

Impact of Sectorial Distribution of Commercial Banks' Credit on Economic Growth in Sri Lanka

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Abstract

The study attempts to investigate the impact of sectorial distribution of Commercial banks' credit on economic growth in Sri Lanka from 2004 to 2017. The data of commercial banks' loans and advances to the agriculture sector, industry sector, personal consumption, and service sector are used to track the sectorial credit distribution to the private sector by commercial banks. The regression analysis, Johansen-Juselius Cointegration test, Granger Causality test, Impulse Response Function (IRF) analysis and Forecast Error Variance Decompositions (FEVD) models are employed to determine the effect of sectorial distribution of Commercial banks' credit on economic growth in Sri Lanka. The regression results indicate that the commercial bank sectorial credit have significant positive impact on the economic growth except agricultural sector. Agriculture sector has a long run negative relationship with Gross Domestic Product (GDP) while other sectors have positive long run relationship between economic growth. Granger Causality tests showed that there is a unidirectional causality from agriculture sector on GDP. IRFs and Variance decomposition analysis confirmed the statistically significant short run relationship between GDP and agriculture sector. According to the study results, the policy makers could motivate banks to distribute credit amongst the industry and service sectors since it has a positive impact on GDP in the long-run. Moreover, it is possible to use credit distribution to the agricultural sector as a short term mechanism to increase GDP.

Keywords: Commercial bank, Credit, Economic growth, Private Sector

INTRODUCTION

A Commercial bank's primary function is defined as acquiring funds from surplus units in term of deposits and lending them to all legitimate businesses and consumer financial needs with a competitive interest rate (Rose, 2002). The commercial banks extend loans and advances to the different sectors such as agriculture, service and industry to enhance the sustainability of an economy. The previous literature emphasize that the commercial banks'-private sector lending services plays a catalytic role to promote the entire sectorial businesses to adopt the advanced technology, financial consultancy, educate sustainable business practices and absorb

the uncertain shocks from the external environment (Köhler, 2015;Chinweokeet al., 2015). Sri Lankan banking sector consist of 700 billion as capital funds and LKR 2.3 Trillion under the total investment and LKR100 Million as profit in 2016 (CBSL, 2017). Majorly, banking profit is earned from credit facilities (Chinweokeet al. (2015).

The present context of Sri Lankan economy indicates that, Commercial banks and the Stock market are challenged with negative macroeconomic conditions (Dewasiri and Kumarasinghe, 2014). The lending profits were dropped in 2017, the GDP indicated a lower growth rate, lack of credit expansion was the elevated inflation rate due to adverse impact of weather conditions, tax adjustments and international prices of commodity in 2017. Moreover, the Sri Lankan currency rate has also shown a depreciating trend in the market (Rajakaruna, 2017). The regulatory body tightened the fiscal and monetary policy to overcome from these problems. As a result, the standing lending facility rate (SLRF) increased up to 8.00% in 2016 (Rajakaruna, 2017). The banking sector is still addressing the real sectors' monetary requirements though operations under an unfavourable environment. In general, the Sri Lankan commercial bank loans and advances facilities dropped for the industry sector and agriculture sector meanwhile the service sector recorded a positive credit expansion. There is a contradiction of the findings of impact of sectorial distribution of commercial banks' credit on the economic growth as indicated in the studies conducted in the past few decades (Waheed, 2009; Uzomba et al., 2014; Mulu, 2012). For instance, Köhler (2012) argued that there is an inverse relationship between credit facilities to the real sectors and productivity of an economy. Contrary to Köhler's (2012) findings, Burzynska (2009) stated that the economy has one way causality between economic growth and loans to commercial sector while Mulu, (2012) arguing that banking sector credit facility does not contribute to the economy growth. Moreover, most of the studies individually investigated on credit facility to a single sector and its impact on economic growth of the respective country (Mulu, 2012; Burzynska, 2009). This study is different from those studies since it focuses on a holistic view focusing agriculture, industry, and service sectors in a single study. Moreover, there is a paucity of studies conducted in the Sri Lankan context in the same phenomenon. Hence, the contradiction of the findings of the previous studies and paucity of the studies conducted in the Sri Lankan context motivate this study to a greater extent. Thus, this research aimed to be a fruitful addition to the existing studies on this area filling the aforementioned research gaps of contradictory findings and paucity of studies conducted in the Sri Lankan context. Thereby, the research problem of this study is identified as: "what is the impact of sectorial credit distribution of commercial banks' credit on the economic growth of Sri Lanka?"

