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ISTANBUL GELISIM UNIVERSITY
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Department of Economics and Finance

RE-EXAMINING THE RELATIONSHIP BETWEEN BANKING EFFICIENCY AND ECONOMIC GROWTH: EVIDENCE FROM CAMEROON

Master Thesis

Ulrich Donve TIAMGNE

Supervisor

Asst. Prof. Dr. Edmund Ntom UDEMBA

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Ulrich Donve TIAMGNE

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DECLARATION

I hereby declare that thesis is my own original work with the exception of specific sources which are acknowledged throughout and referenced according to the established scientific rules. The data used in this study is not biased and I further declare that this thesis has not previously been submitted, and will not be presented to any other University for any other degree.

Ulrich Donve TIAMGNE

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The thesis study of Ulrich Donve TIAMGNE titled as Re-examining the relationship between banking efficiency and economic growth: evidence from Cameroon, has been accepted as MASTER THESIS in the department of Economics and Finance by the jury.

Director   *Asst.Prof. Dr. Edmund Ntom Udemba*
(Supervisor)

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Asst.Prof. Dr. Ebru Gul Yilmaz

Member
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SUMMARY

This study is conducted to explore the extent of the relationship between banking efficiency and economic growth in Cameroon using time series data from 2000 to 2019. The urgent need to carry out this investigation stem from the fact that banking sector efficiency contributes to a significant share of financial development and economic growth in Cameroon while the capital market is less developed. We use GDP as dependent variable and three explanatory variables (ROA, ROE and NIM,) and a control variable (RGQ). In the purpose of carrying out our main estimation, the study uses the FMOLS estimation techniques. The unit root test employed in this study is the Augmented Dicker Fuller (ADF) and Phillips-Perron (PP) unit root test to check the stationarity of the parameters and the Johansen cointegration test was carried out to check the cointegration among the variables. Therefore, the banking sector is more important in Cameroon than in developed nations because the health of the financial system in this region rely on the efficiency level of banking institutions. The results reveal that banking efficiency has a significant positive long run relationship with economic growth in Cameroon over the period under review. Further outcome suggest that a unit change in ROA ratio account for 1.23% positive change in economic growth through the effect on GDP with. Also, a percentage increase in ROE causes a 0.096% increase in GDP. The findings further suggest a positive long run relationship that exist between NIM and GDP (2.33% increase in GDP when NIM increases by 1 unit) and an improvement in RGQ causes a 0.56% increase in GDP. These results were confirmed in the robustness checks by using the same variables on a different empirical approach (DOLS technique). We also carried VAR granger causality test and the results revealed a unidirectional relationship between ROA and GDP and between ROE and GDP. Similar causality was also found between NIM and GDP and between RGQ and GDP. These results are consistent with prior studies and confirm the two theories that are employed to support this study (agency theory and neoclassical theory). The study concludes with policy recommendations to the government and other stakeholders and suggestions for future studies.

Keywords: banking efficiency, economic growth, Cameroon

ÖZET

Bu çalışma, Kamerun'da bankacılık verimliliği ile ekonomik büyüme arasındaki ilişkinin boyutunu 2000'den 2019'a kadar olan zaman serisi verileri kullanılarak araştırmak için yapılmıştır. Kamerun'da finansal gelişme ve ekonomik büyüme olurken, sermaye piyasası daha az gelişmiştir. GSYİH'yı bağımlı değişken ve üç açıklayıcı değişken (ROA, ROE ve NIM) ve bir kontrol değişkeni (RGQ) olarak kullanıyoruz. Ana tahminimizi gerçekleştirmek amacıyla, çalışmada FMOLS tahmin teknikleri kullanılmaktadır. Bu çalışmada kullanılan birim kök testi, parametrelerin durağanlığını kontrol etmek için Augmented Dicker Fuller (ADF) ve Phillips-Perron (PP) birim kök testi ve değişkenler arasındaki eşbütünleşmeyi kontrol etmek için Johansen eşbütünleşme testi yapılmıştır. Bu nedenle, Kamerun'da bankacılık sektörü gelişmiş ülkelere göre daha önemlidir çünkü bu bölgedeki finansal sistemin sağlığı bankacılık kurumlarının verimlilik düzeyine bağlıdır. Sonuçlar, incelenen dönemde Kamerun'da bankacılık etkinliğinin ekonomik büyüme ile önemli bir pozitif uzun vadeli ilişkiye sahip olduğunu ortaya koymaktadır. Diğer bir sonuç, ROA oranındaki bir birim değişikliğin, GSYİH üzerindeki etkisiyle ekonomik büyümedeki %1,23'lük pozitif değişimi açıkladığını göstermektedir. Ayrıca, ROE'deki yüzdesel bir artış, GSYİH'da %0,096'lık bir artışa neden olur. Bulgular ayrıca, NIM ile GSYİH arasında uzun vadeli pozitif bir ilişki olduğunu (NIM 1 birim arttığında GSYİH'de %2,33 artış) ve İEK Q'daki bir iyileşmenin GSYİH'da %0,56'lık bir artışa neden olduğunu göstermektedir. Bu sonuçlar, farklı bir ampirik yaklaşımda (DOLS tekniği) aynı değişkenler kullanılarak sağlamlık kontrollerinde doğrulandı. Ayrıca VAR granger nedensellik testi yaptık ve sonuçlar ROA ile GSYİH arasında ve ROE ile GSYİH arasında tek yönlü bir ilişki olduğunu ortaya koydu. NIM ile GSYİH arasında ve RGQ ile GSYİH arasında da benzer bir nedensellik bulundu. Bu sonuçlar önceki çalışmalarla tutarlıdır ve bu çalışmayı desteklemek için kullanılan iki teoriyi (vekillik teorisi ve neoklasik teori) doğrulamaktadır. Çalışma, hükümete ve diğer paydaşlara politika önerileri ve gelecekteki çalışmalar için önerilerle sona ermektedir.

Anahtar kelimeler: bankacılık verimliliği, ekonomik büyüme, Kamerun

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ABBREVIATIONS

RGQ	**:**	Regulatory quality
FMOLS	**:**	Fully Modified Ordinary Least Square
WDI	**:**	World Development Indicators
SSA	**:**	Sub-Saharan Africa
NIM	**:**	Bank's Net Interest Margin
ROA	**:**	Return on Assets
ROE	**:**	Return on Equity
GDP	**:**	Gross Domestic Product
COBAC	**:**	Central African Banking Commission
BEAC	**:**	Bank of Central African States
DOLS	**:**	Dynamic Ordinary Least Square
VAR	**:**	Vector Auto regression
MENA	**:**	Middle East and North Africa
OLS	**:**	Ordinary Least Square
IMF	**:**	International Monetary Fund
GFC	**:**	Global Financial Crisis
HDX	**:**	Humanitarian Data Exchange
PP	**:**	Phillips-Perron
ADF	**:**	Augmented Dicker Fuller

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CHAPTER ONE

INTRODUCTION

1.0 INTRODUCTION OF STUDY

The banking system is considered to be one of the strategic pillars of the financial system across the globe. It contributes to a significant share of the economic growth in both developed and developing countries (Al-Harbi, 2019). The World Bank's report published in 2018 on the World Development Indicators (WDI) shows that the financial sector support to economic growth increased from 140.6% (145.2%) in 1990 to 184.1% (241.9%) in 2016 across the globe. Thus justifying the particular interest paid to this sector by policy-makers scholars and other stakeholders over time (Ye & Zhao, 2019). There has been a significant escalation in banking operations and some major financial renovations over the past few decades across the globe. This resulted to globalization and integration of the financial sector across the world (Kumar *et al.* 2020). The key objective of these renovations was to enhance the efficiency of the banking sector in particular and financial markets in general (Delis, 2012).

A sound operational banking system is unarguably vital for the financial stability in the economy. Moreover with the advent of the consolidation and integration of financial services, inefficiency of the banking system in a country will not only adversely affect economic stability in that area but will more likely have spillover effect to the global financial system (Ye & Zhao, 2019). For instance, the 2007-2009 global financial crisis (GFC) which led to the bankruptcy of one of the biggest banks in the United State of America (USA) banks spillover across other parts of the world. This explains why a functioning financial system is critical to a robust economy, and by extension the financial system is the most secured system in the world (Brei *et al.,* 2020b). Ever since the outbreak of this global financial crisis, the issue of financial system stability has been an area of keen attention by policymakers and scholars (Berger & Hannan, 1998; Claessens & Laeven, 2003; Raddatz, 2006; Levin, 2005; Ahamed *et al.*, 2021).

A well-operational banking structure is crucial for economic stability and hence economic growth especially in the developing nations where the financial markets are inefficiently operational (Dwumfour, 2017). Some authors also argue that a well-regulated and oversight

financial system and a conducive banking environment also contributes to the enhancement of banks efficiency and therefore translate to the improvement of the GDP (Owusu & Odhiambo, 2014; Jayakumar *et al.,* 2018; Ahamed *et al.*, 2021). The Central bank and other supervisory bodies have as principal duty the monitoring of the banking system so as to ensure it stability and performance. To achieve this, some requirements are usually imposed on commercial banks like the capital adequacy ratio, and bank reserves to protect the financial system and achieving macroeconomic equilibrium. Although the profitability of banks is a key macroeconomic signal of the health of the global financial system which is directly connected to the economic growth rate in any given economy, studies on banking efficiency-economic growth nexus in Cameroon is relatively scarce in the extant works.

Banking institutions are considered to be the dominant industry of the financial system due to the bundle of services they offer. Banking efficiency is thus very vital for sustained economic growth. A good example is the bancassurance which is a French base system that allows banks to provide insurance products (Bui, 2019a). Commercial banks, which are being considered in this context accept deposits from their clients or depositors and channel these funds to borrowers and investors. This means that the quantity of liquidity or money supply in circulation depends on the amount of credit creation by these financial institutions which are controlled by the central bank through the monetary policy. Likewise, banks in their main role as financial intermediaries help to mitigate the risk of asymmetric problem in the economy by creating an avenue between fund lenders and fund borrowers. Such relationship is essential for good rating investment ventures thereby limiting information gap between both parties (Berger and Humphrey, 1993). This prudent management of banking institutions is very essential because it significantly determine the economic growth level in every economy.

Most banks to enhance efficiency, invest in financial securities and financial derivatives especially those in countries of the Nord where the capital or financial market is highly developed (Sarpong-Kumankoma *et al.*, 2020). It is important to recall that the main mission of any commercial bank is to maximize the shareholder's wealth. To this end, assessing the efficiency of banking establishments is an essential prerogative of financial managers which is done periodically so as to appraise the operating efficiency of these institutions. The financial statements presented at the end of the appraising process provide a picture to regulatory authority of the health of the global financial system. Because the inefficient running of these banks (low profitability and liquidity) might lead to banking failure and crisis as was the case with the world financial tsunamis which started in USA with the breakdown

of the banking system that will seriously affect economic growth in the economy (Hakenes *et al.*, 2015). This explains why credit is been accorded by policymakers and scholars on the nexus between banking efficiency and economy growth as the profitability or stability of banking institutions is very crucial for economy growth and development (Barth *et al.*, 2000).

The desire to achieve economic growth through the contribution of banking activities development has attracted much attention in recent years. There have been more oversights of the financial institutions in general to ensure efficient allocation of resources especially in the banking sector so as to maintain a robust financial system and enhance economic growth (Swamy & Dharani 2019). Banks play the role of financial intermediation in the economy by channeling funds from surplus units and lending them to deficit units. Banking institutions as financial intermediaries tend to mitigate moral hazard and adverse selection problem by gathering client records, identifying potential sound investments and providing all necessary information to prospective investors (Nyantakyi *et al.,* 2015). When there is disruption in the banking activities or financial system as a whole, economic growth will retaliate given that there will be a decline in investment due to the contraction of money supply in the economy. A stable economy with low level of unemployment, desirable level of inflation and high GDP growth denote objectives of every monetary policy. Banking efficiency is identified as the building rock for macroeconomic stability. Thus, the profitability of banks is vital for a sustained economic growth and stability in the economy (Dwumfour, 2017). This is because the dis-functioning of the banking sector will generate adverse effects in the financial system which might lead to subprime concern and economic or financial crisis in the economy.

Cameroon, a country located in central Africa seems to be a fertile ground for investigations on the performance of banking institutions because the financial markets which are the other constituent of the financial system are less efficient in this part of the globe. That means, the banking system represents a central pivot to the financial and economic growth in Cameroon compared to developed nations where the capital market which is sound and highly efficiently with the contribution of the banking system, significantly impact on the financial system robustness.

In carrying out investigations on the performance of banking institutions in Cameroon and other countries, most early scholars employed accounting ratios to measure banking efficiency and GDP (Gross domestic Product) to measure economic growth level (Sheefeni, 2015; Mulchandani & Totala, 2016; Aguenaou *et al.,* 2017; Sari & Saraswati, 2017; Aluko &

Ajayi, 2018; Bui, 2019; Kumar & Bird, 2020; Banto & Monsia, 2021). For instance, Boyd *et al.,* (2001) argue that there exists a negative connection between banking sector efficiency and economic growth. He argued that, economic instability tends to reduce financial efficiency in the economy and this therefore has a direct impact on economic growth. Sheefeni, 2015 carried out an analysis in selected commercial banks in Namibia and the findings revealed banking efficiency does not have any remarkable connection with inflation level (determinant of stability) in the economy and therefore banking efficiency and economic growth should perhaps be analyzed using different parameters in order to compare the outcome of the investigation. Checking the extent of the relationship between banking efficiency and economic growth in Cameroon is still of vital importance in current era.

1.1 OVERVIEW OF THE BANKING SYSTEM IN CAMEROON

The study provides in this segment, an overview of the banking institutions and financial development in Cameroon. Cameroon is located in the central African region and shares its borders with some important countries. Cameroon is bordered with Nigeria from the Northwest, with Chad from the Northeast, with Central African Republic from the East, Equatorial Guinea and Gabon from the South, and the Republic of Congo from the Southeast. Cameroon is also a member country of the Sub Saharan African (SSA) zone. It population is estimated to be 26.5 million in 2020 (World Bank Data, 2022).

Cameroon is a member of some important economic and financial blocks in the Central African Sub region. It is a member for instance of the Economic and Monetary Community of the Central African Sates (CEMAC) with a unique central bank that supervises the activities of all banking and financial institutions present in the member states (Isoh, 2020). This central bank is called Bank of Central African States (BEAC) with headquarters being in Yaoundé. The central bank supervises the activities of Commercial banks, non-financial institutions, postal banks (CAMPOST), insurance companies and Douala Stock Exchange. BEAC is the unique central bank of six member states which are; Cameroon, Equatorial Guinea, Gabon, Chad, Central African Republic and the Republic of Congo. BEAC created an institutional body in October 1990 called Central African Banking Commission (COBAC), which acts as the supervisory body and enacts laws that govern the banking system in this region (Njimanted *et al.* 2017). The Central Banks theoretically perform their duties without any government intervention, but in practice it is observed they work hand in glove with the Ministries of Finance of their States as part of the macroeconomic policies of the central governments are implemented by them (African Development Bank-AFDB, 2006).

The number of banks significantly increased from 8 to 15 between 1995 and 2017 with Credit Communautaire d'Afrique (CCA) acquiring commercial bank status. These banks are made up of domestic banks and foreign banks. In 2007, ownership of banking institutions in Cameroon was estimated at about 9.8% for Public banks, 33.3% for national banks and 56.9% for foreign banks (Akon, 2008). The banking industry in Cameroon contributes to a significant share of the financial sector. In 2005, it accounted for around 85% of the financial sector's total assets. This contributed to 19.6% of the GDP. Though the financial system is still less developed in Cameroon, it is the dominant financial system in the CEMAC zone with a contribution of about 55% of the financial assets in CEMAC zone in 2005 (Puatwoe & Piabuo, 2017).

However, some elements have been identified which are presumed to contributes to the slow development of the banking and financial system in Cameroon. The narrow amount of financial instruments is one of the main handicaps to the financial system in Cameroon. Added to this, is the less developed capital market. The financial system in Cameroon like many sub-Saharan African countries (SSA) is mainly dominated by the Banking sector because other financial structures (like debt market, equity market or derivative market) that constitute this financial system are either less developed or almost nonoperational (Kumar *et al.*, 2020). The banking industry in Cameroon has struggled to significantly contribute to economic growth in the economy due to the narrow rate of financial inclusion (IMF, 2009). Most of the loans they grant are short term loans and only few wealthy individuals can have access to these loans because they are considered credit worthy borrowers. A great proportion of the Cameroonian population has limited access to financial services and the cost of borrowing is generally so high which discourages potential investors from getting the loan. This makes financial inclusion difficult given that the financial services of these banks are not fully benefited by ordinary Cameroonians. Also, the activities of banks have being reduced to the traditional banking function of short term lending representing around 87.3% of loans granted to borrowers in 1995 (IMF, 2007).

We speculate as well that the huge operating cost of banks in Cameroon could partly be the result of external forces (such as weak institutions and corruption) that are unrelated to banking structures. When business regulations and procedures are ineffective in a particular environment, financial institutions in general will more likely incur substantial day-to-day operational expenses (Altunbas and Molyneux (2001)). The banking and nonbanking institutions in Cameroon, is being believed to be generally characterized by disorganized

overall business environment and legal institutions, and relatively weak public structures such as electricity deficiency that renders banking establishment to operate efficiently as compared to advanced countries where the banking institutions operate more efficiently because of a favorable banking environment (Spong, Sullivan and Young, 1995). Given that banking institutions contribute to a substantial share Cameroonian Banks like that of most economies across the continent, exploring the efficiency of these institutions is unarguably vital because their profitability which stimulates financial development has a great influence on the economic stability and growth in their respective economies (Levine, 2005).

