

Responses of Share Returns to Macroeconomic Information: An Empirical Examination of Bank, Finance and Insurance industry in Sri Lanka

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Abstract

The purpose of this study is to examine the impact of macroeconomic variables on Share Returns of Banking, Financing, and Insurance (BFI) companies listed at the Colombo Stock Exchange (CSE). The Theory of Efficiency Market Hypothesis (EMH) is applied to investigate the research. The study used secondary data of companies listed under Banking, Finance and Insurance sector in CSE from 2010 to 2017. Macroeconomic variables include Exchange rate, Interest rate, Inflation rate and Broad Money Supply (M2). The macroeconomic data were collected from the Central Bank of Sri Lanka. Descriptive Statistics, Augmented Dickey-Fuller, unit root test, Johansen co-integration and vector error correction model were also used in analyzing the study. The co-integration test results depict the positive relation between the Total Return Indices in BFI sector with the interest rate and money supply. In contrast, the Exchange rate and inflation rate negatively affects the correlate with Total Return Index in the BFI sector. This study also emphasizes that there is no significant short-run causality from macroeconomic factors to Total Return Index (TRI). It is concluded that there is a minimum level of positive impact with interest rate and money supply in the long-run causality, while a negative effect with the exchange rate and inflation rate. The study supports the EMH, which states that it is immediately reflected in share return when new information comes into the market.

Keywords: *Macroeconomic Variables, Total Return Indices, Johanson Co-integration, Colombo Stock Exchange, Banking, Finance, and Insurance sector.*

Introduction

In Sri Lanka, the Colombo Stock Exchange (CSE) is the organization responsible for the operation of the stock market within the country. The stock exchange provides facilities for stockbrokers and traders to trade stocks, securities, and other financial instruments. CSE is one of the most modern exchanges in South Asia, providing a fully automated trading platform. The Sri Lankan equity market moved into a new phase of growth after the end of the three decades' huge war in 2009. At the end of the nearly three decades, terrorism in Sri Lanka has shown improvement in key macroeconomic indicators. Thakur (2009) said that "Sri Lanka's stock market value climbs to record as the war ends." As at 31st December 2018, 297 public limited companies were listed at CSE representing 20 business sectors with a Market Capitalization of Rs. 2,919.7 Bn. (Colombo Stock Exchange, 2019).

Macroeconomic variables, namely, exchange rate, interest rate, inflation rate and money supply effect on share return of banking finance and insurance industry listed in CSE. The relationship between macroeconomic variables and share return

is being continuously studied by different academics, economists and practitioners over the past few years. Similarly, there are only a few published books and related websites to study the factors affecting the share return. Most of the research linking macroeconomic variables with share return is through arbitrage pricing theory (APT). Efficiency Market Hypothesis (EMH) is an essential theory in understanding the equity markets and the cost of equity capital. In terms of Capital Market Theory, the conception of market efficiency is used to explain the degree to which stock prices reflect relevant information in a timely manner. The efficiency of equity markets has important implications for the investment policy of the investors (Fama, 1970). If EMH holds, investors cannot expect to achieve excess profits from their investment strategies. From an economic perspective, the efficient market is important as it applies to a well-functioning stock market when allocating scarce resources among economic agents. The pioneer empirical study conducted by Chen et al. (1986) provided attestation to the idea that there is a relationship between stock prices and macroeconomic variables. This study illustrates how economic factors influence the firms, generate cash flows, future dividend payouts, and the firm's cost of capital. These studies also confirms that the movement of share returns is highly sensitive to the changes in the fundamental economic parameters.

Another alternative way of examining the effect of macroeconomic variables on stock return is the co-integration analysis. For example, Mukherjee and Naka (1995) used Johansen co-integration test in the Vector Error Correction Model. They found the Japanese stock market to be co-integrated with six macroeconomic variables such as exchange rate, money supply, inflation rate, industrial production, long-term government bond rate and the short-term call money rate. The findings of the long-term coefficients of the macroeconomic variables were consistent with the hypothesized equilibrium relationships. Moreover, Mayasmai and Koh (2000) used Johansen co-integration test in the Vector Error Correction Model and found Singapore stock market to be cointegrated with five macroeconomic variables. Bulmash and Trivoli (1991) found that interest rates influence by stock prices negatively since higher interest rates attracted another investment alternative. Abdullah and Hayworth (1993) found that stock returns positively relates to the growth of money and inflation rate, while interest rates react negatively to stock returns. The findings of Zafar (2013) revealed that there was a negative relationship with the interest rate. Kalyanarama and Tuwajri (2013) explained that the exchange rate and stock prices were also positively related. Dornbusch and Fischer (1980) suggested a negative relationship between exchange rates and stock prices. Humpe and Macmillan (2007) reported that stock price was influenced negatively by the money supply in the Japanese market. Gunasekarage et al. (2004) emphasized the money supply coefficient was significant and positive.

