

# The Effects of Macroeconomic Factors on the Performance of Stock Market in Sri Lanka

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**Abstract:** The main objective of this research is to analyze the vital impact of macroeconomic factors on the stock market performance in Sri Lanka. All the factors which have a direct impact on the working of the emerging stock market have hereby studied. The relationship between the pivotal factors such as inflation, gross domestic product, interest rates, and exchange rates has been properly conducted with the assistance of the indexes. The results of the analysis revealed that all these factors have an inseparable impact over the performance of the stock market and Sri Lankan stock market performance has eventually over gone through many ups and downs because of them as well. It has been revealed that among all the factors that have been discussed, inflation and exchange rates have comparatively higher effects on the stock market performance. It shows a fluctuation because of the unpredictable nature of these factors. Colombo Stock Exchange has seen a tremendous change in its performance over a period for which these factors have played a prominent as well as a vital role in its functioning.

**Keywords:** Macroeconomic factors, Stock performance, Colombo stock exchange

## 1. Introduction

The stock market has become one of the most pivotal and uplifting aspects of the financial system in today's time. The importance of financial markets in the economy has relatively risen over a period and there are gradually various factors which might impact the performance of the stock market. Therefore, today, the stock markets have become the main dynamical force behind national and international economies around the world. One of such is the macroeconomic factors which have an impact on the financial markets and their growth (Maio and Philip, 2013). The precise link between macroeconomic factors and a developed stock exchange market varies in a timely manner by the level at which the factor impacts the stock market. Performance of the companies is impacted by macroeconomic factors like interest rates, inflation, fiscal deficit (by an impact on currency), and government borrowings. Taking the example of Inflation, if there is high inflation in the country; real purchasing power of people reduces which results in the reduction of demand for certain luxury products because people have less disposable income. This, in turn, impacts the performance of companies in these sectors in one of the many ways in which interest rates impact company performance and thus stock market. Also, if people feel that a country, on the whole, is doing well (good macroeconomic indicators), they tend to feel that businesses would do well too. Moreover, that pushes up the stock market.

### 1.1 Problem Statement

This document will analyze the effects of the macroeconomic factors of the stock market performance in Sri Lanka. Before the period of liberalization, the financial market in Sri Lanka was not as developed as it became after the liberalization was granted in the country. Also, the flexibility in the market took place after the macroeconomics revitalizations in Sri Lanka.

Because of the post-war development, the stock market of Sri Lanka gradually attracted the attention of various investors, academics and policymakers which was not there during the pre-war (Kongahawatte and Nimal, 2015). Thus, with the effect of it, the changes in the stock market could be seen and analyzed.

### **1.2 Aim of the Study**

To have a proper understanding of the stock market in Sri Lanka and its subsequent status, it is thus essential to analyze the impact of macroeconomic factors on it. For this, the variables which have been taken into the account are mainly Inflation (measured by Colombo Consumer price index), Interest Rates, Exchange Rates, Gross Domestic Product and Money Supply. Thus, through considering all these factors, this study would mainly assess the stock market performance in Sri Lanka and its impact on the growth of financial markets. This article will analyze all the pivotal aspects of it by being organized into the sections of the literature survey, the methodology used, discussion of the finding and finally the concluding part. It is thereby expected that the findings of this would also assist the policymakers to make the decisions by giving due consideration to all the factors.

## **2. Literature Review**

The stock market globally varies from country to country. There are various short-term and long-term factors responsible for its efficiency and effectiveness. Stock markets have become an alternative to the bank financing and thereby assisted in reducing the financial constraints of the potential investors. By reviewing the literature in the background of the stock market, it is found that the inflation rate is also one of the major factors to have the significant impact on the capital market followed by the exchange rate and gross domestic product (Pal and Mittal, 2011). As not every country has the same outlook; country's classification as an "emerging" or "mature" market does not depend individually on the level of its stock market development or other economic conditions. Instead, it also depends on whether its GNP per capita is below or above the World Bank's threshold for a "high-income country" (Filer, Hanousek, and Campos, 2000). Thus, it is not easy to declare a country as emerging or mature without actually analyzing the pivotal aspects which would acknowledge that whether it is a high-income country or not.

