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Contents

Firm-Specific Factors Affecting Bank Deposits of Licensed Commercial Banks in Sri Lanka

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Abstract

This study examines the impact of firm-specific factors on deposits of licensed commercial banks (LCBs) in Sri Lanka. The dataset for the study consisted of annual data from 2011 to 2020, gathered from secondary sources; annual reports of the selected commercial banks and annual reports of the Central Bank of Sri Lanka (CBSL). Both descriptive and Generalized Method of Moments (GMM) technique were employed to achieve the objectives of the research. As determinants of deposits, six explanatory variables were used as bank size, capital adequacy, liquidity, bank loans, branch expansion and bank efficiency. The results revealed that capital adequacy has a negative significant impact while liquidity, bank loans and branch expansion have significant positive impact to the customer deposits. However, bank size and bank efficiency are not found to have a significant impact on deposits of LCBs in Sri Lanka. The findings of the current study are useful for the management, shareholders and other interested parties of the commercial banks such as the CBSL and government to implement the workable policies to mobilize the deposits. In addition, the results of this study are essential for the researchers and readers who are interested in this area.

Keywords: *Customer Deposits, Firm-Specific Factors, Generalized Method of Moments, Licensed Commercial Banks.*

1. Introduction

In both developed and developing countries, the financial system plays a crucial role in economic development. According to Gunasekara & Kumari (2018), the financial system in every economy is dominated by the banking sector and, the financial system cannot undertake the development of the economy without banks. In Sri Lanka, the banking sector comprises with 24 Licensed Commercial Banks (LCBs) and six Licensed Specialized Banks (LSBs) at the end of 2020 (CBSL, 2020). In terms of the asset base and the magnitude of services provided, the importance of LCBs is relatively high in comparison to the LSBs. Therefore, LCBs are the most important part of financial institutions within the banking sector (Ministry of Foreign Affairs, 2011). On the other hand, the financial system of Sri Lanka mainly depends on the soundness of the LCBs.

There are so many factors affecting on the soundness of a banking system. According to Kassim & Majid (2009), customer deposits are one of the major factors that affect the sound banking system of a country. Generally, customer deposits are the main method for gathering monetary assets for banks. Commercial banks accept different kinds of deposits such as demand deposits, savings deposits, and fixed deposits from the customers and use those funds for loans and investments. Then, banks will be able to earn high profits due to those deposits. Moreover, banks cannot exist without customer deposits because they refer to as the backbone of banks (Islam, Ali, & Wafik, 2019). Therefore, deposit mobilization is very critical for the soundness of a bank (Gunasekara & Kumari, 2018). In addition, the growth of customer deposits is important for the entire economy because customer deposits are considered as the most important variable in economic development (Islam, Ali, & Wafik, 2019; Ribaj & Mexhuani, 2021).

The determinants of deposits can be generally classified as firm-specific and macro-economic. Firm-specific determinants are the factors that could be controlled by the internal environment of the banks, whereas macro-economic determinants are the factors that could not be controlled by the internal environment. A number of

studies from different countries have examined the determinants of deposits generally using both of these categories of variables named firm-specific and macro-economic (Adem, 2015; Ambe, 2017; Yakubu & Abokor, 2020). However, this study focuses only the firm-specific factors affecting on bank deposits; hence, rapid remedial actions could be taken by the internal parties as the controlling power of these firm-specific factors is lies on the internal environment of the bank. Further, it is important to investigate the factors affecting on customer deposits because customer deposits have a strong relationship with the economic development of a country (Islam, Ali, & Wafik, 2019). While stimulating investments, reducing unemployment and increasing production, bank deposits help to accelerate the economic growth of a country (Ribaj & Mexhuani, 2021).

Deposit mobilization is a key focus of many banks (Gunasekara & Kumari, 2018). From the perspective of the banks, there are only a few empirical studies have been conducted, mainly considering the firm-specific factors that affecting on bank deposits. On the other hand, those determinants can differ from country to country. In the Sri Lankan context, there is an empirical gap for the particular research area because there are few studies have been conducted while examining the firm-specific factors affecting on customer deposits of LCBs in Sri Lanka. Accordingly, this study mainly intends to bridge that empirical gap by scrutinizing the firm-specific factors affecting on deposits of LCBs with reference to Sri Lanka. Therefore, here we present relatively pioneering work in this context.

Further, in Sri Lankan context, there is a need to conduct research regarding this area using recent data. Because, banks unable to manage and control the sufficient amount of funds without having a proper knowledge regarding the firm-specific factors affecting on customer deposits (Werner, 2014). In addition, it will help to implement policies for the improvement of the banking sector in Sri Lanka. Simply, the research problem of this study can be identified as, 'What are the firm-specific factors affecting on deposits of LCBs in Sri Lanka?' Accordingly, this study is conducted to examine the firm-specific

factors affecting on bank deposits of LCBs in Sri Lanka from the viewpoint of banks.

2. Theoretical Review

There are three main theories related to the saving behavior of the individuals in a country such as life cycle hypotheses, permanent income hypothesis, and buffer stock theory. According to the life cycle hypothesis, the individuals seek to maximize the present value of lifetime utility subject to the budget constraint. The theory predicts that the decision of saving depends on the expectations about lifetime income (Hall, 1978). The growth of per capita income will result in an increase of total savings because it increases lifetime earnings. Thus, countries with higher GDP rates and higher per capita growth rates are expected to have higher savings ratios than countries with lower growth rates (Modigliani & Ando, 2005). According to the permanent income theory, individuals will save only if their current income is higher than the anticipated level of permanent income in order to guard against future declines in income (Hall, 1978). Due to the buffer stock theory, individuals expect the savings rate to be pro-cyclical, with individuals saving more when income is higher in order to smoothen the consumption in recession. Moreover, it argues that consumers are impatient and prudent in the face of unpredictable income fluctuations (Carroll, 1992).

2.1. Empirical Review

Customer deposits are one of the main liabilities to a bank. In other words, those are the major source of funds for a bank. Furthermore, there is a highly significant relationship between bank deposits and the profitability of commercial banks in Sri Lanka (Kawshala & Panditharathna, 2017). An empirical study conducted by Turyishime, Memba and Mbera (2015), has found that there is a positive relationship between deposit mobilization and the financial performance of commercial banks in Rwanda. Therefore, bank deposits should be managed and controlled properly to mobilize sufficient customer deposits. In line with the recent empirical studies, some researches have been intended to investigate the factors affecting

on customer deposits at the bank level. Among them, few empirical studies have examined the effect of some of the bank-specific factors including bank size, capital adequacy, liquidity, loans, branch expansion and bank efficiency on customer deposits.

Bank size is a much-concerned factor affecting on customer deposits. According to Islam, Julfikar & Wafik (2019), large banks collect more deposits rather than small banks. Moreover, they found that the bank size has a highly significant impact on customer deposits of commercial banks in Morocco. In addition, Unvan and Yakubu (2020) revealed that as a bank-specific factor, bank size has a positive and significant impact on customer deposits at the confidence level of 99%. Further, they investigated that larger bank are more efficient in deposit mobilization than smaller banks in Ghana as well. Therefore, we hypothesized it as the below.

H_{1A}: Bank size has a statistically significant effect on customer deposits of LCBs in Sri Lanka

Capital adequacy is referred to as the measure of the financial strength of a financial institution (CBSL, 2020). It is also one of the most effective determinants affecting on bank deposits. Meanwhile, capital adequacy plays a major role in determining banking activities and, there is a strong positive relationship between capital adequacy and customer deposits (Karim et, al (2014). However, Unvan & Yakubu (2020) found that capital adequacy has an insignificant effect on bank deposits in Ghana. Further, they investigated that highly capitalized banks that rely less on bank deposits may disincline on efforts to mobilize the bank deposits. However, we hypothesized it as follows to examine the effect of capital adequacy on customer deposits of LCBs in Sri Lanka.

H_{1B}: Capital adequacy of the bank has a statistically significant effect on customer deposits of LCBs in Sri Lanka

The liquidity ratio is a ratio that assesses the ability of banks to meet their short-term financial obligations (Yakubu & Abokor, 2020). It is a much-concerned factor affecting on customer deposits. Turhani & Hoda (2016) revealed that liquidity is the other most important firm-

specific factor that affects the total customer deposits. Moreover, they investigated that there is a positive relationship between liquidity and bank deposits. Using the random effects technique, Unvan & Yakubu (2020) have also investigated that liquidity is a highly significant factor on bank deposits at the 1% significance level. In addition, they revealed that there is a negative effect between the liquidity ratio and bank deposits in Ghana. Hence, we hypothesized it as follows.

H_{1C}: Liquidity of the bank has a statistically significant effect on customer deposits of LCBs in Sri Lanka

Since commercial banks depend on depositors' money as a source of funds, there is a significant relationship between the ability of banks to mobilize deposits and the amount of loans granted to the customers (Tuyishime, Memba, & Mbera, 2015). According to Mamo (2017), loans and advances have a significant positive effect on the deposit growth of commercial banks. Ambe (2017) also revealed that loan provision has a positive impact on the growth of deposit mobilization in Ethiopia. Meanwhile, in an underdeveloped banking system such as Vietnam, the effect of bank loans on customer deposits is not significant (Nguyen, Tripe, & Ngo, 2018). Therefore, loans are one of the important variables to be considered even in the Sri Lankan context as well. Accordingly, we hypothesized it as follows.

H_{1D}: Loans granted by the bank has a statistically significant effect on customer deposits of LCBs in Sri Lanka

Branch expansion can be identified as one of the explanatory variables in resource mobilization through customer deposits (Ambe, 2017). That means the number of branches has a significant effect on customer deposits and it can be captured by some other variables such as the amount of deposit received or the amount of loans provided. A lot of empirical studies have also investigated the effect of branch expansion on bank deposits. According to Erna & Ekki (2004), there is a long run relationship between commercial bank branches and deposits in Indonesia. They also revealed that the deposit growth depends on the number of bank branches of Islamic commercial banks. According to Yakubu & Abokor (2020), branch expansion is also a

significant determinant of deposit growth in the short run in Turkey. Therefore, we selected branch expansion as another one of the independent variables in our model to test whether it impacts on bank deposits of Sri Lanka or not.

H_{1E}: Branch expansion has a statistically significant effect on customer deposits of LCBs in Sri Lanka

Bank efficiency can be defined as the success of the investment decisions of a bank. On the other hand, a bank is considered to be efficient if it has the ability to generate the maximum of revenues by using its resources efficiently. As a firm-specific factor, bank efficiency shows the success of investment decisions of the banks. In the context of Turkey, bank efficiency is a significant determinant of bank deposits in the long run. But in the short run, there is a negative and insignificant relationship between bank efficiency and bank deposits (Yakubu & Abokor, 2020). However, there are only a few empirical studies have been conducted while examining the relationship between bank efficiency and customer deposits. Therefore, the relationship between these two variables is still a matter of investigation, even in Sri Lanka. Consequently, we formulate the following testable hypothesis.

H_{1F}: Bank efficiency has a statistically significant effect on customer deposits of LCBs in Sri Lanka

3. Methodology

Out of 24 LCBs in Sri Lanka, 11 LCBs are purposively selected as the sample of this study based on the availability of data for the period of 2011-2020.

The secondary sources of data from the annual reports of the selected LCBs and annual reports of the Central Bank of Sri Lanka (CBSL) are used to gather the relevant data. Accordingly, the descriptive analysis and Generalized Method of Moments (GMM) estimator are used to examine the impact of firm-specific factors on customer deposits of LCBs in Sri Lanka. Bank deposits are considered as the dependent variable and independent variables used here are bank size, capital

adequacy, liquidity, loans, branch expansion and bank efficiency. The following table provides a clear explanation of all the variables included in our study.

Table 1: Variables Description

Variable	Notation	Definition
Bank Deposits	BD	Natural Logarithm of the Total Value of the Bank Deposits
Bank Size	SIZE	Natural Logarithm of the Total Assets of the Bank
Capital Adequacy	CAR	Total Capital Ratio
Liquidity	LR	Liquidity Assets to Total Assets Ratio
Loans	LOAN	Natural Logarithm of the Total Loans and Advances
Branch Expansion	BRA	Number of Bank Branches
Bank Efficiency	BEF	Bank Net Interest Margin

Source: Developed by the Researcher

Based on the empirical literature reviews, we developed the following equation to examine the relationship between bank deposits and the explanatory variables.

$$BD_{it} = \alpha + \gamma BD_{i,t-1} + \beta_1 SIZE_{it} + \beta_2 CAR_{it} + \beta_3 LR_{it} + \beta_4 LOAN_{it} + \beta_5 BRA_{it} + \beta_6 BEF_{it} + \varepsilon_{it}$$

Where, all the factors are previously defined, except α which is the constant, γ represents the coefficient of lagged dependent variable, *i* stand for banks, *t* stands for the time period, β_1 to β_6 are the coefficients of explanatory variables, and ε represents the error term.

In this study, we have a panel data set with a lagged dependent variable among the explanatory variables. Consequently, we employed the generalized method of moments (GMM) technique as propounded by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998) to examine the relationship between bank deposits and the

independent variables of our study. The GMM provides solutions to the problems of reverse causality and omitted variables. It treats the problem of endogeneity of the variables also. However, the quality of GMM technique depends particularly on the validity of the instrument's matrix and the assumption that there is no serial correlation in the errors. For that, two tests have been proposed, and those are Sargan test and Abond test. The validity of instruments in our model is checked using the Sargan test for over-identified restrictions. Moreover, the serial correlation in the errors has been tested using the Arellano–Bond test for first-order (AR1) and second-order (AR2).

4. Data Analysis and Discussion

The table 02 shows the descriptive statistics obtained for both dependent and independent variables over the study period. It displays the descriptive statistics including mean, standard deviation, minimum and maximum of all variables.

Table 2: The Descriptive Statistics

Variable	Obs.	Mean	SD	Min	Max
BD	110	26.27909	1.217615	23.2	28.5
SIZE	110	26.64964	1.080573	23.9963	28.72394
CAR	110	0.1541739	0.0362695	0.1028	0.409
LR	110	0.0436878	0.0204817	0.01117	0.09801
LOAN	110	26.24224	1.092175	23.51961	28.31836
BRA	110	231.2182	208.2827	30	741
BEF	110	0.0399109	0.0076415	0.0253	0.06

Source: Small Stata 12.0 Output

From findings, the average value of bank deposits is 26.2791 ranging from a minimum of 23.20 to a maximum of 28.50. When considering the bank size of Sri Lankan LCBs, the mean value and the standard deviation are 26.6496 and 1.0806 respectively. Moreover, it has ranged

between 23.9963 and 28.7239. The average total capital ratio is 15.41% and it signifies that LCBs have maintained the total capital ratio of above the minimum capital requirements under Basel III's 12.5% requirement. The mean value of liquidity is 0.0437 with minimum and maximum values of 0.01 and 0.10 respectively. The mean value in terms of loans is 26.2422. It has 1.0922 of standard deviation with minimum and maximum values of 23.52 and 28.32 respectively. The average number of bank branches is 231 with minimum and maximum values of 30 and 741 respectively. The standard deviation of bank efficiency is 0.0076 and the mean value of it is 0.0399. Also, it has ranged between 0.02 and 0.06.

Table 3 shows the results of empirical estimations on the relationship between bank deposits and the selected firm-specific factors such as bank size, capital adequacy, liquidity, loans, branch expansion and bank efficiency. Furthermore, our panel data model has consisted with a lagged dependent variable among the explanatory variables since bank deposits is a persistent and dynamic variable. In determining the factors that impact on bank deposits, we employed GMM technique.

Since there are two estimators of GMM technique such as the difference GMM estimator and system GMM estimator, a preliminary estimation has been conducted to choose the most suitable estimator for our model. For that, the fixed-effect model, pooled OLS and difference GMM were estimated and the coefficient of the lagged dependent variable of the difference GMM (0.2345) was less than the coefficient of the lagged dependent variable of the fixed-effect model (0.4954). It confirms that the difference GMM estimator is downward biased because of weak instrumentation and the system GMM estimator should be used to analyze our model.

Table 3: The Results of System GMM Estimator

Variable	Coefficient	Standard Error	P-Value
DEPOSITS LI	0.2381661	0.047235	0.000
SIZE	0.1648273	0.2738923	0.547
CAR	-0.5333154	0.2592182	0.040
LR	1.294436	0.6528519	0.047
LOAN	0.6075533	0.2528488	0.016
BRA	0.0003439	0.0001578	0.029
BEF	-8.304721	7.2914410	0.255

Source: Small Stata 12.0

Table 3 of system GMM results shows that the lagged value of the bank deposits is statistically significant because its p-value (0.000) is less than the usual significance level of 0.05 (5%). Here, the dynamic character of the model specification is confirmed by the high level of significance of the lagged value of the bank deposits. The coefficient of the lagged dependent variable is 0.2382, and it indicates that a 1% increase of bank deposits in the previous year will lead to a 23.82% increase in the current year bank deposits of LCBs while assuming all the other variables remain constant. Also, this higher value of the coefficient of the lagged dependent variable indicates the strong persistence of the bank deposits of the LCBs in Sri Lanka.

Thus, Unvan and Yakubu (2020) found that capital adequacy has an insignificant effect on bank deposits in Ghana, our findings showed that capital adequacy is a statistically significant variable in banks deposits of LCBs in Sri Lanka as its p-value (0.040) is less than the significance level of 0.05 (5%). It has been confirmed by an earlier empirical study (Karim, Hassan, Hassan, & Mohamad, 2014) conducted for the conventional and Islamic banks in Malaysia as well. However, the coefficient of capital adequacy is -0.5333, and it implies

that there is a negative relationship between capital adequacy and the bank deposits in LCBs of Sri Lanka. It means when the capital adequacy ratio increases by 1% while all the other variables remain constant, the bank deposits of LCBs in Sri Lanka will decrease by 53.33%.

The liquidity is another one of the significant firm-specific variables that affecting on bank deposits of LCBs in Sri Lanka as its p-value (0.047) is less than the significance level of 0.05. Also, the coefficient of liquidity is 1.2944, and it implies that when the liquidity ratio increases by one unit while all the other variables remain constant, the bank deposits will also increase by 1.2944 units. It investigates that there is a positive relationship between the liquidity and bank deposits of the LCBs in Sri Lanka. Our results suggest that when the banks have more ability to meet their short-term financial obligations, it will lead to mobilize the bank deposits in the Sri Lankan context.

According to the above results, the bank loans are also a statistically significant factor when determining the bank deposits because its p-value (0.016) is less than the usual significance level of 0.05. The coefficient of the bank loans is 0.6075, and it implies that when bank loans increase by one unit while assuming that all the other variables remain constant, the bank deposits of commercial banks will also increase by 0.6075 units. It reveals a positive relationship between bank loans and the deposits of the LCBs in Sri Lanka. It has been investigated by a lot of empirical studies (Ambe, 2017; Tuyishime, Memba, & Mbera, 2015) and our results also confirm it for the Sri Lankan context. On the other hand, due to the life cycle hypothesis, permanent income hypothesis, and buffer stock theory, the savings will increase when the consumption level of the individuals increase (Hall, 1978; Carroll, 1992; Modigliani & Ando, 2005). Further, when the loans increase, the consumption level of the individuals will also automatically increase. Hence, the findings of this research are accordance with these theories as well.

As a firm-specific factor, branch expansion is statistically significant because its p-value (0.029) is less than the significance level of 0.05. The coefficient of branch expansion is 0.0003, and it implies that when

the number of bank branches increases by one unit while all the other variables remain constant, the bank deposits will also increase by 0.0034 units. That reveals there is a positive relationship between the branch expansion and the bank deposits of LCBs in Sri Lanka. In other words, it indicates that increasing the number of bank branches could be impacted on enhancing the bank deposits of Sri Lanka. It has also been confirmed by many scholars in the earlier literature (Erna & Ekki, 2004; Yakubu & Abokor, 2020), and our results confirmed this for the Sri Lankan context as well. The study implies that establishing more branches of LCBs in Sri Lanka is a matter for the growth of bank deposits in Sri Lanka.

Even though previous empirical studies (Islam, Ali, & Wafik, 2019; Unvan & Yakubu, 2020) revealed that bank size has a positive and significant impact on bank deposits, our results showed that bank size has not a significant effect on bank deposits of LCBs in Sri Lanka. According to the above system GMM results, bank efficiency is also not a statistically significant firm-specific factor when determining the bank deposits of LCBs in Sri Lanka. In other words, they are found to be statistically insignificant as their p-values are higher than the usual significance level of 0.05 (5%). It implies that, as the firm-specific factors, bank size and bank efficiency are not matters for the deposit mobilization of LCBs in Sri Lanka. Based on the derived results, the best-fitted model can be written as follows.

$$BD_{it} = 0.2381661BD_{i,t-1} - 0.5333154CAR_{it} + 1.294436LR_{it} + 0.6075533LOAN_{it} + 0.0003439BRA_{it} + \varepsilon_{it}$$

As a whole, the above results revealed that capital adequacy, liquidity, loans and branch expansion are the statistically significant determinants of the bank deposits of LCBs in Sri Lanka. On the other hand, bank size and bank efficiency are found to be not significant variables when determining bank deposits. Among these significant variables, liquidity has the highest impact on bank deposits of the LCBs in Sri Lanka, and branch expansion has the lowest impact on the bank deposits.

Table 4: The Result of Sargan Test

chi2(44)	57.53909
Prob > chi2	0.0828

Source: Small Stata 12.0 Output

The Sargan test has been used to check the overall validity of the instruments in our model. It tests the null hypothesis of correct model specification, and valid over identified restrictions. The result of the Sargan test of our study has been represented in the above table and our results show that the Sargan statistic test of over-identifying restrictions does not reject the null hypothesis at any conventional level of significance ($p > 0.05$; $p = 0.0828$). In other words, it shows that the calculated p-value (0.0828) for the Sargan test is greater than the significance level of 0.05 (5%), and null hypothesis for the Sargan test can be accepted. It confirms that our model has valid instrumentation, and it evidences the un-biasness of our model.

Table 5: The Result of Abond

Order	Z	Prob > z
1	-1.4821	0.1383
2	0.43528	0.6634

Source: Small Stata 12.0 Output

Table 5 represents the result of the Arellano–Bond test for first-order (AR1) and second-order (AR2) which, is used to check the residual autocorrelation. In accordance with the work of Arellano and Bond (1991), it is supposed to be correlated to first order but not to second order. In other words, the GMM estimator requires that there could be a first-order serial correlation, but there could not be a second-order serial correlation in the residual. Based on the results in the above table, it shows that there is no first-order or second-order serial correlation in our results since the null hypothesis of no autocorrelation is accepted based on the fact that the calculated z-values are not statistically significant at the significance level of 0.05 ($z = 0.1383$; $p > 0.05$ and $z = 0.6634$; $p > 0.05$). In other words, the null hypothesis for the Arellano-Bond test for first-order (AR1) and second-order (AR2) of this model could be accepted, and there is no first or second-order serial correlation, respectively in the differenced error structure.

Furthermore, these results support the validity of our model specification.

5. Conclusion

As customer deposits are an integral component of the bank operations in every country, identifying the factors affecting on customer deposits is essential for every bank to formulate workable policies and strategies to mobilize their deposits. Hence, this study aimed to detect the impact of firm-specific factors on customer deposits of LCBs in Sri Lanka for the period from 2011 to 2020. This study opted for several specific determinants in the bank such as bank size, capital adequacy, liquidity, loans, branch expansion and bank efficiency. The study used the system GMM technique to investigate the impact of selected firm-specific factors on customer deposits of LCBs in Sri Lanka and established that capital adequacy, liquidity, loans and branch expansion play a crucial role in the determination of bank deposits. Due to our findings, bank size and bank efficiency do not influence the customer deposits of LCBs in Sri Lanka.

Thus, knowing the factors affecting on customer deposits can direct the effort of management and regulators to pay attention to these specific factors to attract bank deposits for the benefits of individual borrowers, entrepreneurs and the economy. Moreover, the findings of this study will be useful for the policy-makers, shareholders and other interested parties of the LCBs, such as the CBSL, government and etc., to make decisions regarding the bank deposits in Sri Lanka. Also, the results of the study will be essential for the researchers and readers who are interested in this area. The main limitation of this empirical study was the limited data for some variables. Hence, the researchers have to limit the study to only a few LCBs in Sri Lanka and the time period has also to be limited for the period from 2011 to 2020 due to the lack of availability of relevant data. In addition, the current study mainly focuses on the impact of firm-specific factors on customer deposits of LCBs in Sri Lanka and this is restricted to examine some of the other firm-specific factors affecting on customer deposits. Therefore, the future researchers are encouraged to examine the other

firm-specific factors that may influence customer deposits using all the LCBs in Sri Lanka.

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Board Attributes and Financial Performance: Evidence from Listed Manufacturing Companies in the Colombo Stock Exchange

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Abstract

Corporate governance contributes to balance the interests of a company's managers, shareholders, and other stakeholders. It provides guidelines for directing and governing the company to realize desired objectives. Inevitably the board attributes are a crucial mechanism in corporate governance. Much attention has been received for studies on board attributes and performance across many contexts. In Sri Lanka, the financial performance has gained much attention in recent past. However, the empirical results are largely inconsistent and studies have mostly focused on all the listed companies. On this background, this study seeks to identify the impact of board attributes on financial performance in listed manufacturing companies in Sri Lanka. Thus, study considers five board attributes; board size, CEO duality, gender diversity, independent directors, and board balance. Financial performance was measured using the accounting measure of Return on Assets (ROA). All listed manufacturing companies except two companies were considered as the sample of the study. Data were collected through annual financial statements of 2018/19. A regression analysis was conducted to address the main research objective of the study. Results show that certain board attributes impact the financial performance of listed manufacturing firms. More precisely, larger boards have a positive impact on ROA. Further, board balance showed a negative impact on ROA. However, neither CEO duality, gender diversity, nor the number of independent directors was found to have a significant impact on ROA.

Keywords: *Board attributes, Corporate Governance, Financial Performance, Manufacturing Sector.*

1. Introduction

Corporate governance has become of increasing importance in both developed and developing countries triggered by numerous scandals, corporate failures, and frauds. Higher levels of corporate governance minimize the risk of investors and enhance the performance of a company (Chang et.al, 2015). Further, it provides transparency and accountability to ensure the equity of wealth distribution, thereby minimizing the agency problems (Clark, 2004).

Since its inception, the complexity of businesses is increasing daily due to the separation of ownership and control. This has created a conflict of interest between owners and managers, popularly known as agency conflict (Jensen & Meckling, 1976). Agency conflicts can be furthered in the present volatile environment as managers can find many loopholes for their opportunistic behaviors in the absence of direct supervision from owners. Thus, corporate governance is one of the best means by which the financial performance of companies can be enhanced by aligning the interest of owners and managers (Anson et. al ,2004).

Corporate governance is manifested by the Board of Directors (BoD) which is a key aspect of corporate governance (Zahra & Pearce, 1989). BoD is responsible for directing the firm by making long-term decisions, providing guidelines to the success of the firm, and also enhancing the shareholder wealth. BoDs of companies are composed of different demographics (Yasser et.al,2017). Accordingly, board attributes are measured through dimensions such as board size, CEO duality, non-executive directors, board independence and gender diversity, etc. (Naseem et.al,2017).

The board attributes are a core component in corporate governance (Horvath & Spirollari, 2012). Hence, more the need to observe the impact of board attributes on firm performance as firm performance is a key indicator of the wellbeing of a corporate.

Based on agency theory, board attributes (aka board mechanisms) are measured using constructs such as board composition, board characteristics, board structure, and board processes (Zara & Pearce, 1989). Board composition looks at both the number and mixture of

different director types, board characteristics denote the key features of directors on the BoD, board structure shows the organization of the board and board processes the way decisions are made with the board. Some researchers indicate that there is a negative relationship between board attributes and firm performance (Hermalin & Weisbach, 2003). On the contrary, some show that board attributes and firm performance have a positive relationship (Carter et.al, 2003; Goodstein et.al,1994). Apart from this, Faleye (2007) found that some board attributes have no impact on firm performance. Furthermore, some studies look at the relationship between dimensions of board attributes and firm performance. According to Azeez (2015), CEO duality and board size have a significant positive relationship with firm performance. Conversely, Suganya and Kenagatharam (2017) found that CEO duality and gender diversity are not significant with firm performance. The empirical results are contradictory although this topic has received much attention.

Sri Lanka has been increasingly paying attention to studies that assess the relationship between board attributes and firm performance from the recent past (Darmadasa et.al, 2014; Senthuran & Velnampy, 2015). Most of these studies looked at the companies listed on the CSE. The attention paid to individual industry sectors is limited. Especially, there is a dearth of studies on the manufacturing sector (Dissanayake & Dissanayake, 2019). Thus, this study sets to address this research gap. Manufacturing companies are essential for economic development. The manufacturing sector of Sri Lanka comprises of both local and multinational companies. In this background, the present study selected the manufacturing sector with the following research objectives. The main objective of the study was to describe the board attributes of listed manufacturing companies in Sri Lanka and to assess the impact of board attributes on the financial performance of listed manufacturing companies of Sri Lanka.

2. Literature Review

2.1. Agency theory

Seal (2006) shows that for many years, corporate governance research is based on the main theoretical context of agency theory. Jensen and

Meckling (1976) show that an agency relationship is a contract by which owners (the principal) assign power to controllers (the agent) of a firm to work on behalf of the principal. Further, they show that this separation of ownership and control in organizations leads to conflicts of interests between owners and controllers. Accordingly, the agent-principal relationship leads to two forms of agency problems. The first problem is conflicting objectives, and the second problem is conflicting attitudes towards risk (Ellstrand et.al,2002; Jensen & Meckling, 1976). Moreover, these two parties have asymmetric information which furthers the agency problem between management and bondholder (DeFond & Jiambalvo, 1994).

Agency theory explains how to mitigate agency costs and prevent the misappropriation of shareholders' wealth by aligning the interests of agents and principals. Corporate governance is a fine mechanism to reduce agency problems. According to Gao et.al, (2016), corporate governance can increase the quality of the non-financial information thereby minimizing the agency problem between principal and agent. While confirming this, Clark (2004) emphasizes that corporate governance works as a performance measurement and motive to achieve business objectives as well. Accordingly, corporate governance is a solution for agency problems and associated agency costs resulted from the opportunistic behavior of managers (Nguyen et.al, 2020).

A key aspect of corporate governance is the BoD (Zahra & Pearce, 1989). Inevitably, directors provide a mechanism for the reduction of agency problems (Jensen & Meckling, 1976). Director boards have varying attributes across different contexts and its indirectly affected by social, political, economic, and SWOT factors (Kakanda et.al, 2016). Thus, context-specific studies could uncover better findings. Many researchers have conducted studies to uncover the impact of board attributes on firm performance (Adams & Ferreira, 2009; Gill & Mathur, 2011b; Hermalin & Weisbach, 2003). Yet the results are conflicting which renders the area to be inconclusive (Kakanda et.al, 2016).

2.2. Board attributes and Firm performance

According to Coles et.al, (2008) board size is the total number of members in the BoD. Pearce and Zahra (1992) determine that board size is a critical factor for effective corporate governance. Farwis et.al, (2021), Romano & Guerrini (2014) confirm this by showing a positive relationship between board size and firm performance. As such, an optimum number of directors effectively drives the company and increases the shareholder value (Bhimani, 2009). It is argued that larger board sizes improve the position of directors as it gives them more right to exercise their power in governance and reduces the CEO dominance on boards (Zahra & Pearce, 1989). However, Dharmadasa et.al, (2014), Liang et.al, (2013), and Lipton and Lorsch (1992) argue that there is a negative relationship between board size and firm performance. This could be because large board sizes can lead to delays in decision making, coordination of activities, communication and thereby reducing the firm performance (Nanka-Bruce, 2011). Proponents of agency theory support smaller board sizes as it minimizes monitoring duties and encourages efficiency (Kakanda et.al, 2016). Concurrently, Senthuran and Velnampy (2015), Dissanayake and Dissanayake (2019) and Connelly and Limpaphayom (2004), concluded that there is no relationship between board size and firm performance.

Rosenstein and Wyatt (1990) stated that independent directors are a tool for monitoring management behavior. Board independence is an important factor that safeguards investor's interests (Fama & Jensen, 1983). Francis et.al, (2012) and Muniandy and Hillier (2015) revealed that there is a significant positive relationship between independent directors and the performance of a firm. It is argued that higher representation of independent directors increases the objectivity of the directors, independence of the board, and access to expertise (Fama & Jensen, 1983). Nevertheless, some studies argue that there is no association between the proportion of independent directors and firm performance (Bhagat & Black 2002). The argument here is that independent directors lack the needed knowledge, expertise, or the time to contribute effectively (Kakanda et.al, 2016).

CEO duality is a popular topic in corporate governance which means the instance when the CEO also holds the position of the chairman in the board (Dharmadasa et.al, 2014). According to Peng et.al, (2009) CEO duality facilitates a timely and effective decision-making process. Also, Sridharan and Marsinko (1997) highlighted that CEO duality influence the firm performance. Gul and Leung (2004) stated that in Hong Kong when the same person holds both positions, it causes to lower the voluntary corporate disclosure. Also, Palmon and Wald (2002) argue there is a negative relationship between CEO duality and firm performance. Conversely, some studies found there is no significant impact between CEO duality and firm performance (Dalton et.al, 1998).

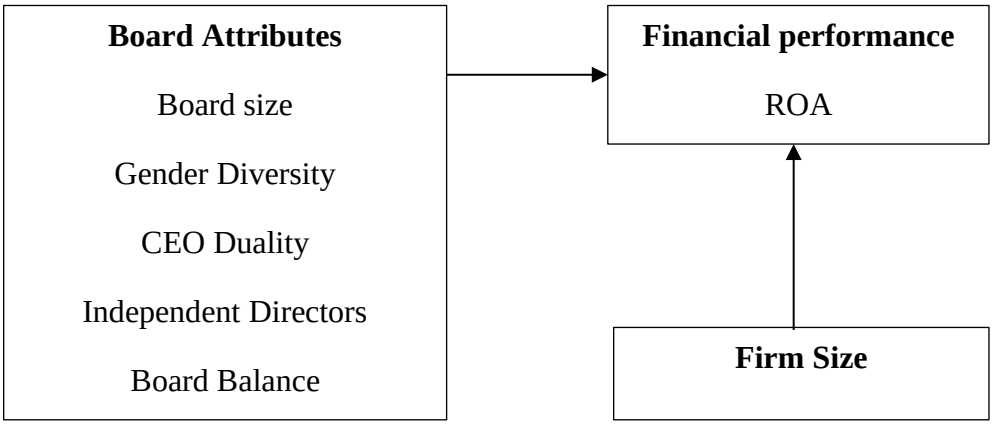
Board balance is one of the main dimensions of BoD and the board should have a balance of executive directors and non-executive directors. Sri Lanka's code of best practices has presented that the board should include at least two non-executive directors or that non-executive directors should be one third of the total directors. An effective board should be comprised of a majority of non-executive directors (Dalton et.al, 1998). But according to Donaldson and Davis (1994), the majority of executive directors represent in the board is effective than none executive directors because executive directors archive the highest profit and shareholder return. Contrary to this, Haniffa and Hudaib (2006) stated that ROA and proportion of non-executive directors are not significantly related to firm performance.

Board gender diversity is another factor that gained much attention in recent corporate governance literature. It is concerned with the representation of female directors on the director board (Carter et.al, 2003). According to Şener and Karaye (2014) one of the most important dimensions related to board attributes is board gender diversity. And also, Cox and Blake (1991) stated that board diversity can be identified as a source of competitive advantage. This is because an increment in the proportion of female employees in the workplace (gender diversity) has become a critical issue in any organization at present. Moreover, in Barber and Odean (2001) perspective, women directors act as risk- adverse agents in decision making and they have not had the confidence.

3. Methodology

This study employs a positivist research paradigm and quantitative techniques to investigate the impact of board attributes in firm financial performance. Secondary data available through annual reports were used for data collection. Financial performance was measured by using the accounting-based performance measurement of ROA. ROA and ROE have been commonly used as accounting measurements of profitability by corporate governance researchers. The current study selected ROA to measure profitability because it directly relates to the ability of the management to efficiently utilize assets for earnings and indicates what management has accomplished with the given resources (Dharmadasa et.al, 2014). Below figure 1 represents the conceptual framework of the study. Based on conceptual framework board attributes measured through different board attributes is the independent variable, financial performance of the firm the dependent variable, and size of the firm considered as a control variable.

Figure I: Conceptual framework



Source: Empirical findings

Further, table 1 shows the detailed breakdown of the variables of the study

Table 1: Operationalization of variables

Variable	Measurement	(Dharmadasa et.al, 2021)
Financial Performance:		
ROA	Return on Assets (ROA) $= \frac{\text{Net Income}}{\text{Average Assets}}$	(Al-Matari et.al, 2014)
Board Attributes:		
Board size (BODSZE)	number of members representing BOD.	(Coles et.al, 2008)
Gender Diversity (GENDI)	Number of female directors representing BOD.	(Ujunwa, 2012)
CEO Duality (CEODUL)	Separation on the roles of CEO and Chairman	Fama and Jensen (1983)
Independent Directors (INDD)	Number of independent directors of BOD.	("Code of best practice on Corporate governance," 2017)
Board Balance (BODBAL)	Number of executive directors and non-executive directors of BOD.	("Code of best practice on Corporate governance," 2017)
Firm Size:		
Total Assets	Total amount of assets owned by entity.	Ujunwa (2012)

Source: Developed by the researcher

3.1. Sample and data collection

There are 37 manufacturing companies listed on the Colombo Stock Exchange (CSE) , and all manufacturing companies were considered as the sample of the study. Two companies; Orient Garment PLC and Pelwatte Sugar Industry PLC were excluded as 2018 annual reports were not published on the CSE website. Accordingly, this study collected data by referring to annual reports of the selected companies.

To examine the behaviour of variables descriptive statics were used. A multiple regression analysis was conducted to assess the relationship between board attributes and firm performance. Based on the research design following hypotheses were formulated for the research study.

H_0- There is no impact of board attributes on financial performance on listed manufacturing companies in Sri Lanka.

H_1- There is an impact of board attributes on financial performance on listed manufacturing companies in Sri Lanka.

$$ROA = \alpha + \beta_1 BODSZE_t + \beta_2 CEODUL_t + \beta_3 INDD_t + \beta_4 BODBAL_t + \beta_5 GENDI_t + \beta_6 FIRSZ_t + \varepsilon$$

In the above formula *ROA*: Return on Assets, *BODSZE*: Board size, *CEODUL*: CEO duality, *INDD*: Independent directors, *BODBAL*: Board balance, *GENDI*: Gender diversity, *FIRSZ*: Firm size, α: Intercept, β: Coefficient of the variable, *t*: Time period, ε: Standard error of the sample.

4. Data Analysis and Discussion

4.1. Board attributes of listed manufacturing companies of Sri Lanka

Table 2 presents descriptive statics of board attributes of 2018/19 listed manufacturing firms in Sri Lanka. The average board size consists of 8-9 members. Complementing this, Guo and KGA (2012),

Dharmadasa et.al, (2014), and Dissanayake and Dissanayake (2019) showed that the average board size of a Sri Lankan listed company is 8-9 members. However, Senthuran and Velnampy (2015) show that for Sri Lankan commercial banks, the average BoD size is 11 members. From this, it's clear that the manufacturing sector complies with the board size of the majority of listed companies on CSE. An optimal board size facilitates better focus, participation, and interaction (Firstenberg & Malkiel, 1994; Kakanda et.al, 2016).

CEO duality is not exercised by all the listed companies subjected to the study. This finding complements with corporate governance studies conducted based on companies listed on CSE (GUO & KGA, 2012; Senthuran & Velnampy 2015; Dissanayake & Dissanayake, 2019). This implies that there could be CEO dominance which hinders independence in some boards (Rebeiz, 2015). The statistics on gender diversity suggest that the boards of listed manufacturing companies are male-dominated. Dissanayake and Dissanayake (2019) also show that women's representation on boards is as low as 6.1%. Board balance indicated that on average 37% non-executive directors are present at a director board.

Table 2: Descriptive statistics of the board attributes

	N	Minimum	Maximum	Mean	Std. Deviation
Board size	35	5	14	8.17	1.87
CEO duality	35	0	1	.54	.51
Independent Directors	35	22.22	66.67	39.13	10.63
Gender diversity	35	0	2	.66	.64
Board balance	35	22.22	60	37.25	9.20

Source: Output of data analysis

4.2 Impact of board attributes on financial performance

Table 3: Regression result of the study

	Unstandardized Coefficients		
	B	Std. Error	Sig.
(Constant)	-.255	.143	.086
Board size	.015**	.005	.009
CEO Duality	.002	.016	.918
Independent Directors	.003	.001	.075
Gender Diversity	.001	.015	.943
Board Balance	-.005**	.002	.004
Firm Size	.025	.016	.141
Adj R^2		36.4%	
F		2.667	
Sig		0.036	

*Indicates significance at .01 level
Source: Output of data analysis

Accordingly, table 3 shows statistical results which support the relationship between board attributes and financial performance. The independent variables explain about 36% of the value of ROA. This is a fairly good model. However, 64% of the variation of ROA cannot be explained by the current model. Thus, future researchers have room to further develop this study. Board size has a statically significant positive impact on ROA ($\beta = .015$, $p = .009$). According to Adams and Mehran (2005) and Dehaene et.al, (2001) large board size is positively and significantly related to firm performance. A recent study in the Sri Lankan context by Farwis et.al, (2021) also shows that even amidst a pandemic, there is a positive association between board size and firm performance. This could be because more members in the BoD increase diversity which contributes to secure critical resources and helps to decrease the environmental uncertainties (Goodstein et.al,

1994; Pearce & Zahra, 1992). Large board size can furnish more expert knowledge and experience to increase firm performance.

Board balance has a statistically significant negative impact on ROA (β = -.005, p = .004). Dissanayake and Dissanayake (2019), also confirm this through their study conducted with companies listed in the manufacturing sector. Hooghiemstra and Manen (2004) concluded that this could be because stakeholders in the firms may not be satisfied with non- executive directors' operation. This is supported by the findings of Haniffa and Hudaib (2006). According to them, there is a negative relationship when non-executive directors represent the director board as a high proportion of non-executive directors may devour the firm in excessive monitoring, their stifle strategic actions can be harmful to the company and lack of real independence cause to decline the firm performance. However, Dharmadasa et.al, (2014) show that there is a positive association between board balance and firm performance in listed companies of Sri Lanka. On the contrary, Guo and KGA (2012), and Senthuran & Velnampy (2015) show that there is no significant relationship between board balance and firm performance in listed companies of Sri Lanka.

CEO duality have a positive but statistically insignificant impact on ROA (β = .002, p > .05). Dahya and McConnell (2005) also found that CEO duality did not reveal absolute relationship or enhancement in firm financial performance. Similarly, Krause and Semadeni (2013) stated that CEO Duality does not seem to have a significant effect on the firm performance. In the Sri Lankan context Not only this but, number of independent directors did not have a statistically significant impact on ROA (β = .003, p = .075). Adams and Mehran (2008), Francis et.al, (2012), and Hermalin and Weisbach (2003) argue that there is no significant relationship between independent directors and the firm performance which supports this finding. Moreover, gender diversity did not have a statistically significant impact on ROA (β = .001, p = .943). Finally, the control variable, Firm size did not have statically significant impact on ROA (β = .025, p = .141).

5. Conclusion

The board attributes play a vital role in corporate governance. There has been a considerable debate on the impact of board attributes on firm performance in the past years. As such, this study examined the relationship between board attributes and financial performance in companies listed under the manufacturing sector of Sri Lanka for 2018/19. Data were collected from 35 companies to identify this relationship. In operationalizing the research five dimensions were used to measure board attributes as board size, gender diversity, CEO duality, independent directors, and board balance. Based on the results, the study concludes that certain board attributes impact the financial performance of listed manufacturing firms of Sri Lanka. Accordingly, the board size has a significant positive impact on firm performance. Further, board balance has a significant negative relationship with ROA. However, CEO duality, number of independent directors, and gender diversity did not have a significant impact on firm performance.

The findings of this study add to the extant knowledge on corporate governance in Sri Lanka. This research study will be of assistance to researchers to conduct further research studies under the topic. Especially, combining qualitative indicators may divulge important findings. Further, the study provides managerial implications concerning aspects of BoDs to consider for appointments.

This study has some limitations that should be acknowledged and addressed in future studies. First, this study only used a cross-section data set. A longitudinal analysis can be conducted to get a clear understanding of the relationship between board attributes and firm performance. Secondly, the study only considered few broad attributes. Further, only ROA was used as a measurement of financial performance. These limitations could be addressed by future researchers. Moreover, a qualitative study would provide more insights into the relationship between board attributes and firm performance.

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Impact of Bank Technological Innovations on Financial Performance of Commercial Banks in Sri Lanka

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Abstract

Recently, commercial banks invest largely on technological innovations. However, the attention given towards to examine its impact on financial performance, is low in both international and local contexts. Therefore, this study examines the impact of banks technological innovation on financial performance of commercial banks in Sri Lanka. Multiple regression analysis was conducted using central bank of Sri Lanka quarterly issued data for the commercial banking sector for the period from 2012 to 2020. The transaction volume of automated teller machines, point of sales machines, internet banking and mobile banking are taken as technological innovations and bank performance was measured by using a proxy, Return on Assets. Total assets, cost-efficiency ratio, capital adequacy ratio and non-performing loan ratio were taken as control variables. The results of analysis show that automated teller machines and point of sales machines have an insignificant negative impact on Return on Assets and internet banking and mobile banking have an insignificant positive impact on Return on Assets. Total assets have a significant positive impact and cost efficiency ratio has a significant negative impact on Return on Asset. The findings of the analysis encourage banks to introduce more banking features to internet banking and develop user-friendly mobile apps since the internet banking and mobile banking positively relate to bank performance and banks also should look for new ways to reduce installation and operating cost of automated teller machines and point of sales machines since they negatively relate to bank performance

***Keywords**: Financial Performance, Multiple Regression Analysis, Return on Assets, Technological Innovations.*

1. Introduction

The twenty-first-century technological boom has led to significant growth in technologies that have changed the way commercial banks conduct business (Quinn 2010). Organizations who wish to stay relevant, productive and sustainable must accept technological innovations as a revolutionary means to achieve (Davila, Epstein & Stretton 2010; Drucker 2013; Khalil 2012). Innovations are conscious creation by companies experimenting with new products or implementing new techniques in production (White 2010). Innovations promote organizations' competitiveness by ensuring they have a competitive advantage (Porter 1997). The global banking and financial sector are on the brink of change due to increasing globalization and deregulation. Technological innovations including those found in Automated Teller Machine (ATM), Mobile Banking, Internet banking and point of sale machines (POS), are taking place at an increasingly rapid rate in the global banking sector. The emerging technological innovation has seen the implementation of electronic banking services on internet-based platforms, online deposits of funds and transactions, and the launch of mobile banking systems lately (Quinn 2010). While some of the conventional elements of baking have ended, most of those operations have become digital. The invention of the mobile phone is seen as key to the progress of many developments in electronic payment (Ingenico 2012). In the last few years, Sri Lanka has undergone excellent technological improvements. Central Bank of Sri Lanka notes that Sri Lanka's banking industry has seen many changes since the launch of mobile banking and internet banking. The commercial banks of the Sri Lankan banking industry are investing largely on technological innovations (CBSL. 2020).

1.2. Background of the study

Although the banking sector has been on the journey of digitalization for many years, the invention of the computer and the mobile system has rapidly accelerated the rate of transformation. Millions of peoples are now using mobile apps to manage most of their transactions. This has altered the way people transact and how banks interact with their consumers. Consequently, banks which do not adopt these changes experienced financial losses. In the last few years, Sri Lanka has undergone excellent technological improvement. CBSL (2020) states

that the use of electronic banking services has been growing because of the implementation of computer technology. Bank customers now have reliable, fast and convenient banking services offered by technological innovations such as ATMs, Point of Sales Machines, Internet Banking and Mobile Banking.

