

Stock Market Capitalization and its Macroeconomic Determinants: An Empirical Investigation from Emerging Economy

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ABSTRACT

The stock market's significance has extended beyond the domestic borders since it is playing a crucial role in attracting foreign direct investment by providing a transparent and regulated platform for investment. Foreign investors are attracted from countries with robust and well-regulated stock markets, contributing to economic growth, job creation, and technology transfer. We estimated the long-run & short-run effect of economic forces on capital market of Pakistan during 1980-2019. Results show that the development in the banking sector and gross domestic product positively while inflation, trade openness and foreign direct investment negatively influence the development of capital market. While in short-term only gross domestic product, inflation, and foreign direct investment is found to be significant. The negative value of error correction term indicates that if the variables vary from the level of equilibrium by 1% in the short term, they will return to equilibrium at a rate of 74.3% each year. The study has significant practical implications for the policy makers and government officials regarding the development of stock market.

1 Introduction

The stock market holds immense importance as a key component of a thriving economy. It serves as a vital platform for companies to raise capital and investors to participate in the growth potential of businesses. At its core, the stock market provides an avenue for companies to issue shares to the public, allowing individuals and institutions to become shareholders and partake in the ownership of these enterprises (Hamrita & Trifi, 2011). One of the primary functions of the stock market is to facilitate capital formation. By enabling companies to raise funds through the sale of stocks, the market acts as a catalyst for economic expansion. The capital raised can be utilized by companies to finance research and development initiatives, expand their operations, and invest in new technologies. This injection of capital fuels innovation, productivity, and job creation, ultimately stimulating economic growth.

On a more local level, the growth of stock markets may be almost entirely ascribed to the emergence of various distinct perspectives on how assets should be valued. This is true both globally and locally.

This is because the concepts in question have made it feasible for investors to get a value that is more accurate for their assets (Omar et al., 2022). These numerous models examine the fundamental share price of a company and may be used to calculate the cost of a company's stock. The stock price of a company can be calculated with the assistance of these various models, which can also be utilized as a price determinant of the stock. As a direct result of this, the principles discussed here are of utmost significance to the expansion of the stock markets (Ho, 2017).

In addition, the stock market serves as a barometer of the overall health and sentiment of the economy. Fluctuations in stock prices reflect investors' perceptions and expectations about the future performance of companies and the broader economic landscape. Positive developments, such as strong corporate earnings or favorable economic indicators, tend to drive stock prices higher, instilling confidence in the market and encouraging investment (Salameh et al., 2022a). Conversely, negative news or economic uncertainties can lead to a decline in stock prices, signaling caution and influencing investment decisions. The stock market also plays a crucial role in resource allocation. It provides investors with a wide array of investment options, allowing them to allocate their capital based on their risk appetite, investment goals, and time horizon. This allocation of capital to diverse companies and sectors supports the efficient allocation of resources within the economy. It channels funds to industries with high growth potential, fostering innovation and competitiveness (Shahbaz, Rehman, & Afza, 2016).

Because of the role that it plays in the distribution of easily available resources, the financial system is a crucial component of the effective functioning of the economy. This is because of the part that it plays in the distribution of resources (Salameh et al., 2022b). The rate at which economic growth is occurring is one of the primary sources by which the stock market players may have the ability to have a helpful impact on market growth rate. This is one of the main sources through which financial market players may have the ability to have a positive impact on the expansion rate. One of the channels that may be used is the one that lowers the expenses associated with information and transactions. Additional routes include the encouragement of the creation of risk-sharing markets and instruments, the growth in saving rates, and the pooling of funds, risk diversification, liquidity management, and monitoring. Other channels include the enhancement of resource allocation. (Naceur et al, 2007).

Few recommended macroeconomic variables that need to be reviewed are the expansion of the economic sector, the level of inflation, the amount of direct foreign investment, and the degree to which trade is open. Others include the degree to which monetary policy is restrictive. Among the many other possible fields of business, the expansion of the banking industry is one of the probable fields that might be examined further (Liu et al., 2022). There are also many other possible sectors of business. The current body of research provides a variety of perspectives on the topic of the connection between the progress of the banking sector and the development of the stock market, in particular as it relates to the achievement of an important financial role for the economy. This topic has been the subject of a significant amount of research in recent years. These points of view are presented as a component of the most recent body of research, which may be discovered on this page (Omar et al., 2022).

