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DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

The impact of anti-money laundering regulations on inclusive finance: Evidence from Sub-Saharan Africa

Isaac Ofoeda¹, Joseph K. Tuffour²* and Emmanuel Adjei Nketia¹

Abstract: This study examined the impact of AML regulations on financial inclusion in Sub-Saharan Africa (SSA). Again, the study assessed whether the level of AML regulatory effectiveness determines the impact of AML regulations on financial inclusion. The study employed the Systems Generalized Methods of Moments (SGMM) estimation technique to assess the influence of AML regulations on financial inclusion for a panel of 44 SSA countries from 2012–2019. Data is sourced from the World Development Indicators and the Basel Institute on Governance. The study showed that AML regulations negatively impact accounts ownership and the number of commercial bank branches whereas AML regulations have a positive impact on the number of commercial bank depositors, the number of commercial bank borrowers, and the number of ATMs. Further, the study provided evidence that AML regulations positively impact the number of commercial bank branches and the number of borrowers in low-effectiveness countries (countries with AML regulations below the mean). In contrast, the study reported that AML regulations have a negative impact on accounts ownership for high-effectiveness countries (countries with AML regulations above the mean), while AML regulations have a positive influence on the number of depositors, the number of commercial bank borrowers and number of ATMs above the mean. The findings of the study imply that the impact of AML regulations on financial inclusion depends on the proxy of financial inclusion and also the extent of AML regulations in SSA countries. The uniqueness of this study is its specific focus on assessing the impact of AML regulations on financial inclusion in SSA.

Subjects: Corporate Finance; Banking; Banking & Finance Law

Keywords: anti-money laundering regulations; financial inclusion; Sub-Saharan Africa

1. Introduction

Poverty eradication remains high on the agenda of most Sub-Saharan African (SSA) countries as it is the number one of the Sustainable Development Goals. According to the Millennium Development Goals Report of 2015, more than 40% of the population in Sub-Saharan Africa live in extreme poverty (UNDPI, 2015). It is estimated that 9 out of every 10 extremely poor people in the world are found in Africa (The Sustainable Development Goals Center for Africa and Sustainable Development Solutions Network 2020). The World Bank estimates that about





© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent. 433 million Africans are living in extreme poverty (Schoch & Lakner, 2020). However, financial inclusion has been touted as a major policy tool for poverty eradication and promoting economic growth (Asuming et al., 2019). Financial inclusion also plays a crucial role in the development process of nations by accumulating capital through the facilitation of savings, providing access to affordable credit facilities to the rural and rural-urban poor populace for productive ventures, promoting human capital development, and providing employment (Asongu et al., 2018; Park & Mercado, 2018; Sethi & Acharya, 2018; Tchamyou, 2020).

Despite governments' significant efforts to promote financial inclusion, it appears that the amount of financial inclusion, although improving, remains low in the African sub-region. Although SSA held the top share of international financial inclusion projects at around 30% as compared to other regions of the world, the level of financial inclusiveness is abysmal (Tolzmann & Tomilova, 2021). According to the Global Findex database, the number of adults (15 and older) holding a formal financial institution account has risen from 51% in 2011 to 62% in 2014 and 68% percent in 2017 and 76% in 2021. However, account penetration in Sub-Saharan Africa (SSA) has increased from 24% in 2011 to 34% in 2014 and 55% in 2021 owing largely to the growth of mobile cash accounts in 2017. According to Demirgüç-Kunt and Klapper (2012), poor financial inclusion levels on the African continent can be explained by high costs of access to finance, discrepancy across financial institutions, fragile and weak financial systems, lack of documentation, low income, high costs of creating and maintaining accounts.

This implies that policymakers must take deliberate policy direction and create the right environment to promote inclusive finance. Despite the abundance of literature on the factors that promote financial inclusion in a country, it appears that empirical research has not focused on how anti-money laundering (AML) policies affect financial inclusion. "Money laundering is the process of disguising the origin of ill-gotten money to make it seem as though such funds were obtained from legitimate sources". Simply put, money laundering is the process of washing 'dirty money to make it look "clean"" (Mekpor et al., 2018, p. 442). Money laundering has become a global scourge, owing to its impact on countries' financial systems and economies. As a result, it has far-reaching implications for the soundness and stability of countries' financial systems. Money laundering destabilizes financial institutions and the entire financial system by corrupting the financial market, eroding client confidence and trust (Mekpor et al., 2018; Van der Zahn et al., 2007).

The preceding evidence shows that money laundering has far-reaching implications for the operations of nations' financial systems and can stymie the financial inclusion efforts of nations. Consequently, AML regulations might influence the financial inclusiveness of nations. According to (Greenspan, 1998), the entire financial system thrives on customer trust and confidence. However, the incidence of money laundering is a major constraint to promoting customer trust and confidence in the financial system as it makes financial systems susceptible to the infiltration of criminal elements, which may end up defrauding customers of the financial institutions. Also, the incidence of money laundering in financial institutions suggests the complicity of the officials of financial institutions in the crimes that generate the illicit funds. Therefore, unchecked money laundering could hamper the financial inclusion efforts of nations. For instance, Ghosh (2021) intimates that trust improves account ownership and use in India, whereas Xu (2020) notes that social trust is still crucial in stimulating inclusive finance around the world. Undoubtedly, AML regulations are expected to promote financial inclusion as they prevent the infiltration of criminal elements into the financial system and restore clients' trust and confidence in the financial system as a whole. Furthermore, Ofoeda et al. (2020) accentuate that financial institutions' good governance and prudent management foster financial sector development. Therefore, we posit that effective AML systems in a country could be a catalyst for financial inclusion in SSA.

Empirically, Ofoeda et al. (2020) looked at the influence of anti-money laundering regulations on financial sector development around the world, while Balani (2019) investigated how the Patriot Act affected stock prices in the United States. In addition, Ofoeda et al. (2022a) investigated how

anti-money laundering regulations influence FDI flows across the globe. At the same time,Ofoeda et al. (2022b) examined the moderating role of anti-money laundering regulations on the FDIeconomic growth relationship. Further, Anarfo et al. (2020) examined the impact of financial regulation on financial inclusion, whereas Kodongo (2018) assessed how Kenyan financial regulations impact inclusive finance. Additionally, in a recent study, Ofoeda (2022) explored the impact of AML regulations on financial inclusion across the globe. Further, Ofoeda et al. (2022a) explored the impact of AML regulations on the relationship between financial development and economic growth.

