

# **Macro-economic determinants of domestic private sector credit in sub-Saharan Africa**

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## **ABSTRACT**

Credit, to the private sector, is a critical component in driving growth and development the world over. In Africa, the level of credit advanced to the private sector as a percentage of GDP seems to have lagged other more developed regions at 46% of GDP in 2015, in comparison to 120% of global GDP.

This study seeks to examine the macro-economic determinants of private sector credit growth in sub-Saharan Africa. The study focuses on independent variables GDP growth (GDP), money supply (M2), inflation (CPI) and interest rates (INTR). Using a panel data approach, twelve sub-Saharan countries are analysed with data observed over a thirty-six-year period, from 1980 to 2015. The size of the panel of countries was determined by the availability of data points on all variables that enabled a balanced panel. Both the random effects and the fixed effects estimation techniques are computed with the random effects method being more significant in the regression analysis, exploring the relationships between the independent variables and the dependent variable.

The key findings of the study are that money supply is a significant determinant of private sector credit growth in sub-Saharan Africa showing a positive correlation coefficient. A percentage increase in M2 results in an increase of 0.9% in credit to the private sector. Inflation, on the other hand, dampens the growth in credit to the private sector with a significant negative correlation: a percentage increase results in a reduction of 0.06% in credit to the private sector. GDP growth was statistically insignificant in determining private sector credit growth, with recessionary periods experienced by the sample countries yielding a marginal negative correlation coefficient. Interest rates were also statistically insignificant with a negative correlation to private sector credit showing that credit growth was driven by the underlying need, rather than the cost of credit, in sub-Saharan Africa.

It is recommended that policy makers and African governments formulate macro-economic policy that delicately balances the need to drive growth in required money supply, while at the same time maintaining stability in the rate of inflation and related variables. It is also recommended that Financial institutions implement strategies that prioritise mobilisation of loanable funds over interest rate margins. Private sector players are encouraged to focus on promoting investment-led credit consumption in key sectors of the African economy.

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## **Glossary of terms**

**Broad money supply (M2):** Sum of currency outside banks; demand deposits other than those of the central government; the time, savings and foreign currency deposits of resident sectors other than the central government; bank and travellers' checks; other securities such as certificates of deposit and commercial paper.

**Consumer price index (CPI):** Annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals such as yearly annually.

**Domestic credit to the private sector (DCRP):** Financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable, that establish a claim for repayment.

**Gross domestic product (GDP):** The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products

**Gross domestic product (GDP) growth:** Annual percentage growth rate of GDP at market prices based on constant local currency.

**Lending interest rate (INTR):** The bank rate that usually meets the short- and medium-term financing needs of the private sector. This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing.

## **Acknowledgements**

This paper is the culmination of an immense period of learning, fuelled by a deep passion for this great continent of Africa, we call home. I am optimistic about the promise it holds and keen to lend my finance skills in leaving it a better, more developed continent than it is today. I would like to take the opportunity to thank my family and friends for the great support rendered to me during this process without which there would be no success to report. My wife Martha-Sarah, you have been a rock, I'm forever grateful. Special thanks to the DEFIC faculty, my supervisor, Dr Abdul Latif Alhassan, for the sturdy guidance throughout the research process.

May we be excellent custodians of Africa's resources, including its intellectual properties.

# Chapter 1

## Introduction

### 1.1 Introduction and background to the study

Despite the age-old economic debate on the causal relationship between financial development and economic growth, it has become apparent globally that both are essential conditions to facilitate economic development. Credit to the private sector is considered a key component in stimulating economic development and a key indicator of financial-sector development (Dembiermont & Drehmann, 2013). The World Economic Forum (2015), proposed seven key areas to measure financial development, key among these being credit to the private sector.

Globally, private sector credit has almost doubled from 66% of Global GDP in 1975 to 128% in 2015. Global GDP is estimated to have grown by 3% in 2017 with an increase in investment spending and growth in credit to the private sector, across both developed and less developed economies, cited as key drivers (United Nations, 2018).

High income and developed economies have generally exhibited high levels of access to private sector credit, as shown in Table 1 below. In sub-Saharan Africa (SSA), private sector credit was reported as 46% of the region's GDP in 2015 (World Bank, 2017). Even though this has grown by over 50% from 1975, it remains more than a third of the level observed for the global economy.

**Table 1: Domestic credit to the private sector**

Domestic credit to private sector as a % of GDP

Country Name	Year								
	1975	1980	1985	1990	1995	2000	2005	2010	2015
East Asia & Pacific	102	96	111	154	159	167	145	137	150
Europe & Central Asia	50	58	62	79	77	missing	96	107	96
European Union	51	58	61	78	79	missing	101	115	98
High income	73	77	92	109	120	154	146	148	147
Heavily indebted poor countries (HIPC)	14	19	15	17	11	13	14	16	20
Latin America & Caribbean	35	32	30	30	33	25	26	40	49
Least developed countries: UN classification	8	11	12	13	11	12	14	19	26
Low & middle income	28	30	35	39	44	48	52	69	96
Middle East & North Africa	18	22	30	30	32	38	40	48	56
Middle income	28	31	36	40	44	48	53	70	97
OECD members	72	77	91	108	119	151	144	146	145
South Asia	13	19	23	24	23	27	37	47	47
Sub-Saharan Africa	29	29	36	41	61	57	61	55	46
World	66	69	82	100	108	131	126	123	128

Source: World Bank database (2017)

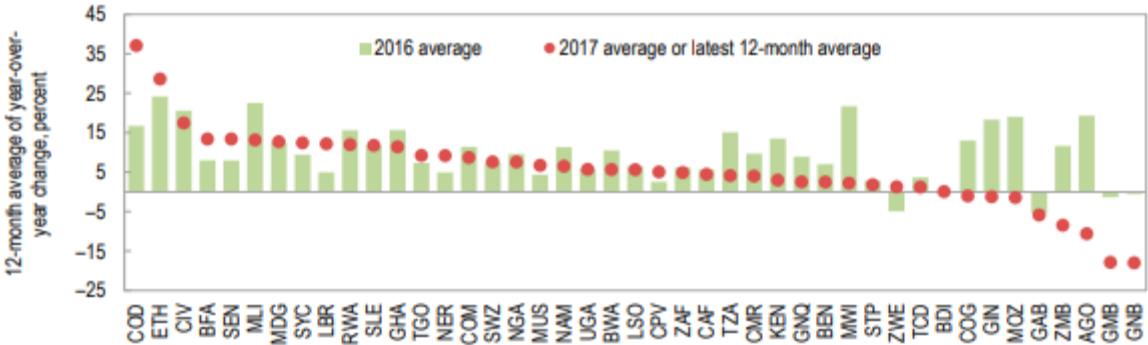
As financial intermediaries, the financial sector players are at the heart of directing surplus resources to where they are needed to drive the required economic development. The study examines the extent to which key macro-economic indicators, based on theoretical expectations, determine the level of domestic credit to the private sector in SSA. The data examined covers the period 1980 to 2015.

**1.1.1 Private sector credit in sub-Saharan Africa**

The World Bank defined private sector credit as the financial resources provided to the private sector through loans, securities, trade credits and other receivables. Primarily measured as a percentage of GDP, global disbursements to the private sector closed at 128% of GDP in 2015. Private sector credit was reported at 46% for sub-Saharan Africa during the same period by the World Bank.

Sacerdoti (2005) in reviewing obstacles of access to credit in sub-Saharan Africa, focusing on small and medium enterprises, indicated that credit expansion in most countries together with private sector credit to GDP ratios remained relatively low in comparison to other more developed regions like Europe. Several contributing factors were highlighted including inefficiencies in markets that led to increased interest rate spreads. Sacerdoti further noted other contributing factors to the low levels of credit expansion, highlighting unsupportive institutional frameworks, particularly citing inadequate borrower information, low credit information sharing, weak accounting and auditing standards, regulatory and judicial frameworks governing the enforceability of property. The chart below depicts the trend observed with nine countries registering a decline in sector credit in 2017 as compared to 2016.

**Figure 1: Private sector credit growth in sub-Sahara Africa in 2017**



Source: IMF, Regional economic outlook, sub-Saharan Africa

Whereas sub-Saharan Africa has registered robust growth in the last decade, recent trends have indicated a slowdown, as shown by the above chart (IMF, 2018). This has important ramifications for economic growth in the impacted countries and sub-Saharan Africa as a whole. A reduction in sector credit results in a slowdown in key sector investments that contribute positively to economic output. According to Jayaram et al (2010) and McKinsey (2018), agriculture was Africa's biggest sector, contributing 15% of the continent's GDP, and continued to see significant flows in private sector credit. Other key non-financial sectors driving the African economy include mining, oil and gas, telecommunications, manufacturing, infrastructure and services.

## **1.2 Problem definition**

Domestic private sector credit is essential in stimulating economic growth within respective sectors and ultimately impacts on the level of economic development. As highlighted above, the level of domestic credit to the private sector in Africa, at 46% of GDP, remains subdued in comparison to the rest of the world at 128%. The global economic report cited in Assefa (2017) indicates 70% as a threshold level reflective of a well-developed financial system. Advanced economies have exhibited levels well above the 100% mark. Whereas the continent has made notable strides in growing this threshold since 1975, other regions still seem to have done a much better job in growing this faster. The World Bank Group (2017a), in a Global Prospects Outlook report, published in June 2017, highlighted a deepening of financial markets in emerging economies since the 2008 financial crisis. This is signalled by the rise in private sector credit by twelve percentage points since then. Notwithstanding this progress, sub-Saharan Africa, at 46% of GDP in private sector credit, still has significant headroom for growth beyond the 70% threshold. This beckons the question of the extent if any, to which the developments in the macroeconomic environments in Sub-Saharan countries influenced the growth in credit to the private sector.

## **1.3 Statement of research objectives and hypotheses**

The study seeks to examine the extent to which key macro-economic indicators determine domestic credit to the private sector as a percentage of GDP. This is essential, especially for policy makers and financial sector supply-side participants, to drive the right interventions in the financial and economic development of African countries. The key economic indicators selected for the study are: GDP growth rate, inflation, lending interest rates and broad money

supply. Prior studies and economic theory have indicated these as being related to the level of credit uptake in an economy.

The primary objective of the research is to determine the relationship between key macroeconomic variables in SSA and the level of domestic credit to the private sector (private sector credit). The research therefore primarily attempts to answer the following question:

To what extent do select macroeconomic indicators affect the level of private sector credit in SSA?

The following hypotheses were formulated to effectively answer the research question above:

#### *Hypotheses*

$H_0$ : The selected economic indicators have no impact on the level of private sector credit in SSA;

$H_1$ : The selected economic indicators have a significant impact on the level of private sector credit in SSA.

