

The Impact of Financial Sector Development on Economic Growth: Evidence from Sri Lanka

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Abstract

The objective of this study is to examine the impact of financial sector development on economic growth in Sri Lanka by taking two complementary sectors, namely banking and equity markets, to represent the financial sector. All previous studies in the Sri Lankan context have examined this relationship employing either the banking sector variables or equity market variables to represent the financial sector. This study is in favour of the supply-leading hypothesis and it tests the empirical validity of the hypothesis. The proposed model has been estimated with five banking sector variables and two equity market variables. Autoregressive Distribution Lag (ARDL) bounds testing approach is employed to identify the existence of short- and long-run relationships. The study relies on quarterly data from 2002:01 to 2020:04. Findings reveal that there exists a long-run relationship between financial sector variables and economic growth. More specifically, the size of financial intermediaries, interest rate, monetization, and size of the stock market have a significant positive impact on economic growth in the long-run. Somewhat surprisingly, the availability of credit to the private sector has a significant negative impact. All seven variables significantly influence economic growth in the short-run. Overall, the results of this study support the supply-leading hypothesis or the notion that financial sector development affects economic growth. These findings are mostly in line with previous literature. The results of seven diagnostic tests show that the estimated model is adequate for the purpose and estimation results are reliable. The study has some important policy implications.

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Introduction

The idea that there is a linkage between financial sector development and economic growth is not new or uncommon. For instance, the important role played by a banking system in economic growth is discussed in Bagehot (1873). Though this is a well-researched area in economics, there is no unanimity among the researchers about the nature of the relationship between financial sector development and economic growth. While studies like King and Levine (1993), Levine (1997), and Levine and Zervos (1998) show evidence that financial sector development bears a positive relationship with economic growth, studies like Lucas (1988) are of the view that the role of the financial sector in economic growth is “badly over-stressed” by economists. Pagano (1993) cites evidence in favour of a negative relationship.

In addition, in the literature, there are different views on the causal direction between financial sector development and economic growth. As pointed out in the literature review, some studies argue that financial sector development leads to economic growth while some other studies emphasize that economic growth causes financial sector development. There is also a set of studies that cite evidence for bidirectional causality between the two. One can also observe that the results are sensitive to factors such as the variables that are assumed to represent the financial sector, the selected sample period, and the estimation method.

The financial sector in an economy can be divided into two main branches, namely, the banking sector and equity markets. Accordingly, in literature, there are attempts to inquire into the link between each of these sectors and economic growth. The number of studies that examine the relationship between financial sector development and economic growth in the Sri Lankan context is only a few (Ahmed & Ansari, 1998; Sinha & Macri, 2001; Hemachandra, 2005; Habibullah & Eng, 2006; Fase & Abma, 2003; Jahfer & Inoue, 2014; De Silva, 2016). Even in these studies, the impact of financial sector development on economic growth is examined from *either* a bank-based *or* market-based

perspective, meaning that the financial sector in those studies is assumed to be represented by *either* the banking sector *or* equity markets. Ahmed and Ansari (1998), Sinha and Macri (2001), Hemachandra (2005), Habibullah and Eng (2006), Fase and Abma (2003), and De Silva (2016) use banking sector variables to represent the financial sector development while Jahfer and Inoue (2014) uses the stock market to represent the same.

The services provided by the banking sector and the equity markets are not the same (Levine & Zervos, 1998). More specifically, the focus of the stock market is trading risk and improving liquidity whereas the role of the banking sector is establishing long-term relationships with companies (Masaoud & Hardaker, 2012). However, in terms of providing financial services, the banking sector and equity markets are not substitutes but complements (Masaoud & Hardaker, 2012). Since the two sectors should be considered in a complementary manner, taking *either* the banking sector *or* equity markets to evaluate the impact of financial sector development on economic growth may provide an incomplete picture of the relationship in question. In the Sri Lankan context, no study has so far examined the impact of the financial sector development on economic growth taking the financial sector as a combination of both banking sector and equity markets. To fill this gap, this study has been organized with the main objective of evaluating the impact of financial sector development on economic growth in Sri Lanka considering the financial sector as a combination of the two complementary sectors: banking sector and equity markets.

Literature Review

Economists have expressed three views on the positive relationship between financial sector development and economic growth. The first, the *Supply Leading Hypothesis* (finance-led growth hypothesis), states that financial sector development leads the economic growth. The studies that are proponents of this hypothesis such as Bagehot (1873), Levine (1997), Levine and Zervos (1998), Ahmed and Ansari (1998), Seetanah et al. (2009), Mhadhbi (2014), Ndako (2017), Mollaahmetoğlu and Akçali (2019), Kapaya (2021), Bekele and Degu (2021), and Hyacinth et al., (2023) highlight that the financial sector is crucial in mobilizing capital for production, which is an essential factor in economic growth. The second, the *Demand Following Hypothesis* (growth-led finance

hypothesis), assumes that economic growth leads to the development of the financial sector. Studies that support this hypothesis argue that economic growth creates the demand for financial services, and hence economic growth leads to development in the financial sector. Among other studies, Shan et al. (2001), Shan and Morris (2002), Odhiambo (2004), Odhiambo (2008), Odhiambo (2009), Akinlo and Egbetunde (2010), Rachdi and Mbarek (2011), Bonin et al. (2014), and Bist (2018), cite evidence in favour of the demand following hypothesis. The underlying reasoning of the third, the *Bidirectional Causality View*, is that financial institutes fund productive investments, and in turn, economic growth creates the need for developed financial systems. Studies such as Shan et al. (2001), Sinha and Macri (2001), Calderón and Liu (2003), Shan and Jianhong (2006), Abu-Bader and Abu-Qarn (2008), Acaravci et al. (2009), Rachdi and Mbarek (2011) emphasize this view.

