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Analyzing the Connection between Macroeconomic Variables and Market Performance: A Panel Study from an Emerging Economy

Surayya Jamal[1], Ahmad Zeb[2], Sadaf Ijaz[3] & Muhammad Ibraheem Jan[4]

[1] PhD, Abdul Wali Khan University Mardan, Pakistan. Email: surayyajml@gmail.com
[2] Lecturer, Department of Management Science, Islamia College Peshawar, Pakistan. Email: ahmad.zeb@icp.edu.pk
[3] PhD Scholar, Institute of Management Studies, University of Peshawar. Email: sadafijaz2024@gmail.com
[4] BBA, Institute of Management Studies, University of Peshawar. Email: ibrahimjan294294@gmail.com

Abstract

This study explores at how Pakistan's market performance is affected by macroeconomic factors from 2014 to 2023. The World Bank's Development Indicators (WDI) dataset and annual reports are the sources of the data. In this research study, the panel data was analyzed using GMM. This research advances the field by using features of macroeconomic variables instead of firm-level elements. The empirical finding demonstrates that macroeconomic factors support non-financial companies' market performance in Pakistan. Companies' operative in Pakistan should be concerned of the possible influence of these factors on market performance and search for new methods to deal with them. The macroeconomic variables effectively enhance market performance. Policymakers and investors need to take these facts into consideration while choices are being made on economic policy and investments.

Keywords Macroeconomic, Market Performance, WDI, GMM, Pakistan

Introduction

The intrinsic growth model, the neoclassical growth model, also the new institutional method are all examples of growth models are the three primary phases of advancements in the field that aid in a better understanding of the theoretical modelling techniques employed in the growth literature to account for the aspects that influence economic growth and cross-national variations in it. Labor and capital inputs are the main forces behind economic development, according to Solow's ground-breaking 1956 model of economic growth. Because changes in growth are caused by labor and capital. Savings and capital creation were prominently included in the model as economic drivers. Therefore, this model shows that each nation's unique route of factor accumulations leads to differences and changes in its growth performances.

Raj and Breda (2011) claim that despite the anticipation that technology innovation will raise productivity across the board for all production components and spur creative growth in economic activities; this method did not include it into the model. It is considered that technical development comes from outside the system, acting as an external component. This leads to the conclusion that domestic policies are unable to influence growth over the long run rate of the economy. Romer (1986) expanded this model and showed how important incentives are to driving technical development and, in turn, raising the productivity of human and physical capital to achieve steady-state growth. This indicates once over that core advancement strategies may adjust the long-term pace of economic growth. The internal development policies are thus more crucial.

The succeeding and better-known modelling application makes use of an endogenic expansion model, that contends that a country's long-term development is determined by elements innate to its economic system. This method lays a lot of emphasis on how creativity, innovation, and

technological progress support economic expansion. Romer (1990) developed a model that proposed that technological developments are the primary cause of higher productivity, which in turn leads to the creation of new products and systems that promote economic expansion. According to the methodology, in order to sustain a higher rate of innovation from the very beginning, a country need to devote a bigger proportion of its resources to research and development. This is because technology is always evolving and becoming more sophisticated. This method prioritizes resources above other considerations.

The third viewpoint focuses on a novel institutional interpretation of growth exercise modelling. As was previously said, both models considered the accumulation of money and the development of new technologies to be the main drivers of development, which might consider the factors that contribute to the disparities in the rates of growth among the countries.. The main question left unsettled by the above discussions was why countries with almost equal degrees of technological development, physical capital, also human capital could not make better use of their resources in order to get better results. The solution to this problem may encourage us in order to search for other elements that have an effect on physical capital, human capital, as well as technological innovation and, like an outcome, lead to variances in the development performance of different countries.

According to Robinson et al. (2005), theoretical traditions have long been incapable of offering a foundational explanation for the phenomena of economic development, even if they are still active in the field and have produced insightful discoveries about its mechanics. The aforementioned components—capital accumulation and technological innovation—according to the authors, are only means to a goal and do not deal with the core issue of differences in comparative development between nations. Because of this, Iyoboyi et al. (2018) argue that institutions should be taken into account as the main factor determining growth performance discrepancies among countries.

