Journal homepage: <u>https://resources.jaze.com.ng/index.php/jaze/login</u>

Article: <u>https://bit.ly/Jazevol</u>.3Issue1 Journal of Arid Zone Economy 3(1): (2024) 83–91 ISSN: 2992–4952

# Journal of Arid Zone Economy

## Does Liberalizing Credit Market Induce Investment? Evidence from Sub-Saharan Africa

Ibrahim Mohammed<sup>1</sup> and Hussaini Aliyu Jibril<sup>1</sup>

<sup>1</sup>Department of Economics, Umaru Musa YarAdua University Katsina

#### Abstract

Keywords: Credit Market regulations Investment GDP Sub-Saharan Africa JEL Classification: G-28

Corresponding author Ibrahim Mohammed Ibrahim.mohammed@umyu.edu .ng Tel: +234796771211 The study aimed to analyze the impact of credit market regulations in facilitating investment in Sub-Saharan Africa. Annual dataset on credit market regulations between 2000 and 2020 from Fraser Institute, along with other relevant control variables, and over a panel of 34 countries were put to empirical testing. Grounded on the theoretical framework of neoclassical investment model, public choice theory and the credit channel for monetary policy, the study employs a panel data regression model that control for fixed effect and with clustered and Driscoll-Kraay standard errors, to estimate the relationship among the variables. Finding from the study shows that relaxing the regulatory burden in credit market can improve investment in Sub-Saharan Africa. By examining the relationship between credit market regulation and investment, the study provides a valuable insight for policy makers, investors and researchers. Findings could contribute to the design of policy reforms that enhances credit access, reduces regulatory barrier and promote investment thereby economic growth and development in the region.

#### 1. Introduction

The economic growth and development of Sub-Saharan Africa (SSA) heavily rely on investment which play an important role in enhancing productivity, creating employment opportunities and reducing poverty. However, investment rate in SSA have remain comparatively low compared to other regions of the world (Hernandez-cata, 2000).

The region sits at the bottom in terms of Economy, with a world GDP share of 3.1% by

2020 (IMF, 2023). In the past decade, (2012-2021) the average annual growth rate of Gross fixed capital formation was 0.98% for SSA while Middle East and North Africa had 49.7%. While in terms of credit access, by 2021 only 19% of firms in SSA used banks to finance their investment, compared with 26% of firms in Middle East and North Africa (World Bank, 2023). One of the primary factors contributing to this low investment and high poverty rate, is the limited access to credit markets in the region

(Brixiova, Kangoye and Yogo, 2020). Another related factor is the lower level of banking sector development compared to other regions.

Furthermore, there is systematic pattern of relationship between countries institutional arrangements and growth as "Nations in the top quartile of economic freedom had an average per-capita GDP of \$48,251 in 2020, compared to \$6,542 for nations in the bottom quartile" The nations that rank poorly in this category also tend to score poorly in the trade and market regulation areas, even though several have reasonably sized governments. (Gwartney, Lawson, Hall, and Murphy, 2022).

From the 1960s to the 1980s, market failure was used to legitimise direct government productive involvement in activities in developing countries, by promoting industrialisation through investing directly in industry and agriculture, and by extending public ownership of enterprises. Regulations were therefore initially to ensure proper functioning of the markets and correct market failure (Ketteni and Kottaridi, 2019).

However, Regulations can sometimes be excessive or of poor quality and thus leading to unnecessary burdens on markets and overall economy (Ketteni and Kottaridi, 2019). Stigler (1971) noted that market regulation is often exploited by industry incumbents for their own benefit, and thus becomes a tool to erect barriers to entry so as to reduce competition and raise incumbent profits. Jalilian, Kirkpatrick, and Parker, (2006) noted that, following the apparent success of market liberalisation programmes in some developed countries, and the evidence of the failure of state led economic planning in developing ones, the role of state regulation was redefined and narrowed to that of ensuring an undistorted policy environment in which efficient markets could operate. Deregulation was widely adopted, often as part of structural adjustment programmes, with the aim of reducing the "regulatory burden" on the market economy.

