The Influence of Macroeconomic Variables on the Stock Market Performance

[1]Anjaly B, [2]Malabika Deo

[1]Research Scholar, Department of Commerce, Pondicherry University, India.
[2]Professor, Department of Commerce, Pondicherry University, Puducherry, India
E-mail: anjalyanju777@gmail.com

ABSTRACT : The purpose of the study is to empirically analyze the influence of the macroeconomic indicators on India's stock market performance. The macroeconomic variables considered are inflation, interest rate, money supply, industrial production, and exchange rates in India. The study covers the period from April 2005 to April 2021. The ADF test has been employed to explore the stationarity of the variables, and the ARDL methodology has been administered to unearth the association between the macroeconomic variables and stock market return. The study found that industrial production, interest rate, and exchange rate have long term negative relationship with stock return. More specifically, the exchange rate has a significant impact on the stock market performance. At the same time, inflation exhibits a negative short-term relationship with the stock market return. Though money supply has a positive relationship, the magnitude is insignificant.

Keywords: stock market, macroeconomic indicators, India, ARDL.

1. Introduction

The financial system in a country serves the purpose of distribution of resources. Thus, it acts as the most important component in an economy. The long-term capital gets channelized through the stock market or capital market. The primary role of the stock market is to distribute the proprietorship to investors. The performance of the stock market shows how the money gets allocated in an economy. The stock market plays a vital role in economic growth and development. Rightly stock market is considered as the barometer of the economy. A fit and prosperous stock market reflects the country's economic growth by channeling capital to entrepreneurs and investors. The stock market has two vital roles to play in an economy. Firstly, the stock market helps in the price discovery process, and secondly, it provides liquidity. A strong stock market supports economic activity by boosting growth and saving, attracting the FDI, and efficiently allocating investment in the economy. Hence, the stock market has a significant relationship with the macroeconomic indicators in a country.

In this study, our main aim is to understand the influence of macroeconomic indicators on India's stock market return. The macroeconomic variables such as inflation, money

supply, exchange rate, interest rate, and industrial production have been considered in this study. According to economic theory, the money supply and stock market should have a positive relationship because an increase in the money supply boosts the overall purchasing power in an economy; thereby, the investment will increase. The association between inflation and the stock market is ambiguous. Studies reveal both negative and positive association of inflation with the stock market. The foreign exchange rate and the stock market can positively or negatively affect the stock market. According to the classical economic theory, it is supposed to be negative as with an increase in exchange rate import become costlier, reduces the profitability, reduces the attractiveness of stock on the other hand increase in exchange rate brings more foreign investment make stock market attractive hence positive relation exhibited. Low industrial production leads to low profit and dividends. Hence the linkage between industrial production and the stock market is expected to be positive.

The structure of the research work includes the background of the study, which consists of the literature review in the context of the factors influencing the stock return and the influence of the macroeconomic indicators on the stock market performance. The third section deals with the methodology part of the study, the fourth section explains the data analysis and discussion, and the fifth and final section deals with the conclusion.

1.1 Factors influencing the stock market

The present study is an investigation of macroeconomic influence on the stock market under the Asset Pricing Theory (APT) or Multi-Factor Asset Pricing (MFAP)theory (Lone, et al, 2021). The variables considered in this study have been discussed, taking the reference of past literature.

1.1.1 National output

There is no unanimity regarding the relationship between real economic growth and the stock market performance or the role of the national output in determining the performance of the country's stock market. Fama, (1981) found a positive association between the stock market and the real economic activity in the context of the investment processor model with the justification that when the output raises, it puts pressure on the current stock market to upsurge the demand of goods and services. Likewise, the rise in the average return on investment leads to an increase in the stock return. So, a firm persuades more investment; consequently, the capital expenditure investment also increases. Tobin and Brainard (1977) found a fluctuating relationship between real economic activity and the stock return.

1.1.2 Investment

Comparatively, there is significantly less work done linking investment and the stock market. Groenewold's study (2004)found that investment in the market has a less significant effect on the stock market performance. However, the findings were done by

Dow and Gorton, (1997)states that the movement of the stock price has an indirect effect on the investment decisions.