The majority of the literature points out that in many contexts supply leading hypothesis prevails. According to Nyasha and Odhiambo (2014), the ongoing debate on the direction of causality between financial development and economic growth dates back to the nineteenth century. “For a long time, the conventional wisdom has been in favour of the supply-leading response” (p. 113). When it comes to identifying the existence of these three views in relation to economic development, Patrick (1966) argues that early phases of economic development are characterized by supply-leading patterns, whereas later stages are characterized by demand-following patterns. Hence, it is more reasonable to assume that Sri Lanka has a supply-leading structure. Specifically, previous literature in the Sri Lankan context (Ahmed & Ansari, 1998; Fase & Abma, 2003; Habibullah & Eng, 2006; De Silva, 2016, for instance) also supports the view that it is the financial sector development that leads to economic growth but not the other way around. Accordingly, this study focuses on the supply-leading rationale of the nexus between financial development and economic growth.

Rousseau and Wachtel (2011), Masaoud and Hardaker (2012), and Sehrawat and Giri (2015) point out different channels through which financial sector development affects economic growth. For instance, financial sector development may promote economic growth by allocating resources efficiently, encouraging the mobilization of idle resources, promoting the implementation of high-quality projects through risk-sharing, increasing the productivity of

capital, and enhancing the speed and efficiency of transactions. Levine (1997) refers to the Functional Approach of financial development, according to which, financial sector development results in economic growth through accumulation of capital and innovation in technology. Levine and Zervos (1998) which concludes that there is a strong and positive association between the financial sector development and economic growth states that stock markets and banks (financial sector) are linked to economic growth through the growth of capital stock and productivity. According to Levine (1997), and Bagehot (1873), financial sector development played an important role during industrialization in England through mobilizing capital.

The financial sector can be divided into two broad categories based on the institutional arrangements which offer financial services to the economy, banking sector and equity market. In considering the relationship between the financial sector development and economic growth, some economists reject this segregation, arguing that what is important is the overall financial sector development, not the development of a particular institutional arrangement. However, identifying the contribution of equity market-based and bank-based financial sector development towards economic growth separately will facilitate the implementation of specific policies targeting each sector to promote economic growth.

Bank-based financial sector development represents the contribution of all commercial banks and savings banks toward the financial sector development. According to Schumpeter (1911 as cited in Nyasha & Odhiambo, 2014), well-developed banking systems spur technological advancements by funding entrepreneurs with ideas about innovative products and services. The McKinnon-Shaw Model (Fry, 1982) identifies the interest rate as a measurement of financial sector development, and its relationship with economic growth. Kapur's open economy model (Kapur, 1983) points out that interest rates and the structure of financial systems have an impact on economic growth. Tobin model (Tobin, 1965) shows that economic growth is influenced by the return on money.

Many studies inquire into the empirical validity of the notion that bank-based financial sector development leads to economic growth. King and Levine (1993), and Ahmed and Ansari (1998) have applied bank-based indicators to

define financial sector development. In discussing Financial Deepening and the implications of it for the Sri Lankan Economy for the period from 1965 to 1997, Hemachandra (2005) employs bank-based features to define and measure financial deepening, which is one form of financial sector development. Further, Hussain and Chakraborty (2012), Petkovski and Kjosevski (2014), Nyasha and Odhiambo (2014), Saksonova and Koleda (2017), and Alkhazaleh (2017) argue that developments in the bank-based financial sector would promote economic growth.

Equity market-based financial sector development covers the performance of the country's stock market and the following mechanisms can be identified as channels through which the stock market affects economic growth. Masaoud and Hardaker (2012) points out that stock markets can mobilize capital efficiently and effectively, provide risk pooling and risk sharing services which will enable investors to invest in risky but high-return projects, and exert corporate control. According to Rousseau and Wachtel (2000), stock markets provide an exit mechanism and liquidity to investors, and convenient access to capital. Malkiel (1998 as cited in Laopodis & Papastamou, 2016), illustrates that well-organized stock markets facilitate the welfare of the economy by providing liquidity that the market participants need.

There are many studies that emphasize the empirical validity of the view that equity market-based financial sector development brings about economic growth. Covering the stock market performances in Germany, the United States, the United Kingdom, Japan, and France Arestis et al. (2001) traces the effect of the stock market on economic growth. Levine and Zervos (1996) concludes that stock market development is positively linked to economic growth. Rousseau and Wachtel (2000), based on equity markets in 47 countries, cites evidence that a stock exchange has been a key institution in promoting economic activity in recent years. Laopodis and Papastamou (2016) concludes that even after other factors such as gross fixed capital formation, inflation rate, and interest rate are controlled for, stock markets are positively and strongly associated with future real economic development. Osaseri and Osamwonyi (2019) reveals that the stock market has a remarkable influence on how fast the economies of BRICs grow.