This study aims to look at how macroeconomic factors affect market performance using a novel institutional approach. The researcher claims that prior study on empirical methods, strategies, and geographical areas was insufficient in examining how economic expansion influences market performance. Even when there is a handful from Sub-Saharan Africa (SSA), they utilize other indicators (Abdullahi et al., 2019; Rasha et al., 2022) or techniques like analysis of time series for individual countries examples (Grabka, 2024). The majority of empirical researches are from Asia (Han, 2014; Zhijun & Juzhong, 2010). Thus, the key goal of this paper is to explore the association concerning market performance and economic growth utilizing a sophisticated, reliable panel data model of "two-step dynamic generalized moment of methods" (GMM). The following part encompasses a review of pertinent literature, which is how the rest of the article is organized. The third part examines research methods, comprising model definition issues and a synopsis of the used data types. Part four covers the analysis, and the last piece presents the findings.

Literature Review

Market Performance and Economic Growth

A contemporary discuss on development issues has focused on how important it is for a good business to be able to flourish economically. These days, experts and policymakers concur on the importance of macroeconomic variables for the advancement of a country. As to the UN development report, possessing strong core values may accelerate a country's progress through the development of a more robust market system, enhancing openness in public administration, stimulating innovation in investment, and aiding in the more effective implementation of development programs (Mee, 2005).

An extensive collection of studies based on factual evidence the roles that institutional components play in a country's economic growth. As an illustration, Kim et al. (2021) assessed the impact of company quality on 48 Asian countries' growth from 2005 to 2018. The quantile regression techniques used to panel data demonstrated that business quality had a major impact on the countries' development. The findings indicated that the pace of economic growth had an institutional limit. If the institutional metric increases beyond the limit, it will have a adverse impact on development. In a similar vein, Dickson et al. (2021) used a two-step GMM estimating technique to investigate the influence of market the influence of quality on economic expansion.

Bousquet et al. (2020) compared the influence that the quality of institutions has on the growth of the economy in countries in southeast Europe that are members of the EU and those that are not. The findings for the Government and economic development may be broken down into six aspects for all significant variables pointed to a long-term relationship among the institutional quality

and economic expansion in the European Union member states. Additionally, their research showed a negative long-term correlation between political steadiness and the lack of violence, economic development and voice and responsibility, government performance and regulatory quality. On the other hand, a long-term positive correlation was shown involving economic expansion and the upholding of the law and the suppression of corruption. Beyene (2024) looked explored the relationship between the characteristics of good governance and the economic development of eighteen Asia-Pacific countries between 2000 and 2017. Using the fixed-effect estimating technique, he found that most governance aspects had a significant influence on development, with the exclusion of voice and answerability. The research suggests that the most important factor driving growth is the effectiveness of the government. It was found that voice and responsibility had very little influence on promoting development.

Fikadu et al. (2021) examined the connection between market performance and the economic success of 15 Eastern African countries utilizing panel data from 2005 to 2016. They found a link between the inadequate economic accomplishment of African countries and their low institutional characteristic. Their outcomes demonstrate that although the lack of the rule of law has a detrimental impact on economic performance, corruption control and administrative efficacy have a positive impact. The results show that stronger institutions lead to higher economic performance in Eastern African countries. In contrast, Abdullahi et al. (2021) explored the association between the quality of an African sample of 46 nations' institutions and their economic progress from 2000 to 2015. They used the GMM intended for panel data in order to calculate the necessary parameters. According to their findings, a statistically significant relationship has been seen between economic growth and institutional quality, with the former having an indirect effect and the latter a direct one.

Time series data collected from many secondary sources were utilized in the Lorenz et al. (2022) research to investigate the connection between Ethiopia's economic progress and strong market performance. Based on his findings, appropriate governance has a significant influence on Ethiopia's economic development. In a similar spirit, Emara et al. (2023) investigated how the degrees of governance in several Middle Eastern and North African countries affected their relative rates of economic development. According to their results, a strong market had a large and beneficial consequence on economic growth throughout the course of the research period, with a rise in GDP of about 2% being seen for each instance in which the Composite Governance Indicator is increased by one unit.

