Banking and financial regulation in Sub-Saharan Africa: a systematic literature review and multiple regression approach

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Abstract

Purpose – A functional financial sector is a major driver of economic development. The purpose of this paper is to provide a comprehensive understanding of existing research findings, gaps in knowledge and emerging trends in the field of banking and finance.

Design/methodology/approach – By conducting a systematic literature review, a total of 98 peer-reviewed articles whose focus and relevance match with the subject matter were reviewed and synthesised to answer the research questions. Multiple regression was also carried to investigate the relationship amongst the identified probable factors affecting financial inclusions.

Findings – The outcome of this study highlighted some factors mitigating the growth of the banking sector in the Sub-Saharan Africa (SSA). These include excessive or stringent regulations, market segmentation, high interest rates, information asymmetry, low credit status and uneven distribution of credit amongst others.

Practical implications – Some of the policy recommendations that could aid the development of the banking sector in SSA include: development and deepening of interbank markets, financial inclusion, improvement of overall market efficiency through redistribution of liquidity within the banking system, improvement of price and encouragement of competition. This study recommends financial inclusion by formulating policies that balances the capital adequacy requirements with the risk of insolvency to ensure credit flows and promotes financial stability via effective operations financial institutions.

Originality/value – This study contributes valuable insights to the understanding of banking and financial regulations in SSA, informing both academic research and policy development in the region.

Keywords Financial inclusion, Financial sector, Financial stability, Regulations, Sub-Saharan Africa

Paper type Research paper

1. Introduction

According to Mtebe and Kissaka (2015), sub-Saharan Africa (SSA) is the region located south of the Sahara Desert of the African continent including the west, southern, east and central Africa. The population of SSA was estimated as 1.2 billion as at 2022 (Statista, 2024).

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Some of the challenges faced by SSA include the widening technology divide, slow markets development and associated its services, slow regional integration, governance and institutional issues, conflicts, HIV-AIDS and other diseases, high unemployment rate, infant, child and maternal morbidity and mortality, rapid population growth rates, climate change issues, environmental degradation, financial system crisis and a growing population of refugees and displaced persons as a result of civil wars and ethnic conflict.

This study focuses on the financial system crisis in the SSA with emphasis on the banking and financial regulations in the region. Most SSA countries are classified as low-income countries, and the financial system is poor integrated with the financial globalisation though not totally excluded. Some banks in the SSA still face insolvency crisis, poor risk management approach, complex regulation and policies, poor development of the financial system in terms of credit facilities, capital flow, digital services and supporting infrastructure amongst others.

Before the 1990s, the regulation of banking activities in the majority of the SSA countries was insufficient, thereby leading to banking crises. Le Gall *et al.* (2004) explained that many factors led to the banking crises which include ineffective supervision of the banking sector carried out by governments, rather than the central banks, outdated laws that limited government's oversight and ability to enforce prudential regulatory requirements, vague regulatory requirements, limited data availability of data and irregularity of financial reports amongst others. This challenges spurred many SSA countries to introduce some reforms in the financial sector in the late 1980s that led to the introduction of major banking regulation and supervisory frameworks, such as, inter alia, entry barriers, ownership structure and restrictions, West African Economic and Monetary Union, capital adequacy requirements, macroprudential policies, activity regulations following the Basel I, II and III accords in the 1980s and after the global financial crisis in 2007–2008 (Barth *et al.*, 2013; Nyantakyi and Sy, 2015; Enoch *et al.*, 2015; Mlachila *et al.*, 2016; Cerutti *et al.*, 2017; Jones and Zeitz, 2017; Jones, Woods and Beck, 2018; Anginer *et al.*, 2019; Thamae *et al.*, 2023). The aim of these banking regulations is to minimise financial and systemic risks from private banks. These had reforms had promoted financial stability and banking development through prudential lending through increased transparency, reduction of systemic risk, determination of the minimum capital required ratio and improved risk monitoring.

It has also strengthened the banking sector, through expansion of financial access and services. Nevertheless, the banking sector in the SSA region still suffer from a lack of competition, high borrowing, provision of low levels of credit and concentration of bank lending (Raga and Tyson, 2021).

Thus, the aim of this study is to investigate trends of the banking and financial regulations in SSA with a view to provide policy recommendations that could assist the policymakers in the quest to achieve financial inclusion and develop the financial system in SSA. To achieve this aim, three research questions were formulated, namely:

RQ1. What is the impact of policies and regulations on financial inclusion and stability of banks in the sub-Saharan Africa?

RQ2. What is the impact of capital flows on financial inclusion and stability of banks in the sub-Saharan Africa?

RQ3. What is the impact of integrated regulatory framework on the financial inclusion and stability of banks in the sub-Saharan Africa?

These research questions were answered using a systematic literature review involving the synthesis of existing studies and report to deduce inferences and answers to the formulated questions.

The motivation for this study stems from the fact that a sound and stable banking system is a major driver for achieving the sustainable development goals as well as economic growth and development (World Bank, 2019; Gondwe *et al.*, 2022). The banking sector provides financial services that contributes to the socio-economic well-being of the society and the nation in general; thus, there is a relationship between bank's performance or stability and economic growth and development (Lin and Huang, 2012; Pradhan *et al.*, 2017; Jayakumar *et al.*, 2018). Some banks in the SSA still struggle with sustainability issues, while some still operate below the optimal level because of lack of strong capital base and stringent regulatory issues, amongst others, thereby making them incapable to support economic growth and development. This study provides some insights into the underlying causative factors affecting the banking operation that can assist policy makers to address the challenges faced by the banks in the SSA region so that they can compete favourably with other international counterparts and help the region to meet the sustainable development goals.

The banking sector in the SSA was investigated because it is the main source of funding, investment and financial services that grows the capital markets in the SSA countries. Lack of stability, stringent regulatory policies and lack of financial capability of the banks in the SSA region will, therefore, affect their performance (Triki *et al.*, 2017). Furthermore, most countries in SSA have weak controls, as well as supervisory and institutional or governance frameworks that exposes them to risks (Beck and Maimbo, 2013). Thus, the operations of these banks differ under different environments making them vulnerable to instability. There is a need for the banks in the SSA region to embrace international regulatory standards, as this will integrate them with their counterparts in the developed countries to promote global trade. The novelty of this study lies in the combination of the systematic literature review and multiple regression analysis to draw inference on the state of banking and financial regulations as well as financial inclusion in SSA.

This study contributes to the understanding of banking and financial regulations in SSA, informing both academic research and policy development in the region. It provides valuable insights into the state of financial inclusion in the SSA region and how the barriers can be effectively mitigated.

2. Theoretical framework

Different theories and studies have contended with the proposition that the major aim of banking regulation is to checkmate the excessive risk-taking behaviour of banks. Crockett (1996) supports this view emphasising the importance banking regulation. Some studies also argue that banking regulation protects customers from losses that could emanate from the banks' risky excessive risk-taking behaviours (Klomp and de Haan, 2012; Djalilov, and Holscher, 2016; Triki *et al.*, 2017; Danisman and Demirel, 2019). First, the systemic risk theory argues that banking regulation reduces the possibilities of transferring risks from one bank to another during the period of financial crises. Second, the fiscal theory indicates that banking regulation protects the government from incurring losses from failed banks in the form of bailouts being the lender of last resort (Dam and Koetter, 2012); the fiscal argument indicates that bank regulation shields the government against losses that it could incur as a lender of last resort when bank failures occur. Third, the efficiency theory states that banking regulation promotes level of financial and economic development through efficient allocation of financial resources. Fourth, the financial intermediary theory also relates to this study which argues that the residents of an economy may boycott the use of financial services when there is information asymmetry and high cost of transactions because of the presence of intermediaries (Demir *et al.*, 2022). This theory relates to the asymmetric information theory which argue that insufficient or imbalance information can limit the banks' incentives

to take risks or embark on prudent lending (Boyd *et al.*, 1998). Thus, factors such as information asymmetry may discourage the banks, while high cost of transactions because of intermediaries may discourage customers and, thus, impede financial inclusion.