1.1.3 Trade openness

There are few past studies available in the field of the stock market, and trade openness Lim & Kim, (2011) found that there is a positive association between trade openness and stock market performance in a country. Moreover, Levine (2001) stated that the stock market liquidity would increase due to the ease of restrictions in trade openness. Therefore, there is a positive association between these two. Chinn and Ito (2006)found that the stock market development depends on the liberalization of the capital account.

1.1.4 Money supply

Money supply plays a vital role in the stock market performance. Asprem, (1989)found a negative relationship between the money supply(m0) and the stock market performance. However, he found a positive association with the stock market using the broad money as a proxy. Some other authors like Wongbangpo and Sharma (2002), Ibrahim and Aziz, (2003) and Abugri, (2008)argue the same. The rise in the money supply leads to the increased inflation; consequently, it negatively affects the stock market performance. Many other authors found the same (M. Ibrahim & Musah, 2014; Maysami & Koh; 2000; Mukherjee and Naka, 1995; Mohammed Nishat, 2005; talla tagne josep, 2013). They conclude that the money supply and the stock market have a positive relationship.

1.1.5 Inflation rate

Many authors have earlier comprehensively examined the analysis of inflation and the stock market performance. The results evidence both negative and positive relationships. The literature in this field proposes the fisher effect hypothesis, tax-effect hypothesis, proxy effect hypothesis, and the reverse causality hypothesis explaining the relationship. A study done in the US by Jaffe and Mandelker (1976) found a short-term negative relationship between inflation and stock market return. At the same time, a long-run positive relationship with the stock market from 1875 to 1970. According to the fisher effect, both inflation and the stock market performance have a long-term relationship. However, some authors like Fama and Schwert, (1977); Gultekin, (1983); Saunders & Tress, (1981) found a negative long-term association between these two variables. According to the proxy effect hypothesis Fama, (1981)found a negative and long-term relationship between inflation and the stock market performance. Geske and Roll, (1983) stated a negative relationship between the stock market and the expected inflation, supporting the reserve causality hypothesis. According to the tax effect hypothesis proposed by Feldstein, (1980)the inflation increase the corporate tax, it causes a lowing in share price.

1.1.6 Interest rate

The studies investigating the association between the interest rate and the stock market are large in financial economics. Many studies like Abugri, (2008); (Asprem, 1989); Ibrahim and Musah, (2014); Ibrahim and Shah, (2012); Maysami and Koh, (2000); Mukherjee and Naka, (1995); talla tagne josep, (2013); Wongbangpo and Sharma, (2002); Majid, (2007) found a negative and significant association between these two variables. They argue that when the interest rate rises, the investors in the stock market tend to move to the debt market. Furthermore, a high interest rate causes the high discount factor, which is expected to affect the stock market negatively.

*1.1.7 Exchange rat*e

The exchange rate and stock market have a theory-based association. According to Dornbusch and Fisher (1980) the relationship between the exchange rate and the capital market could have a flow model. This means the movements in the exchange rate could lead to volatility in the stock price. Many studies like Asprem, (1989); Mukherjee and Naka, (1995); Wongbangpo and Sharma, (2002)have found a positive relationship between stock market performance and exchange rates. The argument is that the export will increase when the currency depreciation happens, and the foreign capital inflow increases and creates better performance in the stock market. On the contrary, some authors like Ibrahim and Musah (2014); Talla tagne josep (2013) found a negative relationship between these two and justify that depreciation in currency leads to the rise in the input cost of the domestic firm and stock returns get negatively affected.

1.1.8 Crude oil price

The relationship between the crude oil price and the stock market performance is debatable. Some studies like Kaul, (1996); Kling,(1985) found that the crude oil price has a significant influence on the stock market performance. However, others like e.g., Chen, Roll and Ross, (1986) found contrary results. They argue that there is no conclusive proof of the impact of the crude oil price on the stock market performance.

2. Review of Literature

It is a well-time-honored fact that the macroeconomic variables do affect the performance of the stock market. Apart from the microeconomic factors like firm value, cost of equity, etc., the macro environment plays a vital role in the stock market performance. In this study an attempt has been made to understand the impact of the macroeconomic influence on the stock market in India.

Kumar (2013)investigated the effect of macroeconomic factors on the stock market performance in India. He carried out his study by classifying the macroeconomic factors into three heads: macro-environment, industrial performance, and policy rates. He found that industrial production has a significant effect on the stock market performance.