This study departs from the existing body of literature (see Ofoeda, 2022; Ofoeda et al., 2022a) as it pays particular attention to Sub-Saharan Africa. According to the Global Findex Database about 33% of Adults in Africa remained unbanked (Demirgüc-Kunt et al., 2022). Again, SSA has less developed financial systems and is perceived as risky due to uncertainties with government policy, low quality of infrastructure and political instability (Asiedu, 2002). In addition, Africa is noted for a high incidence of money laundering and accounts for between 10 to 20 percent of the total illicit cross-border flows (AAPPG, 2006). Additionally, according to the Basel AML Report 2021, Africa has the highest overall money laundering risk score of all regions (Basel Institute on governance, 2021). According to Moshi (2007), there is no country on the African continent where illicit money is not created in significant amounts. Although the incidence of money laundering has a devastating impact on the financial systems of countries, this impact is more pronounced in SSA countries as these countries have relatively small and fragile financial systems, informal economies, and weak economies that are easily exposed to money laundering activities. Therefore, there is the need for policymakers in SSA countries to implement effective AML regulations to create the right environment for financial institutions to thrive and therefore promote inclusive finance.

This study contributes to the body of knowledge by examining the influence of AML regulations on financial inclusion in SSA. The SSA sub-region presents unique characteristics, especially with regards to the risk of money laundering. Second, we examine the impact of the different levels of AML regulatory effectiveness on financial inclusion. We argue that due to the weak AML regulations in SSA countries coupled with weak financial systems, AML regulations may only significantly impact financial inclusion for countries with stronger AML regulatory frameworks. Finally, this study contributes to the literature by employing five different measures of financial inclusion (bank accounts per 1,000 adults, bank branches per 100,000 adults, depositors with commercial banks per 1,000 adults, banks' borrowers per 1,000 adults, and number of automated teller machine per 100,000 people). This study diverges from the works of (Ajide, 2020; Anarfo et al., 2020), which employed a composite index in measuring financial inclusion. It is important to use the individual indicators of financial inclusion as it helps to prescribe the appropriate policy recommendations. We structure the rest of the study as follows; in Section 2, we review relevant literature that explain the relationship between AML regulations and financial inclusion. Section 3 discusses the estimation procedure and the data employed in the study and we discuss the findings of the study in Section 4. Finally, we draw conclusions from the results of the study and provide some policy recommendations in Section 5.

2. Literature review

In recent times, financial inclusion has become a topical issue in the development process of nations. However, the incidence of money laundering has been identified as a major threat to inclusive finance. Despite the potential of anti-money laundering (AML) frameworks in derailing or promoting financial inclusion efforts, extant literature has not been thorough in establishing the link between AML regulations and financial inclusion. The law of finance theory developed by La Porta et al. (1998) anchors the link between AML regulations and financial inclusion. This theory accentuates that a well-functioning financial system capable of playing its role effectively is hinged on an effective legal system. The law of finance projects that legal traditions that promote the protection of private property rights and the rights of investors as well as easily adaptable to

changing economic and financial conditions should play a crucial role in promoting financial activities and stimulating inclusive finance. Further, AML regulations increase customer confidence in the financial system and safeguard the financial system from illicit elements entering it, enhancing its stability and soundness. We therefore posit in this study that an effective AML framework should promote financial inclusion in Sub-Saharan African countries.

Empirically, Jayasekara (2020), using the FATF's assessment of countries on the effectiveness of their local AML laws as well as their compliance to FATF AML recommendations, explored the influence of the effectiveness of AML regimes on financial inclusion. The study found that the AML/ CFT compliance level of a country is a significant driver of inclusive finance. Additionally, using the most recent dynamic panel threshold regression technique developed by Seo et al. (2019) for a panel of 212 economies around the world, Ofoeda (2022) examined the effect of AML regulations on financial inclusion across the globe. Their study found that below the threshold of AML regulations, AML regulations promote financial inclusion, however, above the thresholds, AML regulations harm financial inclusion. Further, Esoimeme (2020) critically examined how AML measures of the UK and Nigeria promote financial inclusion. Using documentary research, the study reported that countries could balance their AML controls with the financial inclusion efforts of financial institutions. The study further noted that the AML controls in the UK strike a fair balance between inclusive finance and AML controls, while there is no balance between AML control and financial inclusion in Nigeria.

Again, Kodongo (2018) explored the impact of financial regulation on financial inclusion in Kenya. The study employed the probit regression and used agency banking regulations, knowyour-customer rules, and capital and liquidity macro-prudential regulations as measures of financial regulations. The study reported that agency banking regulations improve formal financial access while know-your-customer rules and capital and liquidity macro-prudential regulations hamper financial inclusion. In a related study, Anarfo et al. (2020) examined how financial regulations proxied by capital adequacy influence inclusive finance in SSA. Their study further examined the moderating role of financial stability on the financial regulations-financial inclusion nexus. They employed the mixed fixed effects model and provided evidence that tightening prudential regulations could negatively impact access to finance.

Additionally, Issah et al. (2022) investigated how AML regulations affect banking sector stability in 51 African countries. Using a two-step Systems Generalised Moments Methods (SGMM), they found that AML regulations have a significant positive impact on Africa's banking sector stability. Again, they discovered the positive impact of AML regulations on banking sector stability is more pronounced for countries above the mean. Further, Ofoeda, Agbloyor, Abor and Osei (2020) examined the effect of AML regulations on financial sector development across 165 economies of the world. They employed the Basel AML Index to proxy AML regulations and used the Prais-Winsten and the Hansen (2000) panel threshold regression analysis. According to their research, anti-money laundering regulations generally boost financial sector development; however, this benefit is concentrated in developing economies. They also discover evidence of anti-money laundering regulations' threshold effects. The favorable effect of anti-money laundering legislation on financial development is concentrated in countries below the threshold value of anti-money laundering regulations. Additionally, Balani (2019) assessed the impact of the introduction of antimoney laundering (AML) regulations on bank stock valuations in the USA. They used event studies and cross-sectional regression analysis to estimate the expected relationships. Their study suggested that the implementation of AML regulations in 1998 positively impacted bank stock valuations, while the USA PATRIOT Act legislation of 2001 had a negative impact. Following the preceding discussions, we hypothesized that AML regulations significantly influence financial inclusion in Sub-Saharan Africa. Again, we hypothesized that the impact of AML regulations on financial inclusion differ based on the level of AML regulatory effectiveness. In other words, the impact of AML regulations on financial inclusion differ below or above the mean of AML regulations.

3. Methodology

This section discusses the empirical approach and the data adopted in this study. The study focuses on forty-four (44) SSA countries and uses data ranging from 2012 to 2019 due to data availability. Data for AML regulations is collected from the Basel Institute of Governance while data for the other variables employed in the study are collected from the World Development Indicators.