1.2 PROBLEM STATEMENT

As stated in the previous sections, banking institutions represent a key or most important pillar of the financial system. As established in banking literature, the main aim of every commercial bank is to maximize the wealth of its shareholders by minimizing cost and maximizing profit (operating efficiently). Debt and stock markets which significantly contributes to the financial development of most developed nations are less efficient in many African countries especially Cameroon. Hence, the banking sector is more important in Cameroon than in developed nations because the health of the financial system in this region rely on the efficiency level of banking institutions. But the questions to be answered are; how efficient are banking institutions in Cameroon and whether there is any banking efficiency and economic growth nexus in Cameroon is yet to be established.

Previous literature have pointed out that efficiency is very crucial for banking system especially in developing countries like Cameroon where the capital market is less efficient (For more see; Akande, 2018). Furthermore, previous studies have established that, the impact of a sound banking system is essential for financial development and macroeconomic stability. Among other findings in previous studies are (Jayakumar *et al.,* 2018; Ahamed *et al.*, 2021), showed relationship between banking efficiency economic growth nexus especially for advanced nations. Other studies did not support banking efficiency-economic growth positive arguments. Perhaps, the divergent results could be as a result of different empirical methods or different parameters used to analyze banking efficiency.

Furthermore, banking industry represent the major portion of financial institutions in Cameroon and by extension could be considered as the engine room for economic growth (based on the literature review). Moreover, as established in previous sections that banking institutions serves as an engine for financial development, growth and stability in the economy, it is therefore extremely important to further explore the nexus between banking

efficiency and economic growth in Cameroon. To the best knowledge of the researcher, there were few or no empirical studies that measured banking efficiency in Cameroon by using return on asset (ROA), return on equity (ROE), net interest margin (NIM) of banking institutions and institutional quality. However, ROA, ROE, NIM and institutional quality (regulatory quality) are vital to ascertain banking efficiency in Cameroon. This shows the gap between theory and practice. In addition, previous studies measured the phenomenon up to 2017 only. Therefore, this study aims to extend the time covered to be over 2000-2019.

1.3 RESEARCH QUESTIONS

Based on the gaps stated in the problem statement above, the following research questions were developed;

i. Whether there is a nexus between banking efficiency and economy growth in Cameroon?

ii. Whether the assumed relationship between banking efficiency and economic growth in Cameroon can be empirically established?

1.4 RESEARCH OBJECTIVES

Based on the research questions stated above, the following research objectives were developed;

i. To theoretically establish the nexus between banking efficiency and economic growth in Cameroon.

ii. To empirically explore the extent of the nexus between banking efficiency and economic growth in Cameroon.

1.5 DEFINITION OF KEY VARİABLES

1.5.1 Banking Efficiency

Efficiency as a measurement of banking performance was first used by most early researchers in this field. Efficiency is used to evaluate the productivity of an entity's assets (Ramli & Hussin, 2017). Efficiency can otherwise be defined as the ability to generate maximum returns out of the lowest amount of input. A bank is considered to be efficient if it has the ability to generate the adequate profit by using its resources efficiently (Tzeremes, 2015). Banking efficiency in a nutshell captures the overall success or financial soundness of individual banks. Banking efficiency can be measured using return on asset, return on equity

or net interest margin. Efficient banking system helps to enhance the financial development in an economy and economic growth.

1.5.2 Economic Growth

Economic growth is considered as an increase in the production capacity of a country over a given period of time (Yakubu & Affoi 2014). Economic growth can also be considered as a real per capita income increase in a given economy over a period of time caused by financial development contribution or the growth and efficiency of the banking sector. When the economy grows at a moderate rate under low and stable inflation, the economy is economically stable. This means that for policy-makers to achieve the main objective of economic growth, the banking system in particular and financial system in general should be in good state. The efficient performance of banks greatly contributes to a robust financial system which is of utmost importance for economic growth, as most transactions in the economy are done through the banking system (Abrar *et al.* 2021).

1.6 SIGNIFICANCE OF THE RESEARCH

The banking system is assumed to be one of the key pillars of the financial system across the globe. Cameroon is not exempted from this general assumption because financial markets such as debt and stock markets are less efficient, therefore the failure of the banking system can generate a contagion effect in the global economy (Al-Harbi, 2019). This study therefore apart being a step for the researcher's educational career has the following immense contributions to the Cameroon banking system and economy at large. Specifically, it provides;

i.   Although (return on asset) ROA, (return on equity) ROE and (net interest margin) NIM have been used in other studies, this is the first time to the best knowledge of the author to use return on asset, return on equity, net interest margin and institutional quality in Cameroon to extend the knowledge of banking efficiency. This research therefore helps to close the gap in the extant banking literature by extending the knowledge of banking efficiency in Cameroon exploring it contribution to economic growth.

ii. Second, the study will have great importance to external investors and shareholders bank managers, lenders and policymakers in making informed decisions. This lead to better banking regulations in Sub Saharan Africa and Cameroon in particular.

iii. The study notably contributes to the extant literature by providing information on the banking efficiency in Cameroon for more recent years (2019).

iv. Lastly, the finding of this research would be useful in knowing the proportion of individuals patronizing the banking system in Cameroon and also assess the level of financial inclusion of banking and financial services.

1.7 ORGANIZATION OF CHAPTERS

This study is organized into the following five chapters;

1.7.1 Chapter One

Chapter one delivers a general introduction of the study for a better apprehension of banking efficiency and economic growth. This is followed by an overview of banking system in Cameroon. The problem statement is then addressed. Furthermore, research questions and objectives of the study are stated. We then move further with the definition of key variables; banking efficiency and economic growth. The significance of the study is then addressed to justify the current need of this investigation in Cameroon. Organization of chapters is the last section. The last section in chapter one end with the conclusion which summarizes everything mentioned in the chapter

1.7.2 Chapter Two

Chapter Two starts by introducing the importance of literature review in the research and spelled out the points to be discussed in the chapter. The theoretical framework is then stated. The agency theory and the neoclassical economic growth theory of Solow are used for this research. The next section is the discussion of the empirical literature by categorizing studies according to each variable used to ascertain banking efficiency. Furthermore, there is a discussion of other studies that used theoretical literature to study banking efficiency. Conceptual framework is next elaborated. Then we come with the conclusion of the chapter.

1.7.3 Chapter Three

Chapter three outlines the methodology of the research applied for analyzing the relationship between banking efficiency and economic growth in Cameroon over the period 2000-2019. The use of research methodology is highlighted at the introductory section of this chapter. This is followed by the research design. The description and sources of data is elaborated. This is followed by explanations of the dependent and explanatory variables. The next section

outlines the empirical investigations pertaining to the research. Under this section, the model specification and descriptive statistics are explained. This is followed by the correlation analysis. The Augmented Dicker Fuller (ADF) and Philips-Peron (PP) unit root method are identified. This is followed by the Johansen cointegration test. The Fully Modified Ordinary Least Square (FMOLS) is further used as for the main empirical investigations. The Dynamic Ordinary Least Square (DOLS) is later used for robustness check in the research. Granger causality test is last performed. The chapter ends with a conclusion.

1.7.4 Chapter Four

Chapter Four presents the results and analyses pertaining to this research work. The chapter starts with reporting and interpretation of the descriptive statistics results. This is followed by initial empirical investigations such as correlation analysis test, unit root test and cointegration test. Unit root test aims at checking whether our series suffers from unit root issue or not while cointegration test is to explore a possible cointegration among the variables. We next perform the empirical investigation using the FMOLS method. This is aimed at providing answers to the research objectives stated at the onset of this research. Robustness check is then conducted and analyzed using the DOLS method. Granger causality test is the last empirical investigation carried out. We then come with the conclusion of the chapter.

1.7.5 Chapter Five

Chapter five presents a summary of the research which briefly explains the main points discussed in each chapter of this research. The general conclusion of the research is then explained. This chapter then offers policy recommendations. This is followed by the challenges (limitations) encountered in the process of compiling this piece of work and suggestions for future studies based on the research findings.

1.8 CONCLUSION

This chapter started with an introduction of the research meant to provide a general background of banking efficiency and economic growth, later in Cameroon which is the case study in this research. We proceeded with an overview of the banking system in Cameroon. Cameroon is located in Central Africa and a member of some important economic and financial blocks such as Economic and Monetary Community of the Central African Sates (CEMAC). Besides, financial system in Cameroon like many Sub Saharan African countries (SSA) is mainly dominated by the banking sector because other financial structures such as

debt market, equity market or derivative market are less efficient. Furthermore, the discussion of the problem statement was stated. Added to this, the research questions and research objectives of the study were defined. The research objectives section is designed to provide answers to the research questions. The key terminologies in the study were also defined. They are; banking efficiency and economic growth. This helps to clarify the meaning of the key terms used in the study. This was followed by the significance of the research to justify the impact of the research output for carrying out a current research on the relationship between banking efficiency and economic growth in Cameroon. Organization of chapters was next elaborated. This gives a chronological order of the main points discussed in every chapter. The conclusion section is the last section of the current chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

Literature review is very vital in order to know the existing knowledge of the study under review (Sridhar, 2013). The knowledge of this literature review helps to establish the gap in the extant study which serves as a reference for future studies. In this section, a review of the relevant theoretical and empirical literature related to the research problem of our study is discussed in this chapter. We segmented this chapter into three broad sections; the first part covers the theoretical framework relevant to our study. The second section dwells with the empirical literature related to proxies for banking efficiency and economic growth and explores the extent of the nexus that exist between them. The idea here was to identify the gap in the extant literature to justify the urgent need for this research or give credit to this current study. The third section is the discussion of the conceptual framework which is aimed at explaining how the explanatory variables generate banking efficiency which affects economic growth in Cameroon. The theoretical framework is discussed in the first section below.

2.1 THEORETICAL FRAMEWORK

Theoretical framework is very useful in research because it elaborate theories showing the road map for the better research direction (Wang, 2020). There exist a great number of theories that can be used as a basis for a better comprehension of the nexus between banking efficiency and economic growth. This is because the efficiency of a firm can either be measured through the financial statement analysis (internal measurement) or non-financial statement analysis (external or macroeconomic measurement). In this study however, we are interested in knowing efficient performance of banks using some common internal ratios. Two most common theories based on the banking literature are used in this study to explain these concepts. The theories used in this study are; Agency theory that elaborates more on banking efficiency and the neoclassical theory (Solow Growth model) of economic growth. The agency theory is first explained in the next sub section below.

2.1.1 Agency Theory: Information Asymmetry

The agency theory of banking management was developed by Jensen and Meckling (1976). This theory explains the conflicting interest between the shareholders of banking institutions and bank managers. Shareholders are considered as investors as they are the fund providers and bear all the risks. Bank managers are those in charge of running the day to day activities of the institution. Though the aim of every commercial bank is to make profit, bank managers sometimes sign contracts that do not take into account the interest of shareholders. In practice bank managers in their daily activities sometimes make decisions that favor their interest at the expense of the shareholders' interest. For example, bank managers can engage in risky ventures for higher profit expectations and pay less attention to the risk associated. This brings about the information asymmetry problem.

 The information asymmetry suggests that the information gap between the principal (shareholders) and agents (bank managers), or lack of reliable information (Sony & Bhaduri, 2021; Shen *et al.*, 2019) exert an impact on financial intermediaries especially for banks that channel funds from surplus unit to deficit unit and the stability and growth of the economy as well. This is because banks are the main financial intermediaries that act as provider of funds in the economy for investment ventures and therefore any loss of confidence in this sector is more likely to put the stability of the economy at stake and slow economic growth. Information asymmetry generally causes adverse selection and moral hazard.

The information asymmetry problem arising from the agency theory has a direct effect on the efficiency of banks (Fernandez *et al.,* 2013; Nanda & Nicholas, 2014). For instance, the ratio of banks' net interest margin (NIM) also varies according to the confidence that fund borrowers have in the banking system and also how well the banker trust potential borrowers based on information availability. In other words, when there is good risk management or mitigation of the moral hazard and adverse selection problems, banks are more likely to avoid illiquid loans or default borrowers that can lead to more non-performing loans. This therefore goes a long way to improve the efficiency of banks as banks are more confident in advancing more loans at lower costs thereby improving the NIM ratio and which have a direct impact on economic stability via a robust financial system and contributes to economic growth in the economy. This is mostly the case in Africa and to be more precise Cameroon, where the banking system is the main pillar of the financial system as the debt and equity market are less operational. Gehrig and Stenbacka, 2007; Kallberg and Udell, 2003 argued that the credit

information theory can be used as a tool to mitigate information asymmetry and therefore making the banks operate efficiently and therefore guarantee a sustained growth and stable economy. This information approach helps to prevent any bank failure that can generate contagion effect to other economies of other regions across the globe as the case of the US 2007-2009 financial crisis.

Similarly, Doblas-Madrid and Minetti (2013) in his study also illustrate how information asymmetry can affect the efficiency of US banking sector and the economy at large. Extensive studies demonstrate that a more efficient banking system stimulate external funds provision for business ventures thereby mitigating moral hazard and adverse selection problems. This therefore stimulates investment and ensures sustained growth in the economy via the sound financial system. This analysis shows that companies that rely more on external finance are more likely to experience rapid growth in an environment where the banking system operate efficiently than their counterparts that operate in environments with a weak banking system (La Porta *et al.,* 1998; Levine, 2005; Rajan and Zingales, 1998; Claessens and Laeven, 2003; Peia and Roszbach, 2015).

2.1.2 Neoclassical Classical Theory: Solow Growth Model

The neoclassical theory of economic growth was initiated by Robert Solow and Trevor Swang (1956). It suggests that economic growth is achieved as a result of the contribution of capital, labor and technological advancement. These three factors significantly influence the total output produce. Economic growth can also be expressed in terms of GDP (Gross Domestic Product). The model advances that capital accumulation with efficient labor and technological improvement increases the rate of GDP in the economy. The Solow model is considered as exogenous because he believe technological improvement as an external factor that contributes to economic growth. In order to achieve growth according to this theory, it is therefore important to efficiently use the factors of production; labor and capital in the production process with improved technology in order to achieve the highest GDP. Aluko and Ajayi (2018) postulate that the banking institutions who act as financial intermediaries play an important role in the accumulation of investment capital needed by firms in order to increase productivity and therefore economic growth. The profitability and efficiency of banking institutions is therefore a key element that influence economic growth because the success of most firms in an economy depends on the proportion of funds provided by banking institutions (Wang *et al.* 2019).

The significant role of the banking or financial system on the level of economic growth in an economy has extensively been demonstrated in the extant banking literature. For instance, Olweny and Shipho, (2011) analyzed the efficiency of banks in Kenya using return on asset as a proxy of bank profitability. This micro economic indicator provides information on how profitable a company is relative to its total assets. Higher profitability is better as it indicates that banks are operating efficiently. Extant banking literature provides evidence on a positive link between banking efficiency and economy growth. Some scholars posits that there are various measures of banking efficiency but one of the most used proxy is the return on equity ((Sundarajan & Errico, 2002; Sarker, 2005). This ratio indicates the level of efficiency of banks as it explains how the capital invested by owners of the banks is being efficiently used in order to maximize the shareholders' wealth or generate adequate profit. A high ratio is better for a sound banking system which enable policymakers achieve economic growth in the economy. This is a demonstration of how micro economic indicator such as return on equity has a direct impact on banking efficiency and this will have long run implication on the economic growth level.

The studies above demonstrate that banking efficiency is an important factor for economic growth. Banking institutions provide capital accumulation raised by Solow and Swang (1956). The assumption of this model is that there will be a steady rise in the economic growth rate in the economy. This neoclassical growth theory of Solow and Swang therefore provide us with a better understanding of economic growth and GDP (which is the most widely used index to measure total output level) in a given economy (Alkhazaleh, 2017).

2.2 EMPIRICAL LITERATURE

It is universally known in the banking and finance literature that the two main components that comprises the financial system are; the financial institutions (banking institutions are the most important and highly regulated) and financial markets; debt market, equity market and derivative market are the most important here (Trofimova *et al.* 2018). The banking institutions play a very important role in the improvement of the standard of living in any economy (Uddin *et al.* 2014).

Focusing on the financial sphere in Cameroon which is a country located in Central Africa, it is observed that the financial system is mainly dominated by the Banking sector because other financial structures (like the debt market, equity market or derivative market) that constitute this financial system are either less established or almost nonoperational (Ngimanang, 2020).

This implies that the banking efficiency plays a more significant role in Cameroon than in other parts of the world to the sustainability of the financial system. This is because banks act as financial intermediaries by channeling funds from funds providers to those in need of them for investment purposes through the process of credit creation. A strong and efficient banking system is therefore imperative to ensure a robust and sound financial system that contributes to sustainable economic growth and improve the wellbeing of the population (Menyah *et al.* 2014). Unlike ordinary industries where their principal assets are mainly physical and non-physical assets, the major asset of banks is interest collected from loans, which makes their assets different from that of other industries (Garai *et al.* 2020).