Nevertheless, the policy rate reported not having a long-lasting impact on the stock market, even though the impact of the policy rate cannot be denied. Through this study, he suggested that the government should attempt to keep the macroeconomic stability for the better performance of the stock market and favorable market supports better than the policy rates to attract the investment in India. Parmar (2013) examines the predictability of the stock market using the macroeconomic variables and the relationship between the stock market and macroeconomic indicators and their effect on the stock market in India. He found out that the macroeconomic variables are having a significant impact on the SENSEX and conclude that the long-term performance of the Indian stock market depended upon the domestic macroeconomic dynamic rather than the foreign macroeconomic dynamics. Misra (2018) conducted a study to examine the association between India's BSE index and macroeconomic indicators from 1999 to 2017. The results show a long-term association between the IPI, inflation, gold price, interest rates, FII, exchange rate, money supply, and BSE index. He also found a short-term relationship between the money supply and stock market index, inflation, and BSE index. Tripathi and Seth (2014) studied the association between the real economy and the stock market's performance in the Indian context using July 1997 to July 2011. They found that there exists a significant correlation between the macroeconomic indicators and the stock market. Hosseini et al, (2011) made a study by exploring the relationship between the stock market performance and the macroeconomic variables such as the crude oil, inflation rate, money supply, industrial production for January 1999 to January 2009. Using the vector error correction model and cointegration method found that short-term and long-term associations exist between stock market performance and macroeconomic indicators. Naka, Atsuyuki, et al, (1998) studied the relationship between the Bombay stock index and macroeconomic indicators in India using the cointegration and Vector Error Correction model. The study showed that industrial production has a considerable positive impact on the Bombay stock exchange. However, inflation has a negative and significant effect on the stock return. Husnain, et al, (2009) examined the link between the price of shares in the Karachi stock market and the macroeconomic indicators in Pakistan. They used macroeconomic indicators like exchange rate, forex reserve, WPI, money supply, gross fixed capital formation. IPI of Pakistan for 1987 to 2008 and employed Johansson cointegration techniques. The evidence showed that post-1991, the forex reserve and exchange rate significantly affected the stock market return. Moreover, the GFCF, WPI, and M2 were positively and significantly associated with the stock market return. They also reported that inflation depicted the more effective results for the stock market forecast, among other variables. Cota et al, (2008) investigated how the macroeconomic indicators affect the stock market performance of Swedish stock market. Their results show that all macroeconomic variables have a long-term relationship with the Swedish stock return and industrial production, which was found to affect the stock return negatively and significantly. Whereas the money supply was observed to have a negative and long-term association with the Croatian stock return. Rashid et al. (2014) studied the

relationship between the macroeconomic, Islamic stock return, and Malaysia investors' sentiment. The results showed that the currency index, interest rate, and FTSE composite index significantly impact the Islamic stock market than industrial production, CPI, investors sentiments, and money supply. Ouma and Muriu, (2014) examined the influence of macroeconomic indicators over the development of the stock market in Zimbabwe during the 1990s and 2018 using the ARDL model. The result reveals a long-term relationship between these variables and the stock market index. The stock market and exchange rate exhibited a positive and significant association, while inflation and the stock market were found to have insignificant and negative relationships. Bhattacharjee and Das (2021) investigated the effect of macroeconomic variables on India's stock market. The result showed that the relationship between money supply and exchange rates is insignificant in the long term.

The inflation, money supply, and foreign exchange rate have a short-term association with the stock market. They suggest that squeezing the money supply by the government is not suitable for the economy. Nevertheless, the excess money supply is also not good for the economy; it will increase inflation even though he recommended not aggressively reducing the money supply. Kaur and Singh, (2019) examined the association between the macroeconomic indicators like CRR, commodity price, reverse repo rate, gold price, inflation rate, oil price, and Sensex from January 2001 to December 2009 in India through regression and correlation analysis and found out that the exchange rate, gold price, and inflation rates are the most critical variable for the prediction of the Sensex. And suggested that a good prediction model for Sensex must include these variables. Norehan and Ridzuan, (2020) examined the influence of macroeconomic indicators on the stock market in Malaysia during the period from 1981 to 2017. He used the ARDL model to examine the association of macroeconomic indicators like inflation rates, domestic savings, broad money, exchange rates, and the stock market. He found that the inflation rates and exchange rates have a positive and significant influence on the stock market index. Moreover, the money supply and the domestic saving negatively and significantly affect the stock market.

