



**IMPACT OF INTEREST RATE CAPPING ON CREDIT ACCESS IN KENYA**

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### **Declaration**

I hereby declare that this research proposal is my own unaided research work and that it has not been submitted, in whole or in part for any degree and not concurrently submitted for award of any other degree.

**Date:** 24<sup>th</sup> October 2019

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### **Certification**

The undersigned principal supervisor certify that he has read and hereby recommend for acceptance by the University of Nairobi a thesis entitled “IMPACT OF INTEREST RATE CAPPING ON CREDIT ACCESS IN KENYA” in fulfilment of the requirements for the degree of Master of Arts in Economics in the School of Economics, University of University, Nairobi, Kenya.

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## **Abstract**

The interest rate caps introduced in Kenya to curtail lending rate charged by banks and other financial lenders has provoked contrasting responses over appropriateness and effectiveness of this regulatory intervention to meet its intended outcome. This study looks into the implications of capping interest rate in Kenya after the enactment of Banking Amendment Act at the end of third quarter of 2016. The study sets-out to investigate interest rate capping impact on credit access. Monthly quantitative data; pre-capping and post-capping data, and vector autoregressive (VAR) model with dummy variable is used to analyse how this policy has affected credit access to private sector. This study observes a negative significant outcome of capping interest rate on credit to private sector. The results show there is a statistically significant impact of interest rate caps to credit access to private sector, and that credit to private sector, lending rate and inflation are affected by their respective previous lagged values. In the light of these results, regulating interest rate through capping is not an effective way for addressing credit cost and accessibility to credit. Rather, the regulation of interest rate should be left at the hands of Central Bank of Kenya which has the official order of conducting monetary policy to monitor and adjust interest rate in accordance with prevailing economic conditions.

**Keywords:** Interest rate capping; Price ceiling; Credit access; Vector autoregressive model.

## **List of Acronyms and Abbreviations**

ADF	Augmented Dickey Fuller
AIC	Akaike's Information Criterion
CBK	Central Bank of Kenya
CPS	Credit to Private Sector
DV	Dummy Variable
FPE	Final Prediction Error
FSD	Financial Sector Deepening
HQIC	Hannan Quinn Information Criteria
INF	Inflation
ICT	Information and Communications Technology
IRS	Interest Rate Spread
LR	Lending Rate
MENA	Middle East and North Africa
MFI	Micro Finance Institution
SACCO	Saving and Credit Cooperative Organisation
SME	Small and Medium Enterprise
SIC	Schwarz Information Criterion
VAR	Vector Autoregressive

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## **CHAPTER ONE**

### **1. INTRODUCTION**

#### **1.1. Overview of the Study**

Kenyan government introduced interest rate capping in the end of the third quarter of 2016 through the Banking Amendment Act of 2016. The law sets a ceiling on lending rate to be charged for a credit facility to an upper limit of 4 per cent above the Central Bank Rate (CBR). Moreover, the lowest interest rate allowed on a deposit held in interest bearing account should not be less than 70 per cent, the CBR fixed and issued by the CBK (Kenya Gazette, 2016).

The interest rate capping is connected to the CBR in that the rate caps are responsive to markets conditions. In this case, the lending rate increases with monetary contraction and drops with monetary easing in line with the CBK's monetary policy. Interest rate capping intends to address high interest rates that had prevailed in the country for long time and ease the cost of borrowing. This study investigates how capping the lending rate has impacted on credit access in Kenya based on the analysis of credit to private sector.

The remainder of this chapter is structured as follows: Section 1.2 gives the background of the study, sub-sections 1.2.1, 1.2.2 and 1.2.3 discusses the financial access in Kenya, private sector in Kenya and interest rate spread and its effects respectively. The subsequent section, section 1.3 gives a description of the statement of the problem. Section 1.4 describes the overall objective and the specific objectives of the study. The last section of this chapter, section 1.5 gives justification of the study.

#### **1.2. Background of the Study**

Interest rate capping represents the most repeated government intervention in financial markets (Miller & Black, 2016). It remains popular around the world; in 2014 at least 76 countries used some method of interest rate controls on credit facilities (Maimbo & Gallegos, 2014). According to Miller (2014) interest rate controls can be used for a variety of economics and political purposes, for example; to promote specific industry or a certain sector of the economy, and to safeguard vulnerable clients from unscrupulous financial institutions with exploitative lending practices. Based on Helms and Reille (2004) classification, there are three categories of interest rate ceiling; usury limits, bank interest controls, and de factor ceilings. Bank interest controls are included in banking laws to grant central bank authority to set either or both maximum and minimum rates for the deposits accounts and lending accounts of the licenced financial lenders;



usury limit is part of civil code and sets an interest rate limit that private lenders charge on loans; and de facto ceilings exist where there is no formal set interest rate limit but political pressure from subsidised government lending programs keep interest rates at low levels. Interest rate caps can be used on all types of loans or on particular type of loans only or some part of banking sector especially in microfinance that charges high interest rates.

The introduction of legislation to cap interest rate in Kenya to curtail lending rate that banks and other formal short-term lenders charge has provoked contrasting responses over appropriateness and effectiveness of this regulatory intervention to meet its intended outcome. In implementing capping, the government aims at safeguarding borrowers from unreasonable interest rates charged by financial institutions, thereby making loans affordable (Economic Survey, 2017). Proponents of interest rate caps argue that financial lenders earn enormous margins by charging exorbitant sky-high interest rates to borrowers. Some view excessive interest rates as market failure that requires government intervention to protect vulnerable consumers from unscrupulous lenders taking advantage of customers in need of loan. Opponents of interest caps argue this move would pose undesirable consequences for both borrowers and lenders and by extension causing significant damage to the economy. The annual report by CBK (2017) states interest capping undermines the independence of the central bank to exert its powers and execute its duties without interference from any person or authority. The report further hypothesises the law capping interest rates is likely to make the conduct and implementation of monetary policy more complicated. This is because banks would be required to lower lending rates forcing them to avoid lending to high-risk perceived borrowers.

Theoretically, interest rate caps distort markets in that demand and supply cannot interact freely to determine the equilibrium price and equilibrium quantity. Capping interest rate below equilibrium level, a level that banks find it difficult to lend to high-risk consumers, there arise possible consequences such as borrowers turning to informal sources which are more expensive and riskier or go without goods and services which are essential hence disadvantaging the same people who caps are designed to protect. Aveyard (1999) notes that high interest rates are charged to certain loans because they are not economically feasible to service at the low rates of interest.

The government of Kenya pursued interest rate ceiling measures that entailed control of both interest rate and saving rates for all deposit taking institutions before liberalisation of financial sector in July 1991. Interest rate control at this time was aimed at encouraging investment with low cost capital and stimulating economic growth and development (Nguni, 2001; CBK, 2018).

McKinnon and Shaw (1973) termed this regime of heavy government intervention and low interest rates that existed in Kenya and other developing countries as financial repression. Regime of financial repression was characterised by inefficient allocation of capital which discouraged savings and investment, reduction of loanable funds through the banks forcing borrowers to rely on self-finance. When interest rate caps law was enforced, it was feared that interest rate caps may reverse gains that had been made in the banking sector to the consequences experienced before financial liberalisation.

Studies by Collin and Wanjau (2011), Mwegu (2014) and CBK (2018) show that high lending rate has been correlated with higher interest rate spread (IRS) and high credit cost. After introduction of caps, average lending rate for commercial banks had a remarkable decline in all loan categories from approximately 18.1 per cent in July 2016 to approximately 14 per cent in September 2016 and it remained stable below 14 per cent throughout 2017 and 2018. Consequently, interest rate spread declined to 6.4 per cent, the lowest in over two decades (CBK, 2017). Even though caps have solved high IRS and consequently high credit cost, the impact that it has on short-term and long-term credit accessibility is unknown. This study postulates that caps complicate commercial banks extension of credit which is currently low and fluctuating.

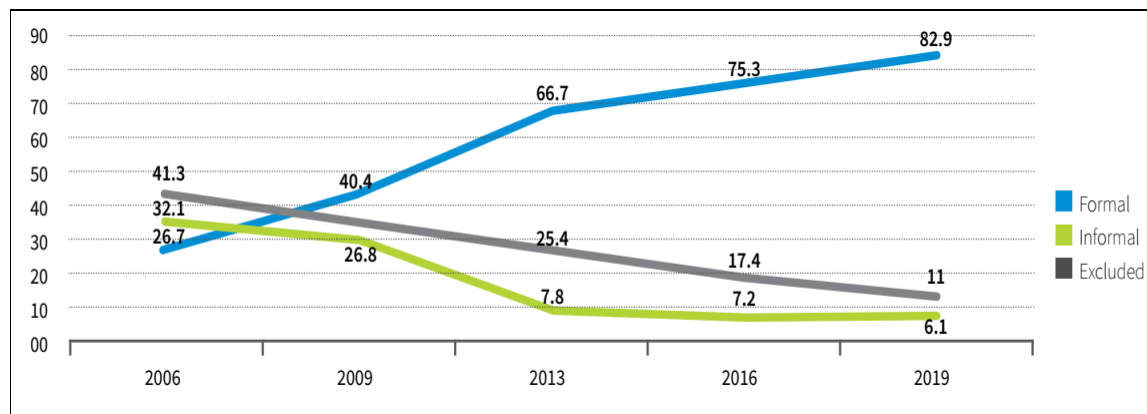
Since implementation of the interest rate caps, few studies have been undertaken to examine the effects interest rate caps has on credit accessibility. Some of studies in Kenya (CBK, 2018; Kiseu, 2017; Okwany, 2017) base their research on qualitative data, descriptive analysis, exploratory analysis and drawing from experiences of other countries. This study looks into the impact of interest rate capping in Kenya post the Banking Amendment Act of 2016. The study sets out to investigate whether capping addresses the cost of credit at the expense of credit access. The study uses monthly quantitative data: pre-capping and post-capping data, and vector autoregressive (VAR) model with dummy variable to analyse how this policy has affected credit to private sector.