During the most recent few years, this topic has attained a greater quantity of academic journals coming from a wide range of distinct points of view. In the framework of these points of view, attention is given to the challenges faced by organizations, the composition of corporate governance, and the propagation of dangers that span many periods (Bhide, 1993). On the other hand, several studies argue that the dialogue concerning the advantage of free-floating financial system over bank regulated financial system should be put on the back burner in favor of giving more weight to the entirety of the financial market. It is believed that a free-floating financial system is considered efficient than bank regulated financial system. This is due to the widespread belief that financial

systems based on markets are more effective at meeting one's needs than those based on banks (Merton & Bodie, 1995; Levine, 1997). Likewise, Levine (2005) has hypothesized that the stock market and banks, both of which offer financial services to the economy, complement one another, which is supported by the fact that both of these organizations provide these services. Based on this inadequate theoretical framework and empirical analysis, it is possible to evaluate that the share market and the financial services industry are complementary to one another and have close ties. However, this conclusion should not be relied upon to reach a definitive verdict by Garcia and Liu (1999), Ben Naceur et al. (2007), and Andrianaivo and Yartey (2010).

In addition, the development of the stock market is seen as a way to invest money in businesses that have a chance of continuing to exist and being successful (Ho, 2018). Not only does a thriving stock market encourage the creation of new capital, but it also helps an economy make better use of the money it already has. This dual effect is the result of the stock market's ability to attain potentially new business entities. When it comes to the benefits that come along with a thriving stock market, you get two for the price of one. Moreover, the performance of the agricultural, industrial, and service sectors as a whole is impacted by the availability of financial resources made accessible by capital markets. This is the case whether the sector in question is agricultural, industrial, or service (Hautcoeur, 2006). This is because the rate of total economic growth is directly proportional to the amount of these available resources. The capital market not only acts as a magnet for investors by providing investment opportunities that provide returns on investments that are appropriate for the amount invested, but it also enables investors to take part in long-term investment projects by providing the necessary financing for such projects, which in turn enables investors to take part in such projects. This cycle continues as long as the capital market continues to provide the necessary financing for such projects (Omar et al., 2019). Capital markets not only contribute to an expanding research and development expenditures, but they also contribute to a similar expense raise in production sector productivity by promoting the development of infrastructure and creating job opportunities. Capital markets also contribute to an expanding research and development expenditures to raise production sector productivity. If the capital market is strong and technologically proficient, it is beneficial to attract foreign direct investment into local industries. This, in turn, serves to boost economic growth. From the information that has been presented, it is clear that the role of stock markets in boosting economic growth is of the highest importance (Shahbaz, Rehman, & Afza, 2016).

On the subject of the nature of the connection that exists between FDI and SMD, several separate pieces of research present points of view that are opposed to one another and contradict one another in a striking manner (Fernández-Arias & Hausmann, 2000). In other words, these two schools of thought are in direct opposition to one another. In a nutshell, we may say that these two schools of thinking are opposed to one another. It is a fascinating and puzzling occurrence that direct investments from other countries opt to go to countries that are not as financially developed as others and have banking institutions that are not as strong as others do (Wang et al., 2022). Because of this, nations that do not have highly developed financial markets are compelled to rely on investments made by direct investors from other nations rather than on debt or equity financing as their primary source of funding. This is because debt or equity financing can be riskier than investments made by direct investors from other nations. This is because debt and equity financing are considered to be more hazardous investments.

On the other hand, Claessens, Klingebiel, and Schmukler (2001) found that nations that have good financial institutions and economic policies are more likely to entice external direct investment. This, ultimately, helps contribute to strengthening of such countries' financial institutions, most notably their stock markets. One way in which foreign direct investment (FDI) benefits the stock market is by encouraging a bigger number of firms to engage in capital markets. This is only one of the many ways in which FDI is beneficial. The FDIC assists the stock market in a variety of ways, including this one.

This is the justification for the prevalent practise of foreign investors funding their investment projects using monies provided from outside of the country. One additional benefit of FDI is that it helps enhance liquidity of market. This is kind of a double-edged sword, but it is one of the advantages of FDI. This benefit is accomplished as a direct result of the widespread habit among international investors to purchase and sell existing shares of stock on local stock exchanges. This activity results in the accumulation of capital. There is evidence that supports both of these hypotheses, even though they seem to be incompatible with one another. This evidence comes from a broad variety of empirical investigations that have been conducted. Jeffus (2004) and Abdul Malik & Amjad (2013) conclude that FDI and the expansion of stock markets are favorably connected. On the other side, Rhee & Wang (2009) find there is a negative correlation between FDI and liquidity of stock markets. This finding contradicts the findings of the previous research.