The research gap of this study is that even though many studies have done this field, we are considering the macroeconomic variables such as inflation, exchange rate, industrial production and money supply, and the stock market return. The study takes into consideration the most updated data i.e., up to April 2021.

3. Methodology

3.1 Data

The objective of our study is to understand the influence of macroeconomic indicators on the stock market performance in India. For this, the data collected were of Money supply(M3), inflation (CPI), the exchange rate (INR/USD), industrial production index

(IPI), and stock market (BSE INDEX). Our dependent variable was Sensex return. The data collected were monthly and from CEIC database during the period April 2005 to April 2021.

3.2 Methodology

The Auto-regressive Distributed Lag (ARDL) model has been employed to examine the impact of the macroeconomic indicators on the stock market return. ARDL equations are given below.

$$sm_t^r = \beta + \sum_{i=1}^{m} \beta\, m_{t-1} + \sum_{i-1}^{n} \beta\, y + \sum_{i=1}^{o} i + \sum_{i=1}^{p} \beta e^r + \sum_{i=1}^{q} i\, \lambda_1 \Delta_{t-1} + \lambda_2 y + \lambda_3 \Delta + \lambda_4 i + \lambda_5 e^r + \varepsilon \quad (1)$$

Where,

sm^r=stock market return

$m3$= money supply

y= Industrial production index

i= interest rate

e^r= exchange rate return

Δ=inflation

Where c is the constant andβ is the parameters? *n, m, o, p, q*is considered lags of respective variables. $m3$ is money supply y is industrial production index $i$inflation rate of India and e^r is the INR/USD exchange rate and ε is the error term. The equation (1) which can be calculated by mean of delta method. This method involved complex procedure (Pesaran, M. H., Shin, 1997). Otherwise, a variant Error Correction form can be expected via instrumental variable. If the cointegration is confirmed, the Error Correction Model(ECM) uses proper lag selection criteria to obtain the short-term relationship with the stock return.

$$sm_t^r = \propto + \sum_{i=1}^{n} \gamma m_{t-1} + \sum_{i-1}^{n} \delta y + \sum_{i=1}^{n} i + \sum_{i=1}^{n} \Delta + \sum_{i=1}^{n} e^r + \lambda_1 m_{t-1} + \lambda_2 y + \lambda_4 i + \lambda_2 \Delta + \lambda_5 e^r + \gamma ECM + \varepsilon \quad (2)$$

Where γ denotes the speed and ECM is the residual of this model. To employ this model, we tested for stability parameters such as the Cumulative Sum (CUSUM) test and Cumulative Sum Square (CUSUMQ) test. The other diagnostic tests were also conducted to ensure no autocorrelation through correlogram Q statistics and Squared residuals and serial correlation through Breusch-Godfrey serial correlation test

4. Data Analysis & Discussion

4.1 Result of ADF test unit root test results

Table (1) shows the result of the Unit root test. To check the stationarity of variables, we used Augmented Dicky fuller test.

Table 1: Results of ADF unit root test

variable	i (0)	i (1)
$bse\ return$	-13.25158***	-14.32393***
inr_usd	-12.57789***	-11.92123***
y	-2.710247	-3.402271**
$m3$	1.624056	-2.919486*
Δ	-0.016873	-3.224381***
i	-1.769311	-12.53935***

Test significance at *** 1 % level ** 5 % level * 10 % level

As per the Augmented Dicky Fuller test result of stationarity, the outcome is mixed, and the variables are stationary i (0) and i (1). Variables like BSE index return, and the INR/USD return variables are stationary at level (0), and variables like index of industrial production index, money supply (broad money, M3), inflation (Consumer Price Index, CPI), and the interest rate (short term) are stationarity at level (1). The IPI variables are stationary at 5% level of significance, the money supply is stationarity at 10% significance, and other variables are significant at 1%.

4.2 Results of F-statistic test

Table (2) shows the bound test results of ARDL (1,4,0,0,0,0). We have used the Akaike Information Criterion (AIC). The estimation results of ARDL, which gives the least negative values, are suitable for the future estimation of results.

