

Financial Development and Economic Growth: The Evidence of Sri Lanka

M.P.K.Withanawasam¹

Abstract: Individual countries, and panels of countries have been studied the association between financial development and economic growth using different methodologies. There are three kinds of results — first one unidirectional relationship second one bidirectional relationship and third one no relationship at all. Studies of Sri Lanka have insufficient; there has a different idea of conclusions and one unique method they have applied the papers. The purpose of the paper is to realize the relationship between financial development and economic growth in Sri Lanka. The annual data sets are used in 1947 to 2016 period of the Sri Lankan economy. This thesis has ten variables which can be obtained from the Central Bank Reports of Sri Lanka from 1950 to 2016. In this thesis, unit root test, the vector error correction model (VECM) and the Chow test method are used to perform the tasks. In between short and long-term decisions, it can be used VECM and, eventually, by economic or political policy changes or unexpected economic shocks, can be used chow tests. The study found that the causal relationship between Money Supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), Consumer Price Index (CPI), Average Weight Deposit Rate (AWDR) to the Gross Domestic Product (GDP) . There are no short-term causal relationship from Loans (loans), Government Debt (GD), Current account balances (CAB), Consumer Price Indices (CPI) and Average Weight Deposit Rate to the Gross Domestic Product. The conclusion of the objective reaffirms that M2 and economic stability are of great importance in Sri Lanka. The factors that affect Sri Lanka's long-term financial development and economic growth are then identified. Developing Sri Lanka as a Financial Center, it will be a catalyst for economic growth and greater international trade. So, involvement Financial Center and Port City, Sri Lanka can be maximized their economic growth and financial development.

Keywords: GDP, VECM, Financial, Development, M2

1. Introduction

At the time of regaining independence, Sri Lanka was mainly an agricultural economy. The production of and trade in three plantation crops, viz., tea, rubber, and coconut, contributed to a major share of the national income. More than half the population of 7 million were dependent on agriculture for a livelihood. The agriculture sector added to 40 percent of national revenue in 1948. There was little interaction between the plantation sector and the domestic non-plantation agricultural sector. The plantation sector performance dominated the activities of most other sectors of the economy such as trade and commerce, banking and insurance, transport and manufacturing activities, including the processing of the three plantation crops. The economy was open to free trade. Exports and imports accounted for about 70 percent of gross domestic product (GDP) (Central Bank of Sri Lanka, 2016). Now, Sri Lanka is capita income of USD 3,835 in 2016 which is underworld bank counties categories is in a lower middle-income nation. Sri Lanka has a total population of 21 million people. Sri Lanka's economy has grown at 4.4 % 2016. In 2016, the service sector has produced for 56.5% of Gross

¹ Department of Business Economics, University of Sri Jayewardenepura, Sri Lanka; madurangaw@sjp.ac.lk

Domestic Product (GDP), followed by manufacturing 26.8 %, and agriculture, 7.1 % (Central Bank of Sri Lanka, 2016).

Individual countries,(Changjun Zheng, 2010; Calderón & Liu,2003;Demetriades & Hussein, 1996; Atif, Jadoon, Zaman, & Ismail, 2007; Akinboade, 1998) and panels of countries,(King & Levine, 1993; Beck, Levine, & Loayza, 2000;Jung, 1986;Asghar & Hussain, 2014;Ahmed & Wahid, 2011) have been studied the association between financial development and economic growth using different methodologies.(Habibullah, 1999)(Sinha & Macri, 2001)(Choong, Yusop, & Soo, 2004)(Tang, 2005)(Asghar & Hussain, 2014). There are three kinds of results. First one unidirectional relationship second one bidirectional relationship and third one no relationship at all. Studies of Sri Lanka have insufficient, There have different idea on conclusions and one unique method they have applied the papers (R. Perera & Ichihashi, 2016) (N. Perera & Paudel, 2009) (Amarathunga, 2012) (U. W. B. M. Kumari, 2014). Among them , Rexiang and Rathanasiri (Rexiang & Rathanasiri, 2011) have same method but additionally applied Engle – Granger dual step methodology.

The objective of this study is to examine the relationship between financial development and economic growth in Sri Lanka. To pursue this objective, this study has developed the following sub objective to identify the factors affecting to the short term financial development and economic growth in Sri Lanka ,to identify the factors affecting to the long term financial development and economic growth in Sri Lanka and to determine open economic policy to change Sri Lankan financial development.

2. Literature Review

The purpose of this section is to provide an overview of empirical research that on related to the relationship between financial development and economic growth. The first part discusses previously, the theoretical foundation for the study, while this part presents a survey of previous studies of the relationship between financial development and economic growth.

In Empirical Literature can be divided three parts.

1. Bidirectional Relationship between financial development and economic growth.
2. Unidirectional Relationship between financial development and economic growth.
3. Non – directional Relationship

For study purpose it is presented as a step by step.

Bidirectional Relationship between financial development and economic growth.

Shan and Morris (Shan & Morris, 2010) has written the paper, and they studied in 19 OECD counties and China. There dependent variable was GDP per capita and Independent variables were total credit, interest rate spread, measures of financial development, productivity, investment, trade openness, CPI and stock market index. Results were out of 19 OECD counties and China have bi-directional relationship among four countries.

Other paper has published Deb and Mukherjee (Patra & Samantaraya, 2014) and they have studied in India. There dependent variable was real GDP growth rate and Independent variables were Market capitalization ratio, value traded ratio and Stock market volatility. Method was quarterly time series granger non- causality test. Results were real market capitalization ratio and economic growth only bi-directional relationship each other.