### **1.4 Justification of the study**

As indicated above, the level of private sector credit in an economy is critical to stimulating economic development and is a signal of the depth of the respective financial systems. Various studies have been conducted on the level of interest rates and spreads in SSA. The literature search and review has revealed similar studies exploring relationships among several variables in relation to the level of domestic credit to the private sector in sub-Saharan Africa and other regions. The proposed combination of macroeconomic indicators is an addition to the body of knowledge useful to policy makers responsible for developing and influencing macroeconomic policy. It is critical for policy makers to derive interventions based on empirical reviews such as this. Banking sector and other, non-banking, financial institutions that largely make up the supply side of the credit market, will also benefit from the results of the study. Apart from benefiting the private sector players promoting different ventures on the demand side, the trickle-down effects of resulting economic growth go beyond the direct credit recipients.

## **1.5 Organisation of the study**

The report commences by introducing the context of the research area in Chapter 1 of the dissertation, including the definition of the problem, research questions, research objectives, and respective hypotheses. A review of the relevant literature covering theoretical and empirical frameworks is covered in Chapter 2 of the report, while Chapter 3 articulates the actual methodological approach undertaken for the study. Chapter 4 analyses and discusses the key findings of the research. The final chapter (Chapter 5) presents the detailed conclusions and recommendations resulting from the study.

## **Chapter 2**

### **Overview of relevant literature**

#### **2.1 Introduction**

The literature review is organised along three major themes in examining private sector credit. First, the review focuses on theoretical studies underpinning private sector credit, its determinants and its relationship with economic development. Second, empirical research into the relationship between private sector credit and economic growth is reviewed. The third thematic area of the literature review covers empirical studies that have looked at the key drivers of private sector credit across industrialised countries, emerging markets and sub-Saharan countries. Finally, some general themes are summarised from the foregoing reviews as a conclusion to the literature review.

#### **2.2 Theoretical framework**

This section of the study highlights some key theoretical foundations surrounding the concept of private sector credit. The study identifies four thematic areas underpinning credit to the private sector. First, the finance growth nexus initially championed by Schumpeter (1911) links availability of credit and economic growth. Second, it is critical to touch on the loanable funds theory of interest, championed by neo-classical economist Robertson (1940). The third theoretical area to highlight is the information theories of credit, highlighting the importance of information flow in price determination and project selection. The last theoretical thematic area is the power theories of credit. This essentially is around the enforceability rights for supply-side players who take the risk of renting out loanable funds to investable projects and consumption requirements of households. These areas are discussed below:

##### **2.2.1 The finance growth nexus**

Schumpeter (1911) cited in King and Levine (1993), presented the idea that the services provided by financial intermediaries stimulate long-term economic growth and, ultimately, economic development. These services include mobilisation of savings, facilitating transactions and managing risk. Schumpeter argued that financial development preceded periods of economic growth. He indicated further that finance was essential in funding new innovations that would disrupt existing business models and create new avenues of growth.

Opinion among economists remains divided on the subject though, with many others indicating that finance was an unimportant factor in economic growth and development. Lucas, (1988) writing about the mechanics of economic development, argued that the relationship between financial development and economic development was simply over-stressed. Robinson (cited in King & Levine, 1993) argued that financial development merely followed economic growth. Whether finance follows development or development causes financial deepening, what is critical to note is both are essential elements of a growing economy.

### **2.2.2 The loanable funds theory**

Robertson (1940) (as cited in Tsiang, 1989), pioneered the loanable funds theory of credit in his seminal work on money supply and demand. Robertson, considered a chief advocate of the theory, defines loanable funds as ‘the sums of money offered and demanded during a given period of time for immediate use at a given price’. The theory maintains that the price of the use of loanable funds, which is the interest rate, must be determined by the supply and demand for such funds. Tsiang (1956) reviewed the theory highlighting that a key basis of the loanable funds theory is that planned investment expenditure for a given time horizon (reduced to a day) gives rise to the demand for loanable funds or funds available for credit. He further articulated four main components of loanable funds that precede the concept of the supply of funds. The first part of the theory refers to the constituents of loanable funds. These are expressed as the supply of loanable funds available in a market being equal to: a) current planned savings that include net prior income less present-day consumption spending; b) disinvestments from prior fixed or working capital; c) the net decrease in idle money; d) net additional credit creation.

The second part of the loanable funds theory indicates that the market interest rate is the mechanism through which the demand for loanable funds, created as above, is equated to the supply of loanable funds, which has generally come to be known as private sector credit. Through this mechanism, Tsiang indicates that, in summary, the demand for finance funds must equal the planned expenditure during the ‘Robertsonian’ day.

It follows further from this theory that the more savings of funds are available in the market the more supply of credit or loanable funds will also become available. By extension, the rate of incentive on savings is therefore expected to drive more savings and ultimately more loanable funds to the market. Tobin (1958) alluded to this phenomenon in theorising liquidity

preferences of economic unit participants, He cited investment balances as one of the key drivers of savings.

### **2.2.3 The information theories of credit**

The information theories of credit derive their bases from the work of Stiglitz and Weiss (1981) on the concept of credit rationing and the idea of information asymmetry. They presented the idea of credit rationing, indicating that despite the loanable funds theory of interest presupposing interest rates to always drive the market to equilibrium, credit rationing was a reality. Stiglitz and Weiss highlight that banks issuing loans are concerned about the interest rate or return they receive on the loan and the riskiness of the loan. Banks use interest rate as one of the screening tools, in the absence of control and information on how the borrower will behave after accessing the loans. It is argued further that riskier investment projects will be attracted to the high interest rates, as promoters are willing to take on more cost for higher pay-off on projects that are unlikely to succeed. Stiglitz and Weiss further indicated that banks rely on legal contracts to direct how the borrower should behave during the life of the loan, to manage the issue of information asymmetry and the associated moral hazard, subsequently ensuring payback. Lofgren et al (2002) drew on the contributions of neo-classical economists Akerlof, Spence and Stiglitz on the inherent issue of markets with asymmetric information. They argue that one side of the market is always more informed than the other, regardless of the type, and that this included financial markets, in which case the borrower knows a lot more about their own creditworthiness than the lender. Akerlof introduced the concept of a market of lemons, arguing that in the context of financial markets, when lenders had imperfect information the borrowers with the weakest repayment prospects tended to crowd out the market, stifling mutually-beneficial transactions. Generally, lenders will try to obtain as much information as possible about their borrowers to mitigate this and avoid the market-of-lemons situation.

### **2.2.4 The power theories of credit**

The power theory of credit is centred around the idea that supply-side legal enforcement rights are critical in driving the growth of private sector credit. The theory is that the higher the enforcement rights, the higher the growth in credit, as financiers will be more willing to invest in projects. (Levine, 1999) reviewed the relationships between law, finance and economic growth, examining how the legal environment affects financial development and in turn how it

is linked to long run economic growth. Levine argued that contractual agreements form the basis of financial transactions and therefore: “Legal systems that protect creditors and enforce contracts are likely to encourage greater financial intermediary development than legal and regulatory systems that impede creditors from gaining access to their claims or that ineffectively enforce contracts”. In extending prior research methodology of King and Levine (1993), Levine finds in his analysis that indeed, legal, and regulatory environments were critical in driving financial development. Countries that had strong creditor enforcement rights were demonstrated to have better developed financial intermediaries and positively impacted long-run economic growth. Hart & Moore (1998) further highlighted the issue of creditor rights being essential to the debt transaction and focused on the foreclosure right. They argued that a level of symmetric information, reduced to a contract between debtor and creditor, ensures control on the part of the lender. Such a framework is essential in driving growth in private credit.

## **2.3 Empirical reviews**

### **2.3.1 Private sector credit (finance) and growth**

King and Levine (1993a) presented evidence that supports Schumpeter’s theory on economic growth. In a study that covered eighty countries over a twenty-nine-year period, they found that various measures of financial development were strongly associated with both current and later rates of economic growth. In the first instance, they found that the average level of financial development during the period was very strongly associated with growth during the period. Second, the results of their analysis showed that financial development preceded growth, finding that it was positively and strongly correlated to real GDP growth. Their review also found that the level of financial depth, measured by money supply to GDP ratios, was positively and significantly related to the level of growth. Financial depth was also measured by the level of private sector credit to GDP, as part of the key indicators. Financial development was positively associated with the rate of investment and the efficiency with which economies used capital.

In another related study, King and Levine (1993) advanced the idea of a finance-growth nexus, concluding that a ‘more-developed financial system fosters productivity improvement by, amongst other things, choosing higher quality entrepreneurs and projects, by more effectively mobilizing external financing for these entrepreneurs’. Financial development is important in contributing to sustainable economic growth. Ghirmay (2004) explored financial development

and economic growth in sub-Saharan African countries, observing data from thirteen countries. Ghirmay's key findings were on three levels: first that data from eleven out of the thirteen countries showed a co-integrated relationship between financial development and economic growth; second, financial development was shown to have a causal effect on economic growth in eight out of the thirteen countries tested. It could, therefore, be concluded that low income countries needed to develop their financial systems to stimulate economic growth. Reverse causality was also observed in this set of data with nine out of the thirteen countries showing that economic growth caused improvements in financial development and a bidirectional causality in six countries.

Valickova, Havranek and Horvath (2015) quantitatively reviewed empirical literature relating to the finance-growth nexus, examining data from sixty-seven different studies on the subject. The study undertook to answer two fundamental questions which were: first, whether financial development fostered growth; second, whether some types of financial structures were more conducive to economic growth than others? Using a meta-analysis approach. Valickova et al found, overall, that an authentic positive link between financial development and economic growth existed. However, the review also indicated that the effect of financial development varied across regions and time periods. More-developed, wealthier countries seemed to exhibit a stronger link in comparison to less-developed countries. Finally, it was observed that the financial structure of the system had a significant impact on the pace of economic growth, with stock market-oriented systems being more conducive to growth than bank-oriented systems.

Dembiermont and Drehmann (2013) reviewed data relating to forty economies covering a period of over forty-five years, with the primary objective of examining private sector credit series data. They highlighted the importance of credit for economic activity and indicated that private sector borrowing had important implications for policy. It influenced the monetary transmission mechanism and was a major determinant of financial stability, private sector credit as a proxy representing banking depth and financial development. It is a key factor in driving economic activity, with important implications for economic policy and development.

Further, Honohan (2004) stated that finance-intensive growth, as measured by banking depth, had been empirically associated with lower poverty ratios of respective economies. In this regard, it becomes imperative for sub-Saharan African countries to use this lever to drive the desired levels of economic growth and development.