Many studies were holistically conducted to understand the impact of macroeconomic factors on the stock market. Ongeru (2014) explored the effect of the selected macroeconomic variable on the financial performance of non-bank institutions in Kenya whereas Marshall (1992), Tanggaard (2002), Hasan (2000), and Menike (2006) explained in various sectors rather than Banking, Finance and

Insurance sector. Therefore, examining the relationship between macroeconomic variables and share market returns in Colombo Stock Exchange assists the entire interested group for deciding operational, managerial and sustainable growth decisions efficiently. This study expects to deliver valuable insight for investors, portfolio management and policymakers. As supported by the efficient market hypothesis diversification benefit, a portfolio is less correlated to publicly available information and stock market returns. However, when weak forms of efficient market exist; market participants get an opportunity to use macro-economic information to gain excess returns. In that sense this study is vital to all market participants, including investors, portfolio and fund managers. However, BFI companies play a significant role in the financial market particularly in the capital market. But considering the scenario there are only limited number of studies that focus the effect of macroeconomic factors on share returns that specifically address the banking, finance and insurance sector. Further, no empirical research has been conducted based on the Colombo stock market after 2011 such that the existing literature would be relatively old and outdated considering the current financial market conditions. Therefore, the need to carry out the studies on macroeconomic variables and stock market returns arises such that this study aims to fill the gap in the existing literature and hence the knowledge gap is not yet filled in Sri Lankan context. Further, sophisticated techniques are not applied to understand the phenomena. Therefore, the study seeks to bridge this gap by finding answers to the following research question. "Does macroeconomic variables impact on Total Share Return of the bank, finance, and insurance listed companies at CSE in Sri Lanka from 2010 to 2017 either in the long run or short run?" The research objectives are two-folded, firstly to identify the relationship between macroeconomic factors and the Total share return (capital Letters) of BFI companies at CSE in Sri Lanka from 2010 to 2017. Secondly to identify the long-run or short-run impact of macroeconomic factors on the Total share return of bank, finance, and insurance listed companies at CSE in Sri Lanka.

The remaining part of the paper focuses on the critical review of the literature and methodology. Subsequently, the findings of the study are provided with discussion and ultimately the conclusions and recommendations are presented.

Literature Review

Several past researchers have developed the relationship on macroeconomic factors affecting to share return of finance, insurance, and bank industry. Similarly, there are only a few published research papers in printed journals and related websites to study the factors affecting the share return. These empirical results further illustrate the different factors that influence share return in different countries and accordingly compare the results with the Sri Lankan context.

Mukherjee and Naka (1995) investigated the relationship between Tokyo stock prices and six macroeconomic variables using a Vector Error Correction Model (VECM). Their study covered 240 monthly observations for each variable in the period from January 1971 to December 1990. The study results shows that the

relationship between Tokyo stock prices; the exchange rate, money supply, and industrial production are positive, whereas the relationship between Tokyo stock prices with inflation and interest rates are mixed. Considering the United Kingdom, he found that the short-run causality runs from stock returns to T-bill from stock returns to the money supply from stock returns to exchange rate, the exchange rate to 15 stock returns and stock returns to industrial production. The long-run causality runs from inflation to stock returns. The short and long-run causal relationship runs from stock returns to inflation, from money supply to stock returns and from industrial production to stock returns. These results indicate the short-run interactions and long-term causal relationship between Germany and the UK stock markets and the macroeconomic fundamentals.

Hondroyannis and Papapetrou (2001) examined the movements in the indicator of the economic activities that affects the stock return for Greece. The study performed a VAR analysis to study the dynamic interaction among indicators of economic activity using monthly data for the period of 1984-1999 for Greece. The major findings of the research emphasize that the domestic market economic activity affected the performance of the domestic stock market, and all macroeconomic activity is taken into consideration were important in explaining stock price movements. Wongbangpo and Sharma (2002) tested the relationship between the stock returns for the ASEAN-5 countries of Indonesia, Malaysia, the Philippines, Singapore and Thailand and five macroeconomic variables. By observing both short and long-run relationship between respective stock indices and macroeconomic variables of gross national production, consumer price index, money supply, interest rate, exchange rate, they found that in the long-run all five stock price indices were positively related to growth in output and negatively related to the aggregate price level. But a long-term negative relationship between stock prices and interest rates was observed for the Philippines, Singapore and Thailand and was found positive for Indonesia and Malaysia.