### **1.2.1. Financial Access in Kenya**

Boissay, Collard, & Smets, (2016) defines access to financial services as the ability to engage with and use financial services that meet the desired consumers' needs. Financial access and inclusion had remained a challenge to the vast majority of the eligible population for long time. This compelled the government to initiate measures to reform financial sector to improve financial inclusion, reduce interest rate spread, enhance consumer trust, safeguard consumer rights, and promote sufficient loanable funds flow to the private sector.

Financial inclusion in Kenya has continued to improve over years with more people being able to access formal financial services.

**Figure 1:** Financial Access trend (%) in Kenya



**Source:** 2019 *FinAccess Household Survey*

Financial inclusion was at 61.6 per cent in 2006, with formal access at approximately 26.7 per cent and majority of 32.1 per cent accessing financial services through informal means. Access to finance at this time was characterised by a big proportion of population that had no access to financial services whether formal or informal with exclusion more acute among low income households, rural households and less educated (FSD Kenya, 2006). Financial inclusion has improved drastically since 2006 as shown in Financial Sector Deepening (FSD) Kenya 2019 survey report. Approximately, 82.9 per cent of Kenyans are now formally included, that is, almost 83 per cent of population use various types of formal financial services.

This considerable change in financial inclusion is as a result of transformation in financial sector which include; introduction of mobile phone based financial services that allows money transfer, deposits, and borrowing. Strengthening of microfinance institutions through enactment of standardised and appropriate legislation under Microfinance Act of 2006; Microfinance institutions fill the gap left by commercial banks by reaching out to low income and rural residents. Democratising banking through the agency banking model has enabled banks to collaborate with third party businesses in offering some banking services on agency model. Introduction of credit sharing mechanism through establishment of credit reference bureaus solved challenges that banks faced such as information asymmetry and high credit application appraisal costs (Mugo & Kilonzo, 2017). While mobile financial services revolution has played tremendous part in increasing financial inclusion, the role other measures have played in promoting financial inclusion cannot be underestimated.

Regardless of improved financial inclusion, bank reforms and deposit mobilisation, continuous growth in credit accessibility has not been realised. FSD Kenya reports show that 35.5 per cent of the population had credit access in 2006; this proportion increased to 37.8 per cent in 2009 before a drastic drop to 28.6 per cent in 2013. Use of credit rose to 34 per cent in 2016 and despite this increase after drop in 2013, it has not reached the levels of a decade ago. Throughout the period from 2006 to 2019, informal credit remained popular with mobile banking and saving and credit cooperative organisations (SACCOs) being the most popular sources of formal credit. The main formal sector, that is, the commercial banks, have not been able to provide affordable and suitable credits to clients as per their financial needs. Commercial banks mainly focus on high end market as it remains reluctant to extend credit to small and medium enterprise (SME) because it's uneconomical and risky to lend to individuals who lack collateral, credit history, formal records and operations. Moreover, SME borrow small size loans which translate to high transaction cost.

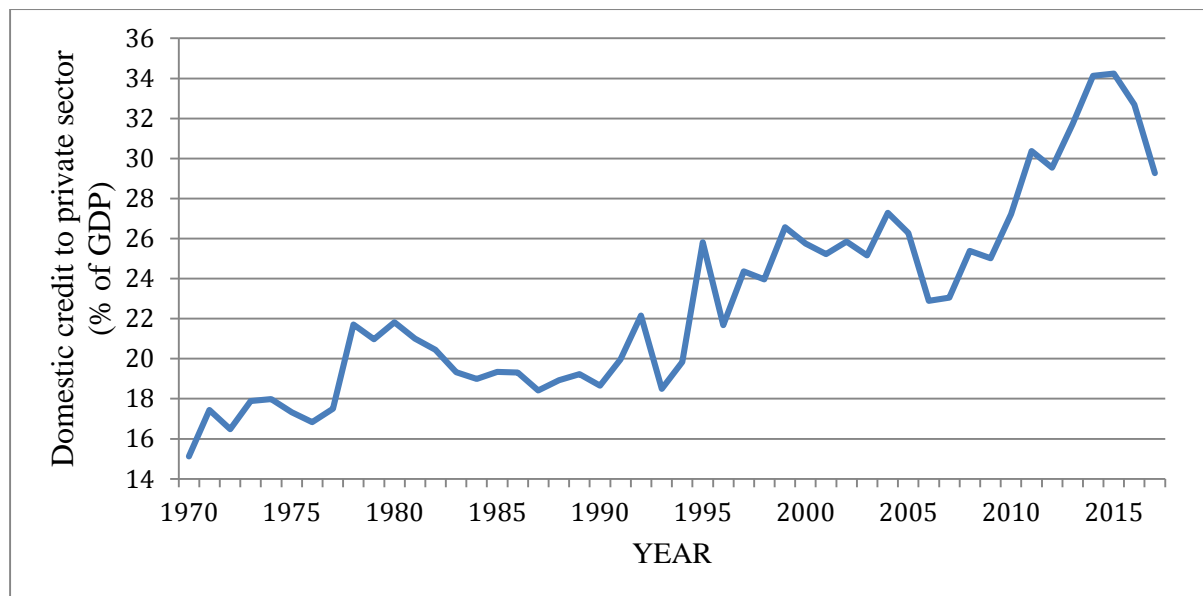
Availability of cheap and easy to access credit facility is a key driver of private sector-led growth; this enhances the productivity capacity of firms. Were, Nzomo and Rutto, (2012) study finds providing credit to private sector in key strategic economic areas pose a high potential to promote targeted economic growth. Thus, organisations with access to adequate and affordable credit have greater potential to grow. Inability to access cheap finances is a prime constraint to the economic growth more so for the small and medium manufacturing firms (Beck and Demirgüç-Kunt 2006; Bigsten et al., 2003). In Kenya, credit access plays important role in the country's economy development.

### **1.2.2. Private Sector in Kenya**

Private sector development and investment are critical for economic growth. In partnership with public sector, the investments made by the private sector especially in areas of competitive advantage such as agriculture, manufacturing and tourism sectors, has tremendous potential to contribute to economic growth. The private sector in Kenya is made up of formal and informal segments, and accounted for over 90 per cent of total credit market in the banking system in 2017 (KIPPRA 2017). At least, 80 per cent input by the private sector to the overall GDP come from agriculture, transport and communication, trade, manufacturing, tourism and financial services. Private sector growth is progressively driven by financial services, ICT, trade and transport. The performance of private sector is unpredictable, impressive at times though below full potential. This is because it is dependent on sectors vulnerable to exogenous shocks, imports and political instability.

High cost of credit is a significant constraint to the growth of private businesses in Kenya and is more difficult for informal micro and small enterprises. Data provided by World Bank for credit to the private sector as a per cent of GDP for Kenya from 1970 to 2017 show that credit to private sector in relation to GDP has increased tremendously from 15.12 percent in 1970 to date amidst fluctuations. The credit to private sector has significantly been rising particularly since 2003 with a maximum of 34.19 percent in 2015. Private sector credit represented 80 per cent of the overall credit in the year 2008 and about 77 per cent of the overall credit in the year 2009.

**Figure 2:** Domestic Credit to Private Sector (% of GDP) from 1970 to 2017



**Source:** *World Development Indicators*

Growth of private sector credit has been on decline since mid-2015. This slowdown which started before introduction of interest rate capping was attributable to factors which included; external factors like the 2015 external financing shock negatively affected the liquidity and exchange rate in the financial sector, lessening of lending by commercial banks to improve balance hit growing number of non-performing loans while credit growth fell, banks tightening credit standards, panic in the financial sector caused by bankruptcy of banks; Chase Bank Limited and Imperial Bank. Therefore, introduction of interest rate capping complicated a lending environment that was not doing well to begin with (CBK, 2017; World Bank, 2017).

The intention of interest rate caps is to address high cost of credit caused by the high lending rate charged by financial institutions. It remains unclear whether the interest rate capping has been able to address the credit cost without curtailing credit accessibility since its enactment in September 2016.