The markets and the financial intermediaries' organizations such as banks, insurance companies, and pension funds, amongst others, are some examples of the types of organizations that are included in this category, which are the two fundamental components that make up financial systems. Financial systems are comprised of both marketplaces and other types of financial intermediaries (bond and stock markets). After passing through a myriad of distinct financial intermediaries and markets, the vast majority of the money that is available to an economy is eventually put to use in a manner that contributes to the economy's growth (Campell, Lo, & MacKinley, 1997). The financial system is comprised of the many marketplaces and intermediaries mentioned above. Given that pace of money market is a primary driver of the future development of an economy over the long term, it is essential for there to be an efficient financial system in place for there to be economic growth. This is because the rate at which capital is accumulated is a primary driver of the future economic progress. The term stock market development (SMD) is an expansion of the stock market as a whole that remains contingent on a wide range of diverse elements. It was determined, in the vast majority of cases, based on the characteristics of the stock market, such as its market size, rate of liquidity, volatility scenario, concentration, relationship with the international money market, and the existence of financial market regulations. As an instance, stock market volume is a major factor in determining whether or not a company will go public (Garcia & Liu, 1999). In conclusion, the stock market is of paramount importance to the functioning of a healthy economy. It facilitates capital formation, drives economic growth, allocates resources efficiently, and promotes transparency and accountability. As investors and businesses engage in the stock market, it becomes a dynamic hub where capital meets opportunity, ultimately contributing to the progress and prosperity of nations.

This study examines the impact of macroeconomic forces on stock market capitalization of Pakistan during the period of 1980 to 2019. The selected variables are economic growth, inflation, banking sector development, trade-openness and foreign direct investment. Thus, the primary objective of the study is to investigate to what extent the market capitalization of Pakistan economy is pronounced by these forces. This study is contributed in the existing vein of empirical literature by several ways such as it is the first study of its nature who address the emerging economy using the data of latest time period and incorporate the most relevant variables to the emerging economy. The study is primarily based on Capital Asset Pricing Model (CAPM) presented by Sharpe (1964) on the idea of portfolio selection that were previously presented by Markowitz (1952). CAPM model often regarded as one of the oldest financial theories and deemed as a standard approach for evaluating stock returns.

The remainder of the paper is organized as follows. Section 2 covers the past studies addressing the same issue, section 3 discussed the methodology, section 4 is about results and discussion and section 5 is on conclusion, limitations and recommendations.

2 Literature Review

Sharpe (1964) and Lintner (1965) are credited with the development of the Capital Asset Pricing Model (hereafter CAPM) in the 1960s. This model draws on the idea of portfolio choice that was first presented by Markowitz (1952). The Capital Asset Pricing Model (CAPM), often regarded as one of the oldest asset pricing theories, is also a standard approach for evaluating the returns on stocks. Another name for the CAPM is the Capital Asset Pricing Model.

In a study that was carried out by Sharpe (1964) and published in 1964, and which received a great deal of attention due to the significance of its findings, the author stated that diversification assists investors in avoiding all risks, except those risks that are produced by fluctuations in the amount of general economic activity. In other words, diversification does not help investors avoid the risks that are produced by fluctuations in the amount of general economic activity. Every stock is exposed to a level of systematic risk that is exactly proportional to the economic and political environment in which it operates. This risk is referred to as market risk. The premium that is attached to this risk is known as the systemic risk premium. Market risk is another name for the dangers that come with participating in the market. Depending on how it influences the firm, this threat might be categorized as either a market risk or a business risk. There are instances to be found in every one of these categories. Diversification alone is not enough to completely liberate even the most lucrative portfolios from the shackles of systematic risk, as the lessons that history has taught us to reveal. The capital asset pricing model (CAPM) is a technique that may be used to assess the amount of risk that is related to the prospective return on investment. This can be done by analyzing the relationship between the two variables. This may be achieved by focusing only on how the behavior of an asset changes in response to the volume of economic activity. Diversification is a strategy that, when used, can make it possible to decrease the amount of unsystematic risk. When effectively executed, this strategy can make it possible to minimize the amount of unsystematic risk (Omar et al., 2022).

Mugableh (2021) used data that is collected on an annual basis and presented in the form of a time series, we conduct an analysis in which we uncover the elements that are responsible for the growth of the stock market in Jordan. This analysis is carried out with the use of the time series (1978–2019). During the investigation of cointegration, the autoregressive distributed lag methodology was utilized, and the vector error correction model was used to estimate (both long-run and short-run) causal connections. These two methods were effective in identifying whether or not cointegration was present in the data. These two strategies, when applied to their respective projects, were both able to attain the levels of success they had aimed for. They are two separate models, although they were utilized together at the same time in combination with one another. In the next paragraphs, an analysis of these two approaches will be offered, during which time each tactic will be dissected into its component pieces, and then compared to the other approach. According to the conclusions of the research, important macroeconomic are major indications of future growth in the stock market. He suggested that stock market growth could be accomplished in three distinct ways: first, by raising the overall level of competition; second, by strengthening the institutional framework; and third, by lowering trade barriers through the formation of a partnership between foreign private investment enterprises and government agencies. These three ideas are intricately intertwined with one another and cannot be separated. These three pursuits are unquestionably necessary for the stock market growth.