Rajeshwaran (2019) conducted an empirical investigation based on the dynamic relationship between macroeconomic variables and stock return in Sri Lanka using co-integration and vector error correction model. The result indicates that interest rate and money supply have positive impact on ASTRI while exchange rate and inflation rate have a negative impact on ASTRI. It is also noted that there is no significant short-run causality from macroeconomic variables to ASTRI. However, it is observed that the exchange rate negatively impacts on ASTRI in the short run. Furthermore, in the long run, interest rate and money supply have a positive impact on ASTRI, whereas exchange rate and inflation rate have a negative impact on ASTRI. It was concluded that exchange rate, interest rate, inflation rate and money supply had asymmetric effects on ASTRI in the long run, on average *ceteris paribus* (when all other factors held constant).

Menike (2006) investigated the effect of macroeconomic variables on stock prices in the Sri Lankan stock market using monthly data for the period from September 1991 to December 2002. The study used employed multivariate regression where eight macroeconomic variables were regressed against each individual stock. The

results indicated that the higher explanatory power of macroeconomic variables was high in explaining most of the stock prices listed in the CSE. The study held that inflation rate and exchange rate reacted negatively to stock prices. Moreover, there is a negative effect on treasury bill rate, implying that whenever the interest rate on treasury securities rises, investors tend to switch out stocks causing a fall in stock prices. However, lagged money supply variables were not emphasized having a strong prediction of the movements of stock prices.

Premawardhana (1997) found a negative relationship between stock returns and interest rates in Sri Lanka while Hassan (2000) found a positive relationship between aforesaid variables. Gunasekarag (2004) found that there is no significant relationship between exchange rates with the Colombo stock prices due to limited participation of foreign investors.

Wickremasinghe (2011) examined the long-run relationship between Sri Lankan Capital Market Prices (CSE) and six macroeconomic variables such as three months fixed deposit rate, consumer price index, US stock market index, narrow M1 and GDP of Sri Lanka. They used the monthly data from January 1985 to December 2004 and with the help of unit root test, co-integration, variance decomposition and error correction mechanism they found out that there is a short term and a long-term relationship between stock prices and macroeconomic variables.

Methodology

Research Design

According to Harry and Charles (2000), the research design is the systematic planning of research to permit valid conclusions. Therefore, the research design is the conceptual structure within which research would be conducted. From a positivism perspective, the quantitative approach is used to undertake the study. The nature of the research is descriptive and explanatory, examining the impact of macroeconomic variables on total stock returns in Sri Lanka. Secondary monthly data of the selected banks, financial, and insurance institutions for an eight-year period in monthly basis (2010-2017) used in this study to examine the impact of selected macroeconomic factors such as inflation rate, interest rate, exchange rate, money supply variables on the Total Share Return of financial, insurance and bank industry in Sri Lanka. Interest rate simply means the percentage of the value of a balance or a debt that one pays or paid each time.

In this context the study focuses the Central Bank treasury bill interest rate. A Treasury bill is a negotiable debt instrument issued by the government of Sri Lanka to directory policy or finance government expenditure. The inflation rate is defined as "A sustained increase in the general price level of goods and services in an economy over a period of time." Wyploz & Burda (1997). In Sri Lanka, the most commonly known index is the Colombo Consumer Price Index (CCPI). Consumer price indices are based on a representative basket of goods and services purchased by consumers in an economy. Composition and relative weights of the basket are reviewed periodically. The exchange rate is defined as the price of a nation's currency in terms of another currency. The money supply is the total stock of one

circulating in an economy. It involves the currency, the money in the deposit accounts as one of the liquid assets. Various money supply types are generally classified as M1, M2, M3, and M4. However, this study uses M2 to measure the money supply. As a stockholder who owns a piece of a company entitles to potential profit on investment. Making a return on investment depends on how well the company is determined by the performance of its shares and if the company pays a dividend. Publicly traded company's earnings (less dividends on preferred shares) divided by the amount of money invested in common stock, expressed as a percentage.

Population and Sample

As at 31st December 2018, 297 public limited companies were listed at CSE representing 20 business sectors with a Market Capitalization of Rs. 2,919.7 Bn. (Colombo Stock Exchange, 2019). This considers the financial, insurance and banking industry sector which consists of 72 companies listed under finance, insurance, and bank industry as the sample of the study.

