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The Journal of ARSYM

A Publication of Students' Research of the
***A**nnual **R**esearch **Sy**mposium in **M**anagement*

Published by
Faculty of Business Studies and Finance
Wayamba University of Sri Lanka

ISSN: 2756-9373

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Volume: 1 Issue: 01 December: 2020

The Journal of ARSYM (JARSYM) is a refereed journal published bi-annually by the Faculty of Business Studies & Finance, Wayamba University of Sri Lanka. The aim of the JARSYM is to disseminate high-quality research findings on a variety of timely topics generated by the undergraduate and postgraduate researchers in the Wayamba University of Sri Lanka. Furthermore, it opens up avenues for the undergraduates involved in the industry to share their inventions, state-of-the-art discoveries and novel ideas. The main philosophy behind the JARSYM is to enhance the research culture within the faculty, thereby within the Wayamba University. All research articles submitted are double blind reviewed prior to publishing. Views expressed in the research articles are not the views of the Faculty of Business Studies and Finance, Wayamba University of Sri Lanka or the Editorial Board.

National Library of Sri Lanka- Cataloging in Publication Data
Journal of ARSYM (JARSYM)
ISSN No: 2756-9373
Bar Code: 9 772756 937008

Published by
Faculty of Business Studies and Finance
Wayamba University of Sri Lanka
Kuliyapitiya, Sri Lanka
Tel: +94 37 228 4216
Web: http://bsf.wyb.ac.lk

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Printed by

Vidyalankara Press, Kelaniya, Sri Lanka
Telephone: +94 11 291 1382, +94 71 634 3183

THE JOURNAL OF ARSYM

A Publication of Students' Research of the

Annual Research Symposium in Management

Volume: 1 **Issue: 01** **December: 2020**

Published by

Faculty of Business Studies and Finance

Wayamba University of Sri Lanka

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The Journal of ARSYM (JARSYM) is a refereed bi-annual journal committed to publish undergraduate research papers of the Faculty of Business Studies and Finance, Wayamba University of Sri Lanka. The JARSYM publishes theoretical and empirical papers spanning all the major research fields in business studies and finance. The aim of the JARSYM is to facilitate and encourage undergraduates by providing a platform to impart and share knowledge in the form of high quality and unique research papers.

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ISSN: 2756-9373

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ISSN: 2756-9373

The Journal of ARSYM
Volume: 1 Issue: I, 2020

THE IMPACT OF MACROECONOMIC VARIABLES ON THE STOCK MARKET RETURNS IN SRI LANKA

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ABSTRACT

This study investigates the impact of macroeconomic variables on the stock market returns on the Colombo Stock Exchange (CSE) of Sri Lanka. Macroeconomic variables impact the stock market performance and especially stock returns through their impact on future cash flows. The performances of the firms may also be impacted by the changes in macroeconomic variables which cause dividends to fluctuate. Therefore, the objective of this study is to identify the impact of the selected macroeconomic variables on the stock market returns in Sri Lanka. The research study on the knowledge of the macroeconomic variables; exchange rate (ER), money supply (MS), inflation rate (INF), interest rate (IR) as independent variables, and stock return (ASPI) as the dependent variable. For the study, all listed companies in CSE were taken as the population and the entire population was taken as the research sample. Listed companies at CSE were identified as the unit of analysis. Secondary data method was used to collect data during the period from January 2000 to December 2019 with a total of 240 observations. Correlation analysis, trend analysis, simple Ordinary Least Square regression analysis and Johansen Cointegration test were applied to analyze the collected input data to draw conclusions. The findings of the study revealed that the money supply and the exchange rate made a positive impact on the stock reruns whereas the interest rate and inflation rate made a negative impact on stock returns. All the chosen macroeconomic variables demonstrate a significant relationship with stock returns. These findings generate practical implication possibilities for investors, policymakers, stock market regulators, stock market analysts. Therefore, it is recommended that the stock market regulators, market participants and investors should concentrate more on these macroeconomic variables in estimating the stock market return volatility in Sri Lanka.