Given the potential advantages of technological innovations, there's a question about whether and how their implementation enhances the financial earnings of commercial banks in Sri Lanka. A few numbers of studies have been carried out in Sri Lanka to understand bank technological innovations and its impact on financial performance of commercial banks in Sri Lanka (Maldeni & Jayasena, 2009; Habeeb & Wcikramasinghe, 2019; Rathanasiri, 2010;). As well as there have emerged a few literatures in global context that discusses recent financial innovations and its impacts on financial performance of banks (Francensca & Claeys, 2010; Sarah Muia, 2017; Akhisar 2015). However, in the literatures, there is no systematic quantitative analysis to examine the effects of technological innovations i.e, ATM, POS Machine, Internet Banking, Mobile Banking on bank financial performance variables, especially in Sri Lanka.

1.3. Innovation and Financial Performance

Banks use technological innovations as tough strategic variables to beat the competition, and they have become a key tool for the bank to improve its performance and sustain its market effectiveness. (Batiz-Lazo and Woldesenbet, 2006). This inspires the interest in analyzing the relationship between technological innovations and bank performance. A successful innovation creates a distinctive competitive position that can provide a bank a competitive advantage and contribute to greater financial performance in dynamic environment (Roberts and Amit, 2003). Despite significant importance of financial innovation in explaining banking performance, the influence of innovation on financial performance continues to be misinterpreted due to two key reasons. There remains a paucity of understanding of the drivers of innovation and the impact of innovation on financial performance. In reality, most existing research takes a simple view to the link between innovation and performance, ignoring the practices to

innovation both in and out of banking organization, all of which could affect this relationship.

1.4. Objective of the study

To examine the impact of technological innovations on the financial performance of commercial banks in Sri Lanka.

2. Literature Review

Francensca and Claeys (2010) explored the role of online banking service in responding to the strategic objectives using among 60 major banks functioning within the European Union. The study suggested that all those banks whose goal was to expand their customer base were likely to implement financial innovations including internet banking as they were able to achieve more customers. Conversely, the performance of the banks that depend heavily on internet banking was shown to be limited since banks spent so much money on internet banking, and subsequent staff cost savings could not be adequate to recover the original capital outlay. Therefore, banks need to make a wise decision about which technological innovation to implement.

Chee-Wooi and Sok-Gee (2014) investigated technological innovation in services and the efficiency of Malaysian commercial banks. The study found that excess numbers of branch, cash deposit machine and cheque deposit machine appeared to be the key weakness of inefficient banks. Also reveals that technological innovation in banking services is an essential aspect of solving the relative efficiency of commercial banks. Banks who have better technological services do have competitive advantages over their rivals. Mwangi (2013) assessed the innovations and financial performances in Nairobi. The aim of the study is to assessing the effect of innovations to the banking industry. The descriptive method was used and the target population was the Nairobian commercial bank. The study concluded that innovations have a significant impact on financial firms' performance. Also found that when compared to internet banking, mobile banking practices has more influence on performance. This study is crucial because it emphasizes the function of innovations in the profitability of financial innovations.

Akhisar (2015) conducted research on the effects of Innovations on Bank Performance - The Case of Electronic Banking Services. The study found that the number of POS terminals and the number of internet banking users has a negative non-significant impact on bank performance and the Ratio of ATM/Branches number has a significant positive impact on bank performance. Sarah Muia (2017) researched the effect of financial innovations on the financial performance of commercial banks in Kenya using s sample of twelve commercial banks. The findings of the study showed that the value of Electronic Funds Transfers and Numbers of Mobile Banking Users has a positive insignificant impact on Return on Assets and the internet banking transactions has a positive significant impact on the return on assets of the commercial banks in Kenya.

Sulieman Aber Abdullah1 and Alrgaibat khawaldeh (2017) evaluated the Technological Innovations and Financial Performance of Commercial Banks in Jordan. They concluded that Agency banking, online banking and mobile banking has a positive significant impact on the performance of Jordan Commercial Banks. Hani El Zouhour (2019) assessed the effect of technical advancement influences on the performance of Lebanese banks over the eight years (2010 to 2017). The study concludes that Investment in technological innovation in automated teller machines (ATMs) and internet banking has a significant positive impact on the performance of commercial banks and non-significant negative effect of mobile banking and non – significant positive computer tech investment on the performance of Lebanese banks.

A few studies can be found in local context especially, Maldeni and Jayasena (2009) evaluated information and communication technology usage and bank branch performance. They used a descriptive survey and used primary data, questionnaires to gather data and data was analyzed and presented in descriptive and comparative ways and correlation analysis has performed as the study's results. The study concluded that ITC usage has a significant positive impact on bank branch performance.

Habeeb and Wcikramasinghe (2019) investigated the Innovation and Development of Digital Finance as a Review on Digital

Transformation in Banking & Financial Sector of Sri Lanka. Based on the works of literature available in the context of digital transformation in the banking and finance sector, the authors presented a framework to have an overview of the digital transformation of banking and the financial sector, and to create a business model and concluded that Big Data, IoT, robots, cybersecurity, artificial intelligence block chain and crypto-currency is becoming increasingly relevant in the context of Digital Transformation in Banking & Financial Sector. This study has been collected primary data using the model of constructivist approach with the combination of explanations and thematic analysis as the techniques for qualitative data analysis. Rathanasiri (2010) conducted a study on financial innovation and diffusion in commercial banks in Sri Lanka in which the author concluded that competitiveness and deregulation in the financial sector have cultivated financial innovations that, in turn, increase the performance of the banking system and with the adoption of innovations and a new financial market environment, the banking approach has shifted to customer-oriented banking.

This study also utilized descriptive surveys and used qualitative data from publications on the evaluation of Sri Lankan banking industry. However, none of the studies has carried out a systematic quantitative analysis to examine the impact of technological innovation i.e, ATM, POS Machine, Internet Banking, Mobile Banking on financial performance of commercial banks in Sri Lanka. Also, there was a mixed findings from the above literatures that are carried out in global context. Hence it is clear that a study on this topic is needed for local context as well as for developing countries a timely update is required to the existing literatures in global context. This study attempts to fill the identified research gap and examines bank technological innovations and their effect on the financial performance of commercial banks in Sri Lanka.

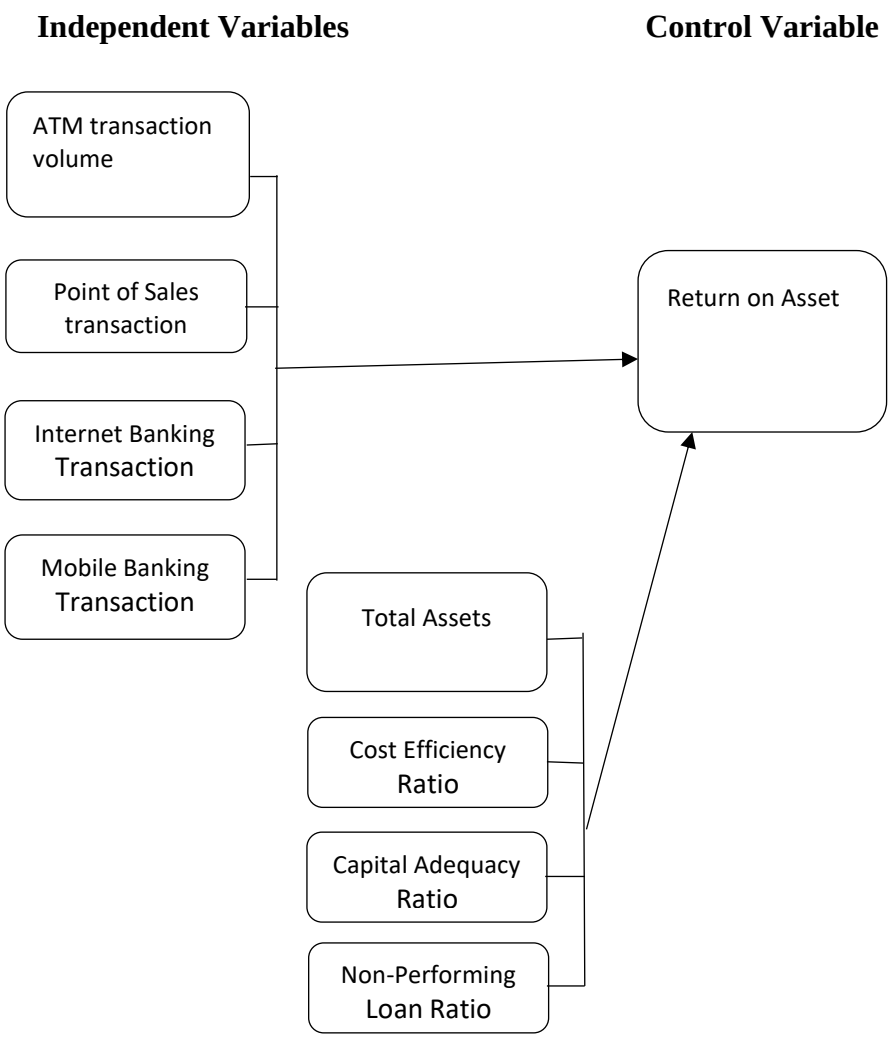
3. Methodology

Descriptive studies were conducted to find the impact of technological innovations on the financial performance of commercial banks in Sri Lanka.

3.1. Conceptual Framework

This research shall have the following conceptual framework.

Figure I: Conceptual framework



Source: Empirical resources

3.2. Description of Variables

Independent variables of this study are transaction volumes of ATMs, POS machines, Mobile Banking and Internet Banking. ATMs were

originally developed to serve as cash dispensing devices. But, due to technological improvements, ATMs can offer a wide variety of services, such as depositing money, transferring money between two or more accounts and paying bills. Banks prefer to use this electronic banking system to gain a competitive advantage as all others do. POS is a way of transferring money by electronic means, without parties being in the same venue. It is a sort of bank technological innovation that makes use of progressions in technology to promote banking transactions. POS machines save costs and take less time to complete transactions. Mobile Banking are the application of mobile phones and related devices to perform banking operations (Nadar, 2011). Customers can make transactions using their mobile phones, make a bill payment from their bank accounts. Most individuals have mobile phones, which may allow financial transfers at their comfort. Mobile banking will therefore improve a bank's consumer base. Therefore, it should be noted that mobile banking will improve commercial bank performance. Mobile banking may be the most meaningful method of bank technological innovations progress since many people have mobile phones within reach. Internet banking comprises doing transactions online (Sarah Muia, 2017).

Most commercial banks have electronic platforms whereby customers can request money transfers and bill payments. Internet banking decreases the bank running cost in such a manner that the banking offices carry out fewer operations. Internet banking may serve as a substitute for offices and hence lowers running cost. When running expenses are reduced to the minimum the performance of the commercial bank may enhance. Dependent variable of this study is Return on Asset. Return on Asset is the calculation of how much profits in a given period an asset can be able to generate. Return on Asset is measured using profits before the tax divided by average total assets. A number of studies for example (Athanasoglou, Brissmis and Delis, 2005; Mamatzakis and Remoundos, 2003) assessed that the assets size, Cost efficiency, capital adequacy, non-performing loans, risk managements are important internal determinant of bank financial performance. Therefore, total assets, cost efficiency ratio, capital adequacy ratio and non-performing loan ratio are used as control

variables for this study. Total assets are the total value of the bank (Goddard *et al*, 2004). Capital adequacy is a measure of the financial strength of the banks. It expresses the ability of the bank to manage unexpected losses. The Non-performing Loans, when the borrower doesn't make any interest payments or principal on loan amount, such loan is classified as non-performing loan by the bank (Thamilselvan & Kumar, 2014). Operating cost efficiency is measured by dividing the total operation expenses by total operation income.

3.3. Descriptive Study

3.3.1. Target population and data collection method

The descriptive study is based on commercial banking sector regulated by the Central Bank of Sri Lanka. Central Bank's quarterly published data has been collected for the period from 2012 quarter to 2020 first quarter. This timeframe was appropriate for this analysis because it was the period bank technological innovations was introducing in the country. This was the period, telecommunications companies and banks implemented mobile technology and electronic banking (Central bank payment bulletin). The study collected the number of mobile baking transactions volume, internet banking transaction volume, Electronic Fund Transfer at Point-of-Sale transaction volume and ATMs transaction volume from the CBSL payment bulletin.

4. The Analysis

Data was analyzed using E-views package. Data was showed in descriptive statistics, where means, standard deviations, minimum and maximum values are analyzed and thereafter coefficients of regression were measured. the multiple linear regression model was established as;

$$ROA_t = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 IB_t + \beta_4 MB_t + \beta_5 TA_t + \beta_6 ER_t + \beta_7 CAR_t + \beta_8 NPL_t + \varepsilon_t$$

Where, ROA_{it} = Commercial banks' return on asset ratio. β_0 = the constant that should be assumed by the model. β_1, β_2 and β_3 = the coefficient of indicating the influence of independent variables on the dependent variable, ATM_t = ATM transaction of commercial banks for

t period, Mb_t = Mobile banking transaction of commercial banks for t period, IB_t = Internet banking transaction of commercial banks for t period POS_t = Electronic Fund Transfer at Point-of-Sale transactions for t period. TA_t = Total of commercial banks for t period, ER_t = Cost Effective Ratio of commercial banks for t period, CAR_t= Capital Adequacy Ratio of commercial banks for t period, NPL_t = non-Performing loan Ratio for t period, t = 2012Q1……2020Q1 and ε = Inherent error in the model

4.1. Descriptive Study

Descriptive Study was conducted to develop a relationship on the financial performance of commercial banks in Sri Lanka between ATM, POS machines, Mobile banking, internet banking and control variables.

Table 1: Descriptive Statistics of Independent Variable, Independent Variables and Dependent Variables.

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
ROA	33	2.027129	0.346401	1.441191	2.835138
ATM	33	52,589,061	12,305,341	31,975,000	76,000,000
POS	33	17,568,273	8,132,304	7,353,000	33,500,000
IB	33	4,745,873	2,712,032	1,023,000	10,710,300
MB	33	1,252,515	1,633,557	48,275	5,661,000
TA	33	12.86	12.37	12.59	12.06
ER	33	0.450674	0.027423	0.405322	0.510131
CAR	33	0.157550	0.008708	0.141318	0.174983
NPL	33	0.036708	0.009493	0.023019	0.056707

Source – Based on Eviews output (2020)

(Note: ROA = Return on Assets, ATM = Automated Teller Machines Transactions, POS = Point of Sales Machine Transactions, IB = Internet Banking Transactions, MB = Mobile Banking Transactions,

TA = Log Value of Total Assets of Commercial Banks, ER = Cost Efficient Ratio, CAR = Capital Adequacy Ratio, NPL = Non-Performing Loan Ratio).

The descriptive statistics shown in Table 1 indicates that the maximum of ROA between from 2012 first quarter to 2020 first quarter being 2.84%, minimum being 1.44%, mean of 2.28%. The return on Assets has fluctuated over the years. The standard deviation was 0.35%, which indicates a variance of the commercial banks' performance over the years. This result shows that the performance of commercial banks was varying across the years. A mean ROA value of 0.35% suggest the low performance of commercial banks. This is vital to emphasize that ROA measures the degree of which assets are used to generate revalue for commercial bank. ATM had a mean of 52.6 million approximate transactions volume with a standard deviation of 12.3 million approximate transaction volume. This indicates a large variation in the volume of transactions transacted via ATMs. On the other hand, Electronic Fund Transfers at Point of Sales Machines has a mean of 17.6 million approximate transactions volume with a standard deviation of 8.1 million transaction volume.

This also indicates a greater variation in the volume of transactions transacted via POS machines. Internet banking has a mean of 4.7 million transactions volume with a standard deviation of 2.7 million transactions volume. Mobile banking had a mean of 1.3 million transactions volume, with a standard deviation of 1.6 million transactions volume and a maximum of 5.7 million approximate transactions volume. An overview of the trend reveals that over the years, all the innovations have continued to expand their usage.

This may be due to the introduction of new technology by commercial banks in Sri Lanka and is a requirement for the implementation of technological innovations in Sri Lanka. Total assets have a mean of 7290 billion with a standard deviation of 2340 billion. Cost-Efficient Ratio had a mean of 0.45%, with a standard deviation of 0.03% and a maximum of 0.51%. Capital Adequacy Ratio has a mean of 0.15%, with a standard deviation of 0.009%. Non-Performing Loan Ratio had a mean of 0.037 %, with a standard deviation of 0.009% and a

maximum of 0.057%. The statistics show that the control Variables also exhibit a considerable variance during the period.

Table 2. Multiple Linear Regression Results

Dependent Variable: DROA					
Method: Least Squares (NLS and ARMA)					
Sample (adjusted): 3 33					
Included observations: 31 after adjustments					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	VIF
C	-0.081024	0.074757	-1.083828	0.2902	-
DDLOGATM	-0.572738	0.472583	-1.21193	0.2384	2.2263
DLOGPOS	-0.302665	0.379226	-0.798112	0.4333	2.2147
DLOGIB	0.049054	0.100617	0.487527	0.6307	1.3274
DLOGMB	0.019072	0.124125	0.153649	0.8793	1.6488
DLOGTA	2.229319	1.050862	2.121419	0.0454	1.3995
DER	-6.620019	0.746646	-8.866338	0.0000	1.2218
DCAR	1.721249	2.704725	0.636386	0.5311	1.5082
NPL	-0.331822	1.713710	-0.193628	0.8482	1.3614
Mean VIF: 1.6135					
R-squared: 0.827948					
Adjusted R-squared: 0.765384					
Prob(F-statistic): 0.000001					
Durbin-Watson stat: 1.972383					

Source – Developed by the researcher based on Eviews output (2020)

Note: DROA = Return on Asset Ratio at 1st difference, DDLogATM = Natural Logarithm of Automated Teller Machines Transactions at 2nd difference, DLogPOS = Natural Logarithm of Point of Sales Machine Transactions at 1st difference, DLogIB = Natural Logarithm of Internet Banking Transactions at 1st difference, DLogMB = Natural Logarithm of Mobile Banking Transactions at 1st difference, DLogTA = Natural Logarithm of Total Assets of Commercial Banks at 1st difference, DER = Cost-Efficient Ratio at 1st difference, DCAR = Capital Adequacy Ratio at 1st difference, NPL = Non-Performing Loan Ratio.

Based on the regression results the model of this study can be specified As,

$$\mathbf{ROA_{it} = - 0.081 - 0.573ATM - 0.303POS + 0.049IB + 0.019MB + 2.229TA - 6.62ER + 1.721CAR - 0.332NPL + \varepsilon_t}$$

Where, ROA_{it} = Commercial banks' return on asset ratio. ATM_t = ATM transaction of commercial banks for t period, Mb_t = Mobile banking transaction of commercial banks for t period, IB_t = Internet banking transaction of commercial banks for t period POS_t = Electronic Fund Transfer at Point-of-Sale transactions for t period. TA_t = Total of commercial banks for t period, ER_t = Cost Effective Ratio of commercial banks for t period, CAR_t= Capital Adequacy Ratio of commercial banks for t period, NPL_t = non-Performing loan Ratio for t period, t = 2012Q1……2020Q1 and ε = Inherent error in the model

Least Squares (NLS and ARMA) method is used for multiple regression model estimation in E-views and 31 observations are included for the model after conducting the unit root test. The unit root test is carried out to check the stationarity of the dataset. The used model is significant for the test as the Probability value F- statistics are zero. F statistic indicates the all of the slop coefficients (excluding the intercept) for the regression are zero. Here mean VIF is 1.6135 and the VIF for individual variables also less than 10. Since the VIF value is less than 10, it confirms that there is no correlation between independent variables and control variables. The R-square (R2) for the regression model is the measure of fitness or the coefficient of determination. The total square R is approximately 82.79%, which implies that 82.79 % of the Asset Return is explained by independent variables.

It is important to realize that the performance of commercial banks is determined by some factors there is no autocorrelation between the independent variables. Other than those investigated in this study. It is in this reason that the R^2 is not 100%. Other variables not evaluated by the study that explanations the remainder of R^2 from 100%. The research tried to estimate the coefficients of multiple regression

models. The calculated Durbin-Watson statistics value of 1.97 states there is no autocorrelation between the independent variables.

As per the regression results in the relationship between the ATM and the performance of commercial banks are statistically insignificant as the P-value for ATM is 0.2902 which is more than 0.05 and the coefficient takes a negative value of 0.572738. The P-value for Point of Sales is 0.4333 which is more than 0.05 hence the relationship between Point of Sales machines and performance of commercial banks is not statistically significant and have a negative coefficient value of -0.302665. The p-value for internet banking is 0.6307 which is more than 0.05 this means the relationship between internet banking and the performance of the commercial banks is not statistically significant but have a positive coefficient value of 0.04905.

The relationship between the Mobile Banking and the performance of commercial banks are statistically insignificant as the P-value for Mobile Banking is 0.8793 which is more than 0.05 and the coefficient takes a positive value of 0.01907. The relationship between the control variables and bank performance is also indicated in the regression results. The relationship between the Total Asset and the performance of commercial banks in Sri Lanka is statistically significant as the P-value for Total Asset is 0.0454 which is less than 0.05 and has a positive coefficient value of 2.229. The P-value for Cost-Efficient ratio is 0 which is less than 0.05 hence the relationship between Cost-Efficient ratio and performance of commercial banks is statistically significant however has a negative coefficient value of 6. 62.

The p-value of Capital Adequacy Ratio is 0.5311 which is more than 0.05 this means the relationship between the Capital Adequacy ratio and performance of the commercial banks are not statistically significant and has a positive coefficient value of 1.721. The relationship between the non-Performing loan and the performance of commercial banks in Sri Lanka is statistically insignificant as the P-value for non-performing loan is 0.8482 which is greater than 0.05 and has a negative coefficient value of 0.332.

4.2. Discussion of Finding

The study established a negative relationship between the Automated Teller machines and the return on assets. The coefficient takes a negative value of 0.572738. This result is consistent with those of Shirley and Sushata (2006) who found that the bank's earnings are diminishing due to the adoption and expansion of IT investment, suggesting negative network effects in this sector. On contrast, Marbrouk and Mamoghli (2010) conclude that those banks that investment in innovations pretty early seemed to have better performance in comparison with those that implemented fairly late.

The first-mover benefit may be the reason for that. This result also agrees with Sok-Gee, Chan (2017) who research technological innovation in services and the efficiency of Malaysian commercial banks and found that excess numbers of branch, cash deposit machine and cheque deposit machine appeared to be the key weakness of inefficient banks. However, this result is against Hani El Chaarani Zouhour El Abiadresearch result, which explores the effect of technical advancement influences on the performance of Lebanese banks over the eight years (2010 to 2017). They concluded that investment in technological innovation in automated teller machines (ATMs) has a significant positive impact on the performance of commercial banks. The study also established a negative relationship between the Point of Sales machines and the return on assets. This is because the coefficient is negative that is -0.302665. This conclusion matches with those of Shirley and Sushata (2006) established that electronic transfers at Point of Sales could potentially build large networks that could minimize the profits of banks in the United States. Further, this finding matches with that of Batu Tunayb, Necla Tuna who found out that POS terminals have a negative insignificant impact on the bank performance. On the opposite, according to Abaenewe, Zephchibueze, et al (2013) electronic funds transactions at Point of Sales generates more customer transactions and consequently more transaction fees from electronic banking leading to more revenues.

This results also contradict the Saraha muia' findings, according to Sahara Muai (2017) Electronic Funds Transfers has a positive on Return on Assets of commercial banks in Kenya. This study identified

a positive relationship between internet banking and commercial bank performance in Sri Lanka. The coefficient value is positive that is 0.04905. Internet banking ensures that customers can use banking facilities under their own, thus reducing bank operating costs. Internet banking is more useful as most transfers can be made online. This result is in line with those of De Young et al (2007) who have identified that internet banking has a positive relationship with the performance of commercial banks by analyzing the effect of e-banking on the competitiveness of U.S. community banks by contrasting banks that provide internet banking with bank physical outlets.

These results are also consistent with those of Malhotra and Singh (2010) who described the major banks that have adopted internet banking had a potential for higher profitability due to reduced running costs. Interestingly, the same study found that those smaller banks that implemented internet banking hurt their performance. Kagan et al (2005) described online banking to be of value to banks as it assured efficient service delivery and hence improved productivity. The study revealed that there is a positive relationship between Mobile Banking and ROA.

This is because the coefficients are positive that is 0.01907. Mobile banking ensures that customers can make financial transactions comfortably. These results align with those of AlJabri (2012) who established that Saudi Arabia banks' adoption of mobile banking led to improved performance. Kigen (2010) also identified that the cost of transactions for mobile banking decreased, thus increasing profitability. On contrast, Agboola (2006) pointed out that mobile banking was useful to banks if the consumers trusted the application that changed from bank to bank. Nader (2011), also concluded that mobile and internet banking were implemented by the commercial bank was not a purpose enough to expect further profits. But Mwangi (2013) established that when compared to internet banking, mobile banking practices has more influence on bank performance.

5. Conclusion and Recommendation

The study aimed to determine the impact of technological innovations on the financial performance of commercial banks in Sri Lanka. The

descriptive studies concludes that transactions with ATMs adversely impact commercial bank performance in Sri Lanka. This may be due to the large installation costs incurred by the banks for the ATMs. The transactions with POSs adversely impact commercial bank performance. The analysis suggests that importance of purchases with EFTs has a negative effect on asset returns. This may be due to the large investment cost of POS machines.

The mobile banking encouraging the efficiency of Sri Lanka's commercial banks. This is demonstrated in the regression model by the progressive coefficient. May be this is because, as consumers transact across the app, mobile banking costs are higher. However, it is important to note that business performance cannot be calculated strictly in terms of financial measure. The study also showed that internet banking transfers had a favorable influence on commercial banks' financial performance. This can be due to the fact that online banking is cheaper than transfers over counter.

The findings suggest that; commercial banks should implement financial technologies, as their efficiency is improved. The study particularly formed a progressive relationship between internet banking and commercial bank results. That is why commercial banks should support internet banking. Online banking allows commercial banks to cut prices, as consumers do not have to fly to the financial services banking halls. This report suggests spending by commercial banks in technical advances and also encouraged to implement financial technologies to improve efficiency. Commercial Banks should Introduce more features to internet banking and launch user friendly mobile apps since the mobile banking relates positively with bank performance. Banks can invest on low-cost ATM with greater security and invest low-cost mobile ATMs and install solar panels for ATMs in order to cut high electricity expenses as well as invest to find new way to reduce the operating costs of POS machines since both ATMs and POSs negatively impacts to the commercial bank performance in Sri Lanka.

5.1. Limitations of this study

This study was related to the fact that numerous factors influence the financial performance of commercial banks. Such considerations include; the firm's specific variables and the country's existing management expertise and experience, government policies and other macroeconomic conditions. But technological innovation is not working in isolation. Rather, the influence of all these conditions affects the Commercial Bank success in Sri Lanka. In light of this finding, the researcher suggests that commercial banks financial performance has been not defined by eliminating other variables.

5.2. Suggestions for Further Research

The research examined the impact of financial innovation on commercial bank performance in Sri Lanka. A study can be carried out to assess the factors which restrict the adoption of financial innovations by commercial banks in Sri Lanka. This will help policy makers identify ways to promote financial institutions' adoption of financial technologies. The study also suggests that another study should be carried out on the effects of financial advances on commercial bank performance, using non- financial measures such as customer satisfaction and improved brand image.

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Equity Investors' Responses to the Announcement of COVID-19 Related Disclosures of the Colombo Stock Exchange

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Abstract

This study analyzes the equity investors' responses to the disclosure announcement relating to the impact of the COVID-19 pandemic of the companies listed on the Colombo Stock Exchange (CSE) using event study methodology, especially incorporating the time series modeling approach. The sample consists of 64 listed companies out of 214 companies that made COVID-19 disclosures during the pandemic from 2019-2021. Time series models are used concerning the stylized facts of each company's returns within the sample in generating abnormal returns within a 29-day window period. Findings show that equity investors negatively reacted to the COVID-19 disclosures on the event day within the 29-window period. Moreover, there is a significant positive response after the first two days of the announcement. Based on each model, the overall equity investors' response to the announcements within a 29-window period shows the positive statistically significant comeback for the COVID-19 pandemic announcements CSE. It implies that the equity holders in CSE believe that the pandemic will gain more benefits in the future for the Sri Lankan economy. In addition, abnormal returns show sectorial differences towards the announcement of a particular event. Subsequently, the results show the statistically significant abnormal returns appear after the actual announcement of the information. These results confirm that the Sri Lankan Share market is inconsistent with the semi-strong form market efficiency hypothesis. The pandemic continues silently, and the future impact may deviate from the current effects with the dynamic fluctuations in the COVID-19 cases and

deaths reporting. The analysis output gives the findings to enhance the quality of decision-making processes by allowing the equity investors to have accurate forecasts. In addition, listed companies can improve the strategic plans aligning with the reactions of equity holders. SEC as the regulatory body, can make necessary changes related to the CSE operations and compare already available data with knowledge updated through this study. Those interested parties and investors have a greater chance of identifying the companies with differing degrees of impact and allocating their finance at an optimum level.

Keywords **–** *Colombo Stock Exchange, Event Study Methodology, COVID-19 Pandemic Disclosures, Time Series Models.*

1. Introduction

Generally, publicly available information plays a vital role in an efficient capital market. When the companies announce the information to the public, it is considered valuable information for the investors to choose their investment portfolios. Moreover, the investors' judgment on this information changes the stock prices, and as a result, they may react positively or negatively in making trading decisions. The world is experiencing a peculiar health shock named COVID-19, where no single unit of an economy is unaffected by this latest disease. The announcement of COVID-19 as a global pandemic by the World Health Organization (WHO) on 11th March 2020 has increased public health awareness. Stock market performance is one of the significant indicators of economic growth, and it affects the whole economy adversely. A pandemic is an unprecedented shock in the external environment; all entities in the economy suffer in varying degrees vested upon their level of containment. Generally, equity holders react in both ways as negatively and positively to new information that comes through the latest announcements. In short, equity holders start to sell their equities as a negative response and buy more equities as a positive response towards a particular notification.

Moreover, analyzing the investors' response to such new events and announcements is a well-established area in research. In contrast, COVID-19 is the latest event that directly impacts the decisions of all

the interested parties in stock markets. So, it is vital to analyze how the COVID-19 pandemic and its announcements impact equity holders' stock market returns and buying and selling decisions.

The first pandemic wave started in Sri Lanka on 27th January 2020, and no cases were reported until 11th May. Unfortunately, the first local case was recorded on 11th March, and the same day, the WHO announcement of this disease as a global pandemic also took place. After that, only three working days of the stock market was opened until 11th May 2020 CSE was closed. Then Securities Exchange Commission (SEC) in Sri Lanka requested all the listed companies to disclose the respective impact of the pandemic as an announcement in CSE how their business is affected (Sri Lanka, Securities, & Exchange, 2020). This study investigates equity investors' reaction to the disclosure relating to the effects of the COVID-19 pandemic of the companies listed on the CSE by using event study methodology especially incorporating the time series modeling approach.

This study contributes in several ways. The stock market's performance is one of the significant indicators of the economic growth of a country. COVID-19 is a global pandemic, and it directly affects all the entities without remaining a single unit unaffected. In the opposite view, the availability of scientific knowledge concerning these types of unprecedented external shocks is deficient. As a result of the request of the SEC to disclose the pandemic impact, listed companies have announced their impact. Although it is the latest event in the CSE announcements, no one has focused on how the equity holders react to certain information they have published. This study analyzed "how the equity holders are responding to the announcement of the COVID-19 impact". The analysis output gives the findings to enhance the quality of decision-making processes by allowing the equity investors to have accurate forecasts. In addition, listed companies can improve the strategic plans aligning with the reactions of equity holders. SEC as the regulatory body, can make necessary changes related to the CSE operations and compare already available data with knowledge updated through this study. Those interested parties and investors have a greater chance of identifying the companies with differing degrees of impact and allocating their

finance at an optimum level. Moreover, as the first study which analyses the COVID-19 announcements as an event study, this research contributes the literature repository to be updated while putting foundation to new research areas.

1.1. Problem Statement

Regarding the Circulars numbered 06-04-2020 and 04-05-2020 issued by the CSE, all listed companies on the CSE must make disclosures regarding the impact of the COVID 19 pandemic. In response to that request, listed companies have announced their respective pandemic effect on business operations, their response to that impact, and expectations of future impact on the financial condition and business operations. Disclosures of COVID-19 of listed companies are the latest public information available at the CSE. Generally, these announcements impact the market prices positively or negatively by influencing the investors' investment decisions. It may rely on investors' confidence relevant to the performance and the stability of particular companies to withstand the unanticipated changes in the external environment. Although there is research in this area in other contexts, there is a vacuum in scientific knowledge investigating the equity holders' responses to COVID-19 announcements. Therefore, this study answers the following questions to assist all the stock market interested parties' decision-making processes.

- How does the market respond to the announcement of the COVID-19 impact?
- How far does the information after the public announcement of the COVID-19 pandemic reflect fully and instantaneously on share prices?

1.2. Objectives of the Study

- Examine how the market responds to the announcement of the COVID-19 impact
- Testing the semi-strong form market hypothesis in CSE

1.3. Hypotheses

Literature in the field of study contains three main hypotheses: no price effect, positive price effect, and negative price to announcements

comprised with new information (Asquith and Mullins, 1986). Base on the literature, the first hypothesis has been developed. In developing H_2, Efficient Market Theory has been encountered.

> H_1: The equity holders negatively respond to the announcement of the COVID-19 pandemic impaction.
>
> H_2: Information after the public announcement of the COVID-19 pandemic reflects fully and instantaneously on share prices.

2. Literature Review

The global financial system was experiencing a considerable health shock with the emergence of the COVID-19 Pandemic in December 2019. The stock market performance is one of the significant indicators of a particular country's economic growth. In addition, stock prices are reflecting all the information thoroughly and quickly in an efficient capital market. However, as a developing country, Sri Lanka faces difficulties balancing health and economic activities. With the WHO declaration of COVID-19 as a global pandemic, CSE requested listed companies to disclose the impact on their business processes. Then the listed companies revealed the impact of the pandemic. Machmuddah et al. (2020) investigated the stock market reaction to COVID-19 in Indonesia before and after the pandemic. There is a significant difference between the daily closing prices and the volume of stocks traded. After the financial crisis in 2007-2008, the COVID-19 pandemic is the most critical non-financial factor that affects the global economy. In addition, during the COVID-19 pandemic, daily stock market returns of Gulf Corporation Council countries significantly decreased when the number of daily deaths of COVID-19 increases (Raéf and Assaf, 2020). Another study was conducted using daily stock market return data of stock exchanges in France, Italy, South Korea, Spain, Germany, China, Japan, and the United States of America to analyses the COVID-19 impact on stock returns. It empirically analyzed the direct and spill-over effects fueled by the pandemic. Empirical findings confirmed adverse and short-term impacts, and the outputs are bidirectional between Asian countries and European and American countries (Qing *et al*., 2020).

The recent literature on the field of study ensures that the stock market returns of different countries are reacting differently towards the pandemic. However, stock market returns generally respond to unprecedented changes in the external environment. There are plenty of studies on shareholders' reactions to new announcements in stock markets in the financial literature. In Sri Lanka, Dharmarathna and Amarasekara (2016) analyzed the shareholders' responses at announcing the changes in executive directors and semi-strong form efficient market hypothesis. It consists of 66 listed companies and 156 public announcements on the CSE from 2009-2013. The study's outputs supported the Mean Adjusted Model, the Market Adjusted Model, and the Market Model. The findings of the thorough research confirm that CSE is inconsistent with the prior mentioned hypothesis.

In addition, another study in the same context suggests that stock prices are not reflecting the information that comes through public announcements instantly and accurately in CSE (Dharmarathna, 2020) (Dissa Bandara & Perera, 2010). Although there is literature on corporate announcements and shareholders' reactions, there are no studies on the equity holders' response to the information of COVID-19 impact of CSE-listed companies in Sri Lanka. The literature on the studying field confirms that the effects of the COVID-19 pandemic are much critical. In the opposite view, policymakers have to change their policies according to the current scenario. Also, investors and management of listed companies need credible information to make prudent decisions. Therefore, this study is critical in decision-making regarding all the gaps, including the research and knowledge gaps.

3. Methodology

This study analyzes the equity holders' responses to the disclosure announcement relating to the impact of the COVID-19 pandemic of the companies listed on the CSE by using event study mythology. Then to enhance the information credibility especially incorporate the time series modeling approach. The COVID-19 disclosures about 214 out of 211 listed companies during this pandemic period are considered. The primary source of data for this analysis is the secondary data gathered from CSE publications. Further, granted moratorium to

client's impact is assumed to be away from the disclosures of the effects of the health crisis.

Regarding predetermined criteria, only 63 companies were purposively selected. The main criteria used are no other announcements in the considered event window of 29 days. The event windows with other specific events have been ignored in the sample. Then, the company should be traded continuously, and untraded companies are removed all the window days. Event impact is assumed to be 29 days and with the event day another 28 days after the event considered under this study. The fundamental reason behind the selection of the event window is the peculiar behavior of the equity investors.

Similarly, the pandemic is still silently continuing, and to avoid the impacts from another events event window is limited. So that event window is consisting of 29 days, including a 28-day post-event window. This post-event window shows the delayed reactions of the equity holders. In recent studies on the field, Dharmarathna and Amarasekara (2016) and Dharmarathna (2020) used 120 days before the estimate window. There is no hard and fast rule in the definition of the estimation window. As the CSE was closed during the first stage of the pandemic period, pre-event window determination is bias, and accurate findings cannot be expected through those bias calculations. The estimation window 120 days before the event was considered in this study to develop return generating models.

a. Models Developed

1. The model used to calculate Actual Returns

$$R_{i,t} = LN\left(\frac{p_t}{p_{t-1}}\right) \quad \textbf{(1)}$$

Where, $R_{i,t}$ is the rate of return of firm i on day t, *LN* is the Natural Logarithm, $p_t$is the Closing price on the current trading date and p_{t-1} is the Closing price on the previous trading date.

2. Models are used to calculate Expected Returns

Market Model

$$R_{i,t} + \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad \textbf{(2)}$$

Where $R_{i,t}$ is the rate of return of security on day *t*, $R_{m,t}$ is the rate of return on the market portfolio of stocks on day *t*, α_i is alpha, β_i is systematic risk and, $\varepsilon_{i,t}$ is the regression error term of the model.

Volatility Time Series Models

- Developing Autoregressive (A.R.) Model

$$Y_t = \emptyset_0 + \emptyset_1 Y_{t-1} + \emptyset_2 Y_{t-2} + \cdots + \emptyset_r Y_{t-r} + \varepsilon_t \quad \textbf{(3)}$$

Where, Y_t = the expected returns for the period *t*, Φ_i = the autoregressive coefficients, and ε_t is residual in the forecasting equation.

- Developing Moving Average (M.A.) Model

$$Y_t = \theta_1 + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \theta_2 \varepsilon_{t-2} - \cdots - \theta_s \varepsilon_{t-s} \quad \textbf{(4)}$$

Where, Y_t = the expected returns for the period *t*, θ_i = the moving average coefficients, and ε_t is residual in the forecasting equation.

- Developing Mixed ARMA Model

$$Y_t = \varepsilon_t + \sum_{i=1}^{r} \emptyset_i \, Y_{t-r} - \sum_{j=1}^{s} \theta_j \varepsilon_{t-s} \quad \textbf{(4)}$$

- GARCH (p, q) Model (Bollerslev, 1986)

$$\sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \, \varepsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \, \sigma_{t-i}^2 \quad \textbf{(5)}$$

- Exponential GARCH (EGARCH) Model (Nelson, 1991)

$$\log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \log\left(\sigma_{t-j}^2\right) + \sum_{t=1}^{p} \alpha_i \left|\frac{\varepsilon_{t-i}}{\sigma_{t-i}}\right| + \sum_{k=1}^{n} Y_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}} \quad \textbf{(6)}$$

- Threshold GARCH (TGARCH) Model (Zakoian,1994; Glosten *et al*., 1993; Engle and Ng, 1993)

$$(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \, \sigma_{t-j}^2 + \sum_{i=1}^{p} \alpha_i \, \varepsilon_{t-i}^2 + \sum_{k=1}^{n} Y_k \, \varepsilon_{t-k}^2 d_{t-k} \quad \textbf{(7)}$$

3. Calculation of Abnormal Returns

$$AR_t = R_t - Y_t \quad \textbf{(8)}$$

Where; AR_t is the Abnormal Return at time *t*, R_t is the Actual Returns at time *t*, and Y_t is the Normal Returns at time *t*.

4. Calculation of Average Abnormal Returns (AARs)

$$ARR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad \textbf{(9)}$$

Where; AAR_t is the Average Abnormal Return for day *t* and *N* is the number of events in the sample.

5. Calculation of Cumulative Average Abnormal Returns (CAARs)

$$CARR_p = \sum_{t=1}^{P} AAR_t \quad \textbf{(10)}$$

Where; $CAAR_p$ is the Cumulative *AAR* for day *t* and *N* is the number of events in the sample.

b. Testing Significance

With the assumption that daily returns are identically and normally distributed, abnormal returns are calculated. The test used in the significance testing is the t-test. If the computed t-stat is higher than the critical t values, reject the null hypothesis. The null hypothesis is that announcements of COVID-19 disclosures have a systematic effect on the equity prices on the event day.

Significance Testing (Parametric) for AAR

$$T(AAR) = \frac{AAR_t}{SE(AAR_t)} \quad \textbf{(11)}$$

Where; AAR_{it} = Average AR for Company *i* for a day of the event window, *S.E.* (AAR_{it}) is the Standard Error of *AAR* of a company *i* during the estimated period.

Significance Testing (Parametric) for CAAR

$$T(CAAR) = \frac{CAAR_t}{SE(CAAR_{it})} \quad \textbf{(12)}$$

Where; *CAAR* is the Cumulative *AAR* for Company *i* for the selected event window, *SE* ($CAAR_{it}$) is the Standard Error of Cumulative Average Abnormal Returns of a company *i* during the estimated period.

c. Measuring Market Responses

The main objective of this study is to investigate the equity holders' response to the announcement of COVID-19 impact. Moreover, in data representation, two methods are used. Firstly, the table containing data of the 29-day event window provides daily AAR and CAAR. Then, the graphical representation of data gives a more precise idea. Through the graph, anticipated changes can be identified easily as delayed reactions and instantaneous reactions separately. In addition, the chart shows the behavior of AAR and CAAR following the announcement. If CAAR is decreasing, it represents the negative response of equity prices. As same, increments show the positive reactions of equity holders. In contrast, continuous decreases and increases in the AAR and CAAR prove that there are delayed responses during the pandemic in the stock market.

4. Analysis and Interpretation

Table 4: Summary of Market Models

No.	Firm ID	R^2	Model	No.	Firm ID	R^2	Model
1	AAIC	0.40	GARCH $_{(1,1)}$	33	CIND	0.38	SRG
2	PINS	0.12	SRG	34	AHUN	0.31	ARCH $_{(1,1)}$
3	HASU	0.21	SRG	35	LWL	0.31	SRG
4	JINS1	0.42	SRG	36	LHCL	0.22	TARCH $_{(1,1)}$
5	PLC	0.35	GARCH $_{(1,1)}$	37	DIPD	0.12	SRG
6	LFIN	0.45	SRG	38	BFL	0.19	SRG
7	LOFC	0.32	ARCH $_{(1,1)}$	39	DIST	0.49	SRG
8	BFN	0.41	ARCH $_{(1,1)}$	40	RAL	0.17	ARCH $_{(1,1)}$
9	SAMP	0.61	SRG	41	LGL	0.48	ARCH $_{(1,1)}$
10	COMB	0.58	SRG	42	NHL	0.06	SRG
11	DFCC	0.64	SRG	43	TAFL	0.21	SRG
12	HNB	0.68	SRG	44	GRAN	0.22	SRG
13	PABC	0.62	SRG	45	AEL	0.51	ARCH $_{(1,1)}$
14	SEYB	0.26	SRG	46	HEXP	0.22	TARCH $_{(1,1)}$
15	SDB	0.26	GARCH $_{(1,1)}$	47	GHLL	0.19	SRG
16	UBC	0.42	GARCH $_{(1,1)}$	48	ACL	0.38	TARCH $_{(1,1)}$
17	HHL	0.21	SRG	49	BERU	0.01	TARCH $_{(2,2)}$
18	SPEN	0.52	SRG	50	RCL	0.66	SRG
19	SIRA1	0.37	SRG	51	CFVF	0.23	E-GARCH $_{(1,1)}$
20	SLTL	0.40	SRG	52	ALUF	0.49	SRG

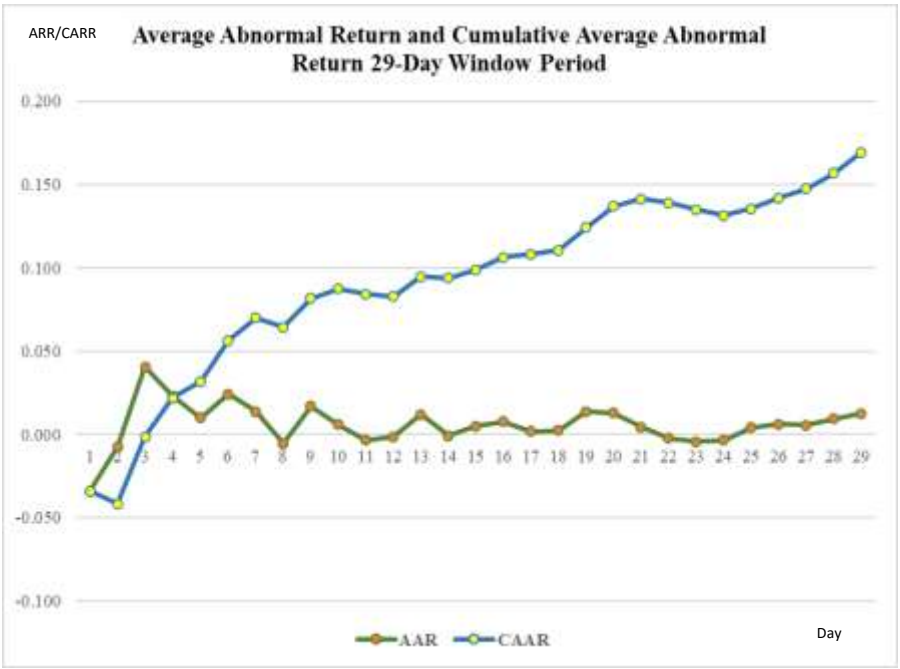
21	JKH	0.68	SRG	53	CFLB	0.25	SRG
22	CSD	0.26	SRG	54	ABNS	0.21	SRG
23	EXPO	0.43	SRG	55	LDEV	0.46	SRG
24	BPPL	0.32	GARCH $_{(1,1)}$	56	MHDL	0.05	GARCH $_{(1,1)}$
25	TJL	0.61	ARCH $_{(1,1)}$	57	REEF	0.42	ARCH $_{(1,1)}$
26	GREG	0.60	SRG	58	CITH	0.35	E-GARCH $_{(1,1)}$
27	TKYO	0.65	SRG	59	ABAN	0.22	SRG
28	DPL	0.54	ARCH $_{(1,1)}$	60	HVA	0.48	ARCH $_{(1,1)}$
29	MGT	0.50	SRG	61	BIL	0.32	SRG
30	MELS	0.40	SRG	62	SIRA2	0.44	SRG
31	DIAL	0.53	SRG	63	BRWN	0.34	SRG
32	ELPL	0.15	E-GARCH $_{(1,1)}$				

Data Source: Results of the analysis

The Daily ARR and CARR of CSE with the announcement of the COVID-19 impact are analyzed and reported in this section. This study was conducted after doing a preliminary study. Then the analysis is done through an event study where the both Market Model and the Time Series Models were employed. The market model is generally accepted for this research area, where new announcements' stock market impact is analyzed through the event study methodology. However, it is deficient when considering the accuracy of the models developed through the market model approach. Out of the selected 63 listed companies in the sample, no company has not complied with R^2 equal to or greater than 50%. It means the market model describes only a lower portion of variations in the stock market returns due to COVID-19 disclosures of the listed companies. Generally, strong models have a higher $R^{2,}$ and they are used in forecasting due to the higher degree of accuracy and explanatory power. In addition, considering the ARCH effects, 23 company data series have volatility effects then the most appropriate model for those types of data series is the time series models. And also, Dharmarathna and Peiris (2017) examined the market model validity in investigating the impact of dividend announcements. They proved that the underlying assumptions of the market model reduce the applicability of the particular model to emerging economies like Sri Lanka.