Data Collection and Analysis

This study was done with the use of secondary data. Data for macroeconomic factors were collected from the central bank statistic data library (2010-2017) on a monthly basis. The sources of data include the Central Bank publications and some related web sites such as www.cbsl.lk, www.sec.gov.lk, www.slstock.com/stock, and www.cse.lk. The data about the Total Return Indices (TRI) collected from data Library issued by Securities and Exchange Commission of Sri Lanka. Descriptive, Augmented Dickey-Fuller test for unit root, Johnson co-integration test and Vector Error Correction Model (VECM) were applied to investigate the long run causality or short run causality.

However, it is important to keep in mind that time series data analysis is subject to the problem of spurious regression if the data is non-stationary, resulting in unreliable results of the models constructed. In order to avoid spurious regression, the unit root test (Augmented Dickey –Fuller test) is conducted first to check whether the time series data is stationary. Since the test shows that the data is non-stationary, the first difference of the variables is employed before conducting the test. Based on the model employed by Masor and Hassanuddeen (2003), the following VECM is developed.

$$\begin{aligned} \Delta TRI BFI_t &= \sigma + \sum_{i=1}^{k-1} \gamma_i \Delta TRI BFI_{t-i} + \sum_{j=1}^{k-1} \delta_j \Delta EX_{t-j} + \sum_{m=1}^{k-1} \alpha_m \Delta INT_{t-m} + \sum_{n=1}^{k-1} \beta_n \\ &\quad \Delta INF_{t-n} + \sum_{p=1}^{k-1} \varphi_p \Delta mMS_{t-p} + \omega CE1_{t-1} + u_t \end{aligned}$$

Where:

TRIBFI_t = Total Returns Indices of Banking, Finance, Insurance listed companies at time t

EX_t = Exchange rate at time t

INT_t = Interest rate at time t

INF_t = Inflation rate at time t

MSt = Money supply at time t

CE1 = Error correction term at time t

ut = error term

σ = Constant

Δ = First difference

$\gamma, \beta, \varphi, \omega$ are coefficient of the variables

Result and Discussion

Descriptive Statistics

The descriptive analysis has been performed to find out the temporal properties of the data. The mean describes; the average value in the series and standard deviation measures the dispersion or spread of the series. The maximum and minimum statistics measure upper and lower bounds of the variables under study during our chosen time span. Table I shows the descriptive statistics of the variables of the study.

Maximum and minimum values of TRIBFI are 27605.41 and 8382.3 respectively. The average TRIBFI is 20377.27 with the standard deviation of 4428.086. It reveals those values of TRIBFI vary around the mean value of 20377.27.

Table I: Descriptive statistics

	Obs.	Mean	Std. Dev.	Min	Max
TRIBFI	96	20377.27	4428.086	8382.3	27605.41
Exchange Rate	96	130.8689	13.85341	109.4881	153.7652
Interest Rate	96	8.194479	1.739747	5.74	13.07
Inflation Rate	96	5.24375	2.600316	-0.3	9.8
Money Supply	96	3,198,622	1,170,817	1,551,744	5,665,313
In Money Supply	96	14.9107	0.3729983	14.25489	15.54987

Source: Survey Data

Correlation Analysis

Table II represents the correlation of exchange rate, interest rate, inflation rate and money supply with Total Return Index. It can be observed that the money supply also has a moderate positive correlation with Total Return Index in banking finance and insurance sector. However, interest rate and the inflation rate have a negative

effect with TRIBFI. Interest rate and the inflation rate have a moderate negative correlation effect with TRIBFI.

Table II: Correlation analysis

Variables	TRIBFI	Exchange Rate	Interest Rate	Inflation Rate	LnMoney Supply
TRIBFI	1.0000				
Exchange Rate	0.4785	1.0000			
Interest Rate	-0.5035	0.1920	1.0000		
Inflation Rate	-0.5585	-0.2186	0.6246	1.0000	
Ln Money Supply	0.6732	0.9532	-0.0289	-0.3479	1.0000

Source: Survey Data

Unit Root Test

Unit root test uses to test whether the data are stationary or not. If the time series is not stationary, the result will have no economic meaning. Non-stationary data will make the result meaningless, and it will raise the problems. Hypotheses are as follows,

H0= Variables are not stationary

H1 = Variables are stationary

There are numerous unit root tests available and the most popular among them is Augmented Dickey Fuller (ADF) test. Augmented Dickey-Fuller (ADF) applied to all dependent and independent variables in this research to test the stationary of the data series.

Table III shows the ADF test before first difference. The null hypothesis for ADF is that the series is non-stationary.

