

The Impact of the Banking Sector Development on Agricultural Development: The Case of Cameroon

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ABSTRACT

Despite the toughness of the competition, Cameroonian agricultural products have succeeded to stand out against the rival products by their quality. Financial investors want to be sure that the agricultural products will generate sufficient funds over years to cover up their debt services and their operating expenses. Therefore, the main question we need to answer is: how the valorization and expansion of the banking sector can positively impact agriculture in Cameroon? The main objective of our study is to highlight the positive effects of the banking sector on agriculture in Cameroon. The main hypothesis is that the development of banking sector influences the development of agriculture in Cameroon. Our analysis will be done using two types of time series data, namely agriculture value added, and domestic credit to private sector. After analysis, our two variables are stationary at first level under ADF and PP. Johansen test concludes that there is a long run relationship amongst the variables. After running the lag length structure, outputs disclose that our optimal results will be reached on lag4. After running VECM test, results show a short and long run relationships between our two variables. And finally, the Granger causality test enables us to conclude that there is a bidirectional relationship amongst the variables.

Keywords: Agriculture value added, Domestic credits, Cameroon

ÖZ

Kamerun tarım ürünü ürünleri kalitesiyle öne çıkmayı başarmıştır. Bu durumdan dolayı, finansal yatırımcılar, tarım ürünlerinin borç servisini karşılamak ve işletme masraflarını karşılamak için yeterli fon yaratacağı konusunu gündeme getirmektedir. Bu nedenle cevaplamamız gereken asıl soru, kamulaştırmada bankacılık sektörünün genişlemesinin tarımı nasıl olumlu etkileyebileceğidir. Çalışmamızın temel amacı, Kamerun'da bankacılık sektörünün tarımda yarattığı olumlu etkileri vurgulamaktır. Ana hipotez ise: Kamerun'da bankacılık sektörünün gelişimi tarımın gelişimini nasıl etkilediği noktasındadır. Analizlerimiz, tarımsal katma değer ve özel sektöre verilen iç kredi olmak üzere iki zaman serisi verisi kullanılarak yapılmaktadır. Analiz sonrasında, iki değişkenimiz ADF ve PP altındaki birinci seviyede durağandır. Johansen testi, değişkenler arasında uzun vadeli bir ilişki olduğu sonucu göstermektedir. VECM testini yaptıktan sonra, iki değişkenimiz arasında kısa ve uzun vadede bir ilişki olduğu tespit edilmiş ve Granger nedensellik testi, ile değişkenler arasında çift yönlü bir ilişki olduğu sonucuna ulaşmaktayız.

Anahtar kelimeler: Tarım katma değer, Yerli krediler, Kamerun

To my late father

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criteria
AVA	Agriculture Added Value
BEAC	Bank of Central African Countries
BICEC	International Bank for Trade, Savings, and Credits
CAMCUL	Cameroon Cooperative Credits Union League
CCIMA	Culture Center and Information for Arab World
CEMAC	Economic Monetary Community of Central Africa
DC	Domestic Credits
ECT	Error Correction Terms
FAO	Food and Agriculture Organization
FAO STAT	FAO Statistics
FCFA	African Financial Cooperation
GDP	Gross Domestic Product
INS	National Institute of Statistics
LN	Logarithm
NGO	Non-governmental Organization
OECD	Organization for Economic Co-operation and Development
PP	Philips Peron
SGBC	General Society of Cameroonian Bank
SCB	Cameroonian Bank Society
UBA	Union Bank of Africa

Chapter 1

INTRODUCTION

1.1 Contextual

After the Second World War, the world faced several crises like the economic crisis, food crisis, and political crisis. After that great drama, each continent and country tried to rebuild its economy through agriculture like Netherland, Brazil, and so many others. While European countries were trying to amend all the damage caused by the war, African countries engaged themselves in setting free from colonialism and regaining their respective independences. Despite the weakness of their structure, they tried to focus on agriculture for their development.

Food crisis is one of the most dangerous and critical crisis that the world has experienced. The African continent was not spared by this, being even the most affected continent. In order to tackle that particular crisis, the main strategy used by the government was to improve, extend, and develop agriculture, by easing the production process, inciting and encouraging people to move into that field. In almost all the African countries, governments applied structural adjustment policies, which aimed at fostering the productivity of the agricultural sector and thus, ameliorate households' life conditions which would be reflected by increase in household income.

This research will be carried out for only Cameroon due to our limited time and sources. The main feature of year 1960 was the freedom of that country; the Cameroon economic condition was shoddy and wretched. Therefore, the government decided after the privatization process to ease the entrance in agriculture sector by freeing it. The main feature of antiquated agriculture is that it is ceiling farmers income and therefore do not reduce the level of poverty. The practices of that antiquated agriculture do not foster the relationship between them and the financial institutions because of the dearth and the shortage of safeguard and warranty. One of the main features of that country is that each type of weather has a particular kind of commodity corresponding to that climate. Therefore, according to the diversification of the weather, each particular commodity will be associated to the related weather.

Cameroon is located in the central part of the African continent. It is a multicultural country (over 250 native languages), which gained its independence in 1960, inheriting a shoddy and wretched economic condition. The country is divided into ten regions, with relatively different climates and a diversity of cultures and tribes. Agricultural methods in Cameroon are, in the larger extent, transmitted from generation to generation, and embodied traditional and archaic characteristics. Cameroon, benefits of two major climates: the tropical in the northern part and the equatorial in the southern part of the country. Each climate is favorable to some specific agricultural products.

The cause of the agriculture growth is the population growth (Dewbre et al., 2008) which in turn positively affects the cultivated land and thus the agricultural resources. During the last decade, the population of Cameroon doubled despite the

precariousness of social structures. In 1992, after the privatization of most of the agricultural agencies, Cameroon had to find how to foster his agriculture through the implication of banking sector on agricultural areas. From 2001 to 2005, the agricultural sponsors' main objectives were to encourage improvement of the Cameroonian government's administrative and policies development functions. During the last decade, the number of farmers in Cameroon decreased. That phenomenon was due to people migration from villages to cities in search of job opportunities, or from the country to abroad with the aim of making money and better education. Agriculture now is seen as underperforming in the country (World Bank, 2007; inter academic-council, 2004).

The particular features making Cameroon so distinctive are its natural endowments such as climate, landscape, and culture. In Cameroon, there is a tremendous diversity of agricultural commodities which are embedded to a specific climate. For instance, the cultivation of cotton is enhanced with the country's northern side climate, whereas the culture of banana is more effective with the southern part's climate. For the realm of this research, we will focus on tradable commodities such as cotton, banana, coffee, rubber, sugar, and cocoa just to name these.

1.2 Historical Background

Paul Biya, the current president of Cameroon, stated in one of his speeches on the 24th of February 1985 that, agriculture is the first national economic activity in association with the industrial sector, which can settle the issue of unemployment and guarantee food self-sufficiency. Twenty years later, he stated that Cameroonians should invest more in agriculture, since it is the foundation of his new policies to lead the country out of poverty. Despite the advice of the president to invest more in

agriculture, nothing has been done so far to develop agriculture. Worse, the government found better to privatized most of the Cameroonian agricultural companies.

1.3 Theoretical Background

While Eyo (2008), Nwanyanwu (2011), and Adolphus (2014) found in their articles that commercial credits are significant tools to foster agricultural production, however; Izar, and Tariq (2009) found opposite results.

In Ghana according to Bahahudeen et al. (2013), 51.23 % of shares in commercial banks are held by the government. According to him, agricultural development banks functions are: to ease the process of agricultural credits, to boost agricultural enterprises through cooperatives collaborations, to invest in the transport of agricultural commodities, and to give microcredits as much as possible. Microcredits main objective are to help poor and rural population by alleviating the level of poverty. And they suggested that commercial credit should be granted to farmers according to their genders and the size of their businesses.

But Holmes and Mosley (1996) stated in their research that microcredit and funding through cooperatives are not efficient and do not help to reduce poverty level as they are supposed to. They stated that the phenomenon of moral hazard is the cause of many failures in those financial institutions. Cameroon has several assets which can grant it a comparative advantage in the culture of so many commodities. Therefore, the comparative advantage is giving to Cameroon a strategic position in central Africa.