Next paper has written Akinlo and Akinlo (Enisan & Olufisayo, 2009) and they have learned in seven countries in sub-Saharan Africa. There dependent variable was per capita nominal GDP and Independent variables were value traded ratio, Market capitalization ratio, discount

ratio and openness ratio. Methodology was Autoregressive distributed lag (ARDL) bounds test. Results were out of seven countries have bi-directional relationship among Cote D'Ivoire, Kenya, Morocco and Zimbabwe.

Another articles has written by Shan *et al* (Shan, Morris, & Sun, 2001) and they have studied 9 OECD countries and China. There dependent variable was real GDP per capita and Independent variables were Bank credit to GDP, total factor productivity, trade openness, CPI, Investment ratio and stock market price. Results were out of 9 OECD counties and China have bi-directional relationship among five countries.

Hondroyannis *et al* (Hondroyannis, Lolos, & Papapetrou, 2005) have pointed out Greece and outcome would be bi-directional relationship. They also used total real output as dependent variable and Independent variables were total stock market capitalization and total bank credit to private sector. Methodology was time series.

Odhiambo (Odhiambo & Africa, 2011) analyzed South Africa financial markets. He also used as a dependent variable real GDP per capita and Independent variable were ratio of M3 to GDP and ratio of stock market capitalization to GDP. Methodology were cointegration-based error correction mechanism and trivariate granger causality model. Using these methods, he claimed South Africa has a bi-directional relationship.

Masoud and Hardaker (Wood, 1993) examined 42 emerging countries. They also used as a dependent variable real GDP per capita and Independent variable were market capitalization, value traded, turnover ratio, ratio of total bank assets to GDP, credit to private sector, population growth rate, secondary school enrolment and investment ratio. They mentioned 42 emerging countries have a bi-directional relationship using endogenous growth model.

Carp (Carp, 2012) has noted that Romania and he found a bi-directional relationship using time series method. He also used as a dependent variable GDP growth rate and Independent variable were market capitalization, turnover ratio, stock value traded and real investment.

Cheng (Cheng, 2012) clearly pointed out a bi-directional relationship among Taiwan using time series and Vector autoregressive (VAR) model. He used a dependent variable real GDP and Independent variable were turnover, volatility and ratio of liquid liabilities of the financial intermediaries to market value of domestic shares.

Marques *et al* (Marques, Fuinhas, & Marques, 2013) analyzed Portugal stock market and found out Portugal has bi-directional relationship using time series method. They used as a dependent variable real gross domestic product and Independent variable were stock market capitalization ratio, total domestic credit ratio, investment ratio and consumer price index.

Arestis and Demetriades (P. Demetriades & Panicos, 1997) examined South Korea, Germany , USA same topic. They have noted USA has bi-directional relationship using Johansen co-integration analysis.

Unidirectional Relationship between financial development and economic growth.

Also Arestis and Demetriades (P. Demetriades & Panicos, 1997) analyzed in Germany using as a dependent variable real GDP per capita and Independent variable were Stock market , capitalization ratio , index of stock market volatility , M2 / nominal GDP and domestic bank credit / nominal GDP. This was a unidirectional relationship, Finance controlled GDP.

Shan and Morris (Shan & Morris, 2010) has written the paper, and they studied in 19 OECD counties and China. There dependent variable was GDP per capita and Independent variables were total credit, interest rate spread, measures of financial development, productivity, investment, trade openness, CPI and stock market index. Results were out of 19 OECD counties and China have a unidirectional relationship among six countries. They were one country finance controlled GDP and five other countries' GDP controlled finance.

Beck and Levine (Beck & Levine, 2004) have examined 40 counties and using panel data analysis Generalized-method-of moments estimators. They found out a unidirectional

relationship which was finance governed growth. They used as a dependent variable initial real GDP and Independent variable were turnover ratio, value traded, market capitalization, ration of bank credit to GDP, black market premium, exports and imports / GDP, inflation rate and government expenditure / GDP.

Choong *et al* (Choong, Yusop, Law, & Liew, 2005) have analyzed Malaysia stock market and they found out unidirectional relationship using Granger causality and VECM model. Here finance long run causality in GDP. Arestis *et al* (Arestis, Luintel, Embassy, & Luintel, 2005) have examined developing countries such as Greece, India , South Korea , Philippines, South Africa and Taiwan. They found out a unidirectional relationship which was finance governed growth using time series and dynamic heterogeneous panel models.

Next paper has written Akinlo and Akinlo (Enisan & Olufisayo, 2009) and they have studied in seven countries in sub-Saharan Africa. There dependent variable was per capita nominal GDP and Independent variables were value traded ratio, Market capitalization ratio, discount ratio and openness ratio. Methodology was Autoregressive distributed lag (ARDL) bounds test. Results were out of seven countries have unidirectional relationship among Egypt and South Africa.

Osuala *et al* (Osuala, Okereke, & Nwansi, 2013) focuses they attention on Nigeria stock market , economic growth and emerging markets. They found out finance controlled growth using time series and ARDL model. Bayar *et al* (Bayar, Kaya, & Yıldırım, 2014) examined Turkey stock market and economic growth. They have unidirectional relationship in Turkey. In Sri Lanka similar results has found for this. Perera and Ichihashi (R. Perera & Ichihashi, 2016) and Rexiang and Rathanasiri [22] has examined Sri Lanka they found out Sri Lanka finance sector controlled Sri Lanka growth rate.