Khan and Khan (2020) looked at whether, in economic downturns, market performance affects the economic expansion of developed and emerging countries. The outcomes of his study showed that the connection relating growth and market performance was largely unaffected by the existence of an economic crisis. The research confirmed that business value affects economic growth during financial crises and that differences in economic development levels across countries led to variations in crisis management.

Hypothesis Development

GDP and Market Performance

The Gross Domestic Product (GDP) of a country is the aggregate worth of all the goods and services that are generated within its borders as of a certain year.. It's regarded as a gauge of economic expansion.

Khan et al. (2021) define economic growth as a country's steady increase in domestic product and service production and consumption over a particular span of time. It is often gauged by variations in a country's Gross Domestic Product (GDP), which is an notable indicator of that country's overall economic progress and well-being. According to Alrabadi et al. (2021), the link between GDPS and governance quality—which includes the rule of law, accountability, and control over corruption—allows businesses to operate successfully. Lower pricing that result in higher profit margins might stimulate investment, employment growth, and general economic expansion (Alrabadi et al., 2021). GDP and market performance are inextricably related. A well-functioning infrastructure is essential for economic growth.

Thus, the following is the hypothesis:

H_1: Market performance is influenced by the GDP of developing economies.

Inflation Rate and Market Performance

A country's goods and services gradually increasing in price over time is referred to as experiencing inflation. The rate of increase in prices is known as the inflation rate. Frequently, the consumer price index is used to measure it. Sequeira et al. (2021) state that the impact of inflation on market performance has long been a topic of research and macroeconomic debate. According to Sequeira et al.'s empirical study, inflation has a detrimental influence on economic development and the market performance of businesses in emerging economies (2021). Elevated inflation is anticipated to hinder economic expansion by warping economic activity and decelerating GDP. A high rate of inflation affects market performance as well.

H2: Market performance is influenced by the Inflation rate of developing economies.

Interest rate and Market Performance

The interest rate is the amount that commercial banks pay interest on deposits made to the central bank and the amount that the central bank charges interest on loans to commercial banks. A commercial bank operates similarly, accepting deposits from clients and making loans. The interest rate that is applied to loans and deposits is known as the interest rate.

Controlling interest rates is essential to a healthy economy. It is vitally important to the functioning of government. The stability of the nation's interest rate affects governance. Thus, the writer proposes the following.

H_3: Market performance is influenced by the Interest rate of developing economies.

Exchange rate and Market Performance

When one nation's currency is exchanged for another, the rate at which this exchange takes place is referred to as the exchange rate. Indian rupees, for instance, may be exchanged at a rate of INR 60 for one dollar. Excessive inflation would increase the amount of external debt due by the government since it has increased the exchange rate and made the local currency depreciate more quickly than foreign currencies (Van Doan et al., 2020). The nation's growth rate will therefore slow. Additionally, the performance of the market will suffer. Nonetheless, we found that most developing countries saw a positive impact. Given that rising nations may provide larger returns on investment, foreign investors could be increasingly interested in stocks.

H_4: Market performance is influenced by the Exchange rate of developing economies.

Government expenditure and market performance

Government spending or expenditures include all government investment, transfer payments, and consumption. Barro & Grilli (2007). Spending by the government helps to improve governance. According to the Saqlain et al. (2020) report, the government should spend more on employment, education, and research and development in order to accelerate the country's economic growth. The success of the market is also impacted by the nation's economy. The following hypothesis serves as the basis for this study.

H_5: Market performance is influenced by the Government expenditure of developing economies.

Conceptual frame Work

The aim and purpose of this research is to link the macroeconomic variable and market performance. This research takes into account the GDP, inflation rate, interest rate, currency rate, and government expenditure as independent macroeconomic factors. The market serves as the dependent variable. Activity. In Figure 2.1, the conceptual framework is shown visually.