Evidence demonstrates that the contribution of the banking and financial development on economic growth which was not given much attention by early financial researchers has been a subject of several investigations in modern era (Pan & Wang, 2013). According to Tamini (2017), in spite of the growing rate of the banking sector over time in SSA and some financial renovations (during 1990s), this banking sector is nonetheless not well developed compared to emerging nations and advanced nations. A recent report published by the International Monetary Fund-IMF (2020) mentioned that the level of financial development remains low in Cameroon like most of sub-Saharan African countries as compared to the rest of the world because of the low level of financial inclusion. Previous studies such as (Akande, 2018; Ahamed *et al.*, 2021), tried to measure how efficient banks are using different approaches in different regions and explore the connection between banking efficiency and economic stability. Among those studies only a few of them focused their attention in Cameroon though it is of high importance to analyze the efficiency of banks in this country member of sub-Saharan African (SSA) so as to prevent any bank failures that can great a contagion effect in the whole economy as the soundness of the financial system greatly depends on the efficiency and stability of the banking system.

However, none of those studies have used a combination of ROA, ROE, NIM and institutional quality (regulatory quality) as a proxy for banking efficiency to explore the nexus between banking efficiency and economic growth in Cameroon. These aforementioned parameters better captures the efficiency and profitability of banks which are essential for reliability in the results that can help policymakers to avoid any bank failure and prevent financial crisis (Athanasoglou *et al.,* 2008). It is on the background of this that this research emerged to fill this missing information in the extant works and suggest different approaches

that can be used to enhance the soundness of the financial system in the economy of Cameroon.

The literature review addresses areas of research related to the extent of the nexus between banking efficiency and economic growth in Cameroon. This is done by analyzing each measure of banking efficiency and exploring the extent of the causality with economic growth or GDP. To achieve this, the work is divided into five parts. In the first part, research investigations connected to the bank return on asset (ROA)-economic growth nexus for few countries are addressed with the findings of the studies. In the second part, there is a discussion of the nexus between bank return on equity (ROE) and economic growth and the results revealed. In the third part, we present studies that explored the relationship between bank's net interest margin (NIM) and economic growth and the findings obtained. The following part was the discussion of studies related to regulatory quality and economic growth. Lastly, there is a discussion of other scholars that used theoretical literature to address banking efficiency

2.2.1 Bank Return on Asset and Economic Growth

There are strands of scientific research in relation to the empirical connection between banking efficiency (used return on asset as proxy) and economic growth found in the existing banking and finance literature. Mulchandani and Totala (2016) carried out investigations on the connection between some key economic indicators and financial efficiency of selected banking establishments in India. The study worked on 39 listed banks as the sample and the data covered the period 2009-2015 with the correlation and multiple regression estimation techniques employed for the analysis. The study utilized return on asset (ROA) and return on equity (ROE) as proxies to bank financial performance. On the other side, Gross Domestic Product (GPD), inflation and interest rate were employed to proxy macroeconomic indicators. The results revealed that bank return on asset (ROA) is directly or positively related to Gross Domestic Product (GDP) but the link is not so significant. This study also mentioned that the banking sector plays a very important role in economic sustainability and this helps to stimulate financial system robustness and therefore economic growth. However, bottlenecks found in this work are; the study used a short data period (six years) which is likely going to create a mismatch between the results revealed in this analysis with what is observed on the field. Lastly, the findings displayed in this study are more likely less reliable as the study did not capture the financial statements of banks that are not listed on the stock exchange market.

Isoh *et al.* (2020) analyzed the effect of prudent management of banks' financial assets on the banking efficiency of selected Commercial banks in Cameroon. The data used was from questionnaire administered to Two hundred and fifty (250) employees of Eco Bank, United Bank for Africa (UBA) and National Financial Credit Bank (NFC). The data was processed using the Structural Equation Modelling (SEM) and the results revealed that prudent management of banks' assets have a significant positive impact on it efficiency. This is because it helps to increase efficiency indicators like the return on asset (ROA) and that favors economic growth in the economy. Akbaş (2012) also investigated the nexus between return on asset (ROA) and economic growth using FMOLS and DOLS. The study explored some key measures of bank profitability and how they are related with macroeconomic variables in Turkey for the period 2005-2010 for 26 banks. ROA is used as the main measure of the efficiency of selected commercial banks in Turkey while return on equity (ROE) was employed as an alternative measure to better capture the efficiency of banks and their connection with the macro-economy. Gross domestic product (GDP) is used in the study as a macroeconomic indicator. The author argues that, the efficient performance of banks is of paramount importance as they help to build a strong financial system that can protect the economy against any form of crises. The most important variable that captures the efficiency of banks is the ROA ratio. The findings in this study equally revealed a positive higher ROA stimulates financial growth which has a huge impact on economic growth. However, the major shortcoming in this study is that, the study did not cover a longer data period and therefore makes it difficult for policymakers to use this research as a reference for planning and forecasting.

Banto and Monsia (2021) carried out an analysis on the influence of banking efficiency on economic stability and growth in third world countries. One of the main measures used for banking efficiency in their study was ROA and he used GDP per capita to proxy economic growth or stability. The study found that there is a direct connection between ROA and GDP. This suggests that a high ROA translate high efficiency and this will go a long way to stimulate the GDP level in the economy. Ceteris Parisbus, high GDP will therefore contribute to economic growth and stability. Also, Sari and Saraswati (2017) also carried out empirical analysis on the relationship between return on asset (ROA) and economic growth in Indonesia for 89 selected banks. The study used annual data for the period 2012-2014 with the DEA (data envelopment analysis) method to estimate the parameters. Efficient performance of banking sector generally depends on the size of the ROA ratio. This means that a higher ROA

ratio indicates greater efficiency in the banking system performance while a low level of ROA indicates a weak banking system or sector. The result in this survey revealed that banks in Indonesia operate efficiently due to the high ROA and this translates the good health of the financial system which is directly associated to economic stability and growth. The limitation in this survey is that, the number of observations is very short and this might therefore provide misleading results.

In EU27, Petria *et al.,* (2015) explored in their study the main elements that account for the efficient performance of banks from 2004-2011. The study used the panel data method for this analysis and it was found that ROA (return on asset) and ROE (return on equity) significantly influence the efficient performance of banks in EU27. The study further revealed that ROA which is a found to be a major element that captures banking efficiency help to achieve economic growth and stability. Kumar *et al.,* (2020) also analyzed the banking efficiency-economic growth nexus in New Zealand using the GMM (generalized method of moment) from 2006-2018 for 19 banks. Beside exogenous factors and the control of government through the monetary policy, bank return on asset (ROA) is found to have a positive effect on GDP like extant literature.

2.2.2 Bank Return on Equity and Economic Growth

Some early scholars employed return on equity (ROE) as the main independent variable to explain banking efficiency for different case studies. ROE is one of the most widely used ratios to measure the efficient performance of banking firms (extant literature). This ratio tells you whether or not banks in particular and companies in general are receiving adequate profit on the invested capital by the owners (shareholders). Mulchandani and Totala (2016) beside ROA like previous scholars used ROE (return on equity) as a proxy to banking efficiency. In their study, they attempt to explore the nexus between ROE of Indian Banks and some macroeconomic variables like GDP. By using regression models, the results confirm a positive relationship between ROE and GDP level. Bui (2019a) also carried out an empirical study on the correlation between banking efficiency and economic stability with insights from Asian countries. The data used in this study covered a period of 13years (2004-2017) and the Generalized Method of Moments (GMM) estimation approach was employed. GDP growth is the dependent variable here and the independent variables involved in this investigation are ROA, NIM and ROE. The author argues that these ratios that proxy bank efficiency is more reliable than other measures used in previous studies. These ratios are also indicated in the

world's bank financial development indicators to measure bank efficiency. From the ROE perspective, the study revealed that, higher ROE ratio indicates efficient performance of banks and this contribute largely for the GDP growth in the economies of the 6 selected Asian countries. Furthermore, the good performance of the banking system through efficiency is vital for economic growth.

Similarly, Arafat *et al.* (2013) analyzed the efficiency of 25 Indonesian banks over the period 2005-2007 using the multivariate regression approach. To measure bank efficiency, the study employed ROA and ROE unlike previous studies that used loan management, non-performing loans and depth of financial inclusion. The study revealed in a global perspective that, banking efficiency is positively related to economic growth and stability in Indonesia which is in line with previous researches. This is because when ROE which is a major indicator of banking efficiency, is high then there is little probability of bank failures and therefore mitigate any chance of systemic risk occurrence that might affect the global stability in the economy. This means that the efficient performance of banks is a prerequisite requirement for policymakers to achieve their key objective of economic growth and stability. Alber (2017) in similarly analysis in the MENA region mentioned that ROE is a good measure of how well banks might be performing as the efficiency of banks is a yardstick by the central bank and other regulatory bodies to measure the stability of the global financial system which is directly contributes to economic growth and stability.

2.2.3 Bank Net Interest Margin and Economic Growth

Few economists equally empirically investigated the link between bank net interest margin (NIM) and economic growth and stability for different locations. Dwumfour (2017) for instance, carried out analysis on the role of bank net interest income (NIM) in banking stability and how it affect economic growth for sub-Saharan Africa (SSA). The study used a sample of 32 selected Sub Saharan African nations over the period 2000-2014. The study found NIM as a good proxy for banking efficiency that helps to translate the stability in the global financial system. The study revealed that higher ratio of NIM increases the efficient performance of banks in Sub Saharan Africa (SSA). The author further suggests that the proceeds of commercial banks come mainly from interest, which is the main asset of the bank. This interest is divided into two; interest income and interest expense. This is consistent with the studies of Bikker & Vervliet (2018); Borio *et al.* (2017). Also, a high bank net interest margin (NIM) condenses significantly the risk of bad loans or default loans which are vital for

a robust and sound banking environment and financial system in general that can prevent instability or crisis in the economy.

The study however further argues that a high ratio of NIM is good up to a certain level. Though a high NIM could translates the capacity of banks to earn adequate return on their investments, the NIM ratio should not go beyond a certain ceiling level. This is because the banks in the seek to reap more profits by charging high interest rate might end up discouraging borrowers from taking more loans and increase risk of outstanding loans not been settled due to the high cost of borrowing. This therefore means that the ability of banks to continue to generate high NIM in the long run depends on how efficient they manage the bank assets or portfolio. The findings indicated in SSA, show that high NIM could be appropriate to take the economies of these countries out of severe depressions and help achieve economic growth in the economy. Though a positive long run nexus between NIM and economic growth was established, diversification is really necessary instead of relying on the traditional method of increasing loans to get adequate return. Banks can therefore increase the noninterest activities so as to strike this balance.

Bui (2019b) used NIM, ROA and ROE simultaneously in a research on the relationship between banking efficiency and economic growth in Asia. The study presents that besides ROE and ROA, NIM is a great measure of the performance of banks as it determines how much the bank can earn on the loans given out to investors and borrowers and can easily be controlled by central bank through the monetary policy by determining the amount of credit creation in the economy. From this angle, it becomes much easier to establish the link between NIM and the use of monetary policy to achieve the expected stability and growth rate in the economy. The efficient operation of the banking system will help stimulate investment and other productive ventures in the economy as banks play the role of financial intermediary by channeling funds from savers and given them out as loans to those in need for investment purposes which helps to stimulate GDP and enhance the robustness of the financial system health (Bencivenga & Smith 1991; Guiso *et al.,* 2009). These studies also confirm a positive nexus between banking efficiency and economic growth. Kumar *et al.* (2020) further argued that bank efficiency is a condition to GDP growth or macro equilibrium. That is, banking efficiency stimulate financial stability and therefore less fragility in the financial system which contributes to economic growth. This brings more confidence and eliminates any form of uncertainty or risk in the economy. All these in a nutshell help to shape the financial development and enhance stability in the economy and accelerate economic growth.

Another group of researchers also have investigated on the connection between NIM as a proxy for banking efficiency and economic growth for different countries and come out with results different from previous authors mentioned above. Brei *et al.* (2020a) also scrutinized the possible nexus between bank net interest margin and economic stability for the case of New Zealand over the period 1994-2015. 113 international banks were selected to carry out this survey. The study suggests that low bank net interest margin is more likely to stimulate banking efficiency. This is because when the ratio of NIM is low, banks which focus on alternative sources of income which is done by diversifying her activities. In this case, low NIM ratio will stimulate noninterest income of banks and therefore contributing to a more efficient banking system that enhance stability and economic growth in the economy. The results of this study revealed that that low bank net interest margin (NIM) translates high efficiency in the banking sector in New Zealand and is positively linked to economic growth and stability. Beck *et al.* (2009) also argues that banks are more likely to be efficient in the environment where the cost of borrowing or capital is low than in environment where they are high. Meaning that high bank net interest margin in most cases will lead in the long run to a low efficient banking system which might results to economic crisis. This partly explains why banks are generally more efficient in advanced nations than in emerging and developing nations where the interest rate is high.

2.2.4 Regulatory quality and Economic Growth

Cahn *et al.* (2021) carried out a study on the relationship between institutional quality and banking efficiency for 56 economies using panel data for the period over 2002 to 2015. The results revealed that institutional quality helps to reduce information asymmetry, transaction cost and default loans thereby improving the level of banking efficiency. According to Ibrahim and Alagidede, (2018), banking sector growth contributes to financial development in a global perspective that shapes the level of economic growth and stability in the economy. This study suggest that banking regulation and financial inclusion significantly impact on the efficient performance of banks in sub-Saharan Africa. This investigation was carried out in 29 SSA member countries between the periods 1980-2014. Issa *et al.,* 2020 in their analysis in Middle East and North Africa (MENA) countries reveal that in addition to financial regulation and financial inclusion, banking competition is an important parameter that enhances efficiency in the banking system. This in a nutshell means that in a more competitive and innovative banking environment, banks are more likely to operate efficiently and this contributes to financial development which is positively associated with economic stability.

2.2.5 Theoretical Literature Review

There are few researchers in their analyses that viewed banking efficiency from a different perspective. Unlike the used of accounting ratios as stated in the above studies, some scholar used different indicators to ascertain banking efficiency for different countries (Ibrahim & Alagidede, 2018; Borges & Tavares 2020; Issa *et al.,* 2020; Tamini, 2017; Aluko & Ajayi, 2018; Ehigiamusoe & Samsurijan, 2020; Hamdi & Saada, 2015; Sufian & Noor 2012).

Borges and Tavares (2020) carried out a recent study on the determinants of bank efficiency in Portugal for the period from 2005 to 2011. The authors suggest internal factors such as bank's capital, liquidity and asset quality are relevant indicators for bank efficiency. Similarly, Hamdi and Saada (2015) investigated on the determinants of bank efficiency in Tunisia over the period 2000 to 2013. The results revealed that liquidity, credit risk management and total assets are important micro indictors of bank efficiency in Tunisia over the sampled period. Sufian and Noor (2012) in a similar investigation in India between 2000 and 2008 also found that credit risk management, liquidity and quality management are relevant indicators that can be used to evaluate banks' efficiency in India.

Tamini (2017); Aluko and Ajayi, (2018); Ehigiamusoe and Samsurijan, (2020) postulates that, exogenous factors are of utmost importance in the performance of the banking system. Tamini 2017 for instance in his study point out how important institutional quality can affect the efficiency of the banking system. This is particularly valid in CEMAC and UEMOA zone. Regulatory quality for instance can determine the volume of credit extension or loans given out. Beside institutional quality, Aluko and Ajayi, 2018 in their study added trade openness as an exogenous measurement of banking efficiency. Ehigiamusoe and Samsurijan (2020) went further in his investigation and found out that better institutional quality and macroeconomic growth is a prerequisite for banking efficiency. Under such favorable banking environment, the banks are more likely to operate efficiency which will help for a sustained and robust economy. The study therefore suggests that the relationship between banking efficiency and economic growth is bi-directional.