3.1. Empirical model specification

This section specifies the empirical model in line with the hypothesized relationships and the study's objectives. The study specifies the following dynamic panel models in line with existing literature (see Anarfo et al., 2020; Asuming et al., 2019; Kodongo, 2018);

$$FIN_{it} = \beta_1 FIN_{it-1} + \beta_2 AMLR_{it} + \beta_3 Z_{it} + \varepsilon_{it}$$
(1)

Where FIN_{it} represents financial inclusion of country i in time t and is measured using five (5) proxies (accounts ownership, number of bank branches, deposits, borrowers and mobile money accounts). FIN_{it-1} denotes the lag of financial inclusion. AMLR_{it} represents the AML regulations index. The vector Z_{it} denotes the control variables. The β terms represents the coefficients of the respective variables. $\varepsilon_{it} = \mu_i + v_{it}$ and μ_i represents the individual country effects.

3.2. Description and measurement of variables of the study

In this section, the study describes and measures the variables in the empirical model. Further, the section describes the data used in the empirical analysis. The study provides a theoretical justification for including each variable in the specified model. The appropriate proxy or measurement for financial inclusion has been controversial in extant literature. While some studies employed single indicators (see Chima et al., 2021; Ghosh, 2021), others employed the composite index (see Ajide, 2020; Anarfo et al., 2020) as a proxy for financial inclusion. However, this study employed multiple indicators for financial inclusion in line with the literature (see Inoue & Hamori, 2016; Kim et al., 2018; Van et al., 2019). The study used bank accounts per 1,000 adults, bank branches per 100,000 adults, depositors with commercial banks per 1,000 adults, banks' borrowers per 1,000 adults, and the number of ATMs as financial inclusion: access and usage. Unlike the composite financial inclusion index, individual dimensions of financial inclusion allow for unique policy recommendations.

Further, to measure AML regulations, the study used the Basel AML Index. The Basel AML Index, issued by the Basel Institute on Governance, is used to assess AML regulations. The index assesses countries' money laundering risks and the effectiveness of their anti-money laundering regulatory frameworks. The index is based on the effectiveness of a country's AML framework or regime in combating money laundering and terrorist financing (65%); the prevalence of bribery and corruption (10%); the existence of standards and financial transparency in the business sector (15%); the extent of accountability and transparency in the public sector (5%); and the legal and political risks that countries face (5%). Countries are rated on a scale of 0 to 10, with 0 indicating the lowest risk and 10 indicating the greatest. For easy interpretation, we use the formula 1*(AMLR-10) provided by Ofoeda etal. (2020) and Ofoeda et al. (2022) to rescale the AML regulations index, with higher values denoting a robust AML framework and lower values denoting weak AML frameworks.

In line with the literature (see Anarfo et al., 2019, 2020; Corrado, 2020; Ofosu-Mensah Ababio et al., 2021), the study controlled for economic growth, institutional quality, infrastructural development, inflation, human capital development, financial stability and bank concentration. Economic growth is expected to influence inclusive finance because wealthy nations are likely to be more financially inclusive, as those with higher incomes are more likely to use financial services and products than those with lower incomes (Anarfo et al., 2019). Economic growth is defined as the increase in real GDP per capita. Again, the quality of institutions in a jurisdiction plays a key role

in fostering financial inclusion. Institutions foster social cohesion by removing the financial exclusion, strengthening the financial system's capacity to attract clients, increasing accessibility to financial services, and diversifying the sources of access to financial services (Ongo Nkoa & Song, 2020). We measure the quality of institutions by taking the simple average of the six World Governance Indicators (i.e. control of corruption, government effectiveness, political stability, voice and accountability, the rule of law and regulatory quality).

Further, the development of basic infrastructure helps increase consumer and corporate access to a variety of banking services at a reasonable cost. Infrastructure, in particular, supports penetration, accessibility, and use, lowering the risks and costs associated with delivering financial services to low-income individuals and micro and small businesses (Ongo Nkoa & Song, 2020). We use telephone plus mobile subscriptions per 100 people to measure infrastructure. Again, lower inflation rates contribute to macroeconomic and financial sector stability. As a result, a reduced inflation rate is predicted to increase financial inclusion (Anarfo et al., 2019). The study measures inflation using the consumer price index. In addition, educated people can better appreciate and patronize financial services such as mobile banking, internet banking, operating bank accounts and other financial services. This suggests that the more educated the population, the more financial services are available. Therefore, human capital development is expected to stimulate financial inclusiveness (Lachebeb et al., 2021; Ofosu-Mensah Ababio et al., 2021). We measure human capital as the percentage of secondary school enrolment for all eligible children.

Again, a sound and stable financial system devoid of the financial crisis should encourage financial inclusion (Anarfo et al., 2019). Customer trust and confidence in the financial systems are crucial factors in stimulating financial inclusion. However, customer trust and confidence in the financial system are undermined by liquidity challenges, high-performing loans, and very low capital adequacy ratios, which are signs of instability in the financial sector. We measure financial stability using a z-score calculated as $\left(\frac{E/A_{it}+ROA_{it}}{\partial ROA_{i}}\right)$, where E/A_{it} is equity to total assets, ROA_{it} is return on assets and ∂ROA_{it} standard deviation of return on assets. Finally, financial service accessibility is at the heart of every financial inclusion program. Therefore, bank concentration may impede governments' financial services available to everyone, regardless of socioeconomic rank, social class or location. Therefore, a more concentrated banking environment restricts financial access to everyone. We measure bank concentration by the extent of concentration of deposits in the 5 largest banks. We present the variables, their measurements and sources of data in Table 1.

3.3. Estimation technique

We employ the two-step system generalized method of moments (SGMM) estimator in estimating our hypothesized relationships. There are two classes of the GMM estimator, namely, the systems and the difference GMM. The SGMM avoids the drawbacks of the difference GMM, which is biased because it uses lagged levels of explanatory variables as instruments. Furthermore, the country-specific effect is eliminated using the difference GMM estimator. To deal with the issue of weak instruments, the SGMM adds a level equation to the difference equation (Roodman, 2009). The two-step SGMM introduced by Blundell and Bond (1998) was designed to deal with higher persistent data. We use the two-step SGMM once more because it is particularly useful for studies with shorter time periods than the number of countries which our dataset has. Furthermore, using the two-step SGMM approach, we will treat financial inclusion as a dynamic process in which past financial inclusion influences current financial inclusion.