### **2.3.2 Determinants of private sector credit**

Djankov, McLiesh and Shleifer (2007) examined cross-country determinants of private sector credit by reviewing an expanded sample of data relating to 129 countries over a twenty-five-year period from 1978 to 2003. This study was predicated on the information and power theories of credit respectively. The power theories of credit suggest that private sector credit thrives in an environment where creditors have strong, legally enforceable rights in collecting their dues from debtors, which include the take-over of individuals' or firms' assets. The information theories of credit, on the other hand, suggest that the existence of effectively functioning credit registries, like credit bureaux, drive the extension of credit to the private sector. Djankov et al expanded their set of data to ensure more statistically significant results that could also be observed over a longer time period in comparison to prior, smaller-sample studies that, in the main, showed varying levels of weak relationships. Their main approach was to run cross-country Ordinary Least Squares (OLS) regression. Private sector credit to GDP ratio was the dependent variable and the independent variables were narrowed down to GDP; GDP per capita; contract enforcement (in number of days); inflation; creditor rights; information sharing and legal origin. The creditors' rights index, introduced by La Porta et al (1997), is used as a measure of the legal rights of creditors. The existence of government-owned and private credit registries, on the other hand, is used to test for the information theories. The key conclusions of this study were that legal creditor rights and information-sharing institutions were both statistically and quantitatively important determinants of private sector credit development. It was also observed that the private and public credit bureaux were strongly associated with private credit in poorer countries, less-so in the richer countries. In line with other theoretical and empirical reviews, GDP was found to be positively correlated to the growth in private sector credit whereas inflation rate was negatively correlated.

Hong et al (2015) explored the determinants of bank lending by reviewing data related to 146 countries at varying stages of development from 1990 to 2013, looking at both demand and supply explanatory variables. Additionally, they empirically modelled domestic credit from the perspectives of bank balance sheets and capital requirements. Hong et al used a regression model, incorporating the generalised method of moments (GMM) originally developed by Arellano and Bond (1991). The explanatory or independent variables were categorised into four areas:

a) Internal demand factors that included deposits; real interest rates; banking management/operational costs; capital requirement; real GDP per capita; inflation rate; domestic money supply; and a dummy variable to represent systematic banking crisis.

b) External supply factors that included nominal exchange rate; foreign capital flows; level of financial integration (captured by index of capital account openness, KAOPEN); and a trade openness indicator measured by exports plus imports over GDP.

c) Global factors that included the change in US money supply; change in US federal funds rate; the difference between domestic lending rate and the US lending rate; external debt levels; and a dummy variable to test for systemic banking crisis.

d) characteristics of domestic banking systems, in particular return on equity and return on assets; bank concentration (defined as total assets of the three largest industry banks as a percentage of total assets in the banking system); initial development level of the banking system; bank non-performing loans to gross loans. Hong et al concluded from the empirical analysis that credit was enhanced by a high level of lending interest rate and domestic liquidity. This is almost at loggerheads with some of the economic theory on what drives credit demand, with the expectation that lower lending interest rates will drive good quality credit and avoid 'a market of lemons' scenario. A second key finding was that credit supply was negatively related to capital requirement; exchange rate; non-performing loans; the KAOPEN index; and bank concentration. Most important, on the macro-economy front, they found that GDP per capita was insignificant in explaining bank lending against the pro-cyclical hypothesis put forward by various studies, bringing to the fore a further discussion on reverse causality. Inflation was also found to have an insignificant negative impact on credit.

Calza et al (2003) conducted an econometric investigation into the demand for credit to the private sector within the Euro area. The study models loan demand, even though what is observed, as far as loan developments are concerned, still results from the interaction of both supply and demand factors. Calza et al focused on analysing the impact of three key variables, in the main on private sector credit demand. The variables considered were: GDP growth representing economic activity and both short-term interest rates and long-term interest rates, representing the cost of loans. The interest rates used were short-term market rates and long-term government bond yields respectively, with the study reviewing data relating to eleven countries constituting the original membership of the Euro, over a period of nineteen years,

from 1981 to 1999. The long-run relationship is examined using a semi-linear logarithm function with the demand for loans as the output function, whereas GDP and interest rates are set as the explanatory variables. A vector error correction model (VECM) is incorporated into the variable analysis. The key results of the analysis were a long-run, statistically-significant positive relationship between the demand for loans and real GDP. On the other hand, a negative relationship existed between the demand for loans and both short-term and long-term real interest rates.

Hofmann (2001) analysed the determinants of credit to the private sector in sixteen industrialised countries. The analysis takes the approach of modelling the determinants of private sector credit as a function of economic activity, interest rates and property prices. Data covering the period from 1980 to 1998 was used in a cointegration vector auto regression (VAR) model. Three key factors were significant in explaining the level of demand and supply of credit in industrialised nations. In the first instance, overall economic conditions and prospects determined consumption and investment demand and, therefore, the demand for credit. Hoffman indicated that changes in economic activity would impact on the willingness of banks to extend credit. Financing costs also played a critical role in influencing the demand for credit and therefore the supply as well. Increased interest rates were shown to dampen the market demand and uptake of credit. Banks were also observed to reduce the supply of credit in an increased interest rate environment. The other key finding from Hoffman was that property market prices also had a positive relationship with the level of credit in the market, given the significant portion of household assets that it accounted for. Most collateral offered by individuals and business borrowers was in the form of property. Stepanyan and Guo (2011) examined the changes in bank credit to the private sector for a wide range of emerging market economies with time series and cross-sectional data observed over a ten-year period. The study sought to explore the determinants of private sector credit growth pre-crisis and the key drivers to the post-crisis busts, observed in emerging economies. They reviewed both supply side and demand side factors with a bias on the supply side. The period of observation is from 2001 to 2010, covering thirty-eight emerging countries drawn from Africa, Asia, the Middle East, Europe, Central and South America. Growth in private sector credit was held as the dependent variable with a focus on the following as independent variables in the regression model: banking sector foreign liabilities; banking sector domestic deposits; real GDP; inflation, deposit rate as a proxy for monetary conditions; exchange rate; US federal funds rate; US money supply (M2) and non-performing loans ratio. The regression analysis indicated that several factors

were significant in determining the level of private sector credit to GDP for emerging economies from the pre- and post-2008 global financial crisis data, observed in relation to the selected independent variables. They found that the growth and stability of domestic deposits was a key determinant of the growth in credit. In other words, domestic and foreign sources of funding positively and symmetrically contributed to the growth of credit. There was also a significant reliance on foreign sources of funding channelled to domestic credit through financial institutions in several markets. Strong economic growth measured through real GDP growth positively influenced private sector credit, whereas adverse inflationary trends had a negative impact on real private sector credit growth. Post-crisis slowdown in economic activity played a significant role in explaining lack of credit growth observed in many markets. A healthy banking sector, as reflected through a low level of industry non-performing loans, was also more able to expand private sector credit than an unhealthy sector with higher levels of industry non-performing loans. Stepanyan and Guo further concluded that loose monetary conditions, whether domestic or global, resulted in more credit to the private sector.

Elekdag and Han (2015) explored the drivers of private sector credit growth in emerging Asian markets. Their research work set out to answer two primary questions; first, whether domestic or external factors were more important in determining credit growth in Asia, and how important domestic policies were versus external monetary policies. Second, could domestic monetary policy be used to manage episodes of rapid credit growth and what other policies were helpful in fostering financial stability? They used a structural vector auto-regressive (SVAR) model, examining credit data relating to emerging Asian markets and comparing this to external credit data relating to the US and European markets. Elekdag and Han found that domestic factors were more dominant than external factors in driving rapid credit growth in Asia. Domestic monetary policy was found to play a pivotal role in driving and guiding private sector credit growth. The other key finding was that greater exchange rate flexibility also promoted financial stability, as it reduced the role of external factors impacting on domestic credit dynamics.

Sharma and Gounder (2012) explored the determinants of bank credit to the private sector for six island countries in the South Pacific. The study takes a comprehensive time-series and cross-country panel data analysis approach, covering a period of twenty-eight years from 1982 to 2009. Sharma and Gounder restricted their analysis to some key independent variables, specifically: average lending rates; inflation rates; bank size in terms of assets to GDP; the level

of deposit funding relative to GDP; the presence of the stock market; and the level of GDP. They deployed a regression model to test the relationships incorporating Arellano and Bond's Generalised Method of Moments (GMM). GMM was used to determine first and second order auto correlations with a base model incorporating average lending rates, bank deposits and bank assets. The second model included the impact of stock markets, with the third model finally introducing GDP into the analysis. The key findings of the study were that there was a statistically-significant positive relationship between the level of GDP growth and the growth in private sector credit. An increase in GDP growth would therefore contribute to the expansion of credit to the private sector. In similar fashion, stock market growth, bank deposit funding growth and bank assets were also shown to have positive correlations with private sector credit growth. The existence of stock markets contributed positively to the growth in credit. Acceleration in private sector credit was also explained by growth in bank-deposit funding and asset bases. It was further observed that average lending rates and inflation rates were negatively correlated with growth in private sector credit. A growth in these factors was detrimental to the growth of credit to the private sector in the six island nations of the South Pacific.

Khamis and Iossifov (2009) analysed the growth in private sector credit in sub-Saharan Africa, concentrating on select countries. They examined data related to forty-three countries for a period of ten years. The study used ordinary least squares and fixed effects techniques to regress private sector credit expansion with the independent variables including: per capita GDP; money multiplier ratio (money supply); inflation rates; interest rates; current account balances; and remittances. The key determinants of credit expansion from the study are grouped along supply-side and demand-side drivers. Robust economic growth and reducing interest rates were found to be significant demand-side contributing factors, boosting consumption, investment and the need for finance. Expanding banking profitability and capital adequacy levels were highlighted as supply-side factors that were significant in driving credit expansion. Other drivers of private sector credit were the money multiplier, foreign bank claims on local banks and the current account balance.

Folawewo and Tennant (2008), in a study focusing on sub-Sahara Africa, built on the theory that interest rates were critical in determining the level of private sector credit. They concluded that different market factors and macro-economic policies came together to determine the level of interest rate spreads in sub-Saharan Africa which, in turn, have an influence on the level of

private sector credit. Important determinants highlighted in the research include factors such as the extent of government crowding out in the banking sector, money supply, country population and public-sector deficits. In a similar study, Ahokposi (2013) indicated that internal factors such as efficiency of the respective banks that make up the industry played a key role in determining the level of interest rates. Bank-specific factors such as liquidity risk, credit risk and bank equity were also identified as key determinants. Sacerdoti (2005) further highlighted that large shares of NPLs and high operating costs were also key contributing factors to high levels of interest rate spreads in the SSA banking sector.