### 1.2.3. Interest Rate Spread Effects

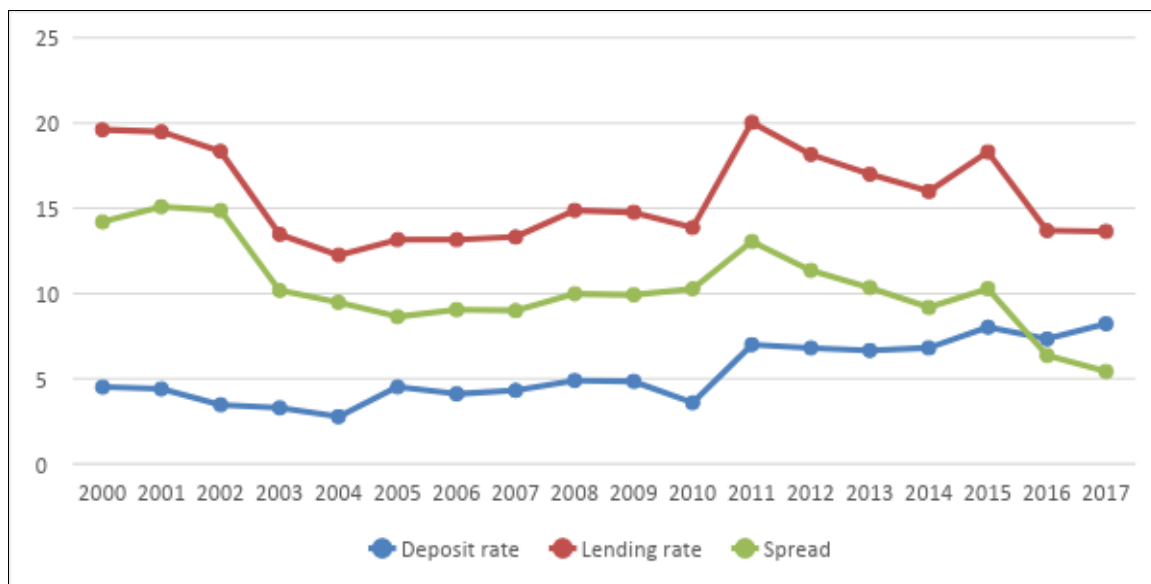
Kenya has experienced persistently high interest rate over years which in turn led to high interest rate spreads despite improved economic conditions in the country and growing profitability of banking industry (Mwega, 2014). According to Were and Wambua (2014) high IRS results from high lending rates and lower deposit rates. High spreads are associated with costly credit to borrowers; alternatively, it would indicate existence of exceptionally low deposit rates that would discourage savings therefore limiting availability of resources for credit (Mureji & Younus, 2009).

Miller (2013) enumerates lending rate is a composition of profits, non-performing loans, overhead costs and cost of funds. According to Miller interest rate should contain profit, the cost of borrowing funds, cost of bad debts and overhead costs that includes the costs of credit processing, loan assessment, and outreach costs for expansion and creating new products. He suggests government should consider interest rate composition to evaluate the suitability of capping as a policy and whether alternative measures would achieve the outcomes intended.

For decades, the Kenyan government has put in place programs and policies for financial sector reforms designed to strengthen the robustness of financial system (Mwega, 2016). The major financial reform was financial liberalization that was advocated by the World Bank. Financial liberalization advocate for deregulation that entails privatization of state-controlled banks, elimination of interest rates controls, soft restrictions on market entry and diversification. Expected benefits of financial liberalisation in the financial sector are; increased bank efficiency, credit allocation improvement, competition among banks, narrow interest rate spreads and reduced transaction costs. Even though financial liberalization achieved some of its agendas, others like narrowing interest rate spread was not realised. Ngugi (2001) notes that, decades after liberalization of financial sector to permit the determination of interest rates by the market forces, high IRS continued to persist.

Figure 3 shows pattern of deposit rate, interest rate spread and lending rate at period between 2000 and 2017. The IRS is high and fluctuating throughout the period due to high lending rates and low deposit rates. Spread was high at 15 per cent in 2002, it dropped below 10 per cent in years between 2005 and 2009. The spread dropped to its lowest in decades at 6.3 per cent in 2016 after interest rate caps came into effect.

**Figure 3:** Lending rates, Deposit rates and Spreads for The Period 2000-2016



**Data Source:** *Annual Economic Surveys 2000-2018*

Factors that determine IRS have been studied widely in developed and developing countries. Crowley (2007) comprehensive study on IRS in Anglophone African countries, Kenya included, shows factors affecting spreads as high overhead costs, quality of loans that is non-performing loans, capital adequacy, public sector involvement, higher required reserve ratios, deposit rates, the size of the economy, broad money indirectly through its effect on inflation and the quality of the regulatory regime.

In Kenya, specific bank attributes like the size of bank, return on assets and credit risk commonly estimated by non-performing loans to overall loans ratio, bank liquidity and operating costs significantly determine the size of IRS (Were & Wambua, 2014). They further noted that among all the factors that impact IRS, bank specific attributes is a primary determinant of IRS across the banking industry. Parliamentary budget office Kenya (2011) argued that high interest rates reduces business profits, restrain investment, worsen unemployment situation, prevents establishment of new businesses, high cost of production leading to high market prices, this can happen when companies increase their margins to compensate for costly bank financing.

A different perspective is brought by Crowley (2007). Despite confirming high IRS negatively impact growth, Crowley study further suggests higher spreads should not always be viewed negatively for it may be an indication of outreaching retail and SME borrowers, lending to riskier clients, breaking up of dominant banks and better oversight. McKinnon and Shaw (1973) argues financial institutions generate revenue through spread between deposit and lending rates and the

fees they charge their customers to meet operating expenses such as administrative and default costs. Therefore, spread is not bad; it is existence of high IRS that is deemed harmful to the economy.

### **1.3. Statement of the Problem**

The Kenya government is focused on reducing both the cost of borrowing and the number of citizens without access to finance as envisaged in Vision 2030, and ensuring adequate credit to the private sector. Despite financial liberalisation, structural transformation that banking sector has experienced, and the policy initiatives and reforms by CBK and government to make this possible, level of interest rate spread continued to be high (CBK Discussion Paper, 2011). This translated to high cost of credit. Parliamentary Service Office (2011) associated high interest rate with drop in business profits, decrease in investment, worsening unemployment situation which leads to low economic growth, higher market prices resulting from increasing costs of capital.

Introduction of interest rate capping through Banking Amendment Act 2016 to curtail lending rate that banks and other short-term financial lenders charge aims at correcting the problem of high interest rate that market determined interest rates have not been able to solve. Affordable credit resulting from market determined forces signifies efficiency and competition in the financial sector. On the contrary, low cost credit in the aftermath of interest rate restriction alters allocation of resources. Thus, this study deals with interest rate limit that was introduced and is currently in use setting a limit to the amount of interest rate financial lenders are allowed to charge borrowers.

The banking industry operate under market conditions that are oligopolistic in nature which mean a bank is not a price taker rather determines lending rates considering the demand in borrowing against the available deposits with aim of maximising profit (Gambacorta, 2008). For banks to operate and transact their business, interest rate spread is necessary for it enables them meet their expenses as well as extend their services to new consumers. However, it is existence of persistent high spreads deemed excessive that has been a cause of alarm. It is clear high lending rates and spreads cannot be justified on the basis of the costs especially when banks continue to earn high profits. Persistence of high interests over long period shows that the use of moral suasion cannot work therefore it is advisable to use a different approach (Kwakye, 2010) The caps have resolved high interest rates charged by financial institutions as it is evident that interest rate spread dropped considerably to its lowest after implementation of the interest caps. The impact this policy has on access to credit depends on whether at the set interest rate caps of 4 per cent above CBR, financial institutions can sustain lending without undermining access to



credit to both retail and small and medium enterprises (SMEs). It is undoubtedly that interest rate caps bring down cost of loans to borrowers; the issue arises when limit is set too low such that banks cannot lend to high risk potential borrowers. This can cause extensive decrease in the number of borrowers involved in the formal credit market and leave relatively low risk borrowers to benefit from low cost loans. If the caps compel financial institutions to favour less risky and wealthier borrowers over riskier borrowers then the caps harm the very people the legislation seeks to protect. In response to these observations, this study proposes to examine the effects of interest rate caps on credit accessibility in Kenya post implementation of the Banking Amendment Act 2016.

#### **1.4. Objectives of the Study**

The overall objective of this study is to investigate the impact of interest rate capping on credit access in Kenya.

The specific objective of this investigation is:

- (i) To determine the impact of interest rate capping on credit to private sector.

#### **1.5. Justification of the Study**

Interest rates play a key part in a market economy. Keynes (1936) states interest rate is the cost of borrowing capital for a specified period of time. Since interest rate is determined by the cost borne by the borrower for the use of funds advanced by the lender for a given time intervals as shown by Fabozzi, Modigliany and Ferri (1998); any form of capping imposed on lending interest rates and savings will have an untended effect on both the demand-side and the supply-side of loanable funds. Thus, it is important to undertake a study to assess how access to credit to private sector has been impacted by interest rate capping.

This study is important in that it provides an empirical contribution to the existing body of literature on effects of interest capping and data base that would provide useful information to policy makers and researchers on its effects in the economy. In a broader perspective, this research will also contribute to a better understanding of the available evidence on impact of interest rate controls which would efficiently help address credit affordability and accessibility in the long term. In the end, results from this research project provide better understanding of effects of this policy; this can enable private lenders, and state agencies involved in interest regulations base their suggestions on how to change inefficient controls in the banking sector.

## CHAPTER TWO

### 2. LITERATURE REVIEW

#### 2.1. Introduction

This chapter looks at prior studies and identifies the research gaps that exist in the interest rate ceiling, and how this rate caps impacts private sector of the economy. The chapter is organised as follows: Section 2.2 presents theoretical review, section 2.3 looks at relevant empirical studies on the impact of interest rate capping. Section 2.4 presents literature overview, that is, a summary of the key findings from the previous studies.

#### 2.2. Theoretical Review

A long tradition in economics dating back to Adam Smith is that market operates best when there is no intervention from the government. Adam Smith emphasised free competitive market can function without government interference to allocate resources efficiently (Mansfield 1983). While some classical economists such as Milton Friedman, David Ricardo support Adam Smith's insight that an economy based on free market transaction is self-organising and sufficient, others like Keynes support public policy interventions that aims to achieve price stability and full employment.