Methodology

The Proposed Model

The proposed model assumes that economic growth is dependent on financial sector development. Economic growth is usually measured in terms of the annual percentage change in GDP (Gross Domestic Product). In previous literature, two measures have been used to represent economic growth: the growth of real GDP (Ahmed & Ansari, 1998; Paun et al., 2019, for instance) and the growth rate of real per capita GDP (Ahmed & Ansari, 1998; Levine & Zervos, 1998; Perera & Ichihashi, 2016; De Silva, 2016; Guru & Yadav, 2019; Paun et al., 2019, among other studies). The growth rate of real per capita GDP indicates the changes in both real GDP and population. Usually, such a measure is used for comparison purposes when more than one country is involved in a study. Since this study focuses only on the Sri Lankan economy and the authors want to isolate the change in real GDP from the change in population, the change in real GDP is used to measure economic growth.

Depending on the channels through which both bank-based and equity market-based financial sector development affect economic growth, nine independent variables have been selected to be included in the model. Out of these nine, six variables, namely the size of financial intermediaries, interest rates, monetization, domestic financial deepening, the supply of domestic credit to the private sector, and financial stability are assumed to represent the bank-based financial sector development. The other three variables, the size of the stock market, turnover ratio, and the value of shares traded, are assumed to represent the equity market-based financial sector development. The following few paragraphs explain the theoretical rationale behind the inclusion of each of those nine variables, the nature of the relationship between each variable and economic growth (whether it is positive or negative), and the measures used to represent each of those variables.

De Silva (2016) suggests that the rise in the *size of financial intermediaries* reduces investment appraisal costs, leads to the efficient mobilization of savings and availability of information, and provides a strong platform to exchange products. This implies a positive relationship between the size of financial intermediaries and economic growth. Following Ahmed and Ansari (1998),

Sinha and Macri (2001), and Giri and Mohapatra (2012) the ratio of quasi-money to nominal GDP is selected to be the measure for the size of financial intermediaries

McKinnon-Shaw model (Fry, 1982) and Kapur's open economy model (Kapur, 1983), Ahmed and Ansari (1998), Hemachandra (2005), and Perera and Ichihashi (2016) emphasize *interest rates* as an indicator of bank-based financial sector development. Perera and Ichihashi (2016) states that the interest rate has been an essential factor in GDP growth and monetary policy implementation. In Sri Lanka, interest rates are the main policy instrument in implementing monetary policy. According to Hemachandra, (2005), the interest rate is one of the main policy instruments that affects financial deepening, the ultimate objective of which, is to achieve economic growth. Since theoretical evidence in favour of both positive and negative relationships is available, the expected sign for the relationship between interest rates and economic growth is inconclusive. Several theories suggest a negative relationship. For instance, Keynesian and neo-classical economists argue that low-interest rates stimulate economic growth. The reason for this argument is that low-interest rates increase consumption and investment through borrowing. Classical theory assumes a positive link between interest rate and savings and a negative link between interest rate and investment. Further, neo-structuralists assume that higher interest rates reduce the availability of credit and, hence economic growth. On the contrary, a positive relationship can be explained using McKinnon-Shaw model and Kapur's open economy model. McKinnon-Shaw (Fry, 1982) model states that higher interest rates motivate savings which in turn become investments. Kapur's open economy model (Kapur, 1983) also asserts that higher interest rates and a liberalized financial system result in economic growth. Following Hemachandra (2005) and Perera and Ichihashi (2016), the Average Weighted Deposit Rate (AWDR) is taken as the representative of the interest rates in the economy.

Since *monetization* acts as a complement to physical capital and it results in the reduction of transaction frictions and expansion of the availability of credit, both Ahmed and Ansari (1998) and Rousseau and D'Onofrio (2013) suggest that it represents an important aspect of bank-based financial sector development. A higher rate of monetization is expected to increase economic growth and, hence

the expected relationship is positive. In the proposed model, monetization is measured by the ratio between M1 and nominal GDP (Sinha & Macri, 2001).

Citing World Bank (1997), Gezer (2018) argues that *domestic financial deepening* contributes to higher investment and faster productivity growth, thus contributing to bank-based financial sector development. A high degree of financial deepening is expected to lead to rapid growth of an economy, thus implying a positive relationship. Following Hemachandra (2005), and Hussain and Chakraborty (2012), financial deepening is proxied by the ratio of financial sector contribution to nominal GDP.

The supply of domestic credit to the private sector, which indicates the efficient allocation of funds to new projects, can be considered another factor through which bank-based financial sector development affects economic growth (De Silva, 2016). The higher the supply of credit to the domestic private sector, the faster the growth rate of an economy, and the expected relationship is positive. Following Levine and Zervos (1998), Calderón and Liu (2003), Ang and McKibbin (2007), Masaoud and Hardaker (2012), Sehrawat and Giri (2015), Svirydzenka (2016), Puatwoe and Piabuo (2017), Bist (2018), and Guru and Yadav (2019), the supply of domestic credit to the private sector is assumed to be represented by the ratio between domestic credit issued to the private sector by commercial banks and nominal GDP.

Guru and Yadav (2019) argues that *financial stability* indicates the development of the bank-based financial sector as it facilitates the smooth functioning of financial services and suggests that financial stability be measured by the ratio of credit to deposits. A higher credit to deposit ratio indicates a high level of banking penetration, which in turn provides more stimulus for economic growth. Accordingly, a positive relationship is expected to exist between financial stability and economic growth.

