ST. MARRY'S UNIVERSITY

THE EFFECT OF COMMERCIAL BANKS CREDIT ON SECTORAL OUTPUT GROWTH IN ETHIOPIA

A Thesis Submitted to St. Mary's University, School of Graduate Studies in Partial Fulfillment of the Requirements for the Degree of MBA Accounting and Finance

By:

Senayt Alemseged

Advisor: Abreham G/Giorgis (Ass. Prof)

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By:
SENAYIT ALEMSEGED

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SENAYIT ALEMSEGED

APPROVED BY BOARD OF EXAMINERS

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Dean graduate studies signature

Abraham G 

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Advisor signature

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External examiner signature

---------- Simon T. (Ass. Prof.) ---------- 

Internal examiner signature

DECLARATION

I, the undersigned, declare that this thesis is my original work; prepared under the guidance of Associate Professor Abreham G/Giorgis All sources of materials used for this thesis have been dually acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of any degree.

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Name Signature
St. Mary‟s University Addis Ababa
June, 2020

ENDORSEMENT

This thesis has been submitted to St. Mary's University, School of graduate studies for examination with my approval as a university advisor.

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Advisor
Signature
St. Mary's University Addis Ababa,
June, 2020

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ACRONYMS

ADF: Augmented Dickey-Fuller

CSA: Central Statistical Agency

ECM: Error Correction Model

GDP: Gross Domestic Product

GTP-I: Growth and Transformation Plan One

GTP-II: Growth and Transformation Plan Two

MoF: Ministry of Finance

NBE: National Bank of Ethiopia

PASDEP: Plan for Accelerated and Sustained Development to End Poverty

Table of Contents

CHAPTER ONE 1

1. INTRODUCTION 1

1.1 Background of the Study 1

1.2 Statement of the Problem 2

1.3 Research Questions 4

1.4 Objective of the Study 4

1.6 Significance of the Study 5

1.7 Scope of the Study 7

1.8 Limitation of the study 7

1.9 Organization of the Paper 7

CHAPTER TWO 8

2. LITERATURE REVIEW 8

2.1 Theoretical Literatures 8

2.1.1 Financial Development and Economic Growth 8

2.2 Banking Sector Development in Ethiopia 9

2.3 Financial Development and Sectoral Output 10

2.4 Empirical Literature 12

2.5 Summary of Literatures 17

2.6 Hypotheses development 18

2.7 Conceptual Model of the Research 20

CHAPTER THREE 21

3. RESEARCH METHODOLOGY 21

3.1 Research Design 21

3.1 Research Approach 21

3.3 Types and Source of Data 22

3.3 Model Specification 22

3.4 Model Diagnostics Test 24

3.4.1 Test of normality 24

3.4.2 Multicollinearity 25

3.4.3 Autocorrelation 25

3.4.4 Model Adequacy 26

3.4.5 Heteroskedasticity 26

3.5 Unit Root (Stationarity) Test 27

3.6. Co-integration Test 27
CHAPTER FOUR 28
4. RESULTS AND DISCUSSIONS 28
4.1 Summary of Descriptive Statistics 28
4.2 Regression Results 30
4.2.1 Stationary Test Result 30
4.2.2 Multicollinearity Test Result 31
4.2.5 Model Diagnostics Test for Long Run Regression Model 33
4.2.6 Cointegration Test Result 34
4.2.3 Long Run Model Estimation 35
4.2.7 Error Correction Model (ECM) 39
CHAPTER FIVE 43
5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION 43
5.1 Summary of Findings 43
5.2 Conclusion 44
5.2 Recommendation 44
REFERENCES 46
Appendix A 48

Table and Figures

Table 4. 1: ADF unit root test results 23
Table 4. 2: Multicollinarity Test Result 24
Table 4. 3: Diagnostic Test Result-Long Run Regression 25
Table 4. 4: Engle-Granger Cointegration Test Result 26
Table 4. 5: Estimated Long Run Regression Result-Agriculture Sector Model 27
Table 4. 6: Estimated Long Run Regression Result-Industry Sector Model 28
Table 4. 7: Estimated Long Run Regression Result-Service Sector Model 29
Table 4. 8: Estimated Error Correction Model (ECM)-Agriculture Sector 31
Table 4. 9: Estimated Error Correction Model (ECM)-Industry Sector 31
Table 4. 10: Estimated Error Correction Model (ECM)-Service Sector 32
Table 4. 11: Short Run Regression (Error Correction Model) Diagnostic Test Result 33

Figure 1: Economy growth development by sectors 20
Figure 2: Commercial banks disbursement development by sectors 21
Figure 3: Government expenditure development by sectors 22

Abstract

This study examined how commercial banks credit affects sectoral output growth in Ethiopia employing annual time series data of 39 years (1981-2019). Each sectors output are modelled as a function of bank credit, government expenditure and labour force as major explanatory factors along with other controlling variables like inflation. The findings confirmed that there is a long run relationship among sectorial output growth, bank credit, government expenditure and other exogenous variables considered as potential determination of sectorial output growth. Bank credit had statistically significant positive effects on agriculture, industry and service output in Ethiopia. This could be attributed to the good performance of banking sector by chaneling funds from those with surplus funds to those with shortages through deposit mobilizing. Though, the effect of bank credit in all sectors is positive and significant, the magnitude effect of the bank loans granted to agriculture sector is lower than industry and service. Hence, the banking sector provides smaller amount of loans for agriculture sector. The finding in the error correction model revealed that the long run disequilibrium in the agriculture, industry and service models is adjusted per year on average by about 35 %, 35 % and 69 %, respectively. This suggests that there will be an adjustment to restore the long run equilibrium relationship between output level and the combined explanatory variables. Finally, the government as well as banking sector should struggle to ensure that there are available and sufficient credit allocated to agriculture, industry and service sector as there is huge market demand for their product outputs and to achieving the desired objective in sectorial output growth and the government should give special attention and implement mechanisms for agriculture sector in order to increase the availability of credit.

Key Words: Commercial Bank Credit, Sectorial Output, Long Run Model, Error Correction Model

CHAPTER ONE

1. INTRODUCTION

In this section the researcher discussed related with background of the study, statement of the problem, research questions, objective of the study, significance of the study, scope of the study limitation and organization of the study.

1.1 Background of the Study

One of the main objectives of financial institutions is mobilizing resources (in particular domestic saving) and channelling them to the would-be investors. This intermediation role of financial institutions takes different forms in different economic systems. Development of the financial sector is vital for economic growth and transformation through mobilizing saving, exerting control, allocating resources and improving innovation. Limited access to finance reduces welfare and hinders the alleviation of poverty and the emergence of a vibrant middle class (Mohieldin et al, 2019). Furthermore, Levine (2005) suggests that financial institutions such as banks and insurance companies and financial markets including stock markets, bond markets, and derivative markets exert a powerful influence on economic development, poverty alleviation, and economic stability.

The vital role of commercial bank credit in generating growth within an economy has been widely acknowledged. For instance, Schumpeter (1932) established that banking sector facilitate technological innovation through their intermediary role. His emphasis was that efficient allocation of savings through identification and funding of entrepreneur with best chances of successfully implementing innovative product and production are tools to achieve real economic performance.

In Ethiopia, the financial sector, and in particular banking sector is the main source of credit to key economic sectors of the economy in order to holds great potential and promote sectorial economic growth. Since mid-2000s Ethiopia strong economic performance has helped the banking sector remaining relatively sound. At the end of June, 2019 total outstanding credit of the banking system (including to the central government) increased by 24 percent and reached Birr 556.6 billion. Commercial banks and Development Bank of Ethiopia (DBE) disbursed Birr 164.5 billion in fresh loans which was 42.5 percent higher than that of a year ago. Of the total new loans, about 60.8 percent was provided by private banks and 39.2 percent by the two state-owned banks. Nearly 25.3 percent of the loans went to finance industry sector followed by domestic trade (20 percent), international trade (16.8 percent), other sectors (10.5 percent), housing and construction (11.9 percent), and agriculture (10.9 percent). The remaining balance went to other economic sectors (NBE, 2019).

Since the financial sector in particular banking sector is the main source of credit to key economic sectors of the economy in Ethiopia, identifying the role of commercial banks credit at industry level is very essential. Therefore, this paper aims to examine the role of commercial banks credit on sectoral output using separate models for each sector specifically Agriculture, Industry and Service with time series data analysis for the period that span from 1981 to 2018.

1.2 Statement of the Problem

Lack of access to credit is a crucial problem in developing countries like Ethiopia; but, the issue is not only providing loan rather better to check the impact of each loan on sectorial development. That is why dealing on the credit and its impact on the sectorial development is very necessary.

Assessing the role of financial development on economic growth has been grown rapidly. Nzomoi (2012) investigates the impact of access to bank credit on the economic performance of key economic sectors using sectoral panel data for Kenya. He found a positive and significant impact of credit on sectoral gross domestic product measured as real value added. However, the magnitude of the impact is smaller once factors such as the labour employed and past economic performance of the sectors are taken into account. Policies aimed at financial sector deepening and increasing access to credit are of essence to enhancing economic performance.

Mohammed et al. (2013) investigated the impact of commercial bank credit accessibility and sectoral output performance in Nigerian economy for the period which spanned between 1986 and 2010. An augmented growth model was estimated via the Ordinary Least Square (OLS) techniques to ascertain the relationship between various commercial bank credits and sectoral output growth. The study found that the various commercial bank credit supply and other included variables has a long run relationship with sectoral output performance i.e., agricultural, manufacturing and services sector output and the main demand for credit facility in Nigeria is the manufacturing sector. The study also reveals that commercial bank credit has direct and insignificant impact on sectoral output performance but cumulative supply and demand for credit in the previous period has direct and significant impact on the growth of agriculture, manufacturing and the services sectors output.

Though, there are several studies conducted in Ethiopia related with the role of commercial banks credit and overall economic growth, there is scarceness in the empirical studies that examine the influence of bank credit on economic performance or growth at sectorial level.

The study conducted by Abdi (2017) entitled with effects of sectorial allocation of commercial bank credit on Ethiopian economic growth using time series data for the period that span from 1980 to 2015. The paper assesses how the bank credit allocation to these sectors contributes to growth by using real GDP as a dependent variable and credit to sectors as independent variables. As the result, the paper only tries to examine the contribution of sectoral credit availability on the overall economic growth. There is no separate model for each sector of the economy and does not assess the effect of commercial banks credit on sectoral output with independent model.