The purpose of the research that Asravor and Fonu (2021) carried out was to have a more in-depth comprehension of the elements that affect the Ghanaian stock market. Using the ARDL cointegration methodology, they examined the long-term and short-term correlations that exist between Ghana's macroeconomic characteristics, stock market returns, and economic growth. Several connections may be found between the many macroeconomic aspects of Ghana. It was found that a number of the macroeconomic indicators were all cointegrated with one another. According to the results of the study, the expansion of the stock market is hampered by a variety of elements, including the size of

the money supply, the rate of inflation, and the quantity of human capital that is available. On the other hand, this rise is being supported by a variety of different elements such as the interest rate, as well as the amount of direct investment coming from outside sources.

According to Chiad and Hadj Sahraoui (2021), the Arab stock markets have seen substantial expansion over the previous several decades, which has resulted in tremendous growth. Both a rise in the total market capitalization of the stock exchange as well as an increase in the number of businesses that are publicly listed on the stock exchange are indicators of the expansion of the stock market. In addition, the number of businesses that are publicly listed on the stock exchange is another indicator of the expansion of the stock market. Also, there has been an increase in the number of firms that are participating in public stock trading on the stock market. This trend can be seen in recent years. In light of this phenomenal growth, they made an effort, intending to gain a deeper comprehension of the phenomenon and to identify the most significant aspects of the economic factors that contributed to the development of this pattern from 2006 to 2017. Using panel data models, they were able to get to the conclusion that trade openness, market liquidity, money supply, and economic development all had a positive impact on the growth of the stock market. This was a result that they were able to reach. This turned out to be a very important discovery. On the other side, there was a negative effect brought about by the global financial crisis. They advised that actions should be taken to boost market liquidity, limit the money supply, and maintain a balanced economic growth rate to make it simpler for Arab stock markets to thrive in light of these results.

Several studies have shown that the stock markets in developing countries are likely to respond to a diverse range of macroeconomic factors. This study lends weight to the premise that emerging countries would keep experiencing economic expansion in the years to come to Panta (2020). These indices take into consideration not only the overall gross domestic product of the country but also the currency exchange rate as well as the number of goods that are imported into and exported from the nation (GDP). According to his view, the stock market is an important and inescapable component of the financial market if there is sufficient demand for a range of financial commodities. This need must exist for the stock market to exist. This is the case regardless of the level of interest that there is. This is the case under circumstances in which there is a significant gap between the amount of a certain financial commodity that is available and the amount of demand there is for that commodity. It would seem from that the stock market is always there wherever there is a large demand for several different financial items. This conclusion can be drawn from the fact that the stock market is always present. It's feasible that demand for this product may come from any region in the whole world. To put it another way, trades may take place on the stock market at any hour of the day or night. When it comes to investing in the stock market, one of the many questions that shareholders need to address for themselves is whether or not they should anticipate a higher rate of return on their assets. This is only one of many things we should be worried about. An excellent illustration of one of these components is provided by the macroeconomic indicators.

3 Methodology

3.1 Autoregressive Distributed lag Model (ARDL)

The ARDL bounds testing approach as a means of investigating the long-term connections that exist between the SMD and the macroeconomic forces that influence it; this is the approach that Pesaran, Shin, and Smith (2001) use to investigate these connections. This methodology has several benefits over other typical cointegration approaches, such as the ones established by Engle and Granger and Johansen and Juselius. These advantages include: These benefits may be traced back to a wide variety of various fields of research. The integration of each variable is needed to take place in the same order as outlined by the usual techniques for cointegration.

$$\begin{aligned}\Delta \ln MC_t &= \alpha_0 + \sum_{i=1}^k \alpha_{MC} \Delta \ln MC_{t-i} + \sum_{i=1}^k \alpha_{GDP} \Delta \ln GDP_{t-i} + \sum_{i=1}^k \alpha_{INF} \Delta \ln INF_{t-i} \\ &+ \sum_{i=1}^k \alpha_{BNK} \Delta \ln BNK_{t-i} + \sum_{i=1}^k \alpha_{FDI} \Delta \ln FDI_{t-i} + \sum_{i=1}^k \alpha_{TRO} \Delta \ln TRO_{t-i} \\ &+ \beta_{MC} \ln MC_{t-1} + \beta_{GDP} \ln GDP_{t-1} + \beta_{INF} \ln INF_{t-1} + \beta_{BNK} \ln BNK_{t-1} \\ &+ \beta_{FDI} \ln FDI_{t-1} + \beta_{TRO} \ln TRO_{t-1} + \mu_t\end{aligned}$$

The abbreviations *MC* refers to market capitalization (% of GDP), *GDP* refers to annual %age change in real gross domestic product, *INF* refers to %age change in consumer price index, *BNK* refers to domestic credit to private sector, *FDI* refers to net inflows as a % of GDP, and *TRO* refers to sum of exports and exports as a share of GDP. The natural logarithm was taken of every variable. Where μ_t , α , and β respectively, stand for the disturbance term, the short- and the long-run coefficients of the model. The symbol Δ for the first difference operator is the letter, and the symbol for the time period is the letter *t*. *K* is representing for the maximum number of lags that may be applied for both dependent and exogenous variables. To determine the maximum number of delays that may be included in a model, the Schwarz criterion (SC) is used. The theoretical and empirical research that was described in the part before this one served as the foundation for the decision-making process that led to the selection of these macroeconomic factors.