The increase in the *size of the stock market* improves the ability of mobilizing and diversifying risk (Levine & Zervos, 1998), thus suggesting a positive relationship. Following Levine and Zervos (1996), Levine and Zervos (1998), Arestis et al. (2001), Masaoud and Hardaker (2012), Jahfer and Inoue (2014), Sehrawat and Giri (2015), Svirydzenka (2016), Guru and Yadav (2019), and

Paun et al. (2019), the ratio between market capitalization and nominal GDP is chosen to be the measurement of the size of the stock market.

The *turnover ratio* and the *value of shares traded* are measures of liquidity in the stock market (Guru & Yadav, 2019). The former measures liquidity compared to the economy, and the latter measures liquidity compared to market capitalization. More liquid stock markets enhance the use of share capital, influence investment, and facilitate technological innovation (Masaoud & Hardaker, 2012). The expected relationship between the degree of liquidity and economic growth is positive. The value of shares traded is computed as a ratio of it to nominal GDP (Levine & Zervos, 1996; Levine & Zervos, 1998; Levine, 2001; Masaoud & Hardaker, 2012; Jahfer & Inoue, 2014; Guru & Yadav, 2019). Turnover itself acts as the statistical measurement of it (Levine & Zervos, 1996; Levine & Zervos, 1998; Masaoud & Hardaker, 2012; Guru & Yadav, 2019).

Accordingly, this study proposes the following functional relationships:

$$\begin{aligned}\text{Economic Growth} &= f(\text{financial sector development}) \\ &= f(\text{bank-based financial sector development, equity market-} \\ &\quad \text{based financial sector development}) \\ &= f(\text{Size of Fin. Int, Stability, Credit, Interest, Monetization,} \\ &\quad \text{Deepening, Size of Stock Mkt, Shares Traded, Turnover})\end{aligned}$$

where ‘Size of Fin. Int’ is the size of market intermediaries, ‘Stability’ is financial stability, ‘Credit’ is the supply of domestic credit to the private sector, ‘Interest’ is interest rates, ‘Monetization’ is monetizing the economy, ‘Deepening’ is financial deepening, ‘Size of Stock Mkt’ is the size of the stock market, ‘Shares Traded’ is the value of shares traded, and ‘Turnover’ is the stock market’s turnover.

In terms of the measures selected for each variable, the model to be estimated can be stated by Equation 1:

$$EG_t = \beta_0 + \beta_1 Q_t + \beta_2 CD_t + \beta_3 CR_t + \beta_4 IR_t + \beta_5 M_t + \beta_6 FD_t + \beta_7 MS_t + \beta_8 VT_t + \beta_9 TO_t + u_t \quad (1)$$

where EG is the growth of real GDP, Q is the ratio of quasi-money to nominal GDP, CD is the credit to deposit ratio, CR is the ratio of domestic credit issued to the private sector to nominal GDP, IR is the AWDR, M is the ratio of M1 to nominal GDP, FD is the ratio of financial sector contribution to nominal GDP, MS is the ratio of market capitalization to nominal GDP, VT is the ratio of the value of shares traded to nominal GDP, and TO is stock market turnover.

In estimating the model, two changes had to be made to the list of independent variables. Turnover (TO) had to be dropped as it bears a very high correlation with the value of shares traded (VT). The ratio of financial sector contribution to nominal GDP (FD) which measures domestic financial deepening was also removed to obtain the dynamic stability of the model.

Control variables are not employed for the parsimony of the model. Including the lag terms of all nine independent variables, there are twenty-nine (29) regressors in the model. The inclusion of control variables would further increase this number, thus decreasing the degrees of freedom of the model and deteriorating the precision of the parameters.

Econometric Method and Data

The augmented Dickey-Fuller test (ADF) is employed to identify the stationarity of the time series and the results show that there are both I(1) and I(0) series among the variables selected. Therefore, Autoregressive Distributed Lag (ARDL) model procedure is employed as the econometric method to identify the short- and long-run relationships between financial sector development and economic growth. The ARDL bounds testing approach was introduced by Pesaran et al (2001) as an alternative to the existing cointegration techniques such as the Johansen procedure which require all variables involved to be integrated of order 1. Nkoro and Uko (2016) shows that the use of the ARDL bounds testing approach does not need pre-testing for unit roots. More specifically, the unrestricted error correction model in Equation (2) has been used.

$$\begin{aligned}
 \Delta GDP_t = & \beta_0 + \alpha_0 GDP_{t-1} + \alpha_1 Q_{t-1} + \alpha_2 CD_{t-1} + \alpha_3 CR_{t-1} + \alpha_4 IR_{t-1} \\
 & + \alpha_5 M_{t-1} + \alpha_6 MS_{t-1} + \alpha_7 VT_{t-1} \\
 & + \sum_{i=1}^n \beta_{1i} \Delta GDP_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta Q_{t-i} + \sum_{i=0}^n \beta_{3i} \Delta CD_{t-i} \\
 & + \sum_{i=0}^n \beta_{4i} \Delta CR_{t-i} + \sum_{i=0}^n \beta_{5i} IR_{t-i} + \sum_{i=0}^n \beta_{6i} M_{t-i} + \sum_{i=0}^n \beta_{7i} MS_{t-i} \\
 & + \sum_{i=0}^n \beta_{8i} VT_{t-i} + u_t
 \end{aligned} \tag{2}$$