Therefore, this study intends to fill the gap by examining the commercial banks credit effects on sectoral output growth using separate models for each sector specifically Agriculture, Industry and Service with time series data analysis for the period that span from 1981 to 2019.

1.3 Research Questions

Based on the above gap identified, the study critically investigates the following research questions regarding the link between commercial banks credit allocation and sect oral economic growth in Ethiopia.

1. How does commercial banks credit have an impact on the Agriculture sector output in Ethiopia?
2. How does commercial banks credit have an impact on the Industry sector output in Ethiopia?
3. How does commercial banks credit have an impact on the Service sector output in Ethiopia?

1.4 Objective of the Study

The aim of this study is to examine the commercial banks of credit on sectoral output performance including agriculture, industry and service.

1.5 The specific objectives are;

- To investigate the commercial banks credit impact on agriculture output growth.
- To examine the effect of commercial banks credit on industry output growth.
- To examine to what extent commercial banks credit has impact on service output growth.

1.6 Significance of the Study

Understanding the main drivers of sustainable growth of a nation is important for finding sound solutions to business cycles, for the identification of the most appropriate public policies and for the enforcement of regulations and institutions. As the result, this study result of conducted by the researcher will have immense benefit for the stakeholders who are interested regarding credit provision, management and its impact on sectorial development in the country considering GDP as a principal point to be considered. The availability of credit has its own impact for the development of real GDP in the economy. The credit system that is followed by commercial banks may vary from state to state as well as from bank to bank. It is already known that the credit provision systems followed by commercial banks are highly dependent on the paying capacity of the borrower. Additionally the borrower must use the loan for the stated purpose for the development of different sectors in the country. The result of the study will be used by the policy makers to design a new policy and/or modify the existing policy of commercial banks by observing the impact of the credit facility on the sectoral development.

This research was examining the impact of credit on sectoral development and also identified the determinant factors affecting credit provision as well as the association of loan disbursement on sectorial development. Additionally, the result shows the basic impact of loan on sectorial development and it will provide to the result of credit on the sector.

By investigating the contributing factors for the development of the sector and the credit, the result will contribute for the policy makers to see and if needed to revise the existing housing policy. This study provide more information to the commercial banks that is responsible to facilitate the formulation of operational plans and strategies based on the existing realities in order to facilitate supplying of credit to meet the needs of the majority investments in the country.

This study will add to the body of knowledge on the effect of credit on sectorial development in Ethiopian commercial banks, which will be beneficial to prospective commercial banks, policy makers, academicians, learning institution instructors and other stakeholders. It also provides a basis for further research on the effect of credit on sectorial development by considering services, industry and agriculture. Thus, contributes to the literature on determinants of housing affordability.

This research will add insight by outlining the government's critical role in developing policies that regulate and promote the appropriate distribution of the credit volume for the important sector of the economy such as service agriculture and industry sectors.

The result of the study can be used as a basis and a reference for other researchers who are undertaking a study on the banking sector. Additionally, this research will add on the existing body of knowledge on the sectorial development of the state using the credit accessed from commercial banks.

Lastly, the study will have significance in being additive to the body of knowledge in trying to establish the relationship of commercial banks credit and sectoral output performance. It may also the study would benefits stockholders such as researcher, policy makers and a professional using the research as guide for future research.

1.7 Scope of the Study

The roles of commercial banks are several. Among those activities collecting deposit from the households and provide credit for business firms in the economy in order to boost investment. Therefore, the work of this research is delimited to the role of commercial banks credit specifically on the sectoral output performance of agriculture, service and industry for the period of 1981 to 2019 using time series analysis.

1.8 Limitation of the study

Though there are different activities under the main sector categories of agriculture, service and industry, this study is limited only the broad sector of the economy in aggregate level (agriculture, service and industry). It does not cover all the disaggregated category level or sub sector of the economy.

1.9 Organization of the Paper

The rest section of the study is organized into four chapters. The second chapter consists of literature review, theoretical literature. While the third chapter contained research methodology which includes introduction, research design and approach, source of data, model specification model diagnostics tests and method of data analysis. The fourth chapter focused on result and discussion such as summary of descriptive analysis, regression results, long run model estimation and error correction model estimation. Finally, the fifth chapter concentrated on conclusion and recommendations.

CHAPTER TWO

2. LITERATURE *REVIEW*

2.1 Theoretical Literatures

2.1.1 Financial Development and Economic Growth

For long period of time, both theoretical and empirical analysis argued that financial sector development comprises an important mechanism for long run economic growth through effective mobilization of domestic savings for productive investment, thereby alleviation of poverty especially for developing nations.

Financial development is considered as one of the important inputs needed for economic growth and development. This is because the financial sector development determines the level of domestic saving distributed towards productive investments in which efficient resources mobilization and credit expansion raise the level of investment thereby capital accumulation in a given economy. The capacity of financial sector of the economy to provide capital for investment is an essential determinant of economic growth and transformation. As result, inancial development is linked to economic growth due to having various functions, includes financial intermediation, reduction of transaction costs, and the possibility for diversification. The overall functions of financial institution come up with an improved accumulation of capital, efficient allocation of economic resources and improvement in technological capability which are crucial ingredients for economic growth (Levine , 2004).

Sustainability of economic development was previously linked by various economic schools of thought to natural resources (agriculture, land, minerals, metals etc.), labor force (including skills, productivity, and education), entrepreneurship or technology and innovation. Capital was later introduced by classical economic theory as the key element. Without significant capital accumulation, all other production factors remain idle. The value added of the production process is a result of the existence, the accessibility and the cost of capital. Therefore, the development and the sophistication of the financial sector has gradually become very important for any nation interested in sustainable growth (Bakar and Sulong, 2018).

There are three potential causality relations that have been explored in the literature linking the financial sector to economic growth. On the one hand, there is the supply side perspective (also named "supply leading response") which argues that the development of the financial sector is a condition for economic growth. Without access to certain financial services and some specific functions that a "liberalized" financial sector under a framework of correct institutions performs, the real economy will not be able to significantly take off. On the other hand, the demand side perspective (also named "demand following response") considers that without a real economic sector that demands certain types of financial goods and services, there could be no development in the financial sector. The third approach, sometimes called "the feed-back hypothesis", is that there is no strong or stable causality relation between the two processes (Paun et al. 2019).

2.2 Banking Sector Development in Ethiopia

Financial sector has its own history in Ethiopia. For instance, during the Derg regime, the government nationalized all large corporations. After the downfall of this regime, there is a new change in the whole economy and it also a significant change on financial sectors in Ethiopia.

Among this changes the National Bank of Ethiopia (NBE), is vested the powers and duties to license, supervise and regulate financial institutions by proclamation No. 84 of 1994. However, the proclamation does not allow foreigners to own and operate banks in Ethiopia, there are no foreign banks operating in the country.

As a result of this, the number of banks operating in Ethiopia becomes 18 of which 16 were private and 2 state owned. Currently, banks opened 807 new branches thereby raising the total number of branches to 5564 from 4757 a year earlier. Consequently, one bank branch serves about 17 thousand people. Meanwhile, the total capital of the banking industry increased by 18.4 percent and reached Birr 101.5 billion by the end of June 2019, of which public banks accounted for 55.8 percent and private banks 44percent. Total resources mobilized by the banking system in the form of deposit, borrowing and loan collection reached Birr 308.3 billion at the end of 2018/19 (NBE, 2019).

Though there are some other institutions such as savings and credit cooperative societies, finance companies and micro finance institutions that provide credit, a significant portion of credit in Ethiopia is extended through the banking system. According to National Bank of Ethiopia (NBE, 2019), the total outstanding borrowing at the end of the fiscal year 2018/19 was Birr 72.2 billion. Of the total new loans, about 60.8 percent was provided by private banks and 39.2 percent by the two state owned banks. In terms of sectoral allocations the highest proportion of credit as a percentage of bank credit went to industry sector followed by domestic trade, international trade, other sectors, housing and construction, and agriculture.

2.3 Financial Development and Sectoral Output

Finance development and sectoral growth comprises financial services for agriculture, industry and service production, processing, and marketing; this includes short, medium, and long-term loans, leasing, savings and payment services. The expansion of banking system and availability of credit, are more important and have a larger impact on sectoral output through expanding productivity. Bank expansion was greatly aided by government road investments and reduced transaction costs for banks and borowers (Khandker and Rosenzweig 1993). For financial institutions, agriculture is a sector that pays poorly because it has long protected by the State, this has resulted in substantial unpaid deletions debt resulting in a deterioration of attitudes in relation to credit. For the side of farmers, financial institutions are often seen as a rapacious industry applying prohibitive interest rates. In the new approach, all financial institutions are engaged in market logic. They must achieve financial autonomy and provide resources for their development. It is therefore logical that move towards the most profitable and most secure areas, and in so doing, they do show great caution in financing agriculture (Dhrifi, 2014).

Muftau(2003), on the other hand, defines agricultural credit granted to farm and ranch operators to assists in planting and harvesting crops to support the feeding and care of livestock. Credit to agricultural sector could take the form of an overdraft, short-term, medium-term or long-term depending on the purpose and gestation period of the project. Such credits granted to farmers to purchase inputs are paid directly to the suppliers who must furnish the bank with evidence of delivery.

Regardless industry and service sector, Macknnon and Shaw (1973), recognizing the importance of capital such as bank credit in industry and service sector growth and outlined the procedure for strengthening the financial sector of an economy so as to enable it play the all-important role of providing capital for industrial and serice sector development. Among the basic expansions for this is that the financial sector serves to reallocate funds from the supply side, given their investment opportunities, to the demand side with a shortage of funds, thus, an economy with well-developed financial institutions will be better able to allocate resources to industries that yield the highest returns.

2.4 Empirical Literature

There are several studies have been conducted to find out the relationship between financial development and economic growth. Some resulted that financial development has a positive relationship with economic growth, but also negative from other studies.

One of the most influential studies on the subject is King and Levine (1993), which shows a strong positive link between financial development and economic growth in a multivariate setting. They also show that financial development has predictive power for future growth and interpret this finding as evidence for a causal relationship that run from financial development to economic growth.

The study by Levine (1997) shows that financial development can reduce the cost of acquiring information about firms and managers, and lowers the cost of conducting transactions. By providing more accurate information about production technologies and exerting corporate control, financial sector development can enhance resource allocation and accelerate economic improving the liquidity of financial assets, and reducing trading costs, financial development can encourage investment in high-return activities.