Further, there is a substantial difference between the developed markets and the Sri Lankan stock market as a developing market (Dissa Bandara & Perera, 2010). Due to the lower explanatory power of the market model and the cluster volatility effects, it is better to use the time series modeling approach in this study. This analysis's time series models are AR, MA, ARMA, GARCH, TARCH, and EGARCH. Through those time series models, abnormal returns for the listed companies were calculated. T-stat is used in testing significance, and then the average abnormal return and cumulative average abnormal return are graphed as the final output and represented graphically.

Figure 1: AAR and CARR within 29-Day Window Period



Data Source: Results of the analysis

Figure 2 contains the graphical representation of the output of the analysis. As the study focuses on the event windows where there are no other event impacts, findings can be used to determine the pure effect of the announcements on the stock market returns. In addition, AAR and CARR on the event day are -0.0341. That shows a negative

response of equity holders towards the COVID-19 disclosures, and as the t-stat value above two, this is a significant abnormality. As same, the on-time reaction of equity holders confirms the semi-strong form market hypothesis. However, the following day also has negative abnormal returns, but that is not significant. As the figure represents, the 3rd day is the starting day that shows positive returns and ensures the short-term impact. In a similar view, throughout subsequent weeks, equity holders could earn substantial and positive abnormal returns. Although the 7^{th}, 9^{th}, 10^{th}, 11^{th}, 12^{th} days of the event window do not show any significant abnormal returns 8^{th} day, there are substantial positive abnormal returns. That ensures the delayed reactions also exit in CSE. Again, similar to the previous days, on the 13th day, investors could earn positive abnormal returns as the AAR is significant. On the contrary, 22^{nd}, 23^{rd}, and 24^{th} days show negative AAR, but those are insignificant. In addition, the last four days of the event window have significant positive AAR, and that confirms until the end of the event window impact of the COVID-19 announcement is substantial, and it is continued.

Similarly, there are both positive and negative abnormal returns in the middle and later parts of the event window. However, out of those days, there are significant positive abnormal returns but no significant negative ARR. In conclusion, only significant negative abnormal returns can be seen on the event day, and out of 29 days, 13 days have substantial abnormal returns. Thus, according to the output graphed in Figure 1 under CAAR, there is a continuous increase in CARR over the period. Mainly, equity investors are earning abnormal returns, although a health shock exists in the business environment. Hence it shows that equity holders are reacting with the expectation of having higher benefits in the future. Thus, the positive relationship between the risk and return is also confirmed by these findings. In addition, they have quickly back to normal and respond positively after the event day.

Table 5: Sectorial Average Abnormal Returns within 29-Day Window Period

No.	Sector	Average Return	Abnormal
1	Automobiles & Components	-	-
2	Banks	-0.075	-7.50%
3	Capital Goods	-0.011	-1.10%
4	Commercial & Professional Services	-	-
5	Consumer Durables & Apparel	-0.026	-2.60%
6	Consumer Services	-0.042	-4.20%
7	Diversified Financials	-0.048	-4.80%
8	Energy	-	-
9	Food & Staples Retailing	-	-
10	Food, Beverage & Tobacco	-0.014	-1.30%
11	Health Care Equipment & Services	0.044	4.40%
12	Household & Personal Products	-0.147	-14.70%
13	Insurance	-0.092	-9.20%
14	Materials	-0.018	-1.80%
15	Pharmaceuticals, Biotechnology & Life Sciences	-	-
16	Real Estate	-0.051	-5.10%
17	Retailing	-	-
18	Telecommunication Services	-0.005	-0.50%
19	Transportation	-	-
20	Utilities	0.041	4.10%

Data Source: Results of the analysis

According to Table 6, the sectorial difference of the abnormal returns due to the COVID-19 announcements are listed. The Household and Personal Products sector was the only sector that records an average abnormal return greater than 10%, and it is about 14.7% negative average abnormal return. Their announcement contains information that the business operations were impacted negatively due to pandemics, and future impact cannot be estimated. However, they have

adopted the regulations and guidelines imposed by the regulators. On the other hand, Health Care Equipment and Services sector and utilities are the sectors that showed positive average abnormal returns throughout the 29-day event window out of the 20 sectors in CSE. The significance behind the reaction is the companies listed under the Health Care Equipment and Services sector have announced that they have dropped in the revenue in the initial stage. Still, after announcing these services as essential services, the impact was reducing step by step. Then the investors have taken that information positively since the COVID-19 pandemic is a health crisis. This sector is the most significant in managing this crisis over the other sectors. Similarly, utility sector companies announced substantial cost reductions on the business operations due to the pandemic, and it hints at the significant increments in the revenue. At the same time, the equity holders of the particular sector earned abnormal returns using this published information.

However, sectors related to commercial services industries, including banks, insurance, diversified financials, and other sectors such as capital goods, consumer durables and apparel, consumer services, food, beverage and tobacco, real estate, and telecommunication services, showed abnormal returns. As an overall view of the disclosed information of those companies, their operations were negatively impacted, and sales channels were disrupted, especially in service industries. Although the banks have considered a significant part of the solution to the pandemic, equity holders in this sector also earned negative abnormal returns. Lankem Development PLC announced no considerable impact on their business and immediately complied with the guidelines in the opposite view. Their announcement on no substantial effect; there were no abnormal returns on the event day. In addition, Pan Asia Banking Corporation PLC showed the highest negative abnormal return on the event day. They mentioned that cash inflows of the bank were significantly impacted in the short term, and borrowers' willingness to repay was also reduced.

Similarly, the announcement has made in the time after the recording of the first COVID-19 death in Sri Lanka and the breakout of Welisara Naval Cluster; the event day impact might be higher and negative. In

contrast, from the day onwards, equity holders of the particular company earned positive abnormal returns. As the listed companies revealed through their disclosures again, investors also took this as a short-term impact. They rated it positively as an overall response by adjusting to the normal condition within several trading days. Similarly, companies announced that this is taken as a short-term phenomenon and planned to recover quicker. Aligning with the imposed trade restrictions also domestic exporting companies have a competitive advantage over the other listed companies. These critical facts ensure a significant difference among the twenty different sectors in the CSE in Sri Lanka.

5. Conclusion

This study analyzes the equity holders' responses at announcing the impact of the COVID-19 pandemic of the listed companies on the CSE by using event study mythology. Market model and time series modeling approaches are used to have credible information for decision-making processes. Due to the lower explanatory power of the market model and the existence of volatility effects in the models, time series models are employed and used in the analysis and interpretations. There are 64 companies in the sample out of 214 companies that have made COVID-19 disclosures with the request of the CSE. As the R^2 of the market models is lower, and it is about 36.97%, time series modeling approaches have been used to interpret and discuss the outputs. Time series models including AR, MA, ARMA, GARCH, TARCH, and EGARCH are used concerning the stylized facts of each listed company's returns within the sample in generating abnormal returns within a 29-day window.

Findings show that equity holders earn a 3.41% negative abnormal return on the event day, and it is statically significant at a 5% level due to the P-value is less than 0.0000. That ensures the equity holders have negatively reacted to the COVID-19 disclosures on the event day. An on-time reaction can be seen in an efficient market where the information impact reflection is fast and on time. In contrast, there is a significant positive response 3rd day onwards in the event window. It evidences that equity holders believe that the pandemic will gain more benefits in the future for the Sri Lankan economy. In addition, there

are sectorial differences towards the announcement of the COVID-19 impact on listed companies. Apart from that, the results show that there is a delayed reaction of equity investors. That implies the market is inconsistent with the semi-strong form efficient market hypothesis. These findings will be necessary to all the parties interested in the stock market, including investors, management of the specific companies, and the stock exchange regulatory agencies in decision-making processes regarding unprecedented externalities in the macro-environment. As the overall impact is substantial and equity investors reacted positively, the high risks associated with the investments are the risk-seeking investors' preference to earn higher returns. Thus, issuance parties of the equities can figure out the risk appetite of the equity investors since this pandemic is an enormous health shock that disrupts the whole global economy after the global financial crisis in 2007 and 2008.

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Effect of the COVID-19 Pandemic on Stock Market Returns: A Case Study of the Colombo Stock Exchange

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Abstract

This study analyses the effect of the COVID-19 pandemic on the stock market returns in Colombo Stock Exchange (CSE) in Sri Lanka. The period concerned here runs from the first COVID-19 wave in Sri Lanka from 27th January 2020 to 24th May 2021. The daily new cases and the daily deaths are used as the proxies of the COVID-19 pandemic. The All-Share Price Index (ASPI) is used in determining stock market returns. The analysis was conducted as a two-stage analysis. In the first stage, the E-GARCH volatility regression model was developed. An in-depth analysis was performed as an event study in the second stage analysis. In defining the estimation window, 238 trading days were taken into account to enhance the credibility of forecasted returns. The event windows contain 16 trading days, including the event day. The findings of volatility regression model confirm daily new cases and daily deaths were negatively significant with the stock market returns. Furthermore, the event study assured that abnormal returns were fueled by the impact of the pandemic in CSE. Similarly, within the event windows, frequently delayed reactions can be seen. In addition, fluctuations in abnormal returns in the event windows often confirm that investors in CSE think that pandemic will impact more benefits in the future. Generally, abnormalities in the event windows have adjusted back instantly. With the severity of the impact of the pandemic, abnormal returns showed an irregular pattern. In conclusion, these findings will be much worthier to all the stock market interested parties, including investors and policymakers, to make prudent decisions regarding their investments and policy changes.

Keywords: *Stock Market Return, COVID-19 Pandemic, Volatility Regression, Event Study.*

1. Introduction

The world is experiencing an unanticipated health shock as Coronavirus Disease of 2019 (COVID-19) spread worldwide from the later part of 2019 up to now. With the reporting of the first case of COVID-19 in China's Wuhan in December 2019, a massive number of infected people and deaths are repeated daily. Regarding the scenario, the World Health Organization's (WHO) first global alert was made at the end of January 2020 and then announced COVID-19 as a worldwide pandemic on 11th March 2020. On the same day, the first local COVID-19 case was reported in Sri Lanka.

After the 2007–2009 Global financial crises, the COVID-19 pandemic severely affected the global economy and the day-to-day lives of all human beings. These types of Black swan events usually make demotivation in investors and other interested parties in the stock market. As the stock market return of a particular country is one of the significant indicators of the performance of an economy, including stability and development, there is a real need to investigate the impact of COVI-19 on stock market returns. Although the first infected person reported in Sri Lanka was on 27th January 2020, until the declaration of COVID-19 as a global pandemic in March by the WHO, the usual trading of the stock market was going on, but as an immediate response to the announcement Colombo Stock Exchange (CSE) was closed over April.

This newly popped-up pandemic has affected the economies of the individual countries and the world economy critically. As a result of newly imposed health-related rules and regulations such as social distancing and remote working, many economic activities have been paralyzed. Moreover, there were often lockdowns and curfews in many countries. As a result, stock markets also were closed; no more buying and selling interactions were there. In Sri Lanka, CSE closed until 11th May 2020 after the WHO declaration of COVID-19 as a global pandemic in March. It confirms that the regulatory authorities have taken this as a critical event, and there was a fear of being adversely affected.

With the emergence of the movement of COVID-19 adverse impact on the economy, breadth and depth investigation has to be carried on unless the recovering of an economy might be more complicated than ever before. As per the information published by the WHO, Sri Lanka is in a very critical stage due to the reporting of new cases and deaths at an increasing speed compared to the other countries affected. Furthermore, different sectors in the stock market out of the 20 sectors are affected by the pandemic in differing levels according to the readiness to face such unprecedented events in the macroeconomic environment. Moreover, there is a vital need to research the economic effects and impact on stock market returns. Although COVID-19 is a health crisis, its impact on the economy cannot be considered second to a financial crisis. The gradual increase of new cases and the deaths of COVID-19 is silently continuing its impact on the stock market returns is critical. This analysis provides an overview of the impact of the pandemic from 27th January 2020 to 24th May 2021. This paper contributes to the literature, policymakers, and investors in making up-to-date regulatory changes and the prudent decision-making processes in a highly pressured environment with an external shock.

2. Literature Review

Although Covid-19 is the latest unanticipated macroeconomic environmental change, most researchers have focused on investigating its impact. According to the dynamic changes in the financial markets with response to the pandemic, there are considerable losses in the global economy like the economies of infected countries. The findings of a research on "Death and Contagious Infectious Diseases: Impact of the COVID-19 Virus on Stock Market Return" by Abdullah et al. (2020) for the Chinese context revealed that COVID-19 impact was very significant in terms of stock market returns. The daily growth rate of the total COVID-19 confirmed cases and new deaths had shown a great degree of negative impact on stock market returns (Abdullah, Khaled, Ahmad, & Salah, 2020).

An investigation was conducted covering major stock market indices of the Gulf Cooperation Council (GCC) countries through two months from April to June. It is found that returns of the GCC countries' stock markets showed a significant negative relationship with the number of

new and accumulated COVID-19 confirmed deaths in those particular countries (Raéf & Assaf, 2020). Moreover, spillovers and the direct effects of this global pandemic in stock markets of economies as China, Germany, South Korea, France, Spain, Italy, Japan, and the United States of America showed a short-term impact on stock market returns. Also, the effect is negative and significant (Qing, Junyi, Sizhu, & Jishuang, 2020).

In contrast, through the findings of another study on the same field of study, it is revealed that the number of confirmed deaths showed an insignificant relationship with the stock market returns. In comparison, new confirmed cases are reporting showing a severe significant relationship (Tek, Impact of COVID-19 PandemicC on Stock Market Returns, 2020). As with the research findings in Africa, COVID-19 has imposed a restricted performance of stock markets. Due to that reason, there are no chances of having an optimistic expectation relevant to the stock market returns there (Paul & Isaac, 2020).

When considering the stock market returns affected by the COVID-19 pandemic in advanced and emerged economies, it has fueled the market inefficiency while making speculators more profitable. Moreover, a significant level of wealth inequalities has been created, and most market participants are suffering from liquidity shortages. However, there are participants with plenty of idle funds in the U.S. market (Hui, Hong, Zhicun, & Chien-Chiang, 2021). All these referred literature on the field of study witnessed that the impact of COVID-19 was much critical, and it had been significantly impacting the financial markets, including stock markets globally. This study on the effects of COVID-19 on stock market returns contributes to the rapidly enhancing literature repository of the impact of COVID-19 on stock markets while associating the policymakers and investors in their decision-making processes.

3. Methodology

This study employed a two-stage investigative approach when analyzing the effect of the COVID-19 pandemic on stock returns in CSE. The first stage comprises a volatility regression, and the second stage employs event study methodology to give an in-depth analysis

regarding the COVID-19 impact. Daily All Share Prices Index (ASPI) values were obtained to calculate the market returns, while COVID-19 data were gathered from the WHO from 27th January 2020 to 24th May 2021.

3.1. Modeling the Volatility Regression

Daily stock market returns were calculated using the following equation.

$$R_t = \left(\frac{p_t - p_{t-1}}{p_{t-1}}\right) \quad \textbf{(1)}$$

Where, R_t is the rate of return on day *t;* p_t is the closing price on day *t* (current trading date); and $p_{t-1}$is the closing price on day *t-1* (previous trading date).

It is important to note that econometric modeling is always starting with testing the unit root to know the stationarity of the data. The widely used unit root test, the Augmented Dickey-Fuller test, was applied in this study. As the mean model of this volatility regression, the following Autoregressive Moving Average (ARMA) model was considered.

$$Y_t = \emptyset_1 Y_{t-1} + \emptyset_2 Y_{t-2} + \cdots + \emptyset_r Y_{t-r} + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \theta_2 \varepsilon_{t-2} - \cdots - \theta_s \varepsilon_{t-s} \quad \textbf{(2)}$$

Where; Y_t is the expected returns for the period *t*, ϕ_i represents the auto regressive coefficients, and θ_j is the moving average coefficients.

In developing the mean model, we considered several lag values of A.R. and M.A. components. The best-fitted model was then selected through values obtained for Akaike Info Criterion (AIC) and Schwarz Criterion (SIC). Afterward, the ARCH-LM test was used in testing the heteroscedasticity of the residuals in the developed mean model. The null hypothesis stands for unavailability of ARCH up to order one in the residuals. In contrast, the alternative hypothesis represents that there is ARCH up to order 1 in the residuals. The p-values of the test statistics at a 95% confidence level were considered when selecting the hypothesizes. The above model was augmented with Generalized Auto

Regressive Conditional Heteroskedasticity (GARCH) models with significant ARCH effects.

The specifications of the E-GARCH regression model considered in this study are given in the following equation.

$$\log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \log\left(\sigma_{t-j}^2\right) + \sum_{t=1}^{p} \alpha_i \left|\frac{\varepsilon_{t-i}}{\sigma_{t-i}}\right| + \sum_{k=1}^{n} Y_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}} + \theta_1 DNC + \emptyset_1 DD \qquad \textbf{(3)}$$

Where; θ_1 and $\emptyset_1$ represent the coefficients of DNC and DD DNC stands for Daily New Cases of COVID-19, and D.D. represents Daily Deaths of COVID-19.

ARCH-LM test was used in testing further heteroscedasticity of the residuals in the developed model. With the absence of other ARCH effects, the model is considered for the interpretations.

3.2. Application of Event Study Methodology

The event study is the second stage of analysis. Here the event-by-event impact of COVID-19 was analyzed. Two-time windows were defined as Estimation-Window and Event-Window. Following Peiris (2011), Estimation-Window was used to develop a Timeseries model to forecast stock returns for the Event-Window. Event impact was assumed to extend up to 16 trading days, including the event day; thus, the Event-Window consists of only 16 observations. There is no well-established rule in defining the period of Estimation-Window. Therefore, following Peiris (2012), the Estimation-Window was restricted to 240 trading days. The significant COVID-related events that occurred during the initial pandemic have been included in the study to continue the investigation on the impact of the COVID-19 on the stock market returns. Eight specific events related to the COVID-19 pandemic were identified under this study which is as follows;

Table 1: Specific Events Related to COVID-19 Pandemic

No.	Date	Event
1	27.01.2020	The first wave started with the first COVOD-19 case
2	28.03.2020	First COVID-19 death
3	23.04.2020	Break out of Welisara Cluster
4	07.07.2020	Break out of the Kandakadu Cluster
5	04.10.2020	The second wave started with the Minuwangoda and Divulapitiya Cluster breakout
6	21.10.2020	Peliyagoda Fish Market Cluster
7	27.11.2020	Passing 100 deaths as total deaths
8	07.03.2021	Passing 500 deaths as total deaths

Data source: Author created

The actual returns were then compared with the confidence levels of the forecasted returns to investigate the abnormal behavior of stock returns, if any. When the actual market returns cross the confidence levels, it identifies as an abnormal return fueled by the pandemic.

4. Discussion of the Findings

This section consists of the results and interpretation of the analysis. Usage of the two-stage data analysis approach is one of the significances of this study and first stage analysis conducted to develop a volatility regression model. The second stage gives an in-depth analysis through an event study. When creating the volatility regression model, the stationarity of the data was tested as the first step. Table 2 provides the results obtained in this regard by using the Augmented Dickey-Fuller test.

Table 2: Unit Root Test of Data Series

Augmented Dickey-Fuller Test Null Hypothesis: Data Series has a unit root		
Data Series	**T-Statistic**	**Probability Value**
MR*	-16.9644	0.0000
DD(NC)**	-15.30288	0.0000
DD(DD)**	-10.99402	0.0000

Note: * implies that the data set is stationary at level series and ** represents that the data set is stationary at the second difference.

Source: Output of the analysis

Reported results in Table 2 show that the market returns are stationary at the level. However, daily new cases and daily deaths were stationary at the second difference. Therefore, the level series of stock returns and the second difference series of the regressors were used for further modeling.

4.1. Volatility Regression Results

A volatility regression model has first developed to analyze the effect of daily new cases and daily deaths on the volatility of market returns. E-GARCH volatility regression model was found as the best-fitted model in this regard. Table 3 depicts the results for the fitted regression model.

Table 3: E-GARCH Volatility Regression Model

Variable	Coefficient	Std. Error	z-Statistic	P-value
AR (1)	0.04119*	0.01687	2.44131	0.0146
AR (2)	-0.08034*	0.02947	-2.72638	0.0064
ω	-14.12078	0.16271	-86.78471	0.0000
β	0.009212	0.029826	0.308852	0.7574
α	-0.083323	0.012194	-6.832862	0.0000

γ	-0.876952	0.021592	-40.61481	0.0000
DD(NC)	-0.00779*	0.00035	-21.99834	0.0000
DD(DD)	-0.05409*	0.01036	-5.21906	0.0000

Note: * implies that the coefficient is significant at 0.05 percent probability level.

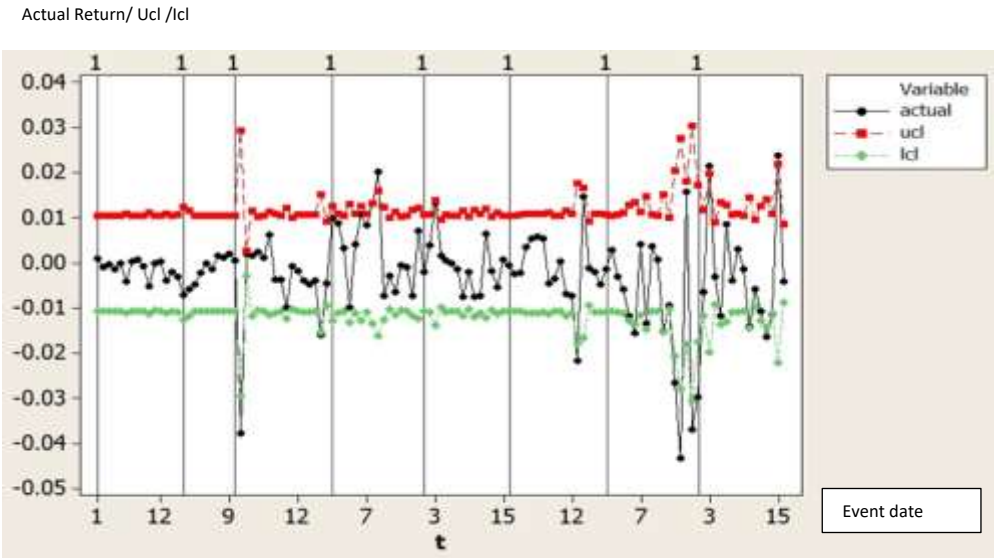
Source: Output of the analysis

All the variables were significant in the E-GARCH volatility regression model (p-values<0.05) at a 95% confidence level. The coefficients of the daily new cases and daily deaths were negative (-0.00779 and -0.054089, respectively) and statistically significant in the developed model at a 5% significance level. These negatively significant coefficients for both the volatility regressors indicate that the prevailing COVID-19 pandemic negatively influences the volatility of stock returns in CSE. Meanwhile, the γ coefficient depicts a negatively significant coefficient in the model, showing that the stock market volatility is negatively related to the stock returns. Further, it indicates that a negative return shock to the CSE creates higher volatility than a positive return shock during this period. Thus, the stock market volatility in this period is significantly asymmetric. Significantly asymmetric volatilities in stock returns would lead to significant abnormal returns. Therefore, this study further extended to investigate the response of stock returns to several COVID-related adverse return shocks.

4.2. Response of Stock Returns to COVID Shocks

An event study approach was employed to investigate the effect of COVID shocks. As mentioned previously, eight adverse shocks were considered under this extended analysis. The behavior of stock returns is depicted in Figure 1. It has been divided into eight panels to represent each event and the starting point of each of the panels labeled as t = 1, which means the event date.

Figure 3: Behavior of Stock Returns over the Event-Windows



Data source: Author created

Where,

Actual = Actual Return

ucl = Upper Confidence Level

lcl = Lower Confidence Level

According to the graphical output shown in Figure 1, there are no abnormal returns in the first event window that started with reporting the first COVID-19 case on 27th January 2020. No abnormal returns were observed even with the reporting of the first COVId-19 death, which is the second event reported on 28th March 2020. The re-opening of the stock market and breaking out of the first COVID-19 cluster were the significant events considered in the 3rd window. On the following day of the event, significantly negative abnormal returns were reported. However, the abnormality of the returns has not lasted for the rest of the days in the particular event window. Surprisingly, negative abnormal returns were not reported in the breakout of the next most significant two clusters, namely the Kandakadu and Divulapitiya clusters.

Nevertheless, following the Kandakadu cluster (fourth event), a positive abnormal return was reported on the 7th day after the circumstance on 14th July 2020. This may be due to the significant reduction in the said new cases after the Kandakadu cluster; that is, when compared to 300 cases reported on 10th July, only 19 further were declared on 14th July. Subsequently, the 6th panel concerned with the Peliyagoda Fish Market cluster depicts a significantly negative abnormal return on the 12th day after the event. This negatively significant abnormal return might have resulted either due to the delayed responses of the investors or due to the considerable increase in the daily reported new COVID-19 cases. On this event date, the total number of cases reported was only 5978, but within these 12 days, it increased up to 11,335 cases. Investors have earned negative returns throughout the event window when considering the passing of the first 100 deaths of COVID-19, and in the latter part, these returns show a significant abnormality. That is mainly due to the substantial increase in the number of deaths reported. This event is defined as passing the first 100 deaths; however, 150th COVID death has also been reported within the same window. The final event window, which captures the effect of reaching 500 deaths, depicts an irregular behavior of abnormal returns. This weird behavior might have resulted from the significant volatility of the stock prices during that period.

5. Conclusion

This study investigated the effect of the COVID-19 pandemic on the stock market returns in CSE in Sri Lanka. The investigation was conducted as a two-stage inquiry. The first stage E-GARCH volatility regression model was developed to investigate the effect of the COVID-19 pandemic on stock market volatility. An in-depth analysis was performed later as an event study in the second stage analysis. Overall findings confirmed daily new cases and daily deaths, which were taken as the proxies of the COVID-19 pandemic, were negatively significant with the stock market volatility in CSE.

Further, the result confirmed that the stock market volatility is negatively related to the returns during the period. Stock returns in CSE have shown similar behavior even in the post-war period (Peiris, 2012). Therefore, the effect of the COVID-19 pandemic on stock

returns in CSE is destructive. Several previous studies have also depicted similar results for other world counterparts (Abdullah et al. 2020; Qing et al. 2020). While further confirming the findings of previous studies, this study extended the investigation of individual COVID-related events. Herein, the event study approach also confirmed that the pandemic's impact on CSE fuels abnormal returns. In the first stage, during the year 2020, of the COVID-19 pandemic in Sri Lanka, abnormal returns have not continued much in the event windows. Often these abnormalities have adjusted back instantly. However, in the second phase, in early 2021, often fluctuations in the abnormal returns have been observed. There were continuous abnormal returns in the event windows, and most of the time, they depicted an irregular pattern indicating the severity of the effect. These findings will be much worthier to all the stock market interested parties, including investors and policymakers, to make prudent decisions regarding their investments and policy changes.

5.1. Future Research

The study focuses on the early stage of the COVID-19 pandemic impact on stock market returns in Sri Lanka, although it is silently continuing in differing degrees up to now. The number of new cases reported and the daily deaths recorded in Sri Lanka is rapidly growing with the breakout of the 3rd COVID-19 wave. Thus, future research on the field of study needed to focus on all this updated information. In addition, the overall view of the pandemic impact in stock market returns is significant, and ascertaining the impact in different sectors to investigate the sectorial impact in the economy is highly emphasized. Hence it magnifies the importance of conducting further researches on this area.

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Determinants of Solvency in the Insurance Sector: Evidence from Selected Insurance Companies in Sri Lanka

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Abstract

The financial system of any country plays a crucial role in economic development, and the insurance industry is a part of the financial system that ensures economic development. Hence, the solvency of insurance companies holds a significant proportion on it. This study investigates the determinants of solvency in the insurance sector in Sri Lanka by considering both firm-specific and macroeconomic factors. The study used a quantitative research approach and, 11 insurance companies licensed in Sri Lanka considered taken as the study sample. Data were collected from 2010 to 2019, and Two-Step System Generalized Methods of Moment (GMM) has been employed to investigate the determinants affecting the insurance sector's solvency in Sri Lanka. The results revealed that profitability and economic growth have a significant positive impact on the solvency of the insurance industry in Sri Lanka. In contrast, leverage shows a significant negative impact on the solvency of the insurance sector. Among them, economic growth has the highest impact on the solvency and leverage has the lowest impact on the solvency of the insurance companies of Sri Lanka. Further, firm size, premium growth, and inflation demonstrate an insignificant impact when determining the solvency of the insurance sector in Sri Lanka. The findings of this research are crucial for the regulatory authorities and policymakers to regulate and supervise the insurance companies efficiently

Keywords: *Capital Adequacy, Firm-Specific, Insurance Sector, Macro Economic, Solvency Margin,*

1. Introduction

The insurance sector plays a vital role in the financial system of economy. In Sri Lankan Context, the insurance sector contributes 3.4% (Rs.691 billion) to the total assets of the financial system (CBSL, 2019). The growth of gross written premium (GWP) and the sector's total assets grew by 8.4% and 11.6%, respectively (IRCSL, 2021). In comparison, the sector's profitability decreased by 21.7%, and claims increased by 10.3% during 2019 (CBSL, 2019). Twenty-eight insurance companies are operating in Sri Lanka, including 13 long-term insurance companies, 12 general insurance companies, and three composite insurance companies (CBSL, 2019). Moreover, the insurance sector of Sri Lanka is regulated and supervised under the Insurance Regulatory Commission of Sri Lanka (IRCSL).

The solvency of the insurance companies is essential since it plays a significant role in the financial system of any country. As a result, IRCSL has introduced solvency margin rules known as Risk-Based Capital (RBC) under the Regulation of Insurance Industry Act No. 43 of 2000 that can be used to ensure the financial soundness of the insurance industry (IRCSL, 2021). In addition, the increased competition among the insurance companies and the attempt of stakeholders to continue the business while avoiding risks and enhancing business opportunities have increased the need and importance of analyzing the solvency of the insurance sector (Jawad & Jawad, 2019).

Due to that, investigating the factors affecting the solvency of the insurance companies is very much important in several ways. It will be important for the regulatory authorities and policymakers to regulate and supervise the insurance industry by imposing relevant rules and monitoring whether the companies adhere to them properly. On the other hand, it will be beneficial for the insurance companies to mitigate their risks while adhering to the rules relating to solvency margins to protect their interest. Therefore, this research intends to investigate the factors affecting on the solvency of the insurance companies and examine the relationship between solvency and those determining factors.

Simply, the research problem of this empirical study can be identified as 'What are the determinants of solvency in the insurance sector of Sri Lanka?' On the contrary, there is an empirical gap to be fulfilled by conducting an empirical study since there is no research has been conducted in Sri Lanka or the South Asian context regarding this area. Hence, the main objective of this study is to fill that empirical gap while investigating the determinants of solvency in the insurance sector with reference to the Sri Lankan context by using both firm-specific (internal) and macro-economic (external) factors.

2. Literature Review

In both developed and developing countries, the insurance sector plays a significant role in financial systems. The insurance sector is formed of companies that provide risk management within a variety of insurance contracts. Hence, solvency can be identified as the heart of the operations of the insurance sector because it helps to prospect for insurance companies to contribute effectively to the financial system and the economy of a country (Thorburn, 2004). Generally, capital adequacy is referred to as an indicator of the solvency of financial institutions. In Sri Lanka, the regulation on solvency in the insurance industry is based on the RBC rules, IRCSL issues. Therefore, the capital adequacy ratio is used as the measurement criteria of solvency margin in the insurance companies operating in Sri Lanka. Accordingly, we used capital structure theories in order to develop our hypotheses in this current study.

The trade-off theory initiated by Modigliani and Miller (1958) is a significant theory that provides the most plausible explanation to the optional capital structure of companies including the insurance companies. It talks about choosing the optimal capital structure of a company with debt and equity capital due to its costs and benefits. This theory explains that there are costs associated with debt financings, such as agency costs and bankruptcy costs and benefits such as tax benefits (Adair & Adaskou, 2015). The pecking order theory of financing modified by Muyers and Majiluf (1984) is also one of the main theories which provide the most plausible explanation to the capital structure of business corporations. According to this theory, it

suggests that the cost of financing increases with asymmetric information. The financing comes from three sources: internal financing, external debt financing, and external equity financing, as opposed to the trade-off theory. Moreover, it revealed that the information asymmetries between managers and investors make external financing costlier than internal financing. Hence, the organizations may prefer internal and external debt financing rather than issuing new equity (Adair & Adaskou, 2015).

Only a few studies have been conducted on the empirical front to investigate the determinants of solvency in the insurance industry in several countries. Generally, the determining factors of solvency in the insurance sector can categorize into two parts: firm-specific and macro-economic. The firm-specific factors represent the factors related to the company's internal variables, while the macro-economic factors represent the overall macro-economy. Chen and Wong (2004), Shiu (2005) and Moreno, et al. (2018) have explored including both firm-specific and macroeconomic factors while Komen (2012) and Jawad and Jawad (2019) have used only the firm-specific factors to determine the factors affecting solvency in the insurance sector.

As a microeconomic factor, firm size can be one of the most critical factors that affect insurance companies' financial health. The firm size can be measured by the value of the total assets of the firm. Using panel data for 1986–1999, Shiu (2005) found that firm size is a statistically significant factor when determining the solvency of the life insurance market in the United Kingdom (UK). Another study (Moreno, Trujillo-Ponce, & Parrado-Martınez, 2018) investigated that actual solvency margin is inversely and significantly related to the company size in the insurance sector of Spain applying the System Generalized Method of Moments (GMM) estimator. Also, a study conducted relating to Asian economies revealed that one of the significant factors affecting general and life insurers' financial health of Asian economies is the firm size (Chen & Wong , 2004).

Consistent with the pecking order theory, profitability plays an essential role in determining the insurance sector's ability to enhance capital. According to Caporale, Cerrato, and Zhang (2017),

profitability is a significant firm-specific factor of the insolvency risks for general insurance companies in the UK. Furthermore, they revealed that higher profitable insurance companies are less likely to become insolvent because they can effectively manage expenses. A similar study conducted in Spain also investigated that actual solvency margins of insurance companies are positively correlated with profitability (Moreno, Trujillo-Ponce, & Parrado-Martınez, 2018). Moreover, it depicted that a firm's higher profitability leads to a lower probability of insolvencies, in turn, a higher probability of solvency. Hsiao and Whang (2009) also revealed that profitability has a positive and statistically significant impact on the solvency of the insurance industry in Taiwan.

Leverage is the amount of debt a financial company used to finance its assets. Chen and Wong (2004) found that insurance leverage is a significant factor when determining the solvency in the insurance industry of Asia. A similar study conducted in the UK investigated that leverage has a positive impact on the insolvency of insurance companies (Caporale, Cerrato, & Zhang, 2017). Furthermore, Jawad and Ayyash (2019) revealed that the leverage has a significant negative impact on the solvency of the insurance companies in Palestine.

Premium growth measures the rate of market penetration, which is considered a causal factor in the insolvency of the insurers (Komen, 2012). Moreover, the rapid growth of premiums is also considered a significant factor in the insolvency of insurance companies (Kim, Anderson, Amburgey, & Hickman, 1995). However, Chen and Wong (2004) have conducted another empirical study mainly focusing on the solvency of the insurance sector by using both firm-specific and macroeconomic factors. They revealed that the premium growth has an insignificant effect on the financial solvency of the insurance industry in Asia.

As a macroeconomic variable, economic growth means the steady increase in the production of goods and services over one period to another. An empirical study conducted for the insurance sector in Spain found that solvency margin is positively related to economic growth since it is challenging to raise capital in a rescission (Moreno,

Trujillo-Ponce, & Parrado-Martınez, 2018). Inflation is another macro-economic factor referred to as the decline of purchasing power of a currency of one country over time. Moreover, it can be identified as one of the macroeconomic factors important for assessing the solvency in the insurance sector in Sri Lanka. Unexpected inflation is deemed to affect solvency since the actual returns on assets are negatively reduced (Shiu, 2005). However, according to Chen and Wong (2014), unpredicted inflation has a statistically insignificant effect on the solvency of the insurance industry in Asia.

3. Methodology

The target population of the current study was all the insurance companies licensed to carry on insurance business in Sri Lanka at the end of 2019. There are 28 insurance companies licensed in Sri Lanka, consisting of 13 long-term insurance companies, 12 general insurance companies, and three composite insurance companies. Among them, 11 insurance companies were selected as the sample of this study based on the data availability for the period of 2010-2019. Moreover, those selected insurance companies represent long-term, general and composite insurance companies as well. To achieve the objectives of the study, we used annual data from secondary sources such as annual reports of the selected insurance companies, IRCSL, and the Central Bank of Sri Lanka (CBSL).

According to the Risk Based Capital (RBC) rules issued by IRCSL, the capital adequacy ratio is selected as the dependent variable to measure the solvency of the insurance companies in Sri Lanka. Accordingly, four firm-specific (internal) variables and two macro-economic (external) variables were identified as the independent variables of this study based on the earlier empirical studies. They are firm size, profitability, leverage, premium growth, economic growth, and inflation. The following table provides a clear explanation for all the factors included here.

Table 1: Variables Description

Variable	Abbreviation	Measurement Criteria
Capital Adequacy Ratio	CAR	Capital / Risk-weighted asset
Firm size	SIZE	Value of total asset
Profitability	PRO	Profits after tax / Total assets
Leverage	LEV	Total debt / Total equity
Premium Growth	PG	(The current year premium – Prior year premium) / Prior year premium
Economic Growth	EG	The growth rate of gross domestic production
Inflation	INF	Colombo consumer price index (Per annum)

Source: Author created

This study has a dynamic panel data model with a lagged dependent variable among the explanatory variables. Hence, we employ the GMM estimator as propounded by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998) to examine the relationship between the dependent variable and the independent variables of our study. It can produce unbiased results for the panel data. Furthermore, the GMM provides solutions to the problems of reverse causality and omitted variables. It treats the problem of endogeneity of the variables as well. Therefore, GMM estimators were used to investigating the determinants of solvency in the insurance sector with reference to the Sri Lankan context, and our basic model can be expressed as follows.

$$CAR_{it} = \alpha + \gamma\, CAR_{i,t-1} + \beta_1\, SIZE_{it} + \beta_2\, PRO_{it} + \beta_3\, LEV_{it} + \beta_4\, PG_{it} + \beta_5\, EG_{it} + \beta_6\, INF_{it} + \varepsilon_{it}$$

Where α represents the constant, γ represents the coefficient of lagged dependent variable, ε represents the error term, t represents the sample

period, i refers to the insurers, and β_1 to β_6 are representing the coefficients of explanatory factors.

4. Data Analysis and Results

Before going to the advanced modeling tools, looking at the descriptive statistics of the data is very important. Accordingly, the following table summarizes the dependent and independent variables for 11 insurance companies in Sri Lanka from 2010 to 2019 with 110 observations. The table shows the total number of observations, mean, standard deviation, minimum and maximum for the dependent variable and independent variables such as firm size, profitability, leverage, premium growth, economic growth, and inflation.

Table 2: The Descriptive Statistics

Variable	Obs.	Mean	SD	Min	Max
CAR	110	2.6009	2.0512	0.00	12.30
SIZE	110	22.4625	1.6890	19.25	26.30
PRO	110	0.1371	0.2036	-0.61	0.87
LEV	110	2.4555	1.6970	0.00	9.62
PG	110	0.2313	0.3532	-0.60	2.20
EG	110	0.0530	0.0211	0.03	0.09
INF	110	0.0520	0.0195	0.02	0.08

Source: Small Stata 12.0 Output

The mean value represents the average value of each variable. According to the above table, the mean value of the capital adequacy ratio is 2.600909. From the findings, the standard deviation of the capital adequacy ratio is 2.051157, and there is a higher variation within the data set and a low spread in data. Furthermore, the capital adequacy ratio has ranged between 0 and 12.3. The mean value and the standard deviation of the firm size of Sri Lankan insurance companies can be identified as 22.46245 and 1.688964, respectively. This

confirms a lower variation of firm size among the insurance companies during the study period.

Moreover, the minimum and maximum values are 19.25 and 26.3, respectively. That implies that firm size is ranged between 19.25 and 26.3. According to the above results, the mean value of the profitability is 0.1370909. Also, the standard deviation among insurance companies in terms of profitability is 0.2036112. Moreover, the profitability has been ranged between -0.61 and 0.87 respectively.

The mean value of the leverage is 2.454727, and the standard deviation is 10696986. When considering the premium growth, its mean value is 0.2312727 and ranges between -0.6 and 2.2. The average general economic growth is 0.053, with the minimum and maximum values of 0.03 and 0.09. The standard deviation of economic growth is 0.0210961, which confirms a lower economic variation in Sri Lanka during the study period. The average general inflation is 0.052, and the standard deviation of inflation is 0.0194795. Hence, this confirms a lower variation of inflation in Sri Lanka during the study period. The minimum and maximum values of inflation are 0.02 and 0.08, respectively. In other words, it has been ranged between 0.02 and 0.08.

Since there are two estimators of the GMM technique, such as the difference GMM estimator and system GMM estimator, a preliminary estimation has been conducted to choose the most suitable estimator for our model. For that, the fixed-effect model pooled OLS and difference GMM were estimated. The coefficient of the lagged dependent variable of the difference GMM (0.2524) was below the lagged dependent variable of the difference in the fixed effect model (0.5012). Therefore, it suggested that the difference GMM estimator is downward biased because of weak instrumentation, and the system GMM estimator should be used to analyze our model.

The following table shows the empirical results for the dependent (capital adequacy ratio) and selected independent variables (firm size, profitability, leverage, premium growth, economic growth, and inflation). We had a strongly balanced panel data set with ten-year interval data from 2010 to 2019. It has consisted of a lagged dependent

variable among the explanatory variables of our model in determining the factors that impact the insurance companies' solvency in Sri Lanka.

Table 3: The Results of Two-Step System GMM

Variable	Coefficient	Standard Error	P-Value
CARLI	0.3040	0.6867	0.000
SIZE	0.0085	0.0427	0.843
PRO	2.0578	1.0152	0.043
LEV	-0.3925	0.0913	0.000
PG	1.4280	1.1849	0.228
EG	31.5350	11.3524	0.005
INF	1.8719	4.0413	0.643

Source: Small Stata 12.0 Output

The above two-step system GMM results show that the lagged dependent variable of the capital adequacy ratio is highly significant because its p-value (0.000) is less than the usual significance level of 0.05. The coefficient of the lagged dependent variable is 0.3040. It indicates that the change of one unit in the insurance companies' capital adequacy ratio of the previous year has increased the insurance companies' capital adequacy ratio of the current year by 0.3040 units when all the other variables remain constant. Here, the high value of the coefficient of lagged dependent variable indicates the strong persistence of the solvency margin.

As a firm-specific factor, profitability is statistically significant because its p-value (0.043) is less than the significance level of 0.05. Also, the coefficient of the profitability is 2.0578. It implies that when the profitability increases by one unit while all the other variables remain constant, the capital adequacy ratio will also increase by 2.0578

units. That means there is a positive relationship between the profitability and the capital adequacy ratio of the insurance companies in Sri Lanka. The positive relationship found in this study between profitability and solvency has confirmed by many scholars in the earlier literature (Caporale, Cerrato, & Zhang, 2017) (Hsiao & Whang, 2009) and our results confirmed this for the Sri Lankan context as well. A Higher insurance company's' profitability lowers the tendency of the insurer to become insolvent since they manage their income and expenses well. This implies that regulators should be more concerned about the insurers who have negative figures as their profits since it can directly impact their solvency.

The leverage is another significant variable that determines the solvency of insurance companies in Sri Lanka as its p-value (0.000) is less than the significance level of 0.05. However, we found a negative relationship between the leverage and solvency of the insurance companies in Sri Lanka because the coefficient of leverage is -0.3925. It indicates that when the leverage increases from one unit while assuming all the other variables remain constant, the capital adequacy ratio will decrease by 0.3924849 units. This result is consistent with the findings of a lot earlier literature as well (Caporale, Cerrato, & Zhang, 2017) (Jawad & Jawad, 2019) (Chen & Wong , 2004). The reason is that the insurers tend to go for debt financing when they are unable to finance their funding needs from the equity capital, which reduces their capital adequacy.

According to the above results, economic growth is also a statistically significant determinant when determining solvency because its p-value (0.05) is less than the significance level of 0.05. Therefore, the coefficient of economic growth is 31.5351. It implies that when economic growth increases by one unit while assuming that all the other variables remain constant, the capital adequacy ratio of insurance companies will also increase by 31.5351 units. In other words, economic growth and solvency are deemed to have a significant positive relationship in the insurance companies of Sri Lanka. It is more likely to have a sufficient capital buffer with insurers in a favorable economic situation.

According to the above two-step system GMM results, firm size, premium growth, and inflation are not statistically significant determinants in this model. In other words, they are found to be statistically insignificant as their p-values are higher than the alpha value (0.05). Therefore, it implies that independent variables, firm size, premium growth, and inflation do not impact the insurance companies' solvency in Sri Lanka. Based on the derived results, the best-fitted model can be written as follows.

$$CAR_{it} = 0.3040\ CAR_{i,t-1} + 2.0578\ PRO_{it} - 0.3925\ LEV_{it} + 31.5351\ EG_{it} + \varepsilon_i$$

Table 4: The Results of Sargan Test

chi2(44)	4.055659
Prob > chi2	1.0000

Source: Small Stata 12.0 Output

The Sargan test has been used to check the overall validity of the instruments in our model. In other words, the Sargan statistic tests the null hypothesis of the correct model specification and valid over identified restrictions. Hence, the Sargan test of this study has been represented in the above table. Our result shows that the calculated p-value for the Sargan test (1.0000) is more significant than the significance level of 0.05 (5%). Therefore, it confirms that over-identifying restrictions are valid for this model, and the Sargan test's null hypothesis can be accepted. In other words, it indicates that our model has the overall validity of the instrumentation, and it evidences the un-biasness of the model.

Table 5: The Results of Abond Test

Order	Z	Prob > z
1	-1.3435	0.1791
2	0.23563	0.8137

Source: Small Stata 12.0 Output

The above table represents Arellano–Bond test results for first-order (AR1) and second-order (AR2) used to check the residual autocorrelation. According to Arellano and Bond (1991), it is supposed to be correlated to first order, but not to second order. The result shows that there is no first or second-order serial correlations in our model since the null hypothesis of no autocorrelation is accepted based on the fact that the calculated z-values are not statistically significant at 0.05 (5%) level ($z = 0.1791$; $p > 0.05$ and $z = 0.8137$; $p > 0.05$). That means the null hypothesis for the Arellano-Bond test for the first-order (AR1) and second-order (AR2) can be accepted here. There is no first or second-order serial correlation, respectively, in the differenced error structure, and these results validate the model specification of this study.

5. Conclusion and Recommendations

This study has been conducted to find out the factors affecting the insurance sector's solvency with the evidence from Sri Lanka. The results revealed that profitability and economic growth have a significant positive impact on the solvency of the insurance industry in Sri Lanka. In contrast, leverage shows a significant negative impact on the solvency of the insurance sector. Among them, economic growth has the highest impact on the solvency of the insurance companies and leverage has the lowest impact on the solvency of the insurance companies of Sri Lanka. Further, firm size, premium growth, and inflation demonstrate an insignificant impact when determining the solvency of the insurance sector in Sri Lanka.

The results of this study are crucial for the regulatory authorities and policymakers to regulate and supervise the insurance companies in an efficient way. In other words, the findings of our study have some important implications for regulating, supervising, and monitoring the insurer's solvency. Since profitability is a significant factor of insurer's solvency, IRCSL can closely monitor and regulate the insurers who have losses. Based on our findings, different regulations for life and general insurance could be recommended because there is a significant difference between the products of life insurance and general insurance. The leverage of insurers should also be properly monitored as it is crucial for insurers' solvency. On the other hand, the findings of this research are very much important to the insurers themselves to be in financially solvent and be competitive the market since Sri Lanka has a competitive developing insurance market.

In this empirical study, the researchers have to limit the study to only 11 insurance companies operating in Sri Lanka and the time period has also to be limited for the period of 2011-2020 due to the lack of availability of relevant data. Therefore, future researchers encouraged to conduct their research separately for the life and general insurance companies operating in Sri Lanka since they engage in the different business courses. Further, more firm-specific and macroeconomic variables can be used to carry out future researches. In addition, it is recommended to conduct future research by using qualitative data since the window dressing of the financial statements might affect the current study results.