Keywords: *Inflation Rate, Exchange Rate, Interest Rate, Money Supply, Stock Return*

1. INTRODUCTION

1.1. Background of the Study

Returns on the stock market are in the form of profit through trading (capital gain) or in the form of dividends that the companies occasionally give their shareholders. Macroeconomic variables are related to aggregate indicators that affect the entire economic environment in which organizations operate and they include Gross Domestic Product (GDP) and GDP growth rates, consumer price indices and inflation, savings and investment, monetary and fiscal policies, foreign investments, international trade and international finance (Kaimba, 2010). Therefore, the performance of a company or all the companies are influenced by the above discussed economic fundamentals, and accordingly, the fluctuations in the dividends are affected by changes in macroeconomic variables of the country and the expectations about prospects of those variables.

To estimate the asset's expected returns, Ross (1976) came out with the Arbitrage Pricing Theory (APT). In essence, APT seeks to measure the risk premium linked to different risk factors and attempts to evaluate whether they are significant and whether they are priced into returns on the stock market. Through employing factor analysis, he stated that, in addition to a security beta, there had been several systematic factors (industry-specific and macroeconomic) that affect the security returns. Ross explained that the expected return variation was caused by the volatility in GDP, inflation, term structure, and other economic variables.

According to previous researches, the stock market act as a prominent economic institution that plays a primary role in efficient capital formation and effective allocation of resources (Fernando, 2018). A healthy and growing stock market has been considered essential to the economic growth of a nation by channelling capital for entrepreneurs and investors. An economy is considered to be successful if it has a strong banking system and a strong stock market showing an upward trend (Kumari, 2011). Even when various efforts have been made to improve and stabilize stock markets, emerging economies are regarded as the most volatile stock markets **Invalid source specified.**. Besides, emerging economies' stock markets are likely to be vulnerable to different factors such as shifts in economic activity levels, political and international economic environment, and changes in other macroeconomic factors as well **Invalid source specified.**. Investors, therefore tend to assess the macroeconomic factors that might be influential in predicting the behavior of the capital market. Especially, Sri Lanka as a developing market, the innumerable micro and macroeconomic conditions are highly involved. Highly volatile market fluctuations with unstable patterns are a common phenomenon in the CSE (Rathnayaka, 2014). All the factors are not equally relevant and important to every share market, research

period and economy. To explain the volatility in the stock returns of CSE, macroeconomic variables have been selected for this research in such a manner that they complement the interrelationship between the goods market, money market and the capital market on a broad perspective. Therefore, for this analysis, four macroeconomic variables were selected, taking into account all the above considerations, availability of data for analysis and combining the theoretical propositions and prior facts. These variables are interest rate, inflation, money supply and exchange rate according to prior findings of (Fernando, 2018); (Liu, 2008); and (Adam, 2008).

According to the research performed by Cristie (1982), and the interest rate theory, both indicate that stock prices and interest rates have a negative relationship. The 3 months (91-day) treasury-bill rate was used as the interest rate measure in the present study because it serves as an opportunity cost of holding shares. A lower interest rate destroys the incentive to save money in securities and push money to the stock market. Nai-Fu Chen (1986); Fifield, Power, & Sinclair (2002); Beenstock & Chan (1988) provide proof of the relationship between interest rates and returns on stocks. High interest rate conditions result in a high cost of borrowing and a decline in economic activity. Corporate profit, future business cash flows and dividends are also impacted by this. Therefore, a negative relationship between the interest rate and overall stock return can be anticipated.

The exchange rate can be defined as the price, which the currency of one country can be exchanged for the currency of another country. In recent years, as a consequence of globalization, all enterprises have been directly and indirectly impacted by foreign activities. In other words, the exchange rate movements will affect the competitive position of businesses and thus, the operations of industries. With the changes in the exchange rate, the cost of goods and services, sales and cash flows could vary. When a local currency depreciates, domestic companies become more competitive and export-based companies become more profitable. It will cause to increase dividend payments thus, overall stock return. Lee & Wang (2012) identified that exchange rate and stock returns are positively correlated in Japan, Thailand and, in Taiwan, the exchange rate and stock returns are negatively correlated while in Singapore no association was found.

In financial theory, the rate of inflation is measured by the consumer price index, which shows an overall rise in the prices of goods and services. As Ratanapakorn & Sharma (2007) describes that the increase or decrease in inflation declines or raises the investor's purchasing power and ultimately affects the local investor's equity investment decisions. In other words, higher inflation increases the cost of living and funds will move from stock market instruments to consumable goods. This leads to a reduction in the demand for shares which tends to drop down the trading volume.