Ivanovi (2016) reviewed the determinants of credit growth in Montenegro (Eastern Europe), focusing on both supply- and demand-side factors. The study further took in a pre- and post-financial crisis observation period. Ivanovi reviewed quarterly and panel data relating to eleven banks operating within Montenegro over a ten-year period from 2004 to 2014. The period of observation covered both a boom period, characterised by expanding private sector credit and a downturn, following the global financial crises of 2007. A fixed effect, linear regression analysis, model was adopted for the study, focusing on credit growth as the functional or dependent variable on one hand and the explanatory variables being: GDP growth rate; inflation; one-year Euribor; spread; deposit growth; non-performing loans; solvency ratio; inefficiency ratio; and return on equity, on the other hand. The overall results showed that both macroeconomic and bank-specific factors played key roles in explaining credit growth within the Montenegrin economy. The study also concluded that credit supply indicators gained more importance in explaining credit growth during the post-crisis period, whereas both demand and supply indicators were significant explanators during the pre-crisis period. Particularly, GDP growth, solvency levels, deposit growth and return on equity all contributed positively to credit growth in the pre-crisis period. The quality of loan portfolios (non-performing loans) was found to be negatively correlated with growth in credit: the higher the level of non-performing loans, the lower the supply of credit. GDP growth rates and solvency ratios were, however, not found to be statistically significant in the post-crisis period.

Shingjergji and Hyseni (2015) examined the Albanian banking system to understand the influence of some macro-economic and banking variables in explaining credit growth trends in the country. The study covered an eleven-year period from 2002 to 2013, with data relating to the entire banking system. The growth in credit was used as the dependent variable and the following selected as the independent variables for an ordinary least squares regression analysis

equation: GDP growth rate; unemployment rate; inflation rate; lending interest rate; non-performing loans; capital adequacy ratio; and bank size, measured by total assets. Shingjergji and Hyseni came up with seven hypotheses to test in relation to the variables, based on prior theoretical and empirical studies in relation to credit growth. It was expected, from the independent macroeconomic variables, that GDP growth rate would be positively correlated with the growth in private sector credit. The results of the analysis show a statistically significant, positive relationship between credit growth and GDP in the Albanian banking system. This was aligned with other empirical reviews in this regard, including Ivanovi (2016) and Sharma and Gounder (2012). Capital adequacy was also positively correlated. On the other hand, the study found inflation statistically insignificant in explaining Albanian credit growth, which was contrary to Stepanyan and Guo (2011) and the prior studies highlighted above. The study further found a negative correlation between credit growth and unemployment. The level of non-performing loans was also negatively correlated with credit growth.

Tan (2012) explored the determinants of credit growth in the Philippines. The study sought to examine why credit growth remained sluggish in the Philippines despite preceding deposit growth. Tan used Stepanyan and Guo's (2011) approach as the benchmark model of the study but extending this model to include the impact of net interest margins (NIM) on credit growth. Tan also deconsolidated growth to the elements of investment-led growth and consumption-led growth respectively, analysing their separate impacts on private sector credit growth in the Philippines. The other critical factor added to the analysis was the impact of distressed asset ratio as a measure of asset quality. Therefore, having private sector credit as the dependent variable, the other explanatory variables used in the analysis were: inflation; the growth of total deposits to private sector credit; growth of liabilities to non-residents; change in the US federal funds rate; and real GDP growth rate. The input data used was quarterly series data observed over the period from 2002 to 2010 through a regression analysis. The review found that investment-led growth and bank deposit expansion both positively contributed to the growth in private sector credit. On the other hand, consumption-driven growth, a rise in the US Federal Reserve rate, distressed asset ratios and high net interest margins (NIMs) all contributed to slowing down growth in private sector credit.

Awdeh (2016) studied the determinants of credit growth in the emerging economy of Lebanon by examining data related to thirty-four commercial banks, representing 70% of the banks in the market, over a period of fifteen years from 2000 to 2015, because of data availability. The

approach to the review was a panel data analysis for private sector credit, deploying a fixed effects regression model. Private sector credit was held as the dependent variable on one side and, on the other, several supply- and demand-side independent variables, in particular: deposit growth; bank capital; return on assets; bank size measured by assets; GDP growth rate; loan loss provision as a percentage of total loans; inflation rate; public debt as a percentage of GDP; local currency lending interest rate; one year treasury bill rate; and the annual growth rate in money supply. The analysis concluded in the first instance that deposit growth was positively correlated and statistically significant in explaining the growth in private sector credit. This is in line with the loanable funds theory which is predicated on the idea that credit grows, based on pre-existing funds from savings. Other variables statistically significant in explaining credit growth in Lebanon were GDP growth, money supply growth and inflation. The conclusion on inflation in this study was contrary to most of the other empirical studies, including Stepanyan and Guo (2011). Sharma and Gounder (2012) highlighted earlier that both concluded that inflationary increases dampened real private sector credit growth. This, therefore, signals the case for reverse causality in the assessment of inflation and credit growth; that is, which one causes the other? Do households borrow more because of escalating inflation or does credit growth drive further spending and therefore inflationary pressure. The variables that were negatively correlated to credit growth in the Lebanon study were: loan loss provisions; lending rates; Treasury bill yield rates; public debt; and remittance inflows. In short, increases in any of these factors led to a reduction in the growth of private sector credit.

Akinlo and Oni (2015) analyse the dominant factors influencing bank credit to the private sector in the Nigerian economy. The study uses a time-series approach with relevant data used in the analysis from 1980 to 2010. A regression model, deploying the ordinary least squares approach, was used in the analysis, holding private sector credit in Nigeria as the dependent variable. The following variables were then input in the model as independent variables with potential explanation for the growth in private sector credit: broad money supply (M2); liquidity ratio; bank total assets; inflation rate; reserve ratio; cyclical risk premium (difference between lending and saving rate); prime lending rate; exchange rate; minimum rediscount ratio; and the real GDP. Key results of the estimation showed a statistically significant positive correlation between private sector credit, money supply, cyclical risk premium and the liquidity ratio. An increase in any of these factors contributes positively to the growth in private sector credit. Inflation, reserve ratio and the prime lending rate on the other hand were shown to be negatively correlated to private sector credit. Increases in either of these two factors tended to dampen

growth in private sector credit. This observation was congruent with the results in Sharma and Gounder (2012) in reviewing six island nations of the South Pacific. The table below summarises the key empirical reviews from the above studies and the main findings on drivers of private sector credit:

**Table 2: Empirical studies review summary**

<b>Authors</b>	<b>Coverage and observation period</b>	<b>Key findings</b>
<b>Ghirmay (2004)</b>	Financial development and economic growth. 13 Sub-Saharan African countries observed over a period of 30 years.	Financial development led to subsequent economic growth in eight countries. Six countries also showed bi-directional causality, implying that African countries can accelerate their growth by improving their financial systems.
<b>Valickova et al (2015)</b>	Review of 67 different empirical studies on finance and growth.	Found a positive link between financial development and growth, with wealthier countries showing a stronger link.
<b>Djankov et al (2007)</b>	129 countries observed over a 25-year period from 1978 to 2003.	Legal creditor rights and information-sharing institutions were both statistically and quantitatively important determinants of private sector credit development. GDP was found to be positively correlated to the growth in private sector credit, whereas inflation rate was negatively correlated.
<b>Hong et al (2015)</b>	146 countries observed over a 23-year period from 1990 to 2013.	Credit was enhanced by a high level of lending interest rates and domestic liquidity levels. GDP per capita was insignificant in explaining credit growth. Inflation was found to have an insignificant negative impact on credit. Credit supply was negatively related to capital requirement, exchange rate, non-performing loans, the KAOPEN index and bank concentration.
<b>Calza et al (2003)</b>	Private sector credit demand in the Euro area observing 11 countries over a 19-year period from 1981 to 1999.	A long-run, positively-statistically significant relationship between the demand for loans and real GDP. A negative relationship exists between the demand for loans and both short-term and long-term real interest rates.
<b>Hofmann (2001)</b>	Private sector credit in 11 industrialised countries observed 1980 to 1998	Financing costs also played a critical role in influencing the demand for credit and therefore the supply as well.

		Increased interest rates were shown to dampen the market demand and uptake of credit. Banks were also observed to reduce the supply of credit in an increased interest rate environment.
<b>Elekdag &amp; Ham (2015)</b>	Reviewed private sector credit in 10 emerging Asian markets over the period 1989 to 2010	Domestic monetary policy was pivotal in driving and guiding private sector credit growth. The greater the exchange rate flexibility the more financial stability as it reduced the role of external factors impacting on domestic credit dynamics.
<b>Sharma &amp; Gounder (2012)</b>	Private sector credit for six island countries in the South Pacific over a period of 28 years from 1982 to 2009	There was a statistically significant positive relationship between GDP growth and the growth in private sector credit. Stock market growth, bank deposit funding growth and bank assets were also shown to have positive correlations with private sector credit growth. Average lending rates and inflation rates were negatively correlated with growth in private sector credit.
<b>Khamis &amp; Iossifov (2009)</b>	Private sector credit in sub-Saharan Africa reviewing 43 countries over a ten-year period	Robust economic growth and reducing interest rates were significant demand-side contributing factors, boosting consumption, investment, and the need to finance. Expanding banking profitability and capital adequacy levels were significant supply-side factors driving credit expansion. Other drivers of private sector credit were the money multiplier, foreign bank claims on local banks and the current account balance.
<b>Stepanyan &amp; Guo (2011)</b>	Private sector credit in 38 emerging economies over a period of ten years from 2001 to 2010	Domestic and foreign funding sources positively and symmetrically contributed to the growth of credit. Strong real GDP growth positively influenced private sector credit. Post-crisis slowdown in economic activity played a significant role in explaining credit slowdown. Adverse inflationary trends had a negative impact on real private sector credit growth. A low level of industry non-performing loans led to expansion of private sector credit. Loose monetary conditions resulted in more credit to the private sector.

<b>Folawewo &amp; Tennant (2008)</b>	Interest rates in sub-Saharan Africa as a key driver of private sector credit.	The extent of Government crowding out in the banking sector, money supply, country population and public-sector deficits were important determinants.
<b>Ivanovi (2016)</b>	Private sector credit in Montenegro 2004 to 2014.	GDP growth, solvency levels, deposit growth and return on equity all contributed positively to credit growth in the pre-crisis period. GDP growth rates and solvency ratios were not found to be statistically significant in the post-crisis period. Level of non-performing loans was found to be negatively correlated with growth in credit.
<b>Shingjergji &amp; Hyseni (2015)</b>	Albanian trends in private sector credit over the period 2002 to 2013.	A statistically significant, positive relationship between credit growth and GDP in the Albanian banking system. Capital adequacy is also positively correlated. Inflation was statistically insignificant in explaining Albanian credit growth. A negative correlation was observed for the level of non-performing loans and unemployment.
<b>Tan (2012)</b>	Private sector credit in the Philippines observed over period 2002 to 2010.	Investment-led growth and bank deposit expansion both positively contributed to the growth in private sector credit. Consumption-driven growth rise in the US federal reserve rate, distressed asset ratios and high net interest margins (NIMs) all contributed to slowing down growth in private sector credit.
<b>Awdeh (2016)</b>	Private sector credit growth in Lebanon for the period 2000 to 2015.	Deposit growth was positively correlated and statistically significant in explaining the growth in private sector credit. GDP growth, money supply growth and inflation were also statistically significant in explaining credit growth in Lebanon.
<b>Akinlo &amp; Oni (2015)</b>	Nigeria private sector credit growth over the period 1980 to 2010.	Statistically-significant positive correlation between private sector credit, money supply, cyclical risk premium and the liquidity ratio. Inflation, reserve ratio and the prime lending rate were shown to be negatively correlated to private sector credit.