Another articles has written by Shan *et al* (Shan et al., 2001) and they have studied 9 OECD countries and China. There dependent variable was real GDP per capita and Independent variables were Bank credit to GDP, total factor productivity, trade openness, CPI, Investment ratio and stock market price. Results were out of 9 OECD counties and China have unidirectional relationship among three countries. Here specialty was Growth controlled finance. Similar results could be obtained Athanasios and Antonions (Antonios & Adamopoulos, 2012)

Non – directional Relationship

Non- directional means neither finance become a significant variable on growth or growth become a significant variable on finance. Sri Lanka and other counties might have this issue (N. Perera & Paudel, 2009).In this paper some other papers and conclusion were same results.

3. Methodology

This is a study which focuses on relationship between financial development and economic growth in Sri Lanka which is mainly expected to deal with quantitative data such as Gross Domestic Product, M₂ Money Supply, Loans, Investment, Government Debt, Current A/C Balance, The Consumer Price Index and two dummy variables as Political Stability and Economic Stability.

This study adopted an explanatory approach by using panel research design to fulfill the research objective. The advantage of using data is that it helps to study the behavior of each country over time and across space (Gujarati, 2003). Furthermore, data are commonly used because it consists-of both the cross-sectional information which detentions individual variability and the time series data which captures dynamic adjustment in order to give more informative data. In other words, modeling supports to identify a common group of characteristics as well as heterogeneity among individual units.Based on theoretical and

empirical literature on financial development and economic growth the figure 3.1 shows the conceptual framework of this study.

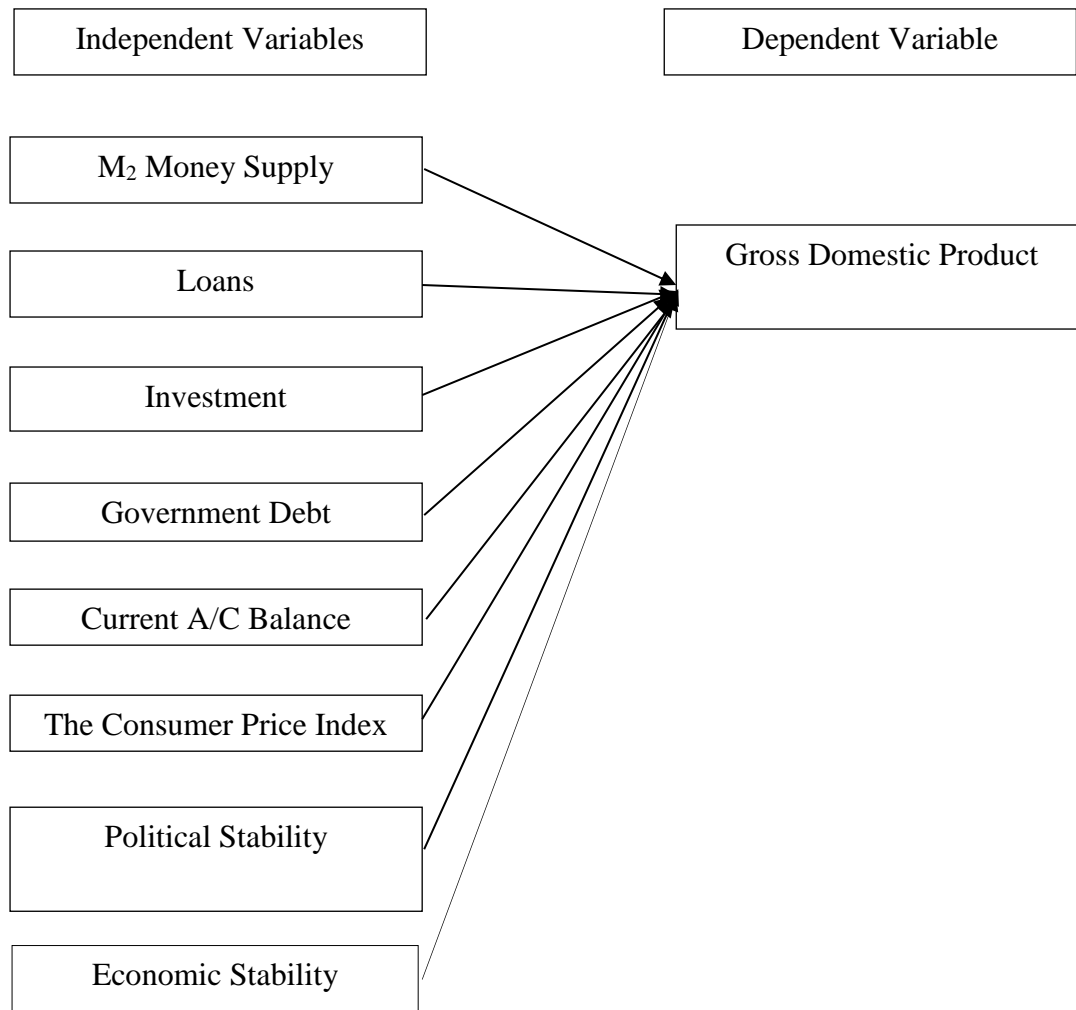


Figure 3.1: Conceptual Framework

Source: Compiled by author

The annual data set is employed for the Sri Lankan economy for the period 1948 to 2016. Gross Domestic Product, M₂ Money Supply, Loans, Investment, Government Debt, Current A/C Balance, The Consumer Price Index are available from Annual Reports of Central Bank of Sri Lanka 1950 - 2016. The data is calculated in United States dollars. All the data are transformed in to natural logarithm.