Corporate earnings are influenced by high inflation, which in turn causes dividends to decline. Consequently, a decline in the anticipated return of stocks causes the value of stocks to depreciate. Therefore, inflation is expected to negatively affect the market index and the stock exchange performance.

M2b is used to represent the money supply in the present study. M2b is the country's broad stock of money. A rise in money supply enhances the economy's liquidity thereby making money available for consumption and investment. As claimed by Ratanapakorn & Sharma (2007); Hussain (2009), an increase in money supply can increase earnings and cash flows as well, thereby indicating a positive impact. When cash flows are increasing, performances of corporates also increase and they will be more profitable. This will lead to an increase in dividend payments and ultimately overall stock returns. Accordingly, the researcher hypothesizes a positive relationship between the supply of money and the stock returns.

1.2 Research Problem

In developed capital markets, such as the USA, Japan, Australia, Canada and European countries, the relationship between macroeconomic variables and stock returns has been widely investigated. For instance, studies by Kaneko (1995), Fama (1981) related to the US and Japanese stock markets report a positive relationship between stock returns and macroeconomic variables. As a result of unexpected conditions within emerging economies like Sri Lanka within exceptionally short periods, the stock market indices and stock returns are increasing and decreasing with greater volatility. Therefore, the results of a limited number of studies on this area in Sri Lanka may vary, when conducted with different sample periods and also with different data frequencies, as observed by Naik & Padhi (2012).

After the adoption of the liberalization policy, the Sri Lankan capital market has undergone a significant transformation and has become more accessible to international investors especially in the contexts of the post war economy and eventual macroeconomic revitalization in Sri Lanka. Investors are attracted to capital markets if they can earn higher returns on investment under lower risk. But the performance of the stock market returns doesn't remain unchanged over time. Rathnayaka (2013) analyzed the trends and cyclical fluctuations in the CSE based on univariate and multivariate techniques and found out that economic conditions influenced stock market volatility directly, between 2007 and 2012. These effects on stock prices may have a subsequent impact on the stock returns in the CSE. Therefore, the investigations on 'how and at what extent the Sri Lankan stock returns respond to changes in macroeconomic variables?' remains an open empirical question. Understanding the macroeconomic variables that could impact the Sri Lanka stock

market index, with the recent data can be useful for investors, traders as well as policy makers for being prudent on their economic decisions and actions.

1.3 Research Questions

To address the main research problem, the following research questions were derived.

v. Is there any significant relationship between the macroeconomic variables and the stock returns in Sri Lanka?
vi. Is there any significant relationship between the inflation and the stock returns in Sri Lanka?
vii. Is there any significant relationship between the exchange rate and the stock returns in Sri Lanka?
viii. Is there any significant relationship between the money supply and the stock returns in Sri Lanka?
ix. Is there any significant relationship between the interest rate and the stock?

1.4 Research Objectives

The overall objective of the study was to identify the impact of macroeconomic variables on the stock returns in Sri Lanka. According to the research questions, the specific objectives of the research were also introduced.

i. To identify the relationship between the inflation and the stock returns in Sri Lanka.
ii. To identify the relationship between the money supply and the stock returns in Sri Lanka.
iii. To identify the relationship between the interest rate and the stock returns in Sri Lanka.
iv. To identify the relationship between the exchange rate and the stock returns in Sri Lanka.

2. LITERATURE REVIEW

This section will work as the basis for the development of the study. It will discuss the organized literature relating to the impact of macroeconomic variables on stock market returns. Thus, it will specifically focus on the theoretical review and empirical review of literature on the intended subject matter.

In the Sri Lankan Context, Menike (2006) studied the effects of macroeconomic variables on stock prices in the emerging Sri Lankan stock market. The fitted regression model reveals that a strong relationship exists between macroeconomic variables and stock prices. The findings of the study by Balagobei (2017) with the aim of investigating the impact of macroeconomic variables on stock market returns in Sri Lanka indicate that except the money supply, the other macroeconomic

variables affect stock market returns in Sri Lanka. Interest rate and factory industry production have a negative effect on stock returns, while the inflation rate and exchange rate have a positive impact. Fernando (2018) examined the relationship between the stock market returns and the selected macroeconomic variables and examined the impact of macroeconomic uncertainty on stock market volatility in Sri Lanka. The results of the study have concluded that the interest rate is one of the most prominent economic factors determining investment decisions and a positive long-run relationship between inflation and stock market returns and money supply and stock market returns was identified. A negative relationship between the stock returns and the exchange rate has been emphasized.