In terms of the unrestricted error correction model represented by Equation 2, the null hypothesis, which implies that the absence of a long-run relationship between financial development and economic growth, to be tested is $\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = 0$. ARDL bounds testing approach suggests two sets of critical values for $I(0)$ and $I(1)$ time series at each level of significance: lower bound (F_L) and upper bound (F_U). If the computed F statistic is less than the lower bound critical values (i.e. $F < F_L$), the null hypothesis cannot be rejected. Alternatively, if the computed F statistic is greater than the upper bound critical values (i.e. $F > F_U$), then the null hypothesis is rejected in favour of the existence of a long-run relationship between financial sector development and economic growth. However, if $F_L < F < F_U$, the inference is said to be inconclusive. Quarterly data is selected to capture the frequently changing nature of the variables in the stock market and banking sector. Although the daily or monthly frequency is ideal, the lack of data availability results in not selecting those frequencies. Secondary data are extracted from two local sources. Data for GDP and bank-based financial sector variables are obtained from published statistics of the Central Bank of Sri Lanka. Published statistics of the Colombo Stock Exchange are the source of data for market sector variables. The selected sample period is from 2002 quarter 01 to 2020 quarter 04. The selection of the sample period is based on data availability and estimating a stabilized model. Quarterly data for certain variables is not available before 2000. Though quarterly data for all variables are available from 2000 onward, the first eight data points in 2000 and 2001 have been omitted to estimate a model with stable parameters.

Results and Discussion

The ARDL Bound test approach is employed to find whether there is a long-run relationship between financial sector variables and economic growth. The existence of long-run relationship between variables. As the results reported in Table 01 indicate, the computed F-statistic of the test is 7.23 and is higher than the upper bound critical value (3.9) at a 1% significant level. This means that the null hypothesis $\alpha_0 = \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = \alpha_7 = 0$ is rejected and there exists a long-run relationship between financial sector variables and economic growth. It implies that the supply leading hypothesis or the notion that financial sector development influences economic growth is accepted.

Table 01: ARDL Bounds Test Results

Computed <i>F</i> -Statistic	Asymptotic Critical Value Bounds for <i>F</i> -Statistic			
	95%		99%	
	I(0)	I(1)	I(0)	I(1)
7.23	2.17	3.21	2.73	3.9

Since the results of the ARDL bounds testing approach show that financial sector variables and economic growth are cointegrated, an ARDL model is used to estimate the parameters associated with each financial sector variable. The lag length is determined to be 5 using Akaike Information Criteria (AIC).

Results for the relationship between financial sector development and economic growth have been identified in terms of both long-run and short-run. The estimation results for the long-run relationship between financial sector variables and economic growth are presented in Table 02.

Table 02: Long-run Coefficients

Variable	Coefficient	<i>t</i> -statistic
<i>Q</i>	7395298	11.1688**
<i>CD</i>	-16256.73	-1.1128

CR	-7246692	-8.7263**
IR	15946307	4.2618**
M	11560575	2.9258**
MS	1346452	7.3919**
VT	-3019520	-1.1762

Note: ** indicates significance at 1% level.

According to the *t*-statistic values, the size of financial intermediaries (Q), interest rate (IR), monetization (M), and size of the stock market (MS) have a significant positive impact on economic growth. All four coefficients are significant at a 1% level of significance and bear the expected sign. Though the availability of credit (CR) is statistically significant at a 1% level, it has a significant negative impact. Financial stability (CD) and the value of shares traded (VT) do not indicate a significant relationship with economic growth. The rest of this section is dedicated to discussing these results in detail.

The significant positive impact of the size of financial intermediaries (Q) on economic growth reiterates that the rise in the former would lead to high economic growth through reduced investment appraisal costs, efficient mobilization of savings, and provision of a strong platform to exchange products. This finding is in line with the previous literature. Ahmed and Ansari, (1998) finds that financial intermediation causes economic growth in Sri Lanka, India, and Pakistan. Sinha and Macri, (2001) provides the same evidence with respect to India and Sri Lanka. Giri and Mohapatra (2012) presents evidence in support of this relationship in India. Guru and Yadav, (2019) finds that financial intermediation has a positive and significant impact on economic growth in BRICS countries. Yakubu et al., (2021), a study that captures the level of financial intermediation through an index that includes broad money, bank deposits, and domestic credit by the financial sector, reports that financial intermediation has a significant effect on economic growth in the long-run in Turkey.

As pointed out in the section of Methodology, the expected sign is inconclusive for the interest rate (IR). Our findings reveal that there is a positive relationship between interest rates and economic growth. An attempt to explain this behavior of the interest rate can be made using existing literature related to Sri Lankan financial markets. Hemachandra (2011) states that only private investment is

influenced by interest rates in Sri Lanka. Usually, private investment is financed by credit, which is influenced by interest rates. However, government investment, which is funded by borrowings, foreign direct investments, and donor funding, is less likely to be influenced by interest rates. Hemachandra (2011) also argues that investment and economic growth are influenced by private investment, and private investment is influenced by credit, meaning that it is the lending rate that plays a vital role in influencing economic growth. However, following the existing literature, this study has employed AWDR to represent interest rates and that can be one reason for the result associated with interest rates. The incomplete interest rate passthrough in Sri Lanka can also be a reason for this result. Changes in interest rates do not provide expected results on economic growth when the interest rate pass-through is incomplete. The interest rate pass-through includes two stages. The first stage is from policy rates to call money market rates. The second is from call money market rates to lending and deposit rates of commercial banks. According to Amarasekara (2005), call money market rates do not quickly and completely transmit to the lending and deposit rates of commercial banks in Sri Lanka.