Table 2: Result of Bound Test

Test statistic	value	k	significance level	I (0)	I (1)
F-statistic	33.47619***	5	10%	2.26	3.35
			5%	2.62	3.79
			2.50%	2.96	4.18
			1%	3.41	4.68

Source: Author's estimation, Indication: I (0) is the lower bound value, and I (1) is the upper bound value.

Null hypothesis: there is no long-term relationship between variables.

The ARDL estimation shows a long-term relationship or cointegration between the variables because the F-statics is 33.47619, greater than the upper bound value of 4.68 at 1% of level significance. Hence the null hypothesis that there is no long-term association between these variables was rejected. The rest directed is to do for further examination for the Error correction model and long-term cointegration.

4.3 Co-integration and long run form

Table (3) showing the long-term relationship between the macroeconomic indicators and Bombay stock market performance. The result revealed a negative and significant relationship between the BSE index and the exchange rate (INR_USD) at 1% and a negative and significant long-term relationship between the short-term interest rate and the industrial production at a 10% level of significance. The inflation was found not to have any significant long-term effect on the Bombay stock market performance.

Table 3: Long-run coefficient -ARDL model (1,4,0,0,0,0)

Dependent variable: BSE return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ	0.000179	0.000837	0.214328	0.8305
inr_usd	-1.570251	0.190488	-8.243308***	0.000
y	-0.000461	0.000189	-2.438583*	0.0157
$m3$	0	0	-0.431447	0.6667
i	-0.008037	0.003792	-2.119326*	0.0354
C	0.137686	0.048131	2.860651**	0.0047

Cointeq = BSE - (0.0002*CPI -1.5703*INR_USD -0.0005*IPI-0.0000*M3-0.00080*T-BILL+.1377

Note: Test significant at *** 1 % level ** 5 % level * 10 % level. The numbers are concerned variables coefficient, St. Error, and t-statistics of variables

4.4 Short-run coefficients and residual diagnostic tests

Table (4) shows the results of the short-run relationship and residual diagnostic of this ARDL estimation. The inflation and BSE500 index return depicted a positive and short-term relationship. The money supply was found to have an insignificant relationship with the BSE500 index return. The other variables were found to be negatively related to the BSE500 index. The error correction term (ECM) (-.99321) was negative and significant at 5% significance, implying the existence of the long-term relationship among variables.

Table 4: Short-Run Coefficients and Residual Diagnostic Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (Δ)	0.002565	0.001594	1.609523	0.1093
D (ΔI (-1))	-0.008768	0.007199	-1.217986	0.2248
D (Δ(-2))	0.020153	0.007145	2.820765**	0.0053
D (Δ (-3))	-0.011586	0.004374	-2.649165**	0.0088
D (inr_usd)	-1.557019	0.163667	-9.513334***	0.000
D (y)	-0.000457	0.000186	-2.454217*	0.0151
D ($m3$)	0.000	0.000	-0.430832*	0.671
D (i)	-0.007969	0.003813	-2.089949*	0.038
Residual diagnostic test			T-statistic	Prob. value
Breusch-Godfrey Serial Correlation LM Test: F-Statistic			0.022664	0.976
Heteroskedasticity Test: Breusch-Pagan-Godfrey			3.410522	0.8507
Ramsey RESET test-statistics			1.559388	0.1207

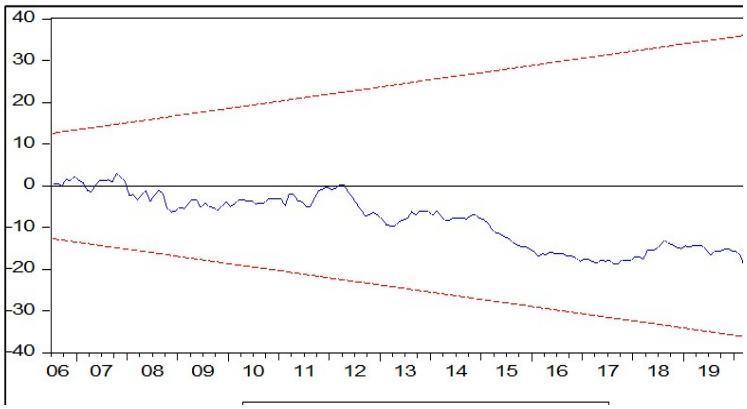
Note: Test significant at *** 1 % level ** 5 % level * 10 % level