Unit out Test

As mention in the economic theory variable should be stationary before application of standard econometric techniques. In this study, unit root test for stationary was applied to evaluate the stationarity of the variables in the model. A stationary process or variable is a stochastic process whose parameters such as the mean and variance do not change over time or position. A variable whose observation changes over time or position is described as a nonstationary or having a unit root. Testing the stationarity of economic time series is of great importance since

standard econometric methodologies assume stationarity in the time series while they are, in fact, non-stationary. Hence, based on two testable hypotheses (for each variable) are formulated as follows:

Null Hypotheses H_0 = Variable is not stationarity or has got unit root test

Alternative Hypotheses H_1 = Variable is stationarity or has not unit root test

Guideline: If P value is more than 0.05 then Null Hypothesis is accepted or Alternative Hypothesis is rejected. If P value is less than 0.05 then Null Hypothesis is rejected or Alternative Hypothesis is accepted.

Vector Error Correction Model (VECM)

To decide among short-run and long-run that can be used VECM. (Masih & Masih, 1996) (Engle & Granger, 1987) (Wooldridge, 2012)

Chow test

Due to an economic or political policy change or unexpected shock to the economy, can be used Chow test. (Chow, 1960)(Gujarati, 2003)(Wooldridge, 2012). Here that can be used Chow Breakpoint Test for the check 1977 was milestone or not?

Hence, based on two testable hypotheses (for each variable) are formulated as follows:

Null Hypothesis (H_0) = No breaks at specified break points (1977)

Alternative Hypothesis (H_1) = breaks at specified break points (1977)

Guideline: If P value is more than 0.05 then Null Hypothesis is accepted or Alternative Hypothesis is rejected. If P value is less than 0.05 then Null Hypothesis is rejected or Alternative Hypothesis is accepted.

4. Data Finding and Analysis

Descriptive Statistics: This section shows the descriptive statistics of dependent and independent variables employed in the thesis for 69 years period of Sri Lanka. The dependent variables used in the study is Gross Domestic Product (GDP) while the independent variables are M_2 money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI), Economic Stability (ES) and Political Stability (PS). Thus, the total observations for each dependent and explanatory variable were 69. The table 4.1 presents the mean, median, standard deviation, minimum, maximum values Skewness, Kurtosis, Jarque-Bera, its Probability, Sum and Sum Sq. Dev for the dependent and independent variables.

Table 4.1: Descriptive Statistics

	GDP	M2	LOAN	INVEST	GD	CAB	CPI
Mean	8.632	7.330	6.834	6.973	8.117	-4.390	5.550
Median	8.470	7.270	7.080	7.220	8.240	-5.370	5.020
Maximum	11.310	10.380	10.450	10.200	11.050	12.200	7.970
Minimum	6.460	5.010	3.210	4.110	4.770	-8.440	4.610
Std. Dev.	1.399	1.514	1.979	1.726	1.798	3.532	1.054
Skewness	0.355	0.366	0.030	0.172	-0.139	2.294	0.973
Kurtosis	2.040	1.971	1.934	1.999	1.920	9.510	2.558
Jarque-Bera Probability	4.098 0.129	4.584 0.101	3.281 0.194	3.223 0.200	3.576 0.167	182.318 0.000	11.449 0.003
Sum	595.580	505.790	471.570	481.140	560.070	-302.940	382.950
Sum Sq. Dev.	133.082	155.792	266.252	202.476	219.824	848.532	75.599
Observations	69.000	69.000	69.000	69.000	69.000	69.000	69.000

Sources: Compiled by author

In this study, unit root for stationary is applied to evaluate the stationary of the variables in the model. Table 4.2 shows the test for stationarity. The finding showed that all the variables are stationary at 5% levels of significance. The null hypothesis is unit root and the alternative hypothesis is level stationary. The p-value of less or equal 5% significance level shows a rejection of the null hypothesis. Finding of this unit root test indicate that GDP, M2, INVEST, GD, CAB and CPI are in 1st and 2nd difference stationary and LOAN has only 2nd difference stationary. There is not any variable has passed for unit root in level.

Table 4.1 Unit Root Test

Variable	Test Equation	Test for Unit Root in					
		Level		1st Difference		2nd Difference	
		t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
GDP	Individual Intercept	1.173	0.998	-9.381	0.000	-10.688	0.000
	Individual Intercept and Trend	-2.190	0.487	-9.772	0.000	-10.613	0.000
	None	5.461	1.000	-3.864	0.000	-10.778	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
M2	Individual Intercept	1.668	1.000	-11.260	0.000	-12.859	0.000
	Individual Intercept and Trend	-6.015	0.000	-11.246	0.000	-12.606	0.000
	None	3.231	1.000	-2.754895	0.007	-12.999	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
Loan	Individual Intercept	0.220	0.972	-8.260	0.000	-8.308	0.000
	Individual Intercept and Trend	-2.795	0.204	-8.188	0.000	-8.243	0.000
	None	7.206	1.000	-1.221	0.201	-8.381	0.000
	Conclusion	Non - Stationary		Non - Stationary		Stationary	
INVEST	Individual Intercept	0.312	0.977	-6.838	0.000	-9.500	0.000
	Individual Intercept and Trend	-3.317	0.072	-6.846	0.000	-9.417	0.000
	None	3.836	1.000	-7.138	0.000	-9.577	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
GD	Individual Intercept	-0.922	0.776	-8.952	0.000	-7.991	0.000
	Individual Intercept and Trend	-2.671	0.252	-8.895	0.000	-7.937	0.000
	None	7.300	1.000	-2.716	0.007	-8.055	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
CAB	Individual Intercept	-4.518	0.001	-9.131	0.000	-7.080	0.000
	Individual Intercept and Trend	-7.538	0.000	-9.059	0.000	-7.003	0.000
	None	-0.903	0.321	-9.173	0.000	-7.150	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
CPI	Individual Intercept	-1.664	0.445	-8.442	0.000	-7.470	0.000
	Individual Intercept and Trend	-1.603	0.782	-8.398	0.000	-7.423	0.000
	None	-0.521	0.487	-8.498	0.000	-7.534	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	
AWDR	Individual Intercept	-1.117	0.705	-7.581	0.000	-7.801	0.000
	Individual Intercept and Trend	-2.248	0.456	-7.528	0.000	-7.733	0.000
	None	-0.423	0.527	-7.576	0.000	-7.866	0.000
	Conclusion	Non - Stationary		Stationary		Stationary	