For the success of the stock market performance, fiscal and conducive economic environment is one of the pivotal aspects. If there is a favorable macroeconomic environment, it assists in the promotion of the profitability of the business. The barometer for measuring the performance of the economy also includes the debt position apart from the other important barometers. It had also been concluded that, mostly in the short run, there is an existence of the bidirectional effect between the stock prices and the exchange rates (Islam and Habib, 2016). In India and China, it was concluded that there is an existence of a link between stock market performance indices and other factors like money injection, production, inflation rate and oil price (Ahuja, Makan, and Chauhan, 2012). Whereas, after studying seven countries, namely, UAE, Bahrain, UK, Kuwait, Oman, Qatar, and the USA, it was concluded that stock return could be better predicted by the oil price post to the latest rise in the oil prices. Different countries thus have the different reaction to the variables and factors, like it was found that the stock market of Malaysia is thereby more integrated with the Asian countries economic variables. The variables affecting the other Asian countries have a relative impact on the stock market of Malaysia. It was assumed by the results of regression that factors like exchange rate and foreign direct investment, contributes to the positive impact on the performance of the stock markets in the South Asian countries whereas on the other side, factors like interest rate and inflation have a negative effects on the performance of the stock markets in South Asian countries (Aurangzeb, 2012).

The impact of macroeconomic variables is different to different countries. The impact mainly depends on the factors and their effectiveness. Colombo stock exchange is the first South Asian

region stock market and overall 52nd who obtain the membership of World Federation of Exchanges. In Sri Lanka also, various variables could create similar impacts both positive and negative on the stock market performance. Some studies suggest that various variables like interest rate have a positive effect on the stock market performance and also a negative impact on the same. There had been diverse outcomes of the diverse studies that had been held. For long run and short run relationship aspects Sri Lankan capital market various macroeconomic factors were also examined by using the monthly data with the assistance of certain mechanisms. (Wickremasinghe, 2011). Gunasekarage, Pisedtasalasai, and Power, (2004) state that the impact of macroeconomic factors on stock market returns in Sri Lanka was examined by using the Colombo All-Share price index to represent the stock market and (1) the money supply, (2) the treasury bill rate (as a measure of interest rates), (3) the consumer price index (as a measure of inflation), and (4) the exchange rate as macroeconomic variables. The main and basic aim of such an examination was to analyze the impact of these factors on the other factors prevailing in the macroeconomics that might have an impact on the stock market. It was suggested by this study that GDP and M1(Narrow money supply) plays a very vital role in the stock prices. Whereas, some other studies suggested that exchange rate and inflation rate causes a negative reaction to the prevailing stock prices along with the existence of the negative effect of the treasury bills. It is also expressed that higher explanatory power of the variable is high in explaining the stock prices of most of the stock listed on the Colombo Stock Exchange. This study was expressed by using the monthly data collected during the period from September 1991 to December 2002 by using employed multivariate regression. The VECM analysis extended support as well for the argument that the lagged values of macroeconomic factors like consumer price index, money supply, and the Treasury bill rate create a significant impact on the stock market as these play a vital role in the macroeconomic factors (Aguirre, 2011). There were tremendous changes in the Colombo Stock Exchange after the end of the civil war in the country. When the conditions of the country regarding politics as well as security began improving, a lot of investors, as well as firms, started getting attracted to the stock markets resulting in the rise of the financial market in Sri Lanka. Therefore, the impact of the macroeconomic factors in the performance of stock markets in Sri Lanka varies from study to study. There have been various studies and conclusions which explains the positive and negative relationships between the variables and market.