2.3 CONCEPTUAL FRAMEWORK

As stated in the literature review section, numerous studies have explored the connection between banking performance and economic growth for different countries. The findings of those studies are contradictory though most studies supported the positive relationship

between banking efficiency and economic growth. However, it is noticed that no or few investigations has been done on the relationship between banking efficiency and economic growth in Cameroon by using bank return on asset (ROA), bank return on equity (ROE), bank net interest margin (NIM) and regulatory quality (RGQ) of banking as proxies for banking efficiency in Cameroon. This is however essential in order to have reliable outcome on this issue. By carrying out this analysis, the study is therefore expected to cover this void that exists in the extant works. The novelty of this study is two-fold. First, it looks at how efficient is the banking system in Cameroon using NIM, ROE ROA and institutional quality (regulatory quality) to measure banking efficiency and GDP to capture economic growth. This will help to assess banking efficiency from a more global perspective. Second, the study explore the link that exist between each explanatory variable with the dependent variable in order to have more detail insights on banking efficiency-economic growth nexus in Cameroon and extend the research period till 2019. We provide below, a diagram showing the conceptual relationship between banking efficiency and economic growth;
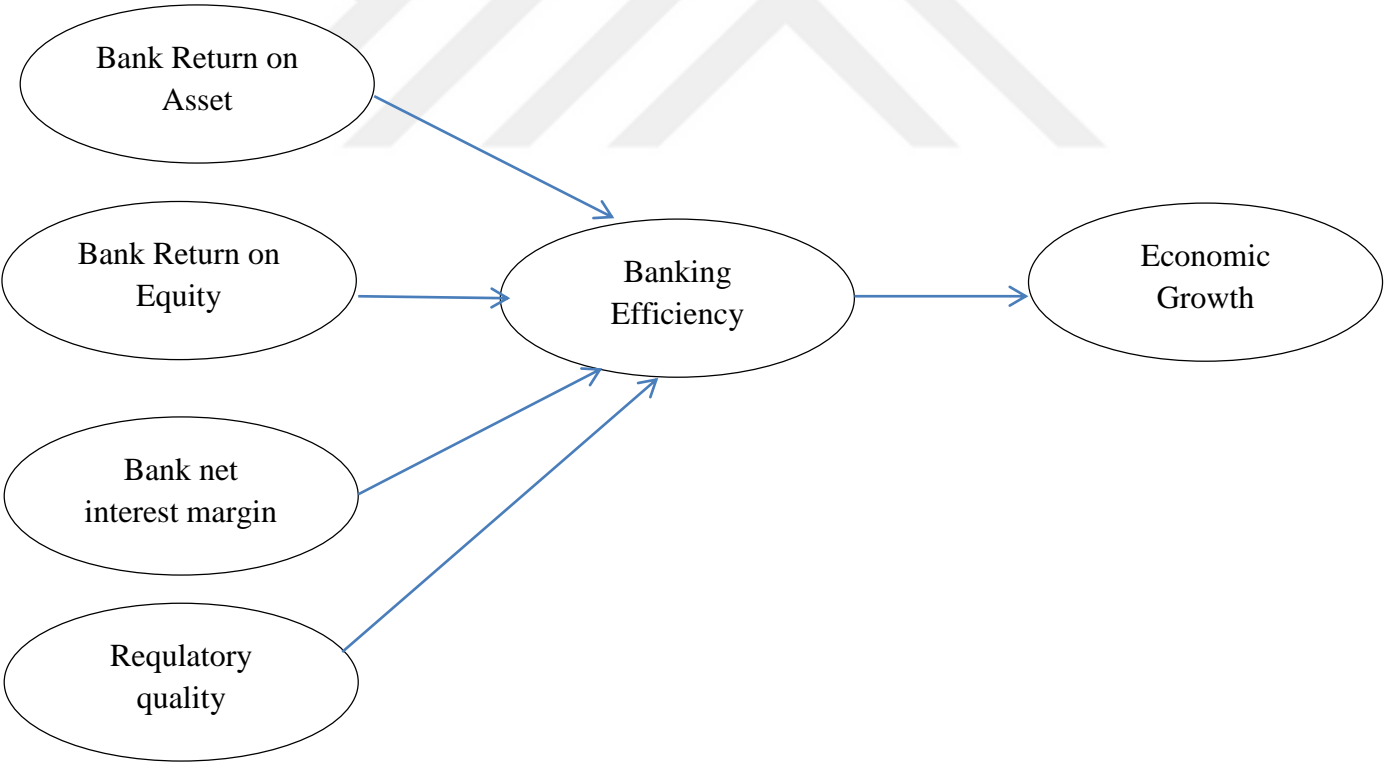
Figure1: Conceptual relationship between banking efficiency and economic growth.

The figure above demonstrates that, bank return on asset, return on equity, net interest margin and regulatory quality has a wider implication on banking efficiency. Banking efficiency will

help stimulate GDP thereby affecting economic growth. ROA gives an indication on how efficient the bank uses its assets to generate adequate profit. One of the major assets of banking institutions is the interest. The net interest is obtained by deducting the interest expense from interest income. High proceeds from interest helps to boost the bank's return on asset. ROA which is the investment side of banks' portfolio could contribute in raising the net interest margin ratio. This is because when the ROA ratio is high, this indicates that there is efficient utilizing of banks' assets such as interest to generate adequate returns, everything being equal. NIM measures the magnitude of net interest income received by banks or financial institutions. When the ROA is high, NIM ratio will also be high, everything being equal. This happens when the net interest income is greater than the net interest expense. Higher NIM is a contributory element to banking efficiency and a higher ratio is desirable up to a certain ceiling. According to accounting principles, this high NIM is going to increase shareholders' return (ROE). ROE gives an indication on the amount of adequate profit generated by banks from the amount of capital or funds invested by its shareholders. Higher ratio indicates bank efficiency which is as result of a good ROA and ROE ratio, ceteris paribus. ROA, ROE and NIM are better achieved when there is a good regulatory policy in the economy to ensure the efficient allocation of resources. All these indicators (ROA, ROE, NIM and RGQ) translate the bank efficiency level. They are therefore vital to ascertain banking efficiency level. The bank efficiency generated from ROA, ROE, NIM and RGQ will then contribute to the enhancement of the GDP and therefore economic growth in the economy.

2.4 CONCLUSION

At the onset on this Chapter, we provided the theoretical framework used to guide the study. The two theories introduced in this study are; the Information Asymmetric theory and the Neoclassical Economic growth theory of Solow. These two theories are the two best theories and widely used in the extant literature to explain banking efficiency and economic growth. The next section was the discussion of the empirical literature. This was done by analyzing each measure of banking efficiency and exploring the extent of the causality with economic growth or GDP. This was elaborated in five parts. In the first part, research investigations connected to the return on asset (ROA)-economic growth nexus was analyzed. In the second part, there was a discussion of the nexus between return on equity (ROE) and GDP. In the third part, studies that explored the relationship between bank's net interest margin (NIM) and economic growth were presented and the findings obtained. The following part was the

discussion of studies related to regulatory quality and economic growth. Lastly, there was a discussion of other scholars that used theoretical literature to study banking efficiency. The next section was the conceptual framework meant to show return on asset, return on equity and net interest margin are connected to banking efficiency until they affect economic growth. This gives credit for the need for this study. The conclusion is then traced at the end of this chapter to recapitulate the entire work in the chapter.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

Research methodology is very useful because it shows the road map of how to achieve the objectives of the study (Wang, 2020).This chapter then outlines the methodology of the research applied for analyzing the nexus between banking efficiency and economic growth in Cameroon from 2000 to 2019. This chapter includes two sections; the first section deals with the research design, methods; sources and description of data and the explanations of variables. The next section outlines the empirical investigations pertaining to the research such as correlation analyses, unit root test, cointegration test and fully modified ordinary least square estimation test. This is followed by robustness check engaged in the research (dynamic ordinary least square method) and granger causality test. The last section provides the conclusion of the Chapter.

3.1 RESEARCH DESIGN

Research design is simply a plan of organization of the research. It is very useful because it spells out every step to be undertaken in the investigation from the introductory point to the final results. At the onset of this dissertation, a general introduction of the research is explained. The research objectives and questions of the study are summarized on the table below;

Table 3.1: Research questions and objectives

Research Questions	Research Objectives
Whether there is a nexus between banking efficiency and economy growth in Cameroon?	To theoretically establish the nexus between banking efficiency and economic growth in Cameroon
Whether the assumed relationship between banking efficiency and economic growth in Cameroon can be empirically established?	To empirically explore the extent of the nexus between banking efficiency and economic growth in Cameroon

The study next is the literature review and the theoretical framework. Literature review gives us information about the extant works in the field so as to help us identify the area to further investigate. The Agency theory and Solow growth theory are used in this research. The research methodology will then show the road map of how to achieve the objectives stated above. To carry out the investigation between banking efficiency and economic growth in Cameroon, we will use a sample size of 20 years (2000-2019). The method of data collection is mainly from secondary sources. The data used in the study are collected from two main sources; World Development Indicators and from the Humanitarian Data Exchange (HDX) of the World Bank financial sector indicators. We have one dependent variable in the study; GDP (Gross Domestic Product) and three independent variables; ROA (return on asset), ROE (return on equity) and NIM (bank net interest margin) and a control variable (institutional quality). The data are processed using the FMOLS method. Furthermore, the next chapter will be the presentation and analyses of the results. The last chapter will be the general conclusion of the study. We then start by discussing the data in the section below.

3.2 METHODS

This section comprises of the sources and description of data used in the research, followed by the explanation of variables used in the study. From the data, a series of empirical investigations will be carried out, in order to provide answers to the questions and therefore achieve the research objectives. The description and sources of data is discussed below.

3.2.1 Sources and Description of Data

This study aims at exploring the extent of the nexus between banking efficiency and economic growth in Cameroon using annual time series data covering the period 2000-2019. The dataset is a balanced dataset with 20 observations or sample size. The annual time series data in this study only begins from 2000 because of the unavailability of balance data in Cameroon prior to 2000. In addition, our data span ends in 2019 because we couldn't get data for later years. However, the selected time period in this study is large enough to enable to achieve the research objective which is that of exploring the extent of the nexus between banking efficiency and economic growth for the case of Cameroon's economy. The data in our analysis is essentially secondary sources and were retrieved from two sources.

Data related to bank's return on asset (ROA), return on equity (ROE) and bank's net interest margin (NIM) were collected from the Humanitarian Data Exchange (HDX) while Gross

[1]Domestic Product per capita (GDP) and regulatory quality was retrieved from the world bank development indicators. ROA, ROE, NIM and regulatory quality (RGQ) are measured in percentage while GDP on the other hand is measured in current US dollar.

To carry out our investigation, the study uses GDP as dependent variables, which is the proxy for economic growth. This variable was transformed to natural logarithmic. We use three proxies for banking efficiency as explanatory variables; return on asset (ROA), return on equity (ROE) and bank's net interest margin (NIM). We use institutional quality which is captured by regulatory quality (RGQ) as a control variable. Below is a tabular representation of the variables aforementioned with their various data sources;

Table 3.2: Variables and Sources

Abbreviation of variables	Definition	Source
GDP	Gross Domestic Product	World Development Indicators of World bank dataset
ROA	Return on Asset	https://data.humdata.org/dataset/world-bank-financial-sector-indicators-for-cameroon/resource/0ff5e881-bd9f-474c-bb72-6e38577395ec
ROE	Return on Equity	https://data.humdata.org/dataset/world-bank-financial-sector-indicators-for-cameroon/resource/0ff5e881-bd9f-474c-bb72-6e38577395ec
NIM	Bank's Net Interest Margin	https://data.humdata.org/dataset/world-bank-financial-sector-indicators-for-cameroon/resource/0ff5e881-bd9f-474c-bb72-6e38577395ec
RGQ	Regulatory quality	World Development Indicators of World bank dataset

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[1] The graphical representation of the data used to carry out this study is displayed in **Figure 1** in the *appendix section* screening the trend of the variables from 2000 to 2019.

3.2.2 Explanation of Variables

This section provides a discussion of the dependent variable and independent/explanatory variables employed in this study and their justification on analyzing the nexus between banking efficiency and economic growth for the case of Cameroon.

3.2.2.1 Dependent variable

In an attempt to analyze the extent of the nexus between banking efficiency and economic growth for the case of Cameroon, we used yearly GDP which is the most widely used economic indicator in extant literature to capture economic growth.

Gross Domestic Product (GDP): GDP is one of the most commonly used macroeconomics variables used to evaluate a country's performance in terms of growth rate, and economic stability (Acharya, 2018). The extant banking literature shows that a sound and robust financial system is more likely to stimulate a sustainable economic stability and economic growth. It is measured in percentage.

3.2.2.2 Independent/ Explanatory variables

There are different approaches of analyzing banking efficiency in economics and finance but accounting ratios method is the most commonly used in similar studies. The accounting ratios or variables that are used to explain banking efficiency in this study are; ROA, ROE and NIM.

Return on Asset (ROA): ROA gives an indication on how efficient the bank uses its assets to generate adequate profit. It is one of the most important proxies for banking efficiency. Higher bank ROA translates better banking efficiency. Mulchandani and Totala (2016) for instance in their study provides evidence to support the positive link between high ROA and economic stability. Some of the banks' assets include; cash reserves, interest and general fees, property, financial securities and short term investments (Tseng & Guo, 2021). These assets can be current assets if they can easily be converted into cash within a short period of time or noncurrent assets with longer maturity period. Banks are having both current and noncurrent assets. ROA can be expressed as;

Bank RETURN ON ASSET =   Banks' net income

Average Total Asset

Return on Equity (ROE): This ratio indicates the amount of adequate profit generated by banks from the amount of capital or funds invested by its shareholders. ROE is as important as ROA to measure the level of banking efficiency or performance of a business entity. In most cases, it is simultaneously used with ROA in order to have a more reliable result. Bui (2019a) also used this variable to capture banking efficiency and explore it connection with stability in the economy. Shareholders equity mostly consists of contributed capital, accumulated income and retained earnings (Tseng & Guo, 2021). In the event banks' achieve high returns, part of the profit could be shared to shareholders as dividend. Bank ROE ratio can be expressed as follows;

Bank RETURN ON EQUITY =   Banks' net income

Average Shareholders' Equity

Bank's Net Interest Margin (NIM): NIM measures the magnitude of net interest income received by banks or financial institutions. These proceeds are generally earned out of the amount of loans granted by banks. There are mainly two types of interest; interest income and interest expense. The interest income is generally the income received from the loans giving out to investors. Banks generally charge interest on loans giving out to borrowers or investors. On the other hand, interest expense could be the interest paid by banks on saving accounts of depositors or clients. Some earlier researchers bank NIM in their study to capture banking efficiency like Bikker & Vervliet (2018) and Borio *et al.* (2017). It can be expressed by the formula below;

Bank NIM =   Bank's net interest revenue (interest income- interest expense)

Average interest-bearing (Total earnings) Asset

3.2.2.3 Control variable

Institutional quality (regulatory quality): Institutional quality generally captures rule of law, government effectiveness, political stability, regulatory quality, control of corruption, voice and accountability. However, we will use only regulatory quality to ascertain the institutional quality in this study. Regulatory quality measures how well the public authorities are able to can create and carry out sensible laws and rules that support and encourage the growth of the private sector.

3.3 EMPIRICAL INVESTIGATIONS

In the perspective to scrutinize empirically the extent of the nexus between banking efficiency and economic growth in Cameroon, the Fully Modified Ordinary Least Square (FMOLS) is employed.

In this section, we first specify the econometric model used to carry out our investigation. We further provide a brief explanation of the meaning of descriptive statistics which provide us with a statistical overview of return on asset (ROA), return on equity (ROE), net interest margin (NIM), regulatory quality (RGQ) and Gross Domestic Product (GDP) in Cameroon from 2000 to 2019. This is followed by the correlation analysis of the variables. Furthermore, we identify the unit root and the Johansen cointegration methods employed to show evidence of stationarity of the variables and evidence of correlation between our series in the research respectively. In the subsequent section, the main empirical technique; the FMOLS technique and the reason for choosing this method is identified. In the last section, we carry out robustness check using the Dynamic Ordinary Least Square (DOLS) method to validate our main results. The causality test is last performed.

3.3.1 Model Specification

To analyze the extent of the nexus between banking efficiency and economic growth in Cameroon using time series parameters, we use the FMOLS (Fully Modified Ordinary Least Square) method. FMOLS is used in this study that uses time series data because it is the most suitable method that unveils cointegration (Adusei, 2013). FMOLS have the advantage of providing robustness checks. Besides, unlike other methods like the ordinary least square (OLS) or fixed effects methods that cannot solve for common problems in time series data like endogeneity or heterogeneity problem, FMOLS estimation accounts for these problems. FMOLS is also suitable for this study because it can overcome any possible serial correlation that can exist between our variables and the error term because of cointegrating relationships. The FMOLS method is also advantageous because of its ability to use several kernel functions like Bartlett, Parzen and so forth (Andrews, 1991). Our investigation is based on the following econometric model;

GDP=f (roa, roe, nim, rgq, e) (1)

Where;

GDP; Gross domestic Product

ROA; bank's return on asset

ROE; bank's return on equity

NIM; bank's net interest margin

RGQ: regulatory quality

e; error term

3.3.2 Descriptive Statistics

Descriptive statistics is a table that shows the summary statistics of the variables employed for exploring the nexus between banking efficiency and economic growth for Cameroon's economy over the period 2000-2019. The mean, maximum and minimum, standard deviation, skewness, kurtosis, jarque-bera and probability statistics have been used in this study to describe the data. The descriptive statistic is useful in research because it traces the trend of the series used in the study. This can guide in the prediction of the final results in the study.

Mean is a measure of central tendency that gives the average value of a particular variable in a dataset. The maximum and minimum value simply gives the maximum and minimum statistics respectively in a particular range of values. Standard deviation (S.D) is the deviation from the mean. It portrays the disparity or gap between the mean values and standard deviation itself. High S.D translates high probability of error or biased dataset. The reverse is true for low S.D values. It is a measure of dispersion of a set of data. Skewness, kurtosis and Jarque-Bera indicate the normality distribution of the dataset. The skewness can be positively skewed or negatively skewed. For normal skewness the value should be zero (0). For kurtosis to show normal distribution of a dataset, the value should be 3 (mesokurtic). The kurtosis can also be platykurtic which implies that values are less than 3. For a leptokurtic kurtosis, the value is greater than 3. The null hypothesis for the jarque-bera statistics is that the distribution of the series is normal. The jarque-value should not be too high but rather too low in order to show a normally distributed dataset. Also, the probability values should not be significant. The descriptive statistics table will be reported in the next chapter and the results will be analyzed and interpreted.

3.3.3 Initial Empirical Investigations

3.3.3.1 Correlation test

The correlation test is meant to analyze the degree of correlation between the dependent variable and explanatory variables. Additionally, we can use this test to detect whether the explanatory variables in our study are correlated to each other (multicollinearity), everything being equal. Having a model with high existence of multicollinearity indicates a problem in the dataset and biased model which might lead to misleading results in the study. Conducting correlation test is generally an important step in data estimation especially when dealing with more than two explanatory variables. The results of this test will be reported and analyzed in the following chapter. Rashid et al. (2020) and Aboyadana (2021) used the following equation to analyze correlation coefficient;

$$W_{xy} = \frac{Cov\,(x,y)}{Zx Zy} \qquad\qquad (2)$$

Where W_{xy} is the strength of the correlation between variable x and variable y; Cov (x,y) is the covariance of x and y; and Z_x, Z_y is the sample standard deviation for x and y respectively.