The results show a positive and significant relationship between monetization (M) and economic growth. This is because monetization is complementary to physical capital, thus resulting in the reduction of transaction frictions and expansion of the availability of credit. This result corroborates similar findings of Ahmed and Ansari (1998) in the context of Sri Lanka, India, and Pakistan. However, Sinha and Macri (2001) presents mixed results on the impact of M1 on economic growth for eight Asian countries. The impact is significant in the cases of India, Sri Lanka, Pakistan, Malaysia, Japan, and Korea, whereas it is insignificant in the Philippines and Thailand. The results of Rousseau and D'Onofrio (2013) also emphasize that monetization is a key variable that affects economic growth in many of the countries in Sub-Saharan African territory.

The significant positive impact of the size of the stock market (MS) on economic growth is due to the improved ability to mobilize and diversify risk in the context of a larger stock market. In the literature, one can find many studies that report similar results for various economies. Levine and Zervos (1996), a study that employs an index in terms of market capitalization, total value traded, and turnover to trace the development in the stock market and uses a cross-country regression, provides evidence for strong links between stock market

development and long-run economic growth. Masaoud and Hardaker (2012) finds that, together with liquidity and efficiency, the size of the stock market also contributes to economic growth. Sehrawat and Giri (2015) cites evidence that the size of the stock market causes economic growth in India. Nazir et al. (2010), states that the size of the stock market influences economic growth positively in Pakistan and that this influence outweighs the influence of the stock market's liquidity on economic growth. Jahfer and Inoue (2014) finds that the relationship between market capitalization and economic growth is bi-directional in Sri Lanka. On the contrary, Levine and Zervos (1998) reports that the size of the stock market does not influence economic growth. The study shows that the relationship between size and growth is not in place when controlled for the stock market's liquidity. This finding indicates that just listing securities on the stock market does not support growth, and what really matters is the ability to trade those securities. Arestis et al. (2001) finds only a weak relationship between stock market capitalization and economic growth in Germany, and a possible reason would be the inferior role played by the stock market when compared to the dominant relationship between the banking sector and industry. An opposite result is found in the United States since it has a capital market-based financial system. Paun et al. (2019) finds that the relationship between these two variables is negative but statistically relevant with respect to a sample of 45 low-middle- and high-income countries.

The significant but negative impact of the availability of credit (CR) on economic growth is contradictory to the expected result. However, one can cite literature support to explain this contradicting behaviour. According to Koivu (2002), credit to the private sector does not speed up economic growth in developing economies that have unsustainable growth in private credit. Further, Rousseau and Wachtel (2002) has stated that inflation has a significant and negative effect on the credit-to-GDP ratio. Accordingly, the negative impact of the availability of credit on economic growth in Sri Lanka can be attributed to unsustainable growth in private credit and persisting inflation. A somewhat similar result is reported by Bist (2018) that focuses on African and non-African low-income countries. Private credit contributes positively to the economic growth in the majority of countries, while the variable has a negative effect on economic growth in three countries (Central African Republic, Madagascar, and Mozambique). Authors point out that this negative impact is not because credit

has a negative impact on growth, but may be due to the least developed financial sector in these countries. On the contrary, the findings of De Silva (2016) reveal that credit to the private sector indicates a long-run relationship with economic growth in Sri Lanka. Further, Levine and Zervos (1998), and Calderón and Liu (2003) support the view that bank credit causes economic growth. Masaoud and Hardaker (2012) finds that the availability of credit contributes to economic growth in countries with emerging economies. Sinha and Macri (2001) points out that private sector credit to GDP contributes to the economic growth in India. Puatwoe and Piabuo (2017) reports that credit to the private sector stimulates economic growth in Cameroon in the long-run. Guru and Yadav (2019) also find that credit to the private sector promotes economic growth in BRICS countries.

The impact of financial stability represented by credit to deposit ratio (CD) on economic growth is found to be statistically insignificant. Contrary to this result, Guru and Yadav (2019) finds that financial stability has a significant positive impact on economic growth in BRICS countries. The insignificant impact of financial stability on economic growth in this study can be due to the selection of a measure that may not adequately represent all aspects of financial stability. According to Schinasi (2004), “financial stability can be thought of in terms of the financial system’s ability (a) to facilitate both an efficient allocation of economic resources and the effectiveness of other economic processes, (b) to assess the price, allocate and manage financial risks and (c) to maintain its ability to perform these key functions even when affected by external shocks or by build-up of imbalances - primarily through self-corrective mechanisms” (p. 08). Though the authors are well aware of this limitation of the selected measure (credit to deposit ratio), practically, it is difficult to find a measure that covers all the above aspects.