1.4 Statement of the Problem

According to Kendo (2010), husbandry procedures incorporate output generation, alteration and marketing. Therefore we will circumscribe our studies on the generation of output, the alteration, which is the modification of those commodities and marketing issues.

Despite the lack of the improvement of transportation means, marketing infrastructure and the labor force due to the phenomenon of migration, Cameroon is so rich that it supplies food in the central part of Africa; and its agricultural commodities are recognized all around the world.

In the agricultural process of production, Dewbre (2008) observes a growth in the production of cocoa and cotton, whereas there were decreases in the production of coffee. The increase in the production of cocoa and cotton is due to the increase in the cultivated areas, the utilization of some particular fertilizers, and the increase in the foreign demand triggered by the competitive quality/price ratio per kilogram in the world market. The decrease in coffee is due to the reduction in the areas cultivated, the drop of the demand, the surge of the international market price, and farmers' difficulties in maintaining coffee plantations.

In the transformation process, the knowledge of good technology is necessary in order to transform the remaining commodities which were not exported into final products for further commercialization. The marketing of those agricultural commodities is also important. Because the sustainability of financial support from banks has to be warranted by a contract between a husbandry supplier and potential

clients in order to make sure that the latter will purchase the goods of the farmer, and hence that the supplier company will not default. Agricultural imports tariffs and exports taxes policies can influence the evolution of the market prices and therefore the consumption of those commodities and their commercialization too.

After defining each item of the agricultural sector of Cameroon, the assessment of its contribution in term of value added, and the contribution in domestic credits will be done. In this study, two variables are put into a relationship: the agricultural value added and the domestic credit to private sector. In this study, we will figure out how credits delivered by a commercial bank can influence agriculture sector in Cameroon. Therefore, how can domestic credits contribute in the development of agriculture? How can agriculture contribute in alleviating the level of poverty?

1.5 Research Question

The thrust of microfinance structures has been figured out after the process of the structural adjustment plan policies four decades ago. Microfinances, which main purpose is alleviation of poverty, started to consider the farmers need for loans finance their activities. Therefore, the main drift is to figure out how the banking sector can positively impact the growth of agriculture in Cameroon.

1.6 Aim of the Study

The aim of this study is to figure out the impact of the banking sector on agriculture amelioration in Cameroon. From this main objective, we have three secondary objectives which are if:

- the amelioration of services quality in financial institution influences husbandry commodities positively or not?

- the reduction of loan interest rates in financial institution influences the husbandry commodities positively or not
- the organizational efficiency of financial institutions increases bankers level of trust towards farmers which the aim to enhance their commodities production efficiency?

1.7 Significance of the Study

The main hypothesis is: the managerial improvement of the banking sector has a positive impact on the spread of agricultural policies and targets in Cameroon; and from the main hypothesis, we have also secondary hypotheses. The secondary aim is to see if the:

- amelioration of the quality of the services in financial institutions has a positive impact on commodities husbandry or not
- amelioration of credit policies in financial institutions improves significantly the commodities husbandry or not and finally if
- organizational efficiency in financial institutions foster the commodities husbandry by making it more efficient or not.

1.8 Structure of the Study

The assessment of this topic will be done into five parts. After defining all the main theories related to this research and proceed to the definition of each variable in chapter two, the Cameroon overview will be approached in chapter three, the methodology used to assess this topic will be done in chapter four. In chapter five, analysis will be done on the data so that the link will be established between the variables or not and finally in chapter six; and finally, we conclude with the interpretation of the results of our research.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

After defining the two main concepts which are banking sector and agriculture, for the related topic, three relevant major theories will be stated: the theory of the comparative advantage, the theory of asymmetry of information and theory of agency, moral hazard and also adverse selection and finally the theory of development.

2.2 Definition of Banking Sector Concepts

According to Iannota (2010), commercial banks are intermediaries responsible to accept deposits and make loans. There are two types of banking sectors articulated as follow.

2.2.1 Formal Banking Sector

The formal banking sector refers to formal financial institutions, which incorporate commercial banks and government financial institutions. According to Germidis (1991), formal financial institutions deal only with high-income people who can satisfy their requirements, thus preventing smaller income people who make small deposits and farmers henceforth. Their procedures of having a loan are so complex for rural and smaller savers. Their opening hours do not match with farmer's schedule as when they are opened, farmers are generally in their fields.

To reduce default risks, they require consistent warranties and high transaction costs. In addition, the amount of attributed loan is small, despite the subsidies that they are receiving from government and donors. Their focus is on urban areas, and they do not have close contact with their environment and customers. This means that they have irrelevant information about their customers. They do not have a good and efficient network to spread information and give less importance to rural customers and smaller households including farmers. That is why all their branches are only in urban areas. They do not have good saving policies because the yields of maturity on deposit are low or do not exist at all.

In Cameroon, there are so many formal financial institutions like BICEC, SCB Credit Lyonnais, SGBC, AFRILAND FIRST BANK, UBA, CITIBANK, ATLANTIC BANK.

In the group of formal financial institutions, we have also government financial institutions. But in Cameroon, all the Government financial institutions went bankrupt because of the high default rate on their loans. They ended up closing because they did not have sufficient fund to supply the demand of their customers. But, formal financial institutions can reach the broad part of the rural customer by using NGO (non-governmental organizations), microfinance and by collaborating with the Government.

2.2.2 Informal Banking Sector

Informal banking sector can be defined as an informal financial institution. Informal financial institutions focus both on rural areas and urban areas. That is why in Cameroon; those institutions can be found both in Regions and Divisions (the

territorial administration of Cameroon is sliced down into ten Regions, themselves divided into Divisions, Sub-Divisions and then Districts). They have some good policies concerning their credits, and savings. Those policies contribute to an efficient mobilization of savings and ensure the practice of high-interest rates on loan repayment. The interest rate received on deposits is a good incentive policy for rural people and households. Despite the fact that they do not receive any grant from the Government and donors, their loan procedures are very simple and straightforward. The rural population which has the main features of illiteracy, and to understand them is not very easy. The informal financial institutions schedule match with the farmer's timetable. Rejections in loan approvals are very rare despite the fact that they manage so many small and modest accounts. Their transaction costs are very low relatively to the formal financial institution.

They have a huge information network and an efficient monitoring system of the borrowers. Despite the very efficient network of information, the informal financial institutions are not aware of all the useful innovations in farming techniques which enable them to increase their production and to increase their wealth.

Informal financial institutions include corporate microfinance, microcredit, cooperatives, and NGOs. Isern and Porteous (2005) define microfinance as a type of financial services offered to lower income people like farmers and households. In Cameroon, informal institutions incorporated village banks, cooperatives credits unions, social venture capital funds. The main objective of those informal institutions is to help poor people. It is world widely known that poor populations can hardly access to credits from the banks because they do not have enough collateral to pay

back their debt. But informal financial institutions are targeting those customers who are considered as riskier, at a high-interest of payment (Zeller and Sharma, 1998). Microfinance institutions give people new opportunities by trying to help them have equal chances and make them more responsible. Those informal financial institutions broaden the horizons and thus, act for both economic and social purposes by improving the life conditions of those poor people. Those improvements have the main purpose to alleviate the poverty by focusing mostly in the rural areas. The main challenge faced by the rural population is to gain financial supports which enable them to foster their income through their agricultural activities.

There are some costs which are incurred when the farmers are spread out in vast areas. The microfinance, therefore, applies a high interest rate policy on the payment on their loans because of this cost. The microfinancing is needed to do so in order to cover their total expenses. The microfinance is an informal financial institution where the unit size is usually smaller than the gross domestic product per capital (GDP).

2.2.3 Link between Formal and Informal Financial Institutions

Banks establish a link with microfinance and NGOs in order to enhance the development of agricultural activities and small businesses, particularly in small areas. After microfinance, according to Ledgerwood (1999), credit unions were created in order to afford farmers having some storage facilities, and therefore a small financial power. Banks are acting through microfinance agencies because they are implanted in rural areas and attain more farmers and poorer population. Commercial banks are working with microfinance institutions because these ones collect the broader part of saving (Mbouombouo, 2007). This partnership is leading

banks to modify their technologies and the required files of getting the agricultural loan (Mawuli, 2011).