The objective of this study is to investigate the impact of sectorial distribution of commercial banks' credit on economic growth of Sri Lanka. The specific objectives of this study are identified as: [1] to examine the impact of private sectors distribution of Commercial Banks loans and advances on economic growth, [2] to investigate the short and long run relationship between private sector credit facilities and economic growth.

LITERATURE REVIEW

The concepts of banks and the banking sector in a financial sector became the central theme for many scholars and academics to explore the banks' credit/lending facilities to private sector in the economy to have a sustainable growth (Burzynska, 2009). A sound and resilient banking system empowers the country's real sector. Rahman et al. (2012) emphasized that "a banking system should be more concern on the environment shocks to safeguard the financial system as well as the productivity of a country". The theoretical background of the study is explained through Cobb-Douglas Theory which explains the relationship between labour supply and capital on production. The production represents the economic growth and capital represents the credit borrowings (Mulu, 2012). Thus, the Cobb-Douglas Theory has implications for the current study since credit borrowing is a variable which is related to the economic growth as emphasized by Mulu(2012).

Burzynska(2009) employed an empirical framework using Johansen Co-integration technique to investigate the long-term relationship between Chinese economic growth and sectorial distribution of credit facilities. Burzynska (2009) stated that banking industry extensively supports the economy with the banking credit facilities. Moreover, his study further explained the different types of loans and advance products from different banks have a positive impact on the economic growth. GaleanoandFeijo (2012) supported the argument stating that economic growth of the diverse regions are differed according to the sectorial distribution of the credit facilities for respective regions. Burzynska (2009) revealed that there is a unidirectional causality between economic growth and loans or credit facilities to the commercial sector. Contrary to Burzynska's (2009) and GaleanoandFeijo's(2012) findings, Mulu, (2012) argued that the banking sector credit facilities does not contribute to the economic growth. Mulu (2012) explained that supply and demand of the credit products are statistically significant but the association between sectorial distribution of credit facilities and economic growth reflect a slight negative and insignificant association. Hence, Mulu (2012) concluded that the bank credit facilities are not significantly contributing to enhance the productivity.

Chinweokeet al. (2015) stated that commercial banks play an auxiliary role to develop the real sectors to achieve an outstanding economic growth of an economy through its lending/credit facilities. They further stated that commercial bank loans and advances

encourage the agriculture and manufacturing sectors' productivity. Hence, the empirical literature clearly shows that the banking industry is playing a crucial business in an economy by providing credit facilities (Chinweoke et al., 2015; Burzynska, 2009; Galeano and Feijo, 2012). It significantly supports to develop the real sector of an economy through exposing to various kinds of risks. Thus, the banks should balance the risk exposure and credit utilization in order to achieve a sustainable development of an economy (Kumar et al., 2016). The empirical contradictory evidences in other countries and paucity of the studies conducted in the Sri Lankan context provide the rationale for a further study. Therefore, to address the literature gap, the researchers of this study attempt to examine the impact of sectorial credit distribution of commercial banks' credit on economic growth of Sri Lanka.

METHODOLOGY

Dewasiri et al. (2018) argued that research problem and/or questions drive the methodology of a study. For instance, if the research problem is in descriptive, comparative, relationship bound, or historical in nature, Onwuegbuzie and Leech (2006) recommended the quantitative methodology for such inquiry. Accordingly, this study formulated its research problem in descriptive form (what) and thus it is recommended to proceed with a quantitative inquiry. The period of the study is confined for 13 years from 2005 to 2017. The data points were collected on quarterly basis from Licensed Commercial Banks in Sri Lanka and verified from monthly bulletin of Central Bank of Sri Lanka (CBSL) from 2005 to 2017. The sample consists of 26 licensed commercial banks and accounted for 32% of the population (81 financial institutions). It could be considered as a limitation of the current study. The conceptual model of the study is stated in Figure 1.