The impact of the value of shares traded (VT), the selected measure of stock market liquidity, on economic growth turns out to be insignificant. However, Levine and Zervos (1996 and 1998) finds that when the value of shares traded increases, it results in economic growth. The findings of Guru and Yadav (2019) and Masaoud and Hardaker (2012) are also in line with Levine and Zervos (1996 and 1998) in the context of BRICS countries and 42 emerging economies, respectively. The insignificant and negative impact of the value of shares traded on economic growth in this study can be explained using Levine

(2003) which argues that three core sources explain the theoretically ambiguous relationship between economic growth and stock market liquidity. First, liquidity in the stock market reduces the risk of investing in long-run, high-return projects. The reduced risk affects saving and capital accumulation rates ambiguously. Hence, economic growth will be slow if there is a sufficient fall in the savings rate. Second, stock market liquidity reduces the cost of investing in long-run, high-return projects. However, a higher rate of return on savings impacts savings and capital accumulation rates ambiguously. Therefore, the economic growth will fall if there is a sufficient fall in capital accumulation rates. Third, greater stock market liquidity makes investors less interested in having corporate control since investors can cheaply and confidentially sell the shares in highly liquid markets. Hence, lower corporate control reduces firms' growth and, in turn, the growth of the economy. Further, Levine (2003) mentions that the ratio of the value of shares traded to GDP would increase even though the number of transactions are not changed or transaction cost is not decreased. This kind of increase in the value of shares traded to GDP ratio happens when the value of the ratio increases as a result of the anticipation of larger corporate profits by investors. In such a scenario, an increase in the ratio does not indicate a significant contribution to economic growth.

Table 03: Short-run Coefficients

Variable	Numerical Value	t -stat	
Q	ΔQ_t	-519511.8	-3.0173**
	ΔQ_{t-1}	-1542366	-4.9285**
	ΔQ_{t-2}	-1730487	-5.9248**
	ΔQ_{t-3}	-393205.9	-3.0081**
CD	ΔCD_t	-1311.021	-0.3359
	ΔCD_{t-1}	-3874.111	-1.0157
	ΔCD_{t-2}	-9802.231	-2.8034**
CR	ΔCR_t	-142384.9	-0.5976
	ΔCR_{t-1}	895404.5	2.8329**
	ΔCR_{t-2}	1115057	4.0911**
IR	ΔIR_t	5747984	4.0038**
	ΔIR_{t-1}	3846944	2.7892**
	ΔIR_{t-2}	4339925	3.0046**

M	ΔM_t	-108707.5	-0.3230
	ΔM_{t-1}	-1514266	-3.7026**
	ΔM_{t-2}	-863829.6	-2.4728*
MS	ΔMS_t	71634.28	1.3033
	ΔMS_{t-1}	-176321.5	-3.0441**
	ΔMS_{t-2}	-240139.2	-5.1296**
	ΔMS_{t-3}	-184031	-4.1814**
VT	ΔVT_t	-1303010	-3.4915**
	ΔVT_{t-1}	822780.3	2.2175*
Error Correction Term		-0.219835	-8.84105*

Note: * and ** indicate significance at 5% and 1% levels, respectively.

Findings related to the short-run are presented in Table 03. Contemporaneous as well as lag terms of the size of financial intermediaries (Q), interest rate (IR), and value of shares traded (VT) have a significant impact on economic growth. The contemporaneous impact of the size of financial intermediaries (Q) and the value of shares traded (VT) is negative. Lag terms of availability of credit (CR), monetization (M), and the size of the stock market (MS) have a significant impact on economic growth while their contemporaneous terms do not. Only the second lag term of credit to deposit ratio significantly influences economic growth. The error correction term is significant and lies between 0 and -1, thus implying that 21% of the error during the previous period is corrected in the current period. In summary, the lag term of all the variables has a significant impact on economic growth. When it comes to contemporaneous terms, only the size of financial intermediation, interest rates, and value of shares traded show a significant impact on economic growth.

Overall, the results of this study support the supply leading hypothesis or the notion that financial sector development affects economic growth. First, as the ARDL bounds test results reported in Table 01 indicate, the null hypothesis that there is *no* long-run relationship between financial sector variables and economic growth is rejected at a 1% significant level. Second, the results presented in Table 02 depict that five out of seven financial sector variables have a significant impact on economic growth in the long-run. Finally, as the results included in Table 03 indicate, all financial sector variables have a significant impact on economic growth in the short-run. All these results

together imply that financial sector development is more likely to influence economic growth in Sri Lanka. This finding is in line with previous literature. For instance, King and Levine (1993), Levine (1997), Levine and Zervos (1998), Ahmed and Ansari (1998), and Guru and Yadav (2019) have reported similar results.

To check the validity of the model employed and the results obtained, seven diagnostic tests have been performed. The summary of the results of five tests is presented in Table 04. The results of the Breusch-Pagan-Godfrey test and the Glejser test show that residuals are free from heteroskedasticity. The absence of serial correlation is confirmed by the test results of the LM test and Lung-Box test at 4 lags. The Ramsey RESET test result indicates that the model has been specified correctly.

Table 04: Summary of Diagnostic Test Results

Test	Test statistic (Probability)	Decision
Breusch-Pagan-Godfrey	1.13 (0.3289)	No heteroskedasticity
Glejser	1.31 (0.2020)	No heteroskedasticity
LM test (4 lags)	0.63 (0.6408)	No serial correlation
Ljung-Box (4 lags)	2.77 (0.598)	No serial correlation
Ramsey RESET	0.31 (0.7541)	Model is correctly specified

The cumulative sum of recursive residuals (CUSUM) test and the cumulative sum of squares of recursive residuals (CUSUM of squares) test have been employed to test the parameter stability of the model. Figures 1 and 2 indicate that the plots of the statistics of the CUSUM and CUSUM of squares tests do not cross 5% critical lines throughout the sample period. The implication is that it is unlikely that there would be structural breaks, and the model parameters tend to remain fixed during the entire period considered.