Initially, microfinance used to be an exclusive area of NGOs and cooperative societies (Baydas and al., 1998). But during the last decades, banks started to occupy a very important place in microfinance (Bounouala and Rihane, 2014). Banks have the partnership with microfinances in order to avoid all the cost associated with a start-up.

2.2.4 The Banking Sector

Neri and Llanto (1985) put forward the severe problem in asymmetry information in credit is due to the huge amount of transaction costs for the few amounts of credits, the preference for the bank to have a guarantee, and collateral like land and the application of weak incentive methods in their credit policies. Llanto (1993) showed the contribution of both banking sectors (formal and informal) through NGOs as credits channels, cooperatives, and private voluntary organization. According to him those three channels tried to reduce the transaction costs and ensured the repayment of the loan. He disclosed those three channels as undertaking both the savings and the credits of their members by assuming the link with the bank. He showed the importance of those three channels by their skills to filter loan demand by farmers and by acting as the loan collectors. This approach has been used in Indonesia and was found suitable. He concluded that, despite the recent increase in agricultural credits, the informal sectors continue to have critical features of rural credit. They are regretting the inexistence of organized and systematic data concerning the potential lenders.

Chiyah and Nembo (2010) studied in Cameroon the specific case of CAMCUL microfinance which plays the role of a bank near the farmers. Instead of refusing credits to farmers like banks because of the lack of collateral, CAMCUL borrows money at a high-interest rate because those loans are riskier. In fact, borrowing at a high-interest rate does not guarantee that the farmer will not default, instead, it does guarantee that they can at least recover the principal. According to them, microfinance is the main tool to encourage development in a poor country like Cameroon. With the tough competition in banking sectors, many banks have extended their services to the area of microfinances in order to diversify their activities by including some services like agricultural loans. Despite the precariousness of the economic situation, some commercial banks like CREDIT AGRICOLE have succeeded in their integration into the microfinance sector by offering some profitable financial services to the owner of small business (Moulin et al., 2011).

Bounouala and Rihane (2014) studied the role of microfinance in the development of small activities like agriculture. They tried to define financial cost on the point of view of the lender and the borrower side. According to Bhatt and Shui-Yan (1998), lenders' costs include: cost of searching for loanable fund, cost of training the staff and borrowers, cost of a deep examination of a loan, cost of monitoring borrowers, investment appraisal cost, and cost of reaching out all the farmers when they are dispatched to a wide area. Similarly, borrowers' costs embody: the cost of monitoring group members, the cost of gathering the members of the group for an eventual meeting, the cost of bargaining with the lender, the cost of attending meeting, the cost of giving the reports, cost of the time spent on the project

assessment. Each part both lenders and borrowers have the entire responsibility to minimize the cost and therefore the associated risks that they may encounter (Stiglitz, 1990).

All those costs lead us to the managerial risk which is linked to financial activities. The assessment of each risk should be done in three steps which are: size, duration, and profitability. There are four steps which can enable us to reduce those management risks:

- Risk identification (credit risk, market risk, and liquidity risk)
- Risk assessment: to determine the profitability of a bank
- The risk control: each institution should be able to mitigate and offset the risk
- Risk monitoring: to evaluate each part and identify the changes in riskier profiles.

After identifying all the management risks, the bank should assess the performance of the microfinance through the entities like the number of borrowers (total of the credit portfolio), average loan size and the rate of unsolvable clients.

2.3 Definition of Agriculture Concept

After defining agriculture, this section will disclose the three main stages of agricultures which are: production, transformation, and commercialization.

2.3.1 General Definition of Agricultures and the Types of Agriculture

Agriculture can be defined according to Chandrasekaran, Annadurai, & Somasundaram (2010) in three axes:

- As an art, agriculture needs physical skills which include the capacity to undertake and monitor the farming activity, and intellectual skills and

experiences through which farmers may rely on to forecast weather, manage fertilizer and allocated resources.

- As a science, agriculture will need to use advanced technologies to increase the yield and the productivity.
- As a business requires a minimum of knowledge of the management of the land, seed, fertilizer, water irrigation and technic and technical machines.

According to Chandrasekaran et al. (2010), agriculture has so many branches which are: crop production (which has the main objectives of producing food and controlling sickness), horticulture (production of mainly fruits and plants for decoration), forestry (which deals with the production of the trees in the forest), livestock (which is the main objective of rearing and feeding animals), fishery sciences (which are taking care of rearing fishes), home science (which are dealing with different methods of applying and using the agricultural commodities in efficient manner), industrial agriculture which finally include the production of food, poultry, livestock and fishes. This area is wider because it includes so many innovations of advanced technologies of farming in order to achieve economy of scale, and this method is spread broadly in the developed country.

2.3.2 Production Stage in Agriculture

According to Poisot et al. (2007), farmers need to have an exact idea on what they are going to produce and at which season of the year. The farmer needs to prepare the land to receive the seeds, to use fertilizer if it is necessary or compulsory and therefore to know the quality and quantity of fertilizer that are needed. They need to know how to seed and how to control plants sicknesses. If it is not raining, they need

to have a plan to manage the water through irrigation. After harvesting, they need to have good methods of storage.

In Cameroon, particularly, the diversity of the climate makes the decision of what to seed and plant becomes more strategic, and the control of what to do at each season, on which surfaces and so on.

2.3.2 Transformation Stage in Agriculture

This stage involves the transformation of the commodities through technical machinery. Knowing how those machines are functioning is important for banks so that they are sure that farmers are doing their best to avoid to default in the payment of their loans. The Government should foster educational investment in order to promote a minimum knowledge about agriculture. The Government should invest in advanced technologies of the transformation of those commodities that farmer are bringing from their farms.

2.3.3 Commercialization Stage in Agriculture

Cameroon belongs to the Economic and Monetary Community of Central Africa. Concerning tariff, Cameroon should reduce their agricultural tariffs in order to increase competitiveness. Dewbre (2008) stated that Cameroon was not doing too much exchange with the country of the same community. For him, using tariff as the indicator of the rate protection shall be taken into account carefully because, tariff rate increases the final prices of commodities. After estimating all the agricultural commodities, he states two relevant points in the commercialisation of goods: imports tariffs and exports taxes.

Concerning the export taxes, he stipulates that the export taxes policies of local producer have the potential to slow down all the agricultural policies, while the tariffs of imports have the opposite effects. If the agricultural policies are slowed down due to export taxes, it means that banks cannot invest in that area because they need to recover their funds. And if export taxes do not allow them to recover their funds easily, therefore it will be difficult to endeavour themselves in that business.

According to FAO statistics and OECD calculations (2008), the real agricultural output in Cameroon has grown from the year 1964 to 2010. The decrease of agricultural tariffs can affect positively the bias against agricultural export (Bamou and Masters, 2007). Each bank should have a general idea on the number and the quality of the customer of each commodity in order to plan their payoffs. The bank manager should know objectively the farmers who are qualified to get a loan.

2.3.4 Conclusion about Agriculture

Lambe (1983) stated that the reduction of agricultural productivity is due to the problem of lack of assessment of agricultural inputs, the lack of farmers training. He therefore proposed that, the Government should invest in the training of the farmers so that they can manage allocated resources efficiently in order to attract more investors and contribute in alleviating the threshold of poverty in Nigeria.

According to FAO Statistics and OECD calculation (2008), from 1993 to 2003, the exported production has tripled (from 571.7 to 1414 billion of FCFA), the added value has tripled also (from 511.57 to 1204.36 billion FCFA), the surplus of exploitation has increased tremendously (from 479.48 to 1203.02 billion of FCFA); Cameroon exportation has considerably increased during those years from 82.56 to

117.74 billion of FCFA, and the number of farmers involved in agricultural activities have also considerably increased.

Despite the growth in agriculture of all the points that was stated above, Cameroon still has abundant agricultural surfaces, because till now only twenty-six per cent of the total surface area of Cameroon is used effectively for agriculture. According to FAO statistics and OECD calculations, Cameroonian government predicted that the agricultural GDP will grow by 8% due to the increase of the population.