Sanusi and Salleh (2007) examined the relationship between financial development and economic growth in Malaysia covering the period 1960-2002. Three measures of financial development were used, namely, ratio of broad money to GDP, credit provided by the banking system, and deposit money banks to GDP. By employing the autoregressive distributed lag approach, the study found that, ratio of broad money to GDP, and credit provided by the banking system have positive and statistically significant impact on economic growth in the long-run. Adu *et al.* (2013) conducted a study on financial development and economic growth in Ghana by using eight indicators to proxy for financial development and their result of financial development and its growth effect is sensitive to the choice of proxy used due to the high correlation among the indicators. It was also substantiated from this study that the relationship of private sector credit to GDP ratio positively affect financial development and the relationship of broad money supply to GDP ratio negatively affect financial development on economic growth for five developing countries using the time series data beginning from1989 to 2010.They also found the result that trade openness, financial development and foreign investments affect economic growth.

Mhadhbi (2014) examined the empirical relationship between financial development and economic growth during 1973-2012 using the Generalized Method of Moments dynamic panel. The data cover the regressions according to the maximum of 110 countries and it includes developing and developed countries. The results indicate availability of the banking system has a significant and positive impact on economic growth. Contrary to that extent the credits granted by the financial system to the private sector, even if significant, has a negative influence on growth. Finally, the measure that reflects the financial deepening of the economy seems to depend positively on economic growth for developing countries and negatively for developed country.

Rehman *et al.* (2015) showed the linkage between the financial development and the economic growth in Bahrain covering the time series data from 1981 to 2013.They tried to find relationship among financial development, savings and the economic growth in the short run and long run using tri-variate casualty model. They selected Vector Autoregressive Model which identified the significant relationship between economic growth and savings but Johansen co-integration analysis failed to determine the long-term relationship among financial development, savings and economic growth. The study also reveals bi-directional causality between economic growth and savings at 10 percent significance level according to Granger test.

Mayow (2014) investigated the effect of commercial banks‟ credit on SMEs development in the country during 1992-2011 and the paper adopted Ordinary Least Square OLS) technique to estimate the multiple regression model. The estimated model concluded that commercial banks‟ credit to SMEs, savings and time deposit of commercial banks, exchange rate and interest rate are major long-run determinants of SMEs development in Nigeria, specifically, banks‟ credit to SMEs and the savings and time deposit of commercial banks exhibit direct relationship with SMEs growth.

Joseph C. and Daniel M. (2013) examined the impact of bank credit on agricultural output in South Africa using the Cobb-Douglas production function for the time span of 1970 – 2009. They used OLS estimates of the Cobb-Douglas production function and found that bank credit and capital accumulation has a positive and significant impact on agricultural output.

Kelly (2013) examined the issue of the steady-state relationship between private sector credit and GDP in the case of Ireland. The paper found that, while restricting credit to grow in line with deposits would have resulted in a lower level of GDP proceeding the boom period, the level of GDP post the onset of the crisis in late 2008 and early 2009 would have been higher than what actually prevailed.

Joseph and Nelson (2012) investigated the impact of access to bank credit on the economic performance of key economic sectors using sectoral panel data for Kenya. They found a positive and significant impact of credit on sectoral gross domestic product measured as real value added. However, the magnitude of the impact is smaller once factors such as the labour employed and past economic performance of the sectors are taken into account. Policies aimed at financial sector deepening and increasing access to credit are of essence to enhancing economic performance.

In Malaysia, Ang (2007) examined the relationship between financial development and aggregate output during the period 1960-2003 using the recently developed ARDL bounds procedure. The results show that, aggregate output and its determinants are co integrated in the long-run. The results suggest that financial development, private capital stocks and the labor force exert a positive impact on economic development whereas the accumulation of public capital appears to curtail output expansion in the long-run.

Eddien & Ananzeh (2016) examined the relationship between bank credit and economic growth in Jordan at different sectors for the period that span from 1993 to 2014.

They employ two different methodologies Vector Error Correction Model (VECM) and Granger Causality Test. The results report for a long run relationship could be inferred between Real GDP, and its explanatory variables of total bank credit; bank credit for agriculture sector; bank credit for industry sector; bank credit for construction sector; bank credit for tourism sector. They suggest that all the explanatory are in the long term relationship with the development of Jordanian economy. Granger causality test conclude for a causal relationship going from economic growth to bank credit at agriculture and construction sectors in Jordan economy. Also the results report bidirectional causality observed among economic development and bank credit to construction sector that is the most important sectors in the economy.

Sreeram *et al.* (2012) tried to examine the long-run impact of bank credit on economic growth in Ethiopia using Johansen co integration approach for the period 1971/72-2010/11. They found apositive and statistically significant equilibrium relationship between bank credit and economic growth in Ethiopia through its role in efficient allocation of resources and domestic capital accumulation. Moreover, the effect of control variables such as human capital, domestic capital, and openness to trade on growth are found to be positive and statistically significant while inflation and government spending have statistically significant and negative impact on economic growth in the long-run.

The study conducted by Abdi (2017) entitled with effects of sectorial allocation of commercial bank credit on Ethiopian economic growth using time series data for the period that span from 1980 to 2015. The paper assesses how the bank credit allocation to these sectors contributes to growth by using real GDP as a dependent variable and credit to sectors as independent variables. As the result, the paper only tries to examine the contribution of sectoral credit availability on the overall economic growth. There is no separate model for each sector of the economy and does not assess the effect of commercial banks credit on sectoral output with independent model.

On another hand, Murty et al. (2012) investigated the long-run impact of bank credit on economic growth in Ethiopia via a multivariate Johansen co-integration approach using time series data for the period 1971/72-2010/11. Their focus of the investigation was transmission mechanism through which bank credit to the private sector affects economic growth and found that a positive and statistically significant equilibrium relationship between bank credit and economic growth in Ethiopia. Moreover, they also come up with results that deposit liabilities affect long-run economic growth positively and significantly through banks services of resource mobilization. Basically, their findings show that bank credit to the private sector affects economic growth through its role in the efficient allocation of resources. Finally, Tekilu et al., (2018) investigate the linkage between financial development and sectoral output growth with special emphasis on Agriculture, industry and service sectors in Ethiopia during the period from 1975 to 2016. The study has used Autoregressive Distributive lag (ARDL) bound testing approach via an augmented growth model to examine the linkage between the financial development, proxy by bank credit to sectors, and sectoral output growth. Furthermore, Vector Error Correction Model (VECM) was employed to investigate the direction of causality between financial development and sectoral output growth. The results of bound test confirmed that the long run relationship between explanatory variables and sector output growth with less co integration of agricultural output growth and respective independent variables. The empirical results of this study showed, that in the long run financial development had a less significant positive impact on agricultural and service sector output growth but, short run relationship was found to be insignificant. However, financial development has a positive and significant impact on industrial and aggregate output growth both in the short run and long run.

2.5 Summary of Literatures

To sum up the empirical literatures view, financial sector attracts deposits and provide loans from surplus to deficit side. The overall impact of financial sector in economy is to ensure sustainable growth. It helps to mobilize savings and direct funds into production sectors. As results, it facilitates efficient allocation of resources and increases overall productivity. Furthermore, most of the literatures found that financial development had a positive impact on the sectoral output growth. This all result suggests, financial development is important for sustainable economic growth. As the result, the research hypothesis were derived based on the above literatures.

2.6 Hypotheses development

The review of the above studies gives the insights for framing the hypothesis that fianancial development effect on economic growth specifically sectoral growth.

Hypothesis 1:

The credit has been disbursed directly and indirectly for augmenting and facilitating agriculture and allied activities.

Under direct credit disbursement schemes, farmers are provided with credit facilities for purchasing farm machinery and transport vehicles/accessories, purchasing and implementation of machinery pertaining to irrigation, purchasing machinery for harvesting and activities relating to harvesting, and purchasing seeds and fertilizers and other cropping activities. Further, under indirect finance financial support is provided to purchase or rent land, for agriculture purpose and for payment of transportation of agriculture produce. Ultimately, the direct and indirect financing facilities for agriculture and allied activities are aimed to improve the agricultural output.

Thus, in the first hypothesis pertaining to the agricultural output, it is hypothesized that credit disbursement along with other variables has a positive effect on agricultural output (Dhrifi, 2014).

Hypothesis 1: As credit disbursement increases in the agricultural sector, its output will also increase.

***Hypothesis 2*:**

With respect to the industrial sector, it is hypothesized that credit disbursement has a positive effect on industrial output in terms of meeting the working capital need and augmenting the capital stock of industrial sector. Credit disbursement for the industrial sector covers industrial activities like mining and quarrying, manufacturing, electricity, gas, water supply, and construction (Macknnon and Shaw (1973). Thus, the second hypothesis derived as follow:

Hypothesis 2: As the credit disbursement increases in the industrial sector, the industrial output will also increase.

Hypothesis 3:

For the services sector, it is hypothesized that the credit disbursement has a positive effect on the service sector output by the way of initiating the service sector activities and meeting the ongoing expenses. In the case of small- and medium-level enterprises, banking credit is perhaps the major source of finance. The credit facilities for the service activities include the wholesale and retail trade, repair of motor vehicles and personal/household goods, hotels and restaurants, transport storage and communication, financial intermediation, real estate, renting and business activities, education, healthcare, social work and personal service activities. The credit facility to service sector affects the output of this sector by accelerating the above-mentioned activities (Macknnon and Shaw (1973). Therefore, the third hypothesis can be stated as follow:

Hypothesis 3: An increase in credit disbursement increases the output of the services sector.