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The Impact of Government Expenditure on Economic Growth in Sri Lanka

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Abstract

The contribution of government expenditure to economic growth varies based on the impact of the individual expenditure component. Therefore, it is important to identify the significance of each expenditure component to use the government expenditure to boost economic growth. This study examined the impact of government expenditure (education, health, defense and security, welfare and transport, and communication expenditures) on economic growth in Sri Lanka from 1990 to 2019. Secondary data were gathered from the sources of the Central Bank of Sri Lanka. The annual data was converted into semiannual data due to the unavailability of the data Auto Regressive Distributed Lag Model (ARDL) is applied to determine the impact of government expenditures on economic growth. The results indicated that the government expenditure on defense & security expenses is statistically insignificant in the long and short run. Further, the government expenditure on health and transportation & communication shows a significant positive impact on economic growth in the long and short run. However, education expenditure reported a negative impact on economic growth, and the expenditure on welfare services shows a long-run positive impact while a negative impact in the short run.

Keywords: *Economic Growth, Government Expenditure, ARDL model.*

1. Introduction

A proxy for economic growth is an increase in the quantity and quality of products and services produced and consumed by an economy. According to Todaro and Smith (2005), economic growth is described as the gradual increase in the economy's production capacity through time, resulting in higher national production and income levels. Further, Muritala and Abayomi (2011) concluded that economic growth is a long-term increase in capacity to offer its population increasingly diverse economic products. This growth capability is based on the advancement of technology as well as the institutional and ideological alterations that are required. Economic growth is an increase in the prospective Gross Domestic Product (GDP) of a country, despite the fact that the definition could vary depending on how GDP is calculated. Economic growth is considered a measure of a country's economic performance, and it is viewed as a goal that most countries aim to achieve because of its effect on increasing living standards, government benefits, and employment levels.

Fiscal policy is a mechanism used by the government to manage economic progress. Therefore, it is vital to investigate government expenditure as it is one of the key determinant factors in economic growth. According to the Central Bank of Sri Lanka (CBSL), government expenditure is divided into several categories: recurrent expenditure, capital expenditure, and transfer payments. Generally, expenses for non-repayable activities throughout a year, such as interest on loans, maintenance, salaries, and wages, are referred to as recurrent expenditures, while expenses on capital projects including telecommunication, electricity generation, and transportation are referred to as capital expenditures.

According to the World Bank, Sri Lanka was degraded to lower-middle-income category from upper-middle-income country basket with the effect of 1st of July 2020. Sri Lanka was ranked as an upper-middle-income country in 2019 after recording a per capita income of $4,060. However, in 2020, it recorded a per capita income of $4,020, a drop from the previous year, and was demoted to a lower-middle-income country. Sri Lanka is a country in which the government plays

a major role in its economy. Thus, the government is responsible for deploying its expenditure productively to enhance the standard of living of the people by increasing continuous production and capital development.

There have been previous studies attempted to investigate the influence of government expenditure on economic growth. The results of those studies are contradictory. The findings of Nurudeen and Usman (2010) showed that the transportation and communication expenditure of the government leads to a rise in economic growth. In contrast, Musaba et al. (2013) found a negative impact of transportation and communication expenditure on economic growth. Sri Lankan academics have also investigated the associations between government spending and economic growth in the Sri Lankan context. For example, Guruge et al. (2019) used total government expenditure, taxation, and debt to determine the efficacy of fiscal policy modifications on economic growth in Sri Lanka, and concluded that fiscal policy variables have no noticeable effect on economic growth in the short run. There are few studies conducted to test the impact of individual government expenditure components on economic growth. Ravinthirakumaran and Kesavarajah (2011) detected that the expenditure on education has a significant positive impact, and the defense and health expenditure negatively impact on economic growth in Sri Lanka

Some economists argued that the government must expand demand to enhance growth, emphasizing that consumer demand is the key driver of an economy. Thus, the theory supports a more expansive fiscal policy. In his book “The General Theory of Employment, Interest, and Money” (1936), Keynes explained his hypothesis. It first suggested that government expenditure was a key driver of aggregate demand. Second, Keynes asserted that government expenditure was required to keep full employment. The endogenous growth theory argues that economic growth is an internal factor-driven suggests that investment in knowledge-based sectors and human capital is critical in economic growth (Barro, 1990).

Moreover, concerning economic growth, the association of government expenditure and economic growth in Sri Lanka appears to be debatable with the increasing trend of government spending. Therefore, this study fills the literature gap in identifying the individual components of government expenditure that significantly impact the economic growth of Sri Lanka using data from 1990 to 2019. Following the theoretical and the empirical review findings, the research deploys education, health, defense and security, welfare, and transport and communication as independent variables under the functional classification of CBSL. Specially, it aims to figure out both the long-run and short-run trends of each component of government expenditure to provide insights into government expenditure's long-term and short-term impact on economic growth.

The remaining part of the paper is organized in the following sections. Section two indicates the theoretical justification of the research and the literature review. The data, sample period, and methodology of the study are summarized in section three. Section four summarizes the analysis of results, and the concluding remarks are given in section five.

2. Literature Review

The theoretical span of government expenditure and economic growth can be identified in light of three major theories: Wagner's law, Keynesian growth theory, and endogenous growth theory. Wagner's law (Year) suggests that economic growth causes the expansion of the government sector in an economy. Further, the law explains that this expansion leads to escalating government activities that will subsequently cause a rise in government expenditure (Wagner, 1893). Wagner's law identifies government expenditure as an endogenous aspect driven by economic growth. However, the Keynesian theory (1936) states that government expenditure is an exogenous factor affecting aggregate output. Government expenditure has a positive impact on economic growth according to Keynesian philosophy, and the more money a government spends will lead to economic growth (Romer, 1986). Government can offset a slower level of economic activity by enhancing government expenditure and decreasing taxes;

thus, fiscal policy is considered a defensive tool that helps to reduce short-run variations in output and employment (Zagler & Durnecker, 2003). Further, depending on the multiplier effects of the Keynesian model, this concept also suggests that government spending made a significant contribution towards economic growth (Srinivasan, 2013). Wagner's law (year) and Keynesian theory are applicable in determining the short-run relationship between government expenditure and economic growth. The endogenous growth theory focuses on the economy's behaviour as a whole and argues that economic growth results from the performance of internal factors rather than the external factors of an economy. The theory identifies government expenditure as an internal factor and could be used in determining long-run relationships. Barro (1990) explored that productive government expenditure could directly impact the production function, saving rates and economic growth. In contrast, the increase of non-productive government expenditure would lower savings and economic growth. The study followed the Keynesian growth theory and endogenous growth theory as the basis in conceptualizing its objectives.

2.1. Empirical Review

Economic growth is a long-term improvement in a country's capability of providing highly varied economic commodities to its population, and this expanding capability is based on technological advancements and the institutional and ideological changes that they need (Kuznets, 1973). Empirical evidence relates to economic growth and government expenditure is debatable and contrasts between different contexts. Devarajan et al. (1996) stated that the relationship between the capital component of public expenditure and per-capita growth to be negative for a sample of 43 developing countries, while the current expenditure shows significant positive growth effects. Moreover, Bagdigen et al. (2004) examined that there is no long-run relationship between public expenditure and GDP by using the Engle-Granger co-integration test. However, Loizides & Vamvoukas (2005) examined the relationship between government expenditure and economic growth using trivariate causality testing for UK, Greece, and Ireland. The results showed that the government expenditure granger causes the economic

growth in all the countries in both long and short run. Similarly, Gangal and Gupta (2013) found that there is a positive relationship between government expenditure and economic growth in India.

The quality of education is critical in enhancing the economic growth and human capital capabilities of a country. According to the study of Hussi et al. (2012), which used to enhance economic performance, the government should promote expenditure on education. According to findings of Mallik et al (2016), the long-term investment in education for a sample of 14 Asian countries is an essential predictor of economic growth. Expenditure on education is one of the expenditures resulting in a trained labor force, increased productivity, and increased economic growth. Education expenditure can improve human capital, facilitating current technologies in the manufacturing process by lowering high adoption costs. However, there are previous studies that proposed opposite conclusions. Urhie (2014) has concluded that even though there is a long-run positive relationship between government expenditure on education and economic growth, it has a negative relationship in the short run. In contrast, Gisore et al. (2014) found that the relationship between government expenditure on education and economic growth is insignificant in East Africa.

Government allocation on healthcare would enhance human capital and increase productivity, leading to economic growth. According to the findings of Raghupathi and Raghupathi (2020), based on the Visual Analytics method using United States related data, government spending on the health sector boosts the GDP, productivity, and income of a country because the government expenditure on health has a positive relationship with those economic indicators. Ercelik (2018) examined the association between the government expenditure on the health sector and economic growth in Turkey using ARDL bound testing approach. The results showed a remarkable effect on economic growth in the long run. However, the study conducted by Hasnul (2015) using the Ordinary Least Square technique concluded that government expenditure on the health sector had no impact on economic growth in Malaysia.

Peace is an essential component of global economic progress. Generally, investors are fear to make adequate investments in the economis with the lack of peace because of the market risk and uncertainty of the economics progress. Many governments worldwide invest vast amounts of mental, human, and financial resources to establish and keep peace in their own countries. National and international organizations have invested massive amounts of money to achieving and preserving global peace (Okunlola & Apanasile, 2014). Ando (2009) conducted a study using 109 countries, including 30 OECD countries and suggested a positive relationship between government expenditure on defense and economic growth based on the Feder model. On the other hand, the findings of Okunlola and Apanasile (2014) based on the ARDL model showed a negative relationship between defense expenditure and economic growth in the short run while there is a positive relationship in the long run, in Nigeria.

Critics say that establishing a welfare system creates a barrier to national development. Atkinson (1999) argued that sustained economic growth, which increased public investment in social welfare, may lead to the country's economic downturn. The loss of efficiency in welfare investment might exceed the increasing productivity from welfare expenditure. Therefore, it suggests that if the inefficiency issue caused by uncontrollable elements in welfare investment could be eliminated, the aims of welfare and economic growth are likely to be met efficiently (Kyoungdon, 2011). Nevertheless, the study of Lupu et al. (2018), which is based on the ARDL technique using data gathered from 10 selected Eastern and European countries, emphasized that government expenditure on social welfare has a negative impact on economic growth. Baum and Lin (1993) concluded that social welfare expenditure has an insignificant negative impact on economic growth.

Nurudeen and Usman (2010) explained that the government should enhance its expenditure on the transport and communication sectors, as this will increase the profitability while lowering the cost of operating business in Nigeria. The researchers employed co-integration and error correction techniques that discovered a positive

relationship between government transportation and communication expenditure with economic growth. In the same way, Easterly and Rebelo (1993) also found a positive relationship among those variables using the cross-sectional methodology. Conversely, using co-integration analysis in the context of an error correction model, Musaba et al. (2013) established that there is a negative impact of transportation and communication expenditure on economic growth in Malawi.

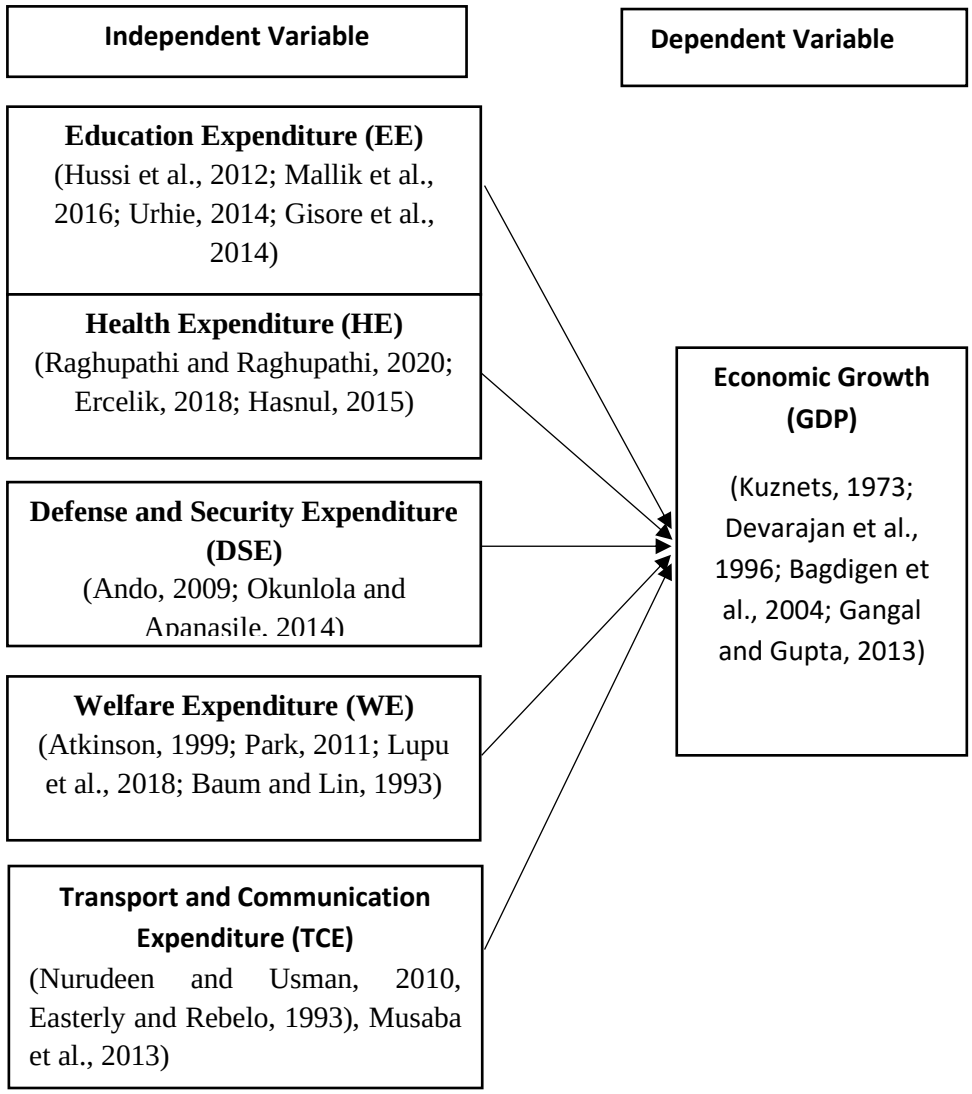
Even though previous studies have examined the effect of government expenditure on economic growth globally and in Sri Lankan contexts, they have indicated mixed results.Some studies demonstrate that government expenditure has a favorable effect on economic growth (Nurudeen & Usman, 2010; Srinivasan, 2013; Gangal & Gupta, 2013), whereas others demonstrate that it negatively impacts (Musaba et al., 2013; Devarajan et al., 1996; Okunlola & Apanasile, 2014). Government expenditure has also been shown to have neutral growth impacts in previous studies. Variations in results could be attributable to the nature of the facts and econometric techniques used. Dissanayaka et al. (2017) examined the relationship between government expenditure and economic growth using the OLS model. The results showed that education, transportation, and communication expenditures strongly contribute to economic growth, with education expenditure having the most beneficial impact. The findings also show that rising government expenditure on education in Sri Lanka significantly impacts economic growth. According to the study conducted by Wickramasiri et al. (2013), to analyze the relationship between government welfare expenditure and economic growth concerning different policy regimes found that there is no significant relationship between government welfare expenditure and economic growth. However, the "Mahinda Chinthana" policy regime appears to impact economic growth among the dummy variables positively. The current study attempts to fill the existing literature gap in the Sri Lankan context and analyzes the relationship between government expenditure and economic growth using the Auto Regressive Lag Distribution (ARDL) model for a sample of data from 1990-2019.

Economic growth, education, health, defense and security, welfare and transport, and communication are the variables used for this study.

3. Methodology

Figure 1 presents the conceptual framework of the study. GDP is used as the proxy for measuring the dependent variable and four proxies are utilized to capture the measures of the independent variable, namely; Education Expenditure (EE), Health Expenditure (HE), Defense and Security Expenditure (DSE), Welfare Expenditure (WE) and Transport and Communication Expenditure (TCE).

Figure 1: Conceptual Framework



Source: Developed by the researcher based on theoretical and empirical review

This study employs secondary data collected from annual reports of CBSL from 1990 to 2019. This study is based on semiannual data, and due to the unavailability, the annual data is converted to semiannual by using the option available in E-views statistical software. This study investigated the impact of Education expenditure (LNEDU), Health expenditure (LNHEA), Government Defense and Security expenditure (LNDEF), Welfare expenditure (LNWEL), and Transport and Communication expenditure (LNTRAN) on economic growth (LNGDP_CH). The data series of the dependent variable, GDP growth rate, was in the form of percentage and the independent variables were in rupees millions. Therefore, to arrange the data set into a similar base and normalize the larger figures, the study used the natural logarithm of variables.

To determine the best-fitted model, first, the data set should be stationary. Thus, the unit root test was conducted using the Augmented Dickey-Fuller (ADF) method. The co-integration test is used to test the long-term relationship, and the ARDL model based on the bounds test is used to investigate the co-integration. In order to execute the ARDL model, several preconditions must be met. One such condition is that the variables should not be stationary at any level above I(1). Many previous researchers have used the ARDL model in their methodology (Kumara & Dayaratne, 2015; Barlas, 2020). F-test statistic is obtained from the ARDL bound testing approach to identify the existence of co-integration or long-run relationship. After confirming the long-run relationship, the study next estimated the long-run coefficients, and to determine the short-run relationship, the Error Correction Model (ECM) was used.

The objectives of the study are examined using the following models:

Equation 1:

$$LNGDP\_CH_t = \beta_0 + \beta_1 LNHEA_t + \beta_2 LNEDU_t + \beta_3 LNDEF_t + \beta_4 LNWEL_t + \beta_5 LNTRAN_t + \varepsilon_t$$

Where,

LNGDP_CH	Gross Domestic Product
LNHEA	Government Health Expenditure
LNEDU	Government Education Expenditure
LNDEF	Government Defense and Security Expenditure
LNWEL	Government Welfare Expenditure
LNTRAN	Government Transport and Communication Expenditure
β_0	Intercept
ε_t	Error Term

Equation 2: ARDL Model

$$\Delta LNGDP\_CH = C_0 + \sum_{i-0}^{p} C_{1i}\,\Delta LNHEA_{t-i} + \sum_{i-0}^{p} C_{2i}\,\Delta LNEDU_{t-i} + \sum_{i-0}^{p} C_{3i}\,LNDEF_{t-i} + \sum_{i-0}^{p} C_{4i}\,\Delta LNWEL_{t-i} + \sum_{i-0}^{p} C_{5i}\,\Delta LNTRAN_{t-i} + \varepsilon_t$$

Equation 2 estimates the regressions to obtain the optimal lag length. The study used Akaike Information Criteria (AIC) to determine the ideal lag length. The model with the lowest AIC value is considered as the optimal model.

4. Data Analysis and Discussion

Table 7: Descriptive Statistics

	LNGDP_CH	LNEDU	LNDEF	LNHEA	LNTRAN	LNWEL
Mean	2.606746	10.92873	11.73698	10.52683	10.88312	11.13701
Median	2.699774	10.85659	11.59810	10.57873	10.50222	11.29149
Maximum	3.510240	12.57845	13.08340	12.40618	12.59915	12.71279

Minimum	1.619880	9.119211	9.978595	8.581857	8.625330	9.392495
Std. Dev.	0.428199	1.081407	0.995350	1.222116	1.287748	0.940108
Skewness	-0.331750	-0.018049	-0.205021	-0.052730	0.011204	0.053894
Kurtosis	3.109189	1.733498	1.859807	1.694557	1.545361	1.864357
Jarque-Bera	0.565194	2.006662	1.835218	2.144128	2.645597	1.626628
Probability	0.753823	0.366656	0.399473	0.342301	0.266389	0.443386

Source: Eviews for Research data 1990-2019

The standard deviation of LNGDP_CH is 0.390154, and the value of skewness is -0.442711, which means the distribution of the data has a left tail. That implies a negatively skewed. The kurtosis value of LNGDP_CH is 3.130951, which is greater than 3. Thus, it shows that the distribution of the data is leptokurtic relative to the normal. The standard deviation of LNEDU is 1.056106, and the value of skewness is -0.013327, which indicates the distribution of the data has a left tail, and it is negatively skewed. The kurtosis value of LNEDU is 1.736768, which is less than 3, so it shows that the distribution of the data is platykurtic (flat) relative to the normal. The probability value of Jarque-Bera for LNEDU is 0.373547, which shows that the data is normally distributed.

The standard deviation of LNDEF is 0.971677 and negatively skewed. The kurtosis value of LNDEF is 1.868888, which is less than 3, so it shows the data is platykurtic relative to the normal. The probability value of Jarque-Bera for LNDEF shows that the data is normally distributed. The standard deviation of LNHEA is 1.194566, and the value of skewness is -0.054297, which means the distribution of the data has a left tailed. The kurtosis value of LNHEA is less than 3, and it implies that the data distribution is flat relative to the normal. The probability value of Jarque-Bera for LNHEA 0.123434 indicates that the data is normally distributed. The standard deviation of LNTRAN is 1.255680, and the value of skewness is 0.050191, which indicates that the data is positively skewed. The kurtosis value of LNTRAN is

1.494068, and it shows that the distribution of data is platykurtic relative to the normal. The probability value of Jarque-Bera for LNTRAN is 0.060814, which is greater than 0.05 suggest that the data is normally distributed. The standard deviation of LNWEL is 0.911471, and the value of skewness is 0.076517, which means the distribution of the data is positively skewed. The kurtosis value of LNWEL is 1.835168, and it shows that the distribution of data is platykurtic relative to the normal. The probability value of Jarque-Bera for LNWEL shows 0.183313, indicating that the data is normally distributed.

Table 8: Augmented Dickey-Fuller (ADF) Test Results

	Null Hypothesis: Variable has a unit root		
Variables	I(0)	I(1)	Order of Integration
LNGDP_CH	0.6327	0	I(1)
LNEDU	0.7194	0.0443	I(1)
LNHEA	0.8229	0.0002	I(1)
LNDEF	0.3007	0.0008	I(1)
LNWEL	0.9355	0.0168	I(1)
LNTRAN	0.8654	0.0023	I(1)

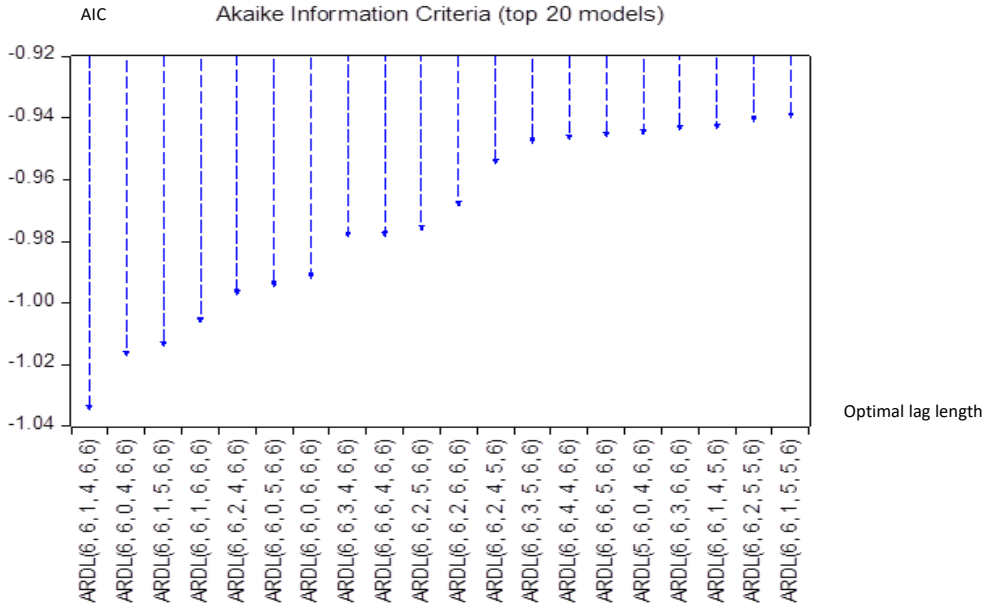
Source: Eviews for Research data 1990-2019

The findings of the ADF unit root test are presented in table 2. The results indicate that all the variables are stationary (has no unit root) in the I (1) given that the p-values are less than 0.05.

It means the null hypothesis of each variable has a unit root can be rejected and accept H_1: has no unit root.

Optimal lag length is determined using the lowest Akaike Information Criteria (AIC), and the maximum dependent lags tested were six. Thus, the selected model was ARDL (6, 6, 1, 4, 6, 6).

Figure 4: Akaike Information Criteria Graph



Source: Eviews for Research data 1990-2019

In the co-integration test, the null hypothesis, there is no co-integration existing among variables tested against the alternative hypothesis, a co-integration exists. The test results are summarized in the table below.

Table 9: Results of ARDL Bound Test

Test statistic	Value	Sig.	I (0)	I (1)
F statistic	4.9544255***	10%	2.08	3.00
		5%	2.39	3.38
		2.5%	2.70	3.73
		1%	3.06	4.15

Note: *** denotes significant at 1% level

Source: Eviews for Research data 1990-2019

The test results show that the calculated F-statistic (4.954425) exceeds the upper bound I(1) at a 1% significant level. Thus, there is sufficient evidence to reject the null hypothesis, and it confirms the existence of co-integration or long-run relationships among selected variables. Further, it suggests a linear combination between LNGDP_CH, LNEDU, LNDEF, LNHEA, LNTRAN, and LNWEL.

The confirmation of the long-run relationship between independent and dependent variables leads to deriving the long-run coefficients. The table below summarizes the long-run coefficients of the selected model.

Table 10: Estimation for Long run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEDU	-6.315594	0.585622	-10.78442	0.0000**
LNDEF	-0.080712	0.197607	-0.408448	0.6878
LNHEA	3.542243	0.368758	9.605886	0.0000**
LNTRAN	1.019824	0.076619	13.31033	0.0000**
LNWEL	1.209315	0.251318	4.811888	0.0001**
C	6.120372	1.045917	5.851678	0.0000**

Note: ** denotes significant at 5% level

Source: Eviews for Research data 1990-2019

$$LNGDP\_CH = 6.120372 - 6.315594LNEDU + 3.542243LNHEA + 1.019824LNTRAN + 1.209315LNWEL + e_t$$

As per the results, LNEDU, LNHEA, LNTRAN, and LNWEL are statistically significant at the 5% significant level. However, LNDEF is statistically insignificant, indicating no impact on economic growth in the long run. LNEDU shows a long-run negative impact on economic growth. Accordingly, a 1% increase in government education expenses will cause a 6.32% reduction in GDP in the long run. LNHEA, LNTRAN, and LNWEL have a significant positive impact on GDP, and it interprets that a 1% increase in the government expenditure on health, transportation & communication, and welfare

will boost the GDP by 3.54%, 1.02%, and 1.21%, respectively in the long run.

The co-efficient of ECM expects to be negative and to be statistically significant. If those two criteria are fulfilled, the co-efficient is used to determine how fast the economy's disequilibrium will be restored to the equilibrium stage in the short run.

$$\Delta LNGDP\_CH = C_0 + C_1\Delta LNHEA_t + C_2\Delta LNEDU_t + C_3\Delta LNDEF_t + C_4\Delta LNWEL_t + C_5\Delta LNTRAN_t + \varphi ECT_{t-1} + \varepsilon_t$$

C_1, C_2, C_3, C_4, C_5	Short-run coefficients
ECT	Error correction term
Ø	Speed of adjustment

Table 11: Estimation for Short-run Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP_CH(-1))	1.321697	0.161478	8.185001	0.0000**
D(LNGDP_CH(-2))	0.697149	0.200387	3.479015	0.0027**
D(LNGDP_CH(-3))	0.840218	0.190707	4.405808	0.0003**
D(LNGDP_CH(-4))	0.537059	0.128214	4.188759	0.0006**
D(LNGDP_CH(-5))	0.305147	0.144850	2.106644	0.0494**
D(LNEDU)	-3.832370	0.850782	-4.504527	0.0003**
D(LNEDU(-1))	9.656946	1.584095	6.096190	0.0000**
D(LNEDU(-2))	5.081985	1.640336	3.098137	0.0062**
D(LNEDU(-3))	6.726087	1.644129	4.090974	0.0007**
D(LNEDU(-4))	2.276236	0.716854	3.175314	0.0052**
D(LNEDU(-5))	2.460488	0.791649	3.108055	0.0061**
D(LNDEF)	-1.042457	0.516378	-2.018787	0.0587
D(LNHEA)	3.177879	0.949341	3.347456	0.0036**
D(LNHEA(-1))	-5.695308	1.259122	-4.523236	0.0003**

D(LNHEA(-2))	-1.052245	1.187644	-0.885993	0.3873
D(LNHEA(-3))	-3.480920	1.182417	-2.943902	0.0087**
D(LNTRAN)	1.792568	0.330483	5.424086	0.0000**
D(LNTRAN(-1))	-0.805182	0.282160	-2.853634	0.0105**
D(LNTRAN(-2))	-0.714622	0.216065	-3.307448	0.0039**
D(LNTRAN(-3))	-0.453022	0.246973	-1.834296	0.0832
D(LNTRAN(-4))	0.366804	0.190662	1.923850	0.0703
D(LNTRAN(-5))	0.355294	0.174546	2.035532	0.0568
D(LNWEL)	-1.376152	0.513950	-2.677598	0.0154**
D(LNWEL(-1))	-3.693686	0.848958	-4.350848	0.0004**
D(LNWEL(-2))	-1.795034	0.804145	-2.232227	0.0385**
D(LNWEL(-3))	-2.782485	0.702060	-3.963315	0.0009**
D(LNWEL(-4))	-1.734290	0.671181	-2.583936	0.0187**
D(LNWEL(-5))	-2.771694	0.713895	-3.882495	0.0011**
CointEq(-1)*	-1.891890	0.278215	-6.800095	0.0000**

Note: ** denotes significant at 5% level

Source: Eviews for Research data 1990-2019

According to table 5, the sign of the coefficient of Error Correction Term is negative (-1.89) as expected and significant (Prob. 0.0000). It states that if a disequilibrium is caused due to LNEDU, LNDEF, LNHEA, LNTRAN, and LNWEL variables, the speed of getting to the equilibrium stage is 1.89%.

The estimated results show that LNEDU, LNHEA, LNTRAN, and LNWEL are statistically significant at the 5% significant level, and LNDEF is insignificant similar to the results of the long-run model estimation. According to the findings, government expenditure on education shows a negative impact on economic growth in the short run, and therefore, a 1% increase in the education expenditure would decrease the GDP growth rate by 3.83%. Government health expenditure positively impacts the economic growth rate, which

implies a 1% increase in health expenditure could increase the economic growth by 3.1% in the short run. Government expenditure on transport and communication shows a positive impact on the GDP growth rate. Therefore, a 1% increase in transport and communication expenses will boost the economy by 1.7%. According to the results, government welfare expenditure negatively impacts economic growth and indicates that a 1% increase in welfare expenditure would cause a slowdown in the economic growth by 1.3%.

4.1. Residual Diagnostic test

ARDL model requires the residuals of the fitted model to be serially independent Pesaran et al. (2001). Therefore, the serial correlation LM test identifies whether the fitted model has no autocorrelation. The study used Breusch-Godfrey serial correlation LM test to test the autocorrelation.

Table 6: Results of Breusch Godfrey Serial Correlation LM Test

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square	Criteria (5% Sig.)	Finding
0.869485	0.4381	5.195648	0.0744	0.074>0.05	No serial correlation

Source: Eviews for Research data 1990-2019

The calculated probability Chi-Square value, 0.0744, is greater than 0.05 significant level, and that provides evidence to accept the null hypothesis. Thus, the findings suggest that the fitted model is not serially correlated. Therefore, this satisfies the key assumption of the ARDL model.

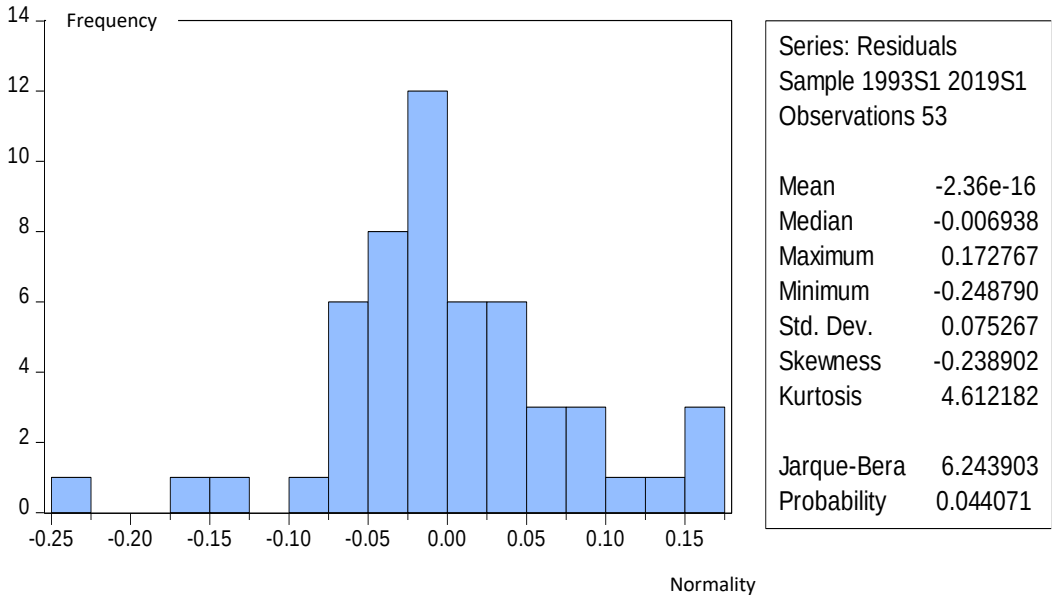
Table 12: Results of Breusch-Pagan-Godfrey' Test

F-statistic	Prob. F	Obs*R-squared	Prob. Chi-Square	Criteria (5% Sig.)	Finding
0.855716	0.6626	32.74279	0.5292	0.52>0.05	Homoskedasticity

Null hypothesis: Homoskedasticity
Source: Eviews for Research data 1990-2019

The heteroskedasticity test is used to determine whether the residuals of the fitted model are homoscedastic distributed or not. Therefore, to test the heteroskedasticity, the study used the Breusch-Pagan-Godfrey method. According to the above result, the P-value is 0.5292, greater than the 0.05 significant level. Thus, there is evidence to accept the null hypothesis, which is Homoskedasticity.

Figure 5: Histogram of Normality Distribution

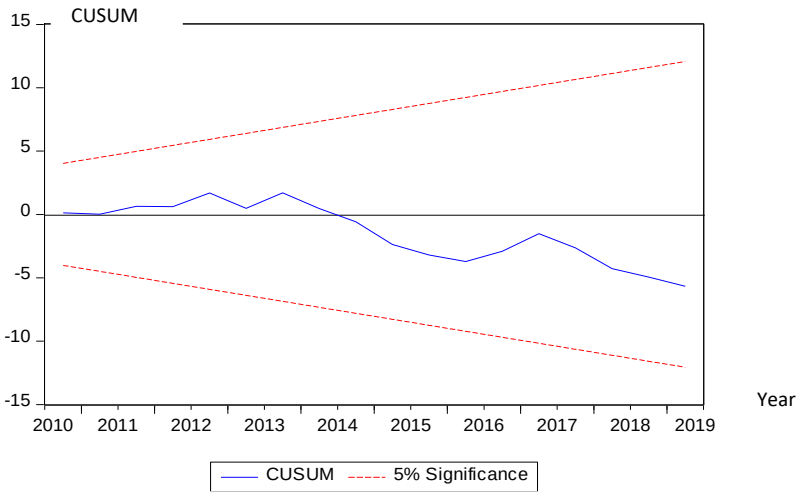


Source: Eviews for Research data 1990-2019

Normality test is done by using the result of the histogram-normality test. Which shows the population's residuals are normally distributed or not? For that Jarque-Bera probability value is used to determine whether to accept or reject the null hypothesis. According to the above result, the Jarque-Bera probability value is less than the 0.05 significant level, and it rejects the null hypothesis of normal distribution. However, the developed model has passed all the diagnostic tests except the normality test.

4.2. Stability diagnostic test

Figure 6: CUSUM Test



Source: Eviews for Research data 1990-2019

According to the CUSUM test, the cumulative sums of the residual lie within the 5% confidence region. The line does not touch the upper and lower boundaries of the region, and it confirms that the model is stable and fits the data well.

5. Conclusion

This study examined the impact of government expenditure on economic growth in Sri Lanka. The government expenditure on education, defense & security, transportation & communication, health, and welfare were used as the independent variables, and the

GDP growth rate was used to proxy the economic growth. The study found that the impact of the government expenditure varies based on the nature of the individual component and the short-term and long-term dynamics. The results indicated that the government expenditure on defense & security expenses is statistically insignificant in the long and short run. This finding collaborates with the findings of Ravinthirakumaran & Kesavarajah (2011). Education expenditure has a negative impact on economic growth. However, the finding is contrary to the endogenous growth theory, which states that the investment in human capital would accelerate economic growth. Government expenditure on health and transportation & communication shows a significant positive impact on economic growth in the long and short run. The expenditure on welfare services shows a long-run positive impact while a negative impact in the short run. According to the findings, it can be suggested that increasing the allocation of government expenditure for the sectors of health, transport, communication, and welfare will have a positive impact on economic growth in the long run.

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Factors Affecting Salesforce Behavior: Evidence from the Life Insurance Industry in Sri Lanka

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Abstract

Sri Lanka is a life insurance unpenetrated country recording the second-lowest penetration in the South Asian region. This under penetration is further fueled by the high lapse rate and a cancellation rate of the policies. Salesforce behavior can be attributed as one of the prominent reasons for this. Since life insurance is a service-providing business and deals with customers directly, the progress of the industry depends highly on the behavior of the salesforce. The life insurance business is entirely based on the transparency of the agreement termed as utmost good faith. Nevertheless, transparency is highly threatened by the unethical behavior of life insurance agents. As an immediate effect, the image of the companies gets tarnished and declines the progress of the industry. Therefore, it is very important to be concerned about factors affecting unethical salesforce behavior in the life insurance industry. The main objective of this study is to identify the factors affecting salesforce behavior in the life insurance industry. To test the hypotheses, 152 life insurance agents in the Badulla district were selected using the snowball sampling technique representing the top five performers in the industry. Using the multiple regression analysis, results indicate that only selling pressure and competitive intensity have a significant positive relationship with salesforce unethical behavior. Furthermore, selling pressure shows a stronger positive relationship with salesforce unethical behavior. Interestingly, the proposed relationships of supervisory role, rewarding system, ethical climate, product complexity and product variety with unethical behavior were not supported. The paper suggests practitioners and

regulatory authorities reduce sales pressure with the aid of reducing sales targets and discouraging anti-competitive behavior.

Keywords: *Life Insurance, Salesforce, Unethical Behavior.*

1. Introduction

The link between insurer and insured is the insurance agent who is also known as the insurance advisor or the wealth planner. Insurance agents are persons registered with an insurer or an insurance broker registered under the act who in consideration of a commission solicits or procedures insurance business for such insurer or insurance broker (IRCSL, 2020). Agents play an important role as a liaison between consumers and the company. In the Sri Lankan context, the insurance agents play not only the role of introducing life insurance policies but also the role of collecting the premium and accounting for the premium for the relevant policy. Life insurance companies are in fact service providing companies and largely depend on the behavior of the insurance salesforce since they directly transact with the clients. In the case of marketing insurance products, it is a combination of commission-based selling and imperfect information which leads to many significant opportunities for unethical or ethically questionable behavior (Stephen et al., 1996). According to Stephen et al. (1996), ethical dilemmas exist more in distribution and promotion arenas compared to product and price arenas.

The insurance industry in Sri Lanka has a long history of over seven decades started with the operation of foreign insurance firms even before the independence in 1948. The industry was nationalized in 1961 with the incorporation of Sri Lanka Insurance and held a monopoly until the establishment of the National Insurance Corporation in 1980. Nonetheless, industry was opened for the private entrants in the same decade. Initially, both life and non-life insurance businesses were carried compositely. However, all the insurers were obliged to segregate their life and general arms as two different legal entities from 2015. As a consequence, Sri Lanka's insurance sector consists of 27 insurance companies including 13 independent life insurance companies by 2019. The Insurance Regulatory Commission

of Sri Lanka (IRCSL) acts as the main body regulating the insurance industry in Sri Lanka. It also safeguards the policyholders via supervisory control of insurance companies. As far as the protection of the policyholders is concerned, significant malpractices are being reported in the market still. IRCSL has received 107 complaints related to unethical behavior of agents in 2019 including but not limited to the inadequacy of explanations, payment of and misappropriation of premiums by sales staff, frauds, misrepresentation, lack of clarification (misunderstanding) and way of functioning branch offices (IRCSL, 2020). There were 32 referrals reported regarding the unfair termination, backlisting and related to educational qualifications of agents too (IRCSL, 2020). As the major distribution channel in the insurance industry, around 85% of sales are generated through life insurance agents. Nevertheless, a lapse rate of 7.34% as a percentage of total insurance policies in force and new policy lapses of 11.69% as a percentage of new policies issued can be witnessed still in life insurance market (IRCSL, 2020). Companies' deceptive marketing and mis-selling of policies have resulted in this higher lapsation (Talwar and Ali, 2016). The number of active life insurance policies amounted to 15.61% of the total population by 2019 (IRCSL, 2020). The total insurance penetration of Sri Lanka stands at 1.26% of GDP while South Asian penetration of peer countries remains at 2.93% of GDP (KPMG, 2019). Sri Lankans' negative perceptions on insurance have contributed to this underpenetrated life insurance market (KPMG, 2019). Negative perception amplified by the life insurance agents' behavior and lack of integrity can be attributed as one of the dominant reasons for low penetration rates as well as higher policy lapse rate.

Given this backdrop, the integrity of the salesforce is crucial since the product mis-selling, misleading the customers and frauds cause to destroy the trust placed upon the insurance companies. A perception of insurance as a scam has destroyed into society due to the recent questionable incidents reported in the industry. Hence, it is high time to identify the causes for malpractices to ensure the confidence of the general public and to create favorable industry. In the Sri Lankan context, there is a paucity of studies on the unethical behavior of

salespeople in the insurance industry. Empirical studies of developing countries plus developed countries suggest that numerous factors affect the salesforce unethical behavior. To the best of our knowledge, in the Sri Lankan context, researchers have studied only the organizational factors that affect the unethical behavior of the salesforce (e.g.: Chandrarathne and Herath, 2020). In light of this gap, the objective of this study is to examine factors affecting the unethical behavior of salesforce in the Sri Lankan life insurance industry from a wider perspective.

The rest of sections of this study consists of nine sections. Section two provides a review of the literature on unethical behavior. Section three presents' hypotheses and conceptual framework. Section four presents the methodology, including the data collection and sampling. Section five, six, seven and eight present findings, discussion, research implications and conclusion respectively. The final section is limitations and future research.

2.Literature review

Unethical behavior is referred to as someone who uses illegal or morally unacceptable conduct to sell products or someone whose behavior is contrary to the widely accepted code of ethics in society (Rest, 1986). According to Cravens et al. (1993), unethical behaviors give rise to disputes between buyer and seller and even the most committed consumers could leave the company. There is a positive relationship between the conduct of business and ethics (Baglione and Zimmener, 2007). Previous scholars have shed some light on the unethical practices of life insurance salespeople. For instance, down selling and twisting (Howe et al., 1994), false or misleading representation, failure to identify customer needs & wants, bad recommendations improper competition (Cooper and Frank, 1991), intentionally delaying the settlement of claims, providing incomplete or incorrect information and lack of professionalism (Ahmad and Sungip, 2008). According to Stephen et al. (1996), even the most successful agents engage more frequently in down selling, lowball pricing and providing false information. Cheng, et al. (2014) constructed five types of common unethical behaviors of life insurance

salespeople namely, incorrect description or deliberately concealed information of the product or service, inability to identify customer needs to provide the appropriate products and services, lack of concept, knowledge, or skills to implement responsibility, failure to fulfill responsibilities due to conflict of interests and misconducts that affects the company's reputation.

The Takaful industry also suffered a shock associated with ethical problems among agents (Aziz et al., 2016). Hamid et al. (2012) argued that the prominent issues of the life industry are lacking the skill to attract participants and retain consumers, inability to communicate, inability to disclose about Takaful products and failure to persuade consumers. Abdullah (2018) analyzed the Takaful agents' behavior against consumers and pointed out that providing false information, inability to understand consumers' needs and lack of professionalism is the core unethical behaviors of insurance agents.

2.1. Hypotheses development and conceptual framework

Ample studies have hypothesized various factors affecting unethical behavior in sales literature. Organizational factors are more common among them. According to Adinan et al. (2013) and Schwepker and Schults (2012), leaders' characteristics shape up the followers' sales behavior and there is a highly significant relationship between a leader's characteristics and sales ethical behavior such as trust. Ethical leadership is a broad construct that comprises altruism, compassion, honesty, fairness, justice etc. A behavior et al., 2013). reflecting these qualities can be distinguished as ethical leadership (Yukl Al Halbusi et al. (2021) stated that a positive relationship exists between the ethical behavior of leaders and the ethical conduct of employees. Ethical leaders hold followers accountable for their unethical actions (Yukl et al., 2013). Therefore, ethical supervision can create ethical practices within their team. A supervision reflects these qualities is termed as supervisory role in current study. Haron et al. (2011) explored that there is a relationship between supervisory influence and unethical behavior of insurance agents. Similarly, supervisory role significantly predicts the unethical behavior of insurance agents (Chandrarathne and Herath, 2020). Thus, the below hypothesis was formulated.

H_1: There is a negative relationship between supervisory role and salesforce unethical behavior in Sri Lankan life insurance industry.

A properly communicated and well-established reward and appraisal system helps to enhance employees' citizenship behavior, encourage work ethics and generate a healthy work environment (Abbasi and Rana, 2012). Life insurance business from its nature consists of higher commission rates. Sales commissions are considered to be best to motivate salespeople to enhance sales. A larger fraction of compensation based on sales commission in salesperson compensation provides an intention to behave unethically (Kalra et al., 2003). Therefore, the reward system (method of compensation) is considered to be an important variable of ethical behavior (Roman and Munuera, 2005). According to Tseng et al. (2016), sales workers possess an attitude towards inappropriate product recommendations once they perceive manipulation of sales compensation by insurers. Similarly, Stephen et al. (1996) revealed that commission-based selling causes unethical behavior. A high commission structure (compared with a low commission structure), is more likely affected by heuristic biases and makes an ethically questionable choice (Hsu et al., 2009). Hence, the below hypothesis was posited.

H_2: There is a negative relationship between rewarding system and salesforce unethical behavior in Sri Lankan life insurance industry.

Selling pressure is the force that appeared on the salesperson as a consequence of lack of time and greater expected performance. Sales targets are constant reminders to salespersons regarding the performance that can produce selling pressure (Hair et al., 2009) plus unethical behavior (Chandrarathne and Herath, 2020) (Haron et al., 2011). Mitchell, et al. (2018) also evidence that employee who demands high performance elicit performance pressure and consequently lead to unethical behavior. Thus, the below hypothesis was formulated.

H_3: There is a positive relationship between selling pressure and salesforce unethical behavior in Sri Lankan life insurance industry.

Ethical climate refers to the salespersons' perception of ethical standards (Mulki et al., 2006). The dimensions of ethical climate shape the ethical behavior of the salespeople (Nwora and Chinbuwa, 2017) (Weeks and Nantel, 1992). Organizational ethical climate plays a salient role in recognizing and addressing ethical issues in turn this ethical sensitivity reduces unethical behavior (Zhang and Zhang, 2016). Yi et al. (2012) shows the ethical climate is inversely related to mis-selling. Therefore, the below hypothesis was formulated.

H_4: There is a negative relationship between ethical climate and salesforce unethical behavior in Sri Lankan life insurance industry.