Government need to develop some infrastructure in order to foster agriculture and hereby the education of the rural population (Poisot et al., 2007). The development of some infrastructures will determine the efficiency of subsistence agriculture. Therefore the government needs productivity in agriculture in order to ease the payment of their loans.

2.4 The Theory of Comparative Advantage

According to the theory of comparative advantage developed by Ricardo (1821) which stipulates that each country should develop its skills where it has a comparative advantage. In the case of this topic, we know that relatively to European countries, African countries do not have the latest state of art of technology for their economic development. But they have raw materials which need to be exported to the European countries. It cannot be denied that the raw materials provided by African countries are the base of the European industrialization process. Therefore, African countries provide their natural wealth for the commercialization, and amongst that natural wealth, we have the farming commodities. According to this theory and the topic of this research, African countries should develop a comparative

advantage in what they have: agricultural products in the case of this study. The knowledge of what we have is to produce the agricultural commodities where we have a comparative advantage. By the same way, the use of their allocated resources in an efficient manner is to have an economy of scale (Bamou and Master, 2007).

2.5 The Theory of Development

Those theories of development were developed by Hildbrand (1876), but were consistently improved from 1950 until 1960. Undeveloped countries tried to create some strategies in order to catch developed countries level. Those theories have deeply influenced the strategy used by poor countries by developing the sector they have a comparative advantage in, like agriculture. This theory includes so many theories: The developments by the bottom theory of Castro (1970), who stipulated that the economic development does not necessarily reduce the poverty in a country, meaning that the populations are the actors and not the recipient of that development. In the case of this specific study, the underdeveloped countries in general and Cameroon, in particular, should invest more in the population by procuring them the knowledge in the agricultural sector since the development of Cameroonian economy rely on agriculture.

2.6 The Theory of Asymmetry of Information

In the case of this thesis, this theory will be applied similarly to Akerlof (1970), where only one incumbent among the parties involved in the transaction has the accurate and full information whereas the other part(s) are left with residual information. In this topic, we have two sides: bankers and farmers. Asymmetry of information can come from the side of the farmer who can hide information about the effective purpose of their activities. And this theory leads directly to three others theories: adverse selection, moral hazard, and agencies problem.

2.6.1 The Theory of Agency and Theory of Moral Hazard

Information asymmetry can lead to the agency problem, where the principal is the banker and the agent is the farmer. Because of the insolvencies of many farmers, the bankers must find some suitable incentives for both parties interest. In order to solve this problem of moral risk, the literature of agency theory has found some solutions like: monitoring the farming activities through experts, and giving some incentive rewards to the hard-working farmer so that their interest will converge.

2.6.2 The Theory of Adverse Selection

The theory of adverse selection implies that bankers can make misjudgements on the activities of farmers and decide to help the wrong person instead of helping the right one. The theory of moral hazard or moral risk implies a situation, whereby the banker do not know the real action and asset of the farmer, and the situation where the banker knows everything about one farmer's activities but cannot verify it.

In the section of the definition of a bank, the main conclusion was that bank can afford to borrow money to the farmer with a high-interest rate in order to alleviate the problem of asymmetric information. The practice of a high-interest rate is also a solution to the adverse selection where a choice can be done between riskier and without risk projects. The trustworthy clients suffer at the expense of the bad ones (Stiglitz, 1976).

2.7 Bank and Agriculture Empirical Literature

The main problems encountered by farmers in Cameroon are obsolete infrastructure, inappropriate long-term finance, shortage of data about the client, unqualified macroeconomic environment, and a very long documentation processes (Anyanwu, 2010). Nwanyanwu (2011) stated that the main feature of commercial credits is to

create employment by maintaining some few sectors like the agricultural sector in order to give them an advantage so that they will develop the economy of scale and help them to reduce the collapses of businesses in the case of natural disaster.

Reactivation and modernisation of agricultural enterprises are sustained by a commercial bank (Muftau, 2003). Therefore, commercial banks encourage farmers to adopt advanced technologies, which could not have been accepted easily (Olokyo, 2011; Eyo, 2008). Commercial banks have the main input needed by the agricultural sector but they do not lend easily due to the problems that are linked to that specific sector (Rahji and Adeoti, 2010).

Ikenna (2012) used time series data from 1979 till 2009 in order to test the long run and short run impact of financial policies. His results indicate that the deregulation of any financial system has a bad influence on the credit allocated to the agricultural sector. His results are showing that on the short and long-run, financial liberalization was insignificant and negative. Finally, he concluded that the central bank has discriminatory credit policies toward the agricultural sector.

Adolphus and Peterside (2014) analysed the importance of the lack of agricultural financing in Nigeria from 1981 till 2010. They used two-panel data from the central bank of Nigeria and they used two analytic techniques: descriptive and inferential techniques. They conclude that the range of agricultural credit gave by commercial banks is between 9.0% and 10.1%. Through their analysis, they concluded that agriculture contributes to the growth of the GDP within that period by 33.5%. There was an obvious weak correlation between the contribution of commercial banks and

the growth of the GDP. In their analysis, they concluded that their beta coefficient is contributing significantly therefore by 48.22%, meaning therefore that agriculture contributes by 48.22% on the growth of the GDP with 100% of the growth of commercial bank lending to farmers.

Their R-square was equal to 23.04% showing that the variation in agricultural contribution to the GDP growth is explained by commercial bank lending. Those results show that the contribution of commercial bank lending in agriculture is significantly low. The conclusion is that commercial banks are risk averse, therefore this behaviour is indicating the shrinkage of the level of liquidity and funding shrinkage in agriculture sectors. They finally concluded that monetary policies should set up some mechanism of allocation of the fund with adapted methods in order to foster the flow of funds to that sector.

Chapter 3

AGRICULTURAL OVERVIEW OF CAMEROON

3.1 Introduction

Cameroon is a country with a strategic position in Central Africa. It was initially colonized by Germany after the World War 1 (1919). After the Germans defeat on WWII, its administration was given to the British and French. The country shares borders with Chad, Central African Republic, Congo (Brazzaville), Equatorial Guinea, Gabon, Nigeria. Cameroon is wide of 475,442 km² of total surface.

Cameroonian landscape is so diversified because of multiple climates. The country has ten administrative regions which are: Far north, North, Adamawa, East, West, North West, South West, Littoral, and Centre. And the capitals of those regions are respectively: Maroua, Garoua, Ngaoundere, Bertoua, Bafoussam, Bamenda, Buea, Douala and Yaounde. The politic capital of Cameroon is Yaounde whereas the economic capital of Cameroon is Douala. The features of those regions are their differences in climates, cultures and native languages. Cameroon counts more than two hundred native languages, which totally differ from each other. In Cameroon, there are two official languages which are French and English. English is spoken only in two regions which are North West and South West; the remaining regions are mostly French speaking.

Cameroon is naturally endowed with two main type of climates which are: the equatorial climate and the tropical climate. The Tropical climate is found in Maroua and Garoua. The equatorial climate is found in remaining eight regions. The main feature of tropical climate is that it is so dry; it rains only three months per year with maximum temperature culminating at 45°C. On the other hand, the equatorial climate is characterized with only three to four months of dry season, temperature can vary between sixteen till twenty-eight degrees. The diversity in climate is making that country to have a strategic position in central Africa.



Figure 3.1: Cameroon Geographical Map
 Source: *United Nations (2015)*

In Cameroon, the central bank is called BEAC and that country belongs to the CEMAC zone. The main currency is the CFA Franc and does not have so much

value because one euro is equal to 655.957 FCFA (fixed parity) whereas dollar value changes between 550 FCFA and 630 FCFA.

3.2 Agricultural Structure

There are two types of agricultural products: agriculture for domestic consumption and agriculture for exportation. The first part of this section includes agriculture for domestic consumption that will be studied; and in the second part, exported production will be introduced. There is one important thing is to notice that: all the products in first part of this session are in tons whereas the second part is in thousand dollars.

3.2.1 Domestic Consumption

In the table below, there are six types of goods which includes diverse products. In fruit groups, there are water melons, pineapples, tomatoes, pawpaw, oranges and others fruits. In cereals groups, there are wheat, maize, rice, and sorghum. In tubers, there are cassava, yam, sweet potato, and potato. In spices groups there are onions, peppers, garlic and so one. In vegetable lipids, there is oil for cooking. In the group of others, there are ground nuts, “egusi”, “okro”, soy, and sesame.