Every market has a demand-side and a supply-side. The forces of supply and demand in the market interact to determine a stable price and equilibrium quantity. Disequilibrium can exist when quantity demanded differ from the quantity supplied, a case that would lead to either excess demand or excess supply. This can result from government interference in form of price ceiling or price floors. For a price ceiling to be effective, it should essentially be set below the ordinary market equilibrium. Price set below equilibrium level makes suppliers to offer their product at a price set by the price ceiling. This is due to the fact that forces of supply and demand in the market tend to shift the price as close to the free market equilibrium as possible such that the market price would be identical to the price ceiling. Price ceiling set below the equilibrium price causes excess demand, persistent shortage of the items whose prices are controlled and emergent of black markets which charge prices that are higher than those prevailed in a free market (Mansfield,1983; Lipsey & Chrystal 1999). Government through legislators turn to controls whenever the free market yields unsatisfactory outcomes.

Interest rate ceiling is a method of price control by which government sets a legal limit on price level; the price charged is different from the equilibrium price arising from free interaction of

demand and supply in the market. Any price ceiling which alters the typical flows of funds slowdown economic growth (Luttrell, 1968). Ceiling the interest rates leads to distortion the market and stop financial lenders from giving loan facilities to low-income borrowers with limited alternative access to credit.

Mankiw (2003) argues credit market operates like any other market in the economy where the interplay between demand and supply of loanable funds determines the amount of interest rate to be charged. When government regulates interest rate, the supply and demand cannot interact without restrictions to determine the stable price and quantity. Thus, the artificial ceiling distorts allocation of resources. Low interest rate capping hinders lenders from charging higher interest rates necessary to offset the higher risks borrowers. The immediate effect is contraction of loanable funds supplies. The credit market contraction affects borrowers adversely, more so those who depend on loans as principal source of funds for capital investments.

DeMuth (1986) observes that price controls in competitive markets create a market gap between supply and demand when the price controls are set at below market equilibrium level. Consumers will demand more of the goods or services than at a higher market price although suppliers will not be able to supply as much. Both consumers and suppliers will attempt to find ways to close the economic inefficient gap between supply-side and demand-side. To achieve this, suppliers will attempt two options, first to fill the increased demand by adjusting prices upward in manner that is not controlled by the regulatory regime. For instance, if interest rates on loanable funds are set below the reasonable cost of the funds whereas other associated lending charges and fees are not controlled, lenders may raise lending charges and fees in an effort to meet their costs. Second, if the price ceilings cannot be by-passed by repricing, suppliers will lower the amount or value of their products. The suppliers will further reduce their production and investment to the point where the production costs are proportionate to the regulated price. Some suppliers especially those with relatively higher costs of production may in the long-run exit from the market entirely. In cases where substitute of unregulated goods and services are available, the production of these goods or services will raise at the expense of the regulated goods or services, for example, informal lenders like shylockers and other informal and payday lenders will become popular in the informal credit market.

### **2.3. Empirical Literature**

Miyauchi (2017) examines the impact interest rate capping has on borrowing by the manufacturing sector in Bangladesh when the rate caps was in operation between 2009 and 2012.

Miyauchi's study uses difference in difference strategy on branch-level disparity of interest rates before regulation and loans for consumer goods as a control variable. The study results show, when the interest rate ceiling was implemented; there were an improved gross proportion of loans, while the removal of the caps had a minor negative effect. The caps increased the proportion of classified loans, decreased the profits during the regulation period which later increased when the caps were lifted.

Heng (2015) examines the effects of financial service law in Bolivia, adopted in 2013 that entails regulations on lending rates and deposit, minimum lending quotas for high-yield loans and for social housing loans, and establishment of assurance funds to cater for initial payments. The study uses financial soundness indicators, simulations, stress tests, and reviewed international experience on credit quotas and interest rate caps to examine impacts of interest capping on both financial strength and financial inclusion. The findings show that when interest rates are capped, there is a considerable implication on the financial inclusion of small and low-income borrowers as banks expanded their credit at a lower rate than before. Furthermore, microfinance institutions number of borrowers declined.

Alessie, Hochguertel and Weber (2002) analysed data on loan applications received by the major consumer credit provider in Italy for period between 1995 to 1999 to investigate how the usury law that came into effect in 1997 affected the consumer credit market. They found that there was an increase in application numbers with the enforcement of the law, the difference in the interest rates on medium sized loans and small loans reduced by notably large amount though the gap widened again after some time. The study further found that this regulation had no impact on neither credit rationing nor loan application rejection; the rate of loan application rejection varied between 17.4 per cent and 22.8 per cent without clear time pattern.

A study by Helms and Reille (2004) shows interest rate controls in developing and transitional countries discourage provision of small loans that benefit low income earners by making it difficult to recover the high administrative cost associated with such loans. Some MFIs often withdraw from the market, grow slowly as institutions reduce their lending to more costly market segments. Caps discourage commercial banks from lending and expanding credit to microcredit markets that require high costs to serve. Moreover, capping reduces transparency on true cost of loans to cover-up the actual interest rate by adding new charges and fees.

Over the period 2004 – 2012, Adair and Berguiga (2015) carried out a multivariate cross-section analysis on 53 microfinance institutions in the MENA region to determine if financial margins

and social performance of MFIs have a relationship. To measure social performance the study used variables such as women borrowers and depth of outreach while productivity of personnel, adjusted return on assets, portfolio at risk is used to measure financial margin. The study shows that interest capping positively impacted Tunisia's social performance in addition to its financial margin, enabling the institutions to meet their cost of operation and make profit. In Morocco, six out of ten MFIs were socially effective and managed to perform better financially while the rest were not socially effective. Four of the five Yemeni MFIs were socially effective, whereas the Syrian MFIs were not socially effective. Even though interest rates caps were effective in Tunisia and Morocco, the study raises issue on whether institutions complied with regulation on capping for it is almost impossible to find out since there is no transparency of effective interest rates.

According to IMF (2013) the Bank of Zambia set ceilings on annual interest rates for banks, non-banks and MFIs in early 2013. The ceilings were initially set at 18.25 per cent for banks, 30 per cent for non-banks, and 42 per cent for MFIs, with the levels tied to the central bank's policy rate. This ceiling was binding for banks only on SME sector while for MFIs were totally binding because they charged high lending rates in the range between 90 per cent and 120 per cent. IMF noted that since the introduction of the lending rate caps, most banks had expanded loan portfolios, total non-bank loans rose though from a small base; non-banking sector restructured in response to declining interest rate margins by implementing cost reduction programs including closing marginal branches, adjusting their business model to remain viable; and some consumer lending MFIs exited the financial sector.

Brouwers, Chongo, Millinga and Fraser (2014), share similar sentiments that interest rate ceilings leads to shrinkage of the microfinance sector, some MFIs stop loaning altogether whereas others would advance loans to existing clients only. Actiam Report (2016) indicates that tight interest rate caps in China make it more strenuous for banks and other short-term financial lenders to grant credit to risky and small borrowers appropriately. Banks in China mainly advance credit to state owned corporations and very large corporations while pushing retail individuals that account for a large proportion of population towards other sources of finance.

According to Mia (2017) interest cap is not an effective way to control high interest rates. Though she acknowledges caps can work in short period, in long-run weak enforcement and lack of necessary resources for effective implementation may become a difficult task. She argues interest rate cap deteriorates social outreach hence measures which can address sustainable interest rates are improving market structure, efficiency and competition in the sector. These

measures would trigger innovations and technological advancement leading to minimising cost of operation thus lowering interest rates through efficiency and prudent resource.

Islam, Porporato and Waweru (2013) investigated the cost structure of MFIs in Bangladesh to find out the likelihood of these institutions to attain financial sustainability after introduction of interest cap. The study uses secondary data for the operating MFIs in the country published by Microcredit Regulatory Authority and twelve variables namely; operation self-sufficiency, return on asset, interest rate spread, savings cost ratio, lending cost ratio, general administration cost, financial costs, source of funds and bank size. Their work show that IRS and the cost of administration are significantly associated with financial sustainability thus for the institutions to remain sustainable at prevailing interest rate cap have to control their fixed and variable costs as interest rate spread would be reduced.

Okwany (2017) study on interest rate capping show there was a decline in the number of newly approved loans in most commercial banks in Kenya, due to banks tightening lending criteria. The ceiling had an adverse impact on bank's profitability as a result of reduced interest rate margins as well as increased loan loss provisions. In addition, the study found the caps had a positive effect on non-performing loans because caps reduced the cost of credit leading to increase in recoveries of loans that would have otherwise gone bad.

In similar study, Kiseu (2017) uses descriptive analysis to analyse quantitative secondary data from forty commercial banks to investigate association between interest rate ceiling and credit issued. Kiseu's analysis finds interest rate capping did not significantly influence how banks issue credit to their clients, most of the banks expanded their loans significantly though some of the banks had credit reductions which were mostly small banks. The growth of the loan book for the period under the study remained almost constant with a difference of 0.2 per cent growth.

Kwakye (2010) analysis on high interest rate in Ghana finds high interest rate kept the cost of credit unreasonably high and discouraged many feasible projects from being implemented. Some of measures he suggested in this study to bring interest rate down are improving macroeconomic stability, especially fiscal policy in that government reduction on spending and borrowing would reduce pressure on interest rate; reducing organisational weaknesses and inefficiencies in the banking system as well as improving competition. Though these measures could bring interest rate down, Kwakye's work argues the use of moral suasion has never worked and a new approach is necessary. His study strongly recommends caps on interest rate spreads at 10 per cent, which

is no way intended to return to the old system of controlled interest rate, but a necessity in correcting market failure in the credit system.