To determine whether or not cointegration occurs between variables, the joint significance of long-run coefficients β_{MC} , β_{GDP} , β_{INF} , β_{BNK} , β_{FDI} , and β_{TRO} is evaluated by conducting a test based on the H_0 that there is no relationship characterized by cointegration. This allows one to determine whether or not cointegration does occur.

$$H_0: \beta_{MC} = \beta_{GDP} = \beta_{INF} = \beta_{BNK} = \beta_{FDI} = \beta_{TRO} = 0$$

If it is found that the variables are cointegrated, the following error-correction model is utilized to estimate the short-run correlations between the variables:

$$\begin{aligned}\Delta \ln MC_t &= \alpha_0 + \sum_{i=1}^k \alpha_{MC} \Delta \ln MC_{t-i} + \sum_{i=1}^k \alpha_{GDP} \Delta \ln GDP_{t-i} + \sum_{i=1}^k \alpha_{INF} \Delta \ln INF_{t-i} + \\ &\sum_{i=1}^k \alpha_{BNK} \Delta \ln BNK_{t-i} + \sum_{i=1}^k \alpha_{FDI} \Delta \ln FDI_{t-i} + \sum_{i=1}^k \alpha_{TRO} \Delta \ln TRO_{t-i} + \beta_{ECT} ECT_{t-1} + \mu_t\end{aligned}$$

where β is the coefficient of the error-correction term, ECT_{t-1} ; β the expected to have a negative sign. It indicates that in the short run, if the levels of the variables deviate from their equilibrium levels, they can quickly revert to their original levels. Here, we use the annual time series data 1980 to 2019. The time period was completely determined by the readily available information, and the data that downloaded from the World Bank's website. The rational behind taking the data period till 2019 is that Covid-19 was started at the end of 2019 and last till 2021, therefore in order to avoid result biasness the study period is limited to 2019.