Table 3.1: Domestic Consumption in Tons

Domestic Consumption				
Years	1990	2000	2001	2002
Fruits	69 419	103 439	105 143	153 787
Cereals	1 574 817	984 043	903 548	1 645 769
Tuber	6 825 135	5 280 454	4 682 971	6 836 420
Spices	41 329	349 287	377 265	434 011
Vegetable lipids	2 825 135	179 878	183 686	11 906
Others	236 476	480 029	496 024	660 228
Totals	11 572 311	7 377 130	6 748 637	9 742 121

Source: *FAOSTAT 2015*

The southern part of Cameroon is represented by eight regions where it rains consistently and the northern part will be Maroua and Garoua where it rains inconstantly. Goods mostly found in the southern part of the country are fruits, tubers, pepper, egusi, and soy. Goods found in both southern and northern parts include, but are not limited to maize (corn) and vegetable lipids. Spices such as onions, garlic, cereals and nuts are most exclusively found in the northern part.

Series 1 represent the domestic consumption in the year 1990, Series 2 represent the domestic consumption in the year 2000, Series 3 represent the domestic consumption in the year 2001, and Series 4 represent the domestic consumption in the year 2002.

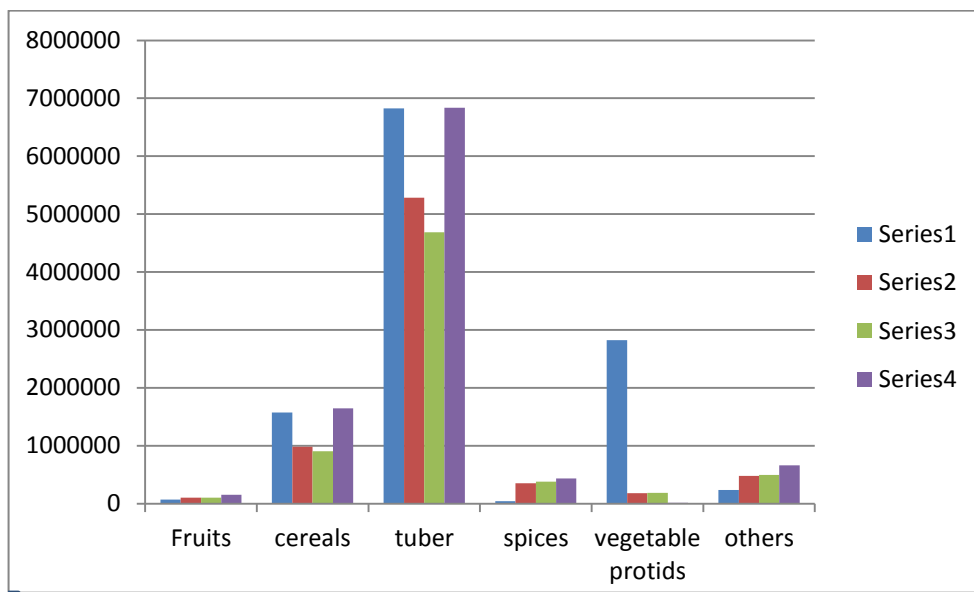


Figure 3.2: Domestic Consumption
Source: FAOSTAT 2015

The graph above represents the domestic consumption of Cameroon, where Series 1 represent the year 1990, Series 2 represent the year 2000, and Series 3 represent the year 2001, and finally Series 4 which represent the year 2002.

According to this graph, the production of fruit and vegetable prods and lipids are insignificant. However, there is a drastic decrease in the production of lipids. The production of fruits, spices and others is increasing slightly, but the highest production did not cross one million tons. The cereals and tubers production is fluctuating but represent the highest production in this graph.

3.2.2 Exported Production

This table represents the goods which are exported from Cameroon. In this table, only eight products are exported from Cameroon which are pineapple, cocoa, coffee, rubber, tea, cotton, oil and banana. In the coffee group, there are Arabica coffee and Robusta coffee. In the cotton group, there are cotton seeds and cotton fibbers.

Only cotton is found in the north part but the remaining products are found in south part. Series1 represents the interval from year 1997 till 2000 and the second part represents the interval from year 2000 till 2002.

Table 3.2: Exported Products in Tons

Exported Production		
Years	1997-2000	2000-2002
Pineapple	13 200	23 900
Cocoa	252 000	238 600
Coffee	176 100	184 200
Rubber	110 100	161 300
Cotton	524 500	83 800
Oil	209 400	545 200
Tee	8 200	12 600
Banana	395 900	773 700
Totals	1 689 400	2 023 300

Source: FAOSTAT 2015

This graph represents the exported products from the year 1997 till 2002. According to the graph below, pineapple and tea exportation are really insignificant relatively to the other products, but there is a slight increase in their exportation during those years. There is a slight decrease in cocoa exportation whereas there is a drastic and considerable decrease in cotton exportation. There is a considerable growth in the exportation of banana and oil but the growth in coffee and rubber exportation is negligible. Series 1 represent the exported production from the year 1997 till 2000, Series 2 represent the exported production from the year 2000 till 2002

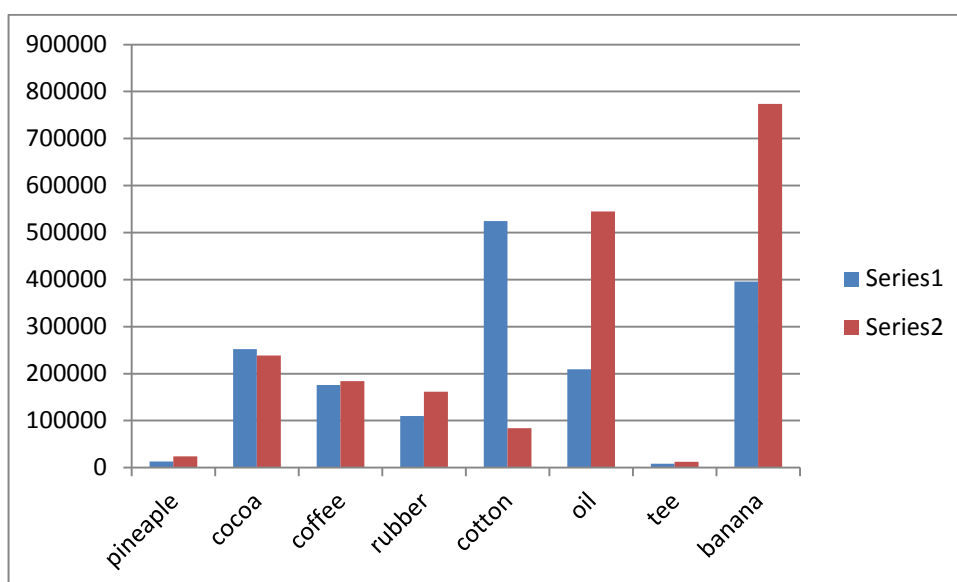


Figure 3.3: Exported Product Graph
Source: FAOSTAT 2015

3.3 Agricultural Credits

The following table information is needed by banks to have an idea of the agricultural account. In this table, there are four items which are important for the banks: total production, added value, exportation and abstract added value. Those

four items are important for bankers as they need it in order to assess the level of profit of that sector, so that they spread their payoff based on it.

A good banker needs to know the total production in order to predict the size of credits that he can grant for each year. Bankers need the value of added value of each year in order to see if the farmers cannot default in the payment of their payoff. Finally, they need to know the quantity imported in order to know if that sector has potential customers abroad in order to mitigate exchange risk and market risk.

Table 3.3: Aggregate Accounts of Agricultural Sector

AGGREGATE ACCOUNT OF AGRICULTURAL SECTOR (thousand FCFA)					
Years	1993-1994	1995-1996	1997-1998	1999-2000	2001-2002
total production	1 312 600	1 772 100	2 114 000	2 363 000	2 681 000
added value	1 156 580	1 504 810	1 845 350	1 996 540	2 285 880
exportation	194 700	228 030	223 200	220 030	232 170
abstract added value	1 052 410	1 390 500	1 667 400	1 853 890	2 141 460

Source: *FAOSAT 2015*

According to the graph below, total production is represented in blue, added value in red, exportation in green and abstract added value in purple. All the values in this table will be multiplied by 1,000 FCFA. In x-axis 1, 2, 3, 4 and 5 represent respectively the intervals from the year 1993-1994, 1995-1996, 1997-1998, 1999-2000, 2001-2002. The y-axis represents each value in FCFA. According to this figure, three items which are total production, added value, and abstract added value are increasing considerably during the years 1993 till 2002 whereas there is a slight increase of exportation.