Fifth, the market structure theory postulates that the more stringent the bank entry barriers are, the lower the competition. Keeley (1990) stated that barriers can increase the market power and banks' profitability through prudent lending and can also cause banks to increase their costs of financial services, thereby reducing customers demand for financial serves and impeding financial inclusion (Claessens and Klingebiel, 2001).

Merrouche and Nier (2017) found a negative correlation between stringent bank entry barriers and bank lending, while Amidu (2014) reported a positive between them. Claessens and Klingebiel (2001) believe that the theory of economies of scale and scope considers restrictions as barriers that can restrict banks' advantage and ability to increases its lending.

Finally, the risk-absorption theory indicates that capital regulatory requirements can promote prudent lending by enhancing the risk-bearing capacity of banks. This is premised on the ground that the higher capital enhances banks' ability to create liquidity. Kim and Sohn (2017), however, opine that high capital regulatory requirements can hinder prudent lending, as this can compel banks to rely more on equity than deposits.

Existing studies have reported on the effect of financial regulation on the performance of the banks in the SSA. However, this study delves deeper into the pros and cons of financial regulation in the SSA region and how such effects could be mitigated; it also investigated the state of financial inclusion in the region using a combination of systematic literature review and multiple regression approach providing valuable insights into how financial inclusion barriers in the SSA region can be effectively mitigated.

3. Methodology

3.1 Systematic literature review

This study uses a systematic literature review to investigate the banking and financial regulations in SSA. The choice of the systematic literature review stems from the fact that the approach is suitable for the synthesis of existing studies and reports to gain an in-depth understanding about the investigated phenomenon to draw useful inferences (Daniyan *et al.*, 2021). The approach is suitable in the critical assessment and summarising of existing literature with reduction in bias or subjectivity (Maware *et al.*, 2024). The aim of this study is to investigate trends of the banking and financial regulations in SSA with a view to provide policy recommendations that could assist the policymakers in the quest to achieve financial inclusion and develop the financial system in SSA. This was achieved by conducting a systematic literature review. The systematic literature review involves the identification of data sources, the use search engines and the implementation of the inclusion and exclusion criteria. Keywords that relate to the subject matter such as "banking", "financial regulations", "sub-Saharan Africa", "Financial inclusion", "regulatory frameworks"," Macroprudential Policy", "Financial Sector Development", "financial stability", "banking crises and resilience", "banking" and "Risk Management" were searched through academic databases such as Google Scholar, Research Gate, digital library, BASE, Science Direct, Directory of Open Access Journals, Scopus and Web of Science. The synonyms for each term were first identified, followed by the use of the keywords, as shown in Table 1. The search process was conducted by searching for single keywords such as "banking" and regulations" and to combination of words such as "financial regulations" and "sub-Saharan Africa". The Boolean operator "AND" was used to combine the keywords such as "banking crises and resilience", "banking and risk management". To identify different versions of the keywords, wild cards, * and?, were used.

Table 1. Synonyms and keywords for systematic literature review

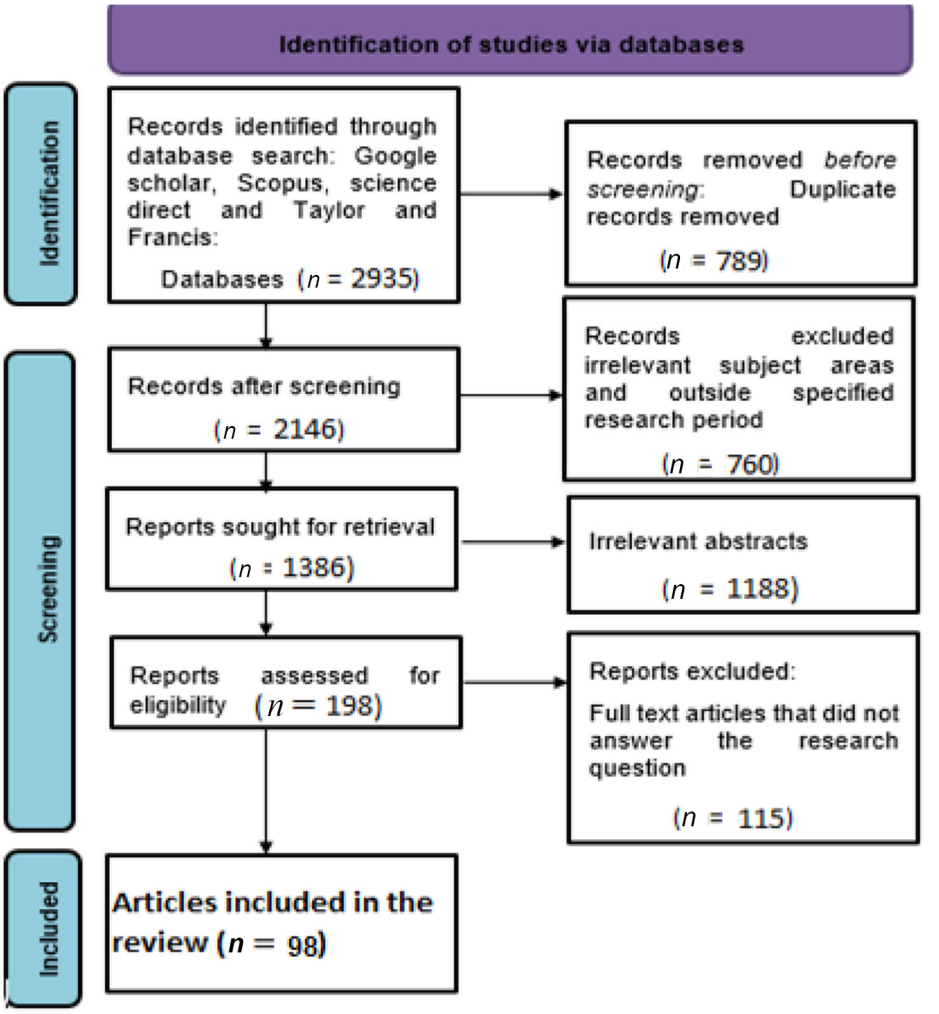
Search aids	Banking	Financial regulation	Sub-Saharan Africa
Synonyms	Banks Financial institutions Banking sector Financial sector	Regulatory frameworks Regulatory policies Supervision Monitoring Macroprudential policy Financial policies Standards	Africa Saharan Africa
Keywords	Banking Banking sector Banking crisis Cross-Border banking Financial institutions Financial sector Financial sector development Banking crisis and resilience	Financial regulations Financial inclusion Regulatory frameworks Macroprudential policy Financial stability Risk management	Sub-Saharan Africa

Source: Authors

Some of the limitations of the systematic literature review as it applies to this study include the risk of bias, during the selection and synthesis of the articles. To mitigate these limitations, the inclusion and exclusion were clearly defined, and the selection and synthesis of the articles were taken through a rigorous process leading to a consensus method for resolving discrepancies. The inclusion criteria include the relevance of the titles and abstracts to the subject matter to identify potentially relevant studies (this was used for the initial screening of articles), types of studies (empirical, conceptual and theoretical studies were considered), year of publication (75% of the articles must not be older than ten years), quality (85% must appear in academic databases such as SCOPUS and Web of Science), language (articles written only in English were considered) and the nature of review process undertaken before publication (peer review articles were mostly considered to ensure the validity of the findings).

The articles were identified, screened and selected using the checklist and guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) as outlined by Page *et al.* (2021).