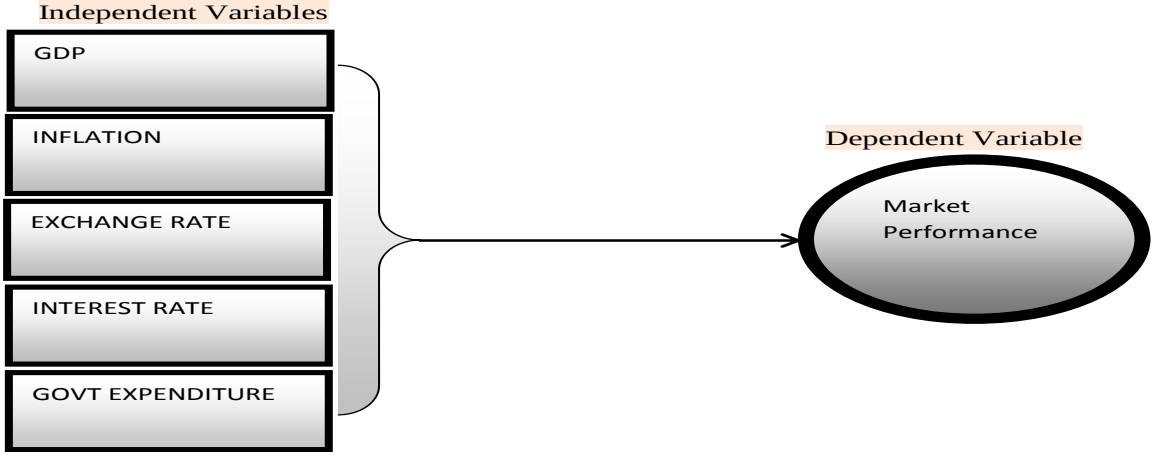

Figure 1: Showing the association between macroeconomic variables and market performance.

Research Methodology

Data, Sample and Population

The present research is quantitative due to the extensive review and discussion of the literature. The researchers make use of the Panel data type. Panel data was gathered across a variety of time periods from many firms. The population of the research consisted of all non-financial enterprises listed on Pakistani stock exchanges. The non-financial enterprises listed on Pakistan's stock exchanges comprise the study's sample. In this analysis, ten years of data—from 2014 to 2023—are utilized. The sources of the information for each variable are the yearly reports and the World Bank's Development Indicator dataset.

Variable Explanation

The performance of the market is the study's dependent variable.Tobins Q is used to calculate market performance. Tobin's q is estimated by dividing the replacement cost of all assets (COA) by the product of the market value (MV) of equity and the book value (BV) of debt (Turamari & Hyderabad, 2018; Song et al., 2008; Giannopoulos et al., 2021).

The Tobin's Q ratio was developed by Branard & Tobins in 1968. It shows the percentage difference between the targeted market value and the replacement value of the actual assets. According to Lindenberg & Ross (1981) and Smirlock et al. (1984), the replacement cost of all assets (COA) is divided by the market value (MV) of equity and the book value (BV) of debt to get the Tobin's q. The assembly sector in particular has employed Tobin's q to explain a wide range of corporate wonders. These include (a) the dissimilarities between venture and growing choices across different categories, (b) the relationship between value and company value, (c) the relationship between implementation and repercussions from the tricky proposition, opening, and delicate response, and (d) finance, profit, and compensation plan Chung and Pruitt (1994).

The model also includes important independent variables from the World Bank's Development Indicator dataset, such as GDP, inflation rate, currency rate, interest rate, and government expenditure, in addition to the market performance indicator previously stated. The PPP-adjusted constant GDP per capita, government expenditure, inflation, currency rates, and interest rates are the independent variables.

Econometric model

The Generalized Method of Moments (GMM), a dynamic panel data estimator, is used in this work to handle autocorrelation, fixed effects, and endogeneity, among other econometric concerns. GMM is commonly used in panel data analysis. For situations with "small T and large N" panels—which indicate a a minimal quantity of periods and a high number of people or observations—this wide estimator is meant to be used. It is also used for linear functional connections. In this study effort, a 2-step GMM estimator is used for all estimations since one-step estimates may lead to heteroscedasticity.