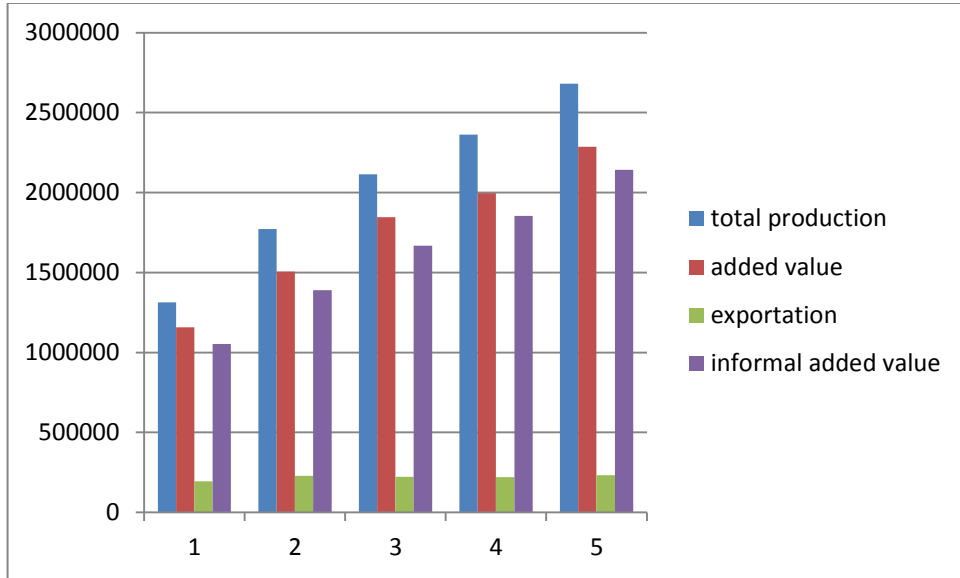


Figure 3.4: Aggregate Account of Agricultural Sector
Source: FAOSAT 2015

Chapter 4

METHODOLOGY

4.1 Data and Sources

Data which will be used to lead this research come from World Development indicators. These times series data cover the period of 1965 to 2014. The two variables that will be studied in this research are the domestic credits to the private sector as the independent variable (DS) and agriculture added value (AVA) as the dependent variable.

4.2 Model Specification

The main objective of this research is to figure out the impact of commercial banks credit on the development of agriculture in Cameroon. Since we already defined the aim of this research, it will be assumed that added value of agriculture (AVA) will be a function DC (domestic credits).

$$AVA_t = f(DC_t) \quad (1)$$

From the equation (1), we have the following equation:

$$AVA_t = \alpha + \beta DC_t + \varepsilon_t \quad (2)$$

By introducing the natural log, the equation (2) will become as following:

$$\ln AVA_t = C + \beta \ln DC_t + \varepsilon_t \quad (3)$$

From the third equation, C is a constant or intercept, therefore if DC is equal to zero, AVA will be equal to C; ε_t is the error term. That error term is supposed to be

independent and normally distributed with the mean equal to zero and the variance constant.

4.3 Methodology

In this section, four steps will be undertaken. The first step will be unit root test, the second step is Johansen co-integration test, the third step will be vector error correction model, and the final step is the causality test.

4.3.1 Unit Root Test

It is important to notice that before running the unit root test concerning the stationary level of our variables, our data will be transformed into logarithm form before any analysis procedures. The main feature of time series is that they are not stable. And this research, we are going to run the unit root test in order to make those variables more stable.

In order to scrutinize long run relationship through co-integration, the unit roots test will be done firstly (Dickey and Fuller, 1981; Phillips and Peron, 1988). Augmented Dickey Fuller and Philipp Peron in the case of this research will be done in order to proceed with the unit roots test, and to find out whether our variables are stationary or not. ADF and PP both has as null hypothesis that our two series are non-stationary.

The rule in this stage is that the Prob-value should be lower than 1% or 5%. Therefore if the Prob value is lower it means that our variables are stationary. If not it means that our variables are not stationary. That is:

$$\Delta Y_t = C + \alpha Y_t - 1 + a_2 J + \sum_2^q \beta \Delta Y_{t-i-1} + \varepsilon_t \quad (4)$$

Where Y is our two variables; J is the bustle; C is the intercept; ε_t is the white noise error term and q = the lag level.

4.3.2 Johansen Co-integration Test

Akaike Info criterion (AIC) will be chosen to make sure that the different error terms are white noise, meaning that are not correlated and are normally distributed. Referring to co-integration, the F statistic will be used to figure out whether or not there is a co-integration relationship between those two variables. If the F-statistic computed is more than the critical value, we can conclude the rejection of the null hypothesis. But if F-statistic is smaller than the critical value, it will be the result of an absence of the long-run relationship amongst the dependent variable (AVA) and the independent variable (DC). Johansen co-integration test is represented by this following equation:

$$X_t = \Pi_1 X_{t-1} + \dots + \Pi_k X_{t-k} + \mu + \varepsilon_t \quad (5)$$

Where $X_t, X_{t-1}, \dots, X_{t-k}$ are vectors of level and lagged values of P variables respectively which are I(1) in the model; Π_1, \dots, Π_k are coefficient matrices with (PXP) dimensions; μ is an intercept. The number of lagged values is determined by the assumption that error terms are not auto-correlated. The rank of Π is the number of co-integrating vectors (i.e. r) which is determined by testing whether its Eigen values (λ_i) are statistically significant.

The trace statistic (λ_{trace}) can be computed by the following formula 6:

$$\lambda_{trace} = -T \sum \ln(1 - \lambda_i) \quad (6)$$

$i = r+1, \dots, n-1$ and the null hypotheses are:

$$H_0: v = 0$$

$$H_1: v \geq 1$$

H0: $v \leq 1$

H1: $v \geq 2$

H0: $v \leq 2$

H1: $v \geq 3$

An existence of a long-term relationship between the two variables through co-integration test will lead us to the next stage of this analysis which will consist of estimating short run and long run relationship between parameters is allowed through vector error correction model (VECM).

4.3.3 Vector Error Correction Model

The VECM test shows the speed of adjustment to the long-run equilibrium following a short run shock. It is also figuring out the short run relationship and the long run relationship between our two variables. At this stage, before running the vector error correction model, the lag length has to be estimated in order to know which lag can be used to maximize our results.

After co-integration test, vector error correction model will be applied in order to see if the model is working very well, and to see the speed of adjustment between those two variables through the short run relationship. The long-run relationship will allow us to estimate the coefficient our regression model by the following equation:

$$\Delta \ln AVA = \beta_0 + \sum_{i=1}^n \beta_1 \Delta \ln AVA_{t-j} + \sum_{i=0}^n \beta_2 \Delta \ln DC_{t-j} + \beta_3 \varepsilon_{t-1} + \mu_t \quad (7)$$

Where Δ represents the fluctuation between our two variables (DC and AVA) and ε_{t-1} is the lag error term spread on one period.

4.3.4 Granger Causality Test

And finally, Granger causality test will be done in order to see the direction of the causality and to see whether that direction is unidirectional or bidirectional. Here the rule will be: if the Prob-value is lower than 5%, it means that one variable Granger causes the other variables. If this rule is applied in two or more cases it means that our variables are bidirectional or multidirectional. Granger causality is explained by the following equations:

$$\Delta \ln Y_t = C_0 + \sum_{i=1}^k \beta_i \Delta \ln Y_{t-1} + \sum_{i=1}^k \alpha_i \Delta \ln X_{t-i} + \rho ECT_{t-1} + \mu_t \quad (8)$$

$$\Delta \ln X_t = C_0 + \sum_{i=1}^k \gamma_i \Delta \ln X_{t-1} + \sum_{i=1}^k \delta_i \Delta \ln X_{t-i} + \theta ECT_{t-1} + \varepsilon_t \quad (9)$$

Where Y and X are series of consideration, and ρ and θ are the coefficients of ECT_{t-1} that denotes the error correction term in both models, Δ indicates the first difference of the variables.