3.3.3.2 Unit root tests

In scientific research, time series data estimation requires that the variables used in the study are free from unit root problem (meaning that the variables are not non-stationary). This is the case with panel data as well. It is important for the series engaged in the study to be stationary in order to determine whether there is a cointegration relation between variables in time series studies or to allow further estimations to answer the research problem. Stationary test also helps to determine the order of integration of the variables. The integration can be written as I (0) which implies that the variables are stationary at level while I (1) show that the variables are stationary at 1st difference. Other reasons for conducting unit root test are; first, regressors may highly impact its behavior; also, a regression of a variable on the other might generate a big R^2 value (Brooks, 2008). This study uses two unit root tests which are; the Augmented Dicker Fuller (1981, ADF) and Phillips-Perron (1988, PP).

The Augmented Dicker Fuller (1981, ADF) and Phillips-Perron (1988, PP) are the most widely unit root technique used for time series data analysis (Puatwoe & Piabuo, 2017).

The ADF takes similar estimation structure as in Dickey Fuller (DF), but adjusts the statistic to conduct for heteroscedasticity and autocorrelations. The ADF test is assumed superior because of its wide application and popularity. The ADF test adjusts the Dickey Fuller test to overcome for any possible serial correlation in the error terms by adding the lagged difference term of the regressand. As for the PP analysis, it also accounts for autocorrelation in the error term and its asymptotic distribution is similar to that of the ADF test statistic. Nevertheless, ADF is widely used because of its easy applicability. This model assumes that the null hypothesis (H_o) is non-stationary while the alternative hypothesis (H_1) is stationary. Phillips-Perron (1988, PP) is the complimentary unit root employed to check the stationary level of our parameters. The assumption of non-stationary for null hypothesis and stationarity for alternative hypothesis also holds for this method. The unit root test will be reported in the next chapter and the results will be analyzed and interpreted. The ADF unit root model is expressed by the formulae below;

$$Y_t = \alpha_1 + \phi Y_{t-1} + u_t \tag{3}$$

Where;

Y_t; series

Y_{t-1}; lag 1 of time series

ϕY_{t-1}; is the first difference of the series

u_t is the error term

The hypotheses are given as follows;

H_0: Parameters contains unit root

H_1: Parameters are stationary

3.3.3.3 Cointegration technique

To conduct the FMOLS which is the main empirical technique used in this work to provide answers to our research questions, a pre-cointegration test was carried out to check the long run cointegration of the series. To this end, we conducted the Johansen cointegration test to provide evidence to this long run relationship. Johansen and Julius (1990) is the widely used cointegration method for time series data analyses (Asamoah & Botchway, 2021). It is grounded on the maximum likelihood estimation on a VAR (vector auto regression) system. The reason for conducting cointegration test using this method is because it enables the identification of cointegration vectors the given group of variables (Gujarati, 2004). Results of

the Johansen cointegration test is reported and analyzed in the subsequent chapter. Johansen uses a Vector Autoregressive (VAR) model which can be expressed by the equation below;

$$Y_t = \lambda_1 Y_{t-1} + \ldots\ldots \lambda_p Y_{t-p} + \varepsilon X_t + u_t \tag{4}$$

Where; Y_t is a – vector of non-stationary I(1) variables, X_t is a d-vector of deterministic variables and u_t is vector of innovation. Asamoah and Botchway (2021) also delivered evidence of cointegration in their study using the above equation.

3.3.4 Main Empirical Investigation

3.3.4.1 Fully Modified Ordinary Least Square (FMOLS)

It was previously highlighted in the Johansen cointegration method that, checking cointegration is a pre-condition stage to establishing any long lasting relationship amongst the series. It is therefore convenient at this stage, to establish the long run relationship between banking efficiency and economic growth. To this end, the FMOLS technique proposed by Phillips and Hansen (1990) is utilized. One of the reasons why this method is the best suitable estimation techniques for this study is because of the small sample size which is grounded on existing literature (Merlin & Chen, 2021).. Furthermore, the FMOLS analysis has the advantage of considering inherent biases which is a common issue in ordinary least square. FMOLS is also suitable for this study because it can overcome any possible serial correlation that can exist between our variables and the error term. FMOLS also account for the issue of endogeneity in the model. The FMOLS method is also advantageous because of its ability to use several kernel functions like Bartlett, Parzen and others like previously mentioned.

Our time series model for our FMOLS estimation is as follows;

$$GDP_{,t} = \alpha_1 + \alpha_2 W_t + u_t \tag{5}$$

Where $GDP_{t,}$ is the dependent variable at time t; is used as a proxy for economic growth. α_1 are the intercepts. W_t is the vector that represent our explanatory variables (ROA, ROE , NIM and RGQ) that are used here as proxies for banking efficiency. $_t$ is the period specific factor. The u symbol here is the disturbance term.

3.3.5 Robustness Checks of the FMOLS Estimates

The robustness of the outcomes, in relation to the consistency of the impact of parameter estimates and the statistical significance are verified using the DOLS (Dynamic Ordinary Least Square) method. It is universally known that Static Ordinary Least Square (SOLS) merges at a faster speed than that of the norms when cointegrated (Hamilton, 2020). A serious drawback regarding Ordinary Least Square (SOLS) is that it is asymptotic bias and parameters have an asymptotic distribution, which comprises generally of non-Gaussian asymmetry (Asamoah & Botchway, 2021).

The shortcomings encountered mentioned above when using the static ordinary least square (SOLS) can be fixed using the Dynamic Ordinary Least Square (DOLS) of Chao and Chiang (2000). DOLS controls for endogeneity problem and serial correlation and simultaneously accounts for asymptotic bias of the parameters. The justification for adopting DOLS for robustness check is because this method best dedicated to small sample size for reliability in the results obtained. Besides, DOLS has also been extensively used in prior literature to check for the relationship between banking efficiency and economic growth. Therefore, the choice of DOLS to verify the reliability of our main findings is based on the established literature. The robustness test is based on the econometric model like the one in FMOLS above, the only difference is method (DOLS is used to run the estimates);

$$GDP_{,t} = \alpha_1 + \alpha_2 W_t + u_t \qquad\qquad (6)$$

Where GDP_t, is the dependent variable at time t; is used as a proxy for economic growth. α_1 are the intercepts. W_t is the vector that represent our explanatory variables (ROA, ROE, NIM and RGQ) that are used here as proxies for banking efficiency. $_t$ is the period specific factor. The u symbol here is the disturbance term.

3.3.6 Granger Causality Test

The aim of this test is to determine the causality among the variables in the study. The reason why we use VAR to check causality in the study is because this technique is too flexible and can overcome common issues found in time series models. The small sample size in the study also makes it suitable. The null hypothesis of granger causality is that, there is no causality between two variables. For instance, variable X does not cause variable Y. The result of this test is shown in the table below. The VAR granger causality assumes the following equations;

$$X_t = \pmb{\alpha}_1 + \pmb{\beta}_{1j} X_{t-j} + Y_{t-1} + \pmb{u_{1t}} \qquad\qquad (7)$$

$$Y_t = \pmb{\alpha}_2 + \pmb{\beta}_{2j} Y_{t-j} + X_{t-1} + \pmb{u_{2t}} \qquad\qquad (8)$$

Where X is the vector of our dependent variable and Y is the vector of our independent variables. $\pmb{u}$ is the disturbance term. The first null hypothesis is that X does not cause Y, while the second hypothesis is that Y does not causes a change in X. Saint Akadiri et al. (2019) also used the same equations to check the causality in their study.

3.4 CONCLUSION

This chapter discussed the methodology and data section applied for analyzing the extent of the nexus between banking efficiency and economic growth in Cameroon. Under the data section; we started with the description of the data used in the study and their sources were also identified. This was followed by the definition of our indicators which are; return on asset (ROA), return on equity (ROE), bank's net interest margin (NIM), regulatory quality (RGQ) and gross domestic product (GDP). This was to have a better understanding of those economic indicators. The descriptive statistics of variables were then explained. The second section in this chapter was the methodology section. We did the model specification and later on preliminary tests. The unit root test is conducted using the ADF and PP methods. The Johansen cointegration method was then elaborated which is the method used to check the cointegration between the variables. We also explained the correlation analysis. The main estimation technique; FMOLS was explained with the econometric model established. DOLS is used to check the robustness of the results of the FMOLS estimates. The granger causality is then employed to check the direction of the causality between the aforementioned variables.

CHAPTER FOUR

RESULTS AND ANALYSES

4.0 INTRODUCTION

This chapter covers the results and analyses of our time series datasets. The results and analyses section is one of the most important sections of the research because it presents the empirical findings of the study and discussion of the results ((Pyrczak & Tcherni-Buzzeo, 2018). The previous chapter highlighted the research methodology or empirical investigations that will be carried out in order to achieve the research objectives earlier stated. The chapter is then aimed at presenting the results of the empirical investigations and analyzing them. To this end, we structured this work into different sections; it begins with discussions of descriptive statistics outcome. This is followed by the presentation of results and analyses of initial empirical investigations such as correlation test, unit root test and cointegration test. Next, the main empirical investigation is presented and analyzed; FMOLS. This is followed by presentation and analyses of the robustness test results; DOLS. We then provide analyses for the granger causality test results. We then start this chapter by reporting and analyzing the results of descriptive statistics.

4.1 DESCRIPTIVE STATISTICS

Table 4.1 presents descriptive statistics of the variables of the study. The mean, maximum and minimum, standard deviation, skewness, kurtosis, jarque-bera and probability statistics have been used in this study to describe the data.

Table 4.1: Descriptive statistics (number of observations=20)

Var.	GDP	ROA	ROE	NIM	RgQ
Mean	26.4000	1.2766	28.0105	4.8509	20.5665
Maximum	40.0000	3.0733	52.9430	6.6582	25.3589
Minimum	10.6000	0.7020	18.0149	3.4440	15.6757
Std. Dev.	9.3700	0.5078	7.4815	0.7943	2.4584
Skewness	-0.3158	2.1717	1.7178	0.5174	0.0170
Kurtosis	1.9290	8.9925	7.3270	3.0161	2.6371
Jarque-Bera	1.2883	45.6467	25.4386	0.8926	0.1107

Probability	0.5251	0.0000	0.0000	0.6399	0.9461
Sum	529.0000	25.5325	560.2093	97.0172	411.3304
Sum Sq. Dev.	167000.0	4.8994	1063.491	11.9874	114.8346
Observations	20	20	20	20	20

Note: Var., Std. Dev. and RgQ indicate variables, standard deviation and regulatory quality respectively. ROA, ROE, NIM, are measured in percentages. GDP is measured in billions USD. **Source:** Author's computation.

From table 4.1 above, the mean value of GDP in Cameroon between 2000 and 2019 was 26.400billionUSD. Over the sampled period, GDP in Cameroon ranges from a minimum of 10.600billionUSD to a maximum of 40.000billionUSD. This implies that on average, Cameroon has a GDP of 26.400billionUSD over the time period of the study. The minimum value simply indicates that some years, Cameroon had a GDP value as low as 10.600billionUSD, while the maximum value is an indication that the GDP of Cameroon rose up to 40.000billionUSD in some years. Standard deviation (S.D) is the deviation from the mean. It portrays the disparity or gap between the mean values and standard deviation itself. High S.D translates high probability of error or biased dataset. The reverse is true for low S.D values. The standard deviation for GDP in Cameroon is 9.370; which does not deviate so much from the corresponding mean value. Skewness, kurtosis and Jarque-Bera indicate the normality distribution of the dataset (Adeleye *et al.* 2020). It is observed from the above table that, GDP is negatively skewed. For normal skewness the value should be zero (0). GDP has a skewness value which is close to zero (-0.316). Additionally, GDP shows a platykurtic kurtosis because it value is less than 3 (1.929). Looking at the value of the Jarque-Bera statistics for GDP, it is clearly observed that GDP show normal distribution in the dataset over the sampled period. This is because of a low Jarque-Bera value of 1.288 and probability value which is not significant. We cannot therefore reject the null hypothesis of Jacque-Bera statistics which says that the series are normally distributed.

Furthermore, the mean ROA is 1.28% while the maximum and minimum values are 3.07% and 0.70% respectively. This suggests that in some years, banking institutions in Cameroon had a ROA as low as 0.70% during the period under review. There are also some years that Cameroon had a bank ROA as high as 3.07%. The standard deviation for ROA is 0.508. It has a positive skewness which is far above zero (2.172). ROA shows a leptokurtic kurtosis because 8.993 > 3. This indicator has a high Jarque-Bera value of 45.647 and a probability

value of 0. Therefore, we cannot accept the null hypothesis of normally distribution. The mean ROE is 28.01% while the maximum and minimum values are 52.94% and 18.01% respectively. This means that in some years, banking institutions in Cameroon had a ROE as low as 18.01% during the period under review. There are also some years that Cameroon had a bank ROE as high as 52.94%. The standard deviation for ROE is 7.482. It has a positive skewness value of 1.718. ROE also shows a leptokurtic kurtosis because it value is greater than 3 (7.327). This variable also has a high Jarque-Bera value of 25.439 and a probability value of 0. NIM has a mean value of 4.85%. It maximum value is 6.66% while the minimum value is 3.44%. It has a standard deviation of 0.794, which is closer to the mean value. It has a positive skewness of 0.517. The kurtosis is normal because it value is 3.016. The Jarque-Bera and probability statistics are 0.893 and 0.640 respectively. The average value of the regulatory quality over the period under review in Cameroon is 20.57%. The values for the skewness, kurtosis and probability (0.017, 2.637 and 0.946 respectively) show normal distribution of the dataset.

4.2 INITIAL EMPIRICAL INVESTIGATIONS

4.2.1 Correlation test

The correlation test is meant to analyze the degree of correlation between the dependent variable and explanatory variables. Additionally, we can use this test to detect whether the explanatory variables in our study are correlated to each other (multicollinearity), everything being equal. Table 4.2 presents the correlation test results.

Table 4.2: Correlation Matrix of variables

Variables	GDP	ROA	ROE	NIM	RGQ
GDP	1.0000				
ROA	0.5456	1.000			
	(0.013***)				
ROE	-0.0940	0.1533	1.0000		
	(0.6935)	(0.5189)			
NIM	0.6864	0.3771	-0.1858	1.0000	
	(0.0008***)	(0.1012)	(0.4328)		
RGQ	0.0634	0.1675	-0.1675	0.0946	1.0000
	0.7906	(0.4803)	0.4803	(0.6914)	

Notes: Values in parentheses represent probability values.
*** represent the level of significance at 1%
Source: Author's Elaboration

Table 4.2 above presents a correlation coefficient of 0.5456 between GDP and ROA which is statistically significant at 1%. This suggests a strong positive relationship between the aforementioned variables. Furthermore, the correlation coefficient between GDP and ROE in Cameroon is -0.0940 and it is statistically insignificant. GDP and NIM have a correlation coefficient of 0.6864 and at 1% level of significance. Lastly, GDP and RGQ have a correlation coefficient of 0.0634 but statistically insignificant. This suggests that the variables can be used to explain banking efficiency and economic growth in Cameroon (Olorogun, 2021). Based on our results, we suspect that there is no presence of multicollinearity concern. This is because the correlation coefficients of all our explanatory variables have absolute values under 0.5 translating the non-existence of multicollinearity problem among our series used in the study. Additionally, the result of the correlation matrix indicates that values are less than the threshold of 0.7 for verifications to be carried out (Hair et al. 1984).

4.2.2 Unit root test

Stationarity means that the mean and variance are constant over time. This test can be conducted either using the formal test (ADF and PP) or informal test with the use of graphs (graphical method). However, our discussion here will be limited to the outcome of the formal test which is reported in **Table 4.3** below. The lag is determined according to the Schwarz information criterion SIC.

Table 4.3: ADF and PP Unit root test

Variable	ADF		PP	
	Constant	Trend	Constant	Trend
LGDP	-4.2078 (0.0063***)	-2.9098 (0.1868)	-6.8739 (0.0000***)	-1.2683 (0.8645)
ROA	-3.9002 (0.0087***)	-5.952 (0.0007***)	-3.9112 (0.0085***)	-8.7356 (0.0000***)
ROE	-3.9609 (0.0076***)	-3.8419 (0.0368**)	-3.9466 (0.0079***)	-3.8215 (0.0382**)
NIM	-1.6565 (0.4360)	-2.9317 (0.1752)	-1.4309 (0.5454)	-2.9252 (0.1769)
RGQ	-2.8271 (0.0732*)	-2.7534 (0.2288)	-2.8271 (0.0732*)	-2.7792 (0.2204)
ΔLGDP	-3.3474 (0.0277**)	-4.8864 (0.0062***)	-3.3249 (0.0290**)	-6.8245 (0.0002***)
ΔROA	-5.0328 (0.0012***)	-4.7622 (0.0085***)	-21.6994(0.0000***)	-23.5349(0.0001***)
ΔROE	-5.7377 (0.0002***)	-5.5171 (0.0020***)	-13.0026 (0.000 ***)	-12.4297(0.0000***)
ΔNIM	-6.3707 (0.0001***)	-6.3008 (0.0004***)	-6.8583 (0.0000***)	-6.8317 (0.0002***)

| ΔRGQ | -5.1968 (0.0007***) | -5.5015 (0.0041***) | -6.0921 (0.0001***) | -6.5921 (0.0003***) |

Note: Δ indicates first difference
Values in brackets represent probability values.
ADF and PP are the Augmented Dicker Fuller (1981) and Philipps-Perron (1988) unit root tests respectively.
*** represent the level of significance at 1%
**represent the level of significance at 5%
*represent the level of significance at 10%

Table 4.3 above show the formal unit root tests. The interpretation of these results assumes that null hypothesis has a unit root while the alternative hypothesis does not have unit root (stationary). The calculated coefficient of ADF and PP were compared with probability values in parentheses. The outcome of stationarity shows that under ADF and PP method, LGDP, ROA and ROE are stationary under level at 1%. On the other hand, NIM is non stationary under both ADF and PP at level and both at constant and constant and trend. Additionally, LGDP becomes non stationary under both method at level and constant and trend. NIM is non stationary at level because the t statistics is lower than the critical values or the probability value is non-significant for both ADF and PP method. At first difference all the variables in both ADF and PP unit root tests become stationary at 1% significance level except LGDP which is significant at constant at 5% in both methods. This therefore suggests that all our variables for Cameroon are all integrated of order one (I). The result obtained in this validates that of Joshua *et al.* (2020). In a nutshell, we can say that the unit root test for the series in our study are either integrated at order one (1). This therefore gives room to go ahead with other estimations such as cointegration.