4. Empirical results

This section presents the descriptive statistics for the selected variables and findings from the twostep system GMM estimation technique. In Table 2, we present the summary statistics of the variables used in the study. The study reported a mean of 40.42 for accounts ownership per 1000 adults in Sub-Saharan Africa. The study reported a mean of 8.59 for the number of commercial

Table 1. Variable descriptions and data sources						
Variable	Variable Measurement	Data Source	Reference			
Financial Inclusion	Accounts Ownership Commercial Bank Deposit Commercial Bank Branches Bank Borrowers Automated Teller Machines	World Development Indicators (WDI)	World Development Indicators DataBank (worldbank.org)			
AML regulations Index	Basel AML index	Basel Institute on	Basel AML Index Basel Institute on Governance (baselgovernance.org)			
Economic Growth	The growth of real GDP per capita	WDI	World Development Indicators DataBank (worldbank.org)			
Institutional Quality	The simple Average of the Six World Governance Indicators	World Governance Indicators (WGI)	Worldwide Governance Indicators DataBank (worldbank.org)			
Infrastructure	Telephone + Mobile subscriptions per 100 people	WDI	World Development Indicators DataBank (worldbank.org)			
Inflation	Consumer Price Index	WDI	World Development Indicators DataBank (worldbank.org)			
Bank Concentration	Concentration of Deposits in 5 Largest Banks	WDI	World Development Indicators DataBank (worldbank.org)			
Human Capital	Percentage of Secondary school enrolment	WDI	World Development Indicators DataBank (worldbank.org)			
Financial Stability	$Z\text{-score}\left(\frac{E/A_{it}+ROA_{it}}{\partial ROA_{it}}\right)$	WDI	World Development Indicators DataBank (worldbank.org)			

bank branches per 100,000 adults. Further, the average for depositors with commercial banks per 1,000 adults is 519.28, while commercial banks' borrowers per 1,000 adults reported an average of 127.65. Again, the number of automated teller machines per 100,000 adults reported an average of 17.625. The findings of the study suggest that the level of financial inclusion is quite low in Sub-Saharan African countries. For instance, the Global Findex Database reported that, globally, the number of adults having accounts with financial institutions or mobile money service providers is 68 percent (Demirgüç-Kunt et al., 2018). This is far higher than the 40.42 percent reported by SSA countries. The low levels of financial inclusion may be due to the low literacy rates, the low-income levels, mistrust for financial institutions, proximity of financial institutions and financial services, high cost of financial services, poor financial sector and financial services regulation etc.

Further, the study reported a mean of 3.631 for the AML regulations index. The rescaled index spans from 0 to 10, with 0 being the least effective anti-money laundering regulation (highest risk level) and 10 representing the most effective anti-money laundering regulation (lowest risk level). As a result, the mean of 3.631 indicates a somewhat weak anti-money laundering system in SSA. This is supported by the Basel Institute on Governance's (2021) research, which shows that countries' AML systems are ineffective (Basel Institute on governance, 2021). According to the survey, 17 percent of countries received a zero for their efficiency in preventive measures. Again, Basel Institute on governance (2021) indicates that SSA has the highest overall risk score of all regions. The weak AML regulatory effectiveness may be accounted for by increased risks of bribery and corruption, poor financial and public sector transparency/standards, unstable political environment etc.

Table 2. Summary statistics					
Variable	Obs	Mean	Std. Dev.	Min	Max
Accounts Ownership	351	40.421	23.252	5.527	98.594
Bank Branches	351	8.588	11.646	0.648	54.362
Depositors	351	519.28	580.808	24.354	2173.18
Borrowers	351	127.652	152.305	0.566	880.957
ATM	351	17.625	23.576	0.395	101.503
AML Regulations	351	3.631	1.246	1.541	7.222
Institutional Quality	351	29.283	19.442	0.314	77.48
Inflation	351	171.807	276.149	103.411	453.71
Infrastructure	351	82.452	42.676	11.242	218.74
Economic Growth	351	1.201	4.388	-36.557	18.053
Financial Stability	351	11.943	6.342	0.25	44.413
Bank Concentration	351	81.696	15.553	40.245	100
Human Capital Development	351	60.209	28.188	12.467	158.458

Where financial inclusion is measured using five (5) proxies (accounts ownership, number of bank branches, depositors, borrowers and automated teller machines). AML regulations index is measured using the Basel Antimoney Laundering Index published by the Basel Institute on Governance. We take the inverse of the index following Agoba et al. (2019). Economic growth is measured by the growth rate of GDP per capita. The simple average of the World Governance Indicators' six (6) dimensions is used to measure institutional quality, whereas the consumer price index measures inflation. Telephone and mobile subscriptions per 100 people are used to measure infrastructure. The bank z-score is used to measure financial stability, whereas bank concentration is defined as the degree of deposit enrolled in secondary education.

4.1. The effect of AML regulations on financial inclusion

Further, the study examines the impact of AML regulations on the financial inclusion of Sub-Saharan African countries. AML regulations are expected to foster trust and confidence in the financial system, prevent criminal elements from infiltrating financial systems, defend the integrity of financial systems, improve financial institutions' reputations, and promote good governance and prudent management of financial institutions. Consequently, AML regulations are expected to promote inclusive finance. The study presents the Systems Generalized Methods of Moments (SGMM) estimation results in Tables 3, 4 and 5. The study presents the results for the full sample in Table 3 in models 1–5, countries below the mean of AML regulations in Table 4 in models 6–10 and countries above the mean of AML regulations in Table 5 in models 11-15. From models 1 and 2, the study reports that AML regulations negatively impact accounts ownership and the number of commercial bank branches. This indicates that AML regulations stymie the account's ownership and the number of bank branches across SSA. Although unexpected, this result is possible due to the informal, unregulated, undocumented and pervasive cash economy in most SSA economies. An effective AML regulatory framework requires transparency and proper 'know your customer principles. This means that customers must provide proof of their identity and address, such as ID card verification and/or document verification. However, because most SSA economies are highly informal, citizens may not be able to pass the basic identification and verification processes as the requirement by most AML regulatory frameworks. This has the potential to limit people's ability to open accounts and, therefore, frustrate the financial inclusion efforts of SSA countries. This is corroborated by the Global Findex Report, which indicates that millions of people in SSA remain unbanked due to the lack of identification documentation (Demirgüc-Kunt et al., 2022)