## 2.4 Summary

Theoretical and empirical reviews highlighted above, have shone the spotlight on the importance of finance in economic growth and vice versa. Some common themes have been observed from the empirical studies reviewed, agreeing on several factors that determine private sector credit growth and, in some cases diverging, with country nuances coming into significance. Most of the studies have indicated GDP growth as being a positively significant macroeconomic contributor to the growth in private sector credit. Money supply, in line with the loanable funds theory, significantly positively contributes as well where it has been part of the independent variables tested. Negative regressors of private sector credit have been observed to be inflation and interest rates, except in the case of Hong et al (2015) whose empirical review indicated that a high level of interest rates enhanced the levels of private sector credit. This was against theoretical expectations.

This study takes the aggregated view of sub-Saharan private sector credit levels and reduces the number of independent variables in focus to test this relationship. This builds on the existing body of knowledge with specific focus on sub-Saharan Africa.

# Chapter 3

## Methodology

### 3.1 Introduction

This chapter articulates the research design, analytical framework and overall approach taken for the study. The study is a quantitative explanatory type of research, focusing on macro-economic determinants of private sector credit within sub-Saharan Africa. The chapter outlines the detailed approach to collection and analysis of data, regression model and estimation techniques used. The regression model proposed is based on expectations derived from theoretical and empirical reviews conducted within the preliminary stages of the study.

A quantitative explanatory research approach has been taken to the study, given the nature of the research problem and hypotheses outlined in Chapter 1. The study focuses on the domestic private sector credit levels in sub-Saharan Africa. The World Bank data base is used as the key source of secondary data on private sector credit and the select economic indicators for SSA as a region. The data analysed focuses on a panel sample of twelve countries based on data reported by the World Bank and covers a period of thirty-six years, from 1980 to 2015, influenced by the availability of data points for the main variable of interest. The observation period was arrived at by reviewing the availability of data points for all the variables across the time horizon. This study has been able to achieve a balanced panel with the above countries and number of years covered. The data frequency is annual, as per presentation from the World Bank open data source (The World Bank Group, 2017b). The key variables used in the analysis and the respective sources are shown in Table 3 later in the chapter.

### 3.2 Analytical framework

The study deploys a multivariate linear regression method to analyse the macro-economic determinants of private sector credit. The analysis focuses on the following explanatory variables in line with reviewed literature: GDP growth; inflation rates; broad money supply; and interest rates.

### 3.2.1 The regression model

Based on the theoretical and empirical literature reviewed, with reference to Stepanyan and Guo (2011), the hypothesised relationship model to be examined is given below as:

$$DCRP_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 CPI_{i,t} + \beta_3 M2_{i,t} + \beta_4 INTR_{i,t} + \varepsilon_{i,t}$$

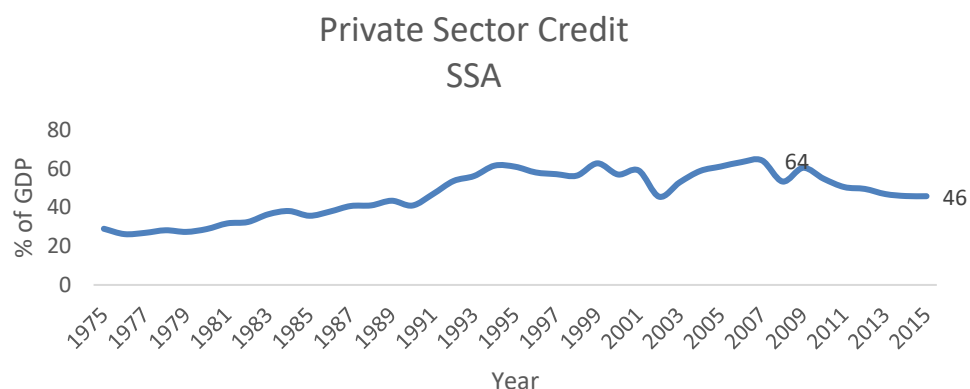
Where  $i$  and  $t$  represent country and year respectively;  $DCRP$  denotes domestic credit to the private sector;  $GDP$  represents growth in gross domestic product;  $CPI$  denotes inflation;  $M2$  and  $INTR$  represent broad money and interest rate respectively.

The number of variables is reduced to the above, based on the literature and the availability of sufficient data to produce statistically significant results over the observation period. The key variables for the model are explained further below using World Bank definitions as the basis:

### 3.2.2 The dependent variable

*Domestic Private Sector Credit* (DCRP). The World Bank defines this as the financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, trade credits and other accounts receivable that establish a claim for repayment (expressed as a percentage of GDP). This is the dependent variable in the regression model, and it is expected that growth in private sector credit will foster economic growth and therefore development.

**Figure 2: Private sector credit growth trend in sub-Saharan Africa**



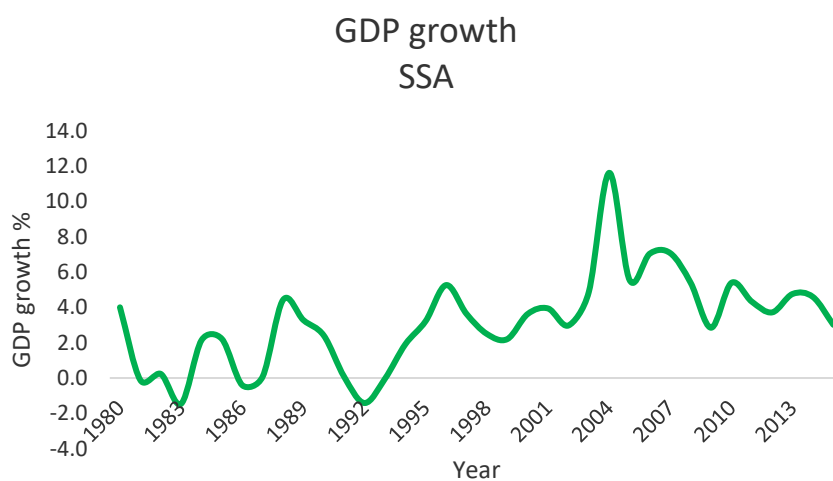
**Data Source: World Bank data, 2017**

As highlighted earlier, in Chapter 2, private sector credit as a percentage of GDP in sub-Saharan Africa has increased over the years, recording a high of 64% of GDP in 2007 prior to the onset of the global financial crisis. Averaging 48% over the period from 1975 to 2015, the lowest observed rate was 30% at the start of the observation period.

### 3.2.3 Independent variables

*GDP growth (GDP)*: Defined as the annual percentage growth rate of GDP at market prices, based on constant local currency. The growth in economic activity expressed as the GDP growth rate is expected to contribute positively to the growth in credit to the private sector. Djankov et al (2007) and Stepanyan and Gou (2011), among other similar empirical studies, found a positive relationship between GDP growth and private sector credit. In line with this, it is expected that this analysis will yield similar results. Economic growth is agreed to be critical in driving financial development. Tan (2012) further argues for a case of deconsolidating growth into consumption-led and investment-led growth, finding that investment-led growth was positively related to private sector credit. Other scholars have also argued that the reverse is true where expanding credit growth has contributed positively to the growth in GDP. GDP growth across sub-Saharan Africa averaged 3.4% over the observation period, with a high of 11.6% prior to the 2007 global financial crisis, albeit driven by thriving commodity prices, which is characteristic of most of the continent's commodity-dependent economies. The figure below summarises the trend.

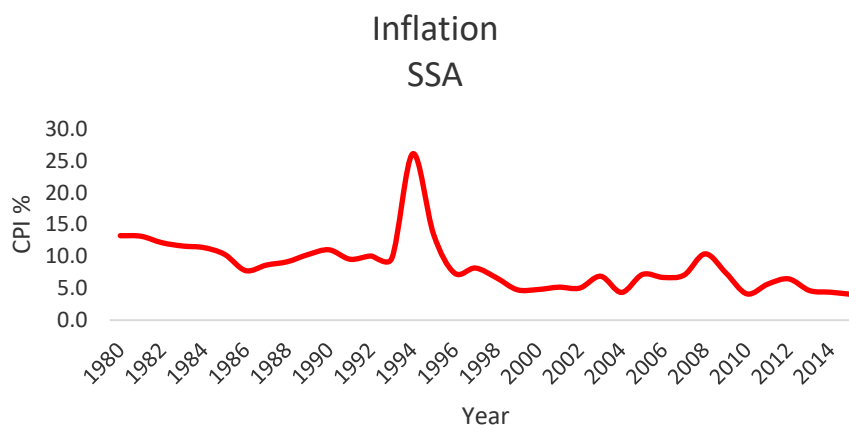
**Figure 3: GDP growth in sub-Saharan Africa**



**Data Source: World Bank data, 2017**

*Inflation rate (CPI)*. This is defined as the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as annually. Whereas the inflation rate is expected to drive nominal credit, it is expected that inflation will have a negative impact on real private sector credit growth. Stepanyan and Guo (2011) found inflation to be negatively related to real private sector credit growth. Sharma and Gounder (2012) came to a similar conclusion finding it negatively correlated. Inflation has been topical in many an African economy and quite often critical in influencing the cost of credit, as central banks intervene in markets using monetary policy. It is further argued that a lower inflation rate would drive a reduced cost of borrowing and therefore faster growth in private sector credit and, ultimately, development. Hong et al (2015) found an insignificant negative relationship of inflation with growth in credit. The expected outcome of this analysis is a negative correlation with private sector credit. As an aggregate measure across sub-Saharan Africa, inflation was observed to have peaked at an all-time high of 26% in 1994 amidst the debt crisis era that adversely affected and incapacitated many African economies. The CPI has averaged 8.2% over the observation period with a low of 4.1% in 2010.

**Figure 4: Inflation trend in sub-Saharan Africa (CPI)**

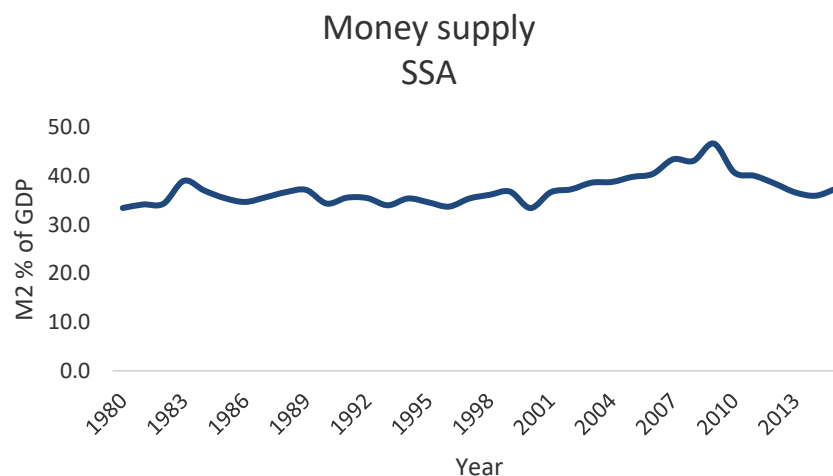


**Data Source: World Bank data, 2017**

*Money Supply (M2)*. Money supply is defined as: the sum of currency outside banks; demand deposits other than those of the central government; the time savings, and foreign currency deposits of resident sectors other than the central government; bank and travellers' cheques; and other securities such as certificates of deposit and commercial paper (expressed as a percentage of GDP). Money supply is essentially the money in circulation within an economy.