4.2.3 Cointegration test

It is essential to explore the long run connection between banking efficiency and economic economic growth in Cameroon. To this end, Johansen's cointegration analysis was conducted to verify the long run equilibrium relationship among the variables used in this study. Johansen and Julius cointegration method (1990) is engage in this study to check this long run cointegration and the results are reported in Table 4.4 below.

Table 4.4: Johansen Cointegration test

Rank No of CE(s)	Trace values				Eigen Values		
	Eigen value	Trace statistics	Critical values	Probability	Max-Eigen Statistics	Critical values	Probability
None*	0.9944	163.1765	47.8561	0.0000***	88.1518	27.5843	0.0000***
At most 1*	0.9497	75.0246	29.7971	0.0000***	50.8201	21.1316	0.0000***
At most 2*	0.7271	24.2045	15.4947	0.0020***	22.0781	14.2646	0.0024**
At most 3*	0.1176	2.1264	3.8415	0.1448	2.1264	3.8415	0.1448

Note: Trace test indicates 3 cointegrating eqn(s) at the 0.05 level   Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level   * denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values   **MacKinnon-Haug-Michelis (1999) p-values

Ho: No cointegration among the variables
* rejection of null hypothesis at 1% level of significance
** rejection of null hypothesis at 5% level of significance

The results are analyzed following the two hypothesis of cointegration; null hypothesis says that there is no cointegration while alternative hypothesis says that there is long run cointegration among the variables. The trace test indicates that there are at least three (3) cointegrating equations at 1% level of significance between the time series variables used in this study. The null hypothesis is therefore rejected. Beside the trace test, the max-eigen value test also indicates that there are at least three (3) cointegrating equations at 1% and 5% level of significance. Max-eigen value therefore rejects the null hypothesis of no cointegration and accepts the alternative hypothesis because the probability value is significant at both 1% and 5% significance level. This therefore provides strong evidence that a long run cointegration exist between banking efficiency and economic growth in Cameroon during the period under review. This evidence of long run cointegration in our study is consistent with existing studies such as Alola *et al.* (2019) and economic theories used to guide this study. We can then proceed with the FMOLS to explore this long run relationship among our variables and elaborate more on it. The robustness test will then help to confirm the results of the empirical investigation.

4.3 MAIN EMPIRICAL INVESTIGATIONS

4.3.1 Fully Modified Ordinary Least Square (FMOLS) test

This section represents the most important part of the empirical investigations because it provides the main results needed for the analysis of the extent of the nexus between banking efficiency and economic growth in Cameroon over the period 2000-2019. Table 4.5 below indicates the results of our FMOLS estimation technique which is obtained based on our econometric model earlier stated in equation (2). The long run evidence of cointegration among our variables was established in Table 4.4 above and we are then looking forward here to explore the direction of this relationship and to know the percentage of contribution of banking efficiency proxies (ROA, ROE, NIM and RGQ) on economic growth (GDP) in Cameroon during the period under review. The result of this FMOLS estimation test is reported in Table 4.5 below.

Table 4.5: FMOLS results (dependent variable: LGDP)

Explanatory Variables	FMOLS Estimation			
	Coefficient	Std. Error	t-statistic	Prob.
ROA	1.2320	0.1672	7.3680	0.0000***
ROE	0.096	0.0090	10.5632	0.0000***
NIM	2.3309	0.0889	26.2105	0.0000***
RGQ	0.5639	0.0216	26.1493	0.0000***
R-squared	0.9084	Mean dependent var		23.9686
Adjuested R-squared	0.8731	S.D dependent var		0.3798
S.E of regression	0.1353	Sum squared resid		0.2378
Durbin-Watson Stat	1.6543	Long-run variance		0.0195

Notes: Std. Error and Prob. Stands for standard error and probability values respectively.
This test was conducted using Bartlett Kernel method.
***represent p-value level of significance at 1%
Source: Author's Elaboration

As revealed in Table 4.5 above, a 1% increase in ROA is associated with a 1.23% increase in GDP using the FMOLS method. The results also reveal that ROA exert a positive effect on GDP since it corresponding coefficient has a positive sign and is statistically significant at 1% level. This suggests that ROA which is a proxy of banking efficiency in this study is positively link with economic growth in Cameroon during our period of study. This result is in line with previous studies like Puatwoe & Piabuo, (2017). Therefore, an increase in banking efficiency captured by ROA will generate a positive long run effect on the economic growth in Cameroon, everything being equal. However, before drawing the final conclusion in support of this result, we need to check on the outcome of other explanatory variables. Our result further reveals that a percentage increase in ROE causes a 0.10% increase in GDP and it is statistically significant at 1%, everything remains constant. ROE is a profitability ratio that indicates how efficient the banking sector in Cameroon is able to generate adequate profit from the owners' invested capital. ROE which captures banking efficiency, has a direct relationship with GDP in the long run given that it has a positive coefficient. It is important to recall that GDP is the proxy for economic growth in this study. These results are consistent with the result of Mulchandani and Totala (2016) where they found out that bank ROA and ROE contribute to banking efficiency in 39 Indian listed commercial banks over the period 2009-2015.

NIM is equally used in this research as explanatory variable that proxy banking efficiency. The findings suggest that there is a positive long run relationship between NIM and GDP. This main empirical investigation suggests that, 1% change in NIM causes a 2.33% increase in GDP, everything being equal. Additionally, the coefficient of NIM is statistically significant at 1% level. From the existing literature, the relationship between NIM and economic growth in the short run is positive. This relationship can either be positive or negative in the long run depending on the bank portfolio management. For instance, the relationship might become negative in the long run if banking institutions in seeking to reap higher profits decide to charge high interest rate. This might end up discouraging borrowers from taking more loans and increase risk of outstanding loans not been settled due to the high cost of borrowing. This is not common in all cases because the ability of banks to earn adequate profit in the long run from high NIM ratio depends on how efficient bank managers are able to manager their portfolio or bank assets. The result in this study confirms a positive long run relationship between NIM and GDP. This is consistent with the studies of Bikker & Vervliet (2018); Borio *et al.* (2017). However, diversification of banking sector portfolio

could also be envisaged. Institutional quality results which is captured by regulatory quality (RGQ) reveals that a percentage increase in RGQ causes a positive change in GDP by 0.56%. An improvement in institutional quality generally helps to reduce information asymmetry, default loans, credit risk thereby enhancing the efficiency of the banking system. This result is in line with the study of Cahn *et al.* 2021.

In a nutshell, the results in Table 4.5 above therefore suggest that there exists a long run relationship between banking efficiency and economic growth in Cameroon over the period 2000-2019. This is consistent with the result of Asamoah & Botchway (2021) in Ghana. The value of the r squared (91%) proves that our explanatory variables used to ascertain banking efficiency are vital to predict economic growth in Cameroon. Also banking institutions in Cameroon perform efficiently given that there is no undesirable result that signals a weak banking system in this area. However, when compared to other countries of the Nord, the efficiency level of banking sector in Cameroon need to be enhanced so as to be able to stand the competition in the global financial market. To avoid having misleading results and interpretations, the robustness check is conducted in the next section so as to validate our results and analyses and the causality of the relationship is checked by the granger causality test.

4.4 ROBUSTNESS CHECK RESULTS

The robustness check was conducted to confirm the results of our main empirical investigation presented in Table 4.5 above. Validation of our main results is very useful because it gives credibility to the research and reliable argument that serve as a guide to validate or refute the hypothesis established in the introductory chapter of our study. We used similar parameters to carry out this robustness check. It is only a new technique that was adopted in order to compare the results reported in the previous Table. To this end, Table 4.6 below presents the result of the DOLS (dynamic ordinary least square) for the robustness test.

Table 4.6: DOLS results (dependent variable: LGDP)

	DOLS Estimation			
Explanatory Variables	Coefficient	Std. Error	t-statistic	Prob.
ROA	4.9551	0.2440	20.3092	0.0313**

ROE	0.1243	0.0044	27.9953	0.0227**
NIM	6.5194	0.2255	28.9147	0.0220**
RGQ	0.1910	0.0387	4.9383	0.0019***

R-squared	0.9815	Mean dependent var	23.9930
Adjuested R-squared	0.7036	S.D dependent var	0.3232
S.E of regression	0.1760	Sum squared resid	0.0310
Durbin-Watson Stat	1.6743	Long-run variance	0.0019

Notes: Std. Error and Prob. Stands for standard error and probability values respectively.
This test was conducted using Bartlett Kernel method.
***represent p-value level of significance at 1%
**represent p-value level of significance at 5%
Source: Author's Elaboration

The results reported in Table 4.6 above suggest that return on asset (ROA) is positively connected with GDP using the DOLS estimation approach. It coefficient is 4.96% and statistically significant at 5%. In other words the DOLS results suggest that for every unit increase in ROA, there will be a 4.96% increase on the GDP level. This implies that the banking institutions' return on asset (ROA) have a long run impact on GDP; which is a macroeconomic variable that proxy economic growth. This is a consistent with the result reported in Table 4.5 as well as the findings of Athanasoglou *et al.* (2008). The results reported further confirms the establish outcome in the previous Table which implies that, the ROE ratio of banking institutions over the period of sample in Cameroon is having a long run positive effect on economic growth level. In addition, the DOLS robustness test provides evidence that confirms a positive long run relationship between Bank's net interest margin (NIM) and economic growth in Cameroon. NIM is having a positive coefficient value of 6.52% and statistically significant at 5% level. That means that NIM positively contributes to banking efficiency that favors economic growth in the long run.

From these analyses, we found that the results of our robustness check through DOLS using inflation are largely consistent with the results reported by the main empirical investigation results in Table 4.5 above and the magnitude of the effects are the same given that coefficient values of our parameters in Table 4.5 and Table 4.6 produce almost similar results. The

overall results translate the robust empirical findings in our study. We can therefore conclude that the results reported by the FMOLS are reliable and robust.

4.5 GRANGER CAUSALITY RESULTS

The purpose of performing the granger causality test is to determine the causality among the variables in the study. The result of this test is reported in Table 4.7 below.

Table 4.7: VAR (Vector Auto regression) causality test

Residual serial correlation LM test

LM-Stat= 28.8962   (p-value=0.2683)   lag:1

VAR Granger Causality

Null hypothesis	Chi. sq	lag	p.Value	Causality	Remark
ROA $\rightarrow$ GDP	6.5581	1	0.0104	Yes	Uni-directional
GDP $\rightarrow$ ROA	2.2293	1	0.9235	No	
ROE $\rightarrow$ GDP	2.3039	1	0.0378	Yes	Uni-directional
GDP $\rightarrow$ ROE	0.0615	1	0.6931	No	
NIM $\rightarrow$ GDP	3.1352	1	0.0766	Yes	Uni-directional
GDP $\rightarrow$ NIM	0.2023	1	0.3377	No	
RGQ $\rightarrow$ GDP	0.4505	1	0.0078	Yes	Uni-directional
GDP $\rightarrow$ RGQ	0.9192	1	0.3377	No	

Notes: p-value is the probability value   **Source:** Author's Elaboration

Table 4.7 above provides the findings of the causality relationship between our dependent variable (GDP), explanatory variables (ROA, ROE, NIM) and control variable (RGQ). The VAR granger causality optimal lag selection is based on the lag selection criteria and the results of residual serial correlation test. The VAR serial autocorrelation accept the null hypothesis of no serial correlation at lag 1 because the P value (0.27) is greater than 5% significance level. For causality using VAR granger causality test the decision is that if the p-value is less than 5%, there is causality. The reverse is true when the p-value is greater than 5% significance level. Also, the null hypothesis says that is variable x does not granger cause variable y.

From the results reported in Table 4.7, we could therefore identify a causal unidirectional relationship from ROA to GDP because the probability value here is 0.01, which is less than 5% significance level. Similarly, there is a causal unidirectional relationship from ROE to

GDP (p-value 0.04). Furthermore, a unidirectional causality is also identified between NIM and GDP. This runs from NIM to GDP because it has a probability value 0.08 though above 5% but it is still significant at 10%. Asamoah and Botchway (2021) found similar results in Ghana. Similarly, there is a unidirectional causality that runs from RGQ to GDP because it has a probability value of 0.01 which is below the threshold significance level of 5%. Overall, the findings reveal a unidirectional relationship that runs from banking efficiency to economic growth. The nature of this unidirectional relationship running from banking efficiency to economic growth is due to the fact that economic growth does not play a significant role in predicting the level of banking efficiency in less advanced economies like Cameroon (Ehigiamusoe, 2021). In developing and emerging market economies, the economic performance is generally narrow due to the low GDP per capita caused by political instability, technological advancement which does not significantly directly influence banking performance.

4.6 CONCLUSION

We discussed the results and analyses of the study for answering the research questions. We started by reporting and analyzing the descriptive statistics results. Correlation test was performed and the results show that all variables are correlated to GDP and no multicollinearity issue was detected. Furthermore, we performed the unit root and it was found that the variables are stationary. We then proceeded with the Johansen cointegration test were evidence of cointegration among the variables was established. Given that the series are cointegrated, we next performed the main empirical investigation using the FMOLS estimation technique. A long run positive relationship between banking efficiency and economic growth was found in Cameroon over the time period of the research. Robustness test confirmed these results using the DOLS empirical test. Finally, the granger causality test was conducted and unidirectional relationship was established running from each explanatory variable to the dependent variable.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 SUMMARY OF THE STUDY

Conclusion is the section of the research that provides a summary of the entire work done throughout the research and decisions drawn based on the results obtained. It is for this reason that it is one of the most important parts of the research as it carries all vital information needed to fully grasp the study without necessarily reading the complete research (Adeleye *et al.* 2020). This chapter delivers the summary, conclusion and some vital policy recommendations born of this research. We start the section of this chapter by providing the highlights of the summary in each chapter. The second section talks about the general conclusion of the study. The last section outlines the policy recommendations which arose from the study and also the way forward for the future researches in the area.

The earliest chapter offered the general introduction and background of the study. The background included the overview of banking system in Cameroon. We discussed in the subsequent section; the problem statement related to the study, research questions and research objectives. We then defined the key terminologies used in the study; banking efficiency and economic growth. Furthermore, the significance of the study was stated which justified the current need for this investigation in Cameroon. We then elaborated the organization of chapters which provide information of the main points discussed in each chapter. The last part of chapter one was the conclusion which summarized what was said in the chapter.

Chapter two discussed about the theoretical grounds and the empirical literature of the work. The information asymmetry theory also known as the agency theory and neoclassical economic growth theory of Solow were the two theories that was adopted (because they are consistent with our research objectives) to guide our study. These theories provided the basis of the understanding of our key terminologies; banking efficiency and economic growth. We discussed in the next part the empirical literature of prior studies in this particular area. This section was segmented according to the following sub headings; return on asset and economic growth related studies, bank's net interest margin and economic growth related studies, return

on equity and economic growth related studies, regulatory quality and economic growth studies and finally we mentioned some other studies that used theoretical literature to study banking efficiency. The last section of chapter two was the discussion of the conceptual framework.

Furthermore, chapter three presented the research methodology which shows the road map for carrying out the empirical investigations meant to answer the research questions. The next point was the discussion of the description and sources of data. Next, the explanation of the dependent and explanatory variables was given. The next section outlined the empirical investigations of the study. We developed the model specification to guide our estimations and then discussed the descriptive statistics. Subsequently, we carried out some initial empirical investigations. These initial empirical tests are; correlation analysis, ADF and PP unit root test and Johansen cointegration test. Our main empirical estimation was then examined; which is the FMOLS. Furthermore, we examined in this chapter the robustness checks and VAR granger causality test. The conclusion was then drawn.

Chapter four was dedicated for the results and analyses of the research. The Descriptive statistics was reported and explained. This was followed by performing and analyzing initial empirical checks such as correlation analyses, unit root test and cointegration test. The main empirical results was then reported and discussed; FMOLS estimation method. This was followed by the robustness check; DOLS technique. We last reported and explained the results of the granger causality test. Conclusion was last discussed.

In the next part of our work, we shall discuss the general conclusion and vital recommendations born of this study.

5.1 CONCLUSION OF STUDY

It has been established in existing literature that the banking industry represents the principal segment of financial institutions in Sub Saharan Africa in general and Cameroon more specifically and by extension the engine room for economic growth. The urgent need to carry out this investigation stem from the fact that banking sector efficiency contributes to a significant share of financial system development and economic growth in Cameroon because other financial sectors are less efficient. This suggests that a failure in the banking system might create a contagion effect in the macroeconomic stability which eventually affects the level of economic growth in Cameroon. With this background knowledge, we empirically

explored in this study the extent of the nexus between banking efficiency and economic growth in Cameroon from 2000 to 2019 using the FMOLS methods. The principal objective of the study was to theoretically and empirically explore the extent of the banking efficiency and economic growth connection in Cameroon.