The research by Olweny et al., (2011) which used the same independent variables as the present study, investigated the effect of macroeconomic factors on the stock return volatility on the Nairobi Securities Exchange Kenya. The results show evidence that the Foreign exchange rate, Interest rate and Inflation rate affect stock return volatility. Samadi et al., (2012) have studied the impact of macroeconomic variables on the stock returns in the Tehran Stock Exchange. Results show that the gold price, inflation and exchange rate variables influencing the stock return and oil price and liquidity had no impact on the stock returns.

The aim of the paper by Jamaludin et al., (2017) was to identify the impact of macroeconomic on both conventional and Islamic stock market returns in the three selected ASEAN countries (Singapore, Malaysia, Indonesia). The findings indicate that the exchange rate and inflation rate greatly influence both stock market returns. The money supply is considered insignificant. The results also suggest that the inflation has a greater impact and is in inverse relation with stock market returns.

The research by Temuhale (2019) looked at the impact of macroeconomic factors on stock returns in Nigeria and the results showed that money supply creates a negative and statistically significant impact on stock returns both within the short run and long run. Exchange rate, interest rate, and inflation, each includes a positive but measurably insignificant impact. However, market capitalization contains a positive and significant impact. Subsequently, the research concludes that macro-economic factors can be used to anticipate the stock market performance within the NSE.

The study of Naseem (2020) revolves around the analysis of the influence of macroeconomic variables on the stock markets of emerging and developed economies by using regression analysis. The results indicate that the exchange rate, Interest rate and inflation growth have a significant linkage with stock returns. Stock returns' relationship with industrial growth is not significant.

The above review of the relevant literature related to the present study contributed to identify mixed results about the relationship between macroeconomic variables and

stock returns. While stock returns are significantly affected by some macroeconomic variables, some other variables make less impact within different economic environments. Therefore, the present study was developed by identifying the most critical macroeconomic factors to Sri Lanka, by taking previous literature into account.

3. METHODOLOGY

This section focuses on the process of analysis, methods and procedures used. This study adopts the following methodological approach for determining the relationship between macroeconomic variables and stock returns in the developing Sri Lankan Stock Market.

3.1 Data

This study used monthly data with 240 monthly observations. Sample period extended from January 2000 to December 2019. There was a very critical situation in Sri Lanka around the year 2000 because of the LTTE war. The war officially ended in 2009. Therefore, the intention of selecting the period between 2000 & 2019 was that it can cover both the war and post-war period, also the global financial crisis period started from 2008, which major economic ups and downs happened.

3.2 Population

The population comprises of 290 listed companies as of January 2020 (end of December 2019) on Colombo Stock Exchange.

3.3 Sample

The sample consists of the entire population under the 'total population sampling' technique since the whole population is accessible.

3.4 Unit of Analysis

All Share Price Index measures the movement of share prices of all listed companies based on market capitalization. Therefore, the unit of analysis will become the listed companies in CSE.

3.5 Sources of Data

Secondary data for the independent variables collected from annual reports of Central Bank of Sri Lanka, monthly bulletins of Central Bank of Sri Lanka and Census and Statistics Department publications. The dependent variable ASPI data were collected from the Colombo Stock Exchange data library, CSE monthly publications.

3.6 Operationalization of Variables

Table 3.6: Results of Demographic Characteristics

Variable	Abbreviation	Justification of Variable	Measures
Stock return	ASPI	(Balagobei, 2017)	Measured by using the monthly closing All Share Price Index (ASPI), CSE's broad market index which assesses overall market movements. ASPI measures in real-time as a weighted index of market capitalization. Both voting and non-voting shares of listed companies in CSE are constituted. This Index includes only capital gains of the stock returns while excluding the dividend.
Inflation rate	INF	**Invalid source specified.** (Samadi et al., 2012)	Measured by year over year changes in Colombo consumer price index (CCPI) (Base 2013=100)
Money supply	MS	(Hussain, 2009) (Ratanapakorn & Sharma, 2007)	Consists of the broad money supply (M2b) of Sri Lanka which is a combination of currency and demand, savings and time deposits denominated in rupees as well as foreign currency held

			by the public with commercial banks.
Interest rate	INT	(Temuhale, 2019) (Samadi et al.,2012)	Three months (91 days) end of the period the Treasury bill rate has been used as the interest rate.
Exchange rate	ER	(Jamaludin et al., 2017) (Samadi, 2012)	The Month-end exchange rate has been used as the measure of the exchange rate. The exchange rate is measured as domestic currency units (Rs.) per unit of the US dollar.