It is expected that higher levels of money supply will lead to higher levels of private sector credit growth, in line with the loanable funds theory, as highlighted by King and Levine (1993). Akinlo and Oni (2015), in reviewing the case of the Nigerian economy, found a significantly positive relationship between broad money supply and the level of growth in private sector credit. This is in line with what Awdeh (2016) concluded in the empirical review of the case of Lebanon. The loanable funds theory, therefore, seems to have held in these and other studies. It is expected that this analysis will reveal similar results. The level of broad money supply to GDP has generally been range-bound over the observation period, peaking at 46.7% in 2009 with an average of 37.4% and a low of 33.4% of sub-Saharan Africa's GDP. The trend is summarised in the figure below:

**Figure 5: Money supply trend in sub-Saharan Africa**



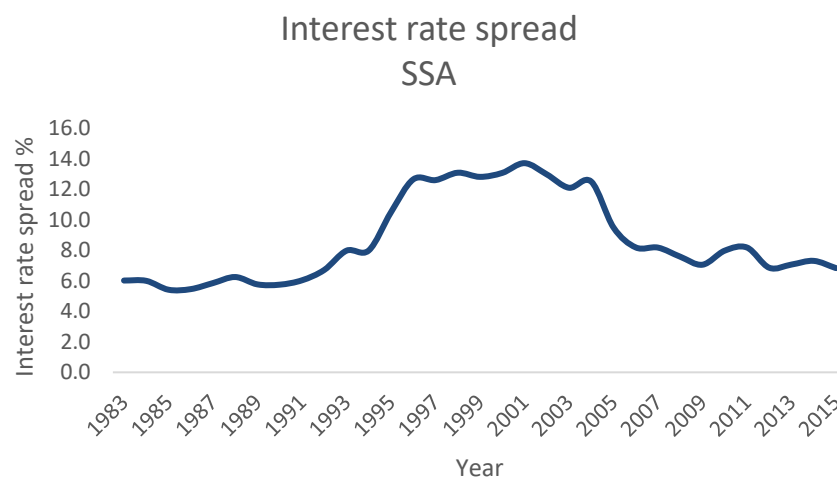
**Data Source: World Bank data, 2017**

As per expectations of the loanable funds theory, the higher the level of funds or savings, the higher the available credit for qualifying projects.

*Interest rate (spread) (INTR)*. This is defined as the interest rate charged by commercial banks on loans to private sector customers, minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits. It is expected that interest rate spread will have a negative impact on the growth of credit to the private sector. Owing to data availability, the study uses actual interest rates in the model as opposed to interest rate spread. According to the loanable funds theory, higher levels of spreads between the savings and lending rates disincentivises savers, thereby reducing the level of funds available as credit supply to

borrowers which, ultimately, should have the effect of reducing private sector credit in an economy. Ivanovi (2016) indicates on the other hand that, whereas high spreads may dampen credit demand, they certainly create incentive for banks to supply more credit to the market and would, therefore, have a more positive relationship to private sector credit growth levels. The results of Ivanovi’s review of Eastern European economies suggest a statistically insignificant, negative correlation with private sector credit. The expectations of this study would be a negative relationship between lending interest rates and private sector credit, as per the loanable funds theory. Spreads across sub-Saharan Africa have averaged 8.7% over the observation period, peaking at a high of 13.7% in 2001 and recording a low of 5.4%.

**Figure 6: Interest rate spread trend in sub-Sahara Africa**



**Data Source: World Bank data, 2017**

*Error term.* This is the statistical error term to account for any residual effects not explained by the variables listed above but impacting on growth in private sector credit.

**Table 3: Summary of expected variable relationships with private sector credit**

<b>Variable</b>	<b>Measurement</b>	<b>Abbreviation</b>	<b>Source</b>	<b>Expectation</b>
<b>GDP growth</b>	Annual percentage economic output growth at market prices.	GDP	World Bank data	Positive
<b>Inflation rate</b>	Annual percentage change in cost of goods and services basket.	CPI	World Bank data	Negative
<b>Broad money supply</b>	Sum of currency in circulation as a percentage of GDP.	M2	World Bank data	Positive
<b>Interest rate spread</b>	The difference between lending and savings rates.	INTR	World Bank data	Negative

### 3.3 The estimation technique

At this stage, it was necessary to determine whether to use the random effects or fixed effects approach to generate the final coefficients of estimates. According to Torres-Reyna, (2007) the fixed-effects model allows control for any country-specific characteristics that may impact on the results of the regression and to deal with the net effect of the predictor variables on private sector credit. Assumptions of the fixed-effects model include that time-invariant characteristics exist within the entity observed. The second assumption is that the time-invariant characteristics are unique to the unit of observation and that there is no correlation of these across variables. Random effects assume that variation across entities is random and uncorrelated with predictor or independent variables included in the model. Random effects also assume that the entity's error term is not correlated with the predictors. Time-invariant characteristics do not exist in this case. The study therefore tests for the panel effect of time-invariant characteristics and default to the fixed effects method should the panel effect be evident in the data.

The study is modelled along the quantitative methods and nomenclature suggested by Keller (2014), as he articulates the essential steps to be followed in performing an effective regression analysis.

### **3.3.1 Non-normality (normal distribution of error variables)**

It is essential that the distribution of error variables, of the respective independent variables, are validated for adherence to a normal distribution for the concept of linearity in the model to hold. Stata was used to compute the multivariate tests for normality for residuals related to the dependent and independent variables of GDP, M2, CPI, INTR, DCRP. A rejection of the null-hypothesis informs the use of a robust adjustment on the regression output model.

### **3.3.2 Autocorrelation (independence of error variables)**

Independence of error terms or residuals of the independent variables is another critical requirement for the effectiveness of the regression model (Keller, 2014). The study tested for the independence of error terms using the Wooldridge test for serial correlation in Stata to determine the existence or not of autocorrelation.

### **3.3.3 Heteroscedasticity**

Gujarati (2004) defines the condition of heteroscedasticity as a situation where the error term variances from the mean are unequal. As highlighted by Keller (2014), it is essential for model effectiveness to check that the variance of the error variable is constant according to regression requirements. This was checked by using Stata to perform the Wald test for heteroscedasticity. Indications of its existence through a significant test result required a robustness adjustment in the regression output model.

### **3.3.4 Multicollinearity**

According to Keller (2014), multicollinearity is a condition that exists when the independent variables (in this case GDP, CPI, M2 and INTR) are correlated with one another. Gujarati (2004) elaborates further on this, to interpret it as primarily a situation of perfect correlation among some of the independent variables. It is essential to check for multicollinearity in our model, like any other multivariate regression analysis, to avoid large sampling errors in the estimated regression coefficients. Keller further indicates that additional consequences of multicollinearity include large variability in coefficients that result in distancing them further

from the actual population parameters with potential opposite signs. Multicollinearity also results in small t-statistic results which result in spurious conclusions, making it difficult to conclude whether the independent variables in question are indeed related to the dependent variables. Interpretation of coefficients also becomes a challenge with the existence of multicollinearity. The study measures the extent of multicollinearity among the independent variables, through a correlation analysis from Stata. If significant levels of multicollinearity were to be observed, the analysis would have to deploy a backward stepwise regression approach to minimise the impact of multicollinearity.

### **3.3.5 Assessment of model fit (Goodness-of-fit)**

The goodness-of-fit test was used to further test the robustness of results. This essentially is the coefficient of determination, R-squared, with a high score indicating significant variation being explained by the model. Credence of the model was enhanced by using the F-test and the measured standard error of estimate (SE). The analysis used a rejection region of 5% for model validity on the F-test at  $n-k-1$  degrees of freedom and the standard error of estimate indicates how much of the dependent variable results are unexplained by the model.

## Chapter 4

### Discussion of findings

#### 4.1 Introduction

This chapter sets out to apply the approach outlined in Chapter 3 for the analysis of the sample data and discussion of the findings therein. The chapter commences with descriptive statistics of the sample data, various diagnostic tests to ensure robustness of the model, estimates the coefficients of the independent variables and, finally, interprets the relationships which are the basis for the conclusions and recommendations of the study in Chapter 5.

#### 4.2 Descriptive statistics

The dependent and independent variables in the regression equation have demonstrated varying levels of performance across the sample of twelve countries in sub-Saharan Africa. This is summarised in Table 4 below. The dependent variable, private sector credit, has ranged from a minimum of 1.6% of GDP for small economies like Sierra Leone to the maximum observed of 160.1% in South Africa, prior to the 2007 financial crisis. The average level of private sector credit to GDP, observed across the twelve countries, is 27.2% of GDP. This is well below the World Bank recommended threshold of at least 70% of GDP, which is reflective of a well-developed financial system and below the overall 46% for aggregate sub-Saharan Africa. All the observations of GDP within the sample are within 31.6 percentage points of the average 27.2 % of GDP.

**Table 4: Descriptive statistics of regression variables**

<i>Statistic</i>	<i>DCRP</i>	<i>GDP</i>	<i>M2</i>	<i>CPI</i>	<i>INTR</i>
Mean	27.2	4.0	35.8	15.5	18.5
Median	16.1	4.2	28.6	10.0	16.0
Standard Deviation	31.6	5.1	21.3	21.3	10.8
Range	158.5	54.3	96.9	219.1	106.8
Minimum	1.6	-20.6	9.9	-35.8	6.5
Maximum	160.1	33.7	106.9	183.3	113.3
Number of observations	432	432	432	432	432

*Note: DCRP=Domestic credit to the private sector; GDP=Gross domestic product growth; M2=Broad money supply; CPI=Consumer price index inflation; INTR=Lending interest rates. Source: Researchers estimates from Research Data*

Many sub-Saharan African countries have recorded strong GDP growth, especially prior to the 2007 global financial crisis, rallying on the back of strong commodities-price performance.

The average GDP growth rate observed from the sample twelve countries is 4% with the minimum showing a decline rate of 20.6% recorded by Sierra Leone in 2015, and a maximum growth of 33.7% by Nigeria in 2004, benefitting heavily from soaring oil prices. A few other countries have shown periods of weakness and contraction in economic output, notable amongst these being Nigeria in the 1980s, South Africa and Zambia as well. All of these are still quite reliant on extractives as a significant portion of their Gross National output. GDP growth observations across the twelve sampled countries are within 5.1% of the average GDP growth of 4%.