A total of 2,935 articles were initially identified from the databases, of which 789 duplicate articles were eliminated during the screening process. Furthermore, 339 anonymous articles were removed, while 104 articles were excluded because they were not written in English. Other exclusion criteria include the relevance of the title as well as the year of publication led to the elimination of 317 articles. This led to the elimination of 1,549 articles, while the remaining 1,386 were further assessed for eligibility. In all, 1,188 articles were further eliminated because of their titles, focus and lack of empirical findings, and 115 articles were excluded, as they neither answer the research questions nor focus on areas that relate directly with banking and regulation. Finally, a total of 98 peer-reviewed articles whose focus and relevance match with the subject matter were reviewed and synthesised to answer the research questions. The included articles contributed empirically, conceptually and theoretically to the literature on banking and financial regulations in SSA. To minimise errors and bias during the selection process, the three authors of this study work collaboratively to screen, review and synthesise the selected articles based on the inclusion and exclusion criteria. Figure 1 shows the PRISMA method flow diagram which detailed on the selection of the articles reviewed.



Source: Authors

Figure 1. The PRISMA method flow diagram

The relevant information on the themes of the subject matter such as financial inclusion, regulatory frameworks, macroprudential policy, cross-border banking, financial sector development, banking crises and resilience, financial stability and economic growth, governance and risk management was drawn from the selected articles. The selected articles were further analysed and synthesised to obtain required evidence about the subject matter in a systematic way.

Information was extracted on banking and financial regulations in SSA, and the outcome study includes the following: the impact of financial regulations on the financial stability and inclusion (primary outcome measure) and the impact of financial policies on

capital flow (secondary outcome measure). All the results obtained were compatible with each outcome domain for which information was were sought. To reduce risk of bias in the included studies, all the authors jointly assessed each study, and all conflicting areas were resolved during a collaborative brainstorming session. The outcomes of the study were tabulated against the outcome measures. The study was limited to synthesis of the selected articles to draw evidences and conclusions without statistical analysis of the information and evidences obtained from the literature.

3.2 Multiple regression

The multiple regression was used in this study to investigate the relationship amongst the identified probable factors (*i*ndependent variables) affecting financial inclusions (dependent variables). The World Bank report on financial inclusion in the SSA was used for the analysis (Demirgüç-Kunt *et al.*, 2021). The regression approach was used to develop a predictive model that correlates the independent variables as a function of the dependent variable (financial inclusions).

Multiple regression allows the determination of the overall fit of a model so as to determine the effect of the independent variables on the dependent variable (financial inclusions) (Akinbowale *et al.*, 2024a). The independent variables (predictors) are: age, gender, education, income, location, bank regulations and charges, while financial inclusion serves as the dependent variable.

The following are the underlying assumptions for the multiple regression approach carried out in this study:

- The data set is quantitative and fairly considerable.
- The dependent variable is measured on a continuous scale.
- The predictor independent variables include: debt, grant, concessional debt, equity and budget.
- It is assumed that the observations are independent and the autocorrelation of the observations was checked using the Durbin–Watson statistics in the Statistical Package for Social Science (SPSS) 2022 environment.
- The independent variables (predictors) did not show autocorrelation or multicollinearity. This was checked by using the Durbin–Watson statistics, as well as tolerance and variance inflation factor (VIF).
- The relationship between the independent variables and dependent variable is linear. This was observed with the aid of the scatterplots and partial regression plots.
- The data shows homoscedasticity with no significant outliners.
- The residuals (errors) are normally distributed by approximation.

Equation (1) presents the general form of the multiple regression model:

$$y_i = \beta_0 + \sum_{j=1}^{k} \beta_j . x_{ij} + u_i \tag{1}$$

where:

y_i is the dependent variable, x_{ij} is the independent variable, β_0 and β_j are the unknown numerical constants of the model, while u_i is the random variable.

The multiple regression was carried out in the SPSS 2022 version.

4. Critical analysis

4.1 Effect of financial regulation frameworks on the banking performance

Financial regulation frameworks are aimed at controlling the operation of the banking and financial regulations to promote effectiveness, stability, consumer protection and growth in the SSA region. This includes analysis of Basel III compliance, capital requirement, anti-money laundering efforts and prudential regulations.

Thamae *et al.* (2023) discussed the dynamics of bank regulation in the SSA before and after 1990, using the statistics obtained from the World Bank's Bank Regulation and Supervision Surveys. The outcome of the investigation shows that both low- and middle-income SSA economies face strict regulation. While the banks in the low-income face more macroprudential policies and regulations, the banks in the middle-income economies face more regulations relating to bank ownership and structure, capital adequacy and regulation requirements, in addition to macroprudential policies.

Thamae *et al.* (2023) concluded that the bank regulations in the middle-income SSA economies are more stringent compared to that of the low-income countries between 1995 and 2007.

Anarfo *et al.* (2020) used the linear mixed effect models' method to investigate the causal relationship between financial regulation and inclusion in SSA. The outcome of the study indicates that the strict financial regulations can hinder access to finance that could jeopardise the financial inclusion goals of the SSAn economies. Although the capital adequacy policy is needful to promote stability considering the effect of insolvency on the banks and their shareholder, it also hinders the financial inclusion goal by limiting the capacity of the banks to provide loans and other forms of financial services because of credit rationing. Furthermore, Anarfo *et al.* (2020) reported that sound financial regulation and stability promotes financial inclusion. Thus, the policymakers in SSAn countries can achieve their financial inclusion goals by formulating policies that balance the capital adequacy requirements with the risk of insolvency to ensure credit flows and promote financial stability via effective operations financial institutions. Such policies should also aim at creating an enabling environment to promote financial stability. Some studies support the implementation of capital regulations in banks (Agoraki *et al.*, 2011; Klomp and de Haan, 2012; Klomp and de Haan, 2015; Djalilov and Holscher, 2016; Triki *et al.*, 2017; Danisman and Demirel, 2019; Saif-Alyousfi *et al.*, 2020).

Other studies indicated that sound regulation reinforced by legal frameworks is important for the sustainability of financial institutions and markets in general, as this will promote trust, reliability, transparency and strong enforcement of institutional mechanisms (Qian, 2017; African Development Report, 2020).

Nevertheless, some studies also show that bank regulations come with not only benefits but also some consequences on bank lending (Barth *et al.*, 2004; Adesina, 2019; Thamae and Odhiambo, 2021).

Yakubu and Bunyaminu (2021) assessed the impact of regulatory capital requirement on the stability bank in the SSA for the period 2000–2017 using the generalised method of moments. The result obtained shows that the capital requirement has a positive and significant effect on the stability of banks stability in the SSA. However, capital adequacy was found to have a negative effect on the financial stability of the banks. Therefore, the formulation and implementation of sound regulatory capital standards is necessary for achieving an effective and stable financial institution in SSA.

Hellman *et al.* (2000) argue that with low capital requirements, banks will have the capacity to operate using their own capital; hence, this will make them more disciplined and careful in taking excessive risk. However, with high capital requirements, capital may be tied

down, and banks may take more risk to ensure profitability and capital flow, thereby causing financial instability. This is referred to as the franchise-value effect (Tabak *et al.*, 2012). This position is supported by Oduor *et al.* (2017), who posited that high capital requirements promote financial instability in SSA except for big banks. However, Beck *et al.* (2006) and Delis and Staikouras (2011) indicate that there is insufficient evidence to support the claim that capital regulations promote financial instability in the banking system. Amidu (2014) conducted a study on 24 SSA economies from 2000 to 2007. The outcome of the study indicates that stringent bank entry requirements may promote bank credit delivery but limit the provision of bank credit to the private sector. Adesina (2019) conducted a study on 38 African countries from 2005 to 2015 and found that compliance with the Basel III liquidity regulations could promote bank lending and enhance the growth and stability of the bank.

Thus, policymakers need to understand the dynamics of stringency of bank regulation, so as to promote resilience and safety of the banking institutions, without imposing sanctions that will affect bank lending and development (Thamae and Odhiambo, 2021).