Continue Table 4.1

Source: Compiled by author

Lag Length Selection: Determining the optimum lag length is a critical issue in the cointegration and VECM analyses. A change in the lag length will completely change the results. In this thesis, the results of the lag length selection tests direct that many criteria and suggest a time lag of one as optimal. Therefore, the optimally selected time lag for the first difference is lag 1.

Johansen Test of Cointegration: Eight variables are used for the estimation of the cointegration namely, Gross Domestic Product (GDP), Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). Optimal lag length is lag one. The null hypothesis of none, at most one and most six, are rejected at five percent level, indicating that the variables are cointegrated because that the variables have a common trend in the long run. More clearly explained, None mean there is no equation cointegrated. The Trace statistics (194.441) more than the critical value (159.5297) therefore it is rejected null hypothesis. Same happen in probability test. The probability test is 0.0002. Then probability value is less than 5%. Then the conclusion is rejected Null hypothesis meaning that the seven variables are not cointegrated. Then, at most one meaning that there is one equation cointegrated. The Trace statistics (128.7576) more than the critical value (125.6154) therefore it is rejected null hypothesis. Same happen in probability test. The probability test is 0.0318. Then probability value is less than 5%. Then the conclusion is rejected Null hypothesis meaning that the seven variables are not cointegrated. But, at most two meaning that there are two equations cointegrated. The Trace statistics (88.09577) less than the critical value (95.75366) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.1497. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are long-term associations. Then, at most three meaning that there are three equations cointegrated. The Trace statistics (53.84802) less than the critical value (69.81889) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.4681. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. After that, at most four meaning that there are four equations cointegrated. The Trace statistics (30.59242) higher than the critical value (47.85613) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.6882. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are long-term associations. Then, at most five meaning that there are five equations cointegrated. The Trace statistics (18.78487) higher than the critical value (29.79707) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.5085. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. Next, at most six means there are six equations cointegrated. The Trace statistics (9.224228) less than the critical value (15.49471) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.3451. Then probability value is less than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are not long-term associations. At last, at most seven means there are six equations cointegrated. The Trace statistics (3.88251) more than the critical value (3.841466) therefore it is rejected null hypothesis. Same happen in probability test. The probability test is 0.0488. Then probability value is less than 5%. Then the conclusion is rejected Null hypothesis meaning that the seven variables are not long-term associations.

Next one Maximum Eigen statistics. None mean there is no equation cointegrated. The Maximum Eigen statistics (65.68341) more than the critical value (52.36261) therefore it is rejected null hypothesis. Same happen in probability test. The probability test is 0.0013. Then probability value is less than 5%. Then the conclusion is rejected Null hypothesis meaning that the seven variables are not cointegrated. Then, at most one meaning that there is one equation cointegrated. The Maximum Eigen statistics (40.66187) less than the critical value (46.23142) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.175. Then probability value is less than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. Next, at most two meaning that there are two equations cointegrated. The Maximum Eigen statistics (34.24775) less than the critical value (40.07757) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.1959. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are long-term associations. Then, at most three meaning that there are three equations cointegrated. The Maximum Eigen statistics (23.2556) less than the critical value (33.87687) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.511. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. After that, at most four meaning that there are four equations cointegrated. The Maximum Eigen statistics (11.80755) higher than the critical value (27.58434) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.9402. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are long-term associations. Then, at most five meaning that there are five equations cointegrated. The Maximum Eigen statistics (9.560641) higher than the critical value (21.13162) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.7848. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. Next, at most six meaning that there are six equations cointegrated. The Maximum Eigen statistics (5.341718) higher than the critical value (14.2646) therefore it is accepted null hypothesis. Same happen in probability test. The probability test is 0.6982. Then probability value is higher than 5%. Then the conclusion is accepted Null hypothesis meaning that the seven variables are cointegrated. At last, at most seven means there are seven equations cointegrated. The Maximum Eigen statistics (3.88251) more than the critical value (3.841466) therefore it is rejected null hypothesis. Same happen in probability test. The probability test is 0.0488. Then probability value is less than 5%. Then the conclusion is rejected Null hypothesis meaning that the seven variables are not long-term associations. According to calculations seven, all other variables in the model have positive values except M2 and Loan variables have negative values. Its indication that M2 or Loan increases that GDP decreases. All other variables increase as result of that GDP increases. Above statistic both Trace statistics and Maximum Eigen statistics, there are two cointegrating relationships in the long term. To explore association among variables this thesis uses the Economic Growth as first cointegrated vector and the Financial Development as a second cointegrated vector. According the variables are cointegrated, then VAR can be accomplished to check the path and degree of associations among all variables.