The culture of an organization is the shared set of assumptions, values, norms, beliefs and behavior patterns that are practiced in the organization to cope with the external and internal environment (Chandrarathne and Herath, 2020). This is a broader and deeper construct than organizational climate which stimulates ethical conduct (Scholz, 1987) and creates a huge impact on ethical decision making (Shafer and Wang, 2010). In line with this, the findings of Kaptein (2008) show that organizational culture negatively related to unethical behavior among workgroups. Thus, the below hypothesis was formulated.

H_5: There is a negative relationship between organizational culture and salesforce unethical behavior in Sri Lankan life insurance industry.

2.2. Environmental factors

In the Sri Lankan context, competition among top life insurance companies is very much fierce where they hold above 75% of the market (IRCSL, 2020). Therefore, the competitive intensity which is beyond the companies' control was incorporated into the model as an environmental factor. Competitive intensity is a key element in an industry that influences the ethical attitudes of salespeople (Wotrubaa, 1990). Therefore, in comparison with other external factors, competitive intensity stands predominant to explore since it can encourage unethical conduct. A situation where competition is fierce due to the presence of numerous competitors and the lack of

opportunities for further growth is termed as competitive intensity (Auh and Menguc, 2005). Yi et al., (2012) categorized competitive intensity as an environmental factor that affects mis-seling. Life insurance agents tend to provide misleading information about competitors considering themselves more ethical than competitors (Stephen et al., 1996). Prior works claim that unethical behavior is triggered by high market competition. For instance, Cooper and Frank (1991) identified improper competition as a salient unethical behavior of life insurance salespeople. According to Wotrubaa (1990), competitors being situational moderators can impact outcomes in the ethical decision/ action process. Moreover, sales agents tend to act opportunistically where competition is intense. Thus, below hypothesis was formulated.

H_6: There is a positive relationship between competitive intensity and salesforce unethical behavior in Sri Lankan life insurance industry.

2.3. Product factors

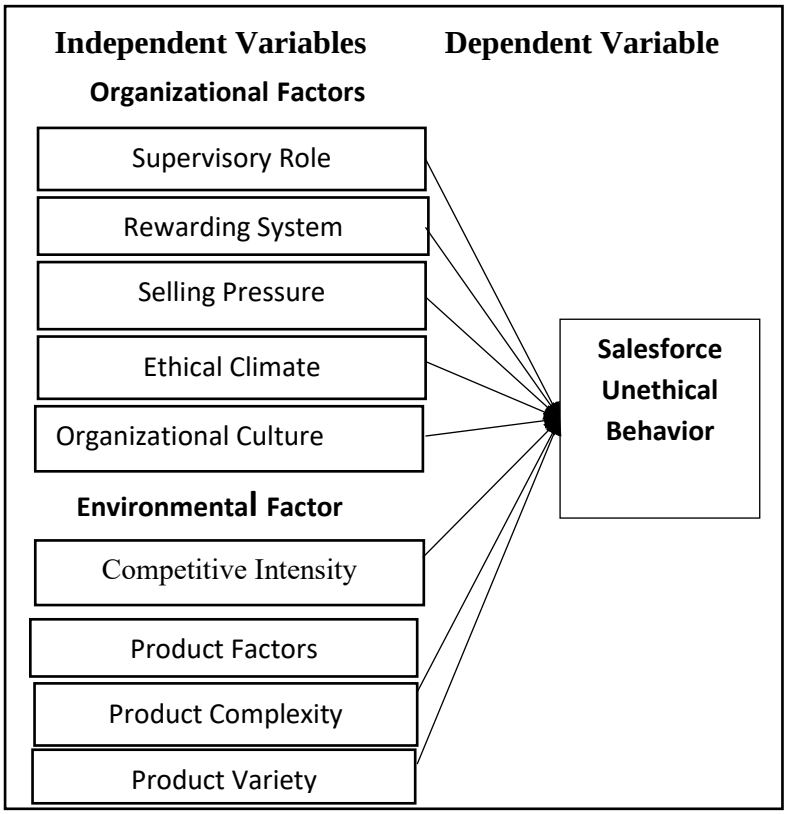
A product that offers a large number of options or that consists of a large number of steps in use are typically complex. When products are more complex and difficult to understand, the product leads to greater uncertainty and risk (Holak and Lehman, 1990). Imperfect information, information asymmetry coupled with a low level of financial literacy leads to ethical lapses in developing nations (Stephen et al., 1996, Ferdous and Polonsky 2013). The product variety is the measured mixture of products offered by an organization to the marketplace (Randall and Ulrich, 2001). There are four dimensions of product variety namely width (number of product lines), length (number of items in the mix), depth (variants of each product) and consistency (closeness of the relationship between products) (Kotler and Keller, 2006). As product variety increases customer's examination of information becomes more selective, information processing can be biased in the person's judgment and limit the evaluation of interrelated items. Thus, there is a possibility of customers being selected adversely because of the limited memory capacity of individuals (Moe, 1991).Previous studies evidence that both product complexity and product variety can trigger unethical

behavior. For example, Gibbs (1993) suggests that product complexity & product variety can give rise to mis-selling especially in financial services due to the information asymmetry. According to Yi et al. (2012) both the product complexity and product variety are positively related to mis-selling of life insurance products among telemarketers. Thus, the below hypotheses were formulated.

H_7: There is a positive relationship between product complexity and salesforce unethical behavior in Sri Lankan life insurance industry.

H_8: There is a positive relationship between product variety and salesforce unethical behavior in Sri Lankan life insurance industry.

Figure 1: Conceptual framework



Source: Developed by researcher

3. Methodology

The present study employed a quantitative research design. As the study is concerned about the perception, attitudes and behaviors of

people, the primary data collection method was used. Data was collected through a questionnaire distributed among the life insurance agents. The first part of the questionnaire contained demographic information of the insurance agents and the second part of the questionnaire contained the statements regarding each construct coded in a five-point Likert scale. The questionnaire was initially prepared in English and then translated into Sinhala. Afterwards, clarity and understandability of the statements were ensured in response to discussions with several practitioners. Subsequently, the pilot study was conducted using 10 percent of the sample representing an equal percentage from each company. The validity & reliability of this preliminary version of the questionnaire were checked using Cronbach's alpha coefficient. Finally, several questions were removed to ensure the same and questionnaire was employed to the total sample. 1.

A sample of 152 sales agents was selected with a 95% response rate from selected top five performing Life insurance companies. The research site is Badulla district. Five companies were spotted as top performers in terms of market share and percentage of insurance agents (IRCSL, 2020). A considerable percentage from each company was included in the sample. The Snowball sampling technique was used as the sample selection technique. Snowball sampling is useful especially in studies where a high degree of trust is required to initiate the contact or hard to involve the sample (Baltar and Brunati, 2012).

4. Results and Discussion

The respondents constitute 15% - 30% respondents from each company. Males represent 55.3% of the sample. Majority of respondents have education up to advanced level (52%) and the lowest percentage recorded as up to O/L (21.7%). Most of the sales agents are in age level of below 30 (35.5%) and the lowest represents the age level of between 61 and 70 (2%). The majority of the sample consists of agents having experience above 5 years (47.4%)

Table 1: Characteristics of the sample

		Frequency	Percentage
Gender	Male	84	55.3%
	Female	68	44.7%
Age	Below 30	54	35.5%
	Between 31 and 40	45	29.6%
	Between 41 and 50	34	22.4%
	Between 51 and 60	16	10.5%
	Between 61 and 70	3	2.0%
Education	Up to O/L	33	21.7%
	Up to A/L	79	52.0%
	Degree or Diploma	40	26.3%
Experience	Below 3	49	32.2%
	Between 3 and 5	31	20.4%
	Above 5	72	47.4%

Source: Developed by researcher

4.1. Descriptive statistics

According to the descriptive statistics, the highest minimum value and highest mean are recorded for the "salesforce unethical behavior" and the lowest maximum value and lowest mean are recorded for "ethical climate". Moreover, "competitive intensity" shows the highest standard deviation. Table 2 shows the descriptive statistics of each independent variable and dependent variable.

Table 2: Descriptive statistics

	Minimum	Maximum	Mean	Standard Deviation
Supervisory Role	1.00	3.14	1.6274	.4881
Reward System	1.00	3.75	1.7815	.7113
Selling Pressure	2.00	5.00	3.9301	.7278
Ethical Climate	1.00	3.00	1.5762	.5143
Organizational Culture	1.00	3.33.	1.6200	.5432
Competitive Intensity	1.00	5.00	2.5338	.9771

Product Complexity	1.00	4.00	2.2710	.7722
Product Variety	1.00	4.00	2.0932	.7826
Salesforce Unethical Behavior	2.50	5.00	4.5217	.4791

Source: Developed by researcher

4.2. Reliability

Cronbach's alpha values were used to measure the reliability of the constructs. Reliabilities less than 0.6 are considered to be poor, those in the 0.70 range are acceptable and those over 0.80 are good (Sekaran, 2003). According to Hair et al. (2010), Cronbach's alpha above 0.6 is also considered to be satisfactory. Therefore, the reliability of all scales was verified by the Cronbach's alpha values above recommended.

Table 3: Reliability

Construct	No of items	Cronbach's Alpha
Supervisory Role	7	0.800
Reward System	4	0.666
Selling Pressure	6	0.768
Ethical Climate	5	0.841
Organizational Culture	3	0.621
Competitive Intensity	5	0.889
Product Complexity	4	0.807
Product Variety	3	0.639
Salesforce Unethical Behavior	10	0.909

Source: Developed by researcher

4.3. Validity

Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity (BTS) were used to check the validity. If the KMO> 0.05 (0.08-1) and BTS Sig <0.05 the data set falls within the adequacy range. KMO values were above 0.05 and BTS values were 0.000 for all the constructs. Therefore, Validity was verified

Table 4: Validity

Construct	Measurement	KMO	BTS
Supervisory Role	SR	0.761	0.000
Reward System	RS	0.609	0.000
Selling Pressure	SP	0.800	0.000
Ethical Climate	EE	0.838	0.000
Organizational Culture	OC	0.628	0.000
Competitive Intensity	CI	0.881	0.000
Product Complexity	PC	0.746	0.000
Product Variety	PV	0.545	0.000
Salesforce Unethical Behavior	UB	0.856	0.000

Source: Developed by researcher

4.4. Correlation analysis

To measure the directions and the strength of the relationship between two variables, Pearson's correlation coefficient was used. P-values values below 0.05 are considered to be correlated. Correlation coefficient values range from +1 to -1 [(above 0.5= higher positive), (0.5 to 0= lower positive), (0 to -0.5= lower negative), (-0.5 to -1= higher positive)]. Accordingly, only supervisory role (-.173), ethical climate (-.219), selling pressure (.367) and organizational culture (-.267) have a significant correlation with salesforce unethical behavior. Furthermore, supervisory role, ethical climate and organizational culture have significant negative law degree correlation and selling pressure has a significant positive low degree of correlation with salesforce unethical behavior.

Table 5: Correlation table

Variable	N	Pearson's Correlation Coefficient	P-Value
Supervisory Role vs Salesforce Unethical Behavior	143	-.173	.038
Reward System vs Salesforce Unethical Behavior	143	-.051	.545
Selling Pressure vs Salesforce Unethical Behavior	143	.367	.000
Ethical Climate vs Salesforce Unethical Behavior	143	-.219	.009
Organizational Culture vs Salesforce Unethical Behavior	143	-.267	.001
Competitive Intensity vs Salesforce Unethical Behavior	143	.92	.276
Product Complexity vs Salesforce Unethical Behavior	143	.49	.560
Product Variety vs Salesforce Unethical Behavior	143	.025	.765

Source: Developed by researcher

4.5. Regression analysis

The regression coefficient, which was depicted by R square can be defined as the amount of variance explained independent variable by predictors (Sekaran, 2010). R square is ranging from 0 to 1. R-Square was reported as 0.225 (see table 6). Therefore, it can be concluded that only 22.5% of the variance of unethical salesforce behavior can be explained by the model. The rest of the 77.5% is explained by other variables which are not examined in the current study. According to Frost (2017) small R square values are not always a problem and high R square values are not necessarily good especially when outcome variable like human behavior which is very hard to predict. In such instances, a small R square does not mean the predicted model is useless.

Table 6: Model summary

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
1	0.475[a]	.225	.179	.43413

Source: Developed by researcher

ANNOVA table7 shows the significance of the regression model. Output p-value than 0.05 is considered to be significant. The output p-value reported is 0.000. Hence, the model was significant.

Table 7: ANNOVA table

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	7.348	8	.918	4.873	.000[b]
Residual	25.255	134	.188		
Total	32.603	142			

Source: Developed by researcher

Table 8 shows the regression coefficients of the regression analysis. The results show that, for the hypotheses that reflect relationships between unethical behavior and other independent variables, the relationships were not significant on supervisory role (B= -0.70; P> 0.05), rewarding system (B= 0.14; P> 0.05), ethical climate (B= -0.163; P> 0.05), organizational culture (B= -0.125; P> 0.05), product complexity (B= 0.004; P> 0.05) and product variety (B= -0.020; P> 0.05). Only relationships of selling pressure (B= 0.214; P< 0.05) and competitive intensity (B= 0.103; P< 0.05) with unethical behavior were shown to be significant. Therefore, Only H4 and H6 was supported.

Table 8: Coefficient table

Model	Unstandardized B	Coefficients Std.Error	Sig.
(Constant)	3.999	0.320	0.000
Supervisory Role	-0.70	0.84	0.411
Rewarding System	0.14	0.054	0.798

Selling Pressure	0.214	0.053	0.000
Ethical Climate	-0.163	0.089	0.068
Organizational Culture	-0.125	0.079	0.117
Competitive Intensity	0.103	0.044	0.019
Product Complexity	0.004	0.049	0.0927
Product Variety	-0.020	0.051	0.701

Source: Developed by researcher

4.6. Discussion

The significance of the current study lies in exploring the reasons for unethical behavior and providing measures to mitigate the same. According to the results, only H4 and H6 were supported. Looking closely at each variable in the model, selling pressure was the only organizational factor to influence unethical behavior. Sales pressure originates from the top management by means of monthly targets generates a significant burden on salespeople which drives them towards unethical acts. For instance, holding the agents' license due to the continuous failure to reach monthly sales targets. However, the previous findings of Yi et al. (2012) do not confirm the results of the present study. A possible explanation is that they have selected the life insurance companies with a rewarding system consisting with high basic salary and low level of commission level (Yi et al., 2012). Nevertheless, our sample consists with companies with a rewarding system of solely a straight commission plan which nurture the selling pressure.

All the other hypothesized relationships of organizational factors were not supported. Prior researchers analyzing the relationship between unethical behavior and organizational factors have led to mixed findings. Some previous works are in line with the findings of the current study. Despite the fact that, the life insurance business consists of higher rates of commissions, Kurland (1996) found that a rewarding system (commission earning) does not significantly regress unethical behavior. Cooper and Frank (1991) highlight that organizational ethical culture does not encourage insurance agents to act ethically. Chandrarathne and Herath (2020) stated that the organizational culture of Sri Lankan life insurance companies does not affect the unethical behavior of insurance agents. However, our findings are also not

consistent with some prior studies which provides evidences for the significant causal relationships of rewarding system, organizational culture, and ethical climate with unethical behavior (Hsu et al., 2009) (Hair et al., 2009) (Baglione and Zimmener, 2007) (Shafer and Wang, 2010) (Yi et al., 2012). More importantly, in the Sri Lankan setting, the supervisory role and reward system significantly influenced unethical behavior (Chandrarathne and Herath, 2020). Therefore, our findings have contributed to a debate in this domain.

We witness very strict competition prevails within the top performing companies in the life insurance market. When the competition is intense, misconducts are triggered against the rivalry in order to grab the market share. Confirming the same, our findings show that competitive intensity significantly affects the unethical behavior of insurance agents. Nonetheless, some previous findings are contrary to our findings (McLaren, 2013) (Schwepker, 1999). Yi et al. (2012) argued that competitive intensity is unrelated to mis-selling of life insurance because the financial services sales agents should establish and develop long-term relationships. However, their findings were entirely based on telemarketing which represents a very small percentage of sales in the Sri Lankan context. But our findings are based on a highly competitive distribution channel which is direct sales agents.

Present findings do not align with the results of Gibbs (1993) and Yi et al. (2012). Both product complexity and product variety are positively influenced by mis-selling of life insurance products sold via telemarketing (Yi et al., 2012).

As per our results, both the product factors do not have a significant relationship with the unethical behavior of life insurance agents.

The possible reason for this might be the face-to-face interaction provided by the direct sales agents enables customers to clarify wordings and understand various products. Therefore, it can be concluded that the complex nature of the life insurance policies due to the policy terms, conditions and warranties along with the wide range of products do not give rise to unethical behavior.

4.7. Research implications

The findings of the study also hold significant implications for the practical context of the insurance industry in Sri Lanka. Since the sales pressure is an organizational factor insurance companies themselves have to pay more attention to reducing the selling pressure created on insurance agents. Sales target is a vital source of sales pressure (Hair et al., 2009). Consequently, decreasing the sales targets of the company reduces the unethical behavior of insurance agents. Inability to cover the sales targets can hinder the employability of the agents. Hence, the struggle to cover the sales targets ends up with misconducts. There is a considerable number of inactive life insurance agents that remain in the market yet. Part-time basis employees also give rise to unethical activities because employees struggle with limited time to make sales. Therefore, recruiting agents solely on a full-time basis enable reducing the sales pressure. The competition is very much intense in the Sri Lankan insurance market among the market leaders as they have almost equal market shares. The competition should be a win-win that benefits both insured and insurer. Therefore, there is a need to focus on creating healthy competition refraining from exaggeration of own products over competitors and disparaging competitors which might remain a black mark for the entire industry. Towards this end, the role of regulators should be to demotivate the anti-competitive behavior in the market by means of encouraging the observance of voluntary code of conducts incorporated by IRCSL and issuance of guidelines for fair competition. Moreover, insurance policies must be in line with the principle of fairness which is referred to as both the parties to the insurance contract understand the same thing in the same sense. This enhances the clarity of the offering and convenience of selecting best suited product.

5. Conclusion

The current study investigates the factors affecting the unethical behavior of the life insurance agents in Sri Lanka. The variables for the study were identified through a comprehensive reading of previous literature and they were categorized as organizational factors, environmental factors and product factors. Eight hypotheses were

posited based on the identified variables. Multiple regression analysis was employed to investigate the relationship between independent variables and dependent variables. According to the results, only selling pressure and competitive intensity have a significant positive relationship with salesforce behavior. All the other hypotheses were rejected. Furthermore, selling pressure has a strong relationship with unethical behavior rather than competitive intensity. The value of the adjusted R square of the final developed model was 0.225. Therefore, sales pressure and competitive intensity count for 22.5% of the variance of salesforce behavior. The other 77.5% of the variance of salesforce behavior was explained by other variables that are ignored in the study. These determinants include organizational scale, sales persons' age, sales persons' education, salespersons experience, professional accreditation, managerial position, gender and sales orientation. Sitting on the results, it can be concluded that there are numerous antecedents which influence on salesforce behavior to be examined. Finally, suggestions for insurers to reduce the sales pressure and regulators to create healthy competition are provided based on the empirical findings.

5.1. Limitations and future research

Despite insightful implications, the current study is not without a few limitations. First, only few independent variables from the existing literature were concerned to present the model. Second, a quantitative research approach was used. Future studies can adopt other personal factors (e.g.: age, education, experience, subjective norms), organizational factors (e.g.: organizational scale) and environmental factors (e.g.: community culture) which are to be empirically tested in the Sri Lankan context yet. Consequences of unethical behavior are also another promising field. Future studies can validate our findings using qualitative approaches too. Finally, investigation of the factors using the customer perspectives is another research arena

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Does Financial Literacy Upgrade the Retirement Readiness and Living Standards of Farmers in the Kurunegala District in Sri Lanka?

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Abstract

The purpose of this research is to identify how financial literacy impacts retirement readiness and living standards among farmers in Sri Lanka. This study investigated 200 farmers through a structured questionnaire. We selected the farmers on a convenience basis for the study while considering the density of the farmers' population in the Northwestern Province in Sri Lanka. Thereby, we used experimental research strategy and quantitative methods to address the research question. By considering financial literacy as the independent variable and retirement readiness and living standards as the dependent variables, we developed two ordinary least square regression models to test the hypotheses of the study. The findings of the preliminary survey revealed that most farmers maintain saving accounts, but they visit banks occasionally. Moreover, more than 50% of them are not aware of retirement planning benefits. However, the regression models highlighted that financial literacy has a strong positive impact on retirement readiness and living standards among farmers. Thus, we could recommend developing more awareness among farmers on financial literacy by responsible authorities, which could be possibly uplift the retirement status and living standards of farmers in Sri Lanka.

Keywords*: Farmers, Financial Literacy, Living Standards, Retirement Readiness.*

1. Introduction

According to the Central Bank report 2019, 25.3% of the labor force in Sri Lanka carry on their jobs connected with the agricultural sector. Sri Lankan economy considers agriculture crops, fisheries, livestock, and forestry together in national accounting (Gunawardana, 2018). As per the observations in Sri Lanka, framing is an informal occupation and there is no fixed retirement age for farmers. Thus, it has been observed that the farmers continue working beyond the age of 60 years. Parallelly, there is a social concern that farmers may not generate the same level of income when they become old and disabled as they did at an early age in their life. Since Sri Lanka is currently focusing on developing a National Agricultural Policy (The Island Online, 2020) to support the agricultural economy, we believe it is time to discuss the enhancement of living standards and the retirement stage of the farmers in Sri Lanka.

A study identified that financial literacy is a complex phenomenon and a determinant of other behavioral factors. Further, it ensured that financial literacy has a positive impact on individuals' compulsive buying behavior, followed by a propensity to indebtedness and finally materialism as an indicator of the living standards of a person (Potrich & Vieira, 2018). However, lack of financial literacy is recognized as a significant fact for global poverty, and thereby, financial literacy has become necessary for sustained livelihood. Thus, helping people to make sound financial plans and to manage their financial affairs can make an important contribution towards facilitating communities and households to improve their standards of living (Engelbrecht, Lambert, & Ornellas, 2019).

People with relatively high financial literacy tend to have a few things in common, regardless of where they live. It would help households with day-to-day financial tasks, deal with a financial emergency, and even pull them out of the clutches of poverty (Garg & Singh, 2017). Further, there is evidence that the least financially literates are the least likely to save for retirement (Lusardi & Mitchell, 2009). Thereby, a concern raised whether *financial literacy could help the farmers to uplift their living standards and retirement*

readiness. Therefore, the current research addressed how well financial literacy among farmers impacts their retirement readiness and living standards.

Even though there have been many prior studies addressing the influence of financial literacy on retirement planning in different geographical contexts (Kalmi & Ruuskanen, 2018; Antoni, Saayman, & Vosloo, 2020; Tan & Singaravelloo, 2020; Niu & Zhou, 2018; Boisclair, Lusardi, & Michaud, 2014), limited attention has been drawn towards the impact of financial literacy on retirement readiness and the living standards of farmers. Thereby, this study is distinctly focused on the financial literacy, retirement readiness, and living standards of farmers specifically, while addressing the observed educational needs under the preliminary survey that we conducted within the Sri Lankan context. Some Sri Lanka-based studies have frequently focused on best farming practices to provide agriculturally based support to the local farmers (Senanayake & Rathnayaka, 2015; Abayarathna & Sandika, 2019). However, still there is a need of conducting studies towards their retirement and living standards to provide the necessary support to enhance the quality of life among farmers.

As a rational thought, we accept the fact that farmers need both farming advice (Bachhav, 2012) and guidance to maintain their lives smoothly even for day-to-day living standards and for tomorrow's retirement stage. The Central Bank of Sri Lanka and some public and private organizations conduct financial educational programs for communities, and the findings of this study will direct them to the main areas of focus by drawing attention to developments in the financial literacy levels among farmers in Sri Lanka.

2. Literature Review

Financial literacy provides the basic idea about financial concepts and choices such as saving, investing, paying, and borrowing (Klapper, Lusardi, & Oudheusden, 2015). As per Modern Portfolio Theory, financial literacy is the ability to collect relevant and important information, in addition to differentiating between diverse financial

options, discussing monetary and financial issues, and planning and proficiently answering the events affecting the daily financial decision-making. The lack of financial literacy is the main variable for the lack of portfolio diversification (Mouna & Jarboui, 2015).

To evaluate Americans' financial knowledge, Lusardi & Mitchell (2011) introduced three financial literacy questions that were developed for the American Health and Retirement Study in 2004. Those questions cover the fundamental concepts of economics and finance which have been used in every transaction such as simple calculations about interest rates, inflation, and the workings of risk diversification. Atkinson & Messy (2012) considered financial knowledge, behavior, and attitudes to measure financial literacy. They revealed a positive relationship between financial behavior and financial literacy.

Foley & Lytle (2015) review the theory of work adjustments as a choice of some older workers' desire to continue working and remain engaged in a personally fulfilling career or to transition to a new career beyond retirement, but for other workers, this decision is driven by financial need. These different desires give an important insight into the retirement readiness of a person. Lusardi & Mitchell (2014) discovered that financial literacy is associated with retirement planning and retirement wealth accumulation significantly. They have concluded that financial literacy appears to be highly influential in helping older households to equip themselves with longevity risk protection in retirement.

Financial literacy increases the probability of having a savings plan for retirement and if people save regularly when they are children, they are more likely to develop a retirement plan when they become adults (Sekita, 2011). Thereby, a majority of studies concluded a positive relationship between financial literacy and retirement planning (Sekita, 2011; Perera, 2019; Klapper & Panos, 2011; Antoni, Saayman, & Vosloo, 2020; Kalmi & Ruuskanen, 2018; Tan & Singaravelloo, 2020; Niu & Zhou, 2018).

The likelihood of planning for retirement is highly co-related with financial literacy and that relationship remains strong even after

controlling for wealth and other demographic variables in Russia (Klapper & Panos, 2011). Fernandes, Lynch, & Netemeyer (2013) demonstrated that financial literacy plays a key role in financial preparation for retirement. A study based in Sri Lanka also revealed that if someone has a good financial literacy rate, such respondents tend to choose a retirement plan (Perera, 2019).

Retirement planning is a key element of retirement readiness which is the cognitive preparedness of individuals for their retirement. Besides, there is limited research conducted to analyze the link between farmers' retirement readiness behavior and their financial literacy.

The amount of money and comfort people have in a particular society explains as a living standard and it uses to refer to the level of comfort in which people live and it usually depends on how much money they have (Pass, 2020). Noll (2007) interpreted 'household consumption and income' as measures of living standards based on data from Household Budgeted Surveys.

The economic recession threatens financial well-being and causes economic concerns related to living standards like health, debts, income, and career advancement. However, having financial literacy skills can post an inverse effect on those concerns. Also, by having financial literacy one could influence the conditions of life and work and it can be very helpful in anticipating the future and increasing human income (Taft, Hosein, Mehrizi, & Roshan, 2013). Further Lusardi & Mitchell (2014) traced the several fundamental concepts that lie at the root of saving and investment decisions as modeled in the life cycle setting. General knowledge like education and more specialized knowledge like financial literacy contribute to more informed financial decision-making in life.

The indicators of financial literacy and the standard of living of an individual are fully and directly connected and mutually interdependent (Fabris & Luburic, 2018). Moreover, financial literacy has been recognized with its significant capability for eliminating poverty globally and it has become more necessary for sustained livelihood (Engelbrecht & Ornellas, 2019).

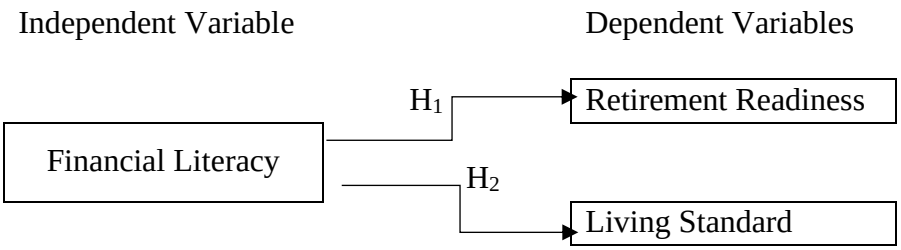
A study stated that a formal education level was extremely low among farmers and 61% of the farmers did not get any formal education beyond primary school. Thus, it was recognized a low level of financial literacy among the farmers (Serin, Bayyurt, & Civan, 2009). Parallelly, Asian country, Bangladesh confirmed that financial literacy is positively associated with their farmers' technical efficiency (Afrin, Haider, & Islam, 2017).

Solinge & Henkens (2007) highlighted that life transitions, including retirement, are subject to social norms about appropriate timing. Also, the cultural and individual norms and expectations about the "right" time for a transition influence not only the individual's transition but also the meaning attached to the transaction by others. However, in developing countries, farmers tend to work beyond their retirement age to earn living for their families (Perera, 2019). Meanwhile, the findings have been confirmed that there is a further need of developing the living standards of the farming households (Serin, Bayyurt, & Civan, 2009). Thus, the lack of financial literacy due to the educational gap could cause social issues among farmers.

3. Methodology

Based on the objectives of the study we generated hypotheses by using existing literature, following Positivism. We applied the deductive research approach and developed a conceptual framework. Thereby, we followed quantitative research methods to analyze the duly collected data. The study used the mono research method and collected cross-sectional data based on a Likert scale questionnaire to quantify the variables addressed in the below conceptual framework.

Figure 7: Conceptual Framework



Source: Empirical Findings

To express the relationships of the conceptual framework, we developed two regression models as follows.

$$RR = \beta_0 + \beta_1 FL + \epsilon_0 \rightarrow (1)$$

$$LS = \beta_0 + \beta_2 FL + \epsilon_0 \rightarrow (2)$$

The first regression model reveals the relationship between Financial Literacy (FL) and Retirement Readiness (RR), and the second regression model finds the relationship between Financial Literacy (FL) and the Living Standards (LS).

β_0 represents the intercept of that sample regression line and the $\varepsilon_\circ$ represents the error term of the model. β_1 explains the relationship between FL and RR while β_2 explains the relationship between FL and LS.

As per the Agricultural Household Survey 2016/17, Kurunegala district has a higher farmer population. Accordingly, among the farmers in the Kurunegala district, we selected 200 farmers as the sample for the study following the convenient sampling method. We collected primary data through a structured questionnaire which was developed based on the literature from various research papers on financial literacy, retirement readiness, and living standards.

We conducted a preliminary survey among farmers to obtain an understanding of their living standards and banking habits. Then we collected the data on the considered variables by using the duly developed questionnaire. We designed the questions to measure the

variables based on five-scale Likert and developed the regression models to test the below hypothesis based on the weighted averages obtained for each variable.

Accordingly, the alternative hypotheses considered for the study are as follows.

H_{1a}: Financial literacy is significantly and positively impacting to determining better retirement readiness among farmers in the Kurunegala district.

H_{1b}: Financial literacy is significantly and positively impacting to determining better living standards among farmers in the Kurunegala district.

4. Findings of the Study

The demographics of the sample selected are as follows.

Table 13: Demographic Characteristics

	Explanatory variable	Numbers	Percentage (%)
Gender	Male	142	71
	Female	58	29
	Total	200	100
Age	18-29	10	5
	30-39	16	8
	40-49	52	26
	50-59	64	32
	Above 60	58	29
	Total	200	100
Educational level	Below O/L	57	28
	A/L	87	44
	A/L & above	56	28
	Total	200	100
Civil status	Single	13	6
	Married	187	94

	Total	200	100
No of dependents	1-3	97	48
	4-6	98	49
	Above 6	5	3
	Total	200	100

Source: Author Developed

Table 1 highlights some demographic characters of the farmers sampled for the study. Accordingly, most of them (71%) are males. When considering their age levels, 64 farmers are in their 50's and 58 farmers are in their 60's. Thus, it highlights the aging character of the farmers in Sri Lanka. Further, it signals the severe need for a formal retirement plan for them to reduce potential social issues within Sri Lanka. Their education level is in a good position because more than 50% of farmers have got A/L and above education. However, there are 187 married farmers in the Kurunegala area and most of them have 1-6 dependents in a family. These demographics highlight the imbalance in living standards that they would experience when they are aging.

Table 14: Demographic Characteristics

	Explanatory variable	Numbers	Percentage (%)
Cultivation method	Paddy	78	39
	Coconut	47	23
	Livestock	17	9
	Other (vegetables, fruits, etc.)	58	29
	Total	200	100
Income gap	Monthly	69	34
	Quarterly	53	27
	Bi-annually	52	26
	Annually	0	0
	Randomly	26	13
	Total	200	100
Monthly income	Less than Rs 10,000	31	15
	Rs 10,000-30,000	120	60

	Rs 30,000-50,000	39	20
	Above Rs 50,000	10	5
	Total	200	100

Source: Author developed

The cultivation method portraits a clear picture of farmers in the Kurunegala area. Paddy becomes the leading cultivation among 39% of farmers. Approximately 1/4th of farmers from the sample are involved in coconut cultivation. Comparatively, there is a higher percentage of farmers involved in other cultivations such as vegetables, fruits, etc. than live stocks.

When assessing the income status of the farmers' majority of them are focusing on monthly income. However, more than 50% of farmers stated that their income is quarterly, bi-annually, or randomly.

When we consider the monthly income of farmers, most of them (60%) stated that their monthly income is between Rs 10,000 to Rs 30,000 in a month. However, 15% of the sample stated that their income is below Rs. 10,000 and 20% of farmers earn between Rs 30,000 to Rs 50,000. Only 5% of farmers can earn above Rs 50,000.

The significance of financial literacy and the need for a retirement plan for farmers can be further emphasized by considering the aging character among farmers, no of dependents, and the level of income.

4.1. Survey on Banking Practices and Living Standard

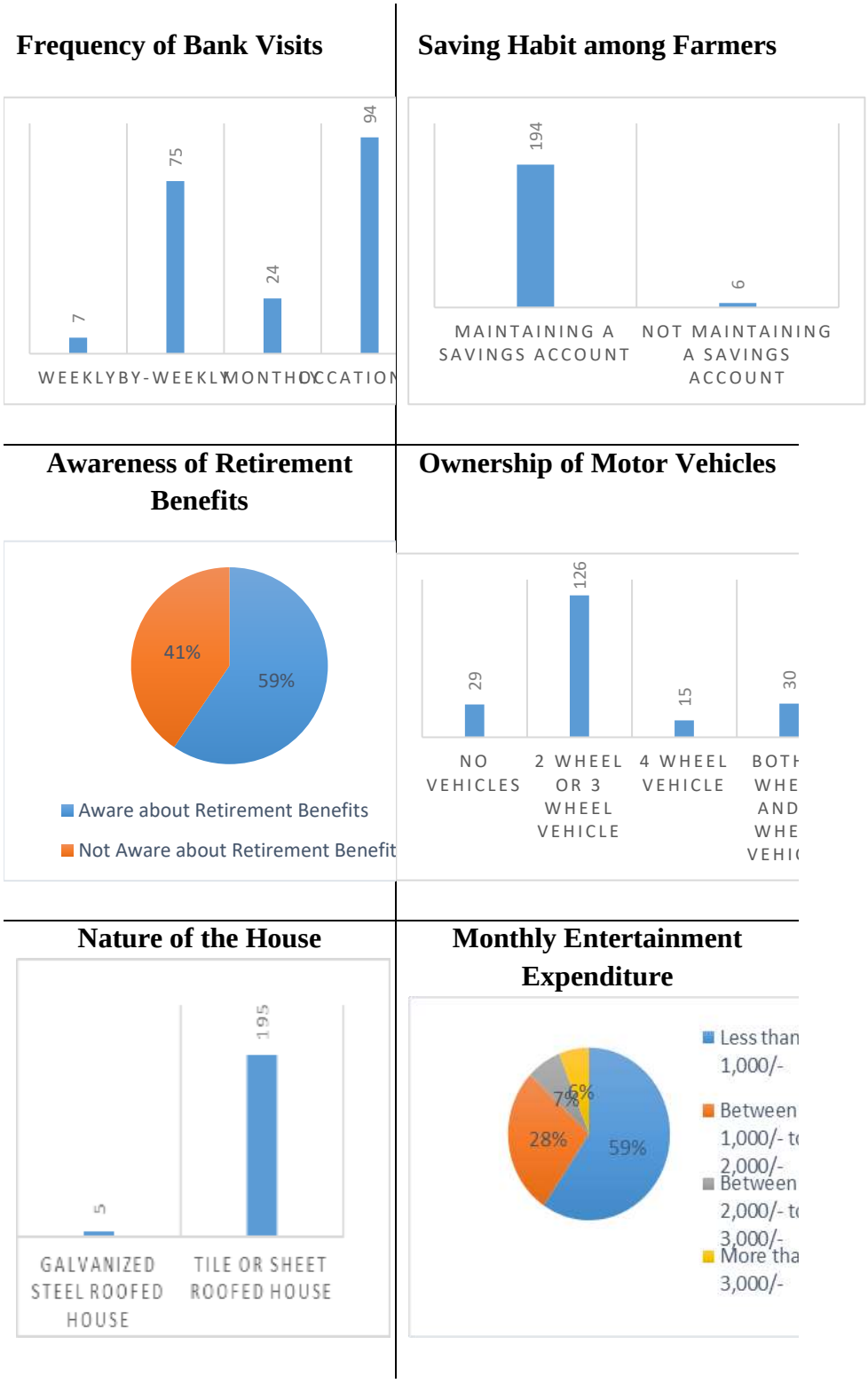


Figure 2: Survey on Banking Practices and Living Standards

A survey was conducted to understand the banking habits and savings behavior and living standards of the farmers. This provided a preliminary understanding of their living standards and banking behavior. As per Figure 2, many of the farmers visit banks bi-weekly or occasionally. However, 194 from 200 farmers maintain a savings account, thus there's 3% of farmers do not maintain savings accounts. Among the sample, 59% of farmers are not aware of the retirement plans which could make them highly vulnerable at their dotage.

When assessing the living standards of farmers more than 100 farmers have two or three-wheel however approximately 15% of the farmers stated that they aren't own any vehicle. 97.5% of farmers live in tile or sheet roofed houses and others have galvanized steel roofed houses. Figure 6 stands for monthly entertainment expenditures of farmers. More than half of them (59%) allocate less than Rs 1,000 for entertainment activities from their monthly income.

Since the preliminary survey provided background knowledge about their banking habits and living standards based on the conceptual framework, a five-point Likert scale questionnaire was developed to collect data of all independent and dependent variables of the study.

4.2. Assessing the Normality of the Variables

We used Jarque-Bera statistics to measure the normality of the data collected to define the variables. The test considered the below hypothesis to confirm the nature of the distribution.

H_0: The data is normally distributed

H_1: The data is not normally distributed

Table 15: Data Distribution Analysis

Variable	FL	RR	LS
Skewness	0.235465	-0.164345	0.117353
Kurtosis	3.250108	2.958129	2.770892
Jarque-Bera	2.369407	0.914918	0.89648
Probability	0.305837	0.63289	0.638751
Observations	200	200	200

Source: Output of analysis

The P-value of the Jarque-Bera statistic of all the variables accepts the null hypothesis (FL: P-Value (0.305837) > 0.05, RR: P-Value (0.63289) > 0.05, LS: P-Value (0.638751) > 0.05), thus the data is normally distributed. Also, the skewness, which is closer to zero, and the kurtosis which is closer to three of each variable further confirmed the normal distribution of data collected.

4.3. Assessing the Reliability of the Questions

We used the Cronbach's Alpha statistic to test the reliability of questions used to define the variables in the conceptual framework.

Table 16: Cronbach's Alpha Values

Reliability Statistics		
Variable	Cronbach's Alpha	N of Items
Financial Literacy "FL"	0.865	9
Retirement Readiness "RR"	0.863	6
Living standards "LS"	0.894	4

Source: Output of analysis

As per Table 3, Cronbach's Alpha value of FL, RR, LS is 0.865, 0.863, and 0.894 respectively. Since all these values are beyond 0.8, we can confirm strong reliability within the questionnaire when defining the variables through the questions.

4.4. Assessing the Adequacy of the Sample and Multicollinearity of the Variables

Table 17: KMO & Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.716
Bartlett's Test of Sphericity	Approx. Chi-Square	235.795
	df	3
	Sig.	0.000

Source: Output of analysis

KMO statistics measures the sampling adequacy of the variables and Bartlett's test outlines the redundancy between those variables. The favorable KMO value is greater than 0.5 and Bartlett's Test value is lesser than 0.05.

The KMO statistics result (0.716) in Table 4, is greater than 0.5 which emphasis the adequacy of the sample size to conduct the study. The P-value of the Chi-square statistic is 0.000 < 0.05 rejects the null hypothesis of Bartlett's Test, thus it is concluded that the variances are not equal between the dependent variables. Hence, there is no redundancy between the dependent variables.

4.5. Correlation Matrix

Table 6: Correlation Matrix

		FL	RR	LS
FL	Pearson Correlation	1	0.662**	0.652**
	Sig. (2-tailed)		0.000	0.000
	N	200	200	200
RR	Pearson Correlation	0.662**	1	.575**
	Sig. (2-tailed)	0.000		0.000
	N	200	200	200
LS	Pearson Correlation	0.652**	.0575**	1
	Sig. (2-tailed)	0.000	0.000	
	N	200	200	200
**. Correlation is significant at the 0.01 level (2-tailed).				

Source: Output of analysis

As per Table 05, the correlation between FL and RR is 0.662 and the correlation between FL and LS is 0.652. Thereby, FL, RR, and LS are moderately and positively correlated together and the correlation between the independent and dependent variables are significant. Thus, two ordinary least square regressions were developed to understand the impact between independent and dependent variables.

4.6. OLS Regression Results

Table 18: OLS Regression Model 01 and 02 results

Model	Dependent Variable		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
1	1: RR	(Constant)	0.719	0.196		3.662	0.000
		FL	0.743	0.060	0.662	12.438	0.000
2	2: LS	(Constant)	0.544	0.222		2.450	0.015
		FL	0.817	0.068	0.652	12.096	0.000

Source: Output of analysis

$$RR = 0.719 + 0.743FL + \epsilon \rightarrow (1)$$

$$LS = 0.544 + 0.817FL + \epsilon \rightarrow (2)$$

As per table 06, the first model shows the relationship between the independent FL and RR which explains a positive and significant relationship (P = 0.000 < 0.05). The model explains that an increase in financial literacy among farmers can increase their retirement readiness from approximately 74.3%. The second model that explains the relationship between FL and LS also stated a significant and positive relationship between the two variables (P = 0.000 < 0.05). In addition, the model emphasis there is an 81.7% of likelihood to increase the living standards of farmers by increasing their financial literacy levels.

4.5. Residuals of the Regression Models

We tested the reliability of the regression models by testing the behavior of the residuals by using Breusch-Pagan-Godfrey Heteroskedasticity Test and the Breusch-Godfrey Serial Correlation LM Test.

Table 19: Heteroskedasticity test and BG correlation LM test

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
Model 01	F-statistic	1.432327	Prob. F (1,198)	0.2328
	Obs*R-squared	1.436404	Prob. Chi-Square (1)	0.2307
	Scaled explained SS	1.646305	Prob. Chi-Square (1)	0.1995
Model 02	F-statistic	0.582606	Prob. F (1,198)	0.4462
	Obs*R-squared	0.586764	Prob. Chi-Square (1)	0.4437
	Scaled explained SS	0.60929	Prob. Chi-Square (1)	0.4351
Breusch-Godfrey Serial Correlation LM Test:				
Model 01	F-statistic	4.060995	Prob. F (2,196)	0.0187
	Obs*R-squared	7.957977	Prob. Chi-Square (2)	0.0187
Model 02	F-statistic	2.516035	Prob. F (2,196)	0.0834
	Obs*R-squared	5.006236	Prob. Chi-Square (2)	0.0818

Source: Output of analysis

Table 7 previews the heteroskedasticity test and serial correlation LM test results for both models. The P-values of F-statistics of the Breusch-Pagan-Godfrey Heteroskedasticity Test confirms that the error variances are equal for both the models (Model 01: $P = 0.2328 > 0.05$ and Model 02: $P = 0.4462 > 0.05$). On the other hand, Breusch-Godfrey Serial Correlation LM test results show a serial correlation among residuals of model 01, however no serial correlation among residuals of the regression model 02.

Accordingly, we used these model results to test the hypothesis we developed within the study.

Table 20: Summary of Hypothesis Testing

Hypothesis	Co-efficient	Reported sign	P-value	Relationship	Results
H1	0.743	Positive	0.000	Significant	Accepted
H2	0.817	Positive	0.000	Significant	Accepted

Source: Output of analysis

H_{1a}: Financial Literacy is significantly and positively impacting to enhance the retirement readiness among farmers in the Kurunegala district.

The results of the first regression model we accepted the alternative hypothesis developed with a 95% confidence level as the P-value = 0.000 < 0.05. Therefore, it is confirmed that there is a significant positive relationship between Financial Literacy and Retirement Readiness among farmers.

H_{1b}: Financial Literacy is significantly and positively impacting to enhance the living standards among farmers in the Kurunegala district.

Similarly, regression model 02 confirms that financial literacy has a positive and significant influence on the living standards of the farmers with a 95% confidence level as the P-value = 0.000 < 0.05.

5. **Discussion and Conclusion**

The literature stated that there is limited knowledge among farmers on financial literacy (Afrin, Haider, & Islam, 2017) and further found that financial literacy can enhance the retirement readiness and living standards of individuals (Rooij, Lusardi, & Alessie, 2011). Further to the preliminary survey, we observed that farmers have occasional banking habits, low knowledge of retirement plans, and average living standards. Although the Central Bank Annual Report (2020) stated the mean household income as of 2016 is Rs. 62,237 per month the survey revealed that the majority has a low level of monthly income. Thus, we directed the current study to understand whether we can use financial

literacy knowledge to enhance the living standards and retirement readiness among farmers.

Based on the data analysis it was confirmed that there is a significant positive relationship between financial literacy and retirement readiness among farmers. In line with our findings, Alemenberg & Save-Soderbergh (2011) also confirmed that there is a positive and statistically significant relationship between financial literacy and planning for retirement among Swedish adults. Sekita (2011) further confirmed that financial literacy increases the probability of having a saving plan for retirement readiness in Japan. Parallelly a study conducted by Perera (2019) confirmed that there is a high possibility of one respondent having a retirement plan when he/she belongs to a higher financial literate category. Thus, the findings of the study support the positive relationship between financial literacy and retirement readiness.

The regression model 02 concluded that financial literacy has a positive and significant influence on the living standards of the farmers. Consistent with these findings Taft, Hosein, Mehrizi, & Roshan (2013) also revealed that financial literacy is statistically linked with living standards. This study expresses that the financial management ability among individuals is also impacted by high financial literacy. Thus, it makes humans assess their economic situation to achieve a less stressful and worrying life.

Based on the findings we expect to direct the attention of the government and the government authorities such as the Ministry of Agriculture, Agricultural Development Department, and Divisional Secretariat Office to introduce more awareness programs for farmers to uplift their knowledge in retirement planning and living standards.

Lusardi & Mitchell (2009) highlighted the need for a greater level of financial sophistication among youngers, despite the difficulties and costs related to the promotion of financial literacy. Since most farmers have no proper plan or idea about retirement planning, proper guidance and mechanism would help them to have a stable retirement age. The authorities can further enhance the awareness of the *Farmers' Pension* and *Social Security Benefit Scheme* in Sri Lanka which is the

government pension plan established for Sri Lankan farmers. Thus, the authorities can organize the awareness programs at the committee level ("*Govi Samithiya*") which gathers all farmers into one place. Also, a structured follow-up process needs to be there to get a flashback of all these activities and thereby to find the spaces and get the necessary re-corrections to fill the gap. That is a good innovative point to enhance the financial literacy level of farmers and to enlighten their retirement readiness and living standards.