3.7 Techniques of Data Analysis

Firstly, the unit root test was carried out to check the satationarity of the data set. Trend analysis was done to determine the trend of a variable and was then analyzed further to determine its development over time with other variables. It is important to identify the behaiour of variables during the study period to have a reliable analysis of data. To accurately describe and summarize the data, a descriptive analysis of variables was carried out to determine their maximum, minimum, mean, median and standard deviation. The Jarque-Bera (JB) test must also apply to all the variables to decide whether they fulfill the normal probability distribution by measures of their kurtosis and skewness. Correlation analysis was done as a method of statistical evaluation used to study the strength of a relationship between two, numerically measured variables. To obtain reliable estimators of the coefficients which are able to investigate the relationships among the variables, Simple Ordinary Least Square Regression Analysis was carried out. The coefficient of determination (R2) was calculated for relationships to determine how differences in the dependent variable can be explained by the difference in an independent variable. Then the Johansen Cointegration Test was conducted to see the long-term relationships between variables.

3.8 Conceptual Framework

The following graph depicts the research conceptualization (design) of this study. Here, the stock return is the dependent variable while the inflation rate, money supply, exchange rate, interest rate become the independent variables. The relationship between the dependent variable and independent variables is draft on the following conceptual framework.

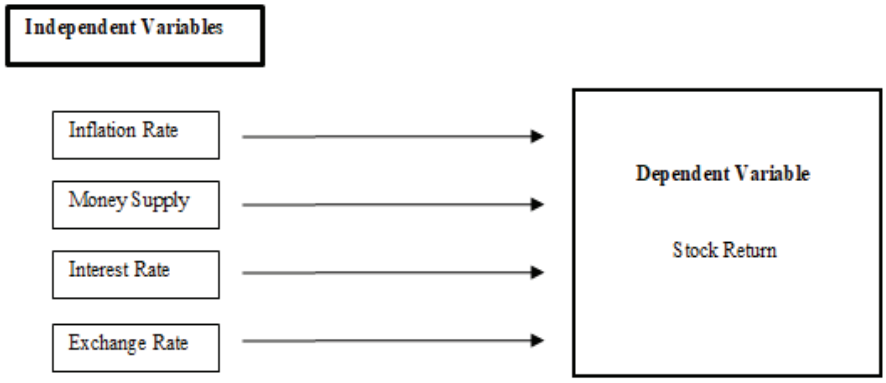


Figure 1: Conceptual Framework

3.9 Hypothesis

Based on the research design and research questions, the following hypotheses were formulated for this research study. Most of the kinds of literature conclude that the stock return is affected by the macroeconomic variables. Even though theoretically that is true, this is not the case in all periods and different economic situations.

Inflation

H0: There is no significant relationship between the inflation and the stock returns in Sri Lanka.

H1: There is a significant relationship between the inflation and the stock returns in Sri Lanka.

Exchange rate

H0: There is no significant relationship between the exchange rate and the stock returns in Sri Lanka.

H2: There is a significant relationship between the exchange rate and the stock returns in Sri Lanka.

Money supply

H0: There is no significant relationship between the money supply and the stock returns in Sri Lanka.

H3: There is a significant relationship between the money supply and stock returns in Sri Lanka.

Interest rate

H0: There is a significant relationship between the interest rate and the stock returns in Sri Lanka.

H 4: There is a significant relationship between the interest rate and the stock returns in Sri Lanka.

4 RESULTS

4.1 Unit root Test

To draw meaningful conclusions in a time series analysis and to increase the accuracy and reliability of the constructed models, the stationarity of a data series is a requirement. To test the stationarity Augmented Dickey Fuller (ADF) test was carried out under the unit root test. The results revealed that none of the data set is stationary since probability values for all the variables are higher than 0.05 under the ADF test.