4.2 Effect of supervision and oversight functions on the banking performance

Supervision and oversight functions carried out by the regulators can curb excessive risk-taking behaviour and other practices of the banks (Barth *et al.*, 2004). The regulations are done in the interest of the public and the shareholders with the aim at protecting the banks and their shareholders from the adverse effect of risky practices. Regulators usually carry out oversight and enforce sanctions when they discover practices that are not aligned to the best practices (Danisman and Demirel, 2019). As it is practically impossible for the public or the individual shareholders to effectively monitor the operations of the banks on a regular basis, the regulators serve this purpose, so the banks can gain public trust and build a strong reputation (Alexander, 2006). However, Boot and Thakor (1993) stated that it is possible for some organisations to override the regulators and that the regulators can also serve personal rather than collective interests. Thus, ineffective supervision can promote corrupt practices and financial instability. Some existing studies found that the exercise of supervision, monitoring and oversight can significantly reduce the banking risks (Delis and Staikouras, 2011; Klomp and de Haan, 2015; Saif-Alyousfi *et al.*, 2020). Conversely, some existing studies found a negative correlation between exercise of supervision, monitoring and oversight and bank stability (Bermpei *et al.*, 2018). Demirgüç-Kunt and Detragiache (2011) stated that there is no significant correlation between banks' compliance with the Basel Core Principles for Effective Bank Supervision and reduction of banking risk.

Effective supervision that is neither influenced negatively nor compromised can promote bank stability and reduce the banking risks and vice versa.

Gondwe *et al.* (2022) used the two dimensions of financial stability *vis-à-vis* two bank risks, namely: solvency risk and liquidity risk. The survey data acquired from the World Bank Regulatory Survey database was used to construct regulation indices on three regulations, namely: capital, supervisory power and market discipline. Furthermore, the impact of each of the regulations on the solvency and liquidity risk was evaluated using a two-step system generalised method of moments estimator. The outcome of the study indicates that the first and third regulations (capital and market discipline, respectively) promote reduction of solvency risk, while the second regulation (supervisory power and restrictions) increases the risk of insolvency (liquidity). This implies access to capital with market discipline can promote the financial stability of banks because of the interests garnered on loans and other forms of financial services. On the other hand, that excessive or strict exercise of supervisory power and restrictions that restrict capital flow can reduce the stability of banks. It is worth mentioning that without oversight through the supervision and

restrictions, compliance with banking standards may be jeopardised which in turn may affect the public and in general the economy. Thakor (2014) stated that the banking operation is characterised with various risks and that the regulatory policies are meant to promote safety of the banks and the shareholder's investment and also to check the excessive risk-taking behaviour by some banks that exposes the financial system to risks. Thus, there is a need to strike the right balance between capital flow, supervision and market discipline.

Mwenda (2022) used the exploratory approach to investigate the structure and models of unified financial services regulation in the sub-Sahara Africa. The study aimed at assessing the recent trends in some sub-Sahara African countries in integrating different financial regulatory bodies into a single holistic regulatory body to regulate or supervise the financial sector. The study acknowledges the progress made on consolidating the financial regulators in the sub-Sahara Africa, drawing similar related developments across in Europe, Asia, the Pacific areas, Latin America, the Caribbean islands and North America. As previously mentioned, the role of the financial regulators in ensuring a safe, roust and stable financial activities cannot be overemphasised. However, excessive exercise of supervision and regulatory policy through different regulatory bodies could be counterproductive, as it could promote stiff restrictions, conflict of policies or interest and limit access to capital flows. A feasible alternative is to integrate the bodies into a single one to promote consolidation of the policies as suggested by Mwenda (2022). The more compact the policies are, the more effective they become.

Beck and Cull (2015) suggest the need to sort out the regulatory and governance issues faced by the banks in the SSA region so that they can contribute significantly towards the growth of African economies.

4.3 Financial inclusion

The concept of financial inclusion seeks to explore initiatives to expand access to banking and financial services to the various populations in SSA, including the role of mobile money and fintech innovations. Nutassey *et al.* (2023) accessed the effect of regulation on financial development and financial inclusion in 30 SSA economies from 2008 to 2020, using a generalised method of moments. The outcome of the study indicated that there is a positive relationship between financial development and financial inclusion in the SSA economies. Furthermore, sound regulation promotes financial system inclusion, while strict regulations restrict the activities of the financial sector, thereby hindering financial inclusion.

Financial inclusion is considered as an important catalyst for accomplishing some of the Sustainable Development Goals such as eradication of poverty and hunger, access to quality health and decent jobs, gender equality, economic growth, as well as industry and innovation (Ofori-Abebrese *et al.*, 2020). Nevertheless, the SSA economies have limited access to financial services, thereby hindering financial inclusions. The report of the Financial Access Survey (2019) shows that just about 24% of adults hold a formal financial institution account. Thus, the financial inclusion in the SSA is still low which hiders the realisation of the accomplishing Sustainable Development Goals (Ofori-Abebrese *et al.*, 2020; Sen and Laha, 2021).

Existing studies link sound regulation and supervision to financial inclusion. For instance, Aymar and Fabrice-Gilles (2021) indicated that sound regulation and supervision can eliminate market failures, thereby promoting efficiency and inclusion in the financial sector.

Therefore, effective regulation is important in achieving financial inclusion. On the other hand, poor regulations can hinder financial inclusion and development through stringent regulations that breeds distrust or discourage the provision of financial services (Sohn *et al.*, 2020). Unfortunately, the financial regulatory systems in the SSA region are still considered

as weak (Bluhm *et al.*, 2020; Union, 2020). Hence, there is a need to ensure sound regulation that will promote the development of the various financial services and open up new delivery channels that will meet all financial needs of the customers. Nutassey *et al.* (2023) stated that the development of a strong regulatory system can strategically aid the financial sector to in achieving the financial inclusion goals in the SSA region.

5. Empirical findings

5.1 Findings from the systematic literature review

Obadire *et al.* (2022) used the pooled ordinary least square estimator to investigate the effect of the Basel III regulations on the stability of African context banks. The outcome of the study reveals that Basel III regulation requirements in terms of the minimum capital requirement, capital adequacy ratio and capital buffer premium have a negative relationship with the stability of African banks, while the liquidity coverage ratio has a positive effect on the stability of the banks. The authors recommended that the African banks should maintain a liquidity coverage ratio within the Basel III specification while increasing the current minimum capital requirement above the average of 13.59% to promote banks' stability.

Mashamba (2018) determined the impact of the Basel III liquidity regulations on the profitability of banks of selected emerging market economies using the Generalised Method of Moments estimator. The outcome of the study indicated that the banks in emerging markets managed their liquidity in compliance with the Liquidity Coverage Ratio rule. Thus, the author concluded that the Basel III liquidity regulations had no negative effects on the banks in emerging economies.

Obadire (2022) also investigated the effect of the Basel III capital regulations on the efficiency of banks in selected African countries. Firstly, the efficiency was investigated in terms of the operational and investment efficiency of selected African banks under the Basel III capital regulations using the random effects and pooled ordinary least square panel data regression models as well as the using the input-oriented Data Envelopment Analysis approach. The results show that the capital buffer premiums had a positive effect on the operational and investment efficiency of African banks positively. This means that the capital buffer premium cushions the capital of the selected banks against financial, market and economic shocks and also promotes the efficiencies of the banks. The results also show that there exists a positive relationship between the liquidity coverage ratio and the banks' operational efficiency. This implies that the African banks with high liquidity ratios perform well in operations. The authors concluded that adoption of stricter liquidity requirements arising from the Basel III capital regulations creates a liquidity buffer for African banks which may improve their increased profitability and operational efficiency. Also, the Data Envelopment Analysis results indicated that the sampled banks are operationally efficient with an aggregate of 84.8% and an aggregate of 94.9% for their investment efficiency. These findings suggest that African banks are significantly efficient and can withstand financial or economic stresses under the Basel III capital regulations.