Credit market regulation, which include both formal and informal rules governing the lending and borrowing activities, significantly affect access to finance for firms, household and other economic agents. These regulations influence the availability, affordability and terms of credit and can either stimulate or hinder investment activities (Atiq and Haque, 2014). In the context of SSA the impact of credit market regulations on investment is particularly important due to the region's institutional and structural challenges, including limited financial sector development, weak legal framework and high level of informality (Robert, 2022). However, despite the positive growth implications from credit market reforms, both financial deregulation, which leads to innovations in the financial sector, and the lack of appropriate financial supervision are implied in the literature as some of the reasons behind the world financial and economic crisis of 2008-2009 (Stankov, 2010).

Recent studies on whether financial liberalization, which involves loosening restriction on financial markets, leads to economic growth have produced conflicting and inconclusive results (Bumann, and Lensink, 2013; Atiq and Haque, 2014; Ketteni and Kottaridi, 2019). This study aimed at a specific aspect of the financial liberalization that is scarcely explored in Sub-Saharan Africa, namely the credit market regulations.

Some specific studies in the past like Henry (2000) and Kose, Ayhan, Prasad Rogoff and Wei (2006) studied capital account liberalization, while Begkert, Harvey and Lundblad (2005) examined liberalization in equity markets; Abiad, et al. (2010) examined the role of different dimensions of financial liberalization. Recent study like Ketteni and Kottaridi, (2019) specifically studies credit markets regulation on a larger panel of countries using semiparametric method.

All these conflicting theoretical arguments and heterogeneity of empirical findings suggests that further studies are needed on the impact of regulations on investment. Therefore, this study contributes to the literature by specifically examining the impact of credit market regulations on investment, while majority of the previous studies deals with financial liberalization broadly or specifically at different markets.

#### 2.0 Literature Review

Theories that seek to explain the role of government regulation can help us understand the nature of the relationship between entry regulations and entrepreneurship. The two principal theories are the public interest theory and the public choice theory. Public interest theory is associated with Arthur Pigou (1932) and holds that government regulation is required to protect the public from market failures. This theory therefore implies that government should regulate new firms to ensure that they comply with minimum standards for providing goods and services. Such regulations reduce the direct harm to consumers from poor-quality products and the indirect harm to the public from negative externalities such as pollution. The public choice theory, on the other hand, points out that the government is not benevolent and regulation may in fact lead to inefficient outcomes. There are two arguments typically forwarded to support public choice theory. The first emphasizes that regulations serve to benefit politicians and government bureaucrats. For example, Shleifer and Vishny (1993) observed that in many cases, permits exist primarily to give government officials the power to deny issuing them in the first place. Thus, they can use this power to extract bribes in exchange for issuing permits to firms.

The second argument, as noted by Stigler (1971) is that the process of regulation is often captured by industry incumbents for their own benefit. When this happens, regulation becomes a tool to erect barriers to entry so as to reduce competition and raise incumbent profits, which harms entrepreneurship through at least two main

channels. The first is the negative impact of entry regulations on new firms' investment activities. Bureaucratic entry regulations.

There is vast empirical literature on credit markets. However, majority of the studies looked into the impact of financial market liberalization on economic growth in general (Bumann and Lensink 2013; Bulut, 2017; Akinsola, Foluso, Odhiambo and Nicholas, 2017). Some other studies examined specific aspect of financial liberalization, like Henry (2000) and Kose, Ayhan, Prasad Rogoff and Wei (2006) studied capital account liberalization, while Begkert, Harvey and Lundblad (2005) examined liberalization in equity markets.

Bumann and Lensink (2013) examined the impact of financial liberalization on income inequality. The authors focused on two specific policies: reducing the reserve requirement of banks and loosening international capital controls. They developed a model that incorporates heterogeneous agents with different investment abilities. The model predicted that reducing reserve requirements can reduce income inequality if overall financial liberalization is not too high. Atiq and Haque (2014) examined whether financial liberalization affect the effectiveness of financial development in spurring growth in large panel dataset. Results from the study shows that liberalization impedes the effectiveness of financial development on growth.