Table 4.1: Results of Demographic Characteristics

Variable	Probability
ASPI	0.7322
ER	0.9851
MS	1.0000
INF	0.4551
IR	0.1185

4.2 Trend Analysis

Observation graphs display the values of the data for each observation in the study and how those data behave throughout the period of study. According to the overall trend lines in figures, the dependent variable of ASPI shows an increasing trend in the long run. The independent variables of the exchange rate (ER) and money supply (MS) show an increasing trend in the long run. But there is a decreasing trend in the inflation rate (INF) and interest rate (IR) in the long run. Accordingly, a negative relationship between stock return and inflation, stock return and interest rate can be

identified. Also, positive relationships can be seen between stock returns and money supply, stock return and exchange rate. Those trends confirm the correlation results.

Figure 2: All Share Price Index

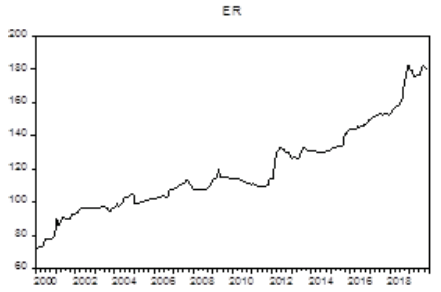


Figure 3: Exchange Rate

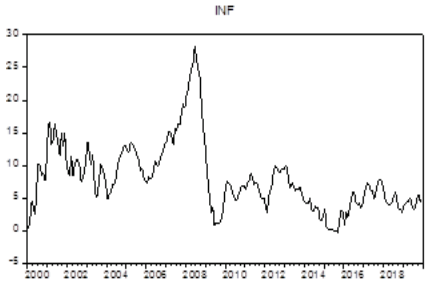


Figure 4: Inflation Rate

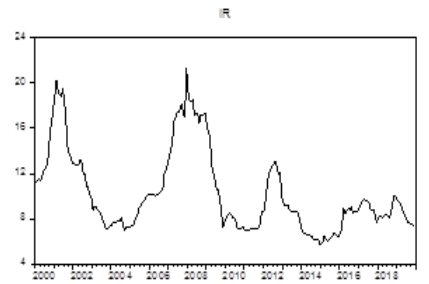
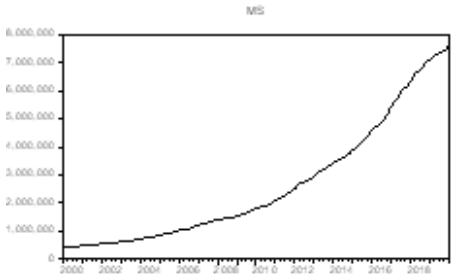


Figure 5: Interest Rate



Figre 6: Money Supply

4.3 Descriptive Statistics

This section focused on the summary of the descriptive statistic of all variables included in this study. Average values for data set denote positive results. For instance, the Mean of ASPI is 38880.365, Mean for ER is 119.4519. Positive values for the skewness of other variables apart from ASPI show that the distribution of the data series displays a long right tail. It also shows the negative skewness for ASPI. Estimates of kurtosis in the table demonstrate that none of the variables is normally distributed, and have found that leptokurtic distribution INF and IR apart from all other variables because the kurtosis values are greater than 3. The results of Jarque-Bera statistics p-values reject the null hypothesis of normal distribution at 5% significance level for all variables. Because the data for the study was found to be not normally distributed since the p values for the Jarque-Bera test were lower than 0.05 for all the variables.

Table 4.3: Descriptive Statistics

	ASPI	ER	INF	IR	MS
Mean	3880.365	119.4519	8.079833	10.28637	2621693.
Median	3510.975	112.6258	7.085000	8.895000	1803387.
Maximum	7798.000	182.7499	28.31000	21.30000	7624121.
Minimum	403.6000	72.64000	-0.270000	5.740000	432180.7
Std. Dev.	2455.128	25.68292	5.308737	3.643523	2128661.
Skewness	-0.040845	0.663524	1.213265	1.132667	0.925663
Kurtosis	1.357002	2.885767	4.903943	3.282765	2.629616
Jarque-Bera	27.06116	17.74105	95.13049	52.11691	35.64594
Probability	0.000001	0.000140	0.000000	0.000000	0.000000
Sum	931287.5	28668.44	1939.160	2468.728	6.29E+08
Sum Sq. Dev.	1.44E+09	157647.3	6735.664	3172.787	1.08E+15
Observations	240	240	240	240	240

4.4 Correlation Analysis

Pearson correlation analysis was conducted as a technique for investigating the relationship between quantitative variables. The correlation coefficient (r) is a measure of the association between the two variables. IR correlation is -0.562

showing that interest rate has a significant, moderate, negative correlation with ASPI. INF correlation is -0.523, which reflects that inflation also has a significant, moderate, negative correlation with ASPI. These negative results imply that if INF and IR increase, stock returns will decrease. MS correlation of 0.789 has a significant positive correlation with ASPI. ER correlation with ASPI is 0.775 also implying that the exchange rate has a significant positive correlation with ASPI. These positive results imply that if MS and ER increase, stock returns will also increase.