Thamae and Odhiambo (2024) investigated the nonlinear effects of bank regulation stringency on bank lending in 23 SSA countries from1997 to 2017 using the dynamic panel threshold regression model. The authors used the updated databases of the World Bank's Bank Regulation and Supervision using some banking regulation indicators such as entry barriers, banking and commerce restrictions, activity restrictions and capital regulatory requirements. The outcome of the study shows the existence of nonlinear effects between bank lending and regulations. The result indicates a positive correlation between bank lending and stringent regulations when the threshold falls below 62.8%; when the threshold is exceeded, a negative and significant correlation was observed. This implies that increase in

the stringency of the regulation beyond the capacity of the banks may affect the bank's lending prowess and vice versa.

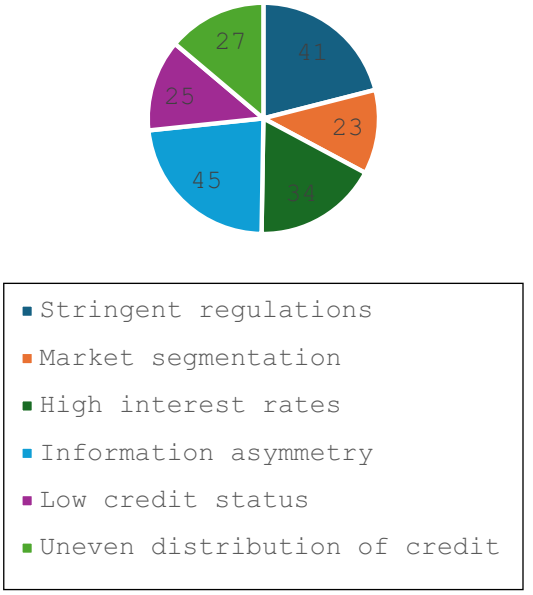
Akande *et al.* (2019) used the structural equation modelling to analyse the relationship amongst competition, regulation and stability using 440 commercial banks in SSA from 2006 to 2015. The outcome of the study indicates that competition can influence the stability of banks via efficiency, while regulation can affect the bank's stability through competition and efficiency. Thus, the study concluded that there exists a significant relationship amongst bank's competition, regulation and stability. The impact of capital regulation significantly influences the stability of banks as substantiated by some existing literature (Allen and Gale, 2004; Hellman *et al*., 2000; Hakenes and Schnabel, 2011). However, Repullo (2004) as well as Matutes and Vives (2000) argue that aside capital regulation, bank's stability is also determined by other factors such as liquidity and assets, nature and quality regulations, competition amongst others, and any change in any of these factors may affect the other. The synthesis of the literature indicated that the SSA economies are still faced with market segmentation and high levels of risks which affect the efficacy of its financial system. In response to this, the addition, the regulators impose some regulations with the aim to mitigate the risks and its spread by deepening interbank networks. Market segmentation includes the discrepancies in interbank pricing and access to funds between different banking institutions. The market segmentation is majorly caused by the size and ownership of banks. For instance, large banks may enjoy lower borrowing costs in the interbank market, while smaller banks may be charged at a higher rate, irrespective of their financial soundness (Raga and Tyson, 2021). Furthermore, some foreign and large banks with strong capital base usually conduct interbank trading amongst each other, excluding the smaller banks who do not have access to liquidity from interbank markets. In addition, some banks have internal credit limits that are lower than the benchmark which causes high interest rates. Information asymmetry also affects the level of market confidence coupled with the structural risks of the financial market in the SSA.

Another factor is the low credit status of the banks in the SSA region. Raga and Tyson (2021) stated that the credit status of the banks in the SSA is lower than that of their counterparts in other regions and lags far below that of the middle- and high-income countries. As of 2018, banks' domestic credit to the private sector in SSA is 28% of the gross domestic product which is five times lower than that of the East Asia and Pacific countries which stands at 140% and approximately half that of the Middle East and North Africa, Latin America and South Asia (Raga and Tyson, 2021). The credit level is not only low but also concentrated in a few sectors which negates the goal of inclusive economic development (Beck *et al*., 2007; Griffith-Jones *et al*., 2014). Another challenge faced by the banking sector in the SSA is the high cost of credit. In 2018, SSA had the highest margins rate of 10.6% between the lending and deposit rate and the highest bank returns on assets (1.9%) and equity (16.8%) (Raga and Tyson, 2021). Honohan and Beck (2007) reported that the subsidiaries of foreign banks to operate at higher profits in SSA than in other regions.

Griffith-Jones *et al.* (2014) linked the high cost of credit to lack of competition in the credit market, suggesting the reduction of entry barriers to pave way for increased competition in the region. However, Raga and Tyson (2021) suggested the development and deepening of interbank markets, as this may improve overall market efficiency through redistribution of liquidity within the banking system, improvement of price and increase in competition. These may translate into lower lending rates that can directly influence the availability of credit facilities for the development of critical sectors in the SSA. Aldasoro and Faia (2016) suggest the deployment of systemic loops and liquidity regulation.

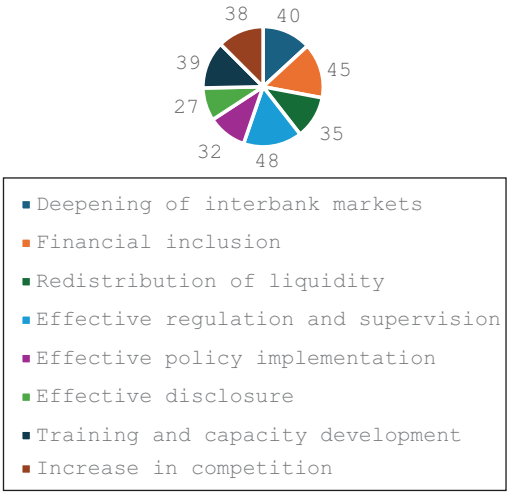
Studies suggest the improvement in competition, markets infrastructure as well as the development of effective risk mitigating approach (Angbazo, 1997; IMF, 2004; Lim *et al.*, 2011; Schipke, 2015). Dinger and von Hagen (2009) suggest a balance between interbank borrowing and bank risk, while Nier and Baumann (2006) suggest market discipline, disclosure and moral hazard to achieve banking stability.

A total of 83 articles that satisfied the inclusion criteria were reviewed in this study. Figures 2 and 3 summarise the data points which show the number of studies that identify the factors mitigating the growth of the banking sector in the SSA. These include excessive or stringent regulations, market segmentation, high interest rates, information asymmetry, low credit status and uneven distribution of credit, amongst others. Some of the policy recommendations that could aid the development of the banking sector in SSA include development and deepening of interbank markets, financial inclusion, improvement of overall market efficiency through redistribution of liquidity within the banking system, improvement in capital base and flow, improvement of price and encouragement of competition. However, some literature highlighted the need for proper policies that balance financial inclusion, capital flow, with effective supervision and market discipline, effective policy implementation and disclosure, change in organisation's culture, effective disclosure, deployment of adequate resources, continuous training and education, continuous monitoring and review, as well as commitment by top management as factors necessary for the successful implementation of the recommended policies.



Source: Authors

Figure 2. The data points that highlight the factors mitigating the growth of the banking sector in the Sub-Saharan Africa



Source: Authors

Figure 3. The data points that support policy recommendations geared towards development of the banking sector in Sub-Saharan Africa

5.2 Findings from the multiple regression analysis

The Pearson correlation statistics was conducted to determine the relationship between the independent variables *vis-à-vis* financial inclusion, and the age results obtained are presented in Table 2.

Perfect correlation exists between variables with near ±1, while variables with values between ±0.50 and ±1 suggest a high or strong correlation. Variables with values between ±0.30 and ±0.49 indicate an average or moderate correlation, while values below +0.29 are considered a weak correlation and a value of zero implies no relationship (Statisticssolutions, 2024).

The results obtained indicate that the variables mostly have moderate to high linear relationship which makes them good determinants of the financial inclusions except for few cases.