Table 3. Two-step systems GMM regression results on the effect of AML regulations on financial inclusion					
	(1)	(2)	(3)	(4)	(5)
	Account Ownership	Bank Branches	Depositors	Borrowers	АТМ
Lag of Accounts Ownership	.812***				
	(.087)				
Lag of Bank Branches		0.987***			
		(0.013)			
Lag of Depositors			1.011***		
			(.023)		
Lag of Borrowers				0.772***	
				(0.121)	
Lag of ATM					1.023***
					(0.016)
AML Regulations	-1.756***	-0.467***	3.309***	3.374***	0.473**
	(.433)	(0.092)	(.048)	(0.962)	(0.182)
Institutional Quality	.257***	0.023***	.037	0.214***	0.025
	(.072)	(0.005)	(.491)	(0.012)	(0.015)
Inflation	004***	-0.003***	214***	-0.115***	0.004
	(.001)	(0.001)	(.039)	(0.017)	(0.005)
Infrastructure	.022***	0.005**	.465**	0.187***	0.005***
	(.002)	(0.002)	(.184)	(0.034)	(0.001)
Economic Growth	.005***	0.003*	.006**	0.001	0.004***
	(.001)	(0.001)	(.003)	(0.001)	(0.001)
Financial Stability	.569***	0.113***	.527	0.435***	0.039
	(.187)	(0.014)	(1.667)	(0.089)	(0.043)
Bank Concentration	232***	-0.013***	394	-0.834***	-0.123***
	(.061)	(0.004)	(.441)	(0.215)	(0.008)
Human Capital	.246***	-0.003	.166***	0.222	0.012*
	(.045)	(0.002)	(.038)	(0.230)	(0.006)
Constant	.889***	0.517	-5.398***	-6.875**	0.945***
	(.278)	(0.479)	(1.687)	(2.736)	(0.102)
Observations	308	308	308	308	308
Country Effects	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes
No. of groups	44	44	44	44	44
No. of instruments	33	31	29	31	32
Prob>F	.000	0.000	.000	0.000	0.000
AR (1)	.001	0.003	.015	0.011	0.012

(Continued)

Table 3. (Continued)						
	(1)	(2)	(3)	(4)	(5)	
	Account Ownership	Bank Branches	Depositors	Borrowers	АТМ	
AR (2)	.244	0.369	.278	0.278	0.258	
Hansen Test	.266	0.286	.248	0.349	0.238	

Robust standard errors are in parentheses *** p < .01, ** p < .05, * p < .1

Again, AML/CFT restrictions also tend to raise transaction costs. This may lead financial institutions to abandon low-value transactions and client markets, which affect the ability of banks to branch. For instance, the LexisNexis Risk Solutions Report 2021 indicated that about 63% of stakeholders in the financial system believe that AML compliance adversely affects financial institutions' productivity and customer acquisition (LexisNexis Risk Solutions, 2021). Again, the finding of this study is supported by the works of Bester et al. (2008). Further, the negative impact of AML regulations on the number of commercial bank branches is possible because AML requirements frequently impose high compliance costs on financial institutions in the form of employee training, reporting, and transaction expenses, among other things, and hence limit their capacity to extend their branch networks. Again, AML restrictions in the areas of know-your-customer and customer due diligence processes may impede banks' ability to branch into poor neighbourhoods, as most poor people are unable to meet these AML standards. This result is supported by Demirgüç-Kunt et al. (2018), who found that AML regulations frustrate the ability of banks to branch across the globe. Again, this finding resonates with Anarfo et al. (2020a), who found that prudential regulation may hamper financial inclusion and in line with the work of Ofoeda (2022).

Furthermore, the study found a positive effect of AML regulations on the number of commercial bank depositors, the number of commercial bank borrowers, and ATMs in models 3 to 5. AML regulations are expected to foster trust and confidence in the financial system, prevent criminal elements from infiltrating financial systems, defend the integrity of financial systems, improve financial institutions' reputations, and promote good governance and prudent management of financial institutions. Hence, countries that have employed robust AML regulatory frameworks are expected to benefit in terms of enhanced inclusive finance. For instance, enhanced customer confidence as a result of effective AML regulatory systems encourage customers to deposit their funds in financial institutions as they are assured of the safety of their funds. Again, improved, well-managed, and developed financial systems can offer diverse products and services to customers irrespective of their socio-economic status, and offer financial assistance to clients. Furthermore, the study provides evidence that AML regulations promote bank borrowings. Financial systems with effective AML regulatory frameworks are seen to be robust and stable and are, therefore, in a better position to give out more loans. Akinlo and Oni (2015) noted that a more healthy and stable banking sector stimulates credit growth. Additionally, effective AML regulation promotes the installation and use of ATM facilities to promote inclusive finance. ATMs are major means of promoting inclusive finance as they guarantee unrestricted access to customer funds at any time. The findings of Kodongo (2018), which claim that agency banking laws enhance financial inclusion, back this up.

Further, the study controlled for institutional quality, inflation, infrastructure, economic growth, financial stability, bank concentration and human capital. The study reported a positive impact of institutional quality on financial inclusion, as presented in models 1, 2 and 4. This means that an improved institutional environment should help promote financial inclusiveness. Institutions foster social cohesion, strengthen financial institutions, promote financial sector stability, and therefore are expected to promote financial inclusion. Again, institutions enhance client trust and confidence in the financial system, thereby promoting inclusive finance. This finding is in agreement with Ongo

Table 4. Two-step systems GMM regression results on the effect of AML regulations on financial inclusion of countries below the mean					
	(6)	(7)	(8)	(9)	(10)
	Accounts Ownership	Bank Branches	Depositors	Borrowers	АТМ
Lag of Accounts Ownership	.364**				
	(.157)				
Lag of Bank Branches		1.009***			
		(0.031)			
Lag of Depositors			1.007***		
			(.129)		
Lag of Borrowers				0.942***	
				(0.116)	
Lag of ATM					1.014***
					(0.054)
AML Regulations	.835	0.693***	.753	0.543**	-0.064
	(.772)	(0.066)	(.634)	(0.218)	(1.783)
Institutional Quality	.107**	-0.003	885	0.167*	0.002
	(.046)	(0.007)	(1.985)	(0.089)	(0.034)
Inflation	003	-0.003***	022**	-0.006	0.001
	(.003)	(0.001)	(.01)	(0.007)	(0.002)
Infrastructure	.031	0.004**	.145***	0.147**	-0.002
	(.07)	(0.002)	(.002)	(0.065)	(0.008)
Economic Growth	.003*	0.004***	.002	0.004***	0.005**
	(.002)	(0.001)	(.019)	(0.001)	(0.002)
Financial Stability	.681***	0.008	2.056**	0.047	0.123**
	(.045)	(0.019)	(.885)	(0.795)	(0.044)
Bank Concentration	886**	-0.003	253***	0.226	0.124***
	(.392)	(0.014)	(.099)	(0.667)	(0.020)
Human Capital	.043	0.006**	.032	0.375***	0.005
	(.09)	(0.003)	(.441)	(0.034)	(0.009)
Constant	.665***	0.991***	391***	0.906**	0.685***
	(.124)	(0.177)	(.058)	(0.435)	(0.057)
Observations	170	170	170	170	170
Country Effects	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes
No. of groups	28	28	28	28	28
No. of instruments	15	18	16	15	20
Prob>F	.000	0.000	.000	0.000	0.000
AR (1)	.011	0.023	.011	0.015	0.016