Table III: ADF test before first difference

Variable	P Value	t-Statistic	Critical Values			Alternative Hypothesis	Results
			1%	5%	10%		
TRIBFI	0.078	-2.677	-3.517	-2.894	-2.582	Rejected 5%	atTRIBFI is non stationary
Exchange Rate	0.957	-0.019	-3.517	-2.894	-2.582	Rejected 5%	atExchange Rate is non- stationary
Interest Rate	0.657	-1.237	-3.517	-2.894	-2.582	Rejected 5%	atInterest Rate is non- stationary

Inflation Rate	0.363	-1.836	-3.517	-2.894	-	2.582	5%	Rejected	at Inflation Rate is non- stationary
Money Supply	0.887	-0.525	-3.517	-2.894	-	2.582	5%	Rejected	at Natural log of money supply is non- stationary

Source: Survey Data

If the coefficient is significantly different from one (less than one) then the hypothesis that contains a unit root is rejected. Rejection of the null hypothesis denotes stationarity in the series. If it is failed to reject the null hypothesis, it means that there is a unit root. By looking at the results, it appears that the p-values for all the included variables in the research are greater than the critical value (5%). Therefore, it fails to reject the null hypothesis that variables are non-stationary, meaning that those variables follow a random walk with drift and no time trend. This also implies that it is necessary to take the first difference of those variables before running the model.

Table IV: ADF test after first difference

Variable	P Value	t-Statistics	Critical Values			Alternative Hypothesis	Results
			1%	5%	10%		
TRIBFI	0.000	-9.402	-3.518	-2.895	-2.582	Accepted	TRIBFI is Stationary
Exchange Rate	0.000	-7.011	-3.518	-2.895	-2.582	Accepted	Exchange Rate is stationary
Interest Rate	0.000	-6.795	-3.518	-2.895	-2.582	Accepted	Interest rate is stationary
Inflation Rate	0.000	-8.424	-3.518	-2.895	-2.582	Accepted	Inflation rate is stationary
Money Supply	0.000	-9.723	-3.518	-2.895	-2.582	Accepted	Natural log of money

Source: Survey Data

Table IV shows the result of unit root tests using the ADF unit root test at the first difference level. The results of the ADF test on the first difference strongly support that all data series are stationary after the first difference at the 10%, 5%, or 1% significance levels. It clearly showed that all the variables are stationary at first difference as critical value is higher than t-statistics at 1% significance level.

Lag Order selection**Table V: Lag Order selection**

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1371.09				2.6e+07	31.2748	31.3315	31.4156
1	-729.979	1282.2	25	0.000	21.8441*	17.2723*	17.6125*	18.1168*
2	-710.095	39.769	25	0.031	24.6731	17.3885	18.0123	18.9369
3	-685.31	49.571	25	0.002	25.14	17.3934	18.3007	19.6455
4	-669.063	32.494	25	0.144	31.4959	17.5923	18.7832	20.5482
5	-649.135	39.855	25	0.030	36.9293	17.7076	19.182	21.3673
6	-629.087	40.097	25	0.029	44.1857	17.8202	19.5781	22.1836
7	-602.994	52.186	25	0.001	47.4752	17.7953	19.8368	22.8626
8	-576.535	52.918	25	0.001	52.5626	17.7622	20.0872	23.5332

Source: Survey Data

* indicates lag order selected by the criterion.

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

HQIC: Hannan-Quinn information criterion

SBIC: Schwarz information criterion

As per the Table V, it describes the selection of lag variables. Lagged variables can be found out in VAR model and VECM model. FPE, AIC, HQIC, and SBIC are criteria to identify the lag selections. According to Liew and Sen (2004) AIC is superior to the other criterion understudy in the case of a small sample size that is below 60. Lag one is ideal lag order selection as asterisk mark in the first lag in four criteria.

Johansen Tests for Co-integration

Johansen test for co-integration can run if the variables should be stationary. Performing a co-integration is necessary to establish a long-run relationship. The Johansen method has two separate tests, the trace test, and the maximum eigenvalue test. Hypotheses are as follows,

H_0 : There is no co-integration in total stock return and macroeconomic variables.

H_1 : There is co-integration in total stock return and macroeconomic variables.

In Johansen co-integration 0 means no co integration among variables. Therefore, trace statistics more than critical value meaning highlights that it rejects the null hypothesis. It simply means there is co integration among the variables. Johansen tests for co-integration show that there is one co-integration as Trace Statistic (40.5621) is smaller than the critical value (47.21) at maximum rank one (Table VI). Similarly, same result is obtained in Johansen tests for co-integration of Max statistic where Max statistic (19.2762) is smaller than the critical value (27.07) at maximum rank one VII.