2.7 Conceptual Model of the Research

For the intention of this research, the research consider as several studies to construct the conceptual model. The proposed research model includes three separate sectoral models for agriculture, service and industry. The conceptual model is depicted as follow:

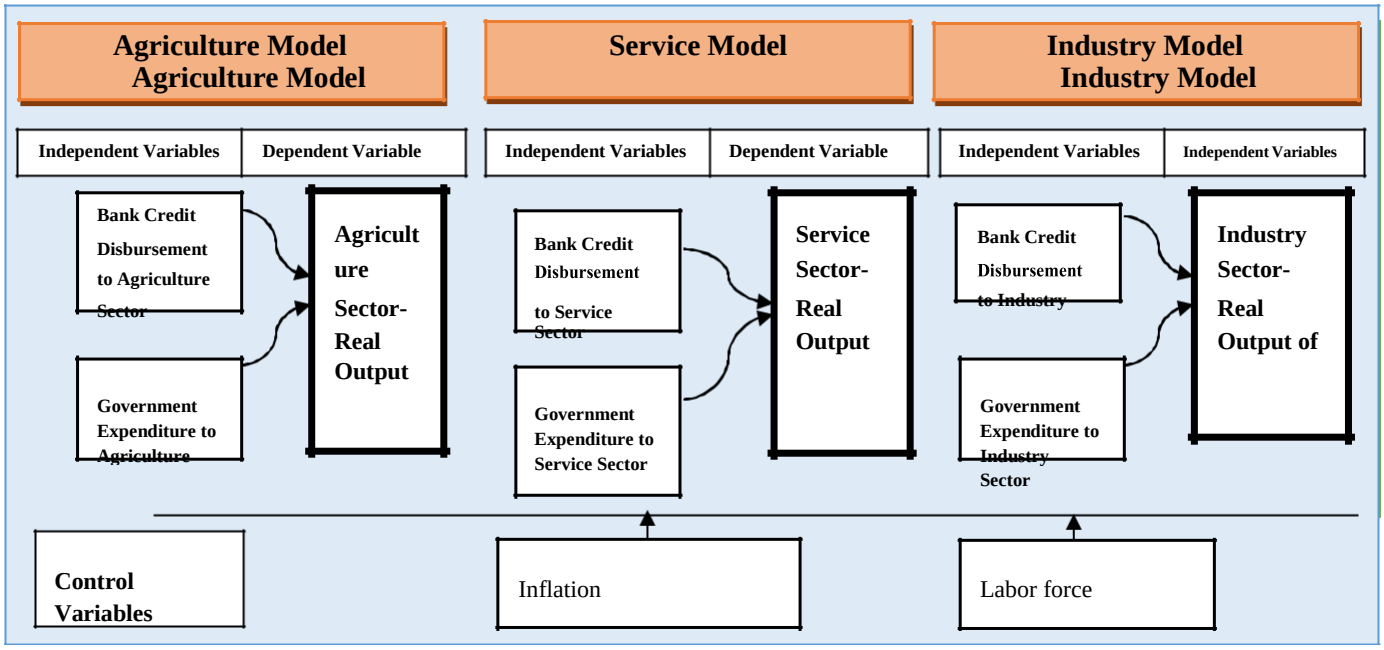


Figure 1: Conceptual Model

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Research Design

As it is indicated in different literatures research designs are procedures for collecting, analyzing, interpreting and reporting data in research studies. Rigorous research designs are important in undertaking a study because they guide the methods and decisions that researchers must make during the study and set the logic by which interpretations are made at the end of the study (Creswell and Clark, 2007).

The means for the success of any study is confined with its research design (Bordens & Abbott, 2011). For Kothari (2004), research design is "the conceptual structure within which the research is conducted". Most recently, as it is described by Creswell (2014) a research design as "… a type of inquiry within the selected research approach…that provides specific direction for the procedures in the research". Besides, research designs offer directions how to rigorously conduct studies to best meet the research objectives and questions as well as the hypothesis developed (Creswell, et al., 2007). An appropriate research design gives appropriate framework to accomplish the researcher smoothly the diverse research moves (Kothari, 2004). Based on the aforementioned factors the research design used in the proposed study is the explanatory research design because it investigate the relationship between variables and by considering the specific objectives stated and the nature of the data demanded by the research.

3.2 Research Approach

The study employed a quantitative research approach in order to investigate the effect of the explanatory variables on each dependent variable. According to Burns and Grove (1993), quantitative analysis is the most appropriate research approach one to use if the purpose of an investigation is to describe the degree of relationship which exists between the variables.

Besides, it also helps in examining and describing the interactions among those variables. Since, this thesis entitled examination the effect of commercial banks credit on sectoral output growth demands quantitative data analysis. This indicates that the research was used a quantitative research approach.

3.3 Types and Source of Data

In order to achieve the stated objectives; collecting different time series data from different organizations is very important. In this research the researcher collected variables such as credit disbursement to to agriculture sector (AGRC), credit disbursement to service sector (SRVC) and credit disbursement to industry sector (INDC), government expenditure (GE), Money supply (MS), Inflation (INF) and lobor force (number of student enrollment in the secondary school, lf) as an explanatory variables.

The sources of data for this research gathered from National Bank of Ethiopia, ministry of Finance (MoF) and Central Statistical Agency (CSA).The time coverage of the study was from 1981 up to 2019. In order to smooth the data, in this paper all the variables are log transformed.

3.4 Method of Data Analysis

After the data processing the researcher made a detail analysis. The detail analysis is done to meet the every specific objective the researcher. Generally the researcher was used explanatory approach using trend analysis and regression analysis. In this paper the analysis was done using EViews-9 software. All the necessary descriptive statistics, multiple regression models including correlation analysis and different tests are done.

3.5 Model Specification

In order to investigate the effect of banking credit for sectoral output growth, the researcher employed both the long run and error correction model. This approach is selected because of that can explore the linear relationship between dependent and independent variables in the long run as well as in the short run. Thus, specified long run model is stated as follow:

Model for Agriculture sector:

$$AGRO_t = \beta_0 + \beta_1 AGRC_t + \beta_2 AGRE_t + \beta_3 MS + \beta_4 LF + \beta_5 INF + \varepsilon_t \text{ .....} \quad \text{..(1)}$$

Model for Service sector:

$$SRVO_t = \beta_0 + \beta_1 SRVC_t + \beta_2 SRVE_t + \beta_3 MS + \beta_4 H + \beta_5 INF + \varepsilon_t \text{ .....} \quad (2)$$

Model for Industry sector:

$$INDO_t = \beta_0 + \beta_1 INDC_t + \beta_2 INDC_t + \beta_3 MS_t + \beta_4 LF_t + \beta_5 INF_t + \varepsilon_t \text{ .....} \quad \text{..(3)}$$

Where,

AGRO, SRVO and *INDO* are Real output of Agriculture, Service and Industry, respectively, at time t,

AGRC, SRVC and *INDC* are Bank credit disbursement to Agriculture, Service and Industry, respectively, at time t,

AGRE, SRVE and *INDE* are government expediture to Agriculture, Service and Industry, respectively, at time t,

MS_t = Money supply at time t,

INF =Inflation at time t,

LF_t =Labor force (proxied by number of student enrollment in the secondary school) at time t

$_0$ = constant for each banks,

$_{1,2,\ 3,\ldots\ 8}$cofficients of the regressors,

ε_{it} = within entity error

To sum up the explanatory and dependent variables of the model are described in the below table.

Table1: Variable Description

Model	Dependent Variable	Explanatory Variable	Expected Signs
Model I: Agriculture	Real output of Agriculture (AGRO)	Bank credit disbursement to Agriculture(AGRC) Government expenditure to Agriculture (AGRE)	(+) (+)
Model II: Service Model	Real output of Service (SRVO)	Bank credit disbursement to Service (SRVC) Government expenditure to Service (SRVE)	(+) (+)
Model III: Industry Model	Real output of Industry (INDO)	Bank credit disbursement to Industry (INDC) Government expenditure to Industry (INDE)	(+) (+)
Control Variables for All Models		Inflation (INF) Money supply (MS) Labor force (LF)	(-) (+) (+)

3.3 Model Diagnostics Test

3.3.1 Test of normality

In factor analysis there are several assumptions that must be met before analysis has been carried out. The first procedure in factor analysis is a test of normality (linearity) of the data. Parametric tests, say regression analysis assumes a Gaussian (normality) distribution of the continuous data. The researcher the researcher will use normality curve. The hypothesis for normality test is given by:

H_0: The series is normally distributed

H_1: The series in not normally distributed

Therefore, if the p-value is greater than chosen significance level (1%, 5% or 10%), we do not reject the null hypothesis and we can to say that the series is normally distributed.

3.3.2 Multicollinearity

When choosing a predictor variable you should select one that might be correlated with the criterion variable, but that is not strongly correlated with the other predictor variables. The term multicollinearity is used to describe the situation when a high correlation is detected between two or more predictor variables. The predictor variables model has experienced the problem of multicollinearity when the correlation matrix of any independent variables that correlates above some level with one another. Some scholars say, correlation coefficient ($r > \pm 0.75$) and some other says ($r \geq \pm$ 0 .80) may induce problematic collinearity. This implied, if one or more correlation coefficients are close to 1 or -1, the variables are highly correlated and a severe multicollinearity problem may exist; remove one of the correlated independent variables in the model. Such high correlations cause problems when trying to draw inferences about the relative contribution of each predictor variable to the success of the model. In general, if there is the problem of collinearity in the predictor variables, the researcher is advised to remove the independent variables which have a highest correlation coefficient in the model. In case when two or more independent variables have a high correlation coefficient, remove the variables which have higher P-value in the estimated model.

3.3.3 Autocorrelation

Another important tool used to diagnose OLS estimation model fit the data well is the absence of autocorrelation in the datasets. Autocorrelation occurs when the residuals are not independent from each other. Autocorrelation in multiple linear regression models was tested using Durbin-Watson test. Durbin-Watson's tests the null hypothesis that the residuals are not linearly auto-correlated. While can assume values between 0 and 4. As a rule of thumb values of $1.5 < d < 2.5$ show that there is no auto-correlation in the multiple linear regression data. Autocorrelation occurs when the residuals are not independent from each other and seriously affects the result of estimation. In dataset whether autocorrelation present or not was tested using Durbin-Watson test. The hypotheis for autocorrelation test is given by:

H_0: There is no autocorrelation

H_1: There is autocorrelation

Thus, if the p-value is greater than chosen significance level (1%, 5% or 10%), we do not reject the null hypothesis and we can to say that there is no autocorrelation.

3.3.4 Model Adequacy

Model adequacy is a situation of checking by how much the model fitted describes the collected data. In the OLS estimation method, R-square (R2) and Adjusted R-square (2) are commonly used techniques to check the fitness of the model (Wooldridge, 2002).R-square is the measure of the „Goodness-of-fit" of the fitted regression model and is calculated by the ratio of the explained to the total variation. It describes how much of the variation in the dependent variable is explained by the included factors or explanatory variables in the model. In social science low R-square in regression is common, especially for cross-sectional analysis (Wooldridge, 2002). In this case, F-statistics in the model estimation shows that $P<0.01$. This means that the independent variables are significantly predicts the dependent variables in the estimated model.F-test shows that whether the explanatory variable jointly explains the dependant variable or not. It also tests the overall significant of the estimated parameters. The hypothesis for the overall F-test is given by:

H_0: All variable are zero jointly and simultaneously
H_1: All variable are different from zero jointly and simultaneously

Therefore, if the p-value is lower than chosen significance level (1%, 5% or 10%), we reject the null hypothesis and we can to say that all the variables are different from zero jointly and simultaneously and the model is appropriate.