Broad money supply has been relatively stable across sub-Saharan Africa, with an average observed rate of 35.8% of GDP across the twelve countries constituting the study sample. The sample further shows a minimum observed M2 level of 9.9% of GDP recorded by Sierra Leone in 1996, and a maximum of 106.9% of GDP recorded by Mauritius in 2015, albeit indicative of the financial services hub that the country has become. The observed level of money supply across the sample of countries is within 21.3% of the average M2 level of 35.8%.

Inflation is another critical component of the macroeconomic environment expected to impact on the level of credit extended to the private sector. The average CPI recorded over the observation period for the sampled countries is an average of 15.5% for the twelve countries. The minimum CPI observed was a deflationary rate of -35.8% attributed to the Sierra Leone economy in 2008 after the onset of the global financial crisis. The highest level observed was a 183.3% recorded by Zambia in 1994 amidst falling copper prices, depreciating currency and increased sovereign debt obligations. Observed inflation among the twelve sample countries is within 21.3 % of the average inflation.

Interest rates have tended to be widely spread across the African continent, with the average interest rate from the sample of twelve countries recorded at 18.5%. The minimum rate observed was 6.5% for Cabo Verde in the early 1980s. The highest observed, 113.3%, was once again attributed to Zambia, amidst its economic crisis of the early to mid-1990s. The rest of the observations in the sample countries show interest rates within 10.8% of the average lending rate.

### 4.3 Tests for normality

The multivariate test for normality incorporates four different tests: the Mardia tests for Skewness and Kurtosis; the Henze-Zirkler and the Doornik-Hansen tests. The null hypothesis for all the tests is that the data-set variables are normally distributed. The results of the tests are shown in the table below:

**Table 5: Statistical test results for normality**

<b>Test result</b>		<b>X<sup>2</sup></b>	<b>Prob&gt; X<sup>2</sup></b>
<b>Mardia mSkewness</b>	= 42.78885	chi2(35) = 3109.373	= 0.0000
<b>Mardia mKurtosis</b>	= 95.15696	chi2(1) = 5583.384	= 0.0000
<b>Henze-Zirkler</b>	= 23.14517	chi2(1) = 2705.860	= 0.0000
<b>Doornik-Hansen</b>		chi2(10) = 5399.574	= 0.0000

Source: Researcher's estimates from source data

All the tests yield a statistically significant result with a p-value that is significantly close to zero. We therefore reject the null hypothesis and conclude that the panel data is not normally distributed. A multivariate regression analysis will subsequently be used to estimate the variable coefficients in Stata.

### 4.4 Heteroscedasticity

This stage of the analysis tests the variables for the existence of inconsistent variances of the observation residuals to the mean, which would indicate the existence of heteroscedasticity. The Wald test for group wise heteroscedasticity is run using Stata. The null hypothesis for this test is that all variances from the mean are equal. The results of the test are indicated below:

**Table 6: Modified Wald test for group-wise heteroscedasticity**

<b>Wald test for group wise correlation</b>
<b>H0: residual variances from the mean all equal</b>
<b>chi2 (12) = 8826.69</b>
<b>Prob&gt;chi2 = 0.0000</b>

Source: Researcher's estimates from source data

The results show a significant statistical result, as the p-value is significantly close to zero. The null hypothesis is therefore rejected, and the conclusion made on the existence of heteroscedasticity. This will be adjusted for in the computation of the final regression output.

## 4.5 Wooldridge test for auto correlation

Following on from the prior section, the Wooldridge test was run for autocorrelation in Stata to confirm the existence or otherwise of serial correlation. Torres-Reyna (2007) indicates that the null hypothesis for this test would be that there were no first-order autocorrelation and a significant F-statistic result would lead to a rejection of this hypothesis.

**Table 7: Wooldridge test for autocorrelation in panel data**

<b>Wooldridge test for autocorrelation in panel data</b>	
<b>H0: no first-order autocorrelation</b>	
	<b>F (1, 11) = 614.687</b>
	<b>Prob &gt; F = 0.0000</b>

Source: Researcher's estimates from source data

The results of the test indicate a significant F-statistic that is less than 0.05. Therefore, the null hypothesis is rejected, and the existence of serial correlation is concluded among the variables in the model.

## 4.6 Multicollinearity

As highlighted in Chapter 3 of the study, Gujarati (2004) defines multicollinearity as a situation where independent variables are perfectly correlated to each other in the model. The test for this condition uses the correlation matrix generated by Stata software from the panel data input. The results are shown in the table below:

**Table 8: Correlation Matrix**

	<b>DCRP</b>	<b>GDP</b>	<b>M2</b>	<b>CPI</b>	<b>INTR</b>
<b>DCRP</b>	1.0000				
<b>GDP</b>	-0.0469	1.0000			
<b>M2</b>	0.3312	0.0574	1.0000		
<b>CPI</b>	0.7370*	0.2340	0.0000	1.0000	
<b>INTR</b>	-0.2280*	0.0005	0.0000	-0.2612*	1.0000
	0.0000	0.0005	0.0000	0.0000	
	-0.2442*	-0.1232	-0.3229*	0.5716*	1.0000
	0.0000	0.0104	0.0000	0.0000	

DCRP=Domestic credit to the private sector; GDP=Gross domestic product growth; M2=Broad money supply; CPI=Consumer price index inflation; INTR=Lending interest rates; \*Denotes significance at Five percent significance level, Source: Researcher's estimates from source data

What is apparent from Table 8 is that there is no strong correlation among any of the independent variables, as each of the coefficients of correlation are less than one, which would be evidence for the existence of such correlation. Some minor correlations are noticeable at the five per cent level of significance, between some of the variables. Interest rates are observed to be slightly positively correlated with inflation rates as shown by the positive correlation coefficient. On the other hand, interest rates are negatively correlated with private sector credit, GDP, and money supply. The symbols leading the coefficients indicate the nature and strength of the correlation. Inflation is indicated to be slightly negatively correlated with private sector credit, GDP and money supply. Money supply is indicated to be slightly positively related with private sector credit and growth in GDP, as shown by the coefficients. GDP growth from the data set is indicated to be marginally negatively correlated with private sector credit.

#### **4.7 Tests for random or fixed effects**

Three tests were run to identify the best applicable method in this case, namely, the Hausman test, the Sargan-Hansen test statistic and the Breusch and Pagan Lagrangian multiplier (LM) test for random effects. The Hausman test using Stata results in a p-value of 0.1736 with F-statistic of 6.36. The result is statistically insignificant, and it is therefore not possible to reject the null hypothesis of random effects. This also indicates the existence of endogeneity amongst the variables and thus the appropriateness of the use of the random effects model in estimating the coefficients.

According to Schaffer and Smith (2006), the null hypothesis of the Sargan Hansen test is that the excluded instruments are valid, in other words, uncorrelated to the error term and correctly excluded from the estimated equation. Rejection of the null hypothesis for this test would favour the use of the fixed effects method. The p-value of 0.5364 shows an insignificant statistical result and it is therefore not possible to reject the null hypothesis. This would indicate that the excluded time invariant instruments are invalid and favour the random effects model of estimation.

**Table 9: Random or fixed effects test**

<b>Test of overidentifying restrictions: fixed vs random effects</b>
Cross-section time-series model: xtreg re robust cluster (12 countries)
Sargan-Hansen statistic 3.130 Chi-sq(4) P-value = 0.5364

Source: Researcher's estimates from source data

The Breusch and Pagan LM test is also computed using Stata software and the following are the results of the test:

**Table 10: Breusch and Pagan LM test**

Variable	Variance	Standard deviation
DCRP	1001.10	31.640
E	87.06	9.330
U	407.58	20.189
Test: Var(u) = 0		
chibar2(01)		4631.47
Prob > chibar2		0.0000

Source: Researcher's estimates from source data

The test result of the BP LM test shows statistical significance with a p-value of 0.0000. Therefore, the null hypothesis that the variance of error terms is zero is rejected, and it is concluded that variances of the error term to the mean are unequal. Therefore, the random effects model is used as the error terms are correlated with the regressors and explain the differences in the coefficients.

#### **4.7 Regression results (random effects method)**

Based on the results of the tests above, the study used the random effects model as the best estimator of the coefficients. This is in cognisance of invalid time-invariant characteristics and the absence of fixed effects explaining the trend of private sector credit observed over the sample period. The study incorporated a condition for robustness in the regression command input into Stata to analyse the panel data. This ensured that the model computation considered the conditions of normality, heteroscedasticity and serial correlation in arriving at the estimates of coefficients. The results of the test are shown in Table 11.

##### **4.7.1 Goodness of fit (R-squared)**

The extent to which the model fits or can explain the variations in the predicted variable is best reflected in the R-squared score shown in the summary table. The results table indicates an R-square of 0.544 for both the random and fixed effects model, meaning that 54.4% of the variation in private sector credit is explained by the model. The other 46% is therefore not explained by the model variables and could be caused by factors external to the model. The F-statistic for the model is computed at 74.35 and the p-value of F at 0.0000 showing statistical

significance of the model. The study, therefore, rejected the null hypothesis that the coefficients of the independent variables are equal to zero.

**Table 11: Regression table**

VARIABLES	Random Effects		Fixed Effects	
	<i>Coefficient</i>	<i>z</i>	<i>Coefficient</i>	<i>T</i>
GDP	-0.0525 (0.108)	-0.49	-0.0494 (0.107)	-0.46
M2	0.939*** (0.172)	5.46	0.936*** (0.171)	5.48
CPI	-0.0632*** (0.0183)	-3.46	-0.0629*** (0.018)	-3.49
INTR	-0.0344 (0.0832)	-0.41	-0.0349 (0.0834)	-0.42
Constant	-4.582 (4.321)	-1.06	-4.474 (6.092)	-0.73
R-squared	0.544		0.544	
Wald $\chi^2$	74.35		19.52	
Prob > $\chi^2$	0.0000		0.0001	
Hausman $\chi^2$	6.36		6.36	
Prob> $\chi^2$	0.174		0.174	
Number of countries	12		12	
Observations	432		432	
Country FE			YES	

*DCRP=Domestic credit to the private sector; GDP=Gross domestic product growth; M2=Broad money supply; CPI=Consumer price index inflation; INTR=Lending interest rates. Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , significance at 1%, 5% and 10% levels respectively,*

**Source: Researcher's estimates from source data**

#### **4.7.2 GDP growth and private sector credit**

The results of the model indicate an insignificant causal relationship between GDP growth and growth in private sector credit. The computed coefficient result is a -0.0525 without statistical significance at the 1%, 5% and 10% levels respectively. This essentially means that, GDP growth did not explain the growth in private sector credit observed across the twelve panel countries. It was observed from the data that private sector credit grew despite recessionary periods experienced in eleven out of the twelve countries within the sample and over several years within the sample period, albeit at slower rates of growth in some instances. This explains the marginal negative coefficient of determination for GDP growth observed with the results.