(Continued)

Table 4. (Continued)						
	(6)	(7)	(8)	(9)	(10)	
	Accounts Ownership	Bank Branches	Depositors	Borrowers	АТМ	
AR (2)	.434	0.519	.318	0.208	0.345	
Hansen Test	.316	0.432	.211	0.342	0.267	

Robust standard errors are in parentheses *** p < .01, ** p < .05, * p < .1

Nkoa and Song (2020), who provided evidence that institutional quality increases financial inclusion as well as the penetration, accessibility, and use of financial services in Africa. Additionally, the study found a negative impact of inflation on financial inclusion, as presented in models 1–4. This suggests that inflationary pressures frustrate the financial inclusion efforts of SSA countries. This is because higher inflation rates reduce the real income of the citizenry, frustrate the operations and stability of businesses and therefore affect their ability to patronize financial services.

In models 1–5, the study found that infrastructure positively impacts financial inclusion. The results suggest that improved infrastructure should promote inclusive finance. The provision of quality infrastructure supports the penetration, accessibility, and use of financial services by lowering the risks and costs associated with delivering financial services to low-income individuals and micro and small businesses. Further, the study found a positive relationship between economic growth and financial inclusion. This means that countries that experience higher growth rates are more likely to be financially included than countries with lower growth rates. Economic growth largely suggests economic prosperity, and therefore, countries are able to allocate enough resources to combating the hindrances of inclusive finance. In addition, in models 1, 2 and 4, the study established that financial stability positively impacts financial inclusion. This indicates that a more stable financial sector is able to make financial services available to a lot more people. Customer trust and confidence in the financial system are crucial in stimulating financial inclusion. An unstable financial system that is on the verge of collapse cannot foster customer trust and confidence, which are important ingredients in promoting inclusive finance.

Further, bank concentration produced a negative coefficient in models 1,2, 4 and 5. This means that a more concentrated and less competitive financial sector stymies financial inclusion. Better financial access is making financial services available to everyone, regardless of socioeconomic status, social class, or geographic location. As a result, a highly concentrated banking sector inhibits everyone's financial access. Most SSA countries are plagued with poor road networks and internet and telecommunication networks. Therefore, having a concentrated banking system may cut a lot of people out of the formal financial system. This is because people may find it almost an impossibility to reach financial institutions and therefore are financially excluded. Finally, the study found that human capital positively influences financial inclusion in models 1,3 and 5. This means that countries with a more educated and developed labour force are more financially included. This is possibly so because more educated people are in a better position to understand and use financial services. More also, more educated people are expected to have improved income levels, enabling them to use financial services. This is confirmed by the works of Lachebeb et al. (2021).

4.2. The effect of AML regulations on financial inclusion above or below the mean of AML regulations

Beyond assessing the impact of AML regulations on financial inclusion for our full sample, we establish the impact of AML regulations on financial inclusion based on the effectiveness of the AML regulatory framework of a country. We argue that the impact of AML regulations on financial inclusion may be different at different levels of financial inclusion. The study runs two separate

Table 5. Two-step systems GMM regression results on the effect of AML regulations on financial inclusion of countries above the mean					
	(11)	(14)	(15)		
	Accounts	Bank			
	Ownership	Branches	Depositors	Borrowers	ATM
Lag of Accounts Ownership	0.741**		-		
`	(0.335)				
Lag of Bank Branches		0.955***			
		(0.102)			
Lag of Depositors			0.989***		
			(0.097)		
Lag of Borrowers				0.728***	
				(0.111)	
Lag of ATM					0.946***
					(0.081)
AML Regulations	-0.127**	-0.312	3.435***	1.750***	1.475***
	(0.061)	(0.170)	(0.916)	(0.419)	(0.272)
Institutional Quality	0.541***	0.237***	0.374	0.111	0.058
	(0.123)	(0.013)	(0.904)	(0.552)	(0.196)
Inflation	-0.082**	-0.023**	-0.090	-0.441***	0.022**
	(0.029)	(0.008)	(0.771)	(0.144)	(0.011)
Infrastructure	0.227***	0.001	0.335*	0.372***	0.053
	(0.012)	(0.014)	(0.186)	(0.033)	(0.151)
Economic Growth	0.002	0.005***	0.006	0.004**	0.003***
	(0.003)	(0.001)	(0.006)	(0.002)	(0.001)
Financial Stability	0.922*	0.002	0.779	0.323***	0.163**
	(0.479)	(0.04)	(0.587)	(0.094)	(0.076)
Bank Concentration	-0.538***	0.003	-0.666***	-0.502***	0.114***
	(0.123)	(0.012)	(0.268)	(0.085)	(0.019)
Human Capital	0.130***	0.002	-0.001	0.465	0.004
	(0.012)	(0.009)	(0.206)	(0.485)	(0.029)
Constant	3.466*	1.63***	4.66***	4.404***	4.520***
	(1.876)	(0.533)	(1.146)	(0.230)	(0.317)
Observations	117	117	117	117	117
Country Effects	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes
No. of groups	22	22	22	22	22
No. of instruments	16	17	19	16	15
Prob>F	0.000	0.000	0.000	0.000	0.000
AR (1)	0.049	0.031	0.004	0.017	0.006

(Continued)

Table 5. (Continued)						
	(11)	(12)	(13)	(14)	(15)	
	Accounts Ownership	Bank Branches	Depositors	Borrowers	АТМ	
AR (2)	0.313	0.268	0.315	0.345	0.267	
Hansen Test	0.288	0.365	0.134	0.368	0.215	

Robust standard errors are in parentheses *** p < .01, ** p < .05, * p < .1

models where the mean of the AML regulations was used to split the countries into a high level of effectiveness and a low level of effectiveness. Countries above the mean of AML regulations are classified as high-effectiveness countries, while countries with AML regulations below the mean are classified as low-effectiveness countries. The mean of AML regulations is 3.631. The study presents the results below the mean (low-effectiveness) in Table 4 and above the mean (high-effectiveness) in Table 5.