Vector Error Correction Model Test (VECM)

Dependent Variable Gross Domestic Product (GDP) : The eight variables are used for the estimation of the VECM namely, Gross Domestic Product (GDP), Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). Optimal lag length is lag one. According to calculations, it can be derived the residual of the cointegration equation when GDP is the dependent variable.

$$\text{GDP} (-1) - 1.83817441941 * \text{M2}(-1) - 0.571358982815 * \text{LOAN} (-1) + 1.37932141869 * \text{INVEST} (-1) + 0.401980355247 * \text{GD} (-1) + 0.244320467405 * \text{CAB} (-1) + 0.108195165375 * \text{CPI} (-1) + 0.0304202767028 * \text{AWDR} (-1) - 3.69209097688$$

According to calculations, R^2 is 40.79 %, This means that 40.79 % of the total variation in the GDP is accounted for by the change in the Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB) , The Consumer Price Index (CPI), and Average Weight Deposit Rate (AWDR) . System is a moderate fit. Because it is less than 60%. According to F-statistic is 5.8605 and its Prob(F-statistic) 0.0000, This means that the GDP can be influenced by the Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR).

Long Run Causality : According to above equation, Speeds of adjustments towards long-run equilibrium is -0.0311. They are significant, and the sign should be negative. There is long-run causality from the seven independent variables such as Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). Meaning that seven variables influence the dependent variables such as GDP in the long run. In other words, there is long-run causality running from Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR) to GDP.

Short Run Causality : Short-Run Coefficient means that Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB) and The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). In the short run coefficient statistically, a significant relationship between GDP and other individual variables at the 5% level of significance level. Among these, M2 are statistically, a significant relationship to GDP. Other are not statistically, a significant relationship to GDP. Table 4.2 present the short run causality in the system. According to table 4.2, M2 has short-run causality running from to GDP.

Table 4.2 Short Run Causality (Dependent GDP)

Variable	Chi-square value	Probability	Short Run Causality
Money supply (M2)	14.05249	0.0002	Short Run
Loan (LOAN)	0.57169	0.4496	No Short Run

Investment (INVEST)	0.624564	0.4294	No Short Run
Government Debt (GD)	0.069982	0.7914	No Short Run
Current Account Balance (CAB)	0.533064	0.4653	No Short Run
Consumer Price Index (CPI)	0.612515	0.4338	No Short Run
Average Weight Deposit Rate (AWDR)	0.00291	0.957	No Short Run

Source: Compiled by the author using data from the survey

Dependent Variable Money supply (M2) : The eight variables are used for the estimation of the VECM namely, Gross Domestic Product (GDP), Money supply (M2), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). Optimal lag length is lag one.

According to calculations, it can be derived the residual of the cointegration equation when M2 is the dependent variable.

$$M2(-1) - 0.544018015615 * GDP (-1) + 0.310829580035 * LOAN (-1) - 0.750375701091 * INVEST (-1) - 0.218684555178 * GD (-1) - 0.132914735852 * CAB (-1) - 0.0588601191665 * CPI (-1) - 0.0165491785663 * AWDR (-1) + 2.00856400671$$

According to calculations, R^2 is 35.77 %, This means that 35.77 % of the total variation in the M2 is accounted for by the change in the Gross Domestic Product (GDP), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB) , The Consumer Price Index (CPI), and Average Weight Deposit Rate (AWDR) . System is a moderate fit. Because it is less than 60%. According to F-statistic is 3.588948 and its Prob(F-statistic) 0.001323 , This means that the M2 can be influenced by the Gross Domestic Product (GDP), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR).

Long Run Causality : According to above equation, Speeds of adjustments towards long-run equilibrium is 0.166565. They are significant, and the sign should be positive. There is not long- run causality from the seven independent variables such as Gross Domestic Product (GDP), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). Meaning that seven variables can not influence the dependent variables such as M2 in the long run. In other words, there is not long-run causality running from Gross Domestic Product (GDP), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB), The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR) to M2.

Short Run Causality : Short-Run Coefficient means that Gross Domestic Product (GDP), Loan (LOAN), Investment (INVEST), Government Debt (GD), Current Account Balance (CAB) and The Consumer Price Index (CPI) and Average Weight Deposit Rate (AWDR). In the short run coefficient statistically, a significant relationship between M2 and other individual variables at the 5% level of significance level. Among these, Government Debt (GD) and

Current Account Balance (CAB) are statistically, a significant relationship to M2. Other are not statistically, a significant relationship to M2. Table 4.3 present the short run causality in the system.

Table 4.3 Short Run Causality (Dependent M2)

Variable	Chi-square value	Probability	Short Run Causality
Gross Domestic Product (GDP)	0.903197	0.3419	No Short Run
Loan (LOAN)	1.153211	0.2829	No Short Run
Investment (INVEST)	0.122166	0.7267	No Short Run
Government Debt (GD)	9.678927	0.0019	Short Run
Current Account Balance (CAB)	4.544638	0.0330	Short Run
Consumer Price Index (CPI)	0.000509	0.9820	No Short Run
Average Weight Deposit Rate (AWDR)	0.415568	0.5192	No Short Run

Source: Compiled by the author using data from the survey

Chow Test: Ten variables are used for the estimation of the chow test, namely, GDP, M2, LOAN, INVEST, GD, CAB, CPI, AWDR, ES, and PS. Null Hypothesis (H0) is no breaks at specified Structural breakpoints in the 1977 or Alternative (H1) is not.

According to calculation, F- statistic is – 1.847949. Critical Value is – 2.04. Then Null Hypothesis is rejected, or Alternative Hypothesis is accepted.