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The Relationship Between Financial Distress Risk and Stock Returns: Evidence from Sri Lanka

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Abstract

If the financial foundation of the company is weak and appears to be in bankruptcy, it can adversely affect all people who are involved in business and financial partnerships with the company. Therefore, the main objective of this study is to identify, whether there is any significant difference in between a Stock return in terms of capital gain of a financially distress company and non-distress company. The Z-score model developed by Altman which is concluded by many researchers as a highly reliable measurement of capturing the distresses situation of a company operates in a country like Sri Lanka has used as a proxy for measuring the financial distress and categorization of the companies in the study. This study has used data from 101 listed companies over period of 5 years taking 500 observations. Therefore, within 101 companies, 59 companies were determined as non-distressed and gray area firms because their Z scores were higher than 1.81, whereas 42 companies were categorized as distressed because of lower scores than 1.81. For the easiness of the calculations and understanding the gray area companies have also obtained under non-distressed category. The analysis indicates that there is not any significant difference between the stock returns of distressed company over non-distressed company. It is also examined from empirical studies that the mathematical interpretation and earlier findings of the distress situation, book to market effect and the market capitalization on stock returns do not hold in the case of Sri Lankan companies on the Colombo stock exchange. Through looking individually and collectively at the return patterns of financially distressed and non-distressed companies, the study can be used

effectively for successful decision-making for investors as well as corporate bodies when getting their investment decisions.

Keywords*: Bankruptcy; B/M ratio; Financial Distress; Stock Returns; Z-score.*

1. Introduction

Going concern is one of the most important aspects of an any given company in the viewpoint of an investor. Therefore, several metrics are used to measure the financial situation and consequences of companies and show the probability of bankruptcy. When it comes to the country like Sri Lanka, there is a high rate of business bankruptcy rate within the shorter period of time after implementation. Further, even a larger listed company also can be bankrupt. This will be evidenced by the companies that are under the "watch list" of the Colombo stock exchange or the "Blacklisted" companies. Basically, these kinds of companies will approximately equal to 9% of the total listed companies in the Colombo stock exchange per year. Therefore, there is a question whether this financial distress risk will affect the stock returns of a selected company or is there any difference between the stock returns of a financially distressed company and non-distressed company. Therefore, When determining the distress situation of a company within Sri Lanka, one of the most prevalent models which is the Z-score model developed by Altman has used and this has further concluded by (Gunathilaka, 2013); Niresh and Pratheepan (2015); (Vassalou & Xing, 2004) that the applicability of Altman's Z-score model in determining the financial distress risk within the Sri Lankan context is at a high level. Therefore, within this study, selection of Z-score model as a good predictive model of financial distress risk and after successfully identifying the distress companies, study observed the pattern of stock returns in terms of capital gain for the selected companies. The study tried to figure out whether Z-scores can be recognized as a signal and whether investors change their portfolio decisions accordingly. It is analyzed whether an investment strategy was accompanied by the acquisition of stocks of companies with high Z-scores (Z>2.29-Safe) or (1.81<Z<2.29-Gray) and the sale of lower ones(Z<1.81-Distressed). Therefore, the main

objective of this study is to identify, whether there is any significant difference in stock returns in terms of capital gain of a financially distress company and non-distress company. Further, this research has backed by the strong literature including some theories and various empirical studies over the concludes conflicting results on the relationship between financial distress risk and stock returns, because some studies have mentioned that there is a positive relationship between financial distress risk and the stock returns (Shen, Liu, Wang, & Zhou, 2020). some studies depicts that there is a negative relationship among financial distress risk and the stock returns while some studies mention that there is not any kind of relationship as well. Then whatever the analyst about the companies in Colombo Stock Exchange can be benefited by this analysis, as he/she can get an idea about what are the companies will not perform well in near future because in advance, he/she can analyze what are the companies that will ended up with the Watchlist or the Blacklist and avoid those from his/her portfolio. Therefore, this study will successfully help to figure out whether Z-scores are recognized as a signal and whether investors change their portfolio decisions accordingly comparing it with the stock returns, without ended up with a loss.

The rest of the paper is structured as follows. The next section presents the most recent literature. The third section describes the data, sample, and variable constructions for this study. The empirical results are discussed in the fourth section, followed by the conclusions in the final section.

2. Literature Review

Financial distress is a situation under which a corporation or individual is unable to produce enough profits or revenue, leaving it unable to satisfy or pay its financial obligations. Therefore, there are some major theories that can be used, based on the both accounting and market-based variables including Z-score of Altman (1968), Ohlson (1980) O-score, Expected default frequency from Merton's option pricing model from Vassalou and Xing (2004) and failure probability from Campbell, Hilscher, and Szilagyi (2008) as a measures of financial distress risk.

The Altman Z-score is the outcome of a credit strength test that tests the probability of mainly in the bankruptcy of a publicly held manufacturing corporations. The Altman Z-score is based on five financial ratios that can be determined from data taken from the annual reports of a companies. In 2007, Altman estimated that the median Altman Z-score among businesses was 1.81. This revealed that 50% of businesses were likely to have lower probability of bankruptcy. When it comes to Sri Lankan context there are few studies that have been carried out in relation to determine the good predictive model for financial distress of a firm or to identify the distressed companies within the listed companies in Colombo Stock Exchange such as Niresh and Pratheepan (2015). Further, Gunathilaka (2013) have also investigated that the Z-score model have a remarkable degree of accuracy in predicting financial distress in Sri Lankan contest. In addition to this study aims to capture this distress situations of the Sri Lankan companies using the Z-score model as well as by using Multivariate Discriminate Analysis (MDA) as the analytical technique. In addition to that, Niresh and Pratheepan (2015), has also concluded about the applicability of Altman's Z-score model in determining the financial distress risk within the Sri Lankan context is at a high level.

Then, a basic performance parameter of investment management is the holding period return. The calculation offers a holistic view of an asset or investment's financial success which it calls the investment's value. In simply, the total stock return can be identified as the return which investor receive when investing in the stock market and it can be received through two forms, profit through trading of shares (Capital gains) and dividend provided by the companies. Further, the estimate for the total return on stock is the price improvement plus any dividends paid, divided by the stock's original price. But in general, dividends are not fixed and mostly, those will be determined by the company profitability, liquidity or the dividend policy that have been practiced over time (Hallerbach, 2003). With that, there are three perspectives on stock returns (01) dividend policy is neither relevant nor requires specific estimation, (02) the amount of dividend is paid is linear to stock price and (03) there is a negative correlation between

dividend policy and stock price, meaning that lower dividend results in higher stock price (Miller & Modigliani, 1961). In addition to that this dividend irrelevance has further studies by PhD, Olarinde, and Abdullahi (2020) and have concluded that Dividend payments do not create wealth for shareholders, nor do they merely add value.

Further, Garlappi and Yan (2011) has revealed that default risk is a systematic risk and investors require a positive premium to bear such risk. As well as several papers such as Anginer and Yıldızhan (2018) has observed that financial distress risk increases equity returns. in addition to that, if a firm is facing higher distress risk, investors may demand higher premiums and in general highest distress risk tend to give higher returns as the theory of risk-return trade off (Boubaker, Nguyen, & Rouatbi, 2016). Further, Kulali (2016) has claimed that the Altman Z-score model was the most common model among accounting-based bankruptcy forecasting models, and so he used this model in his research. The data from companies listed in Borsa Istanbul were included in this research and filed for bankruptcy between 2000 and 2013. Further, the relationship between the returns and the distress risk will get negative in nature may be attributed to market mispricing has concluded by the researchers such as Shen et al. (2020) by indicating there is no clear identification on distress risk whether it is systematic or unsystematic. Further, Garlappi and Yan (2011) has revealed that default risk is a systematic risk and investors will expect a premium for that.

Therefore, after successful analysis about the literature related to the relationship between financial distress risk and the stocks returns, overall results are much conflicted yet and no consistency in even with most recent studies. Further, when it comes to Sri Lankan context even though there were many researches on identification of distressed companies or to test the accuracy of the Z-score model in predicting corporate bankruptcy, there is a lack of research on how the stock returns of a distressed firm behave or being determined with respect to other non-distressed companies within the market. Therefore, by undertaking this study about the relationship between financial distress risk and stock returns evidence from Sri Lanka, study tries to obtain a

clear comparison about how the stock returns are determined among the financially distressed and non-distressed companies or whether there is any significant difference in stock returns of a financially distress company and non-distress company.

3. Methodology

As per the evidence gathered from the literature, the multiple discriminant analysis is used as a statistical model; Altman's Z-score model and the test methodology involves computing the Z-scores for all the companies obtained in the sample within the period of five years from 2015 to 2019 (Gunathilaka, 2013). After, based on the Z-score values calculated, companies have categorized as distress, gray and non-distress companies. As per the easiness, the gray area companies have also obtained under non-distress companies because those are having less probability of become bankrupt in future (Altman, 1968). Then, based on the year that companies are distressed or non-distressed, the holding period return or the capital gain return have calculated. After calculating relevant independent and dependent variables for the study, a detailed analysis has done by using the following models and formulas further.

3.1. Formulas for The Selected Models and Variables for The Models

3.1.1. Altman's Z-Model (I): (Manufactures)

This model was developed by Edward Altman in 1968 using financial statement ratios and multiple discriminant analysis to predict bankruptcy for publicly traded companies.

$$\text{Z-Score} = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1X_5$$

In overall, if the Z-score is more than the 2.29 means the company in the basket of very low probability of bankruptcy also known as safe category, 2.99-1.81 means in the gray area and bellow 1.81 means there is a high probability of bankruptcy (Altman, 1968).

The variable that has used in the model can be explained as,

X_1: Working Capital /Total Assets ratio of working capital to gross assets compares the net liquid assets to the firm's total assets

X_2: Retained Earnings/ Total Assets As a percentage of total assets, this calculates gross profitability over time

X_3: Earnings Before Interest and Taxes/ Total Assets (EBIT/TA) is a ratio which calculates the earnings before interest and taxes (EBIT) of a corporation in relation to its total assets

X_4: Market Value of Equity / Book Value of Liabilities ratio will indicate how the company assets can be weakened in terms of value or the asset deterioration of the company

X_5: Sales / Total Assets is the level of asset turnover calculates the value of the sales or earnings of a company according to the value of its assets.

3.1.2. Calculating the stock returns (Capital gain)

$$\text{Stock Return} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

For the purpose of this analysis, as a method of calculating stock returns, the holding period returns for the year which the companies were distressed have obtained. Further, when obtaining the return, biasness has removed by only capturing the capital gain or the loss of a stock within the relevant period. In addition to that, the issues relating to the calculations of stock returns (The effect of stock splits, scrip dividend, dividend announcements on stock price) have ignored. The return has calculated by obtaining the relevant beginning and the ending prices which are already adjusted for those kinds of events happened during the relevant year.

3.3.3. Financial distress risk on equity returns along with size and book to market effect

For the purpose of analyzing the relationship between the main variables of the study, this study has also used the same model used by Dichev (1998).

$$R_i = \beta_1 + \beta_2 * Z + \beta_3 * MV_{i\,t} + \beta_4 * B/M + e_i$$

R_i: Stock returns
Z-score: Z-score used as a proxy for Financial Distress Risk

MV: Market Size or the Market value

B/M: Book-to-market equity ratio is estimated as the book value of equity at the end of the financial year divided by market value of the equity as at the same financial year end.

β: Coefficients capture the sensitivity of returns to the variations in the respective risk factors

3.2. Data Collection Methods and Instrument

For the purpose of this analysis, annual/interim financial reports of the selected companies over last 5-year period 2015 to 2019 have used which were published on the CSE data library as secondary data.

The summary of the selected sample based on the industry of 101 companies can be given as follows

Industry	**Companies**
1) Real State	19
3) Utilities	7
4) Food Beverage	20
5) Consumer Service	20
6) Capital Goods	15
7) Material	15
8) Household and Personal Products	5
Total	**101**

3.3. Population and Sampling

For the purpose of this analysis, (segments) as per GICS classification listed in the Colombo stock exchange were considered. When obtaining segments, Pharmaceuticals & Biotechnology & Life Sciences, Banks, Diversified Financials, Insurance, Commercial & Professional Services (segments) have excluded because of the different data representing methods as well as insufficient information availability.

3.4. Data Analysis

Data which gathered from the annual reports of the public listed companies screened and cleaned analysed by using IBM Statistical Package of Social Sciences (SPSS 26). Descriptive statistics, inferential statistics and regression diagnostics used mainly in describing the data. As well as data will be screened and cleaned.

4. Analysis

4.1 Descriptive Statistics

Table 4-21 Descriptive Statistics for all variables and descriptive statistics for dependent variable (Return) and main independent variable (Z-score)

Descriptive Statistics			
	Mean	Std. Deviation	N
Return	-.054	0.287	101
Z	5.42	12.63	101
B/M	250.45	20.41	101
M. Cap	6,313,146,692.86	29,140,887,353.68	101

Return	Non distressed	Mean	-0.015
		Std. Deviation	0.310
		Minimum	-0.53
		Maximum	1.16
	Distressed	Mean	-0.109
		Std. Deviation	0.243
		Minimum	-0.62
		Maximum	0.93

Source: Output of analysis

According to the Table 4.1, the average return of a company obtained within the sample for the study has shown a negative return of -0.545 (-5.45%) and this can be varied within the ± 28% range. (5.45% ± 28%), When it comes to the descriptive of the variable Z-score, it has given an average Z-score value of 5.42 and this Z – Score value can be varied by ± 126% range as well. (5.42. ± 126%), B/M Ratio has an average positive figure of 250.45 and it can be varied by ± 204% range. (250.45 ± 204%) and the average market capitalization of a company within the sample is Rs. 6.3 Bn.

Further, an average return of a financially non-distressed company is -1.5% (-0.015) and can be varied within the range of ±31%. When it comes to the other category, which is financially distressed companies, it shows an average return of a company is -1.09% (-0.109) which is also a negative figure or the reduction in share value relative to its previous year value and this value also can be varied within the range of ±24%.

4.2. Independent Sample T Test

Table 4-22 Independent Sample T Tests for the selected sample in terms of returns

Group Statistics					
	Distressed	N	Mean	Std. Deviation	Std. Error Mean
Return	Non-Distressed	59	-.0151	.31007	.04037
	Distressed	42	-.0109	.24389	.03763

Source: Output of analysis

In the output shows in above table 4.2, there are 42 distressed companies and 59 gray and safe companies. Further, the results have shown there are negative average returns for both distressed -1.09% (-0.0109) and gray and safe -1.51% (-0.0151) companies, respectively.

Table 4-23 Independent Sample T-Test under the assumptions of equal and not equal variances

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Return	Equal variances assumed	2.18	.14	1.64	99	.102	.094	.05744	-.019	.208
	Equal variances not assumed			1.71	97.95	.089	.094	.05519	-.014	.204

Source: Output of analysis

As per the above table 4.3 shows, as a summary, this study found that the returns of the financially distressed companies (-0.0109 ± .24 P/A) are indifference compared to return of the financially non-distressed (gray and safe) companies (-0.0151 ± .310 P/A) at the end of the relevant financial year.

4.2. Correlation Analysis

Table 4-24 Correlation of each independent variable with the Stock returns of selected sample of companies under the study

Correlations					
		Return	Z	B/M	M. Cap
Pearson Correlation	Return		.027	-.031	-.049
	Z			-.099	.098
	B/M				-.041
	M. Cap				
Sig. (1-tailed)	Return	.	.393	.378	.315
	Z		.	.162	.166
	B/M			.	.341
	M. Cap		.		.

Source: Output of analysis

According to table 4.4, correlation between the most important variables of this study, which are stock returns and Z-score have indicated a positive relationship but on the other hand, it indicates an insignificant very low strength of correlation between Z – score value and stock return by consistence with the findings of Anginer and Yıldızhan (2018). Further, the stock returns and B/M ratio have indicated a negative relationship cause its value is -0.031, based on the result, it also indicates an insignificant very low strength of correlation between B/M value and stock return by consistence with the findings of Idrees and Qayyum (2018), The stock returns and market capitalization have indicated a low negative relationship cause it value is -0.049 and based on that result, it is also indicating a very low or negligible strength of correlation between market capitalization and stock return as well.

4.6. Regression Analysis

4.4.1. Explanatory power of the model

Table 4-25 Explanatory Power of the model

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.066[a]	.044	.026	.29074	2.058

a. Predictors: (Constant), M. Cap, B/M, Z
b. b. Dependent Variable: Return

Source: Output of analysis

According to the above table 4.5, results will indicate that only 4.4% of the variation in dependent variable (stock returns) is captures by the used three independent variables for the model (Z-score, B/M ratio, market capitalization) and rest of the variation in stocks returns will be captured by the other variables that did not included in the selected model (Dichev, 1998).

4.4.2. Model significance

Table 4-26 Model significance

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.036	3	.012	.140	.936[b]
	Residual	8.200	97	.085		
	Total	8.235	100			

Source: Output of analysis

As per the result of this study, Sig value is 0.936 which is much higher than the 0.05 threshold ($p > 0.05$). Therefore, above table output indicates that, the regression model is not statistically significant in predicting the outcome variable which is stock returns. Further, the Z-score, B/M ratio, and market capitalization are not the best variables in determining the stocks returns as well.

4.4.3. Coefficients interpretation

Table 4-27 Coefficient's interpretation of the tested model

	B	Std. Error	Beta	t	Sig	Tolerance	VIF
(Constant)	.054	.034		-1.586	.116		
Z	.003	.002	.029	.288	.774	.981	1.019
B/M	-.002	.001	-.031	-.299	.765	.989	1.011
M. Cap	-.001	.000	-.053	-.517	.606	.989	1.011

Source: Output of analysis

The (B) coefficients inform us how many work output units improve in each projection for a single unit increase.

Based on the regression results in the Table 4.7, Z-score value or the predictor of the distress has an insignificant very low positive coefficient value of 0.003, B/M ratio has an insignificant very low negative coefficient value of -0.002 and the market capitalization has an insignificant very low negative coefficient value of -0.001.

4.5. The Graphical Relationship between Stock returns and Z-score

Based on the above graph 4.1 shows, it will further support the results obtained through the statistical analysis which is there is not any statistically significant relationship between the stock return and the Z-score value. On the other hand, it tells there is not any difference

between the stocks returns of financially distressed companies over non-distressed companies.

Graph 4-1 Graphical relationship between stock returns vs Z-score

Source: Output of analysis

5. Discussion

5.1. Findings of the Study

As explained in the introductory chapter, the key topic of the analysis is to identify, whether there is any significant difference in stock returns of a financially distress company over non-distress company. Therefore, the strong literature review and strong analysis which used multiple data analysing tools with 500 observations have implemented in the analysis to resolve this problem or to achieve the above-mentioned objective. The results are thus defined based on study questions and objectives as follows.

5.1.1. The relationship between Z-score and stock returns

The most important or the main objective of this study was to find whether the financial distress risk affect to determine the stock returns of a company or is there any significant difference in stock returns of a financially distress company over non-distress company. Therefore, as a

measure of financial distress risk, Z-score value was obtained. If the Z-score is greater than 1.81 it is considered as a financially distressed company and if it is above the 1.81, it is considered as a non-distressed company. Therefore, according to the results of the analysis, the average Z-score value of the entire sample of companies were 5.42 which also indicates most of the companies (52) within the obtained sample are non-distressed companies. Further, the average stock return of a particular company was negative (-5.4%) which also indicates stock returns of most of the companies within the sample are negative in nature or the share value has fallen when getting the YOY change. In addition to that, when the stock returns are analysed based on the Z-score, results have shown that the financially distressed company's average stock returns were -1.1% and the financially non-distressed company's stock returns were -1.51% or there is not any significant difference in stock returns of a financially distress company over non-distress company. when it comes to correlation analysis, it shows weak positive relationship between the stock returns and the Z- score value by having 0.027 correlation coefficient. It can be simply gotten as if the Z-Score is increase or the company is become a safe (non-distressed) one, simultaneously, the stock returns will increase in week positive manner. Finally, based on the tested model it is also showed insignificant positive coefficient of 0.003 for this Z-score and stock return relationship by consistent with the findings of Anginer and Yıldızhan (2018).

5.1.2. The relationship between B/M ratio and stock returns

According to the results of the analysis, the average B/M ratio of the entire sample of companies was at very high value of 250 which indicates, most of the companies within the obtained sample is undervalued companies. Further, when it comes to correlation analysis, it shows weak negative relationship between the stock returns and the B/M ratio by having -0.031 correlation coefficient. It can be simply gotten as if the B/M ratio is increase or the company is become undervalued one, the stock returns will decrease in week positive manner. Finally, based on the tested model it is also shows insignificant negative coefficient of 0.002 for this B/M ratio and stock return relationship by consistent with the findings of Campbell et al. (2008).

5.1.3. The relationship between market capitalization and stock returns

According to the results of the analysis, the average market capitalization of the entire sample of companies was at value of Rs.6 Bn. Further, when it comes to correlation analysis, it shows weak negative relationship between the stock returns and the market capitalization by having -0.049 correlation coefficient. Therefore, it can be simply gotten as, if the market capitalization is increase or the company increase it value, the stock returns will start to decrease in week positive manner. Finally, based on the tested model it is also shows insignificant negative coefficient of 0.001 for this market capitalization and stock return relationship (Friewald, Wagner, & Zechner, 2014).

6.Conclusion

When the company's financial structure is weak and tends to be in bankruptcy, any individuals interested in corporate and financial dealings with the company will be negatively affected. The Z-score model developed by Altman is the most common of these techniques. The study results have given some clear evidence regarding the main objective by indicating that the association between stock returns and the probability of financial distress appears to be consistent with some previous studies' findings Anginer and Yıldızhan (2018), Vassalou and Xing (2004) and Friewald et al. (2014) which is there in no any difference between returns of financially distressed company and non-distressed (Gray and safe) company. Further, The results are inconclusive as the positive negligible coefficient of distress risk found is statistically insignificant, revealing that the risk of distress is generally attributable to the price, implying that there may be no meaningful relationship between the Z-score and the stock returns in terms of capital gain which also indicates the stock returns in terms of capital gain between financially distressed and non-distressed (Gray and safe) companies are indifference to each other. This study has established 42 distressed businesses, so it is advised that their management make acceptable policies for their earlier recovery and avoid their expense. Finally, In the study of the risk involved with their inventories, financial managers play a critical role. Bad business management is one of the causes for financial instability.

Therefore, along with its earlier turnaround, the troubled business should still need to strengthen its management and productive personnel. However, the risk factor should also not be ignored by investors before investing. This will open up potential fields for scholars who are involved in researching the possibility of financial distress and other emerging market anomalies.

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Factors Affecting the End-Users' Acceptance of Enterprise Resource Planning System of the Apparel Industry in Sri Lanka

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Abstract

Enterprise Resource Planning (ERP) system is an integrated set of programs that support manufacturing, logistics activities, sales and marketing, finance and accounting activities and human resources. The research is critically applying the contrary to Sri Lankan context-especially in the apparel industry. The researcher points out that this research study that the factors influencing the degree of end-user acceptance of ERPs in the apparel industry in Sri Lanka. The researcher collected data from 62 ERP users working in two leading companies in the apparel industry in Sri Lanka. Although ERP system adoption is ever increasing in Sri Lanka, there is not as much written evidence on ERP systems, user acceptance and the factors underwriting the user acceptance. The researchers considered the factors such as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Training (TRN) and Shared Belief (SB) to get the conclusion. The study used primary data gathered from the employees in the above two organizations through an online questionnaire and interview. Descriptive statistics, correlation analysis, ANOVA and regression analysis were used to analyze the collected data. The result shows that Performance Expectancy, Effort Expectancy, Social Influence, and Training have a statistically significant impact on End-User Acceptance of Enterprise Resource Planning (ERP) Systems. The impact of Shared Beliefs on End-User Acceptance of Enterprise Resource Planning (ERP) Systems is insignificant.

Keywords: *Apparel Industry, End-User Acceptance, Enterprise Resource Planning, ERP.*

1. Introduction

In this research, the researcher underlined the post-implementation stage of the ERP system's life cycle with a focus on factors affecting End User Acceptance of the Enterprise Resource Planning (ERP) System in the Apparel Industry in Sri Lanka. ERP Systems are implemented from a technical perspective successfully. But the ongoing real success is based on the ERP users' attitude towards and actual use of the system.

This study considered factors concerning the ERP system as the level of user acceptance, factors affecting user acceptance and the attitudes and behaviour. The implementation of the ERP system has become a vital one due to the increasing competition and the development of Information Technology. Therefore, this is necessary for the companies to build competence that provided a competitive advantage to sustain the changing business world. There is a growing trend in the implementation of such systems by apparel manufacturing companies in Sri Lanka with the global economy and the way of containing businesses. Due to the lack of user acceptance of systems, most of the organizations that implemented ERP systems end up failing to acquire the desired benefits. Therefore, End-User acceptance of ERP systems was a very important factor affecting not only the success of ERP Implementation but also making ERP adoption decisions.

In keeping up with the global economy and way of continuing business, there is a growing trend in the implementation of such systems by the Apparel Industry in Sri Lanka. However, most of the organizations implementing ERP systems end up failing to acquire the desired benefits due to the lack of user acceptance of the system. This showed that end-user acceptance of ERP systems was a very much important factor affecting not only the success of ERP implementations but also making ERP adoption decisions.

This will contribute mainly to understanding the level of success an organization would accomplish with ERP implementation. This research study will ascertain the extent to which factors such as performance expectancy, effort expectancy, social influence and facilitating factors would contribute to the level of end-user acceptance of ERP systems in the Apparel Industry in Sri Lanka.

2. Literature Review

The users of the system need to be satisfied with it to ensure their acceptance and desired results. One of the frequently stated reasons for ERP failures is an end-user's unwillingness or reluctance to adopt or use a newly implemented ERP system (Frolick & Barker, 2003, September). One issue of user acceptance of the technology is addressed comprehensively using Technology Acceptance Model (TAM) ((Davis, Richard , & Paul, Aug, 1989). It has identified the usage level of information system (actual use), as a superior indicator of the level of acceptance of technology by End Users (Seymour, Makanya, & Berrangé, 2007, April). As per the TAM model, perceived usefulness and ease of use are primary determinants of information technologies adoption in organizations (Davis, Richard , & Paul, Aug, 1989). It provides a base to find out the impact of external variables on internal values, intent and attitudes.

The usage of technology is voluntary as per the TAM model (Amoako-Gyampah). This mentioned that deemed unsuitable as the adoption of an ERP system in an organization is mandatory. According to Brown et al. 2002, and Venkatesh, et al., 2003, the TAM model thus provides limited explanations of user behaviours, attitudes and user acceptance of ERP systems. This proposed the United Theory of Acceptance and Use of Technology (UTAUT) and has represented in figure 2 as an alternative to the TAM model.

This is an improvement of the TAM model and a combination of eight user acceptance of the model (including TAM). Further, UATUT takes into account. The fact that some systems are mandatory and others voluntary and results obtained using this model explained end users' acceptance of mandatory account management and accounting system more clearly than the results obtained from the TAM model (Venkatesh, Morris, & Davis, 3 Sep, 2003.). Then UTAUT model was used for the study.

The healthcare industry is focused on improving the quality of healthcare and operational efficiency while reducing costs and optimizing back-end operations. It is imperative to improve the efficiency of back-end business functions across supply chain

management, inventory management, patient relationship management, human resources, finance and billing. It can be achieved by business process optimization and technology enablement through successful Healthcare ERP implementation. A national health system is a complex chain of tasks dealing with thousands of human lives. The complications are unmanageable without the help of a system (Perera, Nanayakkara, & Perera, 31 May - 1 June 2012).

When many large Sri Lankan organizations have adopted ERP systems to improve their existing performance measurements, most of the organizations have failed to acquire the true benefits expected mainly due to poor post-implementation practices. The main purpose of the research would be to develop a framework for successful ERP post-implementation by analyzing the best practices, procedures and success factors based on eight selected large scale manufacturing organizations. A qualitative approach based on case studies has been used to derive the importance of each variable to the successfulness of ERP usage. Furthermore, the research was supported by exhaustive interviews and participative observation. The findings identified that ERP post-implementation failure was not just caused by technical issues of the system, but more importantly was also attributed to critical problems related to top management, change management and effective user training. The proposed framework will assist Sri Lankan companies in utilizing their ERP usage in the post-implementation phase. Furthermore, the proposed framework can be used as a guideline in successful ERP implementations. The current research community will be benefited by extending the knowledge into the greater paradigm. (Kiriwandeniya , Samarasinghe, & Ruwan, 2013).

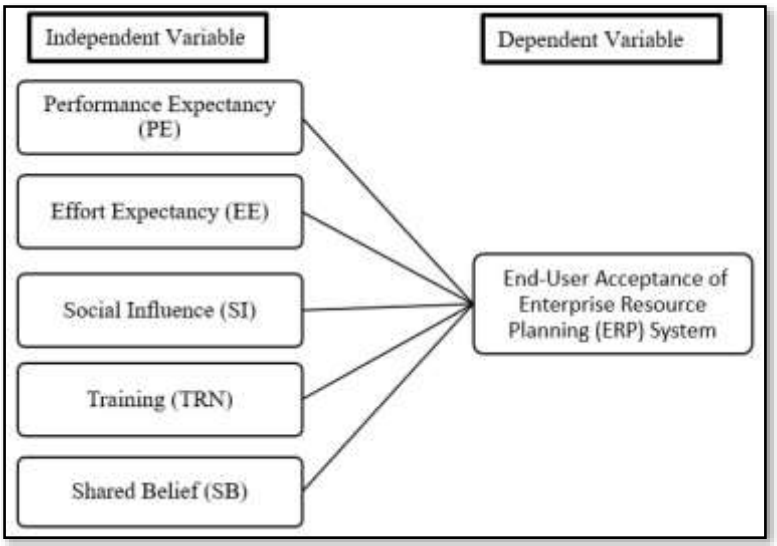
3. Methodology

The researchers used questionnaires and interviews to collect the data from selected organizations in the apparel industry. The researchers have used two leading companies in the apparel industry that ERP systems already implemented. The population is ERP users at the executive level and above in the two companies. The population of the study was 250 users and a sample of 75 users was selected randomly. It was responded to by 62 users to the questionnaires.

The questions used in the questionnaire were selected by considering the findings of previous studies. The variables were tested for reliability and validated.

A pilot survey was conducted to verify the various dimensions of the questionnaire such as the language used, ease of completing the questionnaire and appropriateness of questions with relevance to user behaviour.

Figure 1: Conceptual Framework



Source: Researcher constructed

The model used in this study to test the hypotheses is depicted in the diagram above. With a few adjustments, the model is based on UTAUT proposed by Venkatesh et al. (2003). The behavioural intention factor and the Use Behavior factor have been replaced with the End User Acceptance factor since it has been viewed as it is considered a more appropriate measure of end-user acceptance of ERP systems.

The voluntariness moderating variable has been eliminated from the model because ERP system end-users are required to use the system, making measuring voluntariness superfluous. The facilitating

conditions construct was replaced with two constructs: training and shared belief. Although experience, age, and gender were factored into the model, they were not considered in this study. The experience factor is excluded from this because, as an exploratory study, this research was done at a point in time and not longitudinally.

The Researcher has decided not to differentiate between age and gender in this study as the main focus of this study is discovering the major factors affecting end-user acceptance of ERP systems. It was also concealed that there is a correlation between End User Acceptance and Performance Expectancy, Effort Expectancy, Social Influence, Training and Shared Belief. This confirmed the need for validating further relationships and hence further research.

The researcher must have indicated how the variables are to be measured in the research study. The researcher has provided measures related to the key factors identified during the study and the researcher has used descriptive statistics, correlation analysis, ANOVA test and regression analysis as data analysis methods.

4. Results

Descriptive statistics give a simple summary of the sample and basic features of the study by using the mean, standard deviation and minimum and maximum features of the SPSS 20.0. The variables were computed by the researcher using the questions from the questionnaire.

Table 28: Correlation Analysis

		Performance Expectation	Effort Expectancy	Social Influence	Training	Shared Belief	End-User Acceptance
Performance Expectation	Pearson Correlation	1	.342**	.357**	.402**	.451**	.483**
	Sig. (2-tailed)		.006	.004	.001	.000	.000
	N	62	62	62	62	62	62
Effort Expectancy	Pearson Correlation	.342**	1	.068	.063	.091	.371**
	Sig. (2-tailed)	.006		.598	.628	.482	.003
	N	62	62	62	62	62	62
Social Influence	Pearson Correlation	.357**	.068	1	.742**	.771**	.185
	Sig. (2-tailed)	.004	.598		.000	.000	.151
	N	62	62	62	62	62	62
Training	Pearson Correlation	.402**	.063	.742**	1	.722**	.418**
	Sig. (2-tailed)	.001	.628	.000		.000	.001
	N	62	62	62	62	62	62
Shared Belief	Pearson Correlation	.451**	.091	.771**	.722**	1	.312*
	Sig. (2-tailed)	.000	.482	.000	.000		.014
	N	62	62	62	62	62	62
End-User Acceptance	Pearson Correlation	.483**	.371**	.185	.418**	.312*	1
	Sig. (2-tailed)	.000	.003	.151	.001	.014	
	N	62	62	62	62	62	62

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

*. Correlation is significant at the 0.05 level (2-tailed).

PE and TRN show a moderate positive correlation and EE, SI and SB show a weak positive correlation toward the EUA of the ERP System. The correlation value of 0.483 shows a Moderate correlation of PE towards the EUA of the ERP System. It expresses that, the increase/decrease in relative advantage causes for increase/decrease in customer satisfaction. PE is a statistically significant variable because the p-value is 0.000 and it is lower than 0.01. (0.000<0.01)
EE represents a weak positive correlation towards the EUA of ERP System as its value is 0371 and rises EE to increase in EUA of ERP System as vice versa. Also, the p-value is 0.003 and it is statistically significant. (0.000<0.01)

Likewise, TRN also has a moderate positive correlation with the EUA of ERP systems. Not only that TRN and SB had a weak positive correlation toward the EUA of ERP systems.
ANOVA test is another statistical technique that is used to analyze variability to infer the inequality among population means. Further, it explains the significance of the regression model and its usefulness of it.

Table 3: Multiple Regression Analysis

Model	Unstnd. Coe		Stdn. Coe.	t	Sig.
	B	Std. Er	Beta		
Cons	.069	.946		.073	.942
PE	.365	.157	.289	2.326	.024
EE	.479	.205	.258	2.341	.023
SI	-.255	.122	-.373	-2.087	.041
TRN	.300	.099	.504	3.031	.004
SB	.048	.104	.082	.460	.647

a. Dependent Variable: EUA

Source: SPSS data 2020

According to table 3 following model can be derived for factors affecting EUA of ERP systems.

$$EUA = 0.069 + 0365PE + 0.479EE - 0.255SI + 0.3TRN + 0.048SB + e$$

Based on the results PE has a positive impact on EUA. The coefficient of PE was +0.365 which indicates that one unit of change (decrease or increase) in the PE variable can result in a change EUA by 0.365 units in the same direction. Also, EE and TRN have a positive relationship with EUA. Here coefficients of EE and TRN were 0.479 and 0.300 respectively. Therefore, it indicates that when an increase or decrease of EE and TRN by 1 unit EUA increases or decreases by 0.479 and 0.300 respectively. Coefficients of SI have negative relation towards EUA. So it indicates, that SI changes by 1 unit, EUA changes by 0.251 units in opposite direction. On the other hand, SB has a positive impact on EUA. So the coefficient of that variable was 0.048. It indicates that 1 unit of change by SB can result in to change in the EUA by 0.048 in the same direction. So based on a significant level of variables SB considers statistically insignificant variables affecting EUA. Because p values of SB were not less than 5% significant level. Here SB has 0.647 p values which are not less than 0.05 significant level.

Except SB variable other independent variables have statistically significant which have p values less than 0.05. The hypothesis can be tested by using the significant value of the B coefficient of each independent variable. 95% confident interval is the hypotheses accepting level and for that P value should be less than or equal to 0.05 (5%). In a situation where the significant value is greater than or not equal to 0.05 null hypotheses cannot be rejected and at the same time, the alternative hypothesis is not supported.

5. Discussion

The p-value of the Performance Expectation variable was 0.024 and it was less than 0.05. Therefore, accept the alternative hypothesis (H1) and reject the null hypothesis (H0) at a 5% significant level. Then, it indicates that Performance Expectations could have a significant impact on the End User Acceptance of ERP systems. The p-value of the Effort Expectancy variable was 0.023 and it was less than 0.05. Therefore, accept the alternative hypothesis (H2) and reject the null hypothesis (H0) at a 5% significant level. Then, it indicates that Effort Expectancy will have a significant relationship with the End User Acceptance of ERP systems. The p-value of Social Influence was 0.041 and it was less than 0.05. Therefore, accept the alternative hypothesis (H3) and reject the null hypothesis (H0) at a 5% significant level. Then, it indicates that Social Influence could have a significant impact on the End User Acceptance of ERP systems. The p-value of the Training variable was 0.004 and it was less than 0.05. Therefore, accept the alternative hypothesis (H4) and reject the null hypothesis (H0) at a 5% significant level. Then, it indicates that Training could have a significant relationship with End User Acceptance of ERP systems. The p-value of the Shared Belief variable was 0.647 and it was more than 0.05. Therefore, reject the alternative hypothesis (H5) and accept the null hypothesis (H0) at a 5% significant level. Then, it indicates that Shared Belief would have not a significant impact on EUA.

The researcher can conclude that; this result contradicts the findings of Davis.1989 as the user acceptance of the technology is addressed

comprehensively using TAM to some level extent. As well by referring to the results of regression analysis, the findings of (Kiriwandeniya,, Samarasinghe, ,, & Ruwan) can be significant as the ERP post-implementation failure was not just caused by technical issues of the system, but more importantly was also attributed to critical problems related to top management, change management and effective user training. The proposed framework will assist Sri Lankan companies in utilizing their ERP usage in the post-implementation phase.

Table 4: Hypothesis Testing

Hypotheses	P-value according to Regression Analysis	Results
$H1_0$ - PE has no positive impact on EUA. $H1_1$ - PE has a positive impact on EUA.	0.024	$H1_0$ Rejected $H1_1$ Accepted
$H2_0$ - There is no positive and significant relationship between EE and EAU $H2_1$ - There is a positive and significant relationship between EE and EAU.	0.023	$H2_0$ Rejected $H2_1$ Accepted
$H3_0$ - SI has no positive influence on EUA. $H3_1$ - SI has a positive influence on EUA.	0.041	$H3_0$ Rejected $H3_1$ Accepted
$H4_0$ - There is no positive relationship between TRN and EUA. $H4_1$ - There is a positive relationship between TRN and EUA.	0.004	$H4_0$ Rejected $H4_1$ Accepted
$H5_0$ There is no positive relationship between SB and EUA. $H5_1$ There is a positive relationship between SB and EUA.	0.647	$H5_0$ Accepted $H5_1$ Rejected

Source: Researcher constructed using SPSS data

6. Conclusion

This study was conducted in two leading Apparel organizations which had implemented and used ERP systems for a considerable period. The

researcher sent 75 questionnaires out of which only 62 questionnaires were duly filled and received which resulted in a response rate of 82.66%. This is fairly acceptable in the Sri Lankan context given the usual lower response rates observed. As per the analysis taken place in the above chapter using the reliable data collected through the questionnaire developed by the researcher it can state that there is a significant relationship between the independent factors (Performance Expectancy, Effort Expectancy, Social Beliefs, Training and Shared Beliefs) and End User Acceptance of ERP System in the Appeal Industry. And 60% of the End User Acceptance of ERP System in the Appeal Industry are explained by the above five factors and the remaining 40% is from other factors such as Technological complexity, Technological compatibility and those factors are not covered by the current study, etc. By analyzing the results of the Pearson correlation coefficient it can state that there is a significant relationship between independent variables and dependent variables, and their numeric values were Performance Expectancy against End User Acceptance of ERP System in the Appeal Industry 0.483, Effort Expectancy against End User Acceptance of ERP System 0.371, Social Beliefs against End User Acceptance of ERP System was 0.185, Training was 0.418 and the correlation between Shared Beliefs and against End, User Acceptance of ERP System is 0.312. The coefficient was positive and significant for Performance Expectancy, Effort Expectancy and Training. The effect of Social Influence was negative but significant. This study confirms the findings of research findings of Venkatesh et al (2000). The subjects had higher expectations of the contribution of ERP systems to their job performance. Most of them believed that ERP systems would help them perform their job-related tasks effectively, quickly and with good quality. However, the effort they expected to put in as a result of ERP usage is observed to be high. This could be due to the advanced and less user-friendly nature of the system as perceived by some ERP users. Social Influence played a negative but significant role in the s End User Acceptance of ERP systems by the users. Some of the users did not believe they were being influenced by the immediate society they interact with in deciding on the End User Acceptance of the ERP System. The training was

observed to be a vital factor in determining whether to End User Acceptance of ERP systems or not by the users. A considerable number of users emphasized the fact that they were not initially provided with complete and comprehensive training on ERP usage before the use of the ERP system-which they believe to be a vital factor. However, once they obtained the training or from the little training they were provided with at the time, they were able to perform their tasks more quickly and effectively. One of the factors contributing to most of the users who found it difficult to learn the system and thus required much effort could be stated as lack of training. Especially, according to the rejection of the fifth hypothesis, the researcher can conclude that the users, their colleagues and their superiors are not believed in the benefits of the ERP system. They do not have an overall understanding of the organizational benefits that can be gained through the use of ERP systems.

Organizations spend a considerable amount of capital and resources on ERP systems, hoping to improve business performance. ERP systems are vital components of today's business organization owing to the higher level of effectiveness and efficiency they add to the business as a whole. ERP systems streamline the business processes by integrating and coordinating the various business functions and divisions. Therefore, there is an increasing trend of ERP system adoption by organizations. In some organizations ERP implementation was successful but the true benefits of productivity of ERP were very poor after the system implementation. Post-implementation period is crucial to determine the true value of an ERP to an organization. Mere implementation of the ERP system will not ensure the higher performance of the organization or the ERP system's effectiveness. Most organizations have failed to exploit the benefits of the ERP systems they have adopted owing to the lack of user acceptance of the system owing to several reasons. The User Acceptance (EUA) of ERP systems by end-users is influenced by elements such as Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Training (TRN), and Shared Belief (SB), according to a literature study. However, not all aspects were found to affect End User Acceptance of ERP systems (EUA) in the Sri Lankan context.

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Role of Stock Market Development in Promoting Foreign Portfolio Investments: Evidence from Sri Lanka

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Abstract

Foreign portfolio flow plays a vital role in entire economic development in developed nations and developing contexts. Thus, this study contributes to the existing empirical literature that investigates the impact of stock market development on the foreign portfolio investment flows in the host economy. This study investigates the impact of the stock market development and macroeconomic variables on foreign portfolio investment inflow in the Sri Lankan context. To enhance the objectives of the study, the Autoregressive Distributed Lag (ARDL) bounds testing procedure was employed using data from 1992 to 2019. The results of the empirical analysis revealed that stock market development has a significant impact on foreign portfolio inflows in the long-run and short-run. Among the employed macroeconomic variables, the inflation rate reported as an influential variable on the foreign portfolio investment inflow in both long-run and short-run in Sri Lanka.

***Keywords**: Stock Market Development, Foreign Portfolio Inflows, ARDL model.*

1. Introduction

Conventional banking system provides a basic picture of finance system of an economy. Later, the financial structure of economic activities prolonged different perspectives with the financial intermediation such as stock markets and non-banking financial institutions. Higher capital flow through the stock markets has upgraded the profitability of businesses and has resulted in higher growth for economies worldwide. Levine and Zervos (1998) emphasized that stock market liquidity and market development are good predictors of economic growth. The progression in capital accumulation, efficiency of capital allocation, well-functioning stock markets are expected to affect economic growth. The development of the stock market is therefore one of the foremost factors for economic growth (Levine, 2001). Since, in 20th century, most of the emerging and developing countries were altered their international financial system by emerging new capital markets, adapting to more flexible exchange rate arrangements, reducing capital inflow barriers and foreign exchange restrictions. The stock market plays a significant role in the growth of the trade and industrial sector, which ultimately influences the economic growth of a country to a large extent and also attracting foreign investment to the country. Foreign investment is a very important capital flow for developing countries because the internal savings of developing countries fail to fulfill the investment capital requirement of the country. Therefore, foreign investment helps to fill the gap between internal savings and investment in the host country and push the host country to development. As well as, net foreign investment inflow helps to solve the balance of payment issues in the host country. Hence, many researchers attempted to do their study about the relationship between foreign investment and stock market development in different context.

Foreign portfolio investment is an investment model where investors seek returns in foreign countries without any control over the firms (Agu et al., 2019). Foreign portfolio investments are inflowing to the host country in several ways. It may be a purchase of equity (preference share) or government debt in a foreign stock market, or

loans made to a foreign company. Recently, many researchers investigated about foreign portfolio investment, its determinants, and the relationship between foreign portfolio investment and stock market development. Willet (2006), Knill (2004), Demirgüç-Kunt & Detragiache (1999), and Henry (2003) revealed that foreign portfolio investment volatility leads the host country's financial crisis and results in unforeseeable behavior of money supply, exchange rate, and stock market volatility. Kaminsky and Schmukler (2001) depicted that foreign portfolio investment long-run gain out the weight of its short-term negative effects.

An equity (share) and/or debt security transaction that may not give rise to a long-term stake in or effective management over an enterprise is foreign portfolio investment (World Bank, 2014). Ekeocha et al. (2012) defined foreign portfolio investment as a component of universal capital streams, which included the exchange of financial resources such as money, shares, or debt instruments over universal boundaries in the look of benefit (returns). Foreign portfolio investment can hence be depicted as all inward cross-border streams which are fundamentally focused on at financial assets accessible within the local financial markets, and yet do not necessarily culminate in permanent investments.

More interestingly, after the international debt crisis, most of the private capitals are flowing to developing countries and Agarwal (1997) highlighted that foreign portfolio flows to developing countries increased from 6.2 billion USD to 46.9 billion USD during 1987 and 1993. Sri Lanka also categorized as developing economy and opened the local economy to the international competition in 1977. But net foreign portfolio investment inflows showed negative values in many times during 1992 to 2019 because Sri Lankan government failed to develop a healthy business environment within the country because of engaged with 30 years of civil war against LTTE. The war ended in 2009 defeating LTTE by Sri Lankan government forces. Thereafter, Sri Lankan government attempted to develop an ideal business environment within the country through promoting Colombo Stock Exchange to invite foreign investors by organizing programs like

"Invest Sri Lanka", relaxing regulations, and promoting online trading platforms, etc. Moreover, Sri Lanka has a lower P/E value than regional peers and also the All-Share Price Index (ASPI) continuous to outperform major global and regional indices. While all these things happening, net foreign portfolio investment inflows show negative figures in a few years after 2009 (post-war period) also (year: 2010, 2011, 2015, and 2018). Therefore, an empirical study is desired to investigate whether stock market development attracts foreign portfolio investment into the country or not. This study aims to explore the impact of stock market development and foreign portfolio investment inflow in Sri Lanka.

The rest of this paper is organized as follows. The section 2 states the summary of the previous studies related to the stock market development, foreign portfolio investment, the relationship between stock market development and foreign portfolio investment, and the effects of macroeconomic variables on foreign portfolio investment. Section 3 includes description of the data and the sample period of the study and statistical models. The results are presented and analyzed in section 4. Finally, the concluding remark is given in section 5.

2. Literature review

Agu et al. (2019) measured the impact of foreign portfolio investment on stock market returns in Nigeria for the period 1986 to 2017. They used stock market capitalization as a proxy for stock market returns (dependent variable) and as independent variables, they used foreign portfolio investment, exchange rate, and interest rate. The coefficient of the exchange rate and foreign portfolio investment was positive and the interest rate had negative as well as no significant influence on the stock market return. They found that there was no long-run relationship between foreign portfolio investment and stock market return in Nigeria. They further recommended that government and private individuals should provide enabling business environment that will encourage foreign portfolio investors' savings to enhance the stock market development. To find out whether cross-border investments drive financial market development in a developing country or it is capital market development that drives cross-border

investments, Makoni and Marozava (2018) examined the relationship between foreign portfolio investment and financial market development as a macro-economic strategy by the Republic of Mauritius during the period of 1989 to 2016. By employing ARDL, VECM, and granger causality test they found co-integrating relationships between foreign portfolio investment and foreign direct investment, financial market development, and real economic growth. The existence of a long-run relationship between variables under observation was confirmed. And also short-run causality was found to arise from foreign portfolio investment, foreign direct investment, and real economic growth to financial market development. Financial market development causes both foreign portfolio investment and foreign direct investment, while foreign portfolio investment causes foreign direct investment was confirmed by granger causality results and financial market development in Mauritius is internally catalyzed. Moreover, Sunday (2018) also examined the effect of capital market development on foreign portfolio investment over the period from 1985 to 2016 and found there was no any causality between capital market development and foreign portfolio investment in Nigeria by using the Granger causality test. Results from the vector error correction model showed that market capitalization had a negative significant effect on foreign portfolio investment in Nigeria while all share index had a positive relationship with foreign portfolio investment. Finally, the researcher concluded that there was a significant effect on foreign portfolio investment by capital market development within the period examined in Nigeria. Based on this study researcher pointed out the necessity of policy development to push capital market development and stimulate improved interest to attract foreign portfolios into the country.