According to Miller (2013) capping is an appropriate policy in cases where government intends to support a particular industry that plays a crucial role in the economy which would be worse off without intervention. Caps can play a crucial role in supporting and insulating a sector from market forces until it becomes economically viable and it can operate without government support. Caps can as well promote fairness when set at a level that financial institutions can make enough profit to maintain their sustainability while protecting consumers from high interest rates without impacting outreach. This applies in cases where institutions make high profit and effects of capping can be taken care of by profit margin. Although high lending rates result from market failure and the government can choose to intervene; interest rate caps are perceived as unsuitable approach to setting stable long-term low interest rate.

According to CBK (2018), interest rate ceiling in Kenya increased demand for loans temporarily; 14 per cent reduction of interest rate lead to increase in loan inquiries and applications in the initial months by 20 per cent. This didn't last for long since after a short period the growth of loan applications decelerated, the number of loan accounts declined, and the loan size has a 36.7 average per cent increased whereas there has been increased lending to government by commercial banks.

#### **2.4. Literature Review Overview**

Interest rate ceiling has been a commonly used method of price control by governments for a long time to address concerns of high interest rates. This price control by the government is based on the view that credit market is not different from any other market with buyers and sellers. Theoretically, price ceilings set below the market determined price lower price of product making it less costly; a reasonable justification for the ceiling. Price ceiling create shortage since the quantity demanded surpass the quantity supplied and that some sellers would not be willing to supply their products at the set price. Using the standard economic theory, it can be postulated that in the long-run, consumers suffer because price controls alter the distribution of resources to favour less risky borrowers.

Empirical literature in most cases concurs with economic theory on interest rate ceiling. Interest rate cap reduces financial inclusion by limiting credit to high risk consumers (Heng, 2015; Helms & Reille, 2004), interest rate cap deteriorates social outreach (Mia, 2017), tight interest rate caps

in China make it more challenging for banks and other financial institutions to service riskier and smaller borrowers properly (Actiam report, 2016), introduction of ceilings cause shrinkage of the microfinance sector (Chongo et al, 2014), interest rate caps lead to prepayment penalties, higher application fees, and raised charges.

In contrary studies, capping of interest rate in Bangladesh remarkably improved the aggregate proportion of loans by 13 per cent, while the removal of the caps had a minor negative impact (Miyauchi, 2017), interest caps had a positive impact on Tunisia and Morocco social performance and as its financial margin (Adair & Berguiga, 2015), change in regulation had no impact on neither credit rationing nor loan application rejection rate (Alessie, Hochguertel & Weber, 2002). Kwakye (2010) recommended ceiling on high interest rate that kept the cost of credit unreasonably high and discouraged many viable projects from being implemented.

In general, it can be inferred from the previous studies the impact interest rate caps have on credit accessibility depends on the level its set relative to market rate. Caps set too low make it difficult for financial institutions to recoup costs and make profit to expand their business and this discourages expansion of credit to highly risky consumers. This literature has extensively reviewed researches on impacts of interest rate control done in countries that have regulated interest rates through capping. In Western countries, interest regulation is mainly usury limit that sets limit on interest private lenders may charge. In most African countries studies have been predominantly on MFIs for it seems the only sector that has received regular attention that has called for restrictions. In other countries interest rate capping was set to support certain sectors that required government intervention.

The Kenyan interest rate capping differs from the interest rate controls in the prior literature in that, the regulation is banking interest control that sets lending rate limit of mainstream banking sector. In essence, this involves the commercial banks involved in overall loan types. Since the implementation of interest rate controls in September 2016, only few studies have been done to show impact interest rate caps has on credit accessibility in Kenyan banking sector. These studies mostly based their analysis on qualitative data, descriptive analysis, exploratory analysis and drawing from experiences of other countries. This study brings a new perspective to the current literature on the effects of interest rate capping. To investigate the impact of the capping, the study makes use of wide range of secondary data sets sourced from the financial industry which includes monthly observations on lending rates, private sector credit, and credit to the government.



## CHAPTER THREE

### 3. RESEARCH METHODOLOGY AND DESIGN

#### 3.1. Introduction

This chapter introduces the research methodology adopted in this study. The methodology chapter gives a description of the research method used to examine the impact of interest rate capping in Kenya and data collection and data analysis process was done.

The rest of the chapter is organised as follows: Section 3.2 gives theoretical framework of the model, Section 3.3 presents the model specification and variables, 3.4 gives a brief outline the data source and description

#### 3.2. Theoretic Framework of the Model

The analysis method used in this study entails estimating the econometric models to determine the effect of interest rate capping on credit to private sector.

The general nature of the model is derived within the framework of the theoretical link between lending rate and credit to private sector presented in economic theory and empirical literature.

The relation between credit sector and lending rate can be formulated into a function model in the form:

$$CPS = F(INF, LR) \quad (3.1)$$

Where *CPS* is credit to private sector, *INF* is inflation, *LR* is lending rates.

The equation 3.1 can be formulated into equation 3.2 as follows

$$CPS_t = \alpha_0 + \alpha_1 INF_t + \alpha_2 LR_t + \varepsilon_t \quad (3.2)$$

A dummy variable is introduced in this relationship to show the effect of the interest rate capping policy on credit to private sector. Although in most cases dummy variables are used to represent quantitative effects, in this case it is used to determine the effects of policy change on the independent variable. The dummy variable takes the values 0 and 1 where 0 represent the period before interest capping (January 2010 to August 2016) and 1 represent period after interest rate capping (September 2016 to December 2018).

Dummy variable is then added to baseline model. The expression of the model becomes

$$CPS_t = \alpha_0 + \alpha_1 LR_t + \alpha_2 INF_t + \alpha_3 DV_t + \varepsilon_t \quad (3.3)$$

Where

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$  are parameters,

$CPS$  is credit to private sector

$LR$  is lending rate,

$INF$  is inflation,

$DV$  is dummy variable defined by 0 to represent pre interest capping time and 1 represent post interest capping time,

$\varepsilon$  is error term.

### 3.3. Vector autoregressive model

Vector autoregressive (VAR) model is adopted to examine the influence of interest rate on credit to private sector. The VAR model is adopted for this study because it has shown to be suitable for describing the dynamic behaviour of economic and financial time series, quantifying the dynamic response to an unexpected shock to a variable by the same variable in later period and also by other related variables (Luetkepohl, 2011; Todd, 1990; Viegi, 2010).

The general equation of VAR model is of the form:

$$y_t = \alpha_1 y_{t-1} + \dots + \alpha_p y_{t-p} + \gamma x_t + \varepsilon_t \quad (3.4)$$

Where  $y_t$  is a vector of endogenous variables,  $x_t$  is a vector of exogenous variables, and  $\alpha_1, \dots, \alpha_n$  and  $\gamma$  are matrices of coefficients to be estimated, and  $\varepsilon_t$  is a vector of zero-mean white noise that could be contemporaneously correlated but are uncorrelated with their own lagged values..

Incorporating dummy variable in VAR model gives:

$$CPS = \beta_{10} + \sum_{i=1}^l \beta_{11} CPS_{t-i} + \sum_{i=1}^l \beta_{12} LR_{t-i} + \sum_{i=1}^l \beta_{13} INF_{t-i} + \sum_{i=1}^l \beta_{14} DV_{t-i} + e_{1t} \quad (3.5)$$

$$LR = \beta_{20} + \sum_{i=1}^l \beta_{21} CPS_{t-i} + \sum_{i=1}^l \beta_{22} LR_{t-i} + \sum_{i=1}^l \beta_{23} INF_{t-i} + \sum_{i=1}^l \beta_{24} DV_{t-i} + e_{2t} \quad (3.6)$$

$$INF = \beta_{30} + \sum_{i=1}^l \beta_{31} CPS_{t-i} + \sum_{i=1}^l \beta_{32} LR_{t-i} + \sum_{i=1}^l \beta_{33} INF_{t-i} + \sum_{i=1}^l \beta_{34} DV_{t-i} + e_{4t} \quad (3.7)$$

### 3.3.1. Lag length determination

Before model estimation, the optimum lag length of the VAR model is selected by use of lag selection criterion. The model that gives the lowest lags is selected; the smaller the value of AIC, SIC or any other criterion the better the model. Right number of lags is essential because including excessive lagged terms consume degree of freedom as well as presenting the chance of multicollinearity (Gujarati, 2003); whereas short lag length causes autocorrelation of error terms that can lead to significant and inefficient estimates.

### 3.3.2. Data Source and Variables Description

This study uses secondary data to conduct an investigation into the effect of interest rate capping in Kenya. The secondary data consists of monthly time series data obtained from Central Bank of Kenya's statistical bulletin and monthly economic indicators publications. The data covers period from January 2010 to December 2018. The data is presented in form of monthly observations of commercial banks credit to private sector, lending rates, inflation and deposits.