3.3.5 Heteroskedasticity

The last assumption in the linear regression analysis is homoscedasticity test (error terms along the regression analysis are equal). As the Heteroskedasticity Test- Breusch-Pagan-Godfrey test is used in Eviews.

H_0: Residual has constant variance (Homoskedasticity)

H_1: Residual has no constant variance (Heteroskedasticity)

Based on the above hypothesis, if the p-value is greater than chosen significance level (1%, 5% or 10%), then heteroskedasticity is not a problem for the model.

3.4 Unit Root (Stationarity) Test

The assumptions of the classical regression model necessitate that the variables sequence be stationary that have zero mean and finite variance. If the variables in the regression model are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. In other words, the usual "t-ratios" will not follow a t-distribution, so we cannot validly undertake hypothesis tests about the regression parameters so the regression will be spurious regression. Therefore, this paper will need to test for the presence of units roots in order to avoid the problem of spurious regression. This paper will apply the Augmented Dickey-Fuller (ADF) test to check the order of integration i.e. to test whether the variable are stationary or not.

3.6. Co-integration Test

The presence of co-integration means two things. First, "if two variable are found to be co-integrated, the possibility of no causation is ruled out and there must be at least one way of causations of either uni-directional or bidirectional" Mash and Mashi (1994, p36). Second, the variable have long term relationships in that they will not deviate arbitrarily from each other and that their deviation from long run equilibrium path are corrected. On the basis of the ADF test of unit roots the Engle-Granger method is used to test for the presence of a co-integration between the variables.

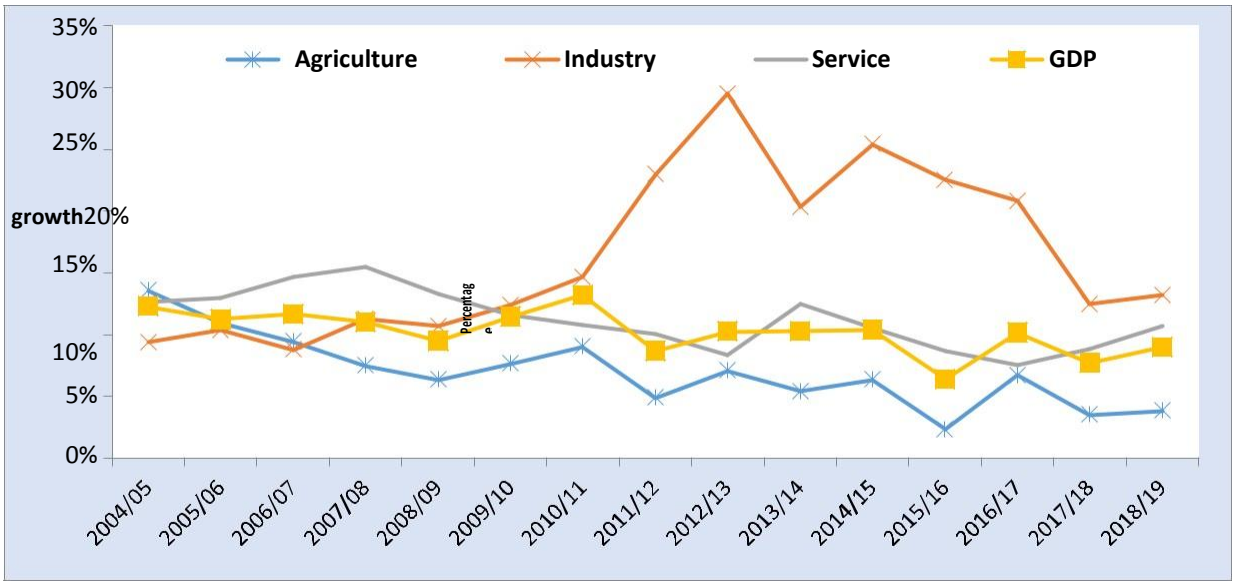
CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1 Summary of Descriptive Statistics

The descriptive statistics overview the general development of the data set and used in order to get insight into the trend of bank's credit disbursement in Ethiopia and for those variables incorporated in this study over a period of time. For the purpose of medium term analysis and understand the recent development appropriately, the researcher used the recent medium term sample period of 2004/5 - 2018/19 in this descriptive analysis. As the result, the performance of bank credit disbursement, government expenditure and sectoral output since 2004/5 up to 2018/19 in terms of its growth rate and percentage share is presented below.

Figure 1: Economy growth development by sectors

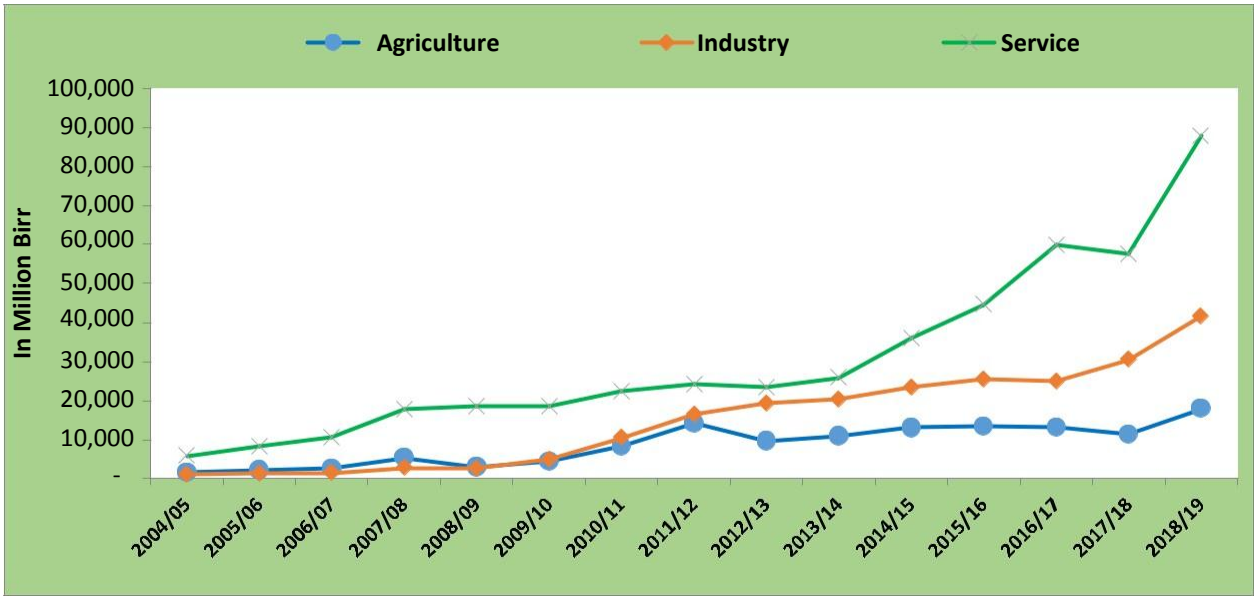


Sources: MoFEC

As shown in the above figure, related to the growth rate, during the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) period (2004/5-2008/9), the average growth rate of service, industry and agriculture was 9.6 %, 10.1 % and 13.8 %, respectively. The total real GDP growth rate during this period was on average 11.1 %.

Meanwhile, during the GTP-I period (2009/10-2013/14), the average growth rate of agriculture, industry and service was 6.8%, 20.0 and 10.7 %, respectively. The total real GDP growth rate for the period of GTP-I was on average 10.8 %. Similarly, in the period of GTP-II (2014/15-2018/19), the average growth rate of agriculture, industry and service was 4.5%, 18.9 and 9.2 %, respectively. The total real GDP growth rate was on average 8.7 % (Figure 1).

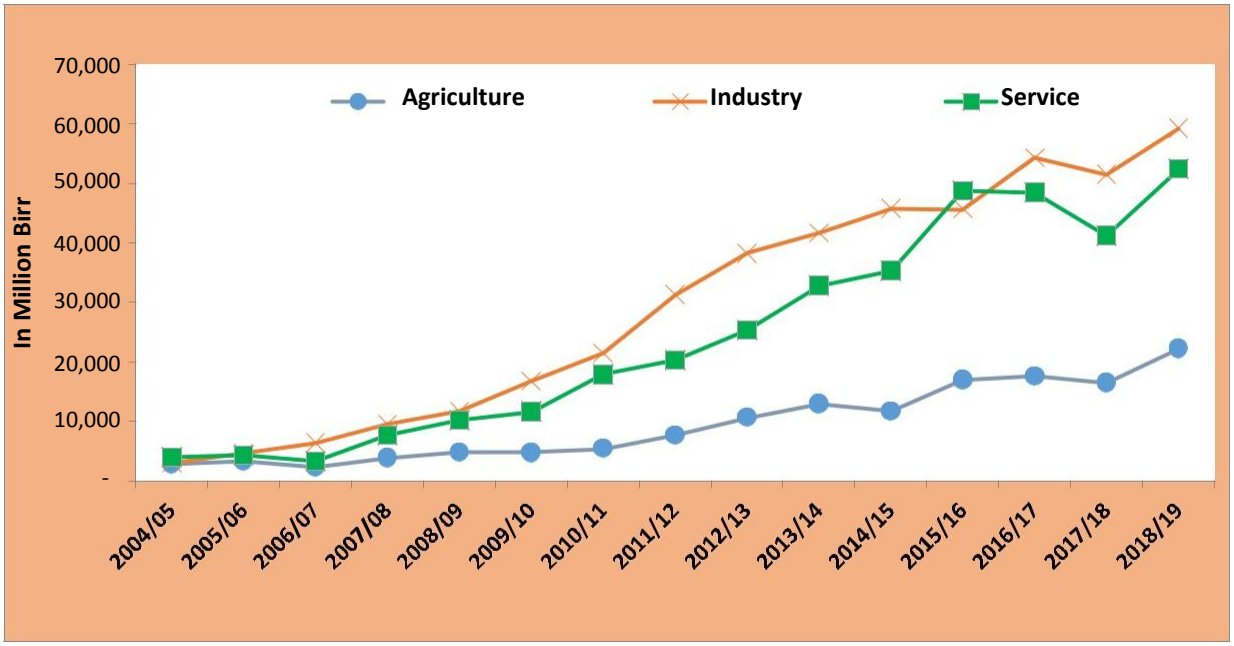
Figure 2: Commercial banks disbursement development by sectors



Sources: NBE

During the last 15 years, all sectors have remarkably increased in absolute basis. The total bank credit disbursed amount to the agriculture, industry and service was just Birr 1.5 billion, Birr 1 billion and Birr 5.8 billion in 2004/5, respectively, which has increased to Birr 17.9 billion, Birr 41.5 billion and Birr 87.7 billion in 2018/19. Though, the credit disbursement shows a growth for all sectors, the share of disbursement for service is higher followed by industry and agriculture (Figure 2).