Table VI: Johansen tests for co-integration (trace statistic)

Max	Parms	LL	Eigenvalue	Trace Statistics	5% Critical Value
0	30	-791.77161	.	74.8535	68.52
1	39	-774.62588	0.30567	40.5621*	47.21
2	46	-764.98779	0.18541	21.2859	29.68
3	51	-757.47975	0.14764	6.2698	15.41
4	54	-755.18973	0.04756	1.6898	3.76
5	55	-754.34485	0.01782		

Source: Survey Data

Table VII: Johansen tests for co-integration (Max Statistic)

Max	Parms	LL	Eigenvalue	Max Statistics	5% Critical Value
0	30	-791.77161	.	34.2915	33.46
1	39	-774.62588	0.30567	19.2762	27.07
2	46	-764.98779	0.18541	15.0161	20.97
3	51	-757.47975	0.14764	4.5800	14.07
4	54	-755.18973	0.04756	1.6898	3.76
5	55	-754.34485	0.01782		

Source: Survey Data

In Johansen co integration test variables are co-integrated it means VECM model is appropriate. Accordingly, VECM is appropriate to investigate the long run causality or short run causality among the variables than unrestricted Vector Auto regression (VAR).

Vector Error-Correction Model

There is a condition that 'If' coefficient of ce1L is negative sign with significant at 5% level, it could also be decided that there is long run causality running from independent variables to dependent variable. According to the Table VIII, coefficient of ce1L is negative. However, significant value is 95.1%. It means that around only 5% is possible to have long run causality running from exchange, interest, inflation and money supply to TRIBFI. Further, there is no short run causality towards TRIBFI as significance values of Exchange LD, Interest LD, Inflation LD, ln Money Supply LD are higher than 0.05. Nevertheless, out of the study period from 2010 to 2017, exchange rate has a negative influence on TRIBFI during around 72% (P value 0.32) of periods (months) while money supply positively influences the TRIBFI during around 63% (P value 0.378) of periods (months).

Table VIII: Vector Error – Correction Model

		Coef.	Std.Err.	Z	P>Z	[95% Conf. Interval]	
D_TRI	Ce1 L1.	-0.00193	0.031199	-0.06	0.951	-0.06308	0.05921
BFI	TRIBFI LD.	-0.03626	0.113576	-0.32	0.750	-0.25887	0.18634
	Ex.Rate LD.	-108.975	102.1577	-1.07	0.28	-309.2004	91.25031
	In.Rate LD.	-125.885	357.9089	-0.35	0.725	-827.3734	575.6039
	Inf. Rate LD.	2.49557	151.4524	0.02	0.987	-294.3456	299.3368
	In Ms. LD.	16784.03	19042.56	0.88	0.378	-20538.7	54106.75
	Constant	-0.14530	364.8708	0.00	1.000	-715.2789	714.9883

Source: Survey Data

$$\Delta \text{TRIBFI}_t = -0.14530 - 0.03626\Delta \text{TRIBFI}_{t-1} - 108.975\Delta \text{EX}_{t-1} - 125.8848\Delta \text{INT}_{t-1} + 2.49557\Delta \text{INF}_{t-1} + 16784.03\Delta \text{lnMS}_{t-1} - 0.00193\text{CE1}_{t-1}$$

The adjustment term (-0.00193) suggesting that previous year's errors (or deviation from long run equilibrium) are corrected within the current year at a convergence speed of 0.19%.

Table IX reveals that co-integration equation is significant. Johansen normalization imposed is desirable, which is given below.

Table IX: Co-integrating equations

Equation	Parms	Chi 2	P>chi2
_cel	4	81.81957	0.0000

Source: Survey Data

Table X: Johansen normalization restriction imposed

Beta	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
_ce1						
TRIBFI	1	.	.	.	.	.
Exchange	1418.105	264.9637	5.35	0.000	898.7852	1937..424
Rate Interest	-	800.6324	-	0.000	-	-1709.781
	3278.992		4.10		4848.202	
Rate Inflation	2410.167	456.8187	5.28	0.000	1514.818	3305.515
Rate ln Money	-	9500.508	-	0.000	-	-35011.67
	53632.32		5.65		72252.97	
Supply	615104.5	.	.	.	.	.
Constant						

Source: Survey Data

$$\Delta \text{TRIBFI}_t = 1.000\text{TRIBFI}_{t-1} + 1418.105\text{EX}_{t-1} - 3278.992\text{INT}_{t-1} + 2410.167\text{INF}_{t-1} - 53632.32\ln\text{MSt}_{t-1} - 615104.5$$

1-615104.5

Table X shows results of Johansen normalization restriction imposed where TRIBFI is positioned as the dependent variable. It is also noted that signs of the coefficients are reversed in the long run to interpret the results as they are in the matrix form. In the long run, Interest Rate and Money Supply have a positive impact on TRIBFI while Exchange Rate and Inflation Rate have a negative impact on TRIBFI. The coefficients are statistically significant at the 1% level.