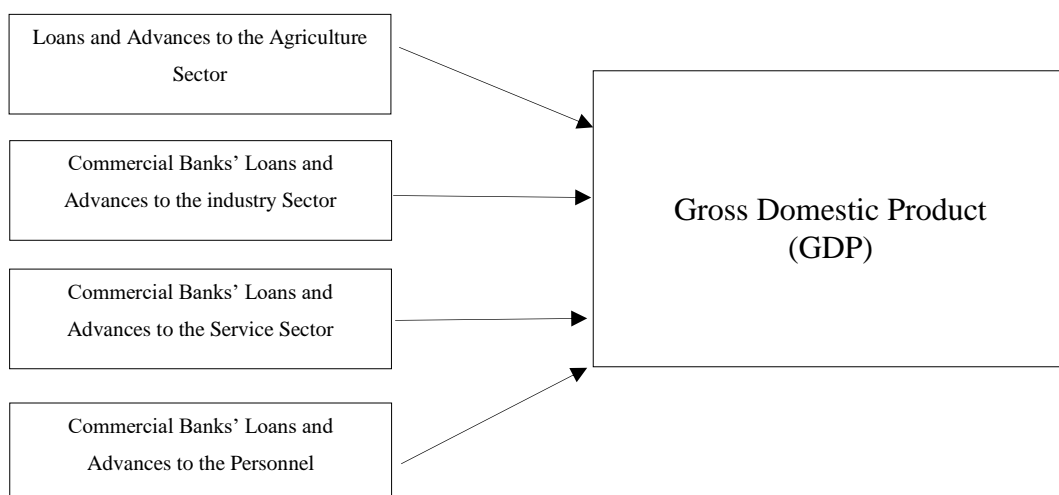


Figure 1: Conceptual Framework of the Study

Source: Authors' own.

The literature review indicated that there is a significant impact from sectorial distribution of commercial bank credit facilities on economic growth in a country (Chinweoke et al., 2015; Burzynska, 2009; Galeano and Feijo, 2012). Hence, the researchers of this study formulated following hypotheses to achieve general and specific objectives of the study.

H₁: There is an impact of Commercial Banks' credit distribution to the agriculture sector on economic growth of Sri Lanka

H₂: There is an impact of Commercial Banks' credit distribution to the service sector on economic growth of Sri Lanka

H₃: There is an impact of Commercial Banks' credit distribution to the industry sector on economic growth of Sri Lanka

H₄: There is an impact of Commercial Banks' credit distribution to the personal consumption sector on economic growth of Sri Lanka

Model Specification

The multiple linear regression model is used to investigate the impact of sectorial distribution of commercial banks' credit facilities on the economic growth. Here, the credit is measured through loans and advances issued by the commercial banks.

$$y_{\text{GDP}} = a + b_1 X_{\text{CBC-AS}} + b_2 X_{\text{CBC-IS}} + b_3 X_{\text{CBC-SS}} + b_4 X_{\text{CBC-PC}} + u$$

Where,

Y = Economic Growth proxied by Gross Domestic Product (GDP)

X_{CBLA-AS} = Commercial Banks' Loans and Advances to the Agriculture Sector

X_{CBLA-IS} = Commercial Banks' Loans and Advances to the Industry Sector

X_{CBLA-SS} = Commercial Banks' Loans and Advances to the Service Sector

X_{CBLA-PC} = Commercial Banks' Loans and Advances to the Personnel Consumption Sector

a = Constant

u = error term

DATA ANALYSIS AND DISCUSSION

The data analysis and discussion is conducted in four stages. First, descriptive statistics including normality tests, unit root tests, and other diagnostic tests such as heteroscedasticity, and serial auto-correlation tests were performed to test on the regression assumptions. Then, a multiple regression analysis is performed to test the general impact of sectorial distribution of commercial banks' credit on the economic growth. Third, short term relationships are measured to investigate the short run causal relationships between dependent and independent variables. Finally, Johansen-Juselius Cointegration test is performed to investigate the long-run relationships.

Descriptive Statistics and Normality of Data

According to the results indicated in Table 1, the mean of industry sector credit is comparatively higher than the other real sectors and the variability also higher for this sector. The consumption lending is higher than the agriculture sector. This reveals that the banking sector has given less priority to the agriculture sector credit facilities. Next, the Skewness of the data measures the symmetric of the data. The study sample data has normal univariate distribution since Kurtosis values are ranged between -1.96 and +1.96 for all variables as emphasized by George and Mallery (2010).