Figure 3: Government expenditure development by sectors



Sources: MoFEC

Likewise, throughout the sample period, government expenditure has remarkably increased on absolute basis. Government expenditure for agriculture, industry and service was about Birr 2.9 billion, Birr 3 billion and Birr 3.9 billion in 2004/5, which has increased to Birr 22.2 billion, Birr 52.9 billion and Birr 52.4 billion in 2018/19. As a share of total expenditure, industry sector took the lion share followed by service and agriculture (Figure 3).

4.2 Regression Results

4.2.1 Stationary Test Result

Using non stationary time series data in empirical analysis may lead to a high likelihood of spurious regression results for which no inference can be made since the standard statistical test are invalid. As a result, the conventional regression model necessitates that all the time series variables to be included in a regression model should be stationary and the disturbance term is assumed to have zero mean and constant variance. Therefore, the standard unit root test of Augmented Dickey Fuller (ADF) is used to determine the order of the integration of the variables considered in this empirical analysis. The null hypothesis of stationary test is

that the time series of a variable has unit root against the alternative of no unit root. The result of ADF unite root test are presented below in Table 4.1.

Table 4. 1: ADF unit root test results

Variables	At Level		At first difference		Order of Integration
	ADF Stat	Prob.	ADF Stat	Prob.	
AGRO	0.527007	0.9855	-6.141535	0.0000	I(1)
AGRC	-0.501577	0.8799	-7.152121	0.0000	I(1)
AGRE	-1.838505	0.3569	-8.879364	0.0000	I(1)
INDO	4.115445	1.0000	-3.433393	0.0160	I(1)
INDC	1.284762	0.9981	-5.133943	0.0002	I(1)
INDE	-0.951355	0.7605	-4.912237	0.0003	I(1)
SRVO	1.923479	0.9997	-4.236268	0.0020	I(1)
SRVC	-0.022446	0.9504	-4.190937	0.0022	I(1)
SRVE	-1.010144	-1.010144	-7.581437	0.0000	I(1)
Ms	-0.266976	0.9205	-6.812912	0.0000	I(1)
Inf	-5.610494	0.0000	-	-	I(0)
Lf	-0.529690	0.8741	-5.049747	0.0002	I(1)

Source: Own computation using Eviews-9

As we can observed from the stationairy test result, all the time series variables incorporated in this study except inflation accept the null hypothesis no stationary in level data of the variables. This implies that the series are not consistent in distribution pattern and not randomly distributed. However, after first differencing, all 11 time series variables found in rejecting the null hypothesis of no stationary at first difference data and hence, they are integrated of order one I(1) (Table 4.1).

4.2.2 Multicollinearity Test Result

Multicollinearity means that one of the independent variables is not really necessary to the model because its effect/impact on the model is already captured by some of the other variables. This variable is not contributing anything extra to the predictions and can be removed. In this research, the researcher therefore tests the multicollinearity problem among

independent variables. If the r is high in absolute value, then the variables are quite correlated and multicollinearity is a potential problem. The researchers are concern about multicollinearity, when the correlation coefficient exceeds 0.80 (Studenmund, 2016).

Table 4. 2: Multicollinarity Test Result

Correlation Coefficient Agriculture Sector Model

	AGRO	AGRE	AGRC01	LF	INF	MS
AGRO	1.000000					
AGRE	0.512636	1.000000				
AGRC0	0.945321	0.407961	1.000000			
LF	0.979133	0.450754	0.630727	1.000000		
INF	-0.135507	-0.389437	0.040826	-0.065132	1.000000	-0.165270
MS	0.943203	0.569786	**0.842122**	0.509571	-0.165270	1.000000

Correlation Coefficient Industry Sector Model

	INDO	INDE	INDC	INF	LF	MS
INDO	1.000000					
INDE	0.750206	1.000000				
INDC	0.964543	0.669601	1.000000			
INF	-0.213598	-0.106428	-0.258266	1.000000		
LF	0.923758	0.696107	0.679098	-0.065132	1.000000	
MS	0.969056	0.764297	**0.961090**	-0.165270	0.509571	1.000000

Correlation Coefficient Industry Sector Model

	SRVO	SRVE	SRVC	INF	LF	MS
SRVO	1.000000					
SRVE	0.956900	1.000000				
SRVC	0.934474	0.656507	1.000000			
INF	0.354802	0.383814	0.241197	1.000000		
LF	0.794253	0.674584	0.633995	0.108762	1.000000	
MS	0.964516	0.620498	**0.926749**	0.311423	0.576795	1.000000

Source: Eviews-9

The result of multicollinarity presented in Table 4.2 shows that the correlation values the control variable money supply (ms) and bank credit for each sectors have a correlation values greater than 0.8. This suggests that there is a mulicollinarity problem because the money supply variables are highly linearly related to bank credit variables for each sectors model. This implies that the effect/impact on each sector output is already captured by bank credit. Bank credit can be explaining the development of money supply. Therefore, money supply variable is not contributing anything extra to the predictions and can be removed.

4.2.5 Model Diagnostics Test for Long Run Regression Model

For the long run regression model, all the necessary model diagnostics are conducted. In this research the overall significances of the regression coefficients (F-test), constant variance (heteroskedasticity test), normality test and autocorrelation (Durbin Watson test) are presented in Table 4.3.

Table 4. 3: Diagnostic Test Result-Long Run Regression

Diagnostic Test	**Agriculture Sector Model**	**Industry Sector Model**	**Service Sector Model**
F-test-	Prob>F=0.0000	Prob>F=0.0000	Prob>F=0.0000
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.4954	0.5893	.9401
Normality test (Jarque-Bera)	0.9163	0.1461	0.35350
Durbin-Watson d-statistic(5, 37)	1.908688	1.852485	1.846137

Source: Own computation using Eviews-9

F-test shows that whether the explanatory variable jointly explains the dependant variable or not. It also tests the overall significant of the estimated parameters. Based on the above Table 4.3 result, P value of F-test for all sectors are less than (0.05) or 5% significance level. This implies that we reject the null hypothesis and accept the alternative hypothesis i.e. all the variable are different from zero and it has a significant impact on the dependent variable.

On the other hand, to check whether the residual has constant variance or not, heteroskedasticity test was conducted. The result of diagnostic test reported in Table 4.3 indicates that the regression of the residuals on predicted values reveals for heteroskedasticity test of *P* values of all sectors model are greater than 5% significance level and confirmed that there is no heteroskedasticity or the residual has constant variance. Similarly, the test of normality test result reveals that, the p-values for all sectors model are greater than 5% (0.05) level of significance which confirmed that the error term is normally distributed and the model is appropriate one.

Furthermore, in order to test the autocorrelation between residuals, a Durbin-Watson statistics has been applied. Based on the result presented in Table 4.3, Durbin-Watson d-statistics values for all sector models are between 1.8and to 2 this indicating that the null hypothesis is not rejected. This confirmed that there is no autocorrelation problem and the model is adequate.

4.2.6 Cointegration Test Result

When testing for cointegration, trying to establish a long-run relationship between two or more variables, such that there is a long-run or cointegrating vector which defines a relationship that tends to hold over time and to which the variables revert. An obvious candidate is to look at the residuals obtained from the long run cointegrating equation. In particular, if the residuals are stationary, then the underlying relationship is cointegrated. Engle and Granger (1987) suggests to testcointegration, the residuals from the long-run model are tested for stationarity using an ADF test. As the result, further attempt was made whether the set of variables are co-integrated or have long-run relationship using unit root test conducted on level data of the residual series generated from the estimated long run regression. The result of Engle-Granger cointegration test is reported below in Table 4.4.

Table 4. 4: Engle-Granger Cointegration Test Result

Model	Residual	ADF Test Prob.	Order of Integration
Agriculture Sector Model	$agr\_ect_t = agro_t - (\beta_0 + \beta_1 agre_t + \beta_2 agrc + \beta_3 lf_t + \beta_4 \inf_t)$	0.0375	I(0)
Industry Sector Model	$ind\_ect_t = indo_t - (\beta_0 + \beta_1 inde_t + \beta_2 indc_t + \beta_3 lf_t + \beta_4 \inf_t)$	0.0352	I(0)
Service Sector Model	$srv\_ect_t = srvo_t - (\beta_0 + \beta_1 srve_t + \beta_2 srvc_t + \beta_3 lf_t + \beta_4 \inf_t)$	0.0280	I(0)

Source: Own computation using Eviews-9

The result of Engle-Granger cointegration test statistics reject the hypothesis of no co-integration and confirmed the existence of cointegration or long-run relationship among the variables at 5 % level of significance for all sectoral models (Table 4.4). This implies that, there is a long run relationship between the dependent variable sectoral output growth and explanatory variables bank credit, government expenditure, labor force and inflation.

4.2.3 Long Run Model Estimation

After established the time series stochastic and consistent process and solving multicollinarity problem, the long-run model specified in section three is estimated and the result is presented. The long run coefficients of the co-integration regression measure the impact of the independent variables on the dependent variable. As the result, the adjusted R-square values of 0.96, 0.97 and 0.98 for agriculture, industry and service sector output show higher explanatory powers of the explanatory variables and 96 %, 97 % and 98 % of the variation in the dependent variable can be explained by variation in the independent variables. And it also reveals that all the models are good and appropriately explain (Table 4.5 to Table 4.7).

Table 4. 5: Estimated Long Run Regression Result-Agriculture Sector Model

Dependent variable-Agriculture output (AGRO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRE	0.150129	0.055324	2.713645	0.0147
AGRC	0.214688	0.042542	5.046556	0.0001
LF	0.154875	0.058430	2.650596	0.0168
INF	-0.001914	0.001668	-1.147334	0.2671
C	8.393610	0.588135	14.27157	0.0000

R-squared	0.969109	Mean dependent var	12.69091
Adjusted R-squared	0.961841	S.D. dependent var	0.431949
S.E. of regression	0.084379	Akaike info criterion	-1.910284
Sum squared resid	0.121036	Schwarz criterion	-1.662320
Log likelihood	26.01312	Hannan-Quinn criter.	-1.851871
F-statistic	133.3307	Durbin-Watson stat	1.908688
Prob(F-statistic)	0.000000		

Source: Eviews-9

The long run regression model result for agriculture, suggests that except inflation variable bank credit, labour force and government expenditure are statistically significant at 1 and 5 % significance level, respectively. Based on this model result, holding other variables constant, a one per cent increase in bank credit, government expenditure and labor force will lead to an average 0.21, 0.15 and 0.15 percentage increases in agriculture sector output growth, respectively (Table 4.5).