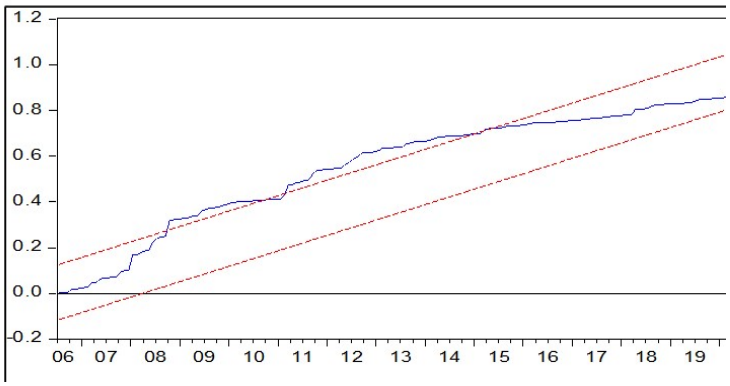
Source: Authors estimation.

The residual diagnostic test i.e., Breusch-Godfrey Serial Correlation LM Test, Heteroskedasticity Test, and Ramsey RESET test-statistics, proved a short-run relationship among variables. There is no serial correlation found. The results of Heteroskedasticity and Ramsey statics show the rightness of this model

4.5 Cusum test

Finally, the diagnostic stability test, namely the CUSUM test and CUSUM Square test, were applied. The CUSUM test 5% fitted precisely, but the CUSUM Square test did not fit at 5% level significance because of the insignificant money supply relationship between the BSE index returns.





For the stability diagnostic result, we have used the CUSUM test. This result shows that the CUSUM test result shows that this model is precisely fitting. However, the CUSUM square test does not fit because of the insignificant relationship between the money supply and the stock market.

5. Conclusion &Critique

Macroeconomic factors like inflation, exchange rate, money supply, interest rate, and industrial production index impact the stock market's performance. The relationship of the money supply is positive with the stock market. Other macroeconomic variables have either long-term or short-term impacts on the stock market performance. The study found that industrial production, interest rate, and exchange rate have long term negative relationship with stock return. Especially the exchange rate has an impact on the stock market performance. Moreover, inflation has a negative short-term relationship with the stock market performance. This study concludes that the money supply does not affect the stock market performance in India, even though the impact of money supply cannot be denied. The healthy and efficient stock market performance dependent upon the economic growth and development, fiscal policy of nation. So, the researcher suggests having a low interest rate and inflation rate and improved national output or industrial production to positively impact the stock market return. The policymakers need to consider the stock market performance of a country while implementing any policy.

REFERENCE

[1] Abugri, B. A. (2008). Empirical relationship between macroeconomic volatility and stock returns: Evidence from Latin American markets. *International Review of Financial Analysis*, *17*(2), 396–410. https://doi.org/10.1016/j.irfa.2006.09.002.

[2] Asprem, M. (1989). Stock prices, asset portfolios and macroeconomic variables in ten European countries. *Journal of Banking and Finance*, *13*(4–5), 589–612. https://doi.org/10.1016/0378-4266(89)90032-0

[3] Bhattacharjee, A., & Das, J. (2021). Investigating the Long-run and the Short-run Relationship Between Domestic Macroeconomic Forces and Indian Equity Market: Evidence based on ARDL Bounds Testing Approach. *Paradigm*, 097189072098767. https://doi.org/10.1177/0971890720987670

[4] Chen, N., Roll, R., & Ross, S. A. (1986). Economic Forces and the Stock Market. *The Journal of Business*, *59*(3), 383–403

[5] Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, *81*(1), 163–192. https://doi.org/10.1016/j.jdeveco.2005.05.010

[6] Cota, Boris, Natasa Erjavec, and J. A. (2008). The Impact of Macroeconomic Variables on Croatian Stock Market. *International Conference Proceedings,* 70–81.

[7] Dow, J., & Gorton, G. (1997). Stock Market Efficiency and Economic Efficiency: Is There a Connection? *The Journal of Finance*, *52*(3), 1087-1129. https://doi.org/10.2307/2329517

[8] Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. *The American Economic Review*, *71*(4), 545–565.