Table 1: Descriptive Statistics: GDP, Agriculture, Industry, Service, and Consumption

Variable	Mean	StDev	CoefVar	Minimum	Maximum	Skewness	Kurtosis
GDP	1582556	817951	51.69	493754	3261838	0.56	-0.77
Agriculture	181663	129001	71.01	20020	366114	-0.08	-1.76
Industry	685524	443431	64.68	228401	1793056	1.23	0.50
Service	451062	346619	76.85	115770	1321427	1.32	0.76
Consumption	436811	276272	63.25	89175	931969	0.31	-1.40

Stationary of Data

Next, the unit root of the variables are tested to have a same order of integration for all the variables. The Augmented Dicky-fuller Test (ADF) is performed in testing such stationary status of the time series data and the findings are indicated in Table 2.

Table 2: The Augmented Dicky-fuller Test (ADF) results

Variable	p-Value	Order of Integration
GDP	0.001	1 st Difference
AGDRICULTURE	0.000	1 st Difference
INDUSTRY	0.000	1 st Difference
SERVICE	0.000	1 st Difference
CONSUMPTION	0.001	1 st Difference

The findings of the ADF tests revealed that all the variables are in stationary status only in the 1st difference since all of the variables are showing there is no unit root (p-value is lesser than 0.01) only in the same order (1st difference) of integration. Hence, 1st order variables are used for the analysis.

Moreover, the Breusch-Pagan test is performed to test the heteroscedasticity of the variables. The results indicated that the residuals are homoscedastic since the p-value of the Breusch-Pagan test was higher than 0.05. Next, Breusch-Godfrey serial correlation test is performed to test the serial correlation of the residuals and the findings revealed that there is no serial correlation since the p-value of the test was lesser than 0.05. Hence, the findings of the diagnostic tests revealed that a multiple regression model is suitable for the analysis since there is no violations in the regression assumptions.

The General Impact of Sectorial Distribution of Commercial Banks' Credit on the Economic Growth

A multiple regression model is performed to measure the impact of sectorial distribution of commercial banks' credit on the gross domestic product (economic growth). The results are presented in Table 3.

Table 3: Results of the Regression Analysis

Predictor	Coef.	St	Coef	t-value	p-value
Constant	-3.566	5.5876		-0.06	0.949
Agriculture	0.1546	0.5273		0.29	0.771
Industry	3.7715	0.4279		8.81	0.000
Service	-3.5908	0.567		-6.33	0.000
Consumption	1.3558	0.3509		3.86	0.000
R ²	0.791				
Adjusted R ²	0.780				

The model summary indicated that 78% of the economic growth (GDP) variation could be explained through the model. Hence it is possible to divulge that there are other exogenous variables which explain the economic growth of the country. Moreover, the p-values of the independent variables suggest that industry, service, and consumption are significant in explaining the economic growth. The respective coefficient values suggest that credit distribution of the service sector are inversely related with the gross domestic product. Further, credit distribution of the industry and consumption sectors are positively related with the Sri Lankan GDP. The impact of credit distribution of the industry sector is higher than the consumption sector.

The regression analysis illustrates that agriculture sector distribution of commercial banks' credit is insignificant in explaining the economic growth in Sri Lanka at 95% significant level since p value ($p=0.771$) is higher than 0.05. Accordance with this study findings, Uzomba et al. (2014) found that the agriculture sector credit facilities has no impact on economic growth in Nigeria during 2002-2014 periods due to farmers high default rates, adverse weather conditions, unpredictable exposures and less infrastructure facilities. Waheed (2009) stated the economy of Pakistan is not facilitated via agriculture industry and it should be improved by the financial support to prosper the economy to achieve the sustainable development of the country. The problems of Sri Lankan agriculture sector are lack of land fragmentation, poor water management, storage facilities, and poor marketing opportunities (Wimalaratana, 2011). These are the major obstacles which freezing the agricultural productivity. Thus, it is possible to argue that credit facilities became meaningless due to the other obstacles arising within the industry which require further investigation for a confirmation.