The positive effect of bank credit on agriculture sector output growth confirms a prior expectation since increased the availability of bank credit will lead to greater availability of investment fund, which will lead to greater productivity and then higher output in the sector. Statistically significant positive effect of bank credit on agriculture sector output growth in Ethiopia could be attributed to the good performance of banking sector by channeling funds from those with surplus funds to those with shortages through deposit mobilizing.

However, the estimation coefficient values suggest that the magnitude effect of the bank loans granted to agriculture sector is lower than industry and service. Industry sector is higher beneficiary compared with others. Hence, the banking sector provides smaller amount of loans for agriculture sector. This regression finding is also supported by descriptive analysis that over the sample period large amount of bank credit was disbursed to industry and service sectors.

Furthermore, government expenditure is found to be positive effect on agriculture output growth, which implies that an increase in government expenditure in agriculture inputs is very important determinants of agriculture output growth in Ethiopia. Similarly, labor force found to be positive effect on agriculture output growth; this also reveals that a rise of labor force is an important factor to increase the productivity of the agriculture output.

Table 4. 6: Estimated Long Run Regression Result-Industry Sector Model

Dependent variable- Industry output (INDO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDE	-0.904117	0.240479	-3.759649	0.0045
INDC	0.752227	0.124547	6.039713	0.0002
LF	0.942260	0.191293	4.925730	0.0008
INF	-0.003371	0.002948	-1.143643	0.2823
C	0.719545	1.276155	0.563838	0.5866

R-squared	0.980941	Mean dependent var	11.88532
Adjusted R-squared	0.972470	S.D. dependent var	0.813315
S.E. of regression	0.134946	Akaike info criterion	-0.895425
Sum squared resid	0.163895	Schwarz criterion	-0.667190
Log likelihood	11.26797	Hannan-Quinn criter.	-0.916552
F-statistic	115.8033	Durbin-Watson stat	1.852485
Prob(F-statistic)	0.000000		

Source: Eviews-9

From the long run industry sector regression model result bank credit and labour force are positively significant at 1 % significance level. The finding reveals that, holding other variables constant, a one per cent increase in bank credit and labor force will lead to an average 0.75 and 0.94 percentage increases in industry sector output growth, respectively (Table 4.6).

The positive effect of bank credit on industry sector output growth confirms a prior expectation since increased the availability of bank credit will lead to greater availability of investment fund, which will lead to greater productivity and then higher output in the sector. Statistically significant positive effect of bank credit on industry sector output growth in Ethiopia could be attributed to the good performance of banking sector by channelling funds from those with surplus funds to those with shortages through deposit mobilizing. This result also supported by the descriptive summary result that shows the industry sector took the lion share of credit disbursement from the banking industry. Furthermore, unlike other sectors, government

expenditure is found to be negative and statistically significant. This might imply that either government spending on this sector is not directly support or the link is not sufficient.

Table 4. 7: Estimated Long Run Regression Result-Service Sector Model

Dependent variable- Service output (SRVO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INDE	0.404406	0.116536	3.470234	0.0060
SRVC	0.279967	0.140750	1.989109	0.0747
LF	0.337179	0.133713	2.521671	0.0303
INF	-0.002176	0.001260	-1.727045	0.1149
C	4.452275	0.382787	11.63122	0.0000

R-squared	0.987030	Mean dependent var	12.91579
Adjusted R-squared	0.981842	S.D. dependent var	0.458601
S.E. of regression	0.061798	Akaike info criterion	-2.468690
Sum squared resid	0.038190	Schwarz criterion	-2.232673
Log likelihood	23.51517	Hannan-Quinn criter.	-2.471204
F-statistic	190.2480	Durbin-Watson stat	1.846137
Prob(F-statistic)	0.000000		

Source: Eviews-9

The long run regression model result for service sector, suggests that government expenditure, bank credit and labour force are statistically significant. Based on this model result, holding other variables constant, a one per cent increase in bank credit, government expenditure and labor force will lead to an average 0.27, 0.40 and 0.33 percentage increases in service sector output growth, respectively.

The banking sector credit for service sector output growth is found to be positive, which implies that a rise the availability of bank credit for the productive sector such as hotel business, trade and education will lead to greater productivity and then higher output in the sector.

Furthermore, government expenditure on service sector is found to be positive, which also implies that an increase in government expenditure in service sector is very important determinants of service sector output growth in Ethiopia. Similarly, labor force found to be positive effect on service output growth, this also reveals that a labor force is an vital factor to increase the productivity of the service sector output.

This finding is also consistent with other studies such as Joseph and Nelson (2012) investigated the impact of access to bank credit on the economic performance of key economic sectors using sectoral panel data for Kenya. They found a positive and significant impact of credit on sectoral gross domestic product measured as real value added. Furthermore, Daniel (2013) examined the impact of bank credit on agricultural output, service output and industry in South Africa using the Cobb-Douglas production function for the time span of 1970 – 2009. He used OLS estimates of the Cobb-Douglas production function and found that bank credit and capital accumulation has a positive and significant impact on sectoral output. Furthermore, the finding of this study also consistent with Tekilu et al. (2018) finding showed, that in the long run financial development had a significant positive impact on agricultural, industrial and service sector output growth in the short run and long run.

4.2.7 Error Correction Model (ECM)

Once co-integration is established, the relationship between that independent and the dependent variables will be most efficient and represented by the Error Correction Model (ECM). The error correction specification model not only facilitates the analysis of the short run impacts on the dependent variable, but also suggests the speed of adjustment to long-run equilibrium (Sources). Accordingly, it is attempted to develop an appropriate short run dynamic model using by first differencing the data variables and the first lag of residual series representing the error correction term as follow:

$$\Delta agro_t = \alpha_0 + \sum_{i-1} \delta_1 \Delta agr_{t-1} + \sum_{i-1} \delta_2 \Delta agre_{t-1} + \sum_{i-1} \delta_3 \Delta agrc_{t-1} + \sum_{i-1} \delta_3 \Delta lf_{t-1}$$

$$+ \sum_{i-1} \delta_4 \Delta \inf_{t-1} + \theta agr\_ect_{t-1} + \varepsilon_{1t} \quad \text{.....} \quad (4)$$

$$\Delta indo_t = \alpha_0 + \sum_{i-1} \delta_1 \Delta indo_{t-1} + \sum_{i-1} \delta_2 \Delta inde_{t-1} + \sum_{i-1} \delta_3 \Delta indc_{t-1} + \sum_{i-1} \delta_3 \Delta lf_{t-1} +$$

$$\sum_{i-1} \delta_4 \Delta \inf_{t-1} + \theta indect_{t-1} + \varepsilon_{1t} \quad \text{.....} \quad (5)$$

$$\Delta srvo_t = \alpha_0 + \sum_{i-1} \delta_1 \Delta srvo_{t-1} + \sum_{i-1} \delta_2 \Delta srve_{t-1} + \sum_{i-1} \delta_3 \Delta srvc_{t-1} + \sum_{i-1} \delta_3 \Delta lf_{t-1} +$$

$$\sum_{i-1} \delta_4 \Delta \inf_{t-1} + \theta srvect_{t-1} + \varepsilon_{1t} \quad \text{.....} \quad (6)$$

Where Δ is first difference operator and θ is coefficient of the error correction term (ect). The coefficient of error correction term θ is expected to be statistically significant with negative sign, depicting how quickly the dependent variable converges to its equilibrium trend. In attempt to develop best representative of the short run error correction models, the estimation process starts from general over parameterized statistical model that includes all the explanatory variables and then proceeds to reduce the model until the preferred model is obtained. The results of estimated ECM with diagnostic test of statistics are presented in Table 4.8, Table 4.9 and Table 4.10, for agriculture, industry and service sector, respectively.

Table 4. 8: Estimated Error Correction Model (ECM)-Agriculture Sector

Dependent variable- First Difference of Agriculture Output (DAGRO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DAGRE	0.055639	0.021968	2.532689	0.0198
DAGRC	0.060053	0.018256	3.289528	0.0037
DINF	-0.000623	0.000432	-1.443396	0.1644
DLF	0.158334	0.032414	4.884827	0.0001
C	0.040500	0.007661	5.286375	0.0000
AGRECT	-0.353569	0.095661	-3.696056	0.0014

R-squared	0.724255	Mean dependent var	0.049318
Adjusted R-squared	0.655319	S.D. dependent var	0.064189
S.E. of regression	0.037685	Akaike info criterion	-3.519918

Sum squared resid	0.028404	Schwarz criterion	-3.229588
Log likelihood	51.75894	Hannan-Quinn criter.	-3.436314
F-statistic	10.50615	Durbin-Watson stat	2.119923
Prob(F-statistic)	0.000047		

Table 4. 9: Estimated Error Correction Model (ECM)-Industry Sector

Dependent variable- First Difference of Industry Output (DINDO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINDE	-0.045859	0.101060	-0.453786	0.6549
DINDC	0.297001	0.137905	2.153666	0.0436
DINF	0.000499	0.001120	0.445287	0.6609
DLF	0.050375	0.077362	0.651161	0.5224
INDECT	-0.333415	0.128947	-2.585676	0.0177
C	0.058828	0.032504	1.809878	0.0854
DINDO(-1)	0.253750	0.169307	1.498760	0.1496

R-squared	0.367167	Mean dependent var	0.123463
Adjusted R-squared	0.177318	S.D. dependent var	0.105301
S.E. of regression	0.095510	Akaike info criterion	-1.640762
Sum squared resid	0.182442	Schwarz criterion	-1.304805
Log likelihood	29.15029	Hannan-Quinn criter.	-1.540864
F-statistic	1.933989	Durbin-Watson stat	1.868494
Prob(F-statistic)	0.124504		

Table 4. 10: Estimated Error Correction Model (ECM)-Service Sector

Dependent variable- Difference of Industry Output (DINDO)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINDE	0.235714	0.100927	2.335489	0.0522
DSRVC	0.076779	0.099938	0.768267	0.4675
DLF	0.167210	0.138071	1.211044	0.2652
DINF	-0.001431	0.001018	-1.405751	0.2026
SRVECT	-0.691876	0.328126	-2.108567	0.0729
C	0.068020	0.027914	2.436742	0.0450
DSRVC(-1)	-0.123241	0.093746	-1.314615	0.2301

R-squared	0.608448	Mean dependent var	0.102008
Adjusted R-squared	0.272833	S.D. dependent var	0.054388
S.E. of regression	0.046379	Akaike info criterion	-2.997078
Sum squared resid	0.015057	Schwarz criterion	-2.677549

Log likelihood	27.97954	Hannan-Quinn criter.	-3.026656
F-statistic	1.812932	Durbin-Watson stat	1.712600
Prob(F-statistic)	0.227068		

From the estimates of ECM result as shown in Table 4.8, Table 4.9 and Table 4.10 , the adjustment coefficients of the error correction term of -0.35, -0.33 and -0.69 in agriculture (agrect), industry (indect) and service (srvect), respectively reveal that the long run disequilibrium in the respective models is adjusted per year on average by about 35 %, 35 % and 69 % i.e. the agriculture, industry and service output level in the previous period was higher than what the long run equilibrium relationship, then there will be an adjustment to restore the long run equilibrium relationship between output level and the combined explanatory variables.