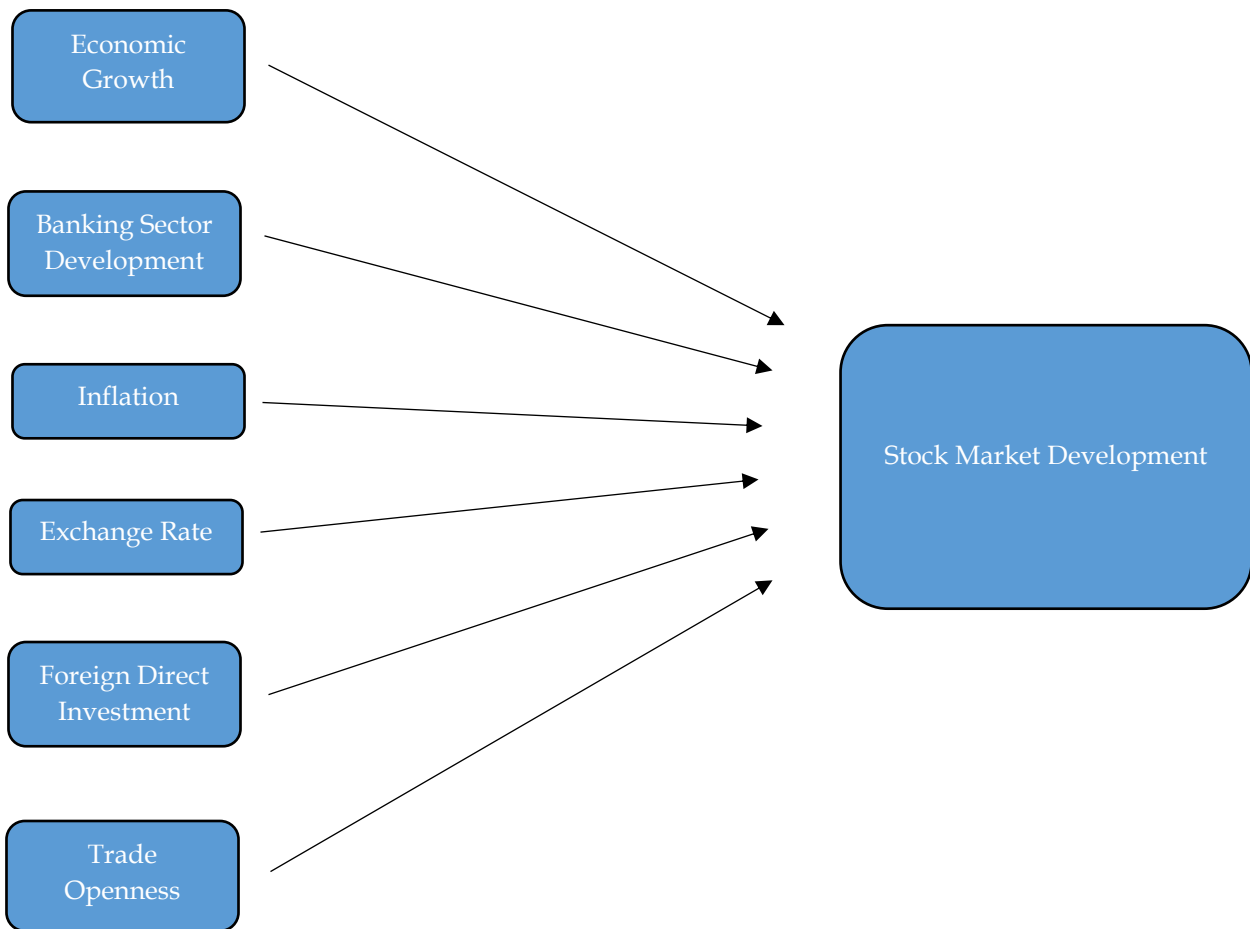


Figure 1
Theoretical Framework

4 Result & Discussion

4.1 Descriptive Statistics

The macroeconomic factors that impact SMD's performance are shown in Table 1, together with the descriptive statistics that are used to describe SMD. So, these are the results of the descriptive statistics obtained with the help of EViews. Descriptive statistics provide us Measures of central tendency (Mean & Median), Measures of dispersion (Standard deviation) & measures of normality. Descriptive statistics EViews provide us the value of mean & median. The mean value of GDP is 6.42, median 6.24, maximum 11.31 and minimum value of GDP is 3.95. The standard deviation showed by GDP is 0.52. The statistics for inflation show the mean value 3.61, median 3.65, maximum value 5.19, minimum value 2.02, standard deviation was reported as 0.98. Banking sector development showed the descriptive values as follows, mean 3.11, median 3.18, maximum value 3.39, minimum value 2.73 and standard deviation was 0.182. The FDI mean value was -0.38, median was -0.43, maximum value was 1.28, minimum value was -2.27 and the standard deviation was 0.73. The descriptive of trade openness were mean 3.47, median 3.49, maximum 3.65, minimum value 3.23, and standard deviation was 0.11. Two collections of data could be discovered at the same location. Since the high variation in INF is 0.98, this indicates that there was substantial volatility in the wholesale price index during the whole sample period. This is inferred from the fact that the INF's high standard deviation was measured. This is shown by the fact that the standard deviation of the INF rate is rather large. The FDI has a range that begins at a low of -2.27 and goes all the way up to a high of 1.28, with a value of -0.38 serving as the mean value somewhere in the middle of these two extremes.

Table 1
Descriptive Statistics and Correlation Matrix of the Variables

	MC.	GDP.	INF.	BNK.	FDI.	TRO.
Mean.	4.774600	6.429111	3.613729	3.116372	-0.386542	3.476372
Med	4.836100	6.246111	3.658239	3.186738	-0.433527	3.496437
Max	5.771111	11.319999	5.199672	3.393287	1.286627	3.652299
Min	3.951111	5.702355	2.023267	2.737890	-2.277374	3.232768
Std. Devi.	0.451117	0.523476	0.983465	0.182678	0.738349	0.112890
Skew	0.002154	0.385241	0.015679	-0.670997	0.074587	-0.702349
Kurtosis	2.812871	1.653727	1.732415	2.312635	3.578923	2.756780
Summ Sq. Dv.	7.898821	10.57232	38.43254	1.314279	21.28232	0.487439

4.2 Results of Stationarity Tests

Next, we will analyze the connection between the expansion of the stock market and the sets of macroeconomic factors that impact it. To begin, we will investigate the characteristics of the variables to evaluate whether or not they are stationary. The variables are dissected into their component components, which are represented by the notations $\ln\text{MCR}$, $\ln\text{BNK}$, $\ln\text{GDP}$, $\ln\text{INF}$, and $\ln\text{FDI}$, respectively. Unit root tests are what we use to determine whether or not they are stationary, and they include the following components to do so: The generalized Dickey-Fuller least squares test, often known more commonly by its abbreviation, DF-GLS. Table 2 displays the results of the unit root tests that were run on the variables that were explored at the levels and the initial differences. These tests were performed on the variables to determine whether or not there was a root unit. It indicates that certain variables, such as $\ln\text{MCR}$, $\ln\text{GDP}$, $\ln\text{INF}$, and $\ln\text{TRO}$, are stationary in levels, whilst other variables, such as $\ln\text{BNK}$ and $\ln\text{FDI}$, are stationary at the first difference in their values. This is shown by the fact that these variables do not change.