This outcome is in line with perspectives of the finance-growth nexus in economic theory, arguing that growth does not drive finance and that, instead, finance is a necessity that will follow wherever development occurs. This was certainly the view propagated by Schumpeter (1912) that finance drives economic growth. Hong et al (2015), in a review of data related to 146 countries, found that GDP was not a significant explanator of growth in private sector credit, using GDP per capita as one of the key independent variables for their regression. In contrast, most of the other empirical studies reviewed indicated positive and statistically significant relationships between GDP growth and private sector credit growth. Stepanyan and Guo (2011) found that strong real GDP growth was key in driving private sector credit growth. In this case, the existence of real growth in GDP over the sample period was essential for the credit growth. It must be noted that a growing economy, as reflected through GDP growth, is essential to driving development and is often synonymous with a stable financial system that fosters private sector credit growth. Schumpeter was a key proponent of the finance-growth nexus, arguing that finance funds innovation and therefore drives much needed growth. We can therefore conclude, from these results that, where recessionary conditions prevail over a period of observation, GDP growth is not a significant explanator of growth in private sector credit. Other determinants will come to the fore in explaining private sector credit growth in these situations, albeit the underlying need for the funding.

### **4.7.3 Money supply and private sector credit**

The estimated coefficient of determination for money supply (M2) in the model is computed as 0.939 and is statistically significant at the one per cent significance level. Money supply has therefore proven to be a key determinant of growth in private sector credit, for sub-Saharan Africa, over the sample period of observation. This is in line with the loanable funds theory of interest rates pioneered by Robertson (1940), which argues that the availability of savings determines the level of lending in a market. Robertson argued that the more savings were available in the market, the more the supply of loanable funds or credit was expected in the market. As indicated in earlier chapters of the study, availability of such funds is therefore critical in driving private sector credit growth and interest rates paid on savings, which incentivise growth in loanable funds.

All the empirical studies reviewed that included money supply as one of the key independent variables, concluded that it was a significant variable in determining private sector credit. Elekdag and Ham (2015) concluded that domestic policy, whose primary objective was to

influence money supply, was a key determinant for credit growth. Khamis and Iossifov (2009) also found money supply to be a significant driver of private credit growth. Stepanyan and Guo (20011) concluded that expansionary or loose monetary conditions resulted in more credit to the private sector. This analysis concludes that a percentage change in monetary supply in the sub-Saharan economy results in a 0.9% increase in the level of private sector credit. The positive relationship is almost on a one-to-one basis. Loanable funds are essential in driving growth in private sector credit. This is aligned with theoretical expectations and the findings of prior empirical studies on the subject across different geographical regions.

#### **4.7.4 Inflation and private sector credit**

The coefficient of determination in this model is computed as -0.0632 statistically significant at the one per cent significance level. It is, therefore, a key variable in determining the level of private sector credit in sub-Saharan Africa as per our sample countries and observation period. Hong et al. (2015) in reviewing data related to 146 countries found an insignificant negative relationship between inflation and growth in credit. Stepanyan and Guo (2011) found inflation to be negatively related to real private sector credit growth. Sharma and Gounder (2012) came to a similar conclusion, finding it negatively correlated with private sector credit growth. This study concludes that a percentage change in inflation will lead to a reduction of 0.0629% in the level of credit growth to the private sector. In other words, growth in inflation dampens real growth in private sector credit. This is in line with theoretical expectations and many of the empirical studies reviewed.

#### **4.7.5 Interest rates and private sector credit**

The estimated coefficient of determination for interest rates from the random effects model in this study is computed at -0.0344 and consistent with the theoretical and empirical expectations that lending interest rates are negatively correlated with the expected growth in private sector credit. The result is not statistically significant and therefore interest rates were not a significant determinant of growth in private sector credit within sub-Saharan Africa.

Sharma and Gounder (2012) found that average lending rates were negatively correlated with growth in private sector credit. This was in line with Tan (2012), who also found that interest rates contributed to slowing down growth in private sector credit. Akinlo and Oni (2015), in reviewing the case of Nigeria, concluded that prime lending rates were negatively correlated to private sector credit, and so did Ivanovi (2016) in a study of Europe. This study concludes

that there is a small negative correlation between interest rates and growth in private sector credit in Africa, although not statistically significant. A percentage change in interest rates results in a 0.0349% decrease in the growth of credit to the private sector. It is critical to add though that, considering the statistically insignificant result, it would be safe to conclude that the growth in credit is much more driven by the underlying need rather than cost. The data shows that the private sector in Africa tends to borrow, despite adverse trends in the lending interest rates, to fulfil its consumption and business obligations.

## **Chapter 5**

### **Conclusions and recommendations**

#### **5.1 Introduction**

This chapter presents the conclusions of the study and related recommendations for policy makers, supply-side and demand-side financial sector participants. It also articulates the limitations faced in the research process.

#### **5.2 Summary and conclusions**

The study examined the determinants of private sector credit in sub-Saharan Africa using a panel data approach with data relating to twelve countries over a thirty-six-year period. The random effects regression model results indicated several relationships from the tested independent variables of GDP growth, broad money supply, inflation, and interest rates.

The findings of the study were generally in line with empirical and theoretical literature examined on the subject, except for the relationship between GDP growth and private sector credit growth in Africa. It was observed that private sector credit in sub-Saharan African countries grew in periods of recession despite the declining GDP output levels. This indicates that there were underlying factors driving the growth in private sector credit other than GDP growth. It can be argued that the need for development, investment capital, working capital and consumption is much stronger a factor in driving credit growth in sub-Saharan Africa. The coefficient of determination was marginally negative and statistically insignificant. This is further explained by the recessionary periods experienced in eleven of the twelve sample countries at some point in the observation period. GDP growth is essential in driving economic development. However, the question of causality in relation to private sector credit growth is shown to be statistically insignificant.

Money supply, on the other hand, was observed to be a statistically significant determinant of growth in private sector credit in sub-Saharan Africa. This aligns with theoretical and empirical evidence reviewed on the subject. The loanable funds theory indicates that the more savings or loanable funds are available in a market, the more credit supply and therefore credit

consumption is expected. This is all relative to market-efficient interest rates that bring equilibrium to the supply and demand of credit in the market. All studies reviewed as part of this research produced similar results with regard to money supply.

Inflation was the other statistically significant variable observed from the analysis of the sample data. A marginal negative correlation, as indicated by the coefficient of determination, showed that inflation dampened growth in private sector credit within sub-Saharan Africa. This is aligned with the theoretical and empirical evidence reviewed during the study.

Lastly, interest rates were shown to have a marginally negative correlation with the level of growth in private sector credit in sub-Saharan Africa. The result was not statistically significant, though indicating that although interest rates slowed down growth in credit to the private sector, they did not play a significant role in determining its level of growth. It was evident that private sector credit grew even in the event of increasing rates. The study, therefore, concludes that credit growth in sub-Saharan Africa is driven much by underlying need, be it working capital, investment, or consumption, rather than the actual cost of it.

### **5.3 Implications**

The findings above have far-reaching supply-side, demand-side and general policy implications for private sector credit growth on the continent.

Given the significance of money supply, it is imperative for African governments and policy makers like the central banks, first to create frameworks that facilitate expansionary monetary policies within the relevant macroeconomic contexts. It is important to highlight that the flexibility of monetary policy tools is as essential as being able to quickly respond to macroeconomic trends and being able to implement the right interventions. Policy makers are required to achieve a delicate counter-balance in this regard, with the management of a stable inflationary environment. As economic theory indicates, expansionary monetary policy might create or increase inflationary pressures which, as the analysis shows, would subsequently dampen credit growth. A sound and stable inflationary environment, supported by deliberate monetary policy, will therefore favour the much-needed growth in private sector credit. This should be accompanied by financial-sector-specific policies that boost capital adequacy growth for supply-side players in the respective markets. These would be both banks and non-banking financial institutions alike.

## 5.4 Recommendations

The following are the key recommendations of the study, arranged in three broad targeted categories. The first is for government and policy makers; the second section is directed at supply-side players in financial institutions and the last section is targeted at demand-side consumers of private sector credit in sub-Saharan Africa.

1. Policy makers in Africa are urged to pay attention to broad money supply and its constituent elements. This is with a view to creating policies that enable the growth of a sufficient level of money supply in circulation, without ‘tipping’ the balance on inflation. These are two important tensions that an effective monetary policy must address and balance at the same time. Policies that create an enabling environment for domestic mobilisation of deposits by banks are also essential. This includes reserve ratio and capital adequacy requirements for financial institutions.
2. Governments should also put in place fiscal policies that ensure there is no crowding out effect for the private sector by government. This entails establishing thresholds for government domestic borrowing levels in comparison to GDP and ensuring private sector participation in various sectors of the economy. This is essential for unlocking capital flow within the various sectors of the economy.
3. Financial institutions need to implement deliberate policies and strategies aimed at increasing the level of deposits or loanable funds, available to them for subsequent lending. This will entail pricing strategies that promote incentives on client deposits cum loanable funds. Empirical evidence has shown interest rate margins to be high in Africa in comparison to other regions. It is therefore incumbent on financial institutions to work with reduced margin differences between lending and savings rates, as a trade-off for more volume of loanable funds. The continent is not short of good investment-led projects that will be key to delivering much needed development.
4. Whereas there have been significant levels of consumption-led credit growth to the private sector on the continent, it is recommended that private sector players prioritise investment-led credit growth, which will form the building blocks of Africa’s developmental agenda. Immense opportunities exist for private sector mobilisation in purely private commercial enterprise, or indeed public-private sector partnerships (PPPs) delivering solutions to challenges around key sectors like energy, waste management, sanitation, infrastructure, and many other key areas, especially those related to the UN sustainable development goals.

## **5.5 Limitations of the study**

The study was generally limited by the availability of data points for all the variables under examination, over the thirty-six-year period of observation. The study could not achieve a balanced panel of data for a higher number of countries. This, therefore, limited the sample size for the panel of countries to twelve, out of the forty-three African countries that make up sub-Saharan Africa. Additionally, a balanced panel for the analysis could only be achieved with the four key Macro-economic variables used in the study, namely GDP growth, money supply, inflation and interest rates. Given these limitations, robustness checks were incorporated in the data analysis using Stata. An increase in the number of countries in the panel and the economic variables tested over the period of observation would have added a greater level of depth to the results of the study. Future studies could incorporate more variables into the regression model, using a larger panel size. Interest rate was consequently used in the model as the independent variable, as opposed to the initially intended interest-rate spread, owing to the availability of data points for the panel of countries. The reliability of the secondary data used in the analysis is based on the accuracy of the World Bank open data base.

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