**Table 1:** Description of the variables used

<b>Variables</b>	<b>Description</b>	<b>Source of data</b>
Credit to private sector (CPS)	Total amount of credit extended to private sector, namely; agriculture, manufacturing, trade, building and construction, transport and communication, finance and insurance, real estate, mining and quarrying, private households, consumer durables, business services and other activities.	CBK statistical bulletin and Monthly economic indicators
Lending rate (LR)	The rate of interest financial institutions charges borrowers.	CBK statistical bulletin and Monthly economic indicators
Inflation (INF)	Rise in the general price level of goods and services	CBK statistical bulletin and Monthly economic indicators
Dummy variable	A variable created to represent impact of interest rate capping. It is defined by 0 for time before introduction of interest rate capping and 1 for time after interest rate capping	

## CHAPTER FOUR

### 4. DATA ANALYSIS AND EMPIRICAL RESULTS

#### 4.1. Empirical Results and Discussion

VAR model is used in this analysis to investigate the impact of interest rate capping to credit access. In this study, all variables values are used at levels. Sims (1980), Stock, and Watson (1990) does not pay any attention to data non stationarity as an impeding problem of the VAR methodology therefore strongly opposed differencing variables regardless of the variables non stationarity. They maintained that the purpose of a VAR analysis is to assess the interrelationships amongst variables of interest, but not to decide on the parameter estimates. The central argument put-forward against differencing is that, differencing non stationary eliminates the rich dynamics the data have. When VAR model is estimated based on data at the level, consistent parameter estimates are generated.

To run the VAR model on this study, the first step is to determine the appropriate lag length. This is a key element in the description of VAR model because the results of this model are sensitive to lag length chosen. Lütkepohl (2011) shows that overfitting causes an increase in the mean-square forecast errors of the VAR model whereas underfitting often generates autocorrelated errors. To minimise the error in the forecasts and also avoid leaving out relevant information, appropriate lag should be used. The appropriate lags are determined by information criterion procedures. Table 2 presents lag selection-order criteria using maxlag 8.

**Table 2: Lag selection results**

Selection-order criteria									
Sample: 09/2010 - 12/2018				Number of obs			=	100	
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC	
0	-1501.76				1.4e+08	30.1151	30.1573	30.2193	
1	-738.604	1526.3	16	0.000	45.6455	15.1721	15.383*	15.6931*	
2	-715.232	46.743	16	0.000	39.4524	15.0246	15.4042	15.9625	
3	-700.003	30.458	16	0.016	40.2246	15.0401	15.5883	16.3948	
4	-681.173	37.66	16	0.002	38.2938*	14.9835*	15.7004	16.755	
5	-679.056	4.2344	16	0.998	51.1613	15.2611	16.1468	17.4495	
6	-666.766	24.579	16	0.078	56.0992	15.3353	16.3897	17.9405	
7	-662.999	7.5342	16	0.962	73.4796	15.58	16.803	18.602	
8	-641.042	43.914*	16	0.000	67.4889	15.4608	16.8526	18.8997	

Endogenous: CPS LR INF DV  
Exogenous: \_cons

The lag selection criterion implies the optimal lag length can either be 1 as per Hannan Quinn Information Criteria (HQIC) and Schwartz Information Criteria (SBIC) or lag 4 as per Final

Prediction Error (FPE), Akaike Information Criteria (AIC). A lag of 4 is chosen for this study because it gives the lowest value of 14.9835.

Once the lag selection is done, what follows is the estimation of the VAR model. The VAR model estimation results are presented in Appendix 2. VAR model results are interpreted by taking into account that each variable in turn is a dependent variable. From the VAR results, it's observed that dummy variable plays a significant role in explaining credit to private sector. This is an indication that dummy variable introduced in the model to capture the impact of policy change, that is, it shows interest rate capping is significant and has an adverse impact on credit to private sector. The negative impact is captured by negative coefficient in dummy variable of -46747.87 and p-value of 0.001 at lag 1 and a negative coefficient of -40328.27 and p-value of 0.006. This can be inferred as; credit to private sector is impacted negatively and significantly by interest rate capping. This finding conforms to economic theory that artificial ceilings alters the interaction of supply and demand for loanable funds, and this distorts allocation of resources where by the immediate effect is contraction of loanable funds to borrowers. The finding is in line with (Heng, 2015), (Helm & Reille, 2004), (CBK, 2018) empirical studies that interest rate capping has had negative impact on credit access.

The results of the study also indicate a negative and significant impact between lending rate and credit to private sector. The coefficient of -623759.1 and p-value of 0.009 at lag 1 implies that an increase in lending rate by one unit leads to decrease in credit to private sector by 623759.10. Inflation has a positive impact on credit to private sector which is indicated by positive coefficient of 2445.301 and p- value of 0.028 at lag 1. As a result, it can be deduced that an increase in inflation by one unit leads to increase in credit to private sector by 2445.30. Credit to private sector is significantly affected by the credit to private sector with a lag period of 1, 2, 3 and 4. So, credit to current private sector is significantly influenced by passed credit to private sector.

In the contrary, this study observes interest rate capping has no effect whatsoever on lending rate and inflation, as the values of p-value are not statistically significant at all lags. Credit to private sector and inflation have no impact on lending rate. At each and every lag when lending rate is independent variable, all p-values are more than 5 per cent which translates to statistically insignificant. Interest rate is significantly affected by the interest rate with a lag period of 1 and 4. This implies current interest rate is significantly influenced by passed interest rate.

The last observations on the VAR model results show a positive impact of credit to private sector on inflation which is statistically significant at lag 3 and 4. In this case, the lending rate has no impact whatsoever on inflation. Current inflation rate is impacted positively and significantly influenced by passed inflation. Surprisingly, the dummy has no impact on any other variable apart from credit to private sector.

#### **4.1.1. Granger Causality Test**

Granger causality test shows the direction of causality among variables in the model. In a VAR model, Granger causality indicates a correlation between current values of a variable and the past values of the other variable. The Granger causality Wald test results identifies the short-run causality among all variables used in the model, see Appendix 2. The null hypothesis is rejected in cases where the p-value is less than 5 per cent significance level. The probability of lending rate, inflation and dummy variable not Granger causing credit to private sector is 0.000. P-value of 0.000 is less than 5 per cent is statistically significant.

Credit to private sector cause lending rate. P-value of 0.039 is less than 5 and therefore the null hypothesis that lagged values of credit to private sector can be rejected at 5% level of significance. However, inflation does not fall below the typical statistical significance threshold of 0.05 therefore, null hypothesis that lags of inflation do not Granger cause lending rate cannot be rejected. The results show that both variables credit to private sector and inflation do not cause lending rate as a whole.

Lagged values of credit to private sector cause inflation since p-value for this variable is less than 5 per cent. Even though lending rate does not cause inflation, when consider together, credit to private sector and lending rates do cause inflation.

#### **4.1.2. Post Estimation Tests**

##### **4.1.2.1. Autocorrelation Test**

The results in Table 3 indicate there is no autocorrelation among the residuals. The test results show that at all lags from the first, second up to the fourth lags, the null hypothesis that no autocorrelation among the residuals at 5 per cent of significance cannot be rejected.

**Table 3: Autocorrelation test**

Lagrange-multiplier test			
lag	chi2	df	Prob > chi2
1	3.3451	16	0.99965
2	16.8648	16	0.39440
3	14.6240	16	0.55233
4	6.6082	16	0.98010

H0: no autocorrelation at lag order

#### 4.1.2.2. Normality Test

This test is done to check whether the error term is normally distributed. There is evidence of non-normality of the VAR residuals as shown in Table 4. Based on Lütkepohl (1993, 2005) and Hofmann (2001) VAR approach does not strictly depend on the normality assumption. Therefore, the contravention of the standard normality assumption might not be too severe to this study.

**Table 4: Normality test results**

Jarque-Bera test				
Equation	chi2	df	Prob > chi2	
CPS	18.167	2	0.00011	
LR	1100.788	2	0.00000	
INF	9.494	2	0.00868	
DV	3770.755	2	0.00000	
ALL	4899.203	8	0.00000	

#### 4.1.2.3. Stability Test

The models fulfil the condition on stability as shown in Table 5 below. All Eigen values lie inside the unit circle as required. This implies the estimated VAR model satisfies stability condition and therefore is dynamically stable.

**Table 5: Stability test**

Eigenvalue stability condition	
Eigenvalue	Modulus
.9917652	.991765
.9198134 + .06744515i	.922283
.9198134 - .06744515i	.922283
.8597381 + .1437719i	.871677
.8597381 - .1437719i	.871677
.6081489 + .4119291i	.734528
.6081489 - .4119291i	.734528
.6890953	.689095
-.3701425 + .5721653i	.681453
-.3701425 - .5721653i	.681453
.03974478 + .6755638i	.676732
.03974478 - .6755638i	.676732
-.1054788 + .5334118i	.543741
-.1054788 - .5334118i	.543741
-.3908893 + .2602754i	.469614
-.3908893 - .2602754i	.469614

All the eigenvalues lie inside the unit circle. VAR satisfies stability condition.

## CHAPTER FIVE

### 5. CONCLUSION AND POLICY IMPLICATIONS

#### 5.1. Summary and Conclusion

The study investigates the impact of interest rate controls introduced in September 2016 on credit access with emphasis on credit to private sector in Kenya. The focus on credit to private sector is because of the role private sector plays in the economy and how it can be affected by policy regarding interest rate. In this study, unrestricted VAR model was estimated using a monthly secondary data over the period 2010 - 2018 from CBK. Model residuals were evaluated using various diagnostic tests to ensure model suitability.

From VAR model results generated, an adverse effect of interest rate capping on credit to private sector cannot be refuted. The study observes statistically significant impact of interest rate capping to credit to private sector. This is an indication that the performance of credit to private sector is greatly influenced by interest rate capping. The VAR results also show that credit to private sector, lending rate and inflation are affected by their respective previous lagged values.