Table 2
Outcomes of Unit Root Tests of the Variables in Levels and at the First Differences

Variable	Measurement	Without-trend	I (0,1)	With-trend	I (0,1)	Without trend	I (0,1)	With trend	I (0,1)
Dickey-Fuller generalized least squares (DF-GLS) test									
$\ln\text{MCR}$	MCR	-2.65*	0	-2.68	0	-8.65***	1	-6.47***	1
$\ln\text{GDP}$	LN-GDP per capita (current US\$)	-0.34*	0	-1.99	0	-5.94***	1	-5.99***	1
$\ln\text{INF}$	LN-CPI (Annual % Change)	-2.68*	0	-2.58	0	-6.12***	1	-6.04***	1
$\ln\text{BNK}$	LN-Broad Money Supply (% of GDP)	-1.29	0	-3.26*	0	-5.40***	1	-5.41***	1

InFDI	LN-FDI net inflows (% of GDP)	-2.11	0	-2.17	0	-5.31***	1	-5.57***	1
InTRO	LN-Imports plus Exports as a % of GDP	-2.35*	0	-2.64	0	-6.52***	1	-6.46***	1

Notes: *, **, *** significant at the 10, 5 and 1 percent levels.

4.3 Empirical Analysis by Using the ARDL Bounds Testing Procedure

Because of the different orders in which the variables are integrated, it is essential to employ the ARDL limits testing technique even when not all variables are integrated in the same order. This is due to the changes in the variable integration order. This is the case regardless of the sequence in which the variables are integrated into the equation. To complete this task, the Vector Autoregressive (VAR) lag order selection strategy is implemented as the method for determining the lag length of the variables. The outcomes of carrying out this process are shown in Table 3, which can be seen down below. It is essential to check the lag order from the very beginning of the process since the choice of lag length has the potential to affect the value of the ARDL F-statistics. This is because the choice of lag time has the potential to affect the value of the ARDL F-statistics. We are unable to conclude which criterion to adhere to based on the data since the ideal lag time that is provided by any of the criteria is 1.

Table 3
Selection of Optimal Lag Length

Var. lag length order selection criteria						
Lag	LnL	LRT	FPER	AC	SIC	Hq
0	59.17956	N/A	3.25e-11	-1.799977	-3.498316	-3.692648
1	301.9070	235.8881*	0.99e-15*	-13.41726*	-9.00398*	-10.55863*
2	486.5621	46.84553	1.87e-15	-11.13580	-8.600991	-13.52597

It is possible to determine whether or not variables are cointegrated by determining a long-term relation between SMD, GDP, INF, BNK, FDI, and TRO. This can be done by looking at the relationship between these variables.

In addition, the testing of the null hypothesis of no cointegration connection is used to assess the combined relevance of long-term coefficients β_{MC} , β_{GDP} , β_{INF} , β_{BNK} , β_{FDI} and β_{TRO} .

This is done by combining the results of each of the previous steps.

$$H_0: \beta_{MC} = \beta_{GDP} = \beta_{INF} = \beta_{BNK} = \beta_{FDI} = \beta_{TRO} = 0$$

The results of the ARDL model are shown in Table 4, and Table 5 provides a breakdown of the lower and upper limit critical values for several different degrees of statistical significance. The links that are given may be used to go to any of the tables. The highest limit that was stated by Pesaran et al. (2001), which was $I(1)$, is much lower than the value of the F-statistics, which is 5.219. As a direct consequence of this, one could realize that the non-cointegration null hypothesis is based on a false assumption. These statistics, which cover the time period between 1980 and 2019, provide more evidence that there is a connection between continuous variables in Pakistan.

Table 4
Bounds Tests for Co-integration

DV	Function	F-Test value	Status
Stock market capitalization	F (MC GDP, INF, BNK, FDI, TRO)	4.219**	Cointegration found

Note: ** denote significance at 5% level.

Table 5
Critical Values of ARDL Bounds Testing Approach

α	I(0)	I(1)
1 percent	1.999	2.944
5 percent	2.277	3.288
10 percent	1.999	2.944

Table 6
Long-run & Short-run Results of Selected Model

Regressor	Coefficient	SE	T-ratio	Probability
Long-run results (DV=lnMCR)				
<i>lnGDP</i>	2.546***	0.229	3.848	0.001
<i>lnINF</i>	-1.675***	0.166	12.099	0.000
<i>lnBNK</i>	1.449**	0.014	-2.235	0.033
<i>lnTRO</i>	-0.747**	0.011	2.338	0.026
<i>lnFDI</i>	-0.665***	0.013	-4.548	0.000
Short-run results (DV=ΔlnMCR)				
Δ <i>lnGDP</i>	2.192***	0.101	3.114	0.004
Δ <i>lnINF</i>	-0.872***	0.123	8.980	0.000
Δ <i>lnBNK</i>	1.349	0.101	1.253	0.219
Δ <i>lnFDI</i>	0.726***	0.101	3.080	0.004
Δ <i>lnTRO</i>	-2.837	1.028	-0.626	0.536
<i>ECM(-1)</i>	-0.743***	0.129	2.976	0.006

Notes: Δ denotes first difference operator. *, **, *** significant at the 10,5 and 1 percent levels.