Table 2. Pearson correlation statistics

Variables	Financial inclusion	Age	Gender	Education	Income	Location	Bank regulations and charges
Financial inclusion	1.000	−0.176	*−0.255*	*0.614*	*0.576*	*0.164*	*0.075*
Age	−0.176	1.000	0.989	−0.696	−0.767	−0.596	−0.098
Gender	−0.255	0.989	1.000	−0.761	−0.818	−0.502	−0.158
Education	0.614	−0.696	−0.761	1.000	0.991	0.156	−0.084
Income	0.576	−0.767	−0.818	0.991	1.000	0.259	0.829
location	0.164	−0.596	−0.502	0.156	0.259	1.000	1.000
Bank regulations and charges	0.075	−0.098	0.017	−0.158	−0.084	0.829	0.444

Source: Authors (Statistical analysis obtained from SPSS)

Table 3 presents the summary of the multiple regression model, while Table 4 presents multiple regression coefficients. The correlation coefficient R and R^2 were found to be 1, which indicates that the model is statistically significant and that the variables are suitable determinants of financial inclusions. The Durbin–Watson (DW) statistic was used to further test the autocorrelation of the data set, and the outcome gave 2.249. The DW statistic usually has values ranging between 0 and 4. A DW value of 2.0 indicates that there is no autocorrelation detected in the sample, while values from 0 to less than 2 imply a positive autocorrelation. On the other hand, values from 2 to 4 mean negative autocorrelation (Kenton, 2021).

For the data set used in this study, the DW gave a minor autocorrelation which implies that the distribution as well as the regression estimates are valid.

Equation (2) presents the final multiple regression equation which can be used for the prediction of financial inclusion of the SSA.

$$\text{Financial inclusion} = -194.463 + 2.326x_2 + 4.691x_3 - 2.784x_4 + 3.001x_5 - 1.606x_6 \quad (2)$$

where: X_2 (Gender), X_3 (Education), X_4 (Income), X_5 (Location) and X_6 (Bank regulations and charges).

Freund and Littell (2000) indicated that any variable with VIF statistics above 10 may indicate significant multicollinearity. Thus, variable X_1 (age) was excluded because of its VIF which exceeds 10 significantly.

The exclusion of age is supported by the literature. The survey conducted by the World Bank report (2024) indicated that in 16 of the 36 economies surveyed SSA from 2021 to 2022, above 50% of the adults have an account. For instance, 56% have an account in Senegal, 79% have accounts in Kenya, while 85% have accounts in South Africa. This implies that age is not a major barrier to financial inclusion in SSA.

World Bank report (2024) noted that the SSA has grown significant in financial inclusion over the past decade, mainly because of the adoption of mobile money account and digital

Table 3. Summary of the multiple regression model

Model	R	R^2	R^2 change	df1	df2	Significant F change	Durbin–Watson
1	1.000[a]	1.000	1.000	5	0	0.000	2.249

Source: Authors (Statistical analysis obtained from SPSS)

Table 4. Multiple regression coefficients[a]

Model	Unstandardised B	Coefficients standard error	Standardised coefficients beta	Tolerance	VIF
Financial inclusion	−194.463	0.000		0.031	
Gender	2.326	0.000	3,440	0.005	1.842
Education	4.691	0.000	6.353	0.005	1.785
Income	−2.784	0.000	−4.457	0.005	2.564
Location	3.001	0.000	4.880	0.018	5.176
Bank regulations and charges	−1.606	0.000	−3.404	0.028	3.067

Note: [a]Dependent variable: Financial inclusion
Source: Authors (Statistical analysis obtained from SPSS)

payments. For instance, the financial inclusion of Nigeria has reportedly grown from 56% in 2020 to 64% in 2023.

However, there are still millions of adults without an account who still receive or make common payments in cash. This indicates the need to increase financial inclusion through digitalisation of the transaction system. The gap in digital more of transaction in SSA has been traced to factors such as level of income, education, financial illiteracy, exposure, sensitisation, gender, regulatory barriers and location of people in the region (World Bank report, 2024).

Table 5 presents the correlation and covariances coefficients of the included variables (variables X_2–X_6), while Table 6 presents the collinearity diagnostics of the included variables.

The eigenvalues indicate the variances in the variables. According to Freund and Littell (2000), a set of eigenvalues of relatively equal magnitudes indicates that there is little multicollinearity. However, when the eigenvalue is zero, it indicates that there is a perfect collinearity amongst independent variables, while very small eigenvalues imply high multicollinearity. The results presented in Table 7 shows that there is no evidence of perfect or high multicollinearity amongst the independent variables used as predictors as the values of their eigenvalues are not zero.

The condition index is calculated as the square root of the ratios of the largest eigenvalue to the individual eigenvalue (Valaskova *et al.*, 2018). Condition index greater than 15 may indicate the presence of multicollinearity, while the ones greater than 30 indicates serious multicollinearity problem (Valaskova *et al.*, 2018). The results presented in Table 6 indicates that there is no multicollinearity problem in the included variables, as the values of the condition index are less than 15.

Table 5. Correlation and covariances coefficients of the included variables

Statistics	Variable	X_6	X_2	X_3	X_5	X_4
Correlations	X_6	1.000	−0.913	−0.148	−0.975	0.015
	X_2	−0.913	1.000	−0.049	−0.892	0.209
	X_3	−0.148	−0.049	1.000	0.297	−0.984
	X_5	−0.975	0.892	0.297	1.000	−0.162
	X_4	0.015	0.209	−0.984	−0.162	1.000
Covariances	X_6	0.000	0.000	0.000	0.000	0.000
	X_2	0.000	0.003	0.000	0.000	0.000
	X_3	0.000	0.000	0.000	0.000	0.000
	X_5	0.000	0.000	0.000	0.000	0.000
	X_4	0.000	0.000	0.000	0.000	0.000

Notes: X_2 (Gender), X_3 (Education), X_4 (Income), X_5 (Location) and X_6 (Bank regulations and charges)
Source: Authors (Statistical analysis obtained from SPSS)

Table 6. The collinearity diagnostics of the of the included variables

Dimension	Eigenvalue	Condition index	Constant	X_2	X_3	X_4	X_5	X_6
1	5.074	1.000	0.00	0.00	0.00	0.00	0.00	0.00
2	1.517	3.133	0.00	0.00	0.00	0.00	0.00	0.00
3	1.372	3.694	0.00	0.00	0.00	0.00	0.00	0.00
4	1.036	11.951	0.01	0.00	0.00	0.00	0.04	0.09
5	1.002	7.401	0.97	0.96	0.02	0.00	0.92	0.90
6	5.001	7.234	0.02	0.03	0.98	1.00	10.03	0.00

Source: Authors (Statistical analysis obtained from SPSS)

Table 7. Residual statistics[a]

Model	Min.	Max.	Mean	SD	N
Predicted value	43.000	4.5700	2.8000	2.27067	6
Residual	0.0000	0.0000	0.0000	0.0000	6
Standard predicted value	−1.006	1.442	0.000	1.000	6
Standard residual	0.000	0.000	0.000	0.000	6

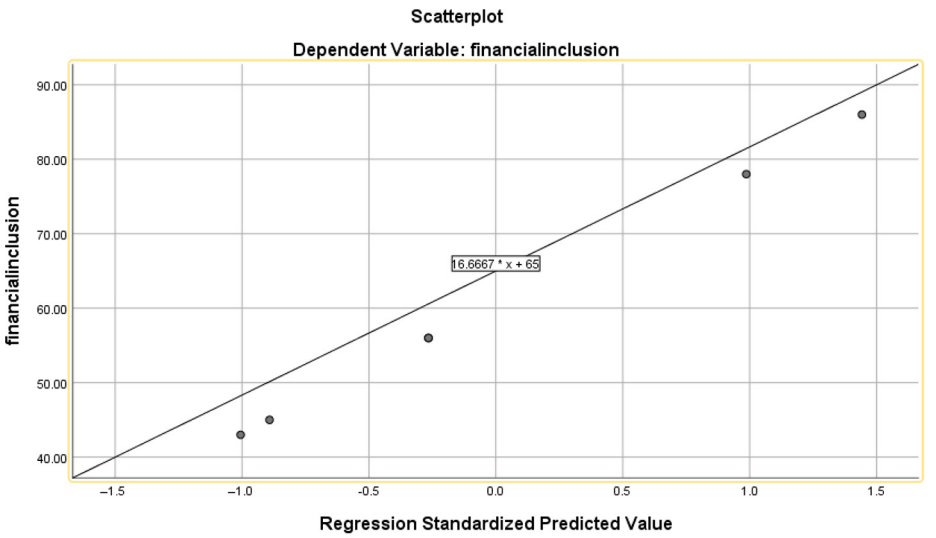
Note: [a]Financial inclusion
Source: Authors (Statistical analysis obtained from SPSS)

Table 7 shows the residual statistics of the multiple regression model. Having a negative residual as shown in Table 7 is an indication that the predictive power of the regression model is high.