The impact of some of the macroeconomic factors on aggregate stock returns was also analyzed by usage of seventeen macroeconomics data announcements beginning from 1980 to 1996 and to find the impact of these factors on the returns, GARCH model was used in this context. This analysis came out with the result that among the six variables, three of them namely CPI, PPI(Producer Price Index)and monetary aggregate are nominal while the other three namely balance of trade, employment trade, and housing starts are real and are strong for the risk factors (Flannery and Protopadakis, 2002).

### **3. Research Methodology**

This research study aims to identify the impact of various macroeconomic factors on the stock market performance of Sri Lanka. For collecting the efficient data for it, sources of secondary data were mainly used and utilized, and for this, Economic and Social statistics in Sri Lanka 1990-2012, as well as annual bank reports, were taken into account. The variables which have been taken into consideration for this research are Inflation (measured by Colombo Consumer price index), interest rates, exchange rates, gross domestic product and money supply. The stock market function of Sri Lanka thus can be described in the following way:

$$SMI = f (IR, ER, I, GDP, MS)$$

Where SMI = Stock Market Index

IR = Interest Rate

ER = Exchange Rate

I = Inflation

GDP = Gross Domestic Product

MS = Money Supply

### 3.1 Model Specification

This can be presented through a general linear regression as below:

$$\text{Aspit} = \alpha + \beta_1 \text{Gdp} + \beta_2 \text{I} + \beta_3 \text{Er} + \beta_4 \text{Ms} + \beta_5 \text{Ir} + e_i \dots\dots\dots 1$$

The regression model that fits into this time series can be represented through these models:

$$\text{Aspit} = \alpha + \beta_1 \text{Log Gdp} + \beta_2 \text{Log I} + \beta_3 \text{Log Er} + \beta_4 \text{Log Bp} + \beta_5 \text{Log Ir} + e_i \dots\dots\dots 2$$

$$\text{Log Aspit} = \alpha + \beta_1 \text{Log Gdp} + \beta_2 \text{Log I} + \beta_3 \text{Log Er} + \beta_4 \text{Log Ms} + \beta_5 \text{Log Ir} + e_i \dots\dots\dots 3$$

$$\text{Log Aspit} = \alpha + \beta_1 \text{Log Gdp} + \beta_2 \text{Log Ms} + \beta_3 \text{Log Er} + \beta_4 \text{Log Bp} + \beta_5 \text{Log Ir} + e_i \dots\dots\dots 4$$

Where Aspit is the all share price index

Above mentioned are the variables that have an impact on the stock market index. The linear-log model and log-log and log-linear models have been utilized above. Financial time series can have both short-term and long-term relationships. The analysis above portrays that the variables have a comparatively higher impact on the share prices in the market.

It had been argued that inflation can affect the stock market either positively or negatively. The relationship between these both aspects is mainly determined by the unexpected and expected inflations. In case of expected inflation, when demand is more than supply in the market, firms exceed their prices, which would result in increased payment of the dividend by the firm followed by an increase in the demand for the stock and thus increase the value of the stock. Whereas an increase in the general price levels would increase day-to-day living; hence people will be forced to invest less. Thus, in such a case the prices of the shares will decrease. This is the case of unexpected inflation. Therefore, both expected as well as unexpected inflations can affect the stock prices of the firms/companies in its way. In Sri Lanka, the stock market-Colombo Stock Exchange has seen both kinds of the inflations. The positive and negative impact of this factor depends upon at what stage the inflation is and where it is affecting prominently.