4.4 Empirical Results

Table 6 shows that, according to the long-run coefficient of GDP, a 1% increase in GDP results in a 2.546% acceleration of SMD, assuming that all other parameters remain the same. As a direct result of this, an increasing number of investors become interested in participating in the capital market. Furthermore, these results are also in line with Atje & Jovanovic (1993) who also confirm this positive relationship.

The data indicate that there is an inverse link, which is statistically significant, between the rate of inflation and SMD, both in the long run and in the short term. According to the data that was gathered over many years, a 1% increase in inflation leads to a 1.675% loss in SMD. This is assuming that there is no other change in the parameters. These results give evidence to support the notion that there exists an inverse connection between inflation and the stock market capitalization of companies,

which is supported by the fact that the concept was supported by findings as according to the findings of previous research such as those done by Ben Naceur et al., (2007).

The growth of the capital market is encouraged by the expansion of Pakistan's financial sector. It has been shown that a one percent increase in the growth of the banking sector results in a 1.449% increase in the capitalization of the stock market and that the opposite is also true. Even if the short-run findings unexpectedly indicate a negative relationship between SMD and banking sector growth, this does not change the fact that the coefficient is not significant because it is not statistically significant. This is statistically significant at $\alpha=5\%$, and it demonstrates that the influence of TRO on the SMD is found to be negative. These results, however, are in line with the conclusions that were drawn from previous research such as Ho (2019) and Shahbaz et al. (2016). It has been shown that a one percent increase in trade openness results in a seven-point four five percent reduction in SMD growth. The amount of business activity in Pakistan is one potential reason for the inverse relationship that can be shown to exist between the two variables.

Table 6 displays the findings of an investigation into the short-run dynamic effect that macroeconomic variables have on SMD. The table was compiled as a consequence of the investigation. The research that was discussed before yielded the results that are shown in the table that follows. This discovery is verified by statistical research, which demonstrates that the value of the ECT_{t-1} coefficient is much lower than one. It appears that if the variables stray from the level of equilibrium by 1% in the short term, they will return to equilibrium at a rate of 74.3% each year. However, if they stray from the level of equilibrium by more than 1% in the long term, they will return to equilibrium at a rate of 0% each year. In the short term, if there is a difference of 1% between them, then this is the rate at which they will converge back to equilibrium.

5 Conclusion, Recommendations and Policy Implications

There is a robust reason why the financial sector is so often seen as an essential component of the potential of an economy for both expansion and success. In light of the significance of the stock market, the objective of this study was to investigate, using a time-series analysis of annual data, the impact of the most important macroeconomic determinants on Pakistan's stock market index (SMD) from 1980 to 2019. This investigation was carried out to determine whether or not the stock market is a good indicator of the country's economic health. During our investigation into the factors that affect SMD, we used the ARDL bounds testing cointegration method to establish whether or not a unit root is present and the order in which the variables integrated. This allowed us to determine both the existence or absence of a unit root as well as the order in which the variables were integrated.

The results provide credence to the cointegration theory as a potential explanation for the phenomenon. GDP has a substantial and direct correlation with SMD in both the short-run and the long run, but inflation has a large association with SMD working in the other way. This relationship holds in both the short run and the long run. But, in the long run, the growth of the banking sector will have a considerable impact on SMD, which will work out to the company's advantage. In the short term, the development of the banking business has practically little influence on SMD. On the other hand, there is a negative association between FDI and SMD over the long run, even though there is an unexpectedly favorable connection between the two in the short term. Increased trade openness does not have much of an effect on the SMD, either in the short term or over the long run, and this is true for both time frames. In conclusion, the negative and significant coefficient of ECT reveals that if the series deviates from equilibrium by 1% in the near term, it would return to equilibrium by 74.3% after a year. This is the inference that may be made as a result of the fact that the significance level of the coefficient was determined to be high.

The results of this study may have some influence on the formation of public policy if they are taken into consideration. For example, governments need to devise economic and financial policies that

foster economic development, which, in turn, is beneficial to the stock market. These policies should also be transparent and accountable. The expansion of both the economy and the financial sector needs to be of the utmost concern of these initiatives. In a similar vein, the government of Pakistan could be able to manage the rate of inflation, which would have a positive influence on the market capitalization of the stock exchange. This would be a win-win situation. This would be an illustration of another way of thinking that is similar to the one described. To win the confidence of international investors and attract foreign capital flows to the stock market, law and order authorities need to take into account the threat of terrorism, and an unfavorable governance system and ensure that the political environment is stable. Only then will they be able to win the confidence of international investors and attract foreign capital flows.

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