For the above short-run regression model or Error Correction Model (ECM), all the necessary model diagnostics are conducted. In this research the overall significances of the regression coefficients (F-test), constant variance (heteroskedasticity test), normality test and and autocorrelation (Durbin Watson test) are presented in Table 4.11.

Table 4. 11: Short Run Regression (Error Correction Model) Diagnostic Test Result

Diagnostic Test	**Agriculture Sector Model**	**Industry Sector Model**	**Service Sector Model**
F-test-	Prob>F=0.0000	Prob>F=0.0000	Prob>F=0.0000
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.6438	0.6262	0.8105
Normality test (Jarque-Bera)	0.1235	0.2534	0.2228
Durbin-Watson d-statistic(5, 37)	2.119923	1.868494	1.712600

Source: Own computation using Eviews-9

The short run ECM diagnostic test reveals that, there is no autocorrelation and heteroskedasticity problem. Furthermore, the F-test shows the entirevariables are different from zero and the normality test shows the error is normally distributed. This all suggests that the model is adequate (Table 4.11).

CHAPTER FIVE

5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summary of Findings

The paper attempted to empirically assess commercial bank credit and sectoral output growth in Ethiopia. Annual data 1981-2019 obtained from NBE, MoF and CSA is used in the data source. Three separate sectoral models for agriculture, industry and service. Sectors output are modelled as a function of bank credit, government expenditure and labor force as major explanatory factors along with other controlling variables like inflation A using long run regression and Error Correction Model (ECM) was applied and the empirical findings confirmed that there is a long run relationship among sectoral output growth, bank credit, government expenditure and other exogenous variables considered as potential determination of sectoral output growth.

Based on this study finding, bank credit had statistically significant positive effects on agriculture, industry and service output in Ethiopia. This could be attributed to the good performance of banking sector by channeling funds from those with surplus funds to those with shortages through deposit mobilizing. This suggesting that bank loans granted to the productive sector of the economy exhibit increased over the sample period, hence, this progress of bank loan influences a rational consumer to put that into good use, enhance private sector transactions level and investments, and reinforces the significance of private sector development within the economy. Which was subsequently accelerated the growth of the sectoral output in Ethiopia over the sample period of the study.

This regression finding is also supported by descriptive analysis that over the sample period large amount of bank credit was disbursed to industry and service sectors. Regarding government expenditure variable, it is positively significant for agriculture and service sector

output. However, it is statistically significant and negative effect for industry sector output. This might imply that either government spending on this sector is not directly support or the link is not sufficient. Furthermore, the variable inflation is not statistically significant in each model.

5.2 Conclusion

Based on this study finding, we can conclude that financial sector has said to be positive effect on sectoral output growth through their credit disbursement. This implies that financial sector promotes and is more significant on economic growth. However, the bank loans granted to agriculture sector is lower compared with industry and service sector. Industry sector followed by service sector is higher beneficiary compared with agriculture. The finding in the error correction model revealed that, the agriculture, industry and service output level in the previous period was higher than what the long run equilibrium relationship, and then there will be an adjustment to restore the long run equilibrium relationship between output level and the combined explanatory variables.

5.2 Recommendation

Based on the empirical research finding the following recommendations are forwarded:

- As the finding investigated that bank credit is found to be the driver to sectoral output growth in Ethiopia. As the result, the government as well as banking sector should struggle to ensure that there are available and sufficient credit allocated to agriculture, industry and service sector as there is huge market demand for their product outputs and to achieving the desired objective in setoral output growth.
- Though, the finding reveals that, bank credit has a positive effect in agriculture output growth, its effect is lower compared with other sectors. Thus, the government specially

the National Bank of Ethiopia should give special attention and need to have implement mechanisms in order to increase the availability of credit for agriculture sector.

- Government need to enhance spending in economic sectors like agriculture, industry and service in order to closing the gap on market failures regarding the provision of necessary agricultural and industrial outputs and on road infrastructures.
- In order to provide cheap credit facility in the market, low lending interest rate is very important. As the result National Bank of Ethiopia need to regulate and adopt policy direction and implement different methods of credit control mechanism specially reducing lending interest rate in order to enhance the rate of investment in the economy which will aid in sustaining economic development.

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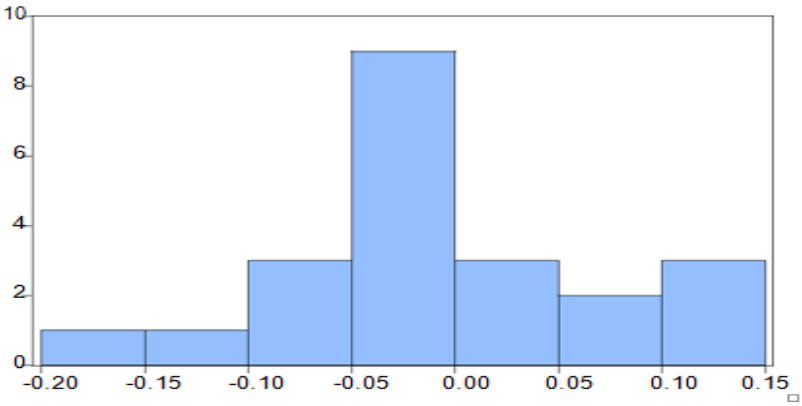
Appendix A

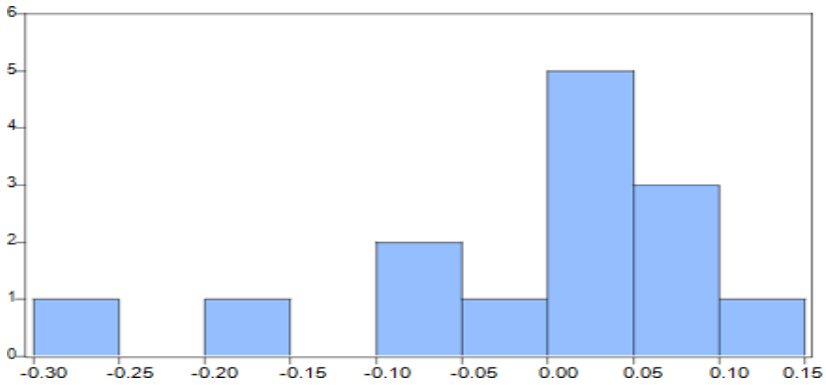
Normality Test Result

Agriculture Sector Model



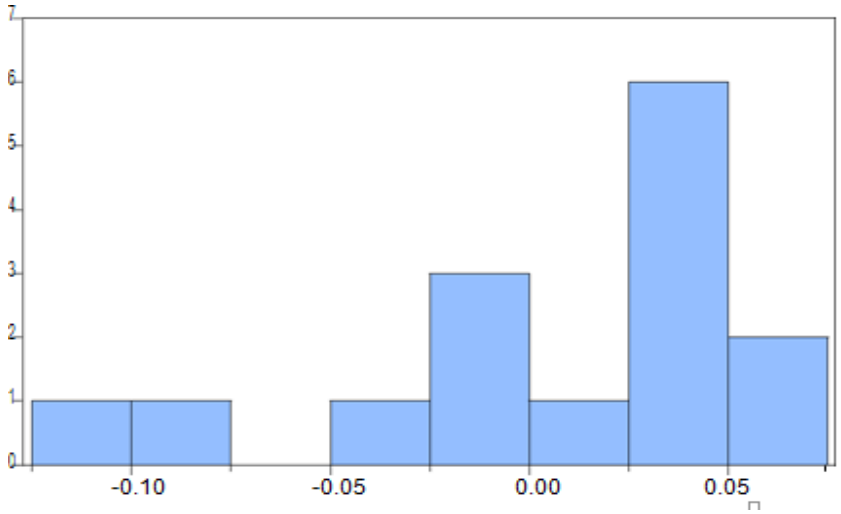
Series: Residuals	
Sample 1998 2019	
Observations 22	
Mean	1.38e-15
Median	-0.005587
Maximum	0.149573
Minimum	-0.175475
Std. Dev.	0.075919
Skewness	0.151381
Kurtosis	3.314694
Jarque-Bera	0.174805
Probability	0.916308

Industry Sector Model



Series: Residuals	
Sample 2006 2019	
Observations 14	
Mean	1.67e-15
Median	0.032304
Maximum	0.140867
Minimum	-0.279504
Std. Dev.	0.112282
Skewness	-1.207070
Kurtosis	3.874355
Jarque-Bera	3.845662
Probability	0.146192

Service Sector Model



Series: Residuals	
Sample 2005 2019	
Observations 15	
Mean	-7.71e-16
Median	0.025553
Maximum	0.061490
Minimum	-0.106919
Std. Dev.	0.052229
Skewness	-0.902777
Kurtosis	2.741655
Jarque-Bera	2.079231
Probability	0.353591

Heteroskedasticity Test Result

Agriculture Sector Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.882016	Prob. F(4,17)	**0.4954**
Obs*R-squared	3.781038	Prob. Chi-Square(4)	0.4364
Scaled explained SS	2.612925	Prob. Chi-Square(4)	0.6245

Industry Sector Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.737594	Prob. F(4,9)	0.5893
Obs*R-squared	3.456399	Prob. Chi-Square(4)	0.4845
Scaled explained SS	2.052878	Prob. Chi-Square(4)	0.7260

Service Sector Model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.186532	Prob. F(4,10)	0.9401
Obs*R-squared	1.041484	Prob. Chi-Square(4)	0.9034
Scaled explained SS	0.403090	Prob. Chi-Square(4)	0.9822

Growth Trend of All Variables (1981-2019)