Apart from this, this paper's analytical approach is informed by past, unsuccessful, efforts to document reliable, time-invariant effects of macroeconomic conditions on equity prices. Previous studies of market returns depict sensitivity to macroeconomic variables regression and monthly market returns on statistical innovations in the macro variables. In the simplest, single-factor case, researchers regress the market's return (rt) on a potential factor's (Z) "surprises." Monthly as well as quarterly stock returns were preliminarily utilized for the research study. Although these returns provide information enormously, they were still preferred over the daily returns as the information through daily returns becomes very complicated to analyze and sort out. Apart from the data of the period of 1990-2012, as has been referred above, the data of the period of 1991-2000 also has been taken into account at some places. The secondary data in such research is very reliable as it provides the adequate information and tends to provide the required information in for the subject matter. The information from Securities and Exchange Commission of Sri Lanka has also been utilized for the conduction of this research study. SEC is the powerful institution which handles the CSE and regulates its functions. It acts as a link between Sri Lankan government and security business and gives all the relevant information and feedbacks about the security markets to the government. SEC has got the powers from the government regarding the grant of power in context to monitoring, giving liaisons and listening to the complaints and grievances of the investors. An annual report is also published which extends a lot of information about the security market of Sri Lanka. The annual reports of some of the years were taken, and the analysis was made regarding the up fall and downfall of the share prices and whether they were because of the macroeconomic factors. This was one of the important secondary sources that assisted in gathering the information about this study.

The description and forecasting of macroeconomics require statistics on macroeconomic variables. The most prominent of these variables is the GDP, inflation, interest rates, and unemployment, but there are many others. The main beneficiary of inflation is the government since the government can create more money before it has an impact on prices. Often, crooked governments will print massive amounts of money to enrich government employees and policymakers and to pay government bills. Economics also distinguishes between a flow variable and a stock variable. A flow variable is specified as a quantity per unit of time; a stock variable is a specific quantity at a specified time (Spaulding, 2018).

## 4. Data Analysis and Interpretation

Turnover velocity is one of the financial variables, which is currently not the most appropriate indicator of the effect of the stock market on growth but it should be the appropriate indicator as it has been purged of forward-looking price effects. Results provide only a very mild suggestion that a higher turnover velocity Granger-causes growth. It has been indicated by various studies in the past that the financial variables affect the functioning of the stock market.

In Sri Lanka, market indicators of the stock exchange are also very much crucial and necessary tool that assists in delivering the market performance of entire Sri Lanka. These indicators are thus necessary to get studied to analyze the market situation. After the proper analysis, it was found out that there are two indicators in Sri Lanka which are responsible for doing a major part in the stock market performance.

### 4.1 All Share Price Index (ASPI)

All share price index is calculated since second January of 1985. The base value of Colombo stock exchange in the year of 1985 is taken as 100 by considering the daily total capital base. The entire shares of the share market of that day are covered under the All Share Price Index and the stock performance of that day. All the trade as well that occurs on that particular day is covered by this index. The value of all share price index varies from day to day and depends upon the share value, number of shares and how the shares are being traded on the market. All share price index is one of the rising and pivotal indicators which depict the stock performance of the stock exchange of the country. Regression results of the log-log model (Log Aspit=  $\alpha + \beta_1 \text{ Log Gdp} + \beta_2 \text{ Log Ms} + \beta_3 \text{ LogEr} + \beta_4 \text{ Log Bp} + \beta_5 \text{ Log Ir} + e_i$ ) as had been discussed above are:

**Table 1:** Regression results of the log-log model

Term	Coefficient	T value	Probability
A	-3.416	-2.43	0.033**
Log GDP	1.5196	2.41	0.035**
Log MS	-0.4788	-1.72	0.070
Log ER	1.9777 4.28 0.001*** Log BP 0.0768 1.9777 4.28 0.001*** Log BP 0.0768 1.9777 4.28 0.001*** Log BP 0.0768 1.9666	4.25	0.001***
Log BP	0.0768	0.53	0.490
Log IR	1.8059	2.24	0.045**

**Source:** Impact of macroeconomic variable on stock market performance, 2009

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Where. IR = Interest Rate, ER = Exchange Rate, I = Inflation, GDP = Gross Domestic Product and MS = Money Supply