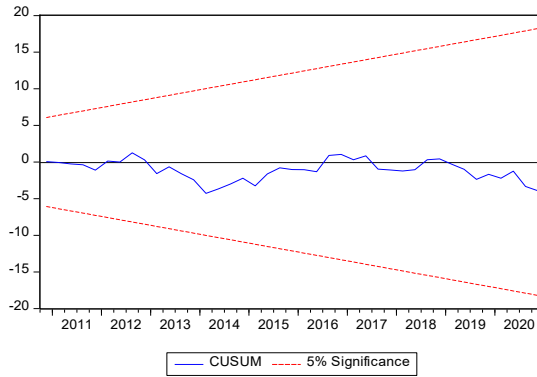


Figure 1. CUSUM Test

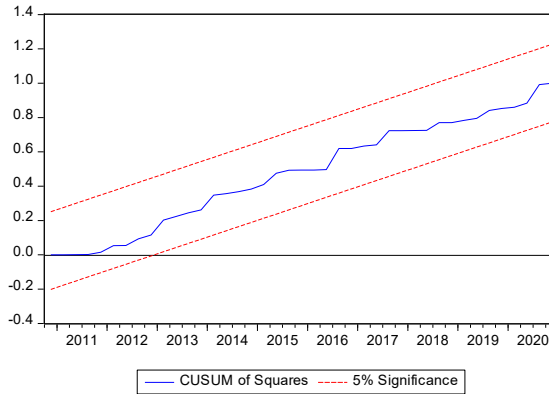


Figure 2. CUSUM of squares Test

Conclusion

The objective of this study is to evaluate the impact of financial sector development on economic growth in Sri Lanka. Unlike the existing studies that examine this relationship in the Sri Lankan context, the present study incorporates both the banking sector and equity markets in a complementary manner to represent the financial sector. Accordingly, six banking sector (or, bank-based) variables and three equity market (or, market-based) variables have been selected to be included in the relevant model. In the final estimation of the model, one variable from each sector has to be dropped to improve the precision of the parameters and to obtain a dynamically stable model. Having dropped

stock market turnover (TO) and the ratio of financial sector contribution to nominal GDP (FD), the model has been estimated with five banking sector variables and two equity market variables. The empirical results show that both market-based and bank-based financial sector developments have an important role to play in determining economic growth in both the short- and long-run in Sri Lanka. More specifically, the size of financial intermediaries (Q), interest rate (IR), domestic credit to the private sector (CR), monetization (M), and size of the stock market (MS) are instrumental in determining economic growth in Sri Lanka in both long-and short-run. However, financial stability (CD) and the value of shares traded (VT) influence economic growth only in the short-run. Overall, the results of this study emphasize that the supply leading hypothesis is more likely to hold in Sri Lanka. The findings are in line with previous literature.

As mentioned in the Introduction, there are only a few papers that inquire into the relationship between financial sector development and economic growth in Sri Lanka and even these few studies take *either* banking sector *or* equity markets to represent the financial sector, but not both. In this context, the present study contributes to the existing literature on the finance-growth nexus by filling this empirical gap through the incorporation of both the banking sector and equity markets in a complementary manner to represent the financial sector in evaluating the impact of the same on economic growth in Sri Lanka.

There are several important policy implications of the findings. First, the positive relationship between the interest rate and economic growth suggests that the benefits of the reduction in interest rates do not transmit toward economic growth. Given that the positive relationship may at least partly be due to incomplete interest rate pass-through, it begs for the immediate attention of policymakers to take suitable measures to remove structural barriers in the financial markets and improve the interest rate pass-through. Second, a positive relationship between monetization and economic growth may encourage policymakers to increase the money supply freely to achieve high growth. However, in the context of the current crisis, one of the crucial factors behind which is the enormous and careless expansion of the supply of money, care should be taken in making such decisions. Third, the negative relationship between the availability of credit to the private sector and economic growth implies that to make this relationship a desired one (i.e. to convert it into a

positive relationship), the growth of private credit must be made sustainable and inflation must be reduced. Fourth, the findings show that stock market development leads to economic growth. In Sri Lanka, though the banking sector is more popular for investments by the general public, the stock market is not equally popular for the same. In that context, it would be sensible to focus on policies to promote investments in the stock market and make the market more accessible to the general public. Following Levine & Zervos (1998), it can also be argued that merely listing securities on the stock market does not support growth, and as a result, suitable measures have to be taken to improve the ability to trade those securities. Finally, since the financial sector development provides a significant contribution to economic growth, the financial sector needs to be expanded and more active. In such a process, for general public to involve in financial activities sensibly, their level of financial literacy needs to be improved.

Two main limitations of this study can be identified. One is the implicit assumption of the study that all the variables that represent the bank-based and market-based sectors are equally important in determining economic growth, hence assigning equal weights to all variables. The other is limiting the banking sector only to commercial banks. The banking sector in any economy consists of many other non-commercial bank financial institutions that are important in determining the economic growth of the economy. These limitations can be overcome in future research. For instance, the first can be addressed by employing two indexes to represent the two sectors each of which can be prepared by assigning suitable weights to different variables based on their importance. The second can be addressed by incorporating more variables that represent the activities of non-commercial bank institutions in the banking sector. Moreover, a study can be conducted to evaluate which sector out of these two is more important in bringing about economic growth.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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