Diagnostic Test

Auto-correction

H0: There is no autocorrelation at lag order

H1: There is autocorrelation at lag order

P- Value of Lag1 and Lag2 > 0.05. Therefore, there is no sufficient evidence to reject the null hypothesis. It means there is no autocorrelation at lag order.

Table XI: Auto-correction

Lag	Chi2	df	Prob > chi 2
1	35.2656	25	0.08351
2	29.4713	25	0.24470

Source: Survey Data

Impulse Response

Impulse response function can give an indication of the causal properties of the system. Figure I shows the line with the variance decomposition, where how each variables response with each other variables. It also shows that only the exchange rate has short-run impact on TRIBFI and other variables show that the long-run relationship between macro-economic factors and Total Return Indices in Banking, Finance and Insurance company.

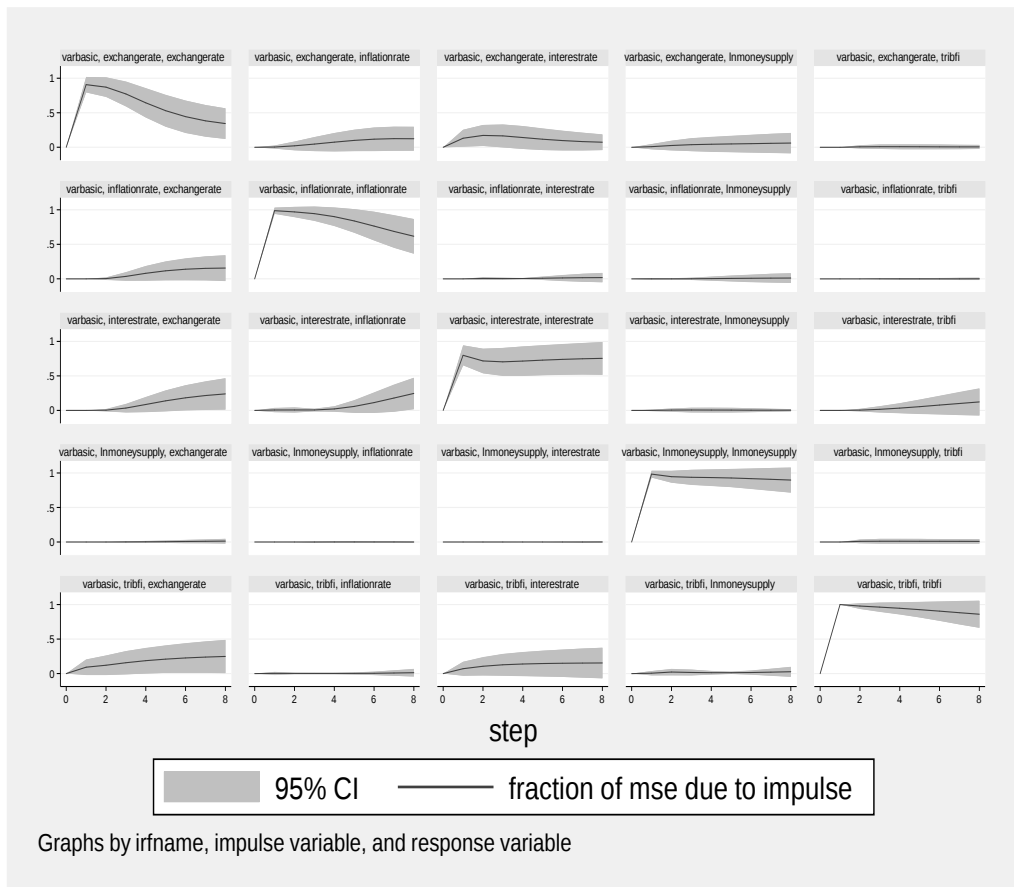


Figure I: Impulse Response Function

Discussion

The stock market of every country plays a vital role in the evolution of their respective economies in terms of commerce and industry, which ultimately determines the development of the overall economy. Therefore, stakeholders keep an eye on the stock market and closely monitor its performance. These parties include however limited to investors and other market participants, government, regulatory authorities of the stock market and academia. From the perspective of policy makers, the findings provide useful insights for the formulation and implementation of macroeconomic policies to achieve financial market stability in an economy. After testing the hypothesis and analysing the data it was found that, the Exchange rate is negatively associated with Total Return Index in Banking, finance, and insurance sector. This result is consistent with our expected sign and the findings of Menike (2006), Rajeshwaran (2019), Mansor and Hassanuddeen (2003). This is cause to foreign investors to withdraw the funds from the stock market. This proved that the exchange rate volatility does impact banking, finance and insurances' stock returns and the appreciation of US currency will harm the banking finance and insurance industry.