In Table 4, the study provided evidence that AML regulations positively impact the number of commercial bank branches and the number of borrowers in low-effectiveness countries (countries with AML regulations below the mean). Although our study reported a negative impact of AML regulations on commercial bank branching, we find that AML regulations positively promote bank branching below the mean. This means AML regulations foster branching at low levels of AML regulatory effectiveness. This, although not expected, especially in Africa, is possible. AML compliance is quite expensive, especially for SSA countries which are mostly poor. These compliance requirements increase the cost of branching as banks are expected to implement AML controls at all branches. This may discourage banks from branching out, especially in poor rural areas. Therefore, when AML compliance requirements are quite low or weak, it may encourage banks to branch into those communities. Again, borrowings by the poor and illiterate may be limited as they may not meet the requirements for such credit facilities due to AML compliance requirements. However, in countries with low AML compliance requirements, these poor low-end clients may be able to access credit facilities from the banks.

Further, in Table 5, the study reported that AML regulations have a negative impact on accounts ownership in high-effectiveness countries (countries with AML regulations above the mean). This suggests that stronger AML regulations frustrate the ability of SSA countries to foster account ownership of people. This is because AML compliance is an expensive enterprise for institutions. Therefore, excessive AML regulatory requirements tend to increase transaction costs, making it expensive for the poor to get enrolled in the formal financial system. Again, extensive AML regulations mean more requirements, especially customer identification and verification. These robust "know your customer" requirements often occasioned by AML regulatory compliance may limit the account opening abilities of people as they may not meet the basic "know your customer" requirements that are required by AML regulations. This is particularly important in SSA countries, where most economies are largely informal and have a large number of illiterates.

Finally, the study reported that AML regulations positively influence the number of depositors, the number of commercial bank borrowers and the number of ATMs. This indicates that AML regulations promote depositors, borrowers, and the number of ATMs for countries above the mean. Further, the study's results suggest that the positive impact of AML regulations on the number of depositors, borrowers and ATMs is more pronounced in countries with higher effectiveness of AML regulations. Due to the high incidence of money laundering in SSA, a more effective and robust AML regulatory framework is expected to engender the trust and confidence of clients in financial

institutions and the entire financial system. Again, a high incidence of money laundering may lead to the deterioration and instability of financial institutions. Therefore, implementing a sound and robust AML regulatory framework in SSA should promote deposit mobilization of financial institutions. Further, Ofoeda etal. (2020) noted that AML regulations promote prudent management of financial institutions, financial sector development and stability. Therefore, a more developed and stable financial system is better positioned to support credit growth. Finally, ATMs leave the door open to classic money laundering techniques such as "smurfing" and microstructuring. Financial institutions with weak AML systems may further expose themselves to money laundering risk by installing ATMs which limits the deployment of ATMs by these financial institutions. Consequently, countries and financial institutions with effective AML systems are able to deploy more ATMs. Undoubtedly, a more robust AML regulatory framework should promote deposit mobilization, credit growth and ATM deployment. This is in line with Ofoeda (2022), who found a positive impact of AML regulations on financial inclusion above the threshold.

5. Conclusion and policy recommendations

This study primarily aimed to examine the impact of AML regulations on financial inclusion in Sub-Saharan Africa. It specifically assessed the influence of AML regulations on the number of accounts ownership, the number of depositors, the number of borrowers, the number of bank branches and the number of ATMs. It further investigated how the level of effectiveness of AML regulations determines how AML regulations affect financial inclusion. The study established that the impact of AML regulations on financial inclusion differs based on the proxy of financial inclusion employed. For instance, the study provided evidence that AML regulations adversely impact accounts ownership and the number of commercial bank branches, whereas AML regulations foster the number of commercial bank depositors, the number of commercial bank borrowers and the number of ATMs. The study further reported that AML regulations positively impact the number of commercial bank branches and the number of borrowers in low-effectiveness countries (countries with AML regulations below the mean). For countries above the mean (high-effectiveness countries), AML regulations are reported to have a negative impact on accounts ownership while they have a positive influence on the number of depositors, the number of commercial bank borrowers and the number of ATMs. Hence, we conclude that AML regulations impact financial inclusion. Nonetheless, AML regulations' impact on financial inclusion depends on the proxy of financial inclusion. Again, we conclude that the extent of AML regulatory effectiveness is crucial in determining the impact of AML regulations on financial inclusion.

The study draws clear policy implications from the findings and conclusions of the study to inform policy as follows; First, the main policy implication of this study is that AML regulations impact financial inclusion differently. The different proxies of financial inclusion react differently to AML regulations. Second, policymakers and regulators should appreciate that the impact of AML regulations on financial inclusion is also determined by the level of AML regulatory effectiveness of a country. For instance, to improve the number of commercial bank depositors, the number of commercial bank borrowers, and the number of ATMs, AML regulations should be strengthened. Although our research adds to our understanding of the AML regulations-financial inclusion nexus, future research might examine the influence of the Basel AML Index's many components on financial inclusion. This is particularly important when AML regulations' impact on financial inclusion depends on the proxy of financial inclusion used. Again, we acknowledge that the AML framework in each nation may differ. As a result, the potential for AML regulations to promote financial inclusion may vary per country. Future research should look into how AML regulatory structures in different countries affect financial inclusion efforts. Furthermore, the study's limited data period (2012-2019) is another issue. A longer data set would have allowed us to examine the influence of AML regulations on financial inclusion throughout periods of relative economic stability as well as times of global crisis.

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Data availability statement

The data that support the findings of this study are openly available in World Development Indicators at http://data topics.worldbank.org/world-development-indicators/and the Basel Institute of Governance at https://www.baselgo vernance.org/basel-aml-index/public-ranking

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References

- Agoba, A. M., Abor, J. Y., Osei, K., Sa-Aadu, J., Amoah, B., & Dzeha, G. C. O. (2019). Central bank independence, elections and fiscal policy in Africa: Examining the moderating role of political institutions. *International Journal of Emerging Markets*, 14(5), 809–830. https:// doi.org/10.1108/IJOEM-08-2018-0423
- Ajide, F. M. (2020). Can financial inclusion reduce the presence of corruption? Evidence from selected countries in Africa. International Journal of Social Economics, 47(11), 1345–1362. https://doi.org/10. 1108/ijse-03-2020-0145
- Akinlo, A. E., & Oni, I. O. (2015). Determinants of bank credit growth in Nigeria 1980-2010. European Journal of Sustainable Development, 4(1), 23–30. https://doi. org/10.14207/ejsd.2015.v4n1p23
- Anarfo, E. B., Abor, J. Y., & Osei, K. A. (2020). Financial regulation and financial inclusion in Sub-Saharan Africa: Does financial stability play a moderating role? *Research in International Business and Finance*, 51, 101070. https://doi.org/10.1016/j.ribaf.2019.101070
- Anarfo, E. B., Abor, J. Y., Osei, K. A., & Gyeke-Dako, A. (2019). Monetary policy and financial inclusion in Sub-Sahara Africa: A panel VAR approach. Journal of African Business, 20(4), 549–572. https://doi.org/10. 1080/15228916.2019.1580998
- Asiedu, E. (2002). On the determinants of foreign direct investment to developing Countries: Is Africa different? *World Development*, 30(1), 207–119. https://doi.org/10.1016/S0305-750X(01)00100-0
- Asongu, S. A., Nwachukwu, J. C., & Aziz, A. (2018). Determinants of mobile phone penetration: Panel threshold evidence from Sub-Saharan Africa determinants of mobile phone penetration: panel threshold evidence from Sub-Saharan Africa. Journal of Global Information Technology Management, 21(2), 81–110. https://doi.org/10.1080/1097198X.2018. 1462069
- Asuming, P. O., Osei-Agyei, L. G., & Mohammed, J. I. (2019). Financial inclusion in Sub-Saharan Africa:

Recent trends and determinants. Journal of African Business, 20(1), 112–134. https://doi.org/10.1080/ 15228916.2018.1484209

- Babajide, A. A., Lawal, A. I., Amodu, L. O., Ewetan, O. O., Esowe, S. L., & Okafor, T. C. (2020). Financial institutions concentration and financial inclusion penetration in Nigeria: A comparative analysis. *Journal of Contemporary African Studies*, 38(4), 610–626. https://doi.org/10.1080/02589001.2020.1822991
- Balani, H. (2019). Assessing the introduction of anti-money laundering regulations on bank stock valuation: An empirical analysis. *Journal of Money Laundering Control*, 22(1), 76–88. https://doi.org/10. 1108/JMLC-03-2018-0021
- Basel Institute on governance. (2021). Basel AML index: 10th public edition - Ranking money laundering and terrorist financing risks around the world. https:// baselgovernance.org/sites/default/files/2021-09/ Basel AML Index 2021 10thEdition.pdf
- Bester, H., Chamberlain, D., De Koker, L., Hougaard, C., Short, R., Smith, A., & Walker, R. (2008). Implementing FATF standards in developing countries and financial inclusion: Findings and guidelines. Washington, DC: FIRST initiative, the World Bank. https://www.findevgateway.org/sites/ default/files/publications/files/mfg-en-paper-imple menting-fatf-standards-in-developing-countriesand-financial-inclusion-findings-and-guidelinesfeb-2008.pdf
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. https://doi. org/10.1016/S0304-40769800009-8
- Chima, M. M., Babajide, A. A., Adegboye, A., Kehinde, S., & Fasheyitan, O. (2021). The relevance of financial inclusion on sustainable economic growth in Sub-Saharan African nations. Sustainability, 13(10), 1–20. https://doi.org/10.3390/su13105581
- Corrado, G. (2020). Institutional quality and access to financial services: Evidence from European transition economies. *Journal of Economic Studies*, 47(6), 1363–1376. https://doi.org/10.1108/JES-03-2019-0131
- Demirgüç-Kunt, A., & Klapper, L. (2012). Financial inclusion in Africa: An overview. World Bank Policy Research Working Paper, 6088. World Bank. https:// doi.org/10.1093/oxfordhb/9780199687107.013.023
- Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). The global findex database 2021: Financial inclusion, digital payments, and resilience and resilience in the age of CODVID-19. The World Bank. https://doi.org/10.1596/978-1-4648-1897-4
- Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution. World Bank. https://doi.org/10.1596/978-1-4648-1259-0
- Esoimeme, E. E. (2020). Balancing anti-money laundering measures and financial inclusion: The example of the United Kingdom and Nigeria. *Journal of Money Laundering Control*, 23(1), 64–76. https://doi.org/10. 1108/JMLC-04-2018-0031
- Ghosh, S. (2021). How important is trust in driving financial inclusion? Journal of Behavioral and Experimental Finance, 30, 100510. https://doi.org/10.1016/j.jbef. 2021.100510
- Hansen, B. Y. B. E. (2000). Sample splitting and threshold estimation. *Econometrica*, 68(3), 575–603. https://doi. org/10.1111/1468-0262.00124
- Inoue, T., & Hamori, S. (2016). Financial access and economic growth: Evidence from Sub-Saharan Africa.

Emerging Markets Finance and Trade, 52(3), 743–753. https://doi.org/10.1080/1540496X.2016.1116282 Issah, M., Antwi, S., Antwi, S. K., & Amarh, P. (2022). Anti-

money laundering regulations and banking sector stability in Africa. *Cogent Economics & Finance*, 10(1). https://doi.org/10.1080/23322039.2022.2069207 Jayasekara, S. D. (2020). Deficient regimes of anti-money

laundering and countering the financial of terrorism: Agenda of digital banking and financial inclusion. Journal of Money Laundering Control, 24(1), 150–162. https://doi.org/10.1108/JMLC-04-2020-0035

- Kim, D. W., Yu, J. S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*, 43(July 2017), 1–14. https://doi.org/10.1016/j.ribaf.2017.07.178
- Kodongo, O. (2018). Financial regulations, financial literacy, and financial inclusion: Insights from Kenya. Emerging Markets Finance and Trade, 54(12), 2851–2873. https:// doi.org/10.1080/1540496X.2017.1418318
- Lachebeb, Z., Ismail, N. W., Ahmad, M. N. N., & Slesman, L. (2021). The nonlinear impact of political institutional quality on financial inclusion. Jurnal Institutions and Economies, 13(2), 1–25. https://doi.org/10.22452/ IJIE.vol13no2.1
- La Porta, R., Lopez de Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106(6), 1113–1155. https://doi.org/ 10.1086/250042
- LexisNexis Risk Solutions. (2021). True cost of financial crime compliance study. (Issue October). https://risk. lexisnexis.com/insights-resources/research/truecost-of-financial-crime-compliance-study-globalreport
- Mekpor, E. S., Aboagye, A., & Welbeck, J. (2018). The determinants of anti-money laundering compliance among the Financial Action Task Force (FATF) member states. *Journal of Financial Regulation & Compliance*, 26(3), 442–459. https://doi.org/10.1108/ JFRC-11-2017-0103
- Moshi, H. P. B. (2007, October). Fighting money laundering: The challenges in Africa. *Institute for Security Studies (ISS) Paper 152*. https://media.africaportal. org/documents/PAPER152.pdf
- Ofoeda, I. (2022). Anti-money laundering regulations and financial inclusion: Empirical evidence across the globe. *Journal of Financial