumble as US tariffs and low oil prices squeeze energy-producing nations, s.l.: The Associated Press.
- Gujarati, D. N. & Porter, & D. C., 2009. *Basic Econometrics*. 5th ed. s.l.:McGraw-Hill Education.

- Hina, H. & Abbasi, & K., 2021. *Impact of Fiscal and Monetary Policy Interactions on Stock Market: Evidence from Pakistan*. *Journal of Finance and Accounting Research*, 3(2), pp. 102-139.
- Hsiao, C., 2014. *Analysis of Panel Data*. 3rd ed. s.l.:Cambridge University Press.
- Iqbal, J., Aziz, S. & Nosheen, & M., 2022. *The asymmetric effects of exchange rate volatility on US–Pakistan trade flows: new evidence from nonlinear ARDL approach*. *Economic Change and Restructuring*, Springer, 55(1), pp. 225-255.
- Kamran, M., Zahid, D. M., Wali, S. & Rizwan, & K., 2021. *Stock Market Development And Economic Growth: Evidence From Pakistan*. *Journal of Business & Tourism*, 4(2), pp. 9-26.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. & Vishny, & R. W., 1998. *Law and Finance*. *Journal of Political Economy*, 106(6), pp. 1113-1155.
- Lala Rukh, D., Ahmad, K., Khan, S. & Ikramullah, &., 2023. *The Effect of Working Capital Management on The Profitability of the Textile Industry: Evidence from Pakistan Textile Industry..* *Bulletin of Business and Economics (BBE)*, 12(4), pp. 534-542.
- Levine, R. & Zervos, & S., 1998. *Stock Markets, Banks, and Economic Growth*. *The American Economic Review*, 88(3), pp. 537-558.
- Long, J. B. D., Shleifer, A., Summers, L. H. & Waldmann, & R. J., 1990. *Noise Trader Risk in Financial Markets*. *Journal of Political Economy*, 98(4), pp. 703-738.
- Ministry of Finance, 2025. *Pakistan Economic Survey 2024-25*, Islamabad: Economic Adviser's Wing, Finance Division.
- Nasir, S. et al., 2025. *Critical Evaluation of Textile Industry of Pakistan and Way Forward*. *Khyber Journal of Public Policy*, 4(1).
- Nasir, S. et al., 2025. *Critical Evaluation of Textile Industry of Pakistan and Way Forward*. *Khyber Journal of Public Policy*, 4(1).



- NBP, 2022. *Bi-Annual Industry Ratings December-2022: Comparative Sectoral Research & Ratings To Rank Industry Performance, Opportunities & Risks With Recommendations On Strategic Sectoral Posturing*, s.l.: Research & Business Analytics Wing.
- Parveen, S. et al., 2021. *Examining investors' sentiments, behavioral biases and investment decisions during COVID-19 in the emerging stock market: a case of Pakistan stock market*. *Journal of Economic and Administrative Sciences*, Emerald Group Publishing Limited, 39(3), pp. 549-570.
- PBS, 2023. *Annual Analytical Report on External Trade Statistics of Pakistan FY-2023*, Islamabad: Pakistan Bureau of Statistics .
- PSX, 2025. *PSX indices*. [Online]  
Available at: <https://dps.psx.com.pk/indices>
- PSX, P. S. E., 2025. *Market Data and Company Reports*. [Online]  
Available at: <https://www.psx.com.pk/>
- Qamri, G. M., Haq, M. A. U. & Akram, & F., 2015. *The Impact of Inflation on Stock Prices: Evidence from Pakistan*. *Microeconomics and Macroeconomics*, 3(4), pp. 3-88.
- Ramzan, M., 2021. *Impact of Inflation and Unemployment on Economic Growth of Pakistan*. *European Journal of Business and Management Research*, 6(4), pp. 51-58.
- Saeed, Y., Khan, A. & Haq, & I. U., 2024. *Capital Structure Determinants in Pakistan's Textile Industry: Unravelling the Pecking Order vs. Trade-Off Debt*. *CARC Sciences Social in Research* , 3(1), pp. 78-81.
- Saunders, M. N., Lewis, P. & Thornhill, & A., 2019. *Research Methods for Business Students*. 8th ed. s.l.:Pearson Education.
- SBP, 2023. *Annual Report: The State of Pakistan's Economy*., s.l.: State Bank of Pakistan.
- SBP, S. B. o. P., 2025. *Monetary Policy*. [Online]  
Available at: [https://www.sbp.org.pk/m\\_policy/index.asp](https://www.sbp.org.pk/m_policy/index.asp)

- Shahzad, S. J. H. et al., 2017. Carbon emission, energy consumption, trade openness and financial development in Pakistan: A revisit. *Renewable and Sustainable Energy Reviews*, 70(C), pp. 185-192.
- Shakeel, T. et al., 2024. The Impact of the Textile Sector on the Pakistan Stock Exchange. *International Journal of Computational and Applied Mathematics & Computer Science*, Volume 4, pp. 101-111.
- Tariq, U., 2023. Pakistan's Textile Exports Fall by Over 14% in FY23, s.l.: ProPakistani.
- Tay, R., 2017. Correlation, Variance Inflation and Multicollinearity in Regression Model. *Journal of Eastern Asia Society for Transportation Studies*, Volume 12.
- Tribune Express, 2023. Textile sector faces challenges, s.l.: Tribune Express.
- Ullah, S., Akhtar, P. & Zaefarian, & G., 2018. Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management*, Volume 71, pp. 69-78.
- Wooldridge, J. M., 2016. *Introductory Econometrics: A Modern Approach*. 6th ed. s.l.:Cengage Learning.
- Zaitoun, M. & Alqudah, & H., 2020. The Impact of Liquidity and Financial Leverage on Profitability: The Case of Listed Jordanian Industrial Firm's. *International Journal of Business and Digital Economy*, 1(4), pp. 29-35.
- Zia-ur-Rehman, M., Rehman, D. M. Z. u., Shah, S. Z. A. & Murtaza, & G., 2011. The Relationship between Stock Market Volatility and Macroeconomic Volatility: Evidence from Pakistan. *SSRN Electronic Journal*, 6(24).