This study's regression model looks like this,

$$TQi,t = \alpha + \delta_0 TQi,t-1 + \delta_1 GDPi,t + \delta_2 INFi,t + \delta_3 EXCHRATEi,t + \delta_4 IRATEi,t + \delta_5 GOVTEXi,t + \varepsilon i,t \quad (1)$$

The relationship between market performance, GDP, inflation, interest rates, currency rates, and government spending is shown in Equation (1). The intercept is represented by α, the coefficient by δ(1-δ0), and the error term by ε.

Analysis

Descriptive Analysis

Descriptive statistics provide a thorough and clear representation of the data. Important components of descriptive statistics are observation, standard deviation, mean, minimum as well as maximum values. The variables' essential aspects are succinctly summarized in Table 1's descriptive statistics.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TQ	800	123.411	8.611	111.891	136.234
GDP	800	4.381	2.19	-1.274	6.487
INF	800	8.003	4.751	2.529	19.874
EXCRATE	800	131.719	34.323	101.1	204.867
IRATE	800	7.033	.685	5.774	8.784
GOVTEX	800	43.633	16.862	13	73

Pakistan's descriptive statistics are included in the table. TQ for the performance of the market. The dependent variable is TQ. The terms "gross domestic product," "inflation," "exchange rate," "interest rate," and "government expenditure" (GOVTEX) all refer to independent variables.

Correlation Matrix

The current research applies a correlation matrix to examine the collinearity between variables. Pakistan's correlation matrix is shown in Table 2. Every variable has correlations that are less than 70% (Greene & Hensher, 2003; Gujarati & Porter, 2010; Khan et al., 2022). This does not constitute an issue with multicollinearity.

Table 2. Pearson Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) TQ	1.000					
(2) GDP	0.173***	1.000				
(3) INF	0.721***	-0.024	1.000			
(4) EXCRATE	0.775***	-0.102**	0.893***	1.000		
(5) IRATE	0.097*	0.005	0.094**	0.127***	1.000	
(6) GOVTEX	0.000	0.000	0.000	-0.000	-0.030	1.000

*The Pearson correlation coefficients among the variables are shown in Table 2, along with the significance levels of each correlation. Table 1 has a description of the variables. Statistically significant values are represented by the symbols ***, **, and *, with 1%, 5%, and 10% meanings, respectively.*

Variance inflation factor

Furthermore, the current study makes use of a variance inflation factor in order to evaluate the collinearity that exists between individual variables. A representation of Pakistan's Variance Inflation Factor (VIF) may be seen in Table 3. When the Variance Inflation Factor is less than 10, it suggests that there are no problems with multicollinearity (Gujarati & Porter, 2010; Khan et al., 2018). In light of this, the data may be used for further study.

Table 3. Variance Inflation Factor

	VIF	1/VIF
EXCRATE	5.146	.194
INF	5.049	.198
GDP	1.034	.967
IRATE	1.028	.972
GOVTEX	1.001	.999
Mean VIF	2.379	

Generalized Method of Moments

For the purpose of estimate, this research makes use of the dynamic panel data estimator, often known as the Generalized Method of Moments (GMM). These findings are shown in Table 4.

Table 4: Estimation Results for Pakistan

Regressor	Model	Prob: value
L.TQ	-.393***	0.00
GDP	.66***	0.00
INF	-.282***	0.00
EXCRATE	.28***	0.00
IRATE	17.605***	0.00
GOVTEX	5.831***	0.00
Constant	0.213***	0.00
Year Dummies	NO	
AR(1)	0.029	16.24
AR(2)	0.695	0.357
Hansen	0.14	0.397
No. Of groups	80	-
No. Of instruments	74	-
No of observations	740	-

Table presents the GMM step two results. ***, **and * are significance at 1%, 5% and 10% respectively.

Empirical Results and Discussion

Table 4 presents the results of the empirical research conducted in Pakistan. The results of the study provide evidence that the F-statistics for each variable are statistically significant. GDP has a positive coefficient of TQ, which suggests that GDP investment enhances both the value of the company and the performance of the market. The conclusion reveals that GDP increases market performance.