Figure 4 shows the scatter plot of the multiple regression model is approximately linear. This shows a linear relationship between the independent variables and the dependent variable (financial stability).

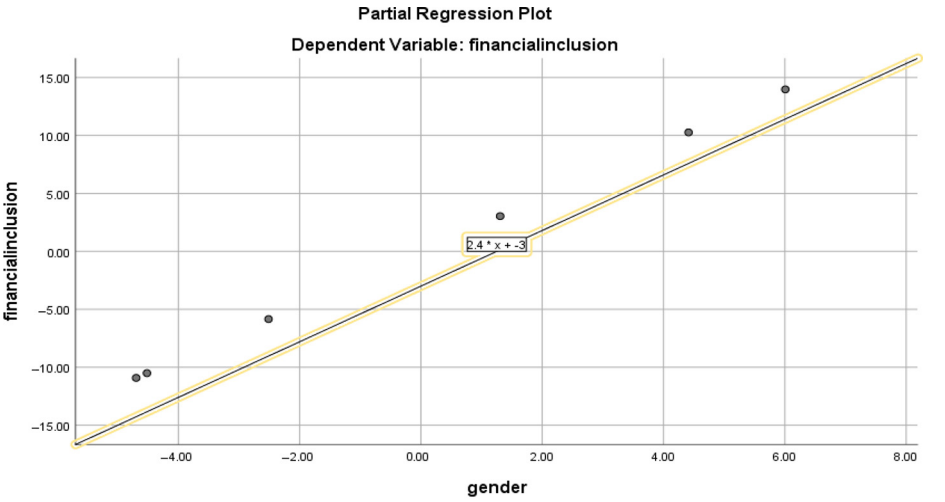
Figures 5–9 present the partial regression plots which establish the relationship between the dependent and independent variables. The plots show that there was no significant outliner, as the data points fall closely to the diagonal line of best fit. This indicates that the developed regression model is suitable for predictive purpose with a high probability that the predicted outcomes of model will be close to the actual values.

Figure 10 shows the percentage of people with financial institution accounts at the regional and global levels from 2011 to 2021. It is obvious that SSA has the lowest percentage of adults with financial institution accounts during this period. Although there is a steady increase in the percentage of account holders in SSA from 23% in 2011 to 40% in



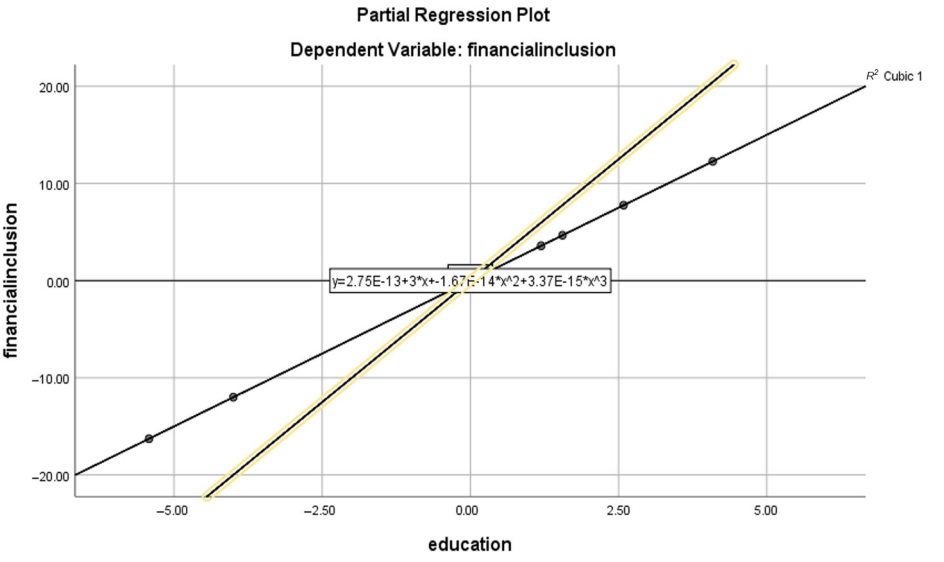
Source: Authors (Statistical analysis obtained from SPSS)

Figure 4. The scatter plot of the multiple regression model



Source: Authors (Statistical analysis obtained from SPSS)

Figure 5. The partial regression plot of the gender variable on financial inclusion



Source: Authors (Statistical analysis obtained from SPSS)

Figure 6. The partial regression plot of the education variable on financial inclusion

2021, this may be because of public sensitisation, government and financial institutions policies aimed at increasing access to financial services in the region.

Some of the efforts geared towards improving increase financial inclusion in the SSA region include: the implementation of National Financial Inclusion Strategies by 87% of

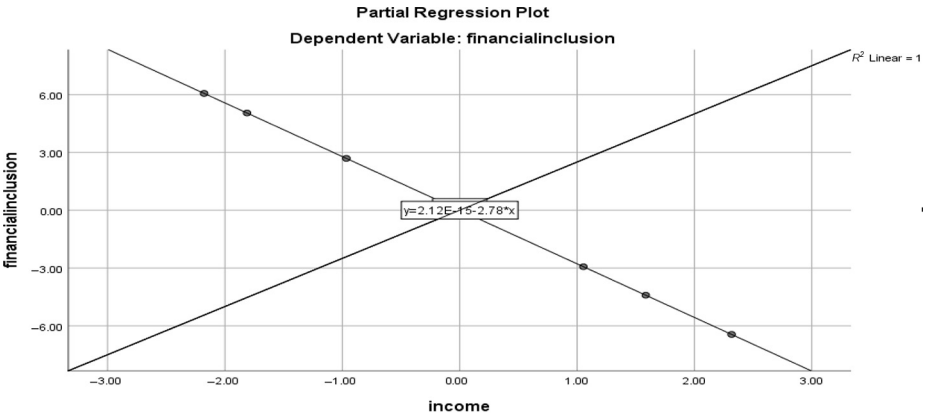


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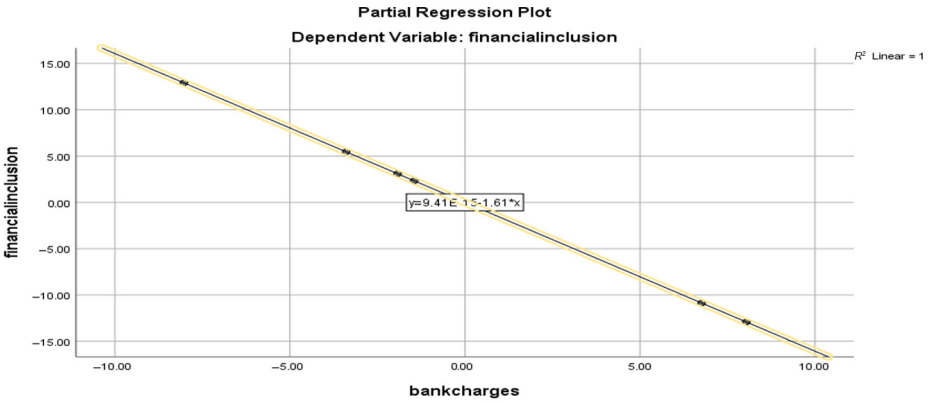
Figure 7. The partial regression plot of the income variable on financial inclusion