The results are in line with economic theory postulating that price ceilings distort allocation of loanable funds to borrowers, and this holds true for interest rate capping in Kenya. This validates similar studies that have been done relating to interest rate capping. CBK (2018) show interest rate capping law has slowed credit to the private sector consequently impacting on economic growth; though, there was increase in demand for credit following interest rate capping, credit to the private sector has continued to decline. This is also documented in study by Okwany (2017) indicating that the aftermath of interest rate controls is a decrease in the number of approved loans.

Negative impact of interest rate controls can be used to show that this legislation is ineffective so far; any financial policy can be declared successful through positive impact they have on efficiency in resource allocation which raise the welfare of the citizen. It can be inferred that banks have lessen either the amount they lend or they have declined to lend money to individuals and companies at high risk of defaulting.

#### 5.2. Policy Recommendations

The introduction of ceiling was to address high interest rate that prevailed in Kenya for a long time; this type of intervention poses challenges in that it causes misallocation of resources. In



the light of these results, it can be recommended policymakers consider interest rates for policy planning. In the light of these results, regulating interest rate through capping is not an effective way for addressing both cost and access to credit. Rather, the regulation of interest rate should be left at the hands of CBK which is charged with mandate of conducting monetary policy to monitor and adjust interest rate in accordance with prevailing economic conditions.

Interest rate capping through Banking Amendment Act of 2016 for financial institutions, restrained the ability of financial institutions to extend credit to meet rising demand for credit. The study recommends abolition of interest rate caps to allow broader access to credit, implement consumer protection laws to deal with predatory lending. The government should thus maintain the financial liberalisation to allow the market forces of demand and supply of loanable funds to determine the interest rate rather than control by legislation done on political considerations and public outcry.

### **5.3. Limitations and Directions for Further Research**

This study uses VAR model which is a theoretical model that uses little priori information, the bulk of information is extracted from the data. VAR model is easily over parameterised, as each variable is allowed to affect each other variable at number of lags. The results are sensitive to the selected lag length and in this study appropriate number of lags was chosen by use of selection order criteria.

This study determined the effect of interest rate capping on credit access where by credit to private sector is used as a proxy to credit access. Credit to private sector variable is used generally to cover all sub-sectors of private sector. The results of the study do not depict the specific contribution of each subsector towards private sector credit accessibility. The study thus recommends further studies on specific private subsector such as manufacturing, private household, trade and agriculture to determine the subsector greatly impacted by interest rate capping. This would give specific information on the form of credit negatively affected by interest rate capping, whether it is small amount of loans or large amount of loans.

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## APPENDIX 1

<b>Period</b>	<b>Credit to private sector (Million)</b>	<b>Inflation (%)</b>	<b>Lending rates (%)</b>	<b>Dummy variable</b>
Jan-10	738,070	5.95	14.98	0
Feb-10	745,262	5.18	14.98	0
Mar-10	749,593	3.97	14.8	0
Apr-10	760,160	3.65	14.58	0
May-10	778,308	3.88	14.46	0
Jun-10	789,269	3.49	14.33	0
Jul-10	804,228	3.57	14.29	0
Aug-10	816,233	3.22	14.18	0
Sep-10	830,754	3.21	13.98	0
Oct-10	852,908	3.18	13.85	0
Nov-10	863,248	3.84	13.95	0
Dec-10	875,547	4.51	13.87	0
Jan-11	892,271	5.42	14.03	0
Feb-11	916,509	6.54	13.92	0
Mar-11	940,811	9.19	13.92	0
Apr-11	965,549	12.05	13.92	0
May-11	989,800	12.95	13.88	0
Jun-11	1,027,445	14.48	13.91	0
Jul-11	1,060,712	15.53	14.14	0
Aug-11	1,079,510	16.67	14.32	0
Sep-11	1,129,836	17.32	14.79	0
Oct-11	1,149,544	18.91	15.21	0
Nov-11	1,139,692	19.72	18.48	0
Dec-11	1,141,706	18.93	20.04	0
Jan-12	1,137,133	18.31	19.54	0
Feb-12	1,149,574	16.69	20.28	0
Mar-12	1,160,925	15.61	20.34	0
Apr-12	1,180,247	13.06	20.22	0
May-12	1,199,619	12.22	20.12	0
Jun-12	1,193,941	10.05	20.3	0
Jul-12	1,204,592	7.74	20.15	0
Aug-12	1,209,022	6.09	20.13	0
Sep-12	1,217,278	5.32	19.73	0
Oct-12	1,234,852	4.14	19.04	0
Nov-12	1,245,414	3.25	18.7	0
Dec-12	1,262,088	3.20	18.15	0
Jan-13	1,275,010	3.67	18.13	0
Feb-13	1,283,064	4.45	17.84	0
Mar-13	1,292,049	4.11	17.73	0
Apr-13	1,303,170	4.14	17.87	0
May-13	1,315,680	4.05	17.45	0
Jun-13	1,342,916	4.91	16.97	0

Jul-13	1,364,790	6.02	17.02	0
Aug-13	1,403,033	6.46	16.96	0
Sep-13	1,427,634	8.97	16.86	0
Oct-13	1,455,340	8.25	17	0
Nov-13	1,493,754	7.63	16.89	0
Dec-13	1,515,613	7.20	16.99	0
Jan-14	1,536,725	7.21	17.03	0
Feb-14	1,560,800	6.86	17.06	0
Mar-14	1,587,152	6.27	16.91	0
Apr-14	1,616,089	6.41	16.7	0
May-14	1,646,162	7.30	16.97	0
Jun-14	1,692,548	7.39	16.36	0
Jul-14	1,716,345	7.67	16.91	0
Aug-14	1,748,777	8.36	16.26	0
Sep-14	1,777,226	6.60	16.04	0
Oct-14	1,797,304	6.43	16	0
Nov-14	1,825,284	6.09	15.94	0
Dec-14	1,851,648	6.02	15.99	0
Jan-15	1,907,811	5.53	15.93	0
Feb-15	1,921,475	5.61	15.47	0
Mar-15	1,937,268	6.31	15.46	0
Apr-15	1,978,299	7.08	15.4	0
May-15	2,028,107	6.87	15.26	0
Jun-15	2,076,574	7.03	16.06	0
Jul-15	2,119,449	6.62	15.75	0
Aug-15	2,153,165	5.84	15.68	0
Sep-15	2,186,416	5.97	16.82	0
Oct-15	2,186,397	6.72	16.58	0
Nov-15	2,205,145	7.32	17.16	0
Dec-15	2,227,353	8.01	18.3	0
Jan-16	2,232,637	7.78	18	0
Feb-16	2,232,538	6.84	17.91	0
Mar-16	2,244,543	6.45	17.87	0
Apr-16	2,252,144	5.27	18.04	0
May-16	2,259,659	5.00	18.22	0
Jun-16	2,270,503	5.80	18.18	0
Jul-16	2,278,361	6.40	18.1	0
Aug-16	2,283,424	6.26	17.71	0
Sep-16	2,305,421	6.34	13.84	1
Oct-16	2,305,985	6.47	13.65	1
Nov-16	2,323,294	6.68	14.31	1
Dec-16	2,340,784	6.35	13.69	1
Jan-17	2,319,904	6.99	13.66	1

Feb-17	2,310,252	9.04	13.69	1
Mar-17	2,309,722	10.28	13.61	1
Apr-17	2,301,130	11.48	13.61	1
May-17	2,300,901	11.70	13.71	1
Jun-17	2,300,305	9.21	13.66	1
Jul-17	2,305,690	7.47	13.7	1
Aug-17	2,314,620	8.04	13.65	1
Sep-17	2,337,200	7.06	13.69	1
Oct-17	2,341,429	5.72	13.71	1
Nov-17	2,373,818	4.73	13.68	1
Dec-17	2,384,054	4.50	13.64	1
Jan-18	2,372,720	4.83	13.65	1
Feb-18	2,368,493	4.46	13.68	1
Mar-18	2,366,020	4.18	13.49	1
Apr-18	2,374,219	3.73	13.24	1
May-18	2,397,248	3.95	13.25	1
Jun-18	2,405,907	4.28	13.22	1
Jul-18	2,383,100	4.35	13.1	1
Aug-18	2,389,900	4.04	12.78	1
Sep-18	2,404,000	5.70	12.66	1
Oct-18	2,422,400	5.53	12.61	1
Nov-18	2,423,300	5.58	12.55	1
Dec-18	2,422,000	5.71	12.51	1



## APPENDIX 2

### Statistics/Data Analysis

User: Florence S. KIVUVA

Project: Impact of Interest Rate Capping On Credit Access in Kenya

```
. tsset Monthly, monthly
      time variable: Monthly, 01/2010 to 12/2018
      delta: 1 month
```

```
. varsoc CPS LR INF DV, maxlag(8)
```

Selection-order criteria  
Sample: 09/2010 - 12/2018                      Number of obs                      =                      100

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1501.76				1.4e+08	30.1151	30.1573	30.2193
1	-738.604	1526.3	16	0.000	45.6455	15.1721	15.383*	15.6931*
2	-715.232	46.743	16	0.000	39.4524	15.0246	15.4042	15.9625
3	-700.003	30.458	16	0.016	40.2246	15.0401	15.5883	16.3948
4	-681.173	37.66	16	0.002	38.2938*	14.9835*	15.7004	16.755
5	-679.056	4.2344	16	0.998	51.1613	15.2611	16.1468	17.4495
6	-666.766	24.579	16	0.078	56.0992	15.3353	16.3897	17.9405
7	-662.999	7.5342	16	0.962	73.4796	15.58	16.803	18.602
8	-641.042	43.914*	16	0.000	67.4889	15.4608	16.8526	18.8997