[9] Fama, E. F., & Schwert, G. W. (1977). Asset returns and inflation. *Journal of Financial Economics*, *5*(2), 115–146. https://doi.org/10.1016/0304-405X(77)90014-9

[10] Feldstein, M. (1980). Inflation, tax rules, and the prices of land and gold. *Journal of Public Economics*, *14*(3), 309–317.

[11] Geske, R., & Roll, R. (1983). The Fiscal and Monetary Linkage Between Stock Returns and Inflation. *The Journal of Finance*, *38*(1), 1–33.

[12] Groenewold, N. (2004). Fundamental share prices and aggregate real output. *Applied Financial Economics*, *14*(9), 651–661. https://doi.org/10.1080/0960310042000233421

[13] Gultekin, N. B. (1983). Stock Market Returns and Inflation Forecasts. *The Journal of Finance*, *38*(3), 240.

[14] Hosseini, S. M., Ahmad, Z., & Lai, Y. W. (2011). The Role of Macroeconomic Variables on Stock Market Index in China and India. *International Journal of Economics and Finance*, *3*(6), 233–243. https://doi.org/10.5539/ijef.v3n6p233

[15] Husnain, A., Lal, I., & Mubin, M. (2009). Short run and Long run Dynamics of Macroeconomics Variables and Stock prices: Case Study of KSE (Karachi Stock Exchange). *Kashmir Economic Review*, *18*(1), 19.

[16] Ibrahim, M. H., & Aziz, H. (2003). Macroeconomic variables and the Malaysian equity market: A view through rolling subsamples. *Journal of Economic Studies*, *30*(1), 6–27. https://doi.org/10.1108/01443580310455241

[17] Ibrahim, M. H., & Shah, M. E. (2012). Bank lending, macroeconomic conditions and financial uncertainty: Evidence from Malaysia. *Review of Development Finance*, *2*(3–4), 156–164. https://doi.org/10.1016/j.rdf.2012.09.001

[18] Ibrahim, M., & Musah, A. (2014). An Econometric Analysis of the Impact of Macroeconomic Fundamentals on Stock Market Returns in Ghana. *Research in Applied Economics*, *6*(2), 47. https://doi.org/10.5296/rae.v6i2.5146

[19] Kaul, C. M. . J. and G. (1996). Oil and the Stock Markets. *American Finance Association*, *51*(2), 463–491.

[20] Kaur, H., & Singh, J. (2019). Impact of Selected Macroeconomic Variables on Indian Stock Market Index. *IBMRD's Journal of Management & Research*, *8*(1), 1. https://doi.org/10.17697/ibmrd/2019/v8i1/142527

[21] Kumar, R. (2013). The Effect of Macroeconomic Factors on Indian Stock Market Performance: A Factor Analysis Approach. *IOSR Journal of Economics and Finance*, *1*(3), 14–21. https://doi.org/10.9790/5933-0131421

[22] Lim, K. P., & Kim, J. H. (2011). Trade openness and the informational efficiency of emerging stock markets. *Economic Modelling*, *28*(5), 2228–2238. https://doi.org/10.1016/j.econmod.2011.06.004

[23] Lone, U. M., Darzi, M. A., & Bhat, S. A. (2021). Macroeconomic State Variables and Stock Market Performance: A Systematic Review and Future Research Agenda. *FIIB Business Review*. https://doi.org/10.1177/2319714521995622

[24] Majid, R. M. . Y. and M. . S. A. . (2007). Macroeconomic variables and stock returns in malaysia : An application of the ardl bound testing approach. *Savings and Development*, *31*(4), 449–469.

[25] Maysami, R. C., & Koh, T. S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics and Finance*, *9*(1),79–96. https://doi.org/10.1016/S1059-0560(99)00042-8

[26] Misra, P. (2018). An investigation of the macroeconomic factors affecting the Indian stock market. *Australasian Accounting, Business and Finance Journal*, *12*(2), 71–86. https://doi.org/10.14453/aabfj.v12i2.5

[27] Mohammed Nishat, R. S. and S. T. H. (2005). Macroeconomic Factors and the Pakistani Equity Market. *The Pakistan Development Review*, *43*(4), 619–637.