Due to the significant relationships that exist between independent variables, a multicolinariality situation has arrived. Because of that reason, multiple regression analysis would not be accurate in implementing.

Table 4.4: Correlation Analysis Table

		All share price index	interest rate	money supply	exchange rate	inflation rate
all share price index	Pearson Correlation	1	-.562**	.789**	.775**	-.523**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	240	240	240	240	240
interest rate	Pearson Correlation	-.562**	1	-.413**	-.386**	.727**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	240	240	240	240	240
money supply	Pearson Correlation	.789**	-.413**	1	.971**	-.487**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	240	240	240	240	240
exchange rate	Pearson Correlation	.775**	-.386**	.971**	1	-.432**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	240	240	240	240	240
inflation rate	Pearson Correlation	-.523**	.727**	-.487**	-.432**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	240	240	240	240	240

**. Correlation is significant at the 0.01 level (2-tailed).

4.5 Simple Ordinary Least Square Regression Analysis

OLS Regression provides simple relationship modeling between independent variables and dependent variable. It is a statistical method of analysis that estimates

the behavior of dependent variables using one independent variable. P-values and Coefficients in regression analysis work together to present which relationships are statistically significant and the nature of those relationships.

Table 4.5.1: OLS Regression between ASPI and ER

Variable	Coefficient	Prob.
ER	74.13063	0.0000
R-squared	0.601362	
Adjusted R-squared	0.599687	
F-statistic	359.0327	
Prob(F-statistic)	0.000000	

According to the ER coefficient 74.13063, a positive relationship can be identified and it says as the one-unit change in the ER, the dependent variable of stock returns will increase by 74 units. The p-value related to coefficient is less than 0.05 which implies that ER is a significant variable to explain ASPI.

Table 4.5.2: OLS Regression between ASPI and INF

Variable	Coefficient	Prob.
INF	-241.7178	0.0000
R-squared	0.273182	
Adjusted R-squared	0.270128	
F-statistic	89.45461	
Prob(F-statistic)	0.000000	

Because the p-value related to the INF coefficient is less than 0.05, it implies that INF is a significant variable to determine ASPI. The coefficient of INF says that there is a negative relationship between inflation and stock return. It implies that, as one unit change in the INF, the decrease of the ASPI will be 241 units.

Table 4.5.3: OLS Regression between ASPI and IR

Variable	Coefficient	Prob.
IR	-378.4228	0.0000
R-squared	0.315391	
Adjusted R-squared	0.312515	
F-statistic	109.6437	
Prob(F-statistic)	0.000000	

Since the p-value related to coefficient is less than 0.05 it indicates that IR is a significant variable to explain ASPI. The coefficient of IR shows that an increase in one unit of interest rate causes a reduction in stock returns by 378 units.

Table 4.5.4: OLS Regression between ASPI and MS

Variable	Coefficient	Prob.
MS	0.000910	0.0000
R-squared	0.621982	
Adjusted R-squared	0.620394	
F-statistic	391.5997	
Prob(F-statistic)	0.000000	

The p-value of the coefficient less than 0.05 indicates that MS is a significant variable to explain ASPI. The coefficient of MS implies that an increase in one unit of the money supply causes to increase in stock returns only by 0.00091 units.

4.6 Johansen Co-Integration Test

This test is required to determine whether long-term relationships exist among the variables. Cointegration tests indicate the presence of such stable long-term relationships. In Johansen co-integration test there are two tests, which are Trace Test and the Maximum Eigenvalue Test.