In related study Akinsola, Foluso, Odhiambo and Nicholas (2017) investigated how financial liberalization affects economic growth in sub-Saharan African countries. The study analyzed a sample of 30 countries in the region and uses dynamic panel estimation to examine the role of financial liberalization and banking crises on economic growth. The findings suggest that financial liberalization has a positive and significant impact on economic growth in sub-Saharan Africa, but this relationship changes to negative for low-income countries. In more recent study, Bezemer, Collins, Lerven and Zhang (2021) analyzed the relationship between credit policies and the allocation of credit in advanced economies from 1973 to 2005. They found that when credit policies declined, there was a significant decrease in the proportion of lending to nonfinancial firms. This suggests that credit policies could be an effective tool in supporting financing for important goals such as innovation, industrial development, and the transition to a low-carbon economy.

In addition, to the studies mentioned above, several other studies have sought to explore the ability of financial conditions, rather than liberalization directly, to predict economic growth in the aftermath of the 2008 global financial crisis. These include research papers by Matheson (2012), Koop and Korobilis (2014), Angelopoulou, Balfoussia, and Gibson (2014), and Bulut (2017), among others.

Moreover, there are studies that are sector specific such as on one side, those who suggested that bank credit retards manufacturing sector output (Udoh and Ogbuag, 2012; Ogunsakin, 2014) and Akinlo and Lawal (2015) who found evidence that bank credit do not encourage investment in manufacturing sectors in Nigeria. While others like Odior (2013) and Imoughele and Ismaila, (2014) suggest that bank credit encourage manufacturing output. and

In a review of the debate on liberalization of credit market, Demirguc-Kunt and Levine (2008) presented the reasons why credit market deregulation may lead to growth. They noted that financial deregulation, such as equity by improving the allocation of capital and reducing its cost, thereby increasing overall efficiency. In a specific sector of financial liberalization, Bekaert, Harvey, and Lundblad (2005) find that liberalizing the equity market liberalization and allowing foreign bank competition, may spur growth leads to a 1 percentage point increase in the annual economic growth, while Demirguc-Kunt, Laeven, and Levine (2004,) conclude that "tighter regulations on bank entry and bank activities boost the cost of financial intermediation," which ultimately hampers growth.,

Ihouma and Rex (2014) indicated that there were direct and positive relationship between credit market and economic development in Nigeria, the effect of the return on investment to economic development was adverse against the Keynesian theory of investment and therefore, recommended that investible funds from the credit market should be restricted to viable investments. Mishra P. *et al.* (2009), provided the evidence in support of the fact that credit market development spurs economic growth. The empirical study done indicated a positive effect of economic growth on credit market development of the country.

Some of the cross-country and withincountry empirical analyses that studied credit market condition in general, also reach contradictory conclusions. For example, Ayyagari, Demirguc-Kunt, and Maksimovic (2011) find that bank financing enhances the innovation of SMEs in developing countries. Xiao and Zhao (2012) argue that credit market development enhances innovation in countries with lower government ownership of banks. Hsu, Tian, and Xu (2014) find that credit market development discourages innovation for more high-tech-intensive industries and industries that are more dependent on external finance. Benfratello, Schiantarelli and Sembenelli (2008) argue that for firms in Italy, banking development accelerates the probability of process innovation, but this is less true for product innovation. Amore, Schneider, and Zaldokas (2013) find that for United States-listed firms from 1976 to 1995, credit market development enhanced the quantity and quality of innovation activities.

The reviewed empirical works provided a range of perspectives on the impact of credit market regulation on investments in Sub-Saharan Africa. They focused on different aspect, such as financial market development, sectoral investment and credit access. Still there is limited studies on regulations of credit market. This study aims to examine the impact of credit market regulation taking into account the heterogeneity of Sub-Saharan Africa.