The Trading Economics ASPI provides you with direct access to our calendar and historical data on thousands of indicators. The API can be used to feed a website, off-the-shelf software like Microsoft Excel or a custom developed application. Providing several request methods to query databases, it is the best way to export data in XML, CSV or JSON format and to keep your events calendar up to date. Trading Economics provides its users with a near real-time economic calendar updated 24 hours a day. Actual values are based on official sources, not third party data providers. Previous values are available before an economic indicator is reported and marked as revised (\*) accordingly. Survey consensus figures are provided displaying the average forecast among a representative group of economists. They also provide forecasts which are driven by our analysts' expectations and technically projected using an autoregressive integrated moving average (ARIMA) model (Colombo Stock Exchange Guide, 2018). The performance of Colombo Stock exchange has eventually risen over the period. Initially, the performance was different as compared to how is it now. From 1994 to 1999, the performance of Colombo Stock Exchange is depicted below.

**Table 2:** The performance of Colombo Stock Exchange during the period of 1994 to 1999

Indicators	One year monthly average November 1994- November 1995	One Year Monthly Average Nov.1998- Nov.1999	Change in %
Turnover value in Rs. Million	1,044.25	1,203.43	15.24
Market capitalization in Rs. Billion	107.2	110.02	(8.71)
ASPI index in points	790.96	557.62	(29.05)
Turnover ratio (%)	0.8653	1.0923	20.46
Average market return of the period	(0.008061)		

**Source:** Stock market performance under different presidential terms. 2005

The performance of the stock exchange of one term has been described as above. During the first prudential term, the average monthly value of all the trading deals has increased by 15.24%. Average value of CSE's ASPI index for the first year of the term stood at 790.96 points, and during last year of the term, it was 557.62 confirming 29.05% decline. During the period turnover ratio has increased by 20.46%. Apart from this, the market capitalization had decreased by 8.71% during the specified term. The indicators about the measurement of the stock performance have been compared from term to term. Similarly, the term two was the comparison between December 1999-2000 and December November 2004-2005. At this period, the Average market turnover value stood at Rs.968.4 million which was at Rs.9, 035.6 in last year term, resulting in 833.06% growth. Average market capitalization for the first year term stood at Rs.99.4 billion which has increased to Rs.536.5 in last year of the term, confirming 439.85% growth. ASPI index value also has gone up by 285.72% during this tenure. Turnover ratio grew by 71.83%.

#### 4.2 S & P Sri Lanka 20

Apart from the All Share Price Index as has been discussed as above, this indicator known as S & P Sri Lanka 20 is also one of the indicators which perform a pivotal role in the stock market performance of Sri Lanka. Although, as compared to this indicator, All Share Price Index is more popular and useful in analyzing the stock market performance as compared to this indicator. S

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S&P Sri Lanka 20 is now used for the Milanka Price Index, and for this reason as well become the rising price index. S&P Sri Lanka 20 base value was calculated at 17th December 2004 and base value of this index on that day is 1000. Most of the companies fall into this S&P Sri Lanka 20 are blue-chip companies, and all the shares fall into this category are Voting common shares. This index change in every year at December month and this indicator does not show entire Sri Lankan stock market performance. Like it has been mentioned in All Share Price Index (ASPI), this index changes every couple of seconds. Because of this indicator, an assumption can be made that in what direction and in which way the Colombo stock exchange is moving and how it is to be expected to perform shortly.

**Table 3:** Results of Regression

Index (currency)	Return type	Bloomberg	Reuters	CSE
S&P Sri Lanka 20 Index (LKR)	Price return	SPLK20LP	.SPLK20LP	S&P SL20
	Total return	SPLK20LT	-	-
	Net total return	SPLK20LN	-	-
S&P Sri Lanka 20 Index (USD)	Price return	SPLK20UP	-	-
	Total return	SPLK20UT	-	-
	Net total return	SPLK20UN	-	-

**Source:** S & P Sri Lanka 20 methodology, 2010

The findings from the analysis depict that the usage of these indicators have eventually grown over a period and now the performance is mainly measured by these indicators. Index system has become relatively popular in the country for marking a fundamental movement of the stock performance in the market. The market moves in two directions which are upward and downward and to know the change, these two indicators play a vital role. These indicators give a slight clue that whether the value of the share in the market will go up or down and whether it would be justifiable to invest or not (Colombo Stock Exchange Guide, 2018).