Chapter 5

DATA ANALYSIS AND RESULTS

5.1 Correlation between Variables

This first session scrutinizes the level of correlation between the variables. As stated in the fourth chapter, the data that will be used are annual times series data from the years 1965 to 2014. As stated in the previous chapter, the dependent variable is AVA (agriculture added value) and the independent variable is DC (domestic credits allocated by private banks). The table below is the correlation matrix between the two variables. It shows that the correlation between the dependent and the independent variable is slightly low because it is less than 50%. Since we have only one independent variable, it means that the assumption of the classical linear model is not questioning out.

Table 5.1: Correlation Matrix of Variables

	GDP	AVA
GDP	1	
AVA	-0.4336	1

5.2 Unit Root Test

Whatever the methodology, it is compulsory to check whether the variables are stationary or not. Therefore, the unit root test will be run in order to determine the level of integration of each variable. This step is really crucial because it is during

this step that the knowledge whether the variable is integrated at the level or at the first difference according to Pesaran et al. (2001).

Figures 5.1 and 5.2 represent the graphs of the two variables (LNAVA and LNDC) respectively. But, since it is not possible to rely on the graphs to decide whether those two variables are stationary or not, table 5.2 will be introduced below in order to determine the level of stationarity.

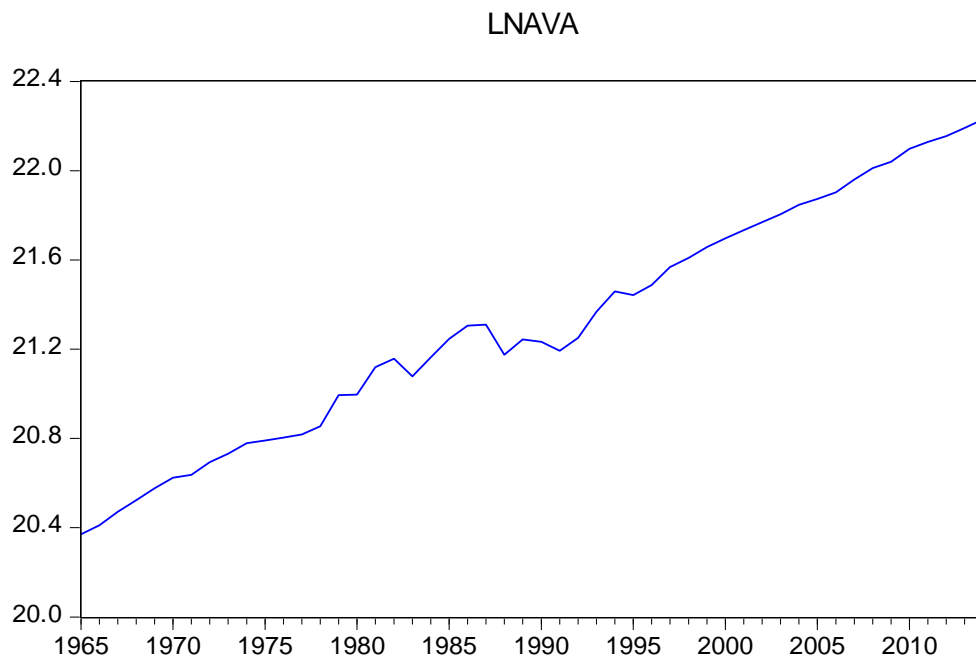


Figure 5.2: Lndc Graph

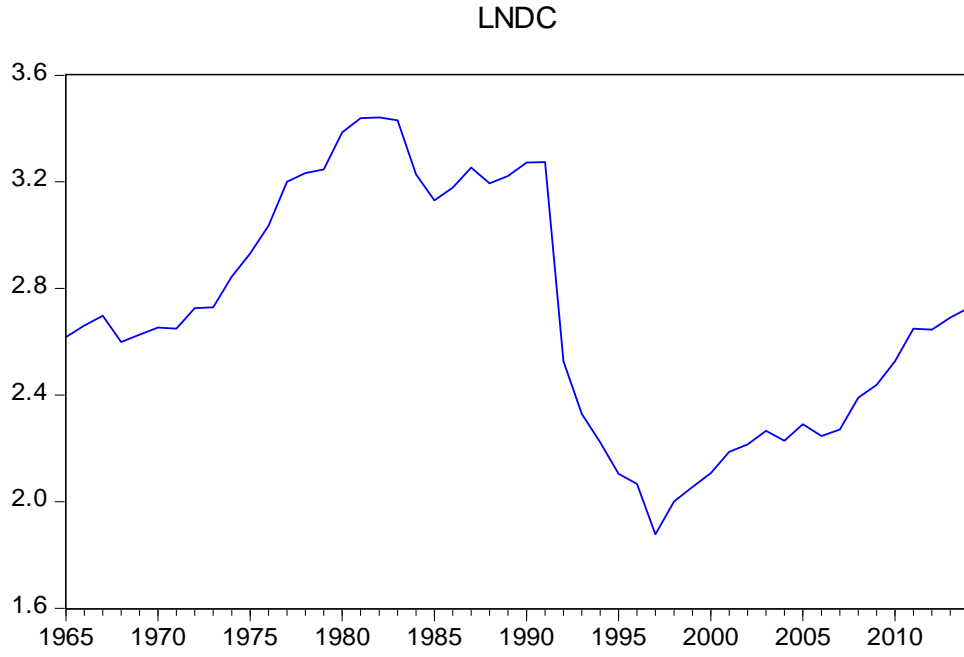


Figure 5.2: Lndc Graph

Table 5.2: ADF and PP Approaches for Unit Root Test

at level I(0)	t-statistic of lndc	lag length	t-statistic of lnava	Lag length
τ_T (ADF)	-1.605465	1	-2.838930	0
τ_μ (ADF)	-1.406871	1	-0.420301	0
τ (ADF)	-0.183448	1	5.869685	0
τ_T (PP)	-1.657919	4	-2.914934	1
τ_μ (PP)	-1.429116	4	-0.392464	4
τ (PP)	-0.150605	4	7.183307	4
at first difference I(1)	t-statistic of dlndc	lag length	t-statistic of dlnava	Lag length
τ_T (ADF)	-4.954766*	0	-7.057322*	0
τ_μ (ADF)	-5.011509*	0	-7.133170*	0
τ (ADF)	-5.065342*	0	-4.569955*	0
τ_T (PP)	-4.953481*	2	-7.267527*	4
τ_μ (PP)	-5.010319*	2	-7.176684*	4
τ (PP)	-5.064129*	2	-4.694676*	4

τ_T , τ_μ , τ are the symbol of stationary respectively with trends and intercept, with intercept and none
*denote the rejection of the null hypothesis at 1% level of significance.

ADF and PP are testing the same following hypothesis: null hypothesis is lngdc has a unit root, Lnava has a unit root or those variables are not stationary.

The decision rule here is that the respective statistics hypotheses should be the lowest values amongst all the values generated or the Prob-values generated by the software should be less than 1%, 5%, and 10%. And according to the result of the software, the values inside the first case were not the smallest amongst all the values generated by the software. And according to table 5.2, the Prob-values generated the software were not less than the interval of confidence 1%, 5% and 10%. Therefore, the conclusion is that the two variables are not stationary at level.

The unit root test will be done this time at the first difference. If it works, the second difference unit root test will not be needed. So the table 5.2 is giving the results of first difference unit root test.

According to this table 5.2 above, the conclusion is that the two parameters are stationary at first difference. ADF test stated that the variables are stationary at first difference with lag length equal to zero. PP test states that the variables are stationary with lag length equal to two. And since the two variables are stationary at first difference, it means that the test of second difference cannot be run. Therefore neither agriculture added value nor private credits are stationary at the second difference. Since those two variables are not stationary at the second difference and the long-run relationship has to be reestablished by co-integration test between the two variables.