According to the results of the regression analysis, sectorial distribution of Commercial Banks' credit of service sector has a significant ($\beta = -3.5908$, $p = 0.000$) negative effect on the economic growth. Accordance with this findings, Triplett and Bosworth (2004) stated that service sector does not directly or quickly contribute to the economic growth and it takes high cost and long time to render a sustainable contribution to an economy. The service industry consist of Transport, Communication and Information, Technology, Printing and Publishing, Education, Health, Shipping, Aviation and Freight Forwarding (Ministry of Finance, 2016). The transportation service sector is experiencing a crisis situation for a longer period due to high operational cost. Moreover, most of the road constructions and transport facilities were heightened in Western province (Ministry of Finance, 2016). The state banks' credit facilities continuously injected into the marine and aviation services but it is continuously making losses to the country (CBSL, 2017). As a whole, the service industry made an adverse condition in Sri Lankan context due to high costs of start-up and maintenance and fixed employment cost.

The industry and consumption sector distribution of Commercial Banks' credit has a significant positive impact on economic growth of Sri Lanka according to the regression analysis. Moreover, the industry sector showed the highest positive impact on the economic growth. Accordance with this study findings, Chinweoke et al. (2015) emphasized that industry sector credit facilities by the commercial bank contribute significantly on the economic growth. Moreover, Waheed (2009) revealed that the banking sector lending for the industry sector in Pakistan highly illuminated the manufacturing sector. The present study agrees with this results.

Long Run Analysis

The Johansen-Juselius Co-integration test is used to investigate the long term relationship between dependent and independent variables. The results of the unit root tests revealed that all the variables are stationary in the 1st difference. Hence, it is possible to proceed with the Co-integration test. The first step of the analysis involves deciding the lag length of the co-integration analysis. The optimal lag length is selected based on five criterion as indicated in Table 4; log likelihood, Schwarz criteria (SC), Akaike information criteria (AIC), final prediction error criteria (FPE), and Hannan-Quinn information criterion (HQ). The results of the sequential modified LR test suggested to proceed with maximum of two lags.

Table 4: Optimum lag length for VAR

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2785.243	NA	2.53e+45	118.7338	118.9306*	118.8078
1	-2744.226	71.56268	1.29e+45	118.0522	119.2331	118.4966
2	-2704.694	60.55967*	7.21e+44*	117.4338*	119.5988	118.2485*
3	-2680.241	32.25722	8.13e+44	117.4571	120.6062	118.6421
4	-2659.393	23.06592	1.18e+45	117.6337	121.7670	119.1891

* indicates lag order selected by the criterion

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

Optimum lag length is the time period which takes to react on GDP from sector credit distribution in respective industries. As an example, commercial bank credit distribution to the service industry will impact to the economic growth in Sri Lanka after two quarters. The immediate reaction cannot be expected from the economic growth due to credit distribution to the each industry need time to utilize the monetary resources to the investment and performance of the industry.

Johansen Co-Integration test determines the long term equilibrium relationship between variables. The Result of Trace Test and Maximum Eigen Test shown in Table 5 and 6.

Table 5 :Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.660387	101.2744	69.81889	0.0000
At most 1 *	0.472411	49.43688	47.85613	0.0352
At most 2	0.201598	18.74386	29.79707	0.5114
At most 3	0.109251	7.936988	15.49471	0.4722
At most 4	0.048448	2.383719	3.841466	0.1226

Table 6: Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.660387	51.83756	33.87687	0.0001
At most 1 *	0.472411	30.69303	27.58434	0.0193
At most 2	0.201598	10.80687	21.13162	0.6666
At most 3	0.109251	5.553269	14.26460	0.6710
At most 4	0.048448	2.383719	3.841466	0.1226

Table 6 shows the results of co-integration tests for the model including the trace test and the max-eigenvalue test at the 5% significance level. The results indicated that the max-eigenvalue tests and trace tests support two co-integrating vector at the 5% significance level. Thus, the variables of this study has long run relationship. Equation 4.1 presents these findings indicating that all variables are statistically significant in explaining long run relationships between GDP and independent variables of this study.

$$\begin{array}{rcccl}
 \text{GDP} & = & 0.542082 & - 1.1526 & + 0.988 & + 0.0357 \\
 & & \text{Agriculture} & \text{Industry} & \text{Service} & \text{Consumption} \\
 & & (0.40404) & (0.25303) & (0.28195) & (0.19255)
 \end{array}$$

Moreover, the results imply that there are significant positive long run relationships between GDP and credit distribution to agriculture, service and consumption sectors' mean while there is a significant negative long run relationship between GDP and industry sector.