Treasury bill interest rate positively affects the share return. Rajeshwaran (2019), Khaled and Le (2009), Majid and Yusof (2009) also found out that interest rate positively affected the share return. The inflation rate has a negatively relationship with TRIBFI. These results match with Rajeshwaran (2019), and Nijam, Ismaail and Musthafa (2015), Menike (2006) in the Sri Lankan Context. Majority of past studies found out that the inflation rate and share return had a negative effect. Because when the economy has a sky touching inflation the production cost comparatively increases considering the consequences. So, the corporate sector is not going to choose risk in investment for their investment portfolio.

This research considers a broad money supply in Sri Lanka. Money Supply is considered as a key macroeconomic factor in economic analysis. Because the stability of the money position is altered by money supply and its changes directly affect real economic factors such as share returns. Increase in money supply increases the demand for equity investment and increases the stock prices. Money supply and stock prices share a positive relationship. The findings of the study reveal that the money supply got a positive relationship with share return. The findings are in line with our expected sign and the research done by Rajeshwaran (2019), Peter (2014), Kalyanarama and Tuwajri (2013), Afzal (2011). Further, these matches with the findings of Mansor and Hassanudeen (2003), Muradoglu and Metin (1996). Increased money supply may induce corporate investments and may increase future cash flows and stock prices.

Conclusions

In this study some basic theories are mentioned that are relevant explaining share return behaviour. Academic research has contributed to the understanding of investor's behaviour and the functioning share market. From the perspective of policy makers, the findings provide useful insights for the formulation and implementation of macroeconomic policies to achieve financial market stability in an economy. The also study aims how four sets of factors shape or determine stock market functioning: Interest rate, inflation rate, exchange rate and money supply. This investigates the relationship between macroeconomic variables and share return of companies in finance, banking and insurance sector in Sri Lanka using monthly data for the period from January 2010 to 2017 December. Conclusions are derived by using STATA software through Johansen Co- integration test and VECM (Vector error correction model).

The first objective of the study is to identify the relationship between macroeconomic factors (exchange rate, interest rate, inflation rate and money supply) and share return (TRIBFI) of finance, insurance and banking industry. It is concluded that exchange rate and inflation rate negatively affected to the share return of finance, banking and insurance sector companies while interest rate and money supply with positively relationship.

The second objective is to identify whether there is a long-run or short-run impact of macroeconomic factors on the Total share return of bank, finance, and insurance listed companies at CSE in Sri Lanka.

This research shows that there is no significant short-run causality from macro-economic factors to Total return index. However, it is concluded that there is a minimum level of positive impact with interest rate and money supply in the long-run causality, while there is a negative effect with the exchange rate and inflation rate.

Based on the results, the researcher recommends that potential investors pay attention to interest rate and other related variables in consideration with the share return relationship in Sri Lanka in long run and short run. The investor perspective is to have a better return on their investments. Investors are keeping a higher weight on the interest rate. But investors are advised to consider other factors like inflation rate, exchange rate and money supply and its performance in their investment decisions. The inflation rate and exchange rate has a considerable impact on the share return in finance and banking sector. The investors can gain highest benefits from these factors, if they are aware of the consequences. According to the findings exchange rate and inflation rate has negative effect with share return.

In order to achieve better performance in stock return, policy makers should have thorough knowledge in this field. Otherwise, they cannot gain better return from their investment. In case of that, investors would like to know the performance of the stock market in previous years before they decide to invest in them. It should utilize the favourable economic conditions to grow which will boost the share return. It is concluded that interest rate and money supply have positive impact on TRIBFI. There is also need for the Government to control the broad money supply in Sri Lanka. Share return is responded to available information. The study supports the theory of Efficiency Market Hypothesis (EMH) as investors should carefully monitor the movement of macroeconomic variables to make investment decision.

Future Research Opportunities

In order to make more accurate and exact research, it is needed to improve some constraints. Firstly, this research only considers about four macroeconomic variables. There are many other economic factors (such as GDP, growth rate, etc.) that can have an effect on the share return of finance, banking and insurance sector. Another study could be undertaken by incorporating more macroeconomic variables.

Secondly, future research can use daily basis data series to get a more accurate result in empirical studies. Also, this research covers only eight years period 2010-2017. In future research, time period can be extended to cover a longer period and get the exact result. Finally, future researchers may try to extend the study on different industry sectors in the Colombo Stock Market/CSE.

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