Interestingly, Haider et al. (2017) investigated that impact of stock market performance and inflation on foreign portfolio investment in China using time series data from 2007 to 2015, they employed an autoregressive distributed lag model and findings of this study revealed that there was a significant positive impact of stock market performance on the foreign portfolio investment. A negative association was found between inflation and foreign portfolio

investment. More than that, the study further revealed that some historical events like the Asian financial crisis of 2008, and the Shanghai composite stock index crash of 2015 significantly affected the foreign portfolio investment in China. Makoni (2016) revealed that foreign portfolio investment inflows of sampled African countries were influenced by stock market capitalization. Koskel et al. (2016) analyzed the impact of foreign portfolio equity and exchange rate risk on the return on the stock market of commercial banks in Kenya. They argued that volatility in the flow of foreign portfolio investment results in the unforeseeable conduct of stock returns in the Kenyan economy and even at the firm level. Therefore, they analyzed the impact of foreign portfolio equity and exchange rate risk on the return on shares of listed commercial banks in Kenya. The result of the panel estimate showed that the exchange rate risk had an effect on the stock returns of listed financial institutions in Kenya. They suggested that policies that would attract foreign portfolio investment should be followed.

Furthermore, Hsu (2013) analyzed how foreign portfolio investment affects the domestic stock market of host countries by comparing the performance of favored and unfavored stocks of foreign investors. The findings revealed that the foreign investors favored group outperformed the other only during expansion and the foreign investor's unfavored group perform better during recessions because market participants did hear in the foreign investors favored stock group but here in the unfavored group only in bare markets. Aigheyisi and Ovuefeyen (2013) examined the effects of the inflows of foreign financial capital into Nigeria's and Ghana's economies and on the development of the country's share market in Nigeria from the period 1981 to 2011 and in Ghana from 1991 to 2011 and reported a positive relationship with the return on the stock market in Nigeria, while the external debt ratio and foreign direct investment had a negative and significant effect on the returns on the stock market in Ghana.

Numerous studies reported about the macroeconomic determinants of foreign investment and their relationship also. Waqas et al. (2015) investigated the relationship between macroeconomic factors and foreign portfolio investment volatility in South Asian countries. They employed the GARCH model and they found the existence of a

significant relationship between macroeconomic factors and foreign portfolio volatility as a result. They showed less volatility in international portfolio flows is associated with a higher interest rate, currency depreciation, foreign direct investment, lower inflation, and higher GDP growth rate of the host country. Domestic inflation negatively affected foreign portfolio investment and home country inflation as well as higher returns in the host country motivates investors to invest in the host country (Rai and Bhanumurthy, 2004). Mody et al. (2001) also showed a negative relationship between inflation and foreign portfolio investment.

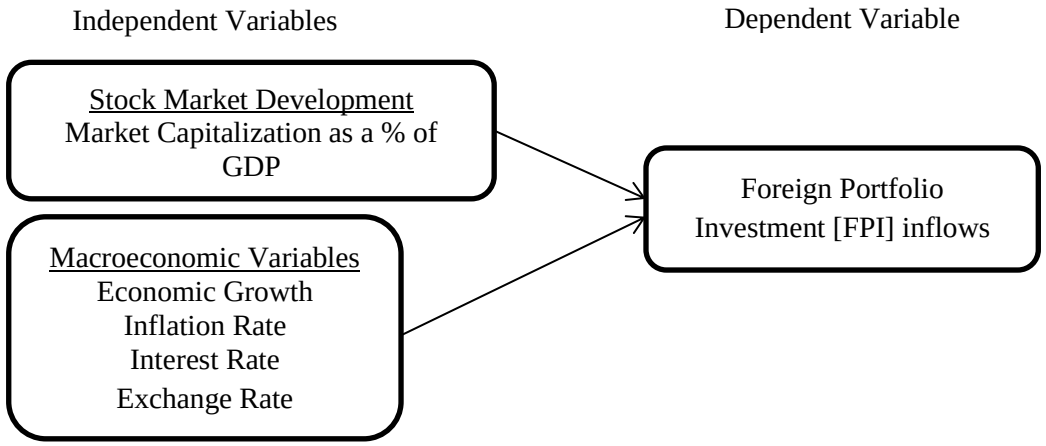
An extensive study of Pala & Orgun (2015) explored a positive direction of deposit interest rate, gross national income, and current account balance towards foreign portfolio investment. Domestic real interest rates revealed a negative influence on foreign portfolio investment (Align and Korap, 2010). Exchange rate volatility is a major driver and risk for foreign investors in developing economies (Billmeier and Massa, 2007). Darby et al. (1999) also showed that the exchange rate fluctuation had a significant effect on foreign portfolio investment. Not the nominal exchange rate, real exchange rate should consider than nominal as a better indicator for foreign portfolio investment because it eliminates inflationary effects from the nominal exchange rate (Carrieri et al., 2006b). The economic condition of the country does have a positive effect on foreign portfolio investment. Improved savings and investment, technology transfer to developing countries, strengthened macroeconomic policies and the development of financial markets are bringing more foreign portfolio investment to the country (Waqas et al., 2015b). Duasa & Kassim (2009) did their study to examine the relationship between foreign portfolio investment and economic growth in Malaysia. They find out that economic growth affects the changes in the foreign portfolio investment and its volatility. Also, they mentioned economic growth as a major pull factor for attracting foreign portfolio investment into the country.

3. Methodology

This study analyzes the effect of both stock market development and macroeconomic conditions on foreign portfolio investment. The

following figure 1 of the conceptual framework shows the relationship between independent and dependent variables graphically.

Figure 1: Conceptual Framework.



Source: Developed by researcher adopting from several sources

The dependent variable is foreign portfolio investment inflows. The selected independent variables are stock market development and macroeconomic variables. Economic growth, interest rate, exchange rate, and inflation are selected for presenting the macroeconomic conditions of the economy. Independent variables were selected by referring to the previous theoretical and empirical literature. The theoretical and empirical evidence used to select these independent variables discussed below.

The development of stock markets is a multidimensional phenomenon. This is typically calculated by stock market size, liquidity, volatility, and concentration, market integration with global capital markets, and the regulation and supervision. Levine and Zervos (1995) explained that stock market development can measure through stock market size and liquidity. They used market capitalization value and All Share Price Index (ASPI) to represent the stock market size because stock market size is positively correlated with the ability to mobilize capital to investment and diversify risk to investors (Tony, 2012). Kunt and Levine (1996) explained that market capitalization is a good indicator

to quantify capital market strength to diversify risk and mobilize capital. Thus, this study also utilized stock market capitalization ratio as the proxy for measuring stock market development.

Duasa and Kassim (2009) explained economic performance as a major pull factor in attracting foreign portfolio investment into the country and further mentioned economic growth affects the foreign portfolio investment and its volatility. The positive relationship between the growth of the domestic output and foreign portfolio investment is explained by Garg et al. (2014). Kinda (2012) also showed a positive relationship between foreign portfolio investments with the economic growth rate. Thapa and Poshakwale (2010) explained that the GDP per capita is a better proxy than the GDP growth rate. The study of Hassan et al. (2009) also used GDP per capita growth as a proxy for economic growth. This study also used per capita income as a proxy for economic growth.

A positive association between foreign portfolio investment and the interest rate was explained by Kreicher (1980). After that Eratas and Oztekin (2010) and Korap (2010) explained the positive relationship between the real interest rate and foreign portfolio investment. Onuorah and Akujuobi (2013) also explained interest rate is positively related to foreign portfolio investment. This study used three months Treasury bill rate as a proxy for the interest rate. Darby et al. (1999), foreign portfolio investment is significantly influenced by exchange rate fluctuation. Agarwal (2006) found that the real exchange rate has a significant positive relationship with foreign portfolio investment by using the data of six Asian developing countries. The positive relationship between the exchange rate and foreign portfolio investment is also explained by Brennan et al. (2011), Onuorah and Akujuobi (2013), and Garg et al. (2014). This study used LKR/USD as an exchange rate. Agarwal (1997) explained that the mother country's low returns and high inflation encourages portfolio investors to invest in foreign countries that have low and high inflation and returns respectively. Mody et al. (2001) mentioned that the inflation rise is related to the decrease in foreign portfolio investment. Agarwal (2006) also found that the inflation rate has a significant negative relationship with foreign portfolio investment by using the data from

six developing Asian countries. Thus, this study also employed inflation rate as a control variable.

Foreign portfolio investment and stock market capitalization data gathered from the Colombo Stock Exchange data library. Data related to all other selected macroeconomic variables were collected from annual reports of the Central Bank of Sri Lanka (CBSL), the Department of Census and Statistics (DCS), and the World Bank website. The study selected a sample period from 1992 to 2019. Data related to foreign portfolio investment inflows available in the Colombo Stock Exchange data library since 1992, because the Colombo stock exchange opened to foreigners in 1992. Furthermore, this study eliminated the data of recent two years of 2020 and 2021 because macroeconomic indicators implied the impact of COVID 19 pandemic.

This study employs the Autoregressive Distributed Lag (ARDL) approach to achieve the purpose of this study.

The estimated ARDL model for this study is as follows;

$$\begin{aligned}\Delta LFPINFLOW_t &= \beta_0 + \beta_1 LFPINFLOW_{t-1} + \beta_2 LSMCR_{t-1} \\ &+ \beta_3 LPCI_{t-1} + \beta_4 LTBR_{t-1} + \beta_5 LER_{t-1} \\ &+ \beta_6 LIR_{t-1} + \sum_{i=1}^{p} \theta_1 \Delta LFPINFLOW_{t-1} \\ &+ \sum_{i=1}^{p} \theta_2 \Delta LSMC_{t-1} + \sum_{i=1}^{p} \theta_3 \Delta LPCI_{t-1} \\ &+ \sum_{i=1}^{p} \theta_4 \Delta LTBR_{t-1} + \sum_{i=1}^{p} \theta_5 \Delta LER_{t-1} \\ &+ \sum_{i=1}^{p} \theta_6 \Delta LIR_{t-1} + \varepsilon_t\end{aligned}$$

Where the dependent variable is log form of foreign portfolio inflow (LFPINFLOW). The independent variables are log form of stock market capitalization ratio (LSMCR), log form of per capita income (LPCI), log form of three months Treasury bill rate (LTBR), log form

of the exchange rate (LER), and log form of inflation rate (LIR). Coefficients of independent variables are measure by β_1, β_2, β_3, β_4, β_5, and β_6. The error term of the model represents by ε_t and Δ is the first-difference operator.

Long run regression coefficients are tested from the specified model by applying the following equation;

$$LFPINFLOW = \beta_0 + \sum_{i=1}^{p} \beta_1 LFPINFLOW_{t-i} + \sum_{i=0}^{p} \beta_2 LSMC_{t-i} + \sum_{i=0}^{p} \beta_3 LPCI_{t-i} + \sum_{i=0}^{p} \beta_4 LTBR_{t-i} + \sum_{i=0}^{p} \beta_5 LER_{t-i} + \sum_{i=0}^{p} \beta_6 LIR_{t-i} + \varepsilon_t$$

To establish the short-run dynamics, the following equation shows the estimated error correction model;

$$\Delta LFPINFLOW = \theta_0 + \sum_{i=1}^{p} \theta_1 \Delta LFPINFLOW_{t-i} + \sum_{i=0}^{p} \theta_2 \Delta LSMC_{t-i} + \sum_{i=0}^{p} \theta_3 \Delta LPCI_{t-i} + \sum_{i=0}^{p} \theta_4 \Delta LTBR_{t-i} + \sum_{i=0}^{p} \theta_5 \Delta LER_{t-i} + \sum_{i=0}^{p} \theta_6 \Delta LIR_{t-i} + \psi ECT_{t-1} + \varepsilon_t$$

4. Results and Discussion

Table 1: Descriptive Statistics of the Variables

Variable	Mean	Median	Std. Dev.	Skewness	Kurtosis	JB	Probability
FPINFLOW	39378.35	27712.40	36742.01	0.5393	1.8283	2.8534	0.2401
ER	98.05	101.19	34.19	-0.0132	2.0153	1.0916	0.5794
IR	8.68	7.67	4.59	1.1086	4.3763	7.6619	0.0217
MCR	20.40	21.61	7.30	-0.0234	1.9630	1.2122	0.5455
PCI	1906.59	1248.70	1319.47	0.5858	1.6533	3.5846	0.1666
TBR	11.91	10.01	4.73	0.5490	1.8687	2.7960	0.2471

Source: Results of Analysis of Eviews

Descriptive statistics describe the mean, median, standard deviation, skewness, kurtosis, and Jarque-Bera (JB) test of normality for all the considered variables of foreign portfolio investment inflow (FPINFLOW), exchange rate (ER), inflation rate (IR), stock market capitalization ratio (MCR), per capita income (PCI), and Treasury bill rate (TBR). According to Table 1, data series of PFINFLOW, PCI, and TBR are showed moderate positive skewness while IR is strongly skewed to the right. ER and MCR showed approximately normal distribution. The probability values of Jarque-Bera statistics of IR also showed non-normal distribution and all other variables supported to accept the null hypothesis of data series is normally distributed at the significance level of 5%. Because of using log-transformed data, further modeling can be done without any effect by the non-normality of the variable of IR.

It is important that the statistical properties of a time series remain unchanged over the time period for conduct statistical tests and modeling. In ARDL also, it is necessary to test stationarity for time series data to confirm integrating order of data series. The stationarity test is conducted first in level series and then in the first difference to establish the presence of unit roots and the order of integration in all the variables. This study employed the Augmented Dickey-Fuller (ADF) test to determine the integration order of variables by formulating the null hypothesis of H_0: $\beta = 0$ and the alternative hypothesis of H_1: $\beta < 0$. The following Table 2 shows the result of the ADF test. According to result log of ER (LER), log of MCR (LMCR), log of FPINFLOW (LFPINFLOW) have unit root (non-stationary) at

level series and log of PCI (LPCI), log of TBR (LTBR), and log of IR (LIR) indicate stationary properties. LPCI, LTBR, and LIR are integrated with order zero, I (0) and LER, LMCR and LFPINFLOW are integrated with order one, I (1). No any variable integrated above the first difference (order one). Therefore, selected variables are chosen for modeling by using the ARDL approach.

Table 2: Unit Root Test Results for the Variables

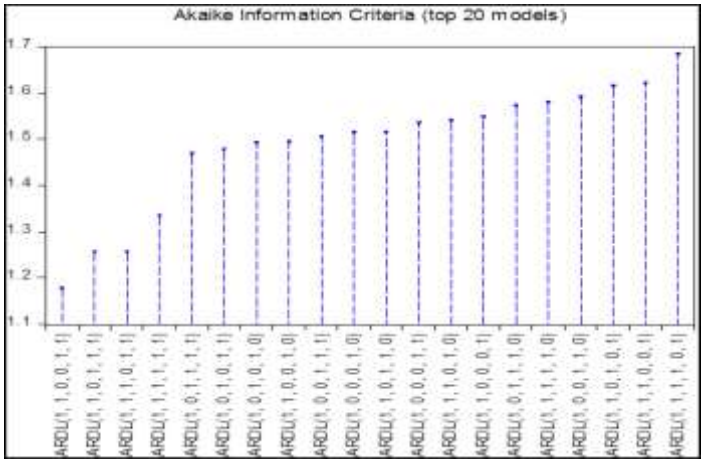
Variables	Level Series	1st Difference	Order of Integration
LFPINFLOW	-2.416433	-5.481469***	I (1)
LMCR	-2.172135	-4.695982***	I (1)
LPCI	-3.988642**	-1.710829	I (0)
LTBR	-3.996549**	-4.748392***	I (0)
LER	-1.574183	-4.751990***	I (1)
LIR	-4.074491**	-4.622135***	I (0)

Notes: ***& ** significant at 1%, 5% and 10% level respectively.
Source: Results of Analysis of E-views

This study adopts the criterion of Akaike Information Criterion (AIC) to determine the lag length and choose the fitted ARDL models which have the lowest AIC value. The summary of the selected number of lags for fitted ARDL models as follows. Moreover, Figure 1 shows the best twenty ARDL models out of 32 evaluated models under AIC for foreign portfolio inflow.

Figure 2 shows the top twenty AIC fitted models for modeling the foreign portfolio investment inflow. It shows the model 1,1,0,0,1,1 which has the lowest AIC value and it is selected as a fitted ARDL model.

Figure 2: Top twenty ARDL models which were fitted to explain FPI inflow under AIC



Source: Results of Analysis of E-views

F–test for the joint significance of the coefficients of the lagged levels of the variables for models is tested via the bound test approach to examine the existence of a long-run relationship among the variables. ARDL bound test is applied in testing the cointegration between the variables. The bound test is mainly based on the joint F–statistic, the asymptotic distribution if which is non-standard under the null hypothesis of no co-integration. The null hypothesis of no cointegration is rejected when the value of the test statistics exceeds the upper critical bounds value, while it is accepted if the F–statistic is lower than the lower bounds value. The results of the ARDL bound test is shown in Table 3. It presents the bound test results for fitted ARDL model to examine the relationship between stock market development and foreign portfolio investment inflows.

Table 3: Results of ARDL Bound Test for FPI inflows from 1992 to 2019

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.553***	10%	2.407	3.517
K	5	5%	2.910	4.193
		1.00%	4.134	5.761
		1.00%	4.134	5.761

Note: *** denotes significant at 1% level.
Source: Results of Analysis of E-Views

The result of the bound test show that the F-statistic of foreign portfolio investment inflow as 10.553 and it is a higher value than the upper bound of lags one at 1% significance level. Therefore, it rejects the null hypothesis and accepts an alternative hypothesis of the existence of cointegration or long-run association among the log series of the variables of foreign portfolio investment inflows, stock market capitalization, per capita income, Treasury bill rate, exchange rate, and inflation rate. And also, it confirms, there is a linear combination between log series of the variables. In other words, it verifies that the stock market development moves together with foreign portfolio investment inflow Therefore, it can be possible to predict the behavior of foreign portfolio investment inflow by using the stock market development in the long-run.

After confirming the long-run association among the variables, it is necessary to test the long-run coefficients of variables to examine the long-run impact. The estimated result illustrates in Table 4. Table 4 gives the long-run coefficient to examine the impact of stock market development on foreign portfolio investment inflow in Sri Lanka. The findings reveal that the log of stock market capitalization ratio (LMCR) and log of inflation rate (LIR) are statistically significant in the long-run. But log of per capita income (LPCI), log of Treasury bill rate (LTBR), and log of exchange rate (LER) are not statistically significant. The Log of Stock market capitalization ratio (LMCR) has

a positive significant impact of 1.2772 at 5% significant level. Therefore, there is sufficient evidence to reject the null hypothesis and accept the alternative hypothesis of the stock market capitalization ratio positively impacts on foreign portfolio investment inflow in the long-run. It indicates that stock market development is a reason to attract foreign portfolio investors to invest in the Colombo stock exchange. More than the stock market capitalization ratio, the inflation rate shows a positive significant impact also. The log of inflation rate has a positive significant impact of 0.9667 at 1% significant level Therefore, these results indicate that increase in stock market capitalization and inflation rate positively impact to attract foreign portfolio investment into Sri Lanka in the long-run. On the other hand, the long-run coefficients of the log of per capita income and log of exchange rate show a positive impact of 0.2950 and 6.0530 respectively. And also the long-run coefficient of the log of Treasury bill rate shows a negative impact of 0.4452. It means per capita income and exchange rate have a positive impact and the Treasury bill rate has a negative impact to attract foreign portfolio investment into Sri Lanka in the long-run. But coefficient values are statistically insignificant for these three variables. Therefore, per capita income, Treasury bill rate, and exchange rate are not important determinants in attracting foreign portfolio investments into Sri Lanka in the long-run.

Table 4: Estimates of Long-run Coefficients for FPI Inflow from 1992 to 2019

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMCR	1.277191	0.389238	3.281262	0.0050**
LPCI	0.295035	0.159628	1.848261	0.0844
LTBR	-0.445248	0.311279	-1.430381	0.1731
LER	6.053004	2.854007	2.120879	0.0510
LIR	0.966742	0.241695	3.999849	0.0012***
C	-3.289151	1.809014	-1.818201	0.0891

Source: Results of Analysis of E-Views

The stability of the long-run coefficients is tested by the short-run dynamics. ARDL Error Correction Regression is used to analyze the short-run behavior of variables with its long-run behavior over time.

Table 5 summarized the result of the ARDL error correction regression and it presents the short-run estimates.

Table 5: Estimates of Short-run Model for FPI Inflows over the Period from 1992-2019

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LMCR)	0.556031	0.184277	3.017368	0.0087***
D(LER)	2.307052	1.118678	2.062302	0.0569
D(LIR)	0.557497	0.117558	4.742329	0.0003***
CointEq(-1)*	-1.264906	0.124381	-10.169600	0.0000***

Note: *** indicates significant at 1% level.
Source: Results of Analysis of E-Views

Table 5 summaries the estimates of the short-run model to explain the short-run determinants of the foreign portfolio inflows in Sri Lanka. The results report that the coefficient of Error Correction Term (ECT), here represented as CointEq(-1)*, is negative with an associated coefficient estimate of -1.2649 and it is statistically significant at 1% significance level. This implies that about 126.49% of any movements into disequilibrium are corrected for within one period. It means that the speed of adjustment of log of foreign portfolio investment inflow to changes in stock market capitalization and other determining variables about 126.49% within the first year to ensure complete alignment with its equilibrium level. Moreover, given the very large t-statistic, namely -10.1696, also conclude that the coefficient is highly significant. Further, in the short-run, coefficients of log of stock market capitalization ratio and log of inflation rate are statistically significant. The estimated coefficient for log of stock market capitalization ratio is 0.5560 and it means increase in stock market capitalization ratio will attract foreign portfolio investors to Sri Lanka. In other words, in short-run foreign investors be aware of stock market development before they invest their funds in Sri Lanka through Colombo stock exchange because stock market development indicates that high returns, low risk, and high liquidity in the capital market. The estimated coefficient for log of inflation rate is 0.5575 and it means an increase in inflation

rate will attract foreign portfolio investors to Sri Lanka. The short-run coefficient value of log of exchange rate shows as 2.3070 but the probability value shows exchange rate is insignificant in short-run. Moreover, the R-squared value of the fitted short-run model is 0.8901 and it indicating that 89.01% of the total variation in the foreign portfolio investment inflow (LFPINFLOW) can be jointly explained by the regressors which are considered in the analysis. Further, the R-squared value is less than the Durbin Watson statistics, confirming the fitted model is not fictitious model. The short-run association between the variables also established and that F-statistics of the bound test is greater than the critical value at 1% level.

It is important to examine whether the residuals of fitted models for foreign portfolio investment inflow of 1,1,0,0,1,1 is normally distributed, homoscedastic, and no autocorrelation. Results of all tests conducted for test normality, heteroscedasticity, and autocorrelation in residuals finally concluded that the selected model for estimation is very well fitted to explain the impact of stock market development on the foreign portfolio investment inflow in Sri Lanka.

The findings of the study confirms that foreign portfolio investment inflow has a positive and significant relationship with stock market capitalization ratio in both long-run and short-run in Sri Lankan context rather than macroeconomic variables considered in this study. Therefore, stock market development is a major determinant of foreign portfolio investment inflow in Sri Lanka and relationship between these two variables confirmed by previous research studies also. Makoni and Marozava (2018) found that financial market development causes both foreign portfolio investment and foreign direct investment in Mauritius. According to findings of the study by Akinmulegun Sunday (2018), researcher concluded that there was a significant effect on foreign portfolio investment by capital market development in Nigeria. Haider et al. (2017) showed that there was a significant positive impact of stock market performance on the foreign portfolio investment in China by employing autoregressive distributed lag model. Makoni (2016) showed that foreign portfolio investment inflows of nine selected African countries for the study were

influenced by stock market capitalization. Lay (2007) also empirically confirmed that stock market capitalization in real terms had a positive relationship with foreign portfolio investment inflow in Singapore.

Obiamaka and Omankhanlen (2011) explained that the inflation can have positive impact on foreign investments provided that it does not exceed a certain threshold. Therefore, after the thirty years war Sri Lanka able to maintain inflation rate as one figure value. Inflation rate showed as two figure value in few times before the year 2009 because of the prevailing civil war in Sri Lanka. Therefore, this may be a reason for positive short-run relationship between inflation rate and foreign portfolio investment inflow in Sri Lanka.

5. Conclusion

This study attempted to examine the impact of stock market development on foreign portfolio investment in Sri Lanka by using the historical data set from 1992 to 2019. The Autoregressive Distributed Lag (ARDL) approach employed to determine the relationship and the impact of stock market development of the Colombo stock exchange and other considering macroeconomic variables on foreign portfolio investment inflow in Sri Lanka. The econometric analysis found a significant positive relationship between stock market development and foreign portfolio investment inflow in both short-run and long-run in Sri Lanka. Therefore, this study shows the importance of developing Colombo stock exchange to attract more and more foreign portfolio investments into the Sri Lanka.

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Impact of Monetary Policy on Financial Stability in Sri Lanka

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Abstract

This study investigates the impact of monetary policy on financial stability in Sri Lanka. Data were gathered from the period of 2000 quarter:1 to 2019 quarter:2. This study used money supply, interest rate, and exchange rate as proxies for the monetary policy, and financial stability is measured via Financial Conditional Index (FCI) developed with seven composite variables of capital flows, liquidity, interest rate spread, credit growth, non-performing assets of banks, exchange rate growth and the ratio of credit to GDP. The Vector Auto Regression (VAR) bound testing procedure is exercised with the application of data from 2000 to 2019. The results revealed that the FCI index developed is validated in the context of Sri Lanka. Further, it was determined and assessed the long-run and the short-run impact of monetary policy on financial stability in Sri Lanka. The findings disclosed that the monetary policy could not significantly impact financial stability in the long run. However, the results emphasized that the monetary policy had a significant impact on financial stability in the short-run of the country. Thus, the findings will give practical implications for policymakers to maintain financial stability in the country.

Keywords: Exchange Rate, Financial Conditional Index, Financial Stability, Interest Rate, Monetary Policy.

1.Introduction

The monetary policy of a country and the financial stability of that country are the most important determinants that determine the pathway for the overall economic development of that country. Especially, in a developing country like Sri Lanka, monetary policy and financial stability play a crucial role in raising the status of the country. These two are closely aligned as they cannot separate each other while the Central Bank of Sri Lanka which is the monetary authority in the country has set these two important dimensions as their two main objectives.

Sri Lanka is a developing country in South Asia which is recently upgraded to an upper-middle-income country with an estimated GDP per capita of USD 4,030 in 2019 and a total population of 21.7 million. After the 30 years of civil war that ended in 2009, the economy expanded by an average of 5.6 percent between 2010 and 2019, representing a peace dividend and a clear policy path towards development and growth although there is a slowdown in growth during the last few years (WorldBank, 2020).

The Central Bank of Sri Lanka (CBSL) is the monetary authority in Sri Lanka which was established in 1950 under the Monetary Law Act No. 58 of 1949. The CBSL aims to be achieved by having two central goals of ensuring a secure and stable economic and financial system while effectively optimizing resource use. They have assigned their two main objectives as maintaining of economic and price stability and maintaining of financial system stability, which are the main characters this study is on it (CBSL, Monetary Policy, 2018).

Though there are shreds of evidence for the price stability that will lead to the financial system stability by mitigating the imbalances in the financial system in a country, which is also known as the "Conventional Wisdom" hypothesis (Sethi & Acharya, 2019), however, the relationship between price stability and financial stability had been debated among researchers recently. Some studies have revealed that price stability will not be sufficient to achieve price stability, while it may simulate financial system stability. In addition, some studies have been suggested that the Conventional Wisdom

theory has to be reversed. This is known as the “New Environment” hypothesis in BSI research papers White et. al, (2006) and they stress that when there is under controlled inflation for a period it may represent the too optimistic view in the financial market and will result of loss in sense of security among the public, lead to the valuation of assets making the financial system more vulnerable.

Since the monetary policy and financial stability are playing a significant role in a developing country like Sri Lanka, it is essential to assess the implemented policy frameworks within the country are efficient and suitable with relevant to the various periods. The effectiveness of selected instruments may vary from time to time with the change of different factors internally and externally. Policymakers also could identify new trends and concepts regarding the policy frameworks from new research findings. However, the researcher has identified the research problem as studies on monetary policy and financial stability outside Sri Lanka, which have measured the financial stability in different methods such as applying a single variable or a composite variable which is also identified some drawbacks to those methods. Kono & chuknecht (2000) have measured the financial stability using nonperforming loans as a percentage of total loans by Panel data model specification, while Slacik & Jakubik (2013) have measured the financial stability by capital adequacy ratio; nonperforming loans as a percentage of total loans; after-tax profit as a percentage of average assets. The lack of related literature will fill the gap by investigating the impact of monetary policy on financial stability by calculating a financial conditioning index suggested by the previous researchers Seth & Acharya (2019). They combine seven indicators of financial stress or imbalances similar to the index used by European Central Bank to evaluate their financial market condition.

Thus, the study's main objective is to examine the impact of monetary policy on financial system stability in Sri Lanka and investigate the short-run and long-run relationship of monetary policy on financial stability in Sri Lanka.

The rest of the paper is structured as follows: Section 2 discusses an empirical review of literature, Section 3 explains the study's data and

methodology, and section 4 presents the study's empirical results, while section 5 concludes the study.

2. Literature Review

2.1. Overview of Monetary Policy

In Adams Smith's period, Monetary policy is considered an economic management tool to bring in sustainable economic growth and development was the goal of nations and the systematic articulation of how money influences economic aggregates. This idea was later promoted by other monetary economists (Onyeiwu,2012). Further, Nkoro (2005) indicates that economic growth is an essential factor for the economy as it leads to decreasing poverty and increasing the quality of life. Monetary policy is considered as the key driver of economic growth as it impacts the economy through other macro-economic variables (Nkoro, 2005). Therefore, policies in a country make that process effective and those policies should be implemented by considering all the consequences in short term as well as the long term.

Any country's monetary policy goes a long way towards shaping the economy's direction and amount of credit. It can be already notice that different monetary authorities have continued to observe the performance of their respective monetary policies, taking into account the significant role it plays in ensuring a sound economic condition (Okay, 2010).

However, as per Nwezeaku & Akujuobi (2010), to have a proper monetary policy within an economy selecting or including some variables is very important, especially the variables related to the entire banking system is essential because monetary policies are performed through the banking system and any policy that is not cover the required components would most probably fail to achieve their desired objectives. Jhingan (2000) defined monetary policy as credit steps taken by a country's central bank. Okwo, Eze, & Nwoha (2012) Indicates that monetary policy is a systematic government initiative to

control the money in the economy with a view to achieving particular economic objectives.

Busari, Omoke, & Adesoye (2002) suggest that there are more chances to stabilize an economy under a flexible exchange rate regime than a fixed exchange rate as it promotes economic growth under a flexible rate scheme but is followed by extreme depreciation, which could weaken the economy, making monetary policy more effective if it is used specifically to monitor inflation than to specifically stimulate growth. According to Abeng (2006), monetary policy to be effective there should be a highly monetized economy and otherwise, the monetary policy will not be valid and the effectiveness of the monetary policy will not happen in a less developed country which is having a large proportion of the production is produced in the traditional sector because then their money supply would be independence and monetary policy will not be a better tool to manage the economy of that nation.

2.2. Theoretical Framework for Monetary policy

2.2.1. The Classical View of Monetary Policy

The view of monetary policy by classical economists is based on the quantity theory of money (Diamond, 2003). Monetary policy has its origins from the Irving fishermen's inventions and the fisherman equation, or the Quantity Theory of Money is reflected by the expression of MV = PY. The Quantity Theory of Money (QTM) is one of the popular classical macroeconomic models that describe "the relationship between the quantity of money in an economy and the level of prices of goods and services" Allmi (2012) also explained that the quantity theory of money is the oldest theory which is remaining though some contraventions are presented latterly (ALIMI, 2012). According to him, this TQM formed the central point of classical monetary analysis of the 19^{th} century providing the most robust conceptual framework with the financial events paying more attention to the adverse impacts of inflation

In the above expression of MV=PY, M refers to the money supply over which the monetary authority has some control, while V denotes the

velocity of the money circulation, which means the average amount of times that the money is spent on final goods and services over a year. P refers to the general price level and Y is the GDP. Therefore, PY represents the current nominal GDP. According to that, the theory of exchange represents that "the current market value of the final goods and services are equal to the money supply multiplied by an average number of times a currency used in a given year's transaction" (Nwoko, Ihemeje, & Anumadu, 2016) The classical economist assumes the economy is always on or near to the real GDP. Therefore, they assume that Y in the exchange equation is constant in the short run, and they also believe that the velocity of the money circulation also tends to remain fixed. According to that, both Y and V are constant in the equation. Then if the monetary authority of the country implements an expansionary or contractionary policy decision, it will lead to only an increase or decrease in money supply, which is affected to the price level. Nwoko, Ihemeje, & Anumadu (2016) has explained this situation as an expansionary monetary policy can only lead to an inflationary situation in the economy and countervailing monetary policy caused for the deflationary situation in the economy.

2.2.2. Keynesian view of Monetary Policy

Keynes provided a modification theory for the quantitative theory of money by introducing a monetary theory of output besides prices. The Keynesian theory does not accept that there is a direct and proportional relationship between price and money. Instead of it is accepted that there is an indirect relationship through the interest rate. Moreover, the Keynesian view rejects the assumption that the economy is always on or near the real GDP and hens they cannot be constant. Further, it is also not acceptable that the velocity of the money circulation is fixed under the Keynesian view of monetary policy.

Keynes criticizes the classical theory of static equilibrium in which money is seen as stable and does not impact the actual equilibrium of relative prices in the economy (Chand, 2013). Keynes suggests that an expansionary monetary policy will increase the loan acquiring for funding purposes, in the banking system and that in return, it caused interest to fall, and then expenditures on investments and interest-

sensitive consumption gradually increased. It will lead to an increase in GDP. Therefore, he argued that monetary policy could indirectly affect the real GDP (Nwoko, Ihemeje, & Anumadu, 2016). In order to his argument, he explained that unemployment occurs due to insufficient aggregate demand, which can be increased because, when the money supply increasing, that will cause to have increased consumption, increasing employment, and economic growth. However, he suggests a proper combination of monetary and fiscal policies, as the monetary policy may fail to achieve its target in some circumstances (Onyeiwu, Monetary Policy and Economic Growth of Nigeria, 2012).

2.2.3. The Monetarist View of Monetary Policy

Monetarists are different from Keynesians because they believe in the mechanism of direct transmission. Monetarist is a view of the school thought developed by Milton Friedman. This method of thinking is a new version of traditional macroeconomics. They built a gentler and more specific version of the quantity theory of money (Nwoko, Ihemeje, & Anumadu, 2016). Here, Friedman has emphasized that money supply is a critical factor for the development of an economy, and it is an essential factor when implementing monetary policy to ensure the stability of the economy. He believed that in order to achieve steady economic growth, the money supply should be growing at a constant rate instead of being regulated or adjusted by the monetary authorities. According to that, he explained that as the supply of money rises, people keep more money in their hands than they wish to hold and that leads them to invest the surplus money on shares, goods, and services, thereby increasing aggregate effective demand (Karmakar, 2014).

2.2.4. Monetary Policy in Sri Lanka

Monetary policy is the mechanism by which a central bank controls the supply and costs money in an economy primarily to accomplish the macroeconomic price stability. The Central Bank of Sri Lanka is responsible for conducting monetary policy in Sri Lanka, which mainly comprises establishing policy interest rates and controlling the

economy's liquidity. Central Bank monetary operations influence interest rates in the economy, impacting borrowers and lenders' behavior, economic activity, and eventually inflation rate. Thus, the Central Bank uses monetary policy to monitor inflation and hold it within the desired range (CBSL, 2018).

The Central Bank introduced monetary targeting as its monetary policy framework during the early 1980s, and monetary aggregates became the main nominal anchor in monetary policy actions. The money supply changes are considered the primary causal factors affecting price stability under a monetary targeting system. In general, two major concepts of monetary aggregates are considered (CBSL, 2018).

2.3. Overview of Financial Stability

Financial stability is a characteristic of the financial system, representing its ability to efficiently assess resource distribution and mitigate financial risk through its self-regulating mechanisms (Apitachioae, 2012). Schinasi (2004) Defines financial stability as a broad concept covering various aspects of the financial system, including institutions, infrastructure, and the economy (Schinasi, 2004). Financial stability needs not only the adequate allocation of capital and risks, but also financing must mobilize savings, encourage the accumulation of wealth and bring about growth and development; moreover, it needs the smooth operation of the payment system in all elements of the official and private economy, retail and wholesale, and formal and informal payment mechanisms (Sethi & Acharya, 2019).

Most countries have been paid attention to ensuring financial stability after the financial crisis in 2007/2008. Firstly, it has led to a rethink of monetary policy frameworks based primarily on maintaining price stability. It is proved that price stability is not a sufficient condition for financial stability, and lack of financial stability may have a considerable negative impact on price stability. (Bean, Paustian, Penalver, & Taylor, 2010). The second thing was it lead to accelerating the new policy implement process around the world called macroprudential policy, introduced by Crockett (2000). It was focused on recognising that maintaining the soundness and security of

individual financial institutions is not sufficient to ensure the stability of the entire financial system, and that a systemic approach to financial stability is required (Papademos, 2009).

Chukwudi & Henry (2019) define financial stability as, it is commonly characterized as the financial system's ability to tolerate shocks, as well as imbalances, and it still provides sufficient financial intermediation. But a common view on financial stability has not been reached yet by the researchers. However many previous researchers have addressed financial stability with the word "Financial Instability". Chant, Lai, Illing, & Daniel (2003) has described that "Financial instability refers to conditions in the financial markets that affect or threaten to affect economic performance through the impact they have on the financial system." Therefore, financial stability refers to the absence of financial instability with a financial system which is efficiently functioning by effective resource allocation and baring risks and having the ability to survive in an economic shock. Therefore, ensuring financial stability is an important thing for every nation as it benefits economically and socially as a whole.

2.4. Financial Stability in Sri Lanka

Secure financial stability is capable of mobilizing savings with the use of allocating them to productive assets, managing risks, and resolving payments, without impacting people's economic growth and welfare significantly, even in times of economic shocks and stressful circumstances. It will assist to create a favorable climate in order to encourage investment and economic development for successful financial intermediation (CBSL, 2018). The financial system in Sri Lanka has been more integrated and dynamic than ever before, making the effect of a crisis bigger than ever in turn. The global financial crisis of 2008 demonstrated the fact that stress in one institution rapidly spread through industries and jurisdictions to similar institutions, causing systemic problems (Financial System Stability Review, 2019). In accordance with the current financial system stand with the problem of corrective regulatory action taken against a few institutions does not mean that the whole non-bank financial institutions market is in danger. Note in particular that some accredited financial firms are on

a par with small to medium-sized banking institutions. Given a challenging macroeconomic environment marked by a strong fiscal deficit, inflationary pressures, and expanding current accounts, the financial system's near-term uncertainties tend to be convenient. Indicators of financial soundness have improved; however, stress tests show that banks are much less resilient to interest rates and liquidity shocks (IMF, 2007). While competition is usually good, when it comes to banking there is a trade-off between competitiveness and stability of the financial system. This is because of the banking system's specific characteristics, such as scale returns, asymmetric details, and liquidity and complexity problems (Liyanagamage, 2015). Therefore, based on its built-in balance sheet power, the Government and the Central Bank have asked the financial sector, especially the banking sector, to continue to support the economy in various ways, while the Central Bank is providing the financial sector with the required liquidity and regulatory support to face these challenges (Lakshman, 2020).

2.5. Empirical Background for the Study

It is found very few articles on investigating the relationship between monetary policy and Financial Stability have been done. Research done by Ouhibi & Hammami (2015) has examined the relationship between monetary policy and financial stability, by using six south Mediterranean countries (Tunisia, Morocco, Egypt, Lebanon, Jordan, and Turkey) by using monthly data from 2006 to 2013. They have analyzed the monetary policy contribution to financial stability using a structural vector Auto-regressive model. Their empirical results show that the short-term interest rates affect the selected asset prices depends on the strategy of the monetary policy. For countries that adopt a flexible exchange rate regime such as Tunisia, Morocco, Egypt, and Turkey, the interest rate is contributing to financial stability. However, in countries that adopt a fixed exchange rate regime such as Jordan and Lebanon, the interest rate is not an effective tool for promoting financial stability.

Onyeiwu (2012) considers the effect of monetary policy on the economy of Nigeria. The Ordinary Least Squares Method (OLS) is used to evaluate data during the period 1981 to 2008. The results of the

analysis show that monetary policy introduced through the money supply has a positive effect on GDP growth and Balance of Payment. However, a negative impact on the rate of inflation has been found. Another analysis done by Chuku (2009) in Nigeria about the impact of Nigeria's monetary policy developments used a Structural Vector Auto-Regression (SVAR) approach to track the impact on Nigerian production and prices of monetary policy stocks. The analysis also examined three alternative policy instruments, namely broad money (M2), minimum rediscount rate (MRR), and the effective real exchange rate (REER). The analysis showed that Innovations in monetary policy have both actual and nominal effects on the economic factor depending on the policy variable chosen.

Chukwudi & Henry (2019) conducted research using an error correction model; this study analyzed the effect of monetary policy on financial stability in the Nigerian banking industry for the period 2008Q1 to 2016Q2. The financial stability index of the banking industry (BIFSI) was measured within the analysis and used as an indicator of financial stability in the Nigerian banking sector. Then the study found that monetary policy had a poor effect on financial stability in the Nigerian banking industry. It also revealed a solid long-term balance between monetary policy and financial stability in the Nigerian banking industry. Finally, it was concluded that open market activity and channels of exchange rates are more efficient mechanisms for transmitting monetary policy to the banking sector's financial stability than the interest rate system.

Mayandy (2019) uses monthly data from 1980 to 2017 to estimate the forward-looking monetary policy reaction feature for Sri Lanka. The findings suggest that Sri Lanka's Central Bank (CBSL) adopted Taylor's law for setting interest rates. His forward-looking model forecasts show that the inflation coefficient rises over time, reflecting the Bank's greater emphasis on price stability. Although the degree of interest rate smoothness progressively decreases over time, the study shows that the CBSL did not respond to fiscal deficit moves during the period under investigation. This result indicates that the inclusion of fiscal deficit in the Taylor rule does not provide a better definition of

Sri Lanka's role of policy reaction. Omoka & Ugwuanyi (2010) examine the relationship between inflation and monetary policy. Consequently, the result suggested that monetary stability would lead to price stability in the Nigerian economy because the change in price level is caused mainly by the money supply. Therefore, the performance was tested using the Co-integration test and the Granger Causality test.

Further, when measuring financial stability most of the previous studies have used the methods of developing a composite index to measure financial stability, and that method was better than using a single variable. However, since this multidimensional analysis involves assigning adequate weight to the FCI index, the principal components analysis (PCA) seems fitting. This method shows that the index can quantify uncertainty in the financial sector by allocating some weight based on a relative contribution. Arzamasov & Penikas (2014) argues that though PCA benefits from integrating a collection of details, the inclusion of too many negative weights complicates the study. Furthermore, they have argued that the time-varying dynamics are ignored when each variable is allocated weights. Weights are not allocated at every point in time in PCA. There is thus a risk that weight will ignore time factors in the analysis. Especially in time series, macroeconomic and financial variables experience structural changes, indicating that over time there might not be a similar pattern of relationship between two different periods, i.e. the pre-and post-interruption periods. (Zivot & Andrews, 2002).

Therefore, to overcome those challenges, the FCI was adopted to measure financial stability developed by Sethi & Acharya (2019), which is based on the indicators suggested by the European Central Bank. They have calculated this FCI index as the UNDP's Human Development Index (HDI) method.

Most of the studies have used a single variable or PCA method to measure financial stability. However, later, it is accepted that it is not appropriate to use a single component to measure a variable like financial stability with compliance of previous researches since it provides insufficient and inappropriate measurements for financial

stability. Therefore, this study was adopted to develop an index for measuring financial stability. This index is denoted as Financial Conditional Index (FCI) that has not used previous research for measuring the financial stability in Sri Lanka. Therefore, this study will provide a novel contribution of calculating the FCI index in Sri Lanka to measure the countries' financial stability.

3. Methodology

3.1. Research Approach, Design, and Sample Selection

The deductive approach has been used as the research approach since this study has been conducted as to the priory developed research questions by the researcher after referring the previous studies within Sri Lanka and outside of Sri Lanka and including valid theories within other nations. The explanatory research design used in this study, which will better understand the issue, has not been addressed in depth by many previous Sri Lankan researchers.

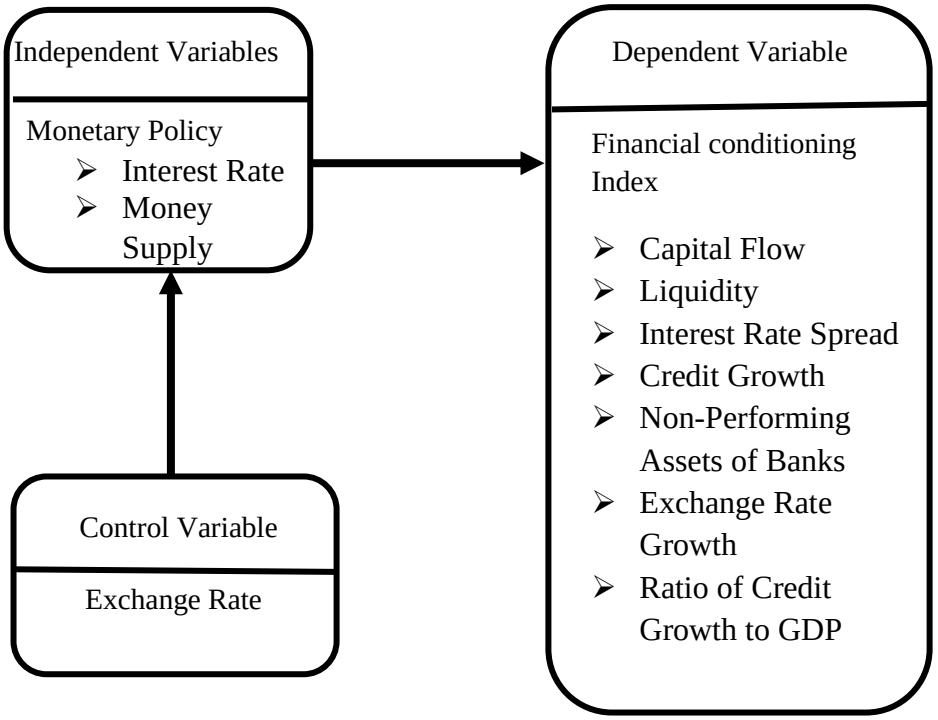
To analyze the impact of monetary policy on financial system stability in Sri Lanka, we use the sample period as quarterly data from 2000 Q1 to 2019 Q4. To investigate the recent and timely effects of monetary policy on financial system stability, the data were collected from 2000 as in 2000; the Central Bank launched a modernization programmed along with the global developments in central banking and rapid shifts in international financial markets as a result of economic liberalization and major advances in IT by adjusting their main objectives (CBSL, About the Bank- Bank History, 2018). The data were gathered from the Central Bank annual reports.

The Vector Auto Regression (VAR) model and Johansen cointegration test were applied to verify the stationarity, correlation, and time-series methodology used to investigate the impact of monetary policy on financial stability. Hence, the data were analyzed by using the program E-Views 10 Student Edition.

3.2. Conceptualization

The analytical model of this study consists of the dependent variable of Financial Stability, which is going to measure by a Financial Condition Index and also three independent variables which are proxies to measure the monetary policy in Sri Lanka; namely, Interest Rate, Money Supply, and the exchange rate is as a control variable in the model. The structural diagram of this study Is as follows.