To conquer the objectives of this study, we used time series data for 20 years to capture the banking efficiency and economic growth in Cameroon. We utilized GDP as our dependent variable to capture economic growth and the combination of ROA, ROE and NIM as explanatory variables for proxies of banking efficiency and institutional quality (regulatory quality) as the control variable. The descriptive statistics reveals that banking sector efficiency ratio are 1.28%, 28.01%, 4.85% and 20.57 for ROA, ROE, NIM and RGQ respectively. These results translate an improvement in the efficiency level of banking institutions in Cameroon over years though better performance is expected. Prior to further empirical investigations, we ran a matrix correlation table to verify that our explanatory variables are not correlated among each other. The results revealed the absence of multicollinearity issue in our study, giving room for other estimations. Based on the confirmation of stationary series, the panel cointegration test was conducted and this confirmed the existence of a long run cointegration between banking efficiency and economic growth in Cameroon.

The FMOLS estimation technique was conducted for the main empirical analyses. The results reveal that banking efficiency has a significant positive long run relationship with economic growth in Cameroon over the period of study. Further outcome suggest that a unit change in ROA ratio account for 1.23% positive change in economic growth through the effect on GDP using the FMOLS method. This means that ROA which is a profitability ratio that captures banking efficiency is important as it is a contributory element to economic growth in Cameroon.

The results further reveal that a percentage increase in ROE causes 0.096% increase in GDP over the period under review. ROE is a profitability ratio that tells us how efficient the banking sector in Cameroon is able to generate adequate profit from the owners' invested capital. ROE which captures banking efficiency is positively connected with GDP in the long run (which is the proxy economic growth in our case study) since it has a positive significant coefficient. This high ratio translates a high efficiency in the management of the banks' equity capital in Cameroon.

Furthermore, a positive long run connection is established between NIM and GDP. This is because a percentage change in NIM causes a 2.33% positive change on GDP with over the time period of the study. This means higher NIM is a contributory factory to efficiency in banking institutions which is essential for financial system robustness and economic stability. This is consistent with the findings of Bikker & Vervliet (2018); Borio *et al.* (2017). However, to have a more sophisticated financial system, the existing literature advanced diversification of banking portfolio as the ultimate solution. RGQ improvement causes a 0.56% increase in economic growth.

The overall result discussed above was checked by using a different empirical method (DOLS) while the variables are unchanged. The findings suggest that the main results are robust and reliable. Our results is consistent with the theories that guide our study; information asymmetry theory. These results suggest that the banking sector in Cameroon perform efficiently and this exerts a positive influence on the financial system robustness and hence economic growth. A unidirectional relationship was also established from ROA to GDP and from ROE to GDP. The same relationship was established between NIM and GDP, RGQ and GDP. This study is in agreement with the conclusions of Joshua et al. (2020) on South-African countries.

5.2 POLICY RECOMMENDATIONS

The following are the relevant policy recommendations born of the findings of this study;

i.   We suggest that competent authorities in Cameroon to develop it capital market. This is because banking institutions in Cameroon are engaged mainly in money market operations and traditional banking function. Capital market activities like the debt and equity market operations will increase diversification of their activities which is primordial to achieve greater efficiency which is desirable for sustainable growth and stability in the economy.

ii. The study further recommends that government should have tightening prudential regulations and oversight over financial institutions in Cameroon. This will help to reduce information asymmetry, credit default and other factors that can weakened the financial system.

iii. Finally, we recommend top management of banking institutions to embrace financial innovation and technology and therefore facilitate financial inclusion. This will go a

long way to improve efficiency and make their products and services available to the clients at the lowest possible cost.

5.3 LIMITATIONS OF THE STUDY

In the process of trying to put the bits that make this work, a host of problems were encountered. Some of these include;

i. Limited Time: The time within which this investigation was carried out was not sufficient enough to explore other related issues on this area.

ii. Data Availability: This was the most challenging point encountered in this research. The data for the variables employed in this research could not cover larger time period. The time period under in this study is just 20years. This is the data availability for larger period in Cameroon could not be found.

iii. Financial constraint: The financial handicap was also a blocking point in this study. Other relevant parameters or variables could not be used in this study because those data were not freely available.

5.4 SUGGESTIONS FOR FUTURE STUDIES

The following are the suggestions for future studies in this particular area;

i. This study examined the nexus between banking efficiency and economic in Cameroon for only 20years (over the period 2000-2019). However, data for up to 2021 could be useful to have a better comprehension of banking efficiency in Cameroon in more recent years. In this regards, we recommend the period of the study to be extended to a more recent year in case data could be later available for more recent years. The study therefore needs to be revisited to capture some changes that might have occurred.

ii. We also suggest that future studies in this area should consider other variables that can be used to explain banking efficiency in Cameroon. This is because our results reveal that the variables used in this study are not the sole determinant of banking efficiency rather they are contributory factors. This will help to check the relationship between banking and economic growth in Cameroon from a more global perspective.

iii. Lastly, we suggest future researchers to revisit this nexus between banking efficiency and economic growth in Cameroon in a panel study with other sub Saharan African countries. This will provide us with a comparative analysis of the level of banking efficiency in Cameroon with respect to other member countries of sub Saharan Africa.

REFERENCES

Aboyadana, G. (2021). Monetary policy and bank risk-taking in sub-sahara Africa. *The European Journal of Applied Economics* , *18* (1).

Abrar, A., Hasan, I., & Kabir, R. (2021). Finance-growth nexus and banking efficiency: The impact of microfinance institutions. *Journal of economics and business* , *114* , 105975.

Acharya, S. (2018). *Improving corporate governance in Nepalese financial institutions to promote growth and performance* (Doctoral dissertation, The University of Waikato).

Adeleye, BN, Gershon, O., Ogundipe, A., Owolabi, O., Ogunrinola, I., & Adediran, O. (2020). Comparative investigation of the growth-poverty-inequality trilemma in Sub-Saharan Africa and Latin American and Caribbean Countries. *Helion* , *6* (12), e05631.

Adusei, M. (2013). Financial development and economic growth: Evidence from Ghana. *The International Journal of Business and Finance Research* , *7* (5), 61-76.

African Development Bank, & Development. Development Center. (2006). *African economic outlook*. OECD.

Ahamed, M. M., Ho, S. J., Mallick, S. K., & Matousek, R. (2021). Inclusive banking, financial regulation and bank performance: Cross-country evidence. *Journal of Banking & Finance*, *124*, 106055

Akande, JO (2018). Do competition, regulation and stability matter for efficiency in Sub-Saharan African banking sectors? *Cogent Economics & Finance*, *6* (1), 1493667.

Akbaş, H. E. (2012). Determinants of bank profitability: An investigation on Turkish banking sector..

Akon, G. (2008). A critical look at banking sector regulations in Cameroon. In *African Development Finance Policy Workshop*.

Alber, N. (2017). Banking Efficiency and Financial Stability: Which Causes Which? A Panel Analysis. In *Advances in Applied Economic Research* (pp. 91-98). Springer, Cham.

Al-Harbi, A. (2019). The determinants of conventional banks profitability in developing and underdeveloped OIC countries. *Journal of Economics, Finance and Administrative Science*.

Alkhazaleh, AMK (2017). Does banking sector performance promote economic growth? Case study of Jordanian commercial banks. *Problems and Perspectives in Management* , *15* (2), 55-66.

Alola, A. A., Yalçiner, K., Alola, U. V., & Saint Akadiri, S. (2019). The role of renewable energy, immigration and real income in environmental sustainability target. Evidence from Europe largest states. *Science of The Total Environment*, *674*, 307-315.

Altunbas, Y., L. Evans, and P. Molyneux (2001). Bank ownership and efficiency. Journal of Money, Credit and Banking, 33(4), 926–954

Aluko, O. A., & Ajayi, M. A. (2018). Determinants of banking sector development: Evidence from Sub-Saharan African countries. *Borsa Istanbul Review*, *18*(2), 122-139.

Andrews, D. W. (1991). Heteroskedasticity and autocorrelation consistent covariance matrix estimation. *Econometrica: Journal of the Econometric Society*, 817-858.

Arafat, M. Y., Warokka, A., Buchdadi, A. D., & Suherman. (2013). Banking efficiency and performance: a test of banking characteristics in an emerging market. *Journal for Global Business Advancement*, *6*(1), 13-23.

ASAMOAH, G., & BOTCHWAY, R. (2021). Finance-Growth Nexus in Ghana: Testing Four Competing Theories. *Journal of Technology, Engineering, Management & Computational Sciences* , *1* (1), 1-55.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of international financial Markets, Institutions and Money*, *18*(2), 121-136.

Banto, J. M., & Monsia, A. F. (2021). Microfinance institutions, banking, growth and transmission channel: A GMM panel data analysis from developing countries. *The Quarterly Review of Economics and Finance*, *79*, 126-150.

Barth, J. R., Caprio, G., & Levine, R. (2000). *Banking systems around the globe: do regulation and ownership affect performance and stability?* (Vol. 15). World Bank Publications

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2009). Financial institutions and markets across countries and over time. *Policy research working paper*, *4943*.

Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. *The review of economic studies*, *58*(2), 195-209.

Berger, A. N., & Hannan, T. H. (1998). The efficiency cost of market power in the banking industry: A test of the "quiet life" and related hypotheses. *Review of economics and statistics*, *80*(3), 454-465.

Berger, A.N., Hancock, D. & Humphrey, D. B. 1993. 'Bank Efficiency Derived from the Profit Function', *Journal of Banking and Finance*, 17: 317-47.

Bikker, J. A., & Vervliet, T. M. (2018). Bank profitability and risk-taking under low interest rates. *International Journal of Finance & Economics*, *23*(1), 3-18.

Borges, MR, & Tavares, AS (2020). Determinants of bank performance in the context of crisis: a panel data analysis for Portugal.

Borio, C., Gambacorta, L., & Hofmann, B. (2017). The influence of monetary policy on bank profitability. *International Finance*, *20* (1), 48-63.

Boyd, J. H., Levine, R., & Smith, B. D. (2001). The impact of inflation on financial sector development. Journal of Monetary Economics, 47(2), 221e248.

Brei, M., Borio, C., & Gambacorta, L. (2020a). Bank intermediation activity in a low-interest-rate environment. *Economic Notes*, *49*(2), e12164.

Brei, M., Jacolin, L., & Noah, A. (2020b). Credit risk and bank competition in Sub-Saharan Africa. *Emerging Markets Review*, *44*, 100716.

Bui, T.N. (2019a). The Role of Financial Development in the Vietnam Economy. *WSEAS Transactions on Business and Economics, 16*, 471-476.

Bui, TN (2019b). How Does The Relationship Between Economic Growth And Bank Efficiency? Evidence From Asean Countries.

Canh, N.P., Schinckus, C., Su, T.D. and Chong, F.H.L. (2021), "Institutional quality and risk in the banking system", *Journal of Economics, Finance and Administrative Science*, Vol. 26 No. 51, pp. 22-40.

Claessens, S., & Laeven, L. (2003). Financial development, property rights, and growth. *the Journal of Finance*, *58*(6), 2401-2436.

Claessens, S., & Laeven, L. (2003). Financial development, property rights, and growth. *the Journal of Finance*, *58*(6), 2401-2436.

Coccorese, P., & Pellecchia, A. (2010). Testing the 'quiet life'hypothesis in the Italian banking industry. *Economic Notes* ,

Delis, M.D. (2012), "Bank competition, financial reform, and institutions: the importance of being developed", Journal of Development Economics, Vol. 97 No. 2, pp. 450-465.

Dietrich, A., & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions and Money* , *21* (3), 307-327.

Doblas-Madrid, A., & Minetti, R. (2013). Sharing information in the credit market: Contract-level evidence from US firms. Journal of Financial Economics, 109(1), 198–223.

Dwumfour, RA (2017). Explaining banking stability in Sub-Saharan Africa. *Research in International Business and Finance*, *41*, 260-279.

Ehigiamusoe, Kizito Uyi. (2021). The nexus between tourism, financial development, and economic growth: Evidence from African countries. African Development Review 11: 382–96.

Ehigiamusoe, KU, & Samsurijan, MS (2020). What matters for finance - growth nexus? A critical survey of macroeconomic stability, institutions, financial and economic development. *International Journal of Finance & Economics*.

Fernández, A. I., González, F., & Suárez, N. (2013). The real effect of banking crises: Finance or asset allocation effects? Some international evidence. *Journal of Banking & Finance*, *37*(7), 2419-2433.

Fernández, A. I., González, F., & Suárez, N. (2016). Banking stability, competition, and economic volatility. *Journal of Financial Stability*, *22*, 101-120.

Garai, A., Mondal, B., & Roy, T. K. (2019). Optimisation of multi-objective commercial bank balance sheet management model: a parametric T-set approach. *Int. J. Math. Oper. Res.*, *15*(4), 395-416.

Gehrig, T., & Stenbacka, R. (2007). Information sharing and lending market competition with switching costs and poaching. *European Economic Review*, *51*(1), 77-99.

Guiso, L., Sapienza, P., & Zingales, L. (2009). Does Local Financial Development Matter? The Banks and the Italian Economy. *Heidelberg: Physica-Verlag HD*, 31-66.

Gujarati, D. (2004). Basic econometrics fourth (4th) edition. *Magraw Hill Inc, New York* , *109* .

Hair, JF, Anderson, RE, Tatham, RL, & Black, WC (1984). Multivariate data analysis with readings, 1995. *Tulsa, OK: Petroleum Publishing* .

Hakenes, H., Hasan, I., Molyneux, P., & Xie, R. (2015). Small banks and local economic development. *Review of Finance* , *19* (2), 653-683.

Hamdi, K., & Saada, MB (2015). The determinants of banking performance: Empirical evidence from Tunisian Listed Banks. *International Journal of Finance & Banking Studies (2147-4486)* , *4* (2), 21-28.

Hamid, N., Ramli, NA, & Hussin, SAS (2017, January). Efficiency measurement of the banking sector in the presence of non-performing loan. In *AIP Conference Proceedings* (Vol. 1795, No. 1, p. 020001). AIP Publishing LLC.

Hamilton, J.D. (2020). *Time series analysis* . Princeton university press.

https://data.worldbank.org/indicator/SP.POP.TOTL?locations=CM

Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*, *40*(6), 1104-1125.

International Monetary Fund (IMF). 2009. Cameroon: Financial System Stability Assessment.

Isoh, AVN, & NCHANG, ND (2020). Assessing The Impact of Operational Risk Management on Financial Performance of Selected Mainstream Commercial Banks in Cameroon. *International Journal of Research In Commerce and Management Studies (ISSN: 2582-2292)* , *2* (2), 1-16.

Issa, S., Girardone, C., & Snaith, S. (2020). Banking competition, convergence and growth across macro-regions of MENA. *The Quarterly Review of Economics and Finance*.

Jayakumar, M., Pradhan, R. P., Dash, S., Maradana, R. P., & Gaurav, K. (2018). Banking competition, banking stability, and economic growth: Are feedback effects at work? *Journal of Economics and Business*, *96*, 15-41

Jensen, MC, & Meckling, WH (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics* , *3* (4), 305-360.

Joshua, U., Adedoyin, FF, & Sarkodie, SA (2020). Examining the external-factors-led growth hypothesis for the South African economy. *Helion* , *6* (5), e04009.

Kallberg, J. G., & Udell, G. F. (2003). The value of private sector business credit information.

Kumar, V., Acharya, S., & Ho, LT (2020). Does Monetary Policy Influence the Profitability of Banks in New Zealand? *International Journal of Financial Studies*, *8* (2), 35.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1998. Law and finance. J. Polit. Econ.106, 1113–1155.

Levine R. (2005), "Finance and Growth: theory and evidence", *Handbook of Economic Growth* 1, 865-934.

Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modeling* , *37* , 386-394.

Merlin, M. L., & Chen, Y. (2021). Analysis of the factors affecting electricity consumption in DR Congo using fully modified ordinary least square (FMOLS), dynamic ordinary least square (DOLS) and canonical cointegrating regression (CCR) estimation approach. *Energy*, *232*, 121025.

Mulchandani, K., & Totala, NK (2016). Impact of Macroeconomic Determinants on Profitability of Indian Commercial Banks. *Research Journal of Management Sciences*, *5* (10), 9-16..

Nanda, R., & Nicholas, T. (2014). Did bank distress stifle innovation during the Great Depression? *Journal of Financial Economics*, *114*(2), 273-292.

Ngimanang, A. (2020). Examining The Finance-Growth Nexus in Cameroon Using Cointegration Approach. *American Journal of Economics* , *4* (2).

Njimanted, G. F., Akume, A. D., & Aquilas, N. A. (2017). Modelling the impact of liquidity trend on the financial performance of commercial banks and economic growth in Cameroon. *International Journal of Financial Research*, *8*(3), 121-134.

Nyantakyi, E. B., Sy, M., & Kayizzi-Mugerwa, S. (2015). The banking system in Africa: Main facts and challenges. *Africa Economic Brief*, *6*(5), 1-16.

Olorogun, LA (2021). The nexus between FDI inflows and economic development in Ghana: Empirical analysis from ARDL model. *Journal for Global Business Advancement* , *14* (1), 93-114.

Owusu, E. L., & Odhiambo, N. M. (2014). Financial liberalisation and economic growth in Nigeria: an ARDL-bounds testing approach. *Journal of Economic Policy Reform*, *17*(2), 164-177.