Endogenous: CPS LR INF DV

Exogenous: \_cons

```
. varsoc CPS LR INF DV
```

Selection-order criteria  
Sample: 05/2010 - 12/2018                      Number of obs                      =                      104

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1567.72				1.6e+08	30.2254	30.2666	30.3271
1	-765.096	1605.3	16	0.000	42.3843	15.098	15.304	15.6065*
2	-739.62	50.951	16	0.000	35.3747	14.9158	15.2866*	15.8311
3	-724.558	30.124	16	0.017	36.1457	14.9338	15.4695	16.256
4	-703.976	41.163*	16	0.001	33.3157*	14.8457*	15.5462	16.5747

Endogenous: CPS LR INF DV

Exogenous: \_cons

```
. var CPS LR INF DV, lags(1/4)
```

Vector autoregression

```
Sample: 05/2010 - 12/2018                      Number of obs                      =                      104
Log likelihood = -703.9764                      AIC                      =                      14.8457
FPE                      =                      33.31572                      HQIC                      =                      15.54618
Det(Sigma_ml)                      =                      8.903993                      SBIC                      =                      16.57473
```

Equation	Parms	RMSE	R-sq	chi2	P>chi2
CPS	17	10999.7	0.9997	319216.7	0.0000
LR	17	.005646	0.9462	1827.884	0.0000
INF	17	.922046	0.9989	98704.81	0.0000
DV	17	.100942	0.9567	2296.519	0.0000

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
CPS					
CPS					
L1.	1.188828	.0965738	12.31	0.000	.9995463    1.378109
L2.	-.3213701	.1490236	-2.16	0.031	-.613451    -.0292892
L3.	.2203866	.14943	1.47	0.140	-.0724908    .513264

L4.	-.134314	.0929284	-1.45	0.148	-.3164504	.0478224
LR						
L1.	-623759.1	238416.6	-2.62	0.009	-1091047	-156471.1
L2.	-92547.96	349229.2	-0.27	0.791	-777024.5	591928.6
L3.	593576	341688.1	1.74	0.082	-76120.32	1263272
L4.	-300411.7	227315.2	-1.32	0.186	-745941.3	145117.9
INF						
L1.	2445.301	1110.934	2.20	0.028	267.9108	4622.692
L2.	-3088.794	2018.562	-1.53	0.126	-7045.102	867.5146
L3.	1693.179	2046.895	0.83	0.408	-2318.661	5705.02
L4.	302.2433	1138.587	0.27	0.791	-1929.346	2533.833
DV						
L1.	-46747.87	13753.81	-3.40	0.001	-73704.85	-19790.9
L2.	19639	19113.45	1.03	0.304	-17822.67	57100.67
L3.	17894.91	18866.18	0.95	0.343	-19082.12	54871.94
L4.	-40328.27	14619.78	-2.76	0.006	-68982.51	-11674.03
_cons	-33450.99	20349.61	-1.64	0.100	-73335.5	6433.521
LR						
CPS						
L1.	1.78e-08	4.96e-08	0.36	0.720	-7.94e-08	1.15e-07
L2.	9.08e-08	7.65e-08	1.19	0.235	-5.92e-08	2.41e-07
L3.	-8.14e-08	7.67e-08	-1.06	0.288	-2.32e-07	6.89e-08
L4.	-3.14e-08	4.77e-08	-0.66	0.510	-1.25e-07	6.21e-08
LR						
L1.	1.207681	.1223802	9.87	0.000	.9678199	1.447541
L2.	-.1601004	.1792607	-0.89	0.372	-.511445	.1912441
L3.	.3028437	.1753898	1.73	0.084	-.0409141	.6466014
L4.	-.3830765	.1166818	-3.28	0.001	-.6117686	-.1543844
INF						
L1.	.0009864	.0005702	1.73	0.084	-.0001313	.002104
L2.	-.0012602	.0010361	-1.22	0.224	-.003291	.0007705
L3.	.0001393	.0010507	0.13	0.895	-.00192	.0021986
L4.	.0001778	.0005844	0.30	0.761	-.0009677	.0013233
DV						
L1.	.0116537	.0070599	1.65	0.099	-.0021834	.0254908
L2.	.0017134	.009811	0.17	0.861	-.0175158	.0209426
L3.	-.0026405	.0096841	-0.27	0.785	-.021621	.0163399
L4.	-.0071998	.0075044	-0.96	0.337	-.0219081	.0075086
_cons	.0016642	.0104455	0.16	0.873	-.0188087	.022137
INF						
CPS						
L1.	-6.41e-07	8.10e-06	-0.08	0.937	-.0000165	.0000152
L2.	-5.86e-06	.0000125	-0.47	0.639	-.0000303	.0000186
L3.	.0000316	.0000125	2.52	0.012	7.03e-06	.0000561
L4.	-.0000224	7.79e-06	-2.87	0.004	-.0000376	-7.08e-06
LR						
L1.	-9.034487	19.98522	-0.45	0.651	-48.2048	30.13582
L2.	-15.30326	29.27406	-0.52	0.601	-72.67936	42.07283
L3.	47.55113	28.64193	1.66	0.097	-8.586013	103.6883
L4.	-16.38942	19.05464	-0.86	0.390	-53.73583	20.957
INF						
L1.	1.572761	.0931238	16.89	0.000	1.390241	1.75528
L2.	-.9158099	.1692055	-5.41	0.000	-1.247447	-.5841732
L3.	.4532638	.1715805	2.64	0.008	.1169721	.7895554
L4.	-.1858482	.0954418	-1.95	0.052	-.3729107	.0012143
DV						
L1.	-.079596	1.15291	-0.07	0.945	-2.339258	2.180066
L2.	-.0469705	1.602181	-0.03	0.977	-3.187187	3.093246
L3.	1.362749	1.581453	0.86	0.389	-1.736843	4.46234

	L4.	.2549893	9991.2255	0.21	0.835	-2.146946	2.656924
	_cons	5.565165	1.705802	3.26	0.001	2.221855	8.908475
DV							
	CPS						
	L1.	-1.10e-06	8.86e-07	-1.25	0.213	-2.84e-06	6.33e-07
	L2.	3.84e-07	1.37e-06	0.28	0.779	-2.30e-06	3.06e-06
	L3.	2.32e-07	1.37e-06	0.17	0.866	-2.46e-06	2.92e-06
	L4.	5.35e-07	8.53e-07	0.63	0.530	-1.14e-06	2.21e-06
	LR						
	L1.	-2.16414	2.187913	-0.99	0.323	-6.45237	2.12409
	L2.	.9804279	3.204822	0.31	0.760	-5.300908	7.261764
	L3.	-.8001343	3.135619	-0.26	0.799	-6.945835	5.345566
	L4.	1.313087	2.086036	0.63	0.529	-2.775469	5.401644
	INF						
	L1.	-.0089059	.0101949	-0.87	0.382	-.0288875	.0110757
	L2.	.0129467	.018524	0.70	0.485	-.0233598	.0492531
	L3.	.0035811	.018784	0.19	0.849	-.0332349	.0403972
	L4.	-.0071286	.0104486	-0.68	0.495	-.0276075	.0122501
	DV						
	L1.	.8334609	.1262166	6.60	0.000	.5860809	1.080841
	L2.	.0275951	.1754012	0.16	0.875	-.3161849	.3713751
	L3.	-.0025791	.173132	-0.01	0.988	-.3419116	.3367535
	L4.	.0011200	.1211635	-0.01	0.991	.2612861	.2615247
	_cons	.035409		0.19	0.849	-.330515	.401513

. vargranger

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
CPS	LR	27.505	4	0.000
CPS	INF	20.466	4	0.000
CPS	DV	33.356	4	0.000
CPS	ALL	42.847	12	0.000
LR	CPS	10.07	4	0.039
LR	INF	3.4773	4	0.481
LR	DV	7.6046	4	0.107
LR	ALL	19.713	12	0.073
INF	CPS	17.265	4	0.002
INF	LR	4.1591	4	0.385
INF	DV	4.4565	4	0.348
INF	ALL	21.937	12	0.038
DV	CPS	5.3521	4	0.253
DV	LR	2.4116	4	0.661
DV	INF	2.0072	4	0.734
DV	ALL	11.795	12	0.462

. varlmar, mlag(4)

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	3.3451	16	0.99965
2	16.8648	16	0.39440
3	14.6240	16	0.55233
4	6.6082	16	0.98010

H0: no autocorrelation at lag order

. varnorm, jbera

Jarque-Bera

test	Equation	chi2	df	Prob > chi2
	CPS	18.167	2	0.00011
	LR	1100.788	2	0.00000
	INF	9.494	2	0.00868
	DV	3770.755	2	0.00000
	ALL	4899.203	8	0.00000

. varstable

Eigenvalue stability condition

Eigenvalue	Modulus
.9917652	.991765
.9198134 + .06744515i	.922283
.9198134 - .06744515i	.922283
.8597381 + .1437719i	.871677
.8597381 - .1437719i	.871677
.6081489 + .4119291i	.734528
.6081489 - .4119291i	.734528
.6890953	.689095
-.3701425 + .5721653i	.681453
-.3701425 - .5721653i	.681453
.03974478 + .6755638i	.676732
.03974478 - .6755638i	.676732
-.1054788 + .5334118i	.543741
-.1054788 - .5334118i	.543741
-.3908893 + .2602754i	.469614
-.3908893 - .2602754i	.469614

All the eigenvalues lie inside the unit circle.  
VAR satisfies stability condition.