Here, according to Trace Test null hypothesis (there is no co-integration between variables), it can be rejected by seen the probability value of 0.0000 because the p-value is less than 0.05. It means there is co-integration between variables. In Trace Test AT most 2 co-integration between variables is accepted because its p-value is higher than 0.05. It means that there are at least 3 co-integrations among these five variables. It implies that these variables have long-run association otherwise, these

variables move together in long run. The Maximum Eigenvalue Test also rejects the null hypothesis (there is no co-integration between variables) because the p-value is less than 0.05. It also confirms that there may be at least 2 co-integrations between variables since it accepts at most 2 co-integrations between variables.

Table 4.6.1: Johansen Co-Integration Test Results

Series: ASPI ER INF IR MS				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)		Statistic	Critical Value	Prob.**
None *		102.1139	69.81889	0.0000
At most 1 *		65.43765	47.85613	0.0005
At most 2 *		34.40215	29.79707	0.0137
At most 3		13.67767	15.49471	0.0922
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				0.123717
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.144500	36.67623	33.87687	0.0225
At most 1 *	0.123717	31.03550	27.58434	0.0173
At most 2	0.084412	20.72448	21.13162	0.0569
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				

At the end of the analysis, it can be seen that the objectives of the study have been achieved through the data analysis. Accordingly, simple OLS Regression analysis for independent variables has shown a significant impact on stock returns in Sri Lanka. According to the results, the following table is made related to hypothesizes which have been already established.

Table 5: Hypotheses Results

Variable	H1	H0
IR	Accept	Reject
MS	Accept	Reject
ER	Accept	Reject
INF	Accept	Reject

5 DISCUSSION

The findings of the study show that there is a significant relationship between the macroeconomic variables and the stock returns in Sri Lanka. From the correlation analysis and regression analysis, a significant positive relationship between stock return and money supply, stock return and exchange rate was found. Previous research findings, such as Afzal & Hossain (2011), Ouma & Muriu (2014), are mostly following the positive relationship between money supply and stock return of current research.

According to the correlation analysis and regression results a significant negative relationship between stock return and interest rate, stock return and inflation have been identified. This relationship also confirms by evidence of capital market progress report, strong market fundamentals and the sustainable decline in both interest rates and inflation during 2012-2013 were forced the performance of CSE to increase. Apart from that, the findings were consistent with the earlier studies. For instance, Balagobei (2017) found a significant positive relationship between exchange rate and stock returns and a significant negative relationship between the interest rate and stock returns in Sri Lanka.

Johansen Co-integration test also confirms that there are long term relationships between variables. It means the five variables including dependent and independent move together in the long run.

6 CONCLUSION

The results of the study helped to accomplish the main objective of examining the relationship between the macroeconomic variables and the stock returns in Sri Lanka. Interest rate findings revealed that interest rate rises had a negative effect on stock returns in Sri Lanka. Therefore, the interest rate rises cause to reduce the stock returns because, whenever the government securities' returns increase, investors shift from the stock market and thus, stock prices decrease. A positive relationship between exchange rate and stock returns in Sri Lanka can be observed through the study. Depreciation of local currency may encourage export-based companies for more

exports, increase profits and thus stock returns. The impact of money supply on stock returns in Sri Lanka postulates that an increase in the money supply causes stock returns to increase. The increase in money supply results in companies' production and sales to increase and thus, profits to increase. Finally, better dividend payment will lead to an increase in stock returns. A negative relationship between inflation rate and stock returns implies that increased inflation causes real income decline and people will move from investments to consumable goods.

According to the findings from the analysis, the following recommendations are made. Investors can view the treasury bills as an alternative to stocks and would switch to the treasury bills if the rate of returns from the Colombo Stock Exchange (CSE) is lower. Therefore, returns from investing in the Colombo Stock Exchange must be more attractive than the returns from Treasury bills. Money supply and inflation should be controlled by a proper monetary policy of the Central Bank of Sri Lanka (CBSL). The exchange rate contains some significant information to forecast stock market performance. Therefore, CBSL should try to maintain a healthy exchange rate. The government should maintain a healthy macro environment to optimize the CSE returns. Fiscal policy changes may quite effective in stimulating economic activity and consumer spending. This will lead to an increase in stock market performance through more investments, ultimately stock returns. The study's findings would be useful for public stock market investors, to concentrate on macroeconomic variables to make successful decisions to increase their return on the stock market.

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Annual Research Symposium in Management

Faculty of Business Studies and Finance
Wayamba University of Sri Lanka

ISSN : ISSN 2756-9373