### 3. Methodology

3.1 Data sources and measurement of variables The data is a balanced panel of 34 sub-Saharan African countries, annually, between 2000 and 2020. Data for Credit Market Regulation (CMR) are sourced from a section of the Economic Freedom of the World (EFW) reports by Fraser Institute. The index measures the degree of government regulations of credit market from three combined areas, namely; the ownership of banks which measures the share of private sector deposits relative to government, private sector credit which measures the extent of government borrowing relative to the private and interest rate control which determines whether interest rate is determined by market forces or fixed by government. The composite score ranges from 0 to 10 with 10 indicating countries with the highest freedom of credit market at a given year, and 0 showing the countries that are highly regulated, or lacks freedom in the three areas of credit market.

The outcome variable is total investment proxied by Gross fixed capital formation (GFCF) which is obtained from the World Bank Development Indicator, (WDI). Other control variables include; GDP per capita (purchasing power parity), total trade and population (POP) stands for demographic change. All the control variables are also sourced from the World Development Indicators (WDI) of the World Bank (2023).

3.2 *Estimation technique and model Specification* Following the results of Hausman (1978) Specification test and time effect test in Table 2, we used a fixed effect model to control for unobservable time-invariant heterogeneity among sub-Saharan African Countries. We also estimated robust standard errors by clustering around the countries. As Wooldridge (2002) noted, provided the number of clusters is large relative to the cluster sizes, standard methods can correct for the presence of within-cluster correlation. Therefore, the generated clustered standard errors are robust to autocorrelation and heteroskedasticity. Alternatively, in order to deal with cross-sectional dependence, we generated alternative standard errors using Driscoll-Kraay (1998) method for the coefficients.

Theoretically, we begin with the Neoclassical Investment model, where it is assumed that firms make investment decision based on expected return and the cost of capital. It can be represented as;

$$\mathbf{I} = f(\mathbf{r}, \mathbf{k}) \tag{1}$$

where **I** represents investment, **r** represents the cost of capital and **k** represents other factors that can influence investment decision such as expected return or economic conditions. However, the cost of capital **r** can be influenced by credit market regulations such as when interest rate is fixed or lending is restricted, thus  $\mathbf{r} = f(\mathbf{R})$ , where R stands for regulations.

In the public choice theory, as noted by Stigler (1971), the process of regulation is often captured by industry incumbents for their own benefit. When this happens, regulation becomes a tool to erect barriers to entry so as to reduce competition and raise incumbent profits.

The econometric model is given as;

$$I_{ct} = \beta_0 + \beta_1 CMR_{ct} + \beta_2 \Sigma x_{ct} + \lambda c + \alpha_c + \varepsilon_{ct} 2$$

where  $I_{ct}$  is the log of Investment proxied by Gross fixed capital formation (GFCF) in country c at time t and CMR<sub>ct</sub> is our Credit market regulations index in country c at time t. X<sub>ct</sub> is a vector of the three control variables; Per capita GDP, Trade and POP. The  $\lambda c$ 's denote a full set of country fixed effects, which will absorb the

Standard Deviation

\$15.20b

\$4,338.22

1.548

\$37.70b

31.8m

impact of any time-invariant country characteristics, and the  $\alpha_c$ 's denote a full set of year fixed effects. The error term  $\varepsilon_{ct}$  includes all

667

667

667

667

667

other time-varying unobservable shocks to investment.

Minimum

\$6974332

\$690.6596

1.42

\$0.172b

1,186,873

Maximum

\$116b

\$23,681.58

10

\$250b

208m

Table 1.	Descriptive	e statistics	
		Observat	ions

Investment (GFCF)

**GDP** Per capita PPP

CMR Index

Population

Trade

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Table 1 shows descriptive statistics for the variables. Investment differs among Sub-Sahara African Country in our sample with a standard deviation of \$1.5 million. The credit market index also varies among the sub-Sahara African

countries with a standard deviation of 1.5. Overall, in the sampled countries, the score for credit market regulation is on average 7.4 which indicates high degree of regulatory burden on the credit market of the SSA economies.