Short Run Analysis

The short term relationships between dependent and independent variables are tested employing Granger Causality tests, impulse response analysis, and forecast error variance decomposition tests. The results of the granger causality tests are indicate din the Table 7.

Table 7 : Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
DAGRICULTURE does not Granger Cause DGDP	49	3.26489	0.0476
DGDP does not Granger Cause DAGRICULTURE		1.24584	0.2976
DINDUSTRY does not Granger Cause DGDP	49	1.30111	0.2825
DGDP does not Granger Cause DINDUSTRY		0.28035	0.7569
DSERVICE does not Granger Cause DGDP	49	0.83660	0.4400
DGDP does not Granger Cause DSERVICE		1.39468	0.2587
DCONSUMPTION does not Granger Cause DGDP	49	0.58363	0.5621
DGDP does not Granger Cause DCONSUMPTION		1.35518	0.2685

According to the results of the Granger Causality tests, credit distribution to the agriculture industry shows one way causality (unidirectional causality) on the gross domestic product (GDP). The credit distribution to the industry, service and consumption sectors do not show any granger cause with the economic growth.

Impulse Response Function Analysis

Impulse response functions track the response of a variable over time after a shock to the vector auto regression system. Figure 2 shows the impulse function analysis of the variables.

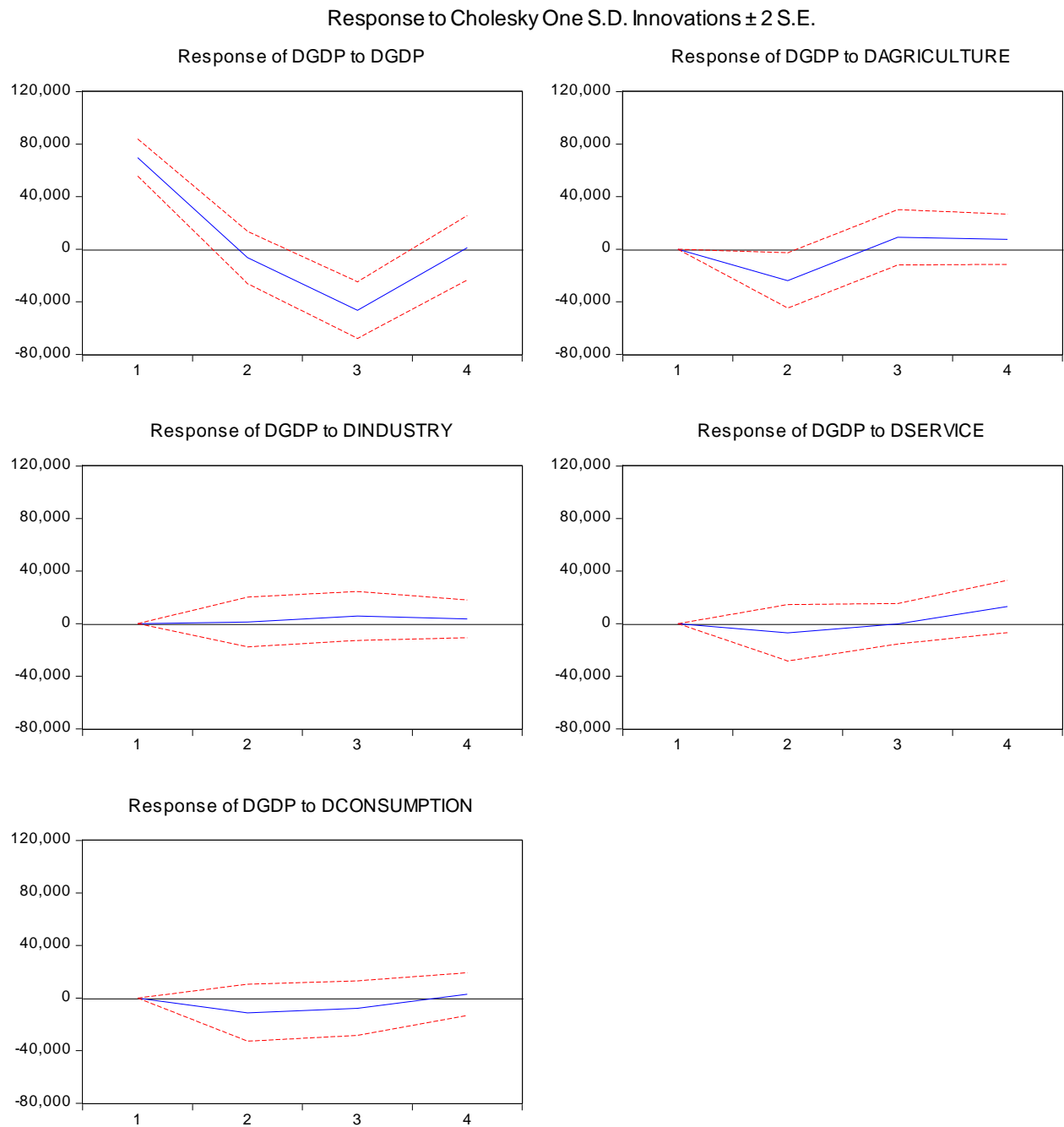


Figure 2: Impulse Response Functions

Figure 2 displays the estimated impulse response functions with 95% confidence bands represented by dotted lines. Here, all panels show the response of GDP to a transitory shock associated with each industry representative variable in the VAR system. The Impulse Response Function analysis indicated that there is no statistically significant short run relationship between GDP and all industry credit facilities except agriculture sector confirming the findings of the Granger Causality tests.

Forecast Error Variance Decompositions (FEVD)

Period	S.E.	DAGRICULTU			DCONSUMPT	
		DGDP	RE	DINDUSTRY	DSERVICE	ION
1	69780.83	100.0000	0.000000	0.000000	0.000000	0.000000
2	75195.49	86.82796	10.07607	0.026576	0.858855	2.210533
3	89350.50	88.46599	8.172696	0.442441	0.608523	2.310351
4	90738.42	85.79603	8.625056	0.584208	2.652333	2.342368

The results ensured that the GDP over four quarter period using the same identification restrictions that were used for the impulse response function(IRF) analysis. The magnitude of the contribution of the variables in the system change dramatically over four quarters which implies that agriculture sector has higher effect than other sectors on the economic growth in the short run. This findings confirm the results obtained in the IRF and Granger causality tests.

SUMMARY AND CONCLUSION