The CSE reviewed and revised the companies to be included in the Milanka Price Index (MPI) annually up to 2004 and quarterly from 2005, considering the increased level of activity and the need for the MPI to represent the changes in the market conditions more regularly. The CSE now reviews & revises the companies to be included in the MPI on a biannual basis commencing from 2007.

#### 4.3 Descriptive Statistics for Sri Lanka

**Table 4:** Descriptive statistics for Sri Lanka

	N	Minimum	Maximum	Std. Dev	Mean
Interest rate	14	5.07	11.25	5.07	9.77
CPI	14	3.42	22.56	2.12	8.59
Exchange rate	14	58.99	114.94	93.23	18.46
SMI	14	3.42	22	1,296	1,643
Foreign Direct Investment	14	171,790	752,200	342,297	184,665

**Source:** Macroeconomic variables and stock market performance in Sri Lanka, 2012

The above data depicts the minimum value, maximum value, total number of the observations, standard deviation and mean value of all the variables. The exchange rate of Sri Lanka shows the low of 58.99 and high of 114.94 in last 14 years. This increase is mainly due to an increase in inflation which also suggests earlier by the CPI and increase in money supply by the central

bank of the country (Aurangzeb, 2012). The dependent variable which is CSE index (Colombo Stock Exchange) shows the low of 419 and high of 5,161 during last 14 years, the mean value of the dependent variable is 1,643 and the standard deviation of 1,296 as has been discussed as above.

The cost of finance and the value of the financial assets and liabilities, which are being held by the firms is immensely affected by the interest rate as it is considered one of the major risk factors, as revealed by the analysis. This is because of the reason that in cases of increase in the interest rate, people become cautious and they tend to divert their funds from the stock market any interest paid financial security or bank which would tend to make a decrease in the up went stock prices. (Pallegedara, 2012). Thus, often there is a negative relationship between the interest rate and stock prices, because of this very reason. Apart from this, it also has been analyzed that when inflation increases because of an increase in demand that exceeds current supply, firms' earnings increase along with their dividends, which will make stocks more attractive and people more willing to invest in the stock market resulting in a rise in stock prices. The relationship between the variables and stock prices depends upon at what extent the variable or the factor is affecting the market.

It also has been analyzed that Consumer Price index plays a pivotal and rising role, the monetary shock consistently negatively affects the stock return, and this is the only variable, both at the aggregate as well as at the segregate levels. The effects of CPI and PPI fluctuations are experienced at shorter horizons immediately after the shock and are comparatively quite small in the magnitude as well.

The effects of the variables or factors of macroeconomic depend upon the magnitude of the factors or variables. The main variables or factors that have an impact on the performance of the stock market as has been discussed thus are the following:

- Inflation rate
- Exchange rate
- Interest rates
- Money supply
- Foreign direct investment
- SMI (Stock Market Index)
- CPI etc.

All these factors or variables affect the stock market performance.

## **5. Conclusion and Recommendations**

To conclude, the performance of the stock market in any country relies on various factors and aspects, among which macroeconomic factors play a vital role. All the factors and variables rely on their magnitude. The macroeconomic factors affecting the foreign as well as Sri Lankan stock market have been discussed above. For the completion of this document, the usage of secondary data has been given a vital emphasis. A time series based on the secondary data has also been conducted in this regard. By analyzing all these aspects of data, it can be revealed that there is an existence of the strong connection between the macroeconomic factors and the stock market. The performance of the stock market in Sri Lanka varies from time to time because of the variation in the factors as well. If there is an upward movement in the factors like interest rate, exchange rate, and GDP, it tends to lead to a better performance of the CPI and ASPI. Whereas, the inflation rate should be as much minimum as possible to have a better performance in the stock market.

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