Therefore, 1977 was a landmark position because of free trade has been started from that year.

5. Conclusion

The Relationship Between Financial Development and Economic Growth in Sri Lanka

Based on the methodology, this thesis discussed to accomplish the goal and solved the research problem. The purpose of this study is to investigate the relationship between financial development and economic growth in Sri Lanka and to achieve it successfully. The one-way relationship between Sri Lanka and its confirmation from financial sector development to GDP was proposed.

Other sub-objectives

Chapter one is given other specific objectives. They are

To exam the reasons for association about the short-term financial development and economic growth in Sri Lanka.

To exam the reasons for the association between the long-term financial development and economic growth in Sri Lanka.

To determine open economic policy to change Sri Lankan financial development

First, Under the factors affecting the short-term financial development and economic growth in Sri Lanka. The conclusion of the 1st sub-objective is reconfirmed that M2 and economics stability are significance in Sri Lanka.

Then identify the factors affecting the long-term financial development and economic growth in Sri Lanka. Adjusted R2 value is 99 percent, and F test is also provided this model is an acceptable model. Finally, determine open economic policy to change Sri Lankan financial development. Yes, it had. The year 1977 was a landmark in the economics and social policies of the post-independence period. Far-reaching policy reforms were introduced in the year to shift the focus from an inward-looking development strategy to an outward-looking development strategy to free the economy from an array of controls.

Suggestions for Future Studies

This study aims to examine the relationship between financial development and economic growth nine variables. As mentioned in the section on limitations, some suggestions can be made for future studies. There are other macroeconomic variables example saving, real interest rate, effective tax rate, savings, liquid liabilities, that may affect finance and GDP. Also, this thesis used VECM and Chow test. There are many advanced methods such as fully modified ordinary least squares (FMOLS) and PDOLS for analyzing the data.

References

- Ahmed, A. D., & Wahid, A. N. M. (2011). Financial structure and economic growth link in African countries: a panel cointegration analysis. *Journal of Economic Studies*, 38(3), 331–357. <https://doi.org/10.1108/01443581111152436>
- Akinboade, O. A. (1998). FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN BOTSWANA: A TEST FOR CAUSALITY. *Savings and Development*, 22(3), 331–348.
- Amarathunga, H. (2012). Finance - Growth Nexus : Evidence from Sri Lanka. *Staff Studies - CENTRAL BANK OF SRI LANKA*, 40(1). <https://doi.org/10.4038/ss.v40i1.4679>
- Antonios, V., & Adamopoulos, A. (2012). Stock Market Development and Economic Growth an Empirical Analysis. *American Journal of Economics and Business Administration*, 4(2), 135–143. <https://doi.org/10.3844/ajebasp.2012.135.143>
- Arestis, P., Luintel, A. D., Embassy, R. N., & Luintel, K. B. (2005). *Financial Structure and Economic Growth*.
- Asghar, N., & Hussain, Z. (2014). Financial Development, Trade Openness and Economic Growth in Developing Countries. Recent Evidence from Panel Data. *Pakistan Economic and Social Review*, 52(2), 99–126.
- Atif, R. M., Jadoon, A., Zaman, K., & Ismail, A. (2007). *Trade Liberalisation , Financial Development and Economic Growth : Evidence from Pakistan (1980-2009)*. PIDE Working Papers (Vol. 19). Islamabad, Pakistan.
- Bayar, Y., Kaya, A., & Yıldırım, M. (2014). Effects of stock market development on economic growth: evidence from Turkey. *International Journal of Financial Research*, 5(1), 93–100. <https://doi.org/10.5430/ijfr.v5n1p93>

- Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance*, 28(3), 423–442. [https://doi.org/10.1016/S0378-4266\(02\)00408-9](https://doi.org/10.1016/S0378-4266(02)00408-9)
- Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, 58(1–2), 261–300. [https://doi.org/10.1016/S0304-405X\(00\)00072-6](https://doi.org/10.1016/S0304-405X(00)00072-6)
- Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321–334. [https://doi.org/10.1016/S0304-3878\(03\)00079-8](https://doi.org/10.1016/S0304-3878(03)00079-8)
- Carp, L. (2012). Can Stock Market Development Boost Economic Growth? Empirical Evidence from Emerging Markets in Central and Eastern Europe. *Procedia Economics and Finance*, 3(12), 438–444. [https://doi.org/10.1016/S2212-5671\(12\)00177-3](https://doi.org/10.1016/S2212-5671(12)00177-3)
- Central Bank of Sri Lanka. (2016). *Central Bank of Sri Lanka Annual Report 2016*. Central Bank of Sri Lanka. Retrieved from <http://www.cbsl.gov.lk>
- Changjun Zheng, X. H. and L. (2010). Financial Development and Economic Growth: Evidence from Cointegration and Granger Causality Tests. In *IEEE* (pp. 237–241). <https://doi.org/10.1213/01.ane.0000351544.23942.33>
- Cheng, S. Y. (2012). Substitution or complementary effects between banking and stock markets: Evidence from financial openness in Taiwan. *Journal of International Financial Markets, Institutions and Money*, 22(3), 508–520. <https://doi.org/10.1016/j.intfin.2012.01.007>
- Choong, C.-K., Yusop, Z., Law, S.-H., & Liew, V. K.-S. (2005). Financial Development and Economic Growth in Malaysia: The Perspective of Stock Market. *Investment Management and Financial Innovations*, 4, 105–115. Retrieved from <http://128.118.178.162/eps/mac/papers/0307/0307010.pdf>
- Choong, C.-K., Yusop, Z., & Soo, S.-C. (2004). Foreign Direct Investment , Economic Growth , and Financial Sector Development : A Comparative Analysis. *ASEAN Economic Bulletin*, 21(3), 278–289.
- Chow, G. C. (1960). Tests of Equality between sets of coefficients in two Linear Regressions. *Econometrica*, 28(3), 591–605.
- Demetriades, P. O., & Hussein, K. . (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387–411. [https://doi.org/10.1016/S0304-3878\(96\)00421-X](https://doi.org/10.1016/S0304-3878(96)00421-X)
- Demetriades, P., & Panicos, A. (1997). Financial Development and Economic Growth : Assessing the Evidence. *The Economic Journal*, 107(442), 783–799.
- Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, 55(2), 251. <https://doi.org/10.2307/1913236>
- Enisan, A. A., & Olufisayo, A. O. (2009). Stock market development and economic growth: Evidence from seven sub-Saharan African countries. *Journal of Economics and Business*, 61(2), 162–171. <https://doi.org/10.1016/j.jeconbus.2008.05.001>
- Gujarati, D. N. (2003). *BASIC ECONOMETRICS*.