Table	2.	Diagnostics	Tests	Results

Test	Statistic	P-Value
Hausman Specification test	Chi2(4) = 224.33	0.000
Breush-Pagan LM test of	Chi2(561) = 1302.345	0.000
Independence		
Pesaran test for Cross-sectional	-2.152	0.0314
Independence		
Modified wald test for groupwise	$Chi^2(34) = 3062.45$	0.000
Heteroskedasticity		
Wooldrige test for autocorrelation	$F(1 \ 33) = 278.086$	0.000
Wald test for Time effect	F(20, 33) = 7.89	0.0000

Mean

\$7.48b

\$4,059.068

7.408

\$18.70b

23.3m

Sources: author's computation using Stata 17

Table 2 above shows the results for the diagnostic test. The result of the Hausman test indicates that we reject the null hypothesis of no difference compared to the random effect model. It is also evident that we reject the null hypothesis in the two tests for cross sectional dependence namely; Breush-Pagan LM test and Pesaran test. That suggest element of spatial correlation among the countries in the sample. The Modified Wald test and the Wooldridge test for autocorrelation also confirmed the presence of heteroskedasticity and autocorrelation

respectively, in our data. Taking these evidence together justify the use of clustered standard errors and Driscoll-Kraay standard errors, in order to produce robust results. Table 3 presents the results for our panel regression over a sample 34 sub-Saharan countries. The results indicate that the credit market regulation (CMR) is positive and significant in both the clustered standard errors and Driscoll-Kraay standard errors. This suggests that the degree of freedom in the credit market fosters investment in the countries. In other words, countries with less regulatory burden on their credit market attracts more investment, both domestic and foreign. Specifically, a 1% increase in the liberalization score of the credit market leads to 0.44% increase in the investment level of the country at a given time.

	Investment		
Independent	Clustered	Driscoll-Kraay Standard	
Variables	Standard errors	errors	
Log CMR Index	0.440***	0.440***	
-	(0.121)	(0.100)	
logPer capita GDP	0.399**	0.399	
	(0.154)	(0.251)	
LogTrade	0.798***	0.798***	
-	(0.800)	(0.044)	
LogPOP	0.635	0.635***	
-	(0.471)	(0.156)	
Constant	-10.990	-10.990***	
	(6.999)	(2.270)	
Within R-squared	0.861	0.861	
Prob > F	0.0000	0.000	
<b>Observations</b>	667	667	
Sampled countries	34	34	

Table 3. Time-fixed Effect Regression Output

Note: standard errors robust against autocorrelation, heteroskedasticity and spatial correlation are

reported in parentheses. Results for year effects are suppressed. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

List of countries sampled: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo Rep., Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guinea-Bissau, Kenya, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe

Source: Authors estimation using Stata 17

Our two control variables, namely; trade and per capita are also very significant in predicting the countries' levels of investment. However, Population does not appear to be significant in the first model where we clustered around countries. This may indicate that the region's vast population does not necessarily translate to more productivity and capital accumulation.

#### 5. Conclusion

This paper examined the impact of credit market regulation on investment in a panel sub-Saharan African country. The economic growth and development of Sub-Saharan Africa (SSA) heavily rely on investment which play an important role in enhancing productivity, creating employment opportunities and reducing poverty. However, investment rate in SSA have remain comparatively low compared to other regions of the world. We used data from Fraser Institute, that measure the degree to which a country's credit market is free from regulatory burdens. The study was urged by lack of comprehensive studies that consider the heterogeneous nature of the region, with respect to credit market.

Controlling for country-specific timeinvariant factors, findings from the study reveals that countries with less regulated credit market attract more investment. In other words, the more regulatory burden placed on credit access or institution, the less investors are attracted in the country, over time. This also sheds light on the deregulation policy in sub-Saharan Africa. It points to the fact that deregulation of financial markets. can improve the investment environment in the region by making the markets more competitive market, and credit more accessible. Further research, can delve in to the role of informal credit market which is also vast and important to the Sub-Saharan African economy.

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