The purpose of this study is to investigate the impact of sectorial distribution of commercial banks' credit on economic growth of Sri Lanka. A quantitative study is carried out in achieving the objectives of the study. Based on the findings of the study, it is possible to conclude that sectorial credit distribution of industry, service, and consumption sectors are significant in explaining the economic growth of Sri Lanka. Moreover, the impact of credit distribution of service sector is inversely related with the economic growth. Further, credit distribution to the industry and consumption sectors are positively related with the Sri Lankan economic growth. The impact of credit distribution of the industry sector is higher than the consumption sector.

The short run analysis implied that credit distribution to the agriculture sector shows a short term relationship with the economic growth and it is confirmed by Granger Causality tests, IRF and FEVD analysis. The credit distribution to the industry, service, and consumption sectors are not significant in explaining the economic growth in the short run.

The long run analysis implied that there are significant positive long run relationships between economic growth and credit distribution to the agriculture, service and consumption sectors' mean whereas industry sector showing an inverse relationship with the economic growth of Sri Lanka.

IMPLICATIONS AND FUTURE DIRECTIONS

This study has implications for bankers, policy makers, government, and future researchers. The bankers could develop their lending policies according to the impact of the credit distribution of respective industries on the economic growth. For instance, they could assign high weightage for the credit distribution of industry and consumption sectors since it has the highest positive impact on the economic growth.

The policy makers and government can develop policies and strategies in accordance with the findings of this study. For instance, if they need to have an economic growth in a short run, they should develop strategies to distribute more credit facilities to the agriculture sector. If the requirement is long run economic growth, they should more focus on distributing credit facilities to the agriculture, service and consumption sectors while pushing minimized effort for the industry sector.

There are multiple implications for future researchers. First, the findings revealed that there is an inverse relationship between credit distribution to the service sector and economic growth. Hence, there is a room for a further investigation on the factors affecting such inverse relationship. Moreover, credit distribution to the agriculture sector was not significant in explaining the economic growth of Sri Lanka. Hence, the future researchers can investigate the reasons for such insignificance and make suggestions to improve the same. Further, this study is conducted using commercial banks as the sample. The future researchers can focus all the financial institutions for a more generalized and comprehensive picture about the research puzzle.

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