Figure 3.1: Conceptual Framework



Source: (Developed by the researcher by referring to the literature, 2020)

3.3. Variable Selection and Justification

3.3.1. Dependent variable

Financial Stability

Financial stability is described as promoting and improving economic cycles, mitigating threats, and absorbing shocks. In addition, financial stability is called a continuum: changeable over time and compatible with various variations of the financial components that constitute it (Schinasi, 2004). In Sri Lanka, financial Stability is defined as Capable of mobilizing resources and allocating them to profitable assets, handling uncertainties, and paying claims, without significantly impacting economic development and people's well-being, even in periods of global disruptions and difficult situations. This tends to create a conducive climate to encourage investment and economic development for successful financial intermediation (Financial System Stability Review, 2019).. The global financial crisis of 2008 demonstrated that tension in one entity rapidly spread through industries and jurisdictions to different entities, causing systemic problems. According to Acharya (2019), in the literature, several main variables are used to calculate financial uncertainty using three different terms: financial tension, financial conditions, and financial soundness. Prominent metrics from the finance, foreign exchange, debt, and stock sectors are used to assess volatility in the capital system.

Constructing the Financial Conditions Index

The Financial Conditions Index (FCI) is a systematic index developed from several variables (Yub, 2014). Calculating the financial conditions and predicting the economic cycle may cover up the shortfall of specific traditional indices, such as money supply and interest rate. FCI has become an important reference index in financial analyses and policymaking in some central banks and foreign organizations. The functioning of the financial system primarily relies on the value of the different transmission channels (Ian, 2018). The FCI discusses key economic and development problems, especially

those facing the Asia and Pacific region. In addition, intellectual, theoretical, or quantitative concerns related to the economic analysis of the project/program, and comparative data and calculation (Gochoco-Bautista, 2013). Therefore, FCI has a relationship between economic activities performed by the county and its ultimate results expected for economics. Calculating the FCI index is compatible with the approach used previously by the United Nations Development Program (UNDP) to measure some standard indices, such as the Human Development Index, the Human Poverty Index, the Gender Development Index, etc. (Acharya, 2019). In the context of Sri Lanka, financial stability can be measured following the Central Bank of Sri Lanka of rules and regulations implanted by the monetary authority to govern the financial system. The Macroprudential Surveillance action that implemented by the Financial Stability Unit (FSU) of CBSL states that there are four segmental indicators, namely, the Macro Economic Stability Indicator (MESI), the Financial Markets Stability Indicator (FMSI), the Banking Soundness Indicator (BSI), and Licensed Finance Companies Soundness Indicator (LFCSI). Those measure the financial instability of Sri Lanka (Financial System Stability Review, 2019). Therefore, major components for financial stability can be identified as Capital Flows, Liquidity, Interest Rate Spread, Credit Growth, Non-Performing Assets of Banks, Exchange rate Growth, Ratio of credit to GDP.

The construction of FCI, according to (Sethi & Acharya, 2019) is followed as below;

Equation 1:

$$FCI_t = \frac{d_{it}}{number\ of\ dimensions\ (\ seven\ inducators)}$$

And $d_{it} = W_{it} * \frac{A_{it} - m_i}{M_i - m_i}$

Where,

W_{it} = weight attached to the dimension i, $0 \leq W_i \leq 1$ for time t.A_{it} = actual value of dimension i for time t.

m_i = minimum value of dimension i.

M_i = maximum value of dimension i.

d_{it} = dimensions of financial conditioning index i for time t.

FCI_t = financial conditioning index for time t.

i = refers to dimensions of FCI, which is the number of variables used in calculating the index.

t = refers to the length of time period used for each dimension (variables) in the FCI index.

More explicitly of FIC index,

Step 1:

Equation 2:

$$d_{it} = W_1 * \frac{A_{1t} - m_1}{M_1 - m_1} + W_2 * \frac{A_{2t} - m_2}{M_2 - m_2} + W_3 * \frac{A_{3t} - m_3}{M_3 - m_3} + W_4 * \frac{A_{4t} - m_4}{M_4 - m_4} + W_5 * \frac{A_{5t} - m_5}{M_5 - m_5} + W_6 * \frac{A_{6t} - m_6}{M_6 - m_6} + W_7 * \frac{A_{7t} - m_7}{M_7 - m_7}$$

Where,

Equation 3:

$$d_{1t} = W_1 * \frac{A_1 - m_1}{M_1 - m_1}, d_{2t} = W_2 * \frac{A_2 - m_2}{M_2 - m_2}, d_{3t} = W_3 * \frac{A_3 - m_3}{M_3 - m_3}, d_{4t} = W_4 * \frac{A_4 - m_4}{M_4 - m_4}, d_{5t} = W_5 * \frac{A_5 - m_5}{M_5 - m_5}, d_{6t} = W_6 * \frac{A_6 - m_6}{M_6 - m_6} \; and \; d_{7t} = W_7 * \frac{A_7 - m_7}{M_7 - m_7}$$

Step 2:

Equation 4:

$$FCI_t = \frac{d_{1t} + d_{2t} + d_{3t} + d_{4t} + d_{5t} + d_{6t} + d_{7t}}{7}$$

Where d_{1t} denoted as the ratio of bank's foreign assets to total assets, d_{2t} denoted as the ratio of banking system's credit to total deposits, d_{3t} denoted as domestic exchange rate change against the dollar, d_{4t} denoted as interest rate spread between lending rate and money market rate, d_{5t} denoted as credit growth, d_{6t} denoted as non-performing assets of banks and d_{7t} denoted as a credit to the private sector to GDP ratio.

Now it is easy to map the cycles of financial imbalances from the FCI index. In the FCI index, the higher FCI value implies higher financial instability in a given period, and the lower FCI value implies lower financial instability. In another term, the higher FCI value implies lower financial stability in a given period and the lower FCI value implies higher financial stability. Therefore, in the context of Sri Lanka, seven variables can be identified as key variables that can be comprised of the FCI.

Capital Flows

Capital Flow means capital movements between countries. Outward flows of capital are transfers of domestic capital abroad; inward flows of capital are the migration of international capital into the domestic economy. For this study, the researcher takes the 'ratio of the bank's foreign assets to total assets as capital flows. This ratio is representative of the amount of external exposure the banking sector has in a region. As per Unseal, (2013) since the middle of 2009, the resumption of capital flows to emerging markets has raised two sets of interrelated challenges for policymakers are to keep capital flows from fueling the overheating and consequent inflation pressures and to mitigate the possibility of extended periods of easy funding weakening the financial stability. The data with regard to capital flows were taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

Liquidity

Liquidity defines as the convenience of turning a commodity or security into ready cash without changing its stock price (Morawakage, 2019). For this study researcher take as liquidity is to 'ratio of banking system's credit to total deposits. Banking Soundness Indicator (BSI) that are adopted by the Central Bank of Sri Lanka has included liquidity to measure the financial stability of Sri Lanka (Financial System Stability Review, 2019). The data with regard to liquidity was taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

Interest Rate Spread

Interest rate spread means that interest rate charged by banks on loans to borrowers in the private sector, minus interest rate paid by commercial or related banks for cash, time, or savings deposits. With the past experience of Sri Lanka, Interest Rate Spread is a trend to make an impact on the financial stability of the country (Financial System Stability Review, 2015). An increase in the difference between the loan rate and the money market rate will adversely affect the credit market. A wider gap between these rates indicates market uncertainties which worsen the fragility of the financial sector (Acharya, 2019). For this study researcher take interest rate Spread is to 'spread between the lending rate and money market rate. The data with regard to interest rate spread was taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

Credit Growth

Credit growth means the continuous increase of credit granted by the financial institute. The value of credit growth reflects real-economic imbalances (Jayaram, 2009). Private loans as a percentage of gross domestic products (GDP) are used to measure financial instability (Carolina Osorio, 2011). Increment in the loan will create financial system instability in Sri Lanka (Financial System Stability Review, 2019). For this study, the researcher takes credit growth as loans granted to the private sector by the financial sector. The data

concerning credit growth was taken from Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

Non-Performing Assets of Banks

A non-performing asset (NPA) is a financial instrument at which the creditor has, for an unspecified period made no previously negotiated interest and principal repayments to the approved lender. Consequently, the non-performing asset does not yield any profits in the interest paid to the lender. An increase in NPA is indicative of bad results for the banking sector. These bad assets increase stress in the banking and financial system as the former depends on the loan interest rates. The Banking Soundness Indicators (BSI) adopted by the Central Bank of Sri Lanka includes-Performing Assets of Banks to measure the financial stability of Sri Lanka (Financial System Stability Review, 2019). For this study, the researcher takes as non-performing assets of Banks is to the banking sector- non-performing loans to total loans and advances (Gross Non-Performing Advances (NPLs) Ratio). The data with regard to the non-performing asset was taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report - Statistical Appendix.

Exchange Rate Growth

An increase in the exchange rate results in a decrease in global competition due to high commodity prices and, therefore, a downturn in export growth (Acharya, 2019). The data with regard to exchange rate growth was taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

Ratio of Credit to GDP

This ratio is meaning as the percentage of private-sector loans to total GDP. A rapid increase in loans will cause unsustainability for the banking sector. Rapid credit-to - GDP growth contributes to economic overheating, which raises financial system vulnerability (Acharya, 2019). The data with regard to the ratio of credit to GDP was taken from the period of Q:1 2000 to Q:4 2019 which was published by CBSL Annual Report -Statistical Appendix.

3.3.2. Independent variables

There are two independent variables in the study. Description for each variable under the study is as follows;

Money Supply

Monetary policy is the mechanism by which a central bank controls the supply and money costs in an economy primarily to achieve the price stability macroeconomic objective. The money supply is the amount that floats around the economy and is available to spend (Abbas, 1991). The money supply shows a good correlation with how much money has been spent and is being examined fervently by economists as clues to economic growth (Bemanke & Blinder, 1992). The Central Bank of Sri Lanka (CBSL) is trying to achieve this objective by manipulating changes in the broad reserve money supply (operating target) through a multiplier (Monetary Policy, 2018). In the short run, the supply of money becomes efficient in generating variations in profits. Monetarism suggests that, in the long run, prices are influenced mainly by growth in the money supply, thus having no apparent impact on growth in wages. If growth in money supply is higher than growth in demand, then inflation will be the result. (Maitra, 2015). Financial stability hence changes the level of the money supply with economic value creation of the county like Sri Lanka. The researcher, therefore, finds financial stability of Sri Lanka will be impacted with the application of money supply (M_2). The data concerning money supply was taken from Q:1 2000 to Q:4 2019, which was published by CBSL Annual Report -Statistical Appendix.

Interest Rate

The interest rate is a major monetary policy instrument of most Central Banks. The rate paid at the interest is paid by the borrower (debtors) that they borrow from the creditors (Ayub & Shah, 2015). An expansionary monetary policy leads to a decline in interest rates, thus raising demand and causing real income to increase. In addition, a lower interest rate discourages savings (encourages borrowing), increasing household consumption, leading to higher aggregate

demand and price levels (Debnath, 2015). The policy rate implemented by the monetary authority will influence financial stability. There is an ongoing discussion as to whether interest rates may be used to meet the needs of financial stability policy, given that monetary policy and financial stability goals are interrelated and the relationship between price and financial stability (Goksu, 2017). The researcher found data with regard to the interest rate from the website of the Central Bank of Sri Lanka. The data is used as statutory reserve ratio (SRR), which is the proportion of the deposit liabilities that commercial banks are required to keep as a cash deposit with the Central Bank. Under the Monetary Law Act (MLA), commercial banks are required to maintain reserves with the Central Bank at rates determined by the Bank. At present, demand, time, and savings deposits of commercial banks denominated in rupee terms are subject to the SRR. Therefore, the Central Bank is currently using the SRR to tackle persistent liquidity problems on the market. Hence, statutory reserve ratio (SRR) as the interest rate is applied to conduct this study from Q:1 2000 to Q:4 2019.

3.3.3. The Control Variable

Any other variable that may be an effect on the result variable is a control variable. The nominal exchange rate, the study states, is the control variable

Nominal Exchange rate

A rational exchange rate is a crucial component of the policy environment required to raise private investment. Depreciation of the rupee was a significant aspect of the 1977 liberalization program. Activities performed by monetary policy instruments will impact on exchange rate significantly in the long run. Policymakers, therefore, must decide whether to tighten policies to stabilize the exchange rate, particularly if higher interest rates are the effective response (Zettelmeyer, 2000). Sri Lanka is moving towards a system for Flexible Inflation Targeting (FIT), which CBSL does not regard as an objective / explicit monetary policy target (CBSL 2019). More excellent stability in currency determination and interference is

restricted to correcting volatile exchange rate changes. Volatility has therefore come across episodes that will remain crucial in the sense of Sri Lanka to explore the relationship between monetary policy and exchange rate (Sumila Tharanga Wanaguru & Anil Perera, 2019). Operation market activities performed by a specific sector or entire county will impact the financial stability of the country as a whole. Therefore, the researcher applies the exchange rate from the CBSL annual report-statistical appendix with the period of Q:1 2000 to Q:4 2019.

3.4. Measurement Model of the Analysis

The model for this study has been developed by the researcher referring previous researches and policy instruments of CBSL, to examine the impact of monetary policy on financial system stability is as follows,

Equation 5:

$$\Delta FS_t = \beta_0 + \beta_1 \lg (MS)_{t-1} + \beta_2 R_{t-1} + \beta_3 EX_{t-1} + \mu_t$$

Where,

$\beta_0 =$ Constant

ΔFS = Financial Instability

lg (MS) = Log of Money Supply

R = Interest Rate

EX = Nominal Exchange Rate

μ_t = disturbance term

t = the quarter under examination

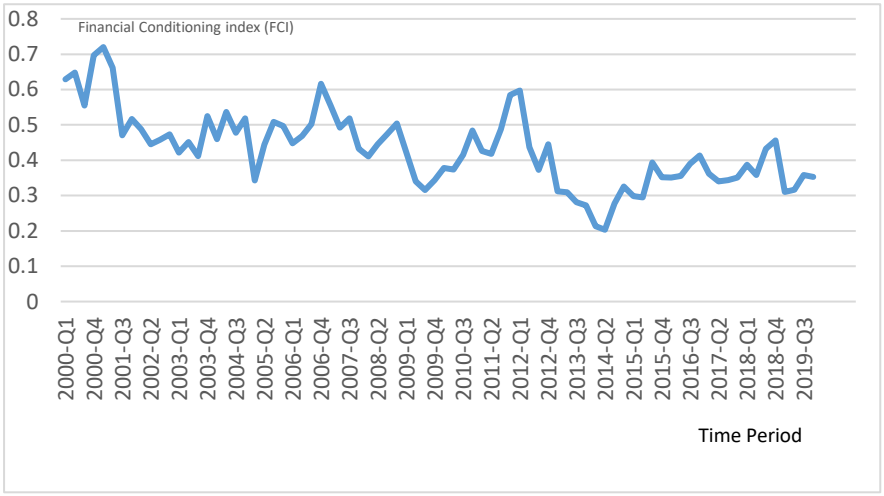
$\beta_1, \beta_2, \beta_3$ = coefficient of the corresponding variables

4. Analysis and Discussion

4.1. Validity of the Financial Conditional Index (FCI) in the Context of Sri Lanka

According to the recent financial crises around the world, which also impacted the Sri Lankan economy was considered. The below figure 2 indicates the financial conditioning index (FCI) for Sri Lanka developed in the study from Q1: 2000 to Q3:2019. Since the reliability of the index is tested against the past seasons which had financial instability around the globe and Sri Lanka, the first financial instability situation which has been occurred within the time frame considered for the study is Asian Financial crisis, occurred in 1997-1998. The impact of this can be seen at the early 2000-2001 in figure 2 because the FCI got a high value indicating financial instability. Another reason for this instability was the civil war that had been in the country in past decades.

Figure 2: Financial Conditions Index (FCI)



Source: Author Created

The 2007-2008 financial crisis (US Sub-Prime Mortgage Crisis) influences all countries worldwide, including Sri Lanka. The FCI index developed for Sri Lanka confirms a higher value in the periods of Q1:2007 to Q3:2008, as shown in the Figure. Moreover, in late 2012 Sri Lanka rupee depreciated highly, and high tariff has led to declining

in consumer goods import. Foreign direct investment flows also have not been improved (Asian Development Bank, 2013). Thus, the FCI index in Sri Lankan context can be validated to measure financial stability on the above grounds.

4.2. Unit root test

The results of the unit root tests are reported in Table 1. Here, we used Augmented-Dicky-Fuller (ADF) test to examine the existence of the unit root. Hence, all the variables become stationary at first difference.

Table- 1: ADF unit root test results

Variables	Exchange rate	Money supply	Interest rate (SSR)	financial stability
P-Value	0.0000	0.0336	0.0000	0.0001

Source: Results of the analysis

4.3. Lag Selection

The AIC, SC, and HQ were used to select the optimum lag for the proposed VAR model. The result is shown in table 2 below. The AIC selected a lag of 8, as against one lag suggested by SC and HQ. However, the lowest value of SC and HQ is -11.25933* and -11.63998* consecutively, which existed under lag 1. Therefore, more significant values exist under lag one since it will be considered more significant criteria to select as lag 1. For this reason, the optimum lag of 1 was selected.

`Table 2: Lag selection

Lag	AIC	SC	HQ
0	0.41628	0.542762	0.466633
1	-11.89174	-11.25933*	-11.63998*
2	-11.96371	-10.82538	-11.51054
3	-11.95382	-10.30957	-11.29924
4	-11.82594	-9.675753	-10.96994
5	-12.15047	-9.494362	-11.09307
6	-12.00323	-8.84119	-10.74441
7	-12.05573	-8.387765	-10.5955
8	-12.20103*	-8.02714	-10.53939

Source: Results of the analysis

4.4 Cointegration test

This test was conducted using the Johansen (1988) test for cointegration, and the result is presented in table 3 below. Here, the null hypothesis of 'one cointegrating equation' is accepted at 5% for both Trace statistic and Max. Eigen-value. The conclusion for both tests was stated as there is no long-run relationship; in order to run the short-run relationship, the first differences of both variables were taken for Vector Autoregression.

Table 3: Johansen Cointegration Test

No of cointegration equation	Trace test	P-value	Maximum eigenvalue test	P-value
None	36.56181	0.3685	19.34246	0.3885
At most 1	17.21934	0.6238	12.14972	0.5329

Source: Results of the analysis

4.5 Vector Auto Regression (VAR)

Vector autoregression (VAR) is widely used to model interrelated time series processes to analyze the complex effect of random fluctuations on variables structure. Here, R- squared states that the model is fitted for conducting a short-run relationship since the value of R-squared is 0.712894, which is more than 0.6. This implies that the model is fitted, stating to what extent the variance of one variable explains the variance of the second variable; it gives the evidence for further analyzing the data with the VAR model. Further, the probability value of each confirms whether significant or not. This provides information at FS (C1) for financial instability as per index is significant since its p-value is lesser than 0.05; this means that it provides sufficient and appropriate evidence to state that there is a short-run relationship between financial stability and monetary policy in Sri Lanka. However, money supply (MS) could not show a significant relationship with financial stability.

Table 4: Statistics of VAR

	Coefficient	Std.Error	t-Statistic	Prob.
FS(C1)	0.549263	0.094007	5.842785	0.0000
MS(C2)	0.053309	0.027615	1.930466	0.0574
R(C3)	2.18024	0.837957	2.601853	0.0112
EX(C4)	-0.001875	0.000834	-2.247366	0.0276
C(C5)	-0.527624	0.357553	-1.475651	0.1443
R-squared	0.712894	VAR Mean dependent		0.428433

Source: Results of the analysis

4.6 Discussion

The Financial Conditional Index (FCI) was used as the proxy for financial stability in Sri Lanka and the increase of the value of FCI reveals that the financial instability is increased in Sri Lanka.

Furthermore, the Cointegration test and VAR model approach were conducted to accomplish the objectives of the study. Table 1 shows the unit root test results to check whether the variables were stationary or not and variables have become stationary at first deference. As per table 2, lag 1 was identified to perform the cointegration test based on

Schwarz information criterion (SC) as it shows the lowest value in the first lag. However, the Akaike information criterion (AIC) did not select for further analysis since AIC detect lag 8, which did not comply with possible equations because more equations were taken out with lag 1.

Johansen Cointegration test could not show a long-run relationship by satisfying the criteria. Thus, VAR was chosen to conduct the short-run relation between variables. The results of VAR show that the model was fitted as R-squared is 0.71, which is higher than 0.6. This reveals that there is a short-run relationship between financial stability and monetary policy in Sri Lankan context.

Since monetary policy can impact financial stability, the results reveal a positive relationship between money supply and financial stability in the short run in the period of 2000 to 2019. However, it is not a significant positive relationship. Tabak, Laiz, & Cajueiro, (2013), analyze the role of monetary policy by accessing a detailed database of Brazil from 2003 through 2009; monetary policy is effective in mitigating the effects of financial stability. As a result, they have discovered a reliable relationship between monetary policy and financial stability.

On the other hand, the study of Monetary Policy and Financial Stability in the Nigerian Banking Industry (2019) discovered that the impact of monetary policy on financial stability in the Nigerian banking industry was weak by examining the effect of monetary policy on financial stability in the Nigerian banking industry for the period 2008Q1 to 2016Q. They have identified that the open market operation and exchange rate channels are more successful than the monetary policy rate in conveying monetary policy to financial stability in the banking industry. As a result, it is thought that combining monetary policy with other relevant policies, such as macroprudential policy, could aid in financial stability.

However, a significant positive relationship between interest rate and financial instability in the short run was identified. Therefore, monetary policy instruments can make a major impact on the financial

market, such as declining interest rates (SRR) which resulting; the bank can manage in an appropriate, short manner. Moreover, it needs to issue a short-term loan to assist production facilities for the organization immediately. The organization can generate production as a result of that, GDP will be increased, and credit to GDP will be declined. Further, there is a significant negative relationship between financial instability and the exchange rate in Sri Lanka. That means increases in the exchange rate initially lead to a decrease in financial instability in the short run. That can be caused due to higher factor price within Sri Lanka. The cost of goods and services produced and production factors in Sri Lanka are higher than goods, services, and production factors imported from abroad because creating demand for goods and services from abroad rather than purchasing goods and services from Sri Lanka will decline expenditure for goods and services. Therefore, it will impact the banking system due to lesser demand for loans and credit to purchase goods, services, and production factors. Thus, in the short run, stabilized the financial stability. The findings demonstrate that a negative relationship between financial instability and exchange rate in the short run. Therefore, the central bank of Sri Lanka has to implement a proper exchange rate policy that can be controlled the high volatility in the exchange rate in the short run. In this study, the exchange rate is a control variable manipulating to stabilize the financial system in the short run. Overall, in the short run, the results reveal a significant negative or positive relationship between all independent variables and financial stability, and there is no significant association between independent variables and financial stability in the long run.

Maitra, (2015) finds that the money supply, interest rate, and exchange rate changes have a significant causal effect on the variations of the price level in Sri Lanka and suggests maintaining price stability while achieving reasonable economic growth with proper monetary management.

5. Conclusion

This study examines the impact of monetary policy on financial stability in Sri Lanka, and the validity of the developed FCI can be

accepted in the Sri Lankan context. The Johansen Cointegration test was conducted to find the long-run relationship; results found no long-run relationship between monetary policy and financial stability. As per VAR analysis with short-run effect, a significant relationship between monetary policy and financial stability can be found.

The role of effective monetary policy and its instruments in stabilizing the financial system in Sri Lanka has had statistically significant effects. Supporting theoretical and analytical results is the - relationship between financial stability and efficient monetary policy framework regulated by Sri Lanka's central bank. The paper therefore analyzed monetary policy activities impacting financial stability in Sri Lanka with exchange rates used as a control variable with a collection of data representing the 2000-2019 period. Since the financial stability trend is more sensitive, the analysis investigates more annual data quarterly to explore relationship dynamics by following the Vector Auto Regression (VAR) approach. The researcher was able to analyze the essence of the relationship, thus estimating the effect on financial stability of the interest rate, money supply and exchange rate. Based on the results of model results, in the short run, all independent variables have a negative or positive relationship with financial stability and there is no significant association with independent variables and dependent variable in long-term.

The findings will give policymakers practical implications for applying several policy instruments to maintain financial stability in the short run. These will assist them in developing or properly implementing a new policy, appropriately making policy coherence, and they must study how to behave in the financial market to take the control actions timely to maintain financial stability. Therefore, the monetary authority of Sri Lanka has to be taken to restrict full action for the financial system; otherwise, it may create vulnerability for the county. Therefore, governors of the financial system in Sri Lanka must be careful when applying financial policy or actions for the country.

Future researchers can investigate other factors that may influence the financial system to add financial condition index development. In the

future, however, the analysis will be expanded in this field for emerging countries and developed markets to compare countries.

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Impact of Low Tax Revenue on Economic Sustainability in Sri Lanka

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Abstract

Tax revenue is one of the most critical factors for the development of any country. Reduction in tax revenue is one of the major problems in developing countries. That would affect every section of the country since it is the primary source of government funding. Sustainable development is not a novelty concept and has three aspects: economic, social, and environmental sustainability. The United Nations published a sustainable report on 2030, mentioning economic, social, and environmental sustainability goals. This research discusses the impact of low tax revenue on economic sustainability in Sri Lanka by using the data from 1990 to 2019. Human Development Index was used to measure the sustainability of the country. The data was collected from Annual Reports and Economic and Social Statistics of Sri Lanka published by the Central Bank of Sri Lanka. Correlation and regression analyses were used to achieve the objectives of the research. The results showed a significant impact of the tax revenue, trade openness, exchange rate, and inflation on economic sustainability. There is a significant positive impact of the exchange rate and the inflation rate on economic sustainability in Sri Lanka. As well as there is a significant negative impact of the tax revenue and the trade openness on economic sustainability. Though we think that increase in revenue can be achieved by increasing taxes, the economy's sustainability cannot be achieved by imposing taxes on the people.

Keywords: *Economic Sustainability, Tax Revenue, Human Development Index.*

1. Introduction

The government, as well as private organizations, want revenue to run both public and administrative activities. For that purpose, every organization is financed by different sources. Tax is the most important and valuable aspect of a country. Taxes play an essential role in economic planning and development since it is the primary source of revenue for the government. According to economic view, the only objective of taxation was to raise government revenue. Taxes play an essential role in financial planning and development since it is the primary source of income for the government. As a result, domestic revenue mobilization is necessary for sustainable development.

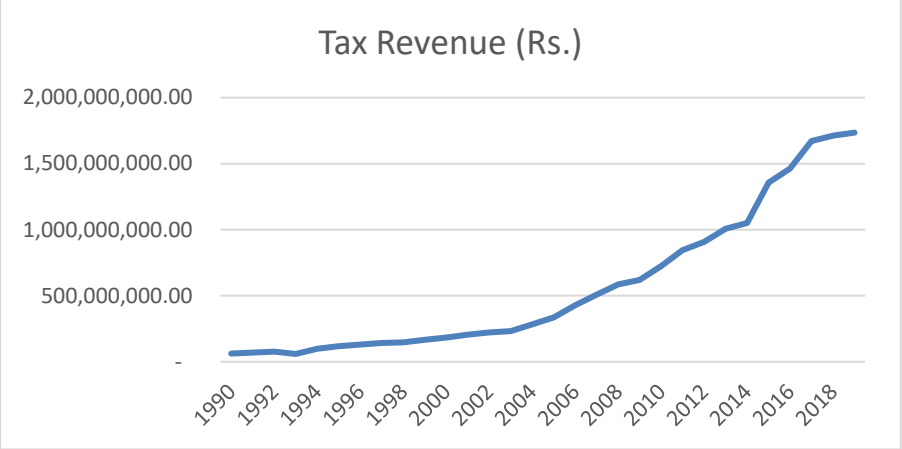
According to Kaldor (1963), if a country wants to develop, it must collect tax revenue more than other financings in developing countries. It proves that tax revenue is one of the best methods to boost the potential for public sector performance.

Sustainability is a novelty concept in Sri Lanka, but not for the world. Most countries look at this concept of sustainable development. Low tax income is the main barrier in most developing countries when implementing sustainable plans. In 2015, all the United Nations Member States agreed to the Sustainable Development Goals (SDG). As a member of the United Nations, Sri Lanka also established the 17 sustainability goals for uplifting social, economic, and environmental sustainability.

According to the Sri Lankan context, tax revenue has reduced in the past years. It was Rs. 1,216 million in the year 2020. It was a reduction of Rs. 0.518 million than in the year 2019. The tax revenue was reported as Rs. 428.378 million and Rs. 508.947 million respectively in 2006 and 2007. However, the increase of tax revenue in 2007 is lower than tax revenue in 2006. The increase of tax revenue was Rs. 91.55 million in 2006. But it was reduced by Rs. 10.981 million in 2007. There was a gradually decreased growth of tax revenue from 2006 to 2009. Although there was an increase in tax growth in 2010 and 2011, tax revenue is decreased up to Rs. 63.216 million after 2011. The growth of tax revenue was Rs.

42.140 million and Rs. 22.607 million respectively in 2018 and 2019. When considering these recent years, the tax revenue is reduced. So, it is clear that the lower tax revenue growth creates a path to low tax revenue in a country.

Figure 8: Annual Tax Revenue in Sri Lanka



Data Source: Central Bank Annual Reports 1990- 2019

The one reason to reduce the tax revenue is, government cannot impose the tax on people continuously by putting higher weight on their shoulders. Apart from that, tax legislation complexity, weakness of tax revenue administration, lack of apparent political rationality, tax collection is lower than optimal, political influence, and favoritism also considered as some of the other reasons for that (Amirthalingam, 2013).

However, Sri Lanka has a low tax income compared to the other emerging countries. Time has come to discuss it as the most valuable case in the present situation. The researcher selected the research issue as the impact of low tax revenue on economic sustainability because income mobilization is essential for the country's sustainability.

1.1. Research Problem

As mentioned earlier, there are sustainable goals to achieve in 2030. The government should allocate considerable funds to fulfill those achievements and some of the goals are already achieved. But there is

an issue in Sri Lanka when finding financial sources for those projects. Tax revenue has been reduced and funding will be limited. From the total government revenue, 80% represents the tax collection from people. If the government does not have enough revenue, it will create a significant barrier to achieve sustainability goals in 2030.

The research problem has been identified as "What is the impact of low tax revenue on the economic sustainability of Sri Lanka?"

1.2. Objective

The primary objective of the study was to identify the impact of low tax revenue on the economic sustainability of Sri Lanka.

1.3. Research Hypothesis

Based on the primary objective of the study, the hypotheses were developed as follows.
H_0: There is no any significant impact of tax revenue on economic sustainability.
H_1: There is a significant impact of tax revenue on economic sustainability.

2. Literature Review

There are several empirical studies about the relationship between tax revenue and economic sustainability in different countries. Following is a review of their findings.

Kalendien & Pukelien (2011) found that economic sustainability depends on the government's tax revenue. They examine that European countries' tax revenue is impacted on economic sustainability performance. Their findings showed that the low tax rate could hit the sustainability of the economy.

Tax revenue is the most critical section in economic growth. Bukie, Adejumo, & Edame (2013) examined the effect of tax revenue on

economic growth in Nigeria from 1970 – 2011 and revealed a positive and significant relationship between those variables.

Tax income directly impacts the Human Development Index (HDI), which is one of the primary measures for assessing a country's sustainable development (UNDP, 2013). Ofoegbu, Akwu, & Oliver (2016) used ordinary least square model to investigate the influence of tax revenue on economic development in Nigeria from 1986 to 2010. The results of ordinary least squares model showed an insignificant relationship between corporate tax revenue and economic growth.

The sustainability concept has begun to look at the three approaches: environment, economy, and equity (Brugmann, 1997). The 51 environmental indicators are broken down into ecological and economic indicators in the Organization for Economic Co-Operation and Development (Organisation for Economic Co-Operation and Development, 1998). Impact of tax on sustainability vary to government both in developing and developed countries. Tax income directly impacts the Human Development Index (HDI), as one of the primary measures for assessing a country's economic development (UNDP, 2013).

In emerging economies, the government must take an active role in attaining sustainable economic growth. Fiscal policy is a critical tool for the government in encouraging economic growth. Many researchers identified that tax revenue is the most significant factor in economic sustainability (Babatunde, Ibukun, & Oyeyemi, 2017).

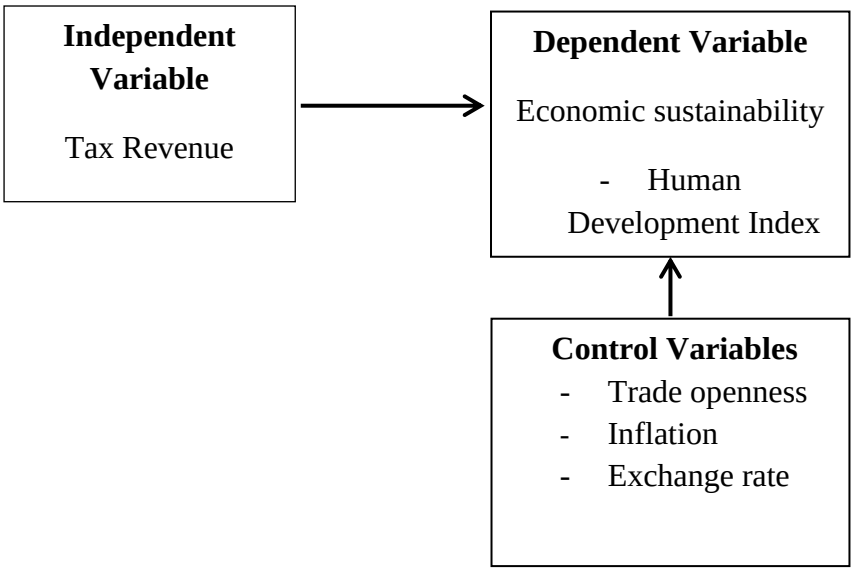
Tax revenues are the most fundamental component of domestic revenue, and their significance grows as a country develops. Taxation provides an antidote to developing nations' reliance on foreign concessional funding, as well as the fiscal dependability and sustainability required to support growth (Paepe & Dickinson, 2014).

According to Kabaday (2013), trade openness positively affects the Human Development Index in the long run. Taxation can impact the implementation of the Sustainable Development Goals. Tariffs can

protect the tax base of developing countries and maintain domestic revenue sustainability (Geneva, 2018).

3. Methodology

Figure 9: Conceptual Framework for the study



Source: Author created

3.1. Research Design

Quantitative research methodology was applied to extrapolate the outcome from collected data and evaluate existing theories. This study will be conducted at the country level. Sri Lanka is a developing country that is in the lower-middle class. Quantitative approach was used and time-series data was collected to fit a model.

3.2. Data Collection

Secondary data was collected from Central Bank reports of Sri Lanka from 1990 to 2019 as yearly observations and publications of Inland Revenue, textbooks, journals, and sustainability reports were also used as supplementary pieces of evidences. Numbers of previous studies

and published journal articles have been used to acquire the depth of theoretical and empirical sound knowledge on this research area.

3.3. Statistical Model

The following multiple regression model was formulated and tested in this study to identify the impact of law tax revenue on the economic sustainability of Sri Lanka. The researcher used other independent variables which control the economic sustainability addition to the tax revenue to get an accurate result from the model.

Equation 3: Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta 3\, X_3 + \beta_4 X_4 + e_t$$

Y = Economic sustainability (Human Development Index)
X_1 = Tax Revenue
X_2 = Trade Openness
X_3 = Exchange Rate
X_4 = Inflation
e_t = Error Term

3.3.1. Trade openness

Trade openness benefits in two ways: exporters may lower their costs while imports and services grow. There is a widespread belief that trade produces employment and increases markets. Kabaday (2013) uses HDI as his dependent variable and Trade openness as the independent variable. Trade openness is measured as the ratio of the sum of export and import of goods and services over GDP.

3.3.2. Inflation rate

Inflation is measured by the annual growth rate of the GDP implicit deflator, which shows the rate of price change in the economy. This is all about how government revenue reacts to price increases over time. Its effect, known as the Olivera-Tanzi effect[1] states that inflation harms

[1] Olivera – Tanzi effect occurs when the price increase exceeds the ideal inflation rate and the loss of actual tax collection benefits from additional money creation.

tax income due to delays in tax collection. In reality, inflation reduces the actual value of collected taxes between adoption and the time the tax is levied. There are lot of empirical studies that have examined the relationship between inflation and HDI. Inflation and HDI use as independent and dependent variables by Yolanda (2017). His result shows that inflation has a significant and positive effect on HDI.

3.3.3. Exchange Rate

The exchange rate is positively correlated with the HDI. Yolanda (2017) shows a relationship between the exchange rate and Human Development Index. That research revealed that the exchange rate has a significant and positive impact on HDI.

3.3.4. Economic sustainability

There is one cluster in the sustainable development aspect. That is Economic sustainability which shows the way of producing goods and services. Following economic sustainability will improves various indicators like the private income, economic growth, inflation, and growth of sustainable new industry (Jayasuriya).

HDI is used to measure the economic sustainability following Korsakiene, Breivyte, & Wamboye (2011).

3.3.5. Tax Revenue

That research revealed that tax revenue has a significant and positive effect on Human Development Index. Also, (Ofoegbu, Akwu, & Oliver, 2016), used tax revenue as the independent variable, and HDI as the dependent variable.

Table 1: Definitions and Sources of Variables

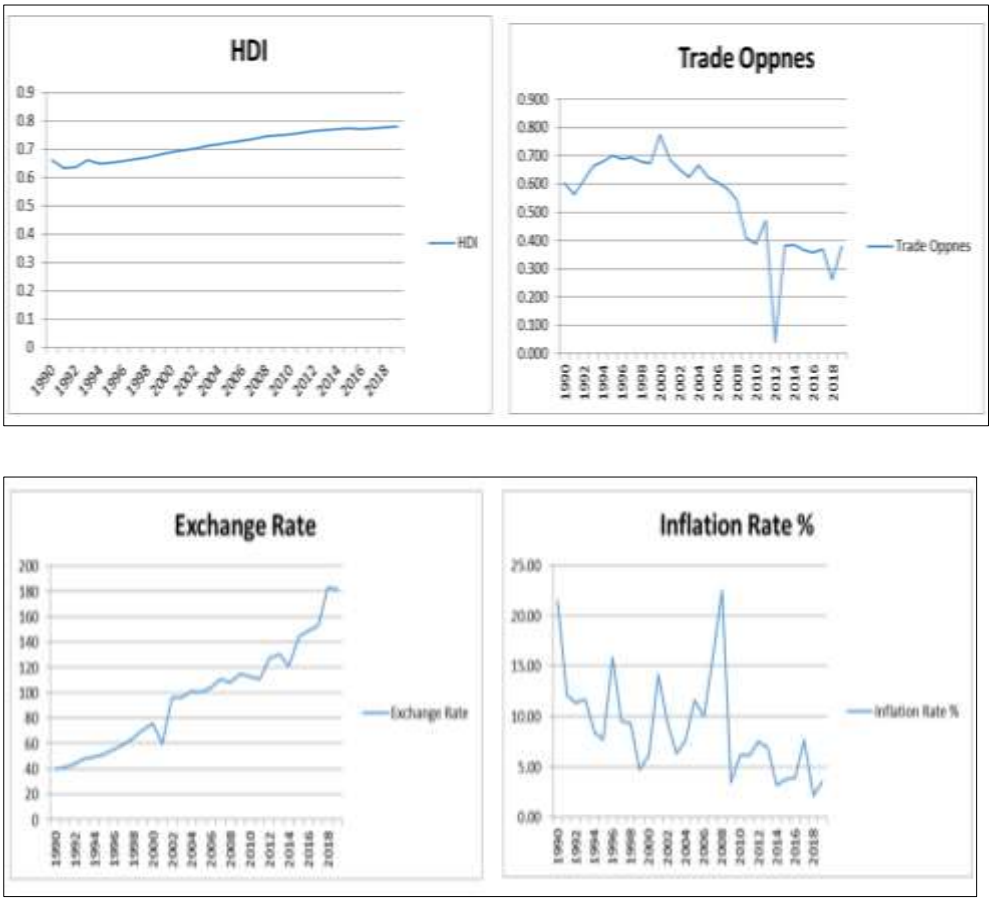
Variables	Definition	Data source
Human Development Index	The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country.	Central Bank Annual Reports (1990-2019)

Tax Revenue	The funds collected from taxes on income and profits; Social Security taxes or "contributions"; taxes levied on goods and services, generally categorized as "consumption taxes"; payroll taxes; taxes on the ownership and transfer of property; and other taxes.	Central Bank Annual Reports (1990-2019)
Trade openness	The extent to which the host country is flexible and accessible to foreign investors for international trade.	Central Bank Annual Reports (1990-2019)
Exchange Rate	The value of a nation's currency in terms of another country's currency or economic zone.	Central Bank Annual Reports (1990-2019)
Inflation rate	The rate at which the value of a currency is falling and, consequently, the general level of prices for goods and services is rising.	Central Bank Annual Reports (1990-2019)

Data source: Results of the output

The following line graphs show those mentioned above independent and dependent variables from 1990 - 2019 except tax revenue, presented in the background. Current trade openness was a shape decrease of trade openness which was 4.3% in 2012. HDI increased gradually up to 2019. The inflation rate is a highly volatile indicator, and it fluctuates every year. The exchange rate is steadily increased year by year except in 2001.

Figure 10: Behaviors of Selected Variables



Data Sources: Central Bank Reports 1990 – 2019

4. Results and Discussion

4.1 Descriptive Statistics

Table 1 below summarizes the descriptive statistics of the variables used in the study to analyze the impact of tax revenue on economic sustainability in Sri Lanka. It includes the mean, standard deviation, variance, coefficient of variance, kurtosis, skewness, etc.

Table 2: Descriptive Statistics

Variable	Mean	Standard Deviation	Variance	Coefficient of Variance	Minimum	Maximum	Skewness	Kurtosis
HDI	0.717	0.049	0.002	6.85	0.63	0.78	-0.19	-1.46
Tax revenue (Rs. M)	571	550	302260	96.21	59	1735	1.02	-0.24
Trade Openness	0.538	0.168	0.028	31.17	0.04	0.77	-1.03	0.90
Exchange Rate (US $)	96.770	41.110	1690.360	42.49	40.06	182.75	0.38	-0.63
Inflation Rate %	9.032	5.085	25.853	56.30	2.14	22.56	1.11	1.13

Source: Results of the output

The maximum and minimum values of these variables give the range of the variables. The minimum value of HDI is 0.634, and the maximum value is 0.782. So, the range is 0.148. The frequency of range is displaying significant fluctuation in its contribution. Standard deviation talks about the spread of the values. The normal distribution curve of HDI indicates a left-skewed, and this distribution has a negative skew. That means HDI has a long tail in the negative direction.

The minimum value of tax revenue is Rs. 59 million, and the maximum value is Rs. 1,735 million. So, the range is Rs. 1,676 million. Tax revenue has a more extensive spread than other variables, according to the data. The normal distribution curve of tax revenue indicates a right-skewed, and this distribution has a positive skew. That means tax revenue has a long tail in the positive direction.

The minimum value of trade openness is 0.042, and the maximum value is 0.774. So, the range is 0.731. The frequency of range is displaying significant fluctuation in its contribution. The normal distribution curve of trade openness indicates a left-skewed, and this

distribution has a negative skew. That means tax revenue has a long tail in the negative direction.

The maximum and minimum values of these variables give the range of the variables. The minimum value of the exchange rate is 40.60, and the maximum value is 182.75. So, the range is 142.15. The normal distribution curve of the exchange rate indicates a right-skewed, and this distribution has a positive skew.

The maximum and minimum values of these variables give the range of the variables. The minimum value of the inflation rate is 2.14, and the maximum value is 22.56. So, the range is 20.42. The normal distribution curve of the inflation rate indicates a right-skewed, and this distribution has a positive skew.

4.2. Correlation Analysis

Table 3: Correlation coefficients between dependent and independent variables

	Human Development Index
Tax Revenue	0.877
Trade Openness	-0.775
Exchange Rate	0.947
Inflation Rate	-0.450

Source: Results of the output

The correlation explains the association between variables. There is a strong significant positive relationship between HDI and tax revenue (0.877) and exchange rate (0.947). Because of correlation coefficients of those variables are positive and close to one. There is a significantly strong negative relationship between HDI and trade openness (-0.775). As well as there is a weak, significant negative relationship between HDI and inflation rate (-0.45). Higher the associations among variables

lead you to have a regression analysis to identify the impact of independent variables on the dependent variable.

4. Regression Analysis

Table 4: Coefficients

Term	Coefficient	SE Coefficient	T-Value	P-Value
Constant	0.59980000	0.01394000	42.04	0.000
Tax Revenue	-0.00001858	0.00000909	-2.04	0.050
Trade Openness	-0.03577000	0.01584000	-2.26	0.035
Exchange Rate	0.00144450	0.00010810	13.36	0.000
Inflation Rate	0.00075610	0.00035970	2.10	0.045

Source: Results of the output

Table 05: Model Summary

S	R-square	R-square (adjusted)
0.00805992	97.6%	97.1%

Source: Results of the output

Table 06: Analysis of Variance

Source	DF	SS	MS	F-Value	P-Value
Regression	4	0.053263	0.013316	204.98	0.000
Residual Error	20	0.001299	0.000065		
Total	24	0.054562			

Source: Results of the output

In this research, Human Development Index is the dependent variable, and the tax revenue is the independent variable. The other three variables are considered as the control variables to the model. A multiple linear regression model is used because there is one dependent and four independent variables.

Equation 4: Regression

HDI = 0.6 - 0.000019 Tax Revenue - 0.0358 Trade Openness + 0.00144 Exchange Rate + 0.000756 Inflation Rate

The coefficient and P-value of the tax revenue are respectively -0.00001858 and 0.050. That means the calculated P-value is equal to the critical P-value. So, there are enough evidence to reject H_0, and accept H_1 at the 95% confidence level. It indicates that tax revenue is the variable that significantly influences the HDI. When considering the trade openness, there is a negative coefficient which is -0.03577000, and P-value is 0.035. That means the calculated P-value is lower than the critical P-value. So, H_0 can be rejected, and H_1 is accepted at the 95% confidence level. It indicates that trade openness significantly influences the HDI in Sri Lanka.

The HDI also significantly influenced by the exchange rate since the coefficient is 0.00144450 and P-value is 0.000. That means the calculated P-value is lower than the critical P value at the 95% confidence level. So, H_0 can be rejected, and H_1 is accepted at the 95% confidence level.

When considering the inflation rate, there is a positive coefficient which is 0.00075610, and P-value is 0.045. That means the calculated P-value is lower than the critical P-value. So, H_0 can be rejected, and H_1 is accepted at the 95% confidence level. It indicates that the inflation rate significantly influenced the HDI in Sri Lanka.

In the final fitted model, all the variables are considered. According to the sample, we tested that exchange rate and inflation rate positively affect HDI since those variables' coefficients were positive and tax revenue and trade openness have a negative relationship with HDI

because those variables' coefficients are negative. However, when testing these coefficients for significance, the researcher found all variables are significant. There is a significant impact of tax revenue, trade openness, exchange rate and, inflation rate on HDI.

5.Conclusion

This study has attempted to identify the impact of low tax revenue on economic sustainability in Sri Lanka. The researcher used past 30 years of data for the analysis. Some factors affect economic sustainability, such as trade openness, exchange rate, inflation rate, and tax revenue. The data was collected from annual reports and economic and social statistics of Sri Lanka published by the Central Bank of Sri Lanka from 1990 to 2019. Minitab is the analysis tool that is used to generate the results.

According to the results of the research, all the variables significantly impact economic sustainability in Sri Lanka. The tax revenue had significant negative impact on economic sustainability in Sri Lanka. Countries that can mobilize tax revenue through a border tax structure attain faster and sustainable development. A sound tax system is a more significant influence on long-term sustainable development. The finding obtained in this study, which focuses on the Sri Lankan context, can also generalize to all developing countries.

There are some limitations of this research, such as the data is limited. The researcher has to consider only 30 years of data because of the data limitation. This research will assist policymakers whose primary focus is tax policy enactment in providing a solution for variables identified and Sri Lankan revenue and customs authority for their future careers. It can give insight into the influence of the research factors on tax performance and allow them to pay close attention. Future researchers will also use the findings of this study to analyze the issues under discussion further.

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