Pan, H., & Wang, C. (2013). Financial development and economic growth: A new investigation. *Journal of Economic Development*, *38*(1), 27.

Pareto, V., & Schwier, A. S. (1927). Manual of political economy Tr. by Ann S. Schwier.

Peia, O., Roszbach, K., 2015. Finance and growth: time series evidence on causality.J. Financ. Stab. 19, 105–118.

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: evidence from EU 27 banking systems. *Procedia economics and finance*, *20*, 518-524.

Puatwoe, JT, & Piabuo, SM (2017). Financial sector development and economic growth: evidence from Cameron. *Financial Innovation* , *3* (1), 1-18.

Puatwoe, JT, & Piabuo, SM (2017). Financial sector development and economic growth: evidence from Cameron. *Financial Innovation* , *3* (1), 1-18.

Pyrczak, F., & Tcherni-Buzzeo, M. (2018). Evaluating Analysis and Results Sections: Qualitative Research. In *Evaluating Research in Academic Journals* (pp. 128-139). Routledge.

Raddatz, C., 2006. Liquidity needs and vulnerability to financial underdevelopment.J. Financ. Econ. 80, 677–722.

Rajan, R.G., Zingales, L., 1998. Financial dependence and growth. Am. Econ. Rev. 88,559–586.

Rashid, M., Ur, H., Zobair, SAM, Chowdhury, M., Iqbal, A., & Islam, A. (2020). Corporate governance and banks' productivity: evidence from the banking industry in Bangladesh. *Business Research* , *13* (2), 615-637

Saint Akadiri, S., Alola, AA, Akadiri, AC, & Alola, UV (2019). Renewable energy consumption in EU-28 countries: policy toward pollution mitigation and economic sustainability. *Energy Policy* , *132* , 803-810.

Sari, PZ, & Saraswati, E. (2017). The Determinant of Banking Efficiency in Indonesia (DEA Approach). *Journal of Accounting and Business Education*, *1* (2), 208-229.

Sarpong-Kumankoma, E., Abor, J., Aboagye, A. Q., & Amidu, M. (2017). Freedom, competition and bank efficiency in Sub-Saharan Africa. *International Journal of Law and Management*.

Sarpong-Kumankoma, E., Abor, JY, Aboagye, AQ, & Amidu, M. (2020). Economic freedom, competition and bank stability in Sub-Saharan Africa. *International Journal of Productivity and Performance Management* .sharing: The US case. Journal of Banking & Finance, 27(3), 449–469.

Sheefeni, J. P. S. (2015). The Macroeconomic Determinants of Profitability among Commercial Banks in Namibia. *Journal of Emerging Issues in Economics, Finance and Banking*, *4*(1), 1414-1431.

Shen, B., Choi, T. M., & Minner, S. (2019). A review on supply chain contracting with information considerations: information updating and information asymmetry. *International Journal of Production Research*, *57*(15-16), 4898-4936.

Sony, B., & Bhaduri, S. (2021). Information asymmetry and financing choice between debt, equity and dual issues by Indian firms. *International Review of Economics & Finance* , *72* , 90-101.

Spong, K., R. J. Sullivan, and R. DeYoung (1995). What makes a bank efficient? A look at financial characteristics and bank management and ownership structure. Federal Reserve Bank of Kansas City.

Sridhar, M. S. (2013). Importance and Issues of Literature Review in Research. In *A presentation made at workshop on „Tackle a Literature Review" under the series „Publish or Perish", orgd. by Mysore University Library and Mysore Librarians and Information Scientists Association*.

Sufian, F., & Noor Mohamad Noor, MA (2012). Determinants of bank performance in a developing economy: Does bank origins matters?. *Global Business Review* , *13* (1), 1-23.

Swamy, V., & Dharani, M. (2019). The dynamics of finance-growth nexus in advanced economies. *International Review of Economics & Finance* , *64* , 122-146.

TAMINI, P. L. A. (2017). How Institutional Framework Shapes Bank Efficiency in Sub-Saharan Africa.

Trofimova, EA, Bakunova, TV, Yuzvovich, LI, Mokeeva, NN, & Sutormina, MA (2018). Econometric Analysis Of Influence Of Bank Efficiency On Economic Growth Of Region. In *International Conference on Research Paradigms Transformation in Social Sciences (RPTSS)* (pp. 1204-1210). FUTURE ACAD.

Tseng, P. L., & Guo, W. C. (2021). Fintech, Credit Market Competition, and Bank Asset Quality. *Journal of Financial Services Research*, 1-34.

Tzeremes, NG (2015). Efficiency dynamics in Indian banking: A conditional directional distance approach. *European Journal of Operational Research* , *240* (3), 807-818.

Uddin, G. S., Shahbaz, M., Arouri, M., & Teulon, F. (2014). Financial development and poverty reduction nexus: A cointegration and causality analysis in Bangladesh. *Economic Modelling*, *36*, 405-412.

Update, IMF Country Report No. 09/51 February 2009.

Wang, C., Zhang, X., Ghadimi, P., Liu, Q., Lim, M. K., & Stanley, H. E. (2019). The impact of regional financial development on economic growth in Beijing–Tianjin–Hebei region: A spatial econometric analysis. *Physica A: Statistical Mechanics and its Applications*, *521*, 635-648.

Wang, Y. (2020). Theoretical Framework and Research Methodology. In *A Comparative Study on the Translation of Detective Stories from a Systemic Functional Perspective* (pp. 57-65). Springer, Singapore.

Yakubu, Z., & Affoi, AY (2014). An analysis of commercial banks' credit on economic growth in Nigeria. *Current Research Journal of Economic Theory* , *6* (2), 11-15.

Ye, X., & Zhao, L. (2019). Are market views on banking industry useful for forecasting economic growth? *Pacific-Basin Finance Journal*, *57*, 101082.
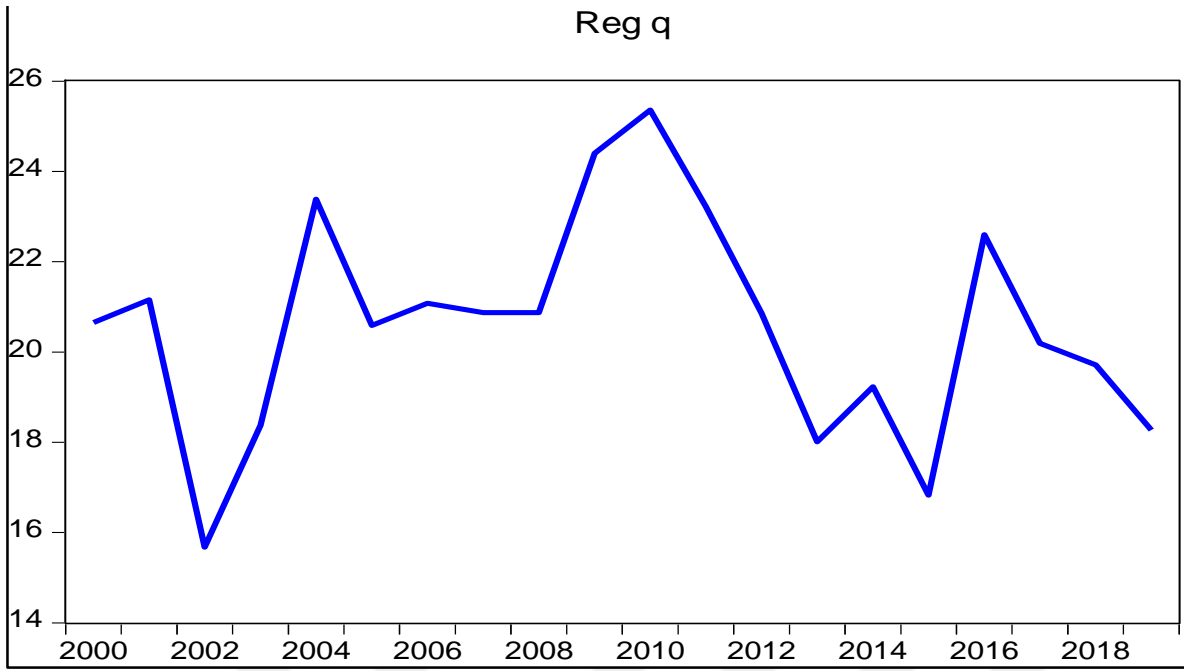
Figure 2: *Graphical representation of the data over the period 2000-2019*

GDP

ROA

ROE

NIM

Reg q
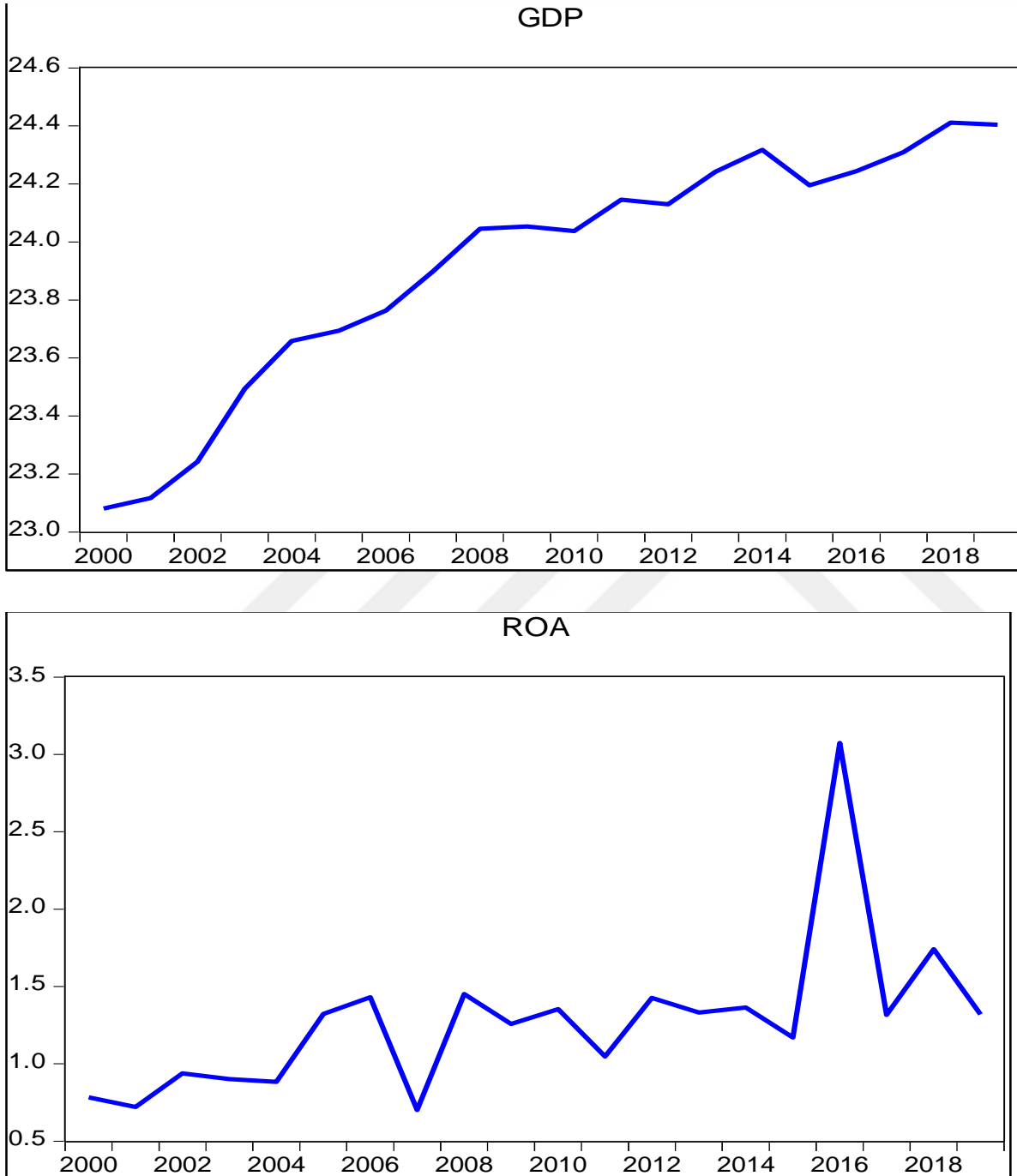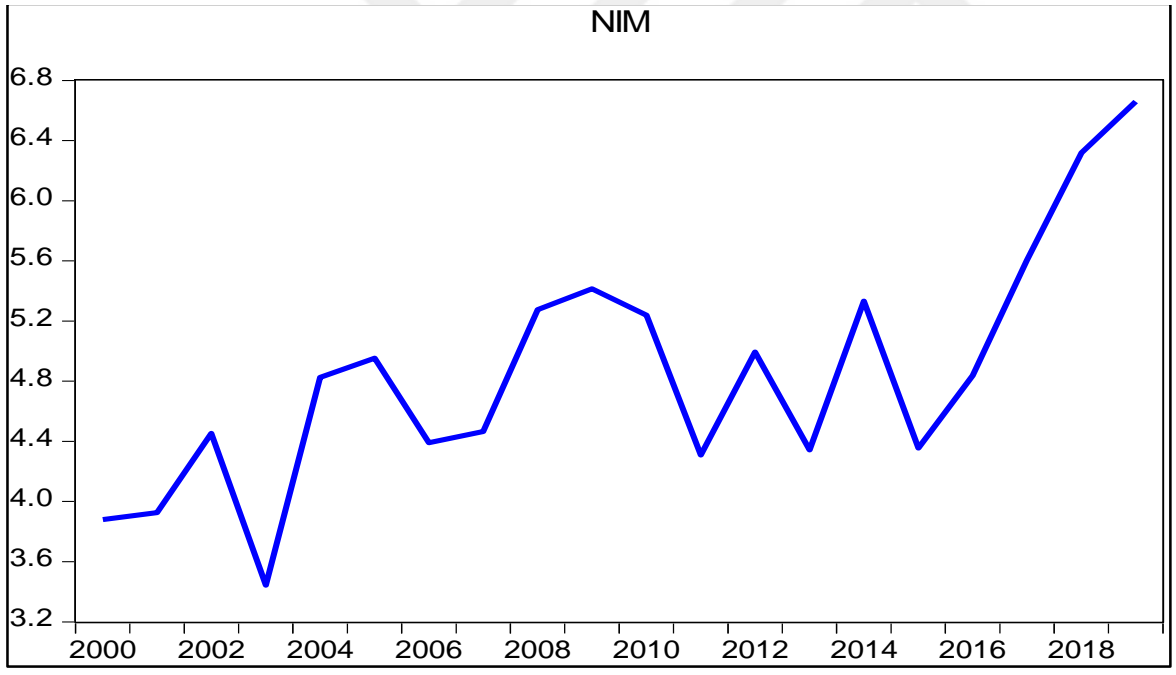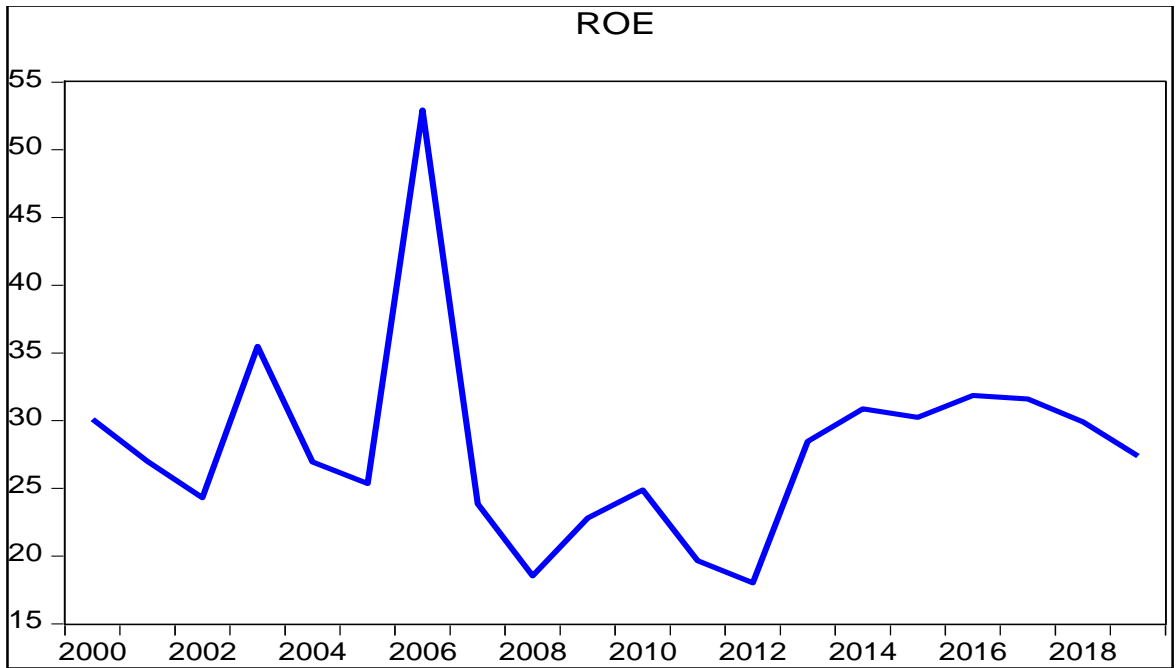
RESUME

Personal Information

Surname, name   : Ulrich Donve TIAMGNE

Education

Degree	Education Unit	Graduation Date
Master	Istanbul Gelisim University	2022
Bachelor	University of Yaoundé II	2015
High School	Government Bilingual High school Yaoundé	2011

Work Experience

Year	Place	Title

Foreing Language

French, German and Turkish

Publications

Hobbies

Reading, Research, Sport, infos.