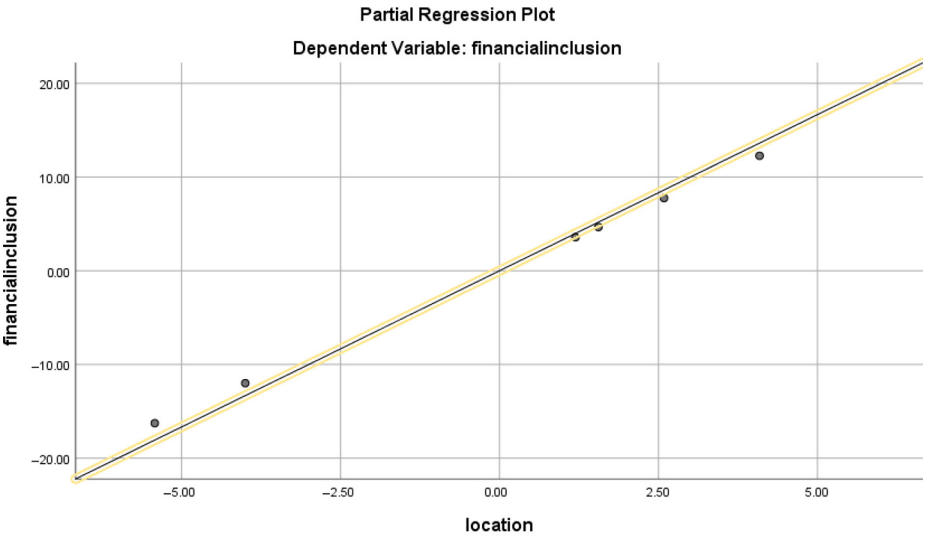
Source: Authors (Statistical analysis obtained from SPSS)

Figure 8. The partial regression plot of the bank regulations and charges variable on financial inclusion

member countries in SSA as at 2022 as opposed to 16% in 2018 (Zins and Weill, 2016; Demirgüç-Kunt *et al.*, 2018), implementation of interventions and reforms in the financial institutions, such as electronic banking, public sensitisation on electronic banking and financial literacy, cashless policy, introduction of digital banking products and services, amongst others (Asuming *et al.*, 2019; Adedokun and Ağa, 2021; Akinbowale *et al.*, 2024b, 2024c, 2024d), reduction in entry barriers for banks and customers, financial services innovation, expansion of access to financial services to rural communities (Asuming *et al.*, 2019; Adedokun and Ağa, 2021).

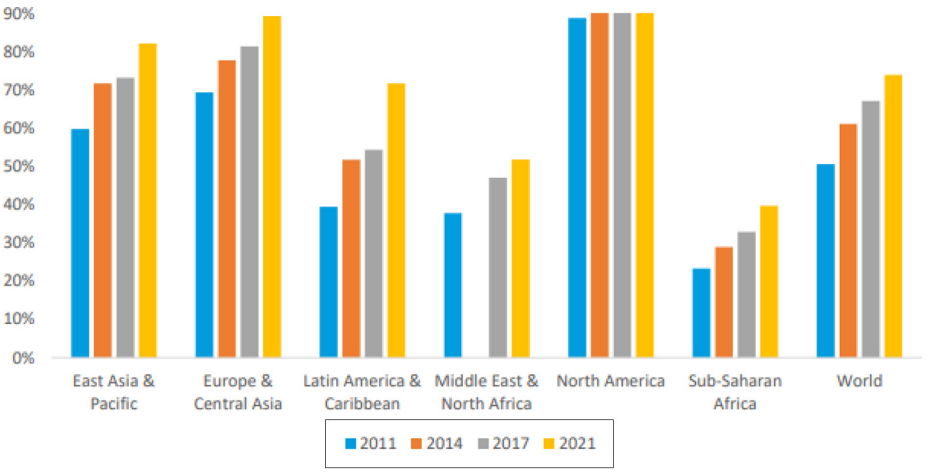
6. Conclusion and policy recommendations

The SSA economies will benefit from a stronger, more liquid and more efficient financial system, as this will enable structural and economic transformation and economic diversification,



Source: Authors (Statistical analysis obtained from SPSS)

Figure 9. The partial regression plot of the location variable on financial inclusion



Source: Damane and Ho (2023)

Figure 10. Percentage of people with financial institution accounts at the regional and global levels from 2011 to 2021

as well as trade and financial inclusion. Evidences from the literature reviewed showed that some efforts and progress have been made over the years in terms of strengthening of regulations, expansion of financial access and services as well as adoption of relevant aspects of Basel accord amongst others. Nevertheless, the banking sector in the SSA is still faced with

some challenges that limit its role in economic development. These include excessive or stringent regulations, market segmentation, high interest rates, information asymmetry, low credit status and uneven distribution of credit, amongst others. Some of the policy recommendations that could aid the development of the banking sector in SSA include: development and deepening of interbank markets, improvement of overall market efficiency through redistribution of liquidity within the banking system, improvement of price and encouragement of competition.

Efforts should also be made to achieve financial inclusion goals by formulating policies that balances the capital adequacy requirements with the risk of insolvency to ensure credit flows and promotes financial stability via effective operations financial institutions. Such policies should also aim at creating an enabling environment to promote financial stability. The removal of entry barriers will broaden and increase participation that will increase competition and help increase the efficacy of the interbank market and reduce market segmentation effort that should also be directed at improving the market infrastructure such as trading platforms; efficient payment systems can promote transparency, interbank development and financial markets. Effective credit risk-mitigating approach such as collateral and securities markets will reduce the volatilities of the banking sector in SSA. The availability of liquidity facilities will boost the confidence to interbank market actors. Policies could be formulated to discourage short-term or excessive borrowing to encourage interbank trading. However, when banks fall short of the required capital adequacy, central banks may impose higher borrowing rate in its lending facility, from the interbank market, as this will improve the relationship amongst the bank to reduce market segregation. To promote financial stability, there is a need to enhance the central banks' macro-financial and micro-prudential supervision of interbank market actors. This will assist the regulators to identify and mitigate the risky behaviours of the banks.

A purposeful solution to the problem of financial inclusion is the formulation and implementation of policies that promote financial literacy through formal and informal financial education programmes across all population in the SSA region (World Bank, 2024; AFI, 2022). Financial illiteracy has resulted in the patronage of unregulated and exploitative financial industry resulting in scams and fraud cases. The financial regulators and supervisory agencies must also ensure transparency and delivery of effective services via the implementation of better supervisory and monitoring frameworks systems to reduce financial risks and safety and stability of the financial institutions with the evolution of digital financial products and services. This will boost the confidence of the customers in the financial services and encourage others to be included. Furthermore, to address the issue of location as a barrier to financial inclusion, there is a need to increase access to financial products and services in financial inclusion including the supporting infrastructure such as internet availability, most especially in the rural communities of the SSA region. The issue of gender inequality as an obstacle to financial inclusion has reduced significantly across the SSA region; however, the socio-economic ills such as poverty, low income and unemployment may still prevent access to internet, smart devices, access to digital financial products and services which ultimately may affect financial inclusion. Deliberate efforts must be taken by the stakeholders such as government agencies and regulatory authorities, financial institutions and technical service providers in ensuring expansion of the region's financial inclusion programme.

This study is limited to systematic literature review and regression analysis using secondary data set, that is subject to bias and authors subjectivity; future studies can consider the investigation of banking stability, as well as financial regulation in SSA using a survey that combines quantitative and qualitative approaches. Furthermore, not many studies have

reported on the rate of use of digital financial products and services as well as the financial well-being and resilience of the financial institutions. Future works can also consider these areas to promote effective financial inclusion and a robust financial system in the SSA.

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