5.3 Johansen Co-integration Test

It is important to find out whether the two variables are co-integrated or not. The guideline of the co-integration test is that the trace statistic should be bigger than the critical value at 5% and at 1% respectively. And according to the table 5.3, the trace value (25.88694) at none is bigger than the critical value at 1% and 5% which are respectively 19.96 and 24.26 meaning that null hypothesis is rejected. Therefore, there is long-run relationship between the variables which is illustrated in table 5.3.

Table 5.3: Tables of Co-integration Outcome

Hypothesized		Trace	5 Percent	1 Percent
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Critical Value
None **	0.392358	25.88694	19.96	24.6
At most 1	0.040308	1.974844	9.24	12.97

**denote the rejection of the null hypothesis at 1% and 5% levels of significance.

None has as the null hypothesis: there is no co-integration between variables. At most one has as the null hypothesis: there is co-integration between variables.

5.4 Lag Length Structure

The next step after proving that there is a long-run relationship between agriculture value added and domestic credit to the private sector will consist of searching for the lag length structure, in order to know the lag to use in vector error correction model. The guideline of the lag length structure is that Akaike information criteria should be the lowest value in order to have the best model in vector error correction model. The first assumption in running the test of lag length is that those two variables are not co-integrated, so that unrestricted VAR test will be run to find the lag length.

Table 5.4: Lag Length According to Akaike Information Criteria

Lag length	AIC
0	2.419816
1	-4.221296
2	-4.340628
3	-4.289225
4	-4.405790*

According to table 5.4, lag 4 has the best model since it is the lowest value. Now, the next step will be to run vector error correction model in order to determine the long-term and the short-term coefficient of the model.

5.5 Vector Error Correction Model

Table 5.5 is the vector error correction test modeled out with four as lag. In this table, there are results of a long-run and short-run relationship between our two variables. The first eight rows are long-run relationship, whereas the remaining rows are short-run relationship outcome. By selecting on the vector error correction model, the two variables are becoming D(LNDC) and D(LNAVA). And each variable is represented till lag 4 as the table above is showing.

Some variables are presented in three lines and each line has a meaning. The first line is the coefficient value, the second line is the standard error correction model and the third line is t- statistic value. The guideline for the short-run coefficient to be accepted is that the coefficient value must be negative and significant. In this specific case, the long-run relationship coefficient value is positive (2.079074) and is significant (1.82989) which is good. In the case of the short run relationship, the coefficient value is negative (-0.010817). However, the first column is significant (-3.52733) according to the law of thumb which stated that if the t-statistic value is

close or bigger than 2 the coefficient is significant. The table below shows that in short run, agriculture added value is 1.0817%, negative, and statistically significant at $\alpha=1\%$. 0.010817 shows that short run values of agriculture added value converge to its long-run equilibrium level by 1.0817% speed of adjustment every year by the contribution of domestic credits.

Table 5.5: Vector Error Correction Model Outcome

Long run relationship	co -integration Equation	co - integration statistics	standard error	t-statistics
	LNAVA(-1)	1		
	LNDC(-1)	2.079074	-1.13618	1.82989*
	C	-31.56412	-3.44789	-9.15463*
Short run relationship	Error Correction (DLNAVA)			
	Speed of adjustment	-0.010817	-0.00307	-3.52733*
lagged variables				
	D(LNAVA(-1))	-0.179768	-0.15298	-1.17507
	D(LNAVA(-2))	-0.075486	-0.15461	-0.48822
	D(LNAVA(-3))	0.205299	-0.15585	1.31728
	D(LNAVA(-4))	0.205299	-0.1537	-1.61879
	D(LNDC(-1))	-0.138716	-0.05238	-2.64837*
	D(LNDC(-2))	-0.049275	-0.0545	-0.90419
	D(LNDC(-3))	0.113352	-0.05289	2.14332*
	D(LNDC(-4))	0.070706	-0.05297	1.33488
	R-squared	0.366446		
	Adj. R-squared	0.225656		
	Sum sq. resids	0.061179		
	S.E. equation	0.041224		
	F-statistic	2.602787		
	Log likelihood	84.66162		
	Akaike AIC	-3.362739		
	Schwarz SC	-3.001406		
	Mean dependent	0.036761		
	S.D. dependent	0.046847		
	Determinant resid covariance (dof adj)	2.35E-05		
	Determinant resid covariance	1.50E-05		
	Log likelihood	122.1809		
	Akaike information criterion	-4.496931		
	Schwarz criterion	-3.653822		

*denote the rejection of the null hypothesis at 5% level of significance

5.6 Granger Causality Tests

Under VECM test, Granger causality is optimal and empower the researcher to discover the link between two variables, and to settle whether those variables are bidirectional or unidirectional. The Granger causality test in the case of this research will be applied under Block Exogeneity Approach. The non-causality between

variables will be defined as the null hypothesis. As stated in the previous chapter, AIC is reliable to choose the maximum lag length which will give the optimal results.

The Prob-values (1.4% and 0.04%) generated in table 5.6 shows us that those values are less than 5%, thus the null hypothesis will be rejected. Because the null hypothesis is rejected in all the cases, it means that there is a bidirectional causality running from agriculture added value to domestic credits to the private sector and from domestic credits to private sectors to agriculture added value.

Table 5.6: Granger Causality Test Outcome

Dependent variable: D(LNAVA)				
	Excluded	Chi-sq	df	Prob.
	D(LNDC)	12.50759	4	0.014*
	All	12.50759	4	0.014*
Dependent variable: D(LNDC)				
	Excluded	Chi-sq	df	Prob.
	D(LNAVA)	20.48465	4	0.0004*
	All	20.48465	4	0.0004*

*denote the rejection of the null hypothesis at 5% level of significance

Chapter 6

CONCLUSION, SUGGESTIONS, AND RECOMMENDATIONS

6.1 Conclusion

The assessment of the domestic credits to the private sector and its impact on the agriculture added value in Cameroon was the main thrust of this research. Moreover, the main objective of this thesis was to find out if the development of banking sector has an influence on the development of agriculture from 1965 to 2014 by employing econometric methods.

In order to explain the development of agriculture during the targeted period, our model has retained, in the case of this research, the development of banking sector through private credits. Some research has been done previously with the use of analytical data techniques to scrutinize and find out the properties of times series data. Then the estimation of the model has been done in order to check the short term and long term coefficient and their significance.

The empirical results through unit root test, co-integration test, vector error correction model and Granger causality have tried to figure out the link between the agriculture added value and domestic credits to the private sector. The model was good because it established that there is a long and short run relationship between variables.

The bidirectional relationship between those variables lead us to conclude that banking sector can foster the development of agriculture by making farmer be more efficient and agriculture can foster the development of banking sector by reducing the level of credit risks

6.2 Suggestions and Recommendations

According to the results obtained in this research, the first recommendation is that the Cameroonian Government should have more implication in financing agriculture by reducing the interest rate applied to farmers, since Cameroon has the natural resources and the available workforce. Rather than engaging into new computers purchase which does not have any impact in regressing poverty level or increasing the Cameroonian GDP, the Government should invest in the acquisition of machineries which can ease the work of farmers, and invest more in development research to optimize farmers' productivity. Cameroonian Government should also try to create a reliable farmers' database to allow financial institutions locating them easily. Finally, the Government should have some shares in each bank's structure in order to try to favor the farmers by creating some smaller structures which can ease the process of collecting the payment.

It can be advised that banks should also employ agronomist engineers, who can be able to monitor the farmer work and advise them to make them becoming more efficient. Banks should also employ engineers so that they should teach the farmers how to use fertilizers and advanced technologies to increase the crops and harvests. Banks should also reduce their interest rate when they give credits to the farmer in order to reduce the level of uncertainty in the payment of their annuity. The

government, should, therefore, reduce the taxes on bank so that they will be able to give credits a lower rate.

Moreover, universities should train more engineers to create some technologies to ease the farmer's work. Consequently, the Government should guide the sector and the education system in order to enhance the development of agriculture. Furthermore, the Cameroonian Government may really consider investing on transportation infrastructures. In some cases, raw goods get deteriorated when they reach transformation centers in urban areas. This is due to the extended time spent in transferring them from rural to urban places with extremely impracticable road network in the country.

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