Further evidence in favor of the stakeholder paradigm is provided by the positive benefits that GDP has on TQ. In accordance with the stakeholder idea, the best actions and performance raise the value of the firm throughout the course of its long-term existence. According to Weber (2008), the quality of market performance serves as a significant factor in determining economic growth.

The findings of this research reveal that there is a negative association between inflation and total quality of performance (TQ). This finding is consistent with the hypothesis that inflation has a significant negative influence on the quality of firm performance. This conclusion is in line with the findings of a significant number of other empirical studies that have been conducted in the past. that have been well confirmed (M. Abdullahi et al., 2019; Khyareh & Amini, 2021).

The result reveals that there is a positive association between TQ and the exchange rate for the currency. It suggests that Pakistan's economy and the increased performance of the market are being hindered by the exchange rate. All of these factors have been found to have a significant negative influence on economic growth via rises in exchange rates. Weak procedures to prevent corruption, inept administrations, and problems with the right implementation of the law are all examples of these factors. Megaravalli and Sampagnaro (2018) revealed that currency rates had a positive influence on governance, which is in contradiction to the findings of Dahir et al. (2018).

In addition, the data indicate that there is a positive correlation between the interest rate and TQ. An increase in the demand for current supply has led to an increase in interest rates, because of this, there has been a rise in the amount of money earned and dividends of companies. This has a good consequence on the views of investors, which in turn causes them to want the shares of the firms, which in turn drives up the price of the shares and encourages economic growth. Nebojša et al.'s study from 2020 and Paitoon and Panawong's research from 2023 both provide evidence that supports this result.

The relationship between government expenditure and TQ is one that is both statistically significant and beneficial. Increasing competitiveness, lowering transaction costs, increasing trade, and increasing productivity are all essential drivers of economic development and the nation's exceptional level of governance (Selvamani et al., 2023). Strategic and effective government investments may raise competitiveness, increase trade, and increase productivity simultaneously. Both the firm's performance and its market value are improved as a result of these efforts.

In addition, Table 4 demonstrates that there is a negative first-order serial correlation (AR(1)) that is accessible, and according to the second-order serial correlation (AR (2)), there was no second-order serial correlation discovered throughout the investigation. On the basis of the results of the Hansen test, it has been determined that there is no possible link between the error term and the instruments. This suggests that the instruments are authentic, moreover, it is not possible to reject the null hypothesis for any of the variables. As an additional point of interest, the reveals that there are 74 instruments and 80 groups.

Conclusion

The primary objectives for doing this research are to analyze the numerous methods in which macroeconomic variables influence the performance of Pakistan's business market between the years 2014 and 2023. This research contributes to the existing body of knowledge by using features at the nation level rather than by focusing on aspects at the business level. For the purpose of this paper, GMM was used to look at panel data. On the basis of the empirical data that have been gathered in Pakistan, it is possible to assert that macroeconomic variables contribute to the market performance of enterprises that are located there. When it comes to non-financial enterprises, prospective and present domestic and foreign investors and shareholders, management, and policymakers, the results of the current research study have a broad range of implications. The findings of the present research indicated that the influence of macroeconomic factors has a positive impact on the overall performance of the market. It is also necessary for the local and international potential that stands to benefit from the macroeconomic factors to be aware of this information. The findings of this research provide shareholders and investors with information that assists them in making judgments on

whether or not to invest in macroeconomic conditions. The fact that rising countries are often linked with lower levels of macroeconomic stability makes perfect sense of course. In order for developing countries to enhance their position, they should make it a priority to raise the level of their economic development. As a result, developing countries have to implement a variety of macroeconomic policies in order to enhance the level of market performance. Furthermore, it is suggested that further macroeconomic topics be investigated in the course of future research. As a result, this will be of assistance in explaining how the performance of the market is affected by macroeconomic factors that include more complex interconnections. In addition, it is recommended that more study be conducted on the effect of macroeconomic conditions on corporate governance. It is also advised that more study be conducted on the mediating and intervening variables in combination with those pertaining to macroeconomic difficulties.

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