- Habibullah, M. S. (1999). FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN ASIAN COUNTRIES: TESTING THE FINANCIAL-LED GROWTH HYPOTHESIS. *Savings and Development*, 23(3), 279–291.
- Hondroyannis, G., Lolos, S., & Papapetrou, E. (2005). Financial markets and economic growth in Greece, 1986-1999. *Journal of International Financial Markets, Institutions and Money*, 15(2), 173–188. <https://doi.org/10.1016/j.intfin.2004.03.006>
- Jung, W. S. (1986). Financial Development and Economic Growth : International Evidence. *The University of Chicago Press Journals*, 34(2), 333–346.
- King, R., & Levine, R. (1993). Finance and Growth Schumpeter Might Be Right. *The Quarterly Journal of Economics*, 108(3), 717–737. <https://doi.org/10.2307/2118406>
- Marques, L. M., Fuinhas, J. A., & Marques, A. C. (2013). Does the stock market cause economic growth? Portuguese evidence of economic regime change. *Economic Modelling*, 32(1), 316–324. <https://doi.org/10.1016/j.econmod.2013.02.015>
- Masih, R., & Masih, A. M. M. (1996). Macroeconomic activity dynamics and Granger causality: New evidence from a small developing economy based on a vector error-correction modelling analysis. *Economic Modelling*, 13(3), 407–426. [https://doi.org/10.1016/0264-9993\(96\)01013-9](https://doi.org/10.1016/0264-9993(96)01013-9)
- Odhiambo, N. M., & Africa, S. (2011). Financial Intermediaries Versus Financial Markets: A South African Experience. *International Business & Economics Research Journal*, 10(2), 77–84.
- Osuala, A. E., Okereke, J. E., & Nwansi, G. U. (2013). Does Stock Market Development Promote Economic Growth In Emerging Markets ? A Causality Evidence from Nigeria. *World Review of Business Research*, 3(4), 1–13.
- Patra, D. S. M. S. K., & Samantaraya, A. (2014). Trade Openness, Financial Development Index and Economic Growth: Evidence from India (1971-2012). *Journal of Financial Economic Policy*, 6(4), 362–375. <https://doi.org/10.1108/JFEP-10-2013-0056>
- Perera, N., & Paudel, R. C. (2009). Financial Development and Economic Growth in Sri Lanka. *Applied Econometrics and International Development*, 9(1), 157–164.
- Perera, R., & Ichihashi, M. (2016). *Financial Development and Economic Growth in Sri Lanka. Department of Development Policy Division of Development Science Graduate School for International Development and Cooperation (IDEC) Hiroshima University (IDEC DP2 Series - Vol.6 No.6)* (Vol. 6).
- Rexiang, W., & Rathanasiri, R. A. (2011). Financial Intermediation and Economic Growth : A Lesson from Sri Lanka. In *International Conference on Business and Information 2011 - Faculty of Commerce and Management, University of Kelaniya*.
- Shan, J., & Morris, A. (2010). International Review of Applied Economics Does Financial Development ' Lead ' Economic Growth ? *International Review of Applied Economics*, 16(2), 153–168. <https://doi.org/10.1080/02692170110118885>
- Shan, J., Morris, A. G., & Sun, F. (2001). Financial Development and Economic Growth: An Egg-and-Chicken Problem? *Review of International Economics*, 9(3), 443–454. <https://doi.org/10.1111/1467-9396.00291>
- Sinha, D., & Macri, J. (2001). Financial Development and Economic Growth: the Case of

Eight Asian Countries. *International Economics*, 1–32.

Tang, T. C. (2005). AN EXAMINATION OF THE CAUSAL RELATIONSHIP BETWEEN BANK LENDING AND ECONOMIC GROWTH: EVIDENCE FROM ASEAN. *Savings and Development*, 29(3), 313–343.

U. W. B. M. Kumari, T. V. and C. R. A. (2014). Financial Development and Economic Growth: The Post-Liberalization Experience in Sri Lanka. In *PROCEEDINGS OF THE PERADENIYA ECONOMICS RESEARCH SYMPOSIUM (PERS) – 2014* (pp. 55–60).

Wood, A. (1993). FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN BARBADOS: CAUSAL EVIDENCE. *Savings and Development*, 17(4), 379–390.

Wooldridge, J. M. (2012). *Introductory Econometrics :A Modern Approach*.
<https://doi.org/10.1016/j.jconhyd.2010.08.009>