[28] Mukherjee, T. K., & Naka, A. (1995). Dynamic Relations Between Macroeconomic Variables and the Japanese Stock Market: an Application of a Vector Error Correction Model. *Journal of Financial Research*, *18*(2), 223–237. https://doi.org/10.1111/j.1475-6803.1995.tb00563.x

[29] Naka, Atsuyuki, Tarun Mukherjee, and D. T. (1998). Macroeconomic variables and the performance of the Indian Stock Market. *Department of Economics and FinanceWorking Papers*. Retrieved from ttps://scholarworks.uno.edu/econ_wp/15

[30] Norehan, M. A. H., & Ridzuan, A. R. (2020). The Impact of Macroeconomics Variables toward Stock Market in Malaysia. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *10*(1) 360-367. https://doi.org/10.6007/ijarafms/v10-i1/7232

[31] Ouma, W., & Muriu, P. (2014). The impact of macroeconomic variables on stock market returns in Kenya. *International Journal of Business and Commerce*, *3*(11), 1–31.

[32] Parmar, C. (2013). Empirical Relationship among Various Macroeconomics Variables on Indian Stock Market. *International Journal of Advance Research in Computer Science and Management Studies*, *1*(6), 190–197.

[33] Pesaran, M. H., Shin, Y. (1997). An autoregressive distributed lag modelling approach to cointegration analysis. *Cambridge Working Papers in Economics.*, *3–5*(1995), 1–31. https://doi.org/10.1017/CCOL521633230

[34] Rashid, M., Hassan, K. M., & Yein, N. Y. (2014). Macroeconomics, investor sentiment, and Islamic stock price index in Malaysia. *Journal of Economic Cooperation and Development*, *35*(4), 221–236.

[35] Talla, T. J. (2013). Impact of Macroeconomic Variables on the Stock Market Prices of the Stockholm Stock Exchange (OMXS30). *Jonkoping International Business School*, (May), 3–48.

[36] Tripathi, V., & Seth, R. (2014). Stock Market Performance and Macroeconomic Factors: The Study of Indian Equity Market. *Global Business Review*, *15*(2), 291–316. https://doi.org/10.1177/0972150914523599

[37] Wongbangpo, P., & Sharma, S. C. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics*, *13*(1), 27–51. https://doi.org/10.1016/S1049-0078(01)00111-7

Annexure-I

1.Correlogram Q-statistics

Sample: 2005M04 2021M04

Included observations: 192

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	-0.032	-0.032	0.2051	0.651
		2	0.020	0.019	0.2831	0.868
		3	-0.019	-0.018	0.3533	0.950
		4	0.049	0.047	0.8233	0.935
		5	-0.090	-0.087	2.4474	0.784
		6	-0.157	-0.166	7.3997	0.285
		7	0.030	0.025	7.5798	0.371
		8	-0.041	-0.039	7.9220	0.441
		9	0.029	0.029	8.0896	0.525
		10	-0.049	-0.039	8.5826	0.572
		11	-0.050	-0.092	9.0988	0.613
		12	0.026	0.007	9.2359	0.683
		13	0.008	0.009	9.2503	0.754
		14	-0.062	-0.072	10.054	0.758
		15	0.029	0.036	10.234	0.805
		16	0.030	0.002	10.423	0.844
		17	-0.100	-0.126	12.545	0.766
		18	0.077	0.091	13.817	0.741
		19	0.108	0.108	16.342	0.634
		20	0.067	0.053	17.315	0.632
		21	-0.015	0.012	17.367	0.689
		22	0.057	0.024	18.088	0.701
		23	-0.089	-0.115	19.816	0.653
		24	-0.022	0.017	19.926	0.701
		25	-0.019	0.018	20.007	0.746
		26	-0.141	-0.132	24.458	0.550
		27	-0.097	-0.104	26.590	0.486
		28	-0.018	-0.044	26.664	0.537
		29	0.105	0.098	29.179	0.456
		30	-0.004	0.055	29.183	0.508
		31	0.028	-0.015	29.369	0.550
		32	0.083	0.047	30.968	0.519
		33	0.039	0.016	31.316	0.551
		34	-0.051	-0.091	31.941	0.569
		35	0.029	0.092	32.141	0.607
		36	-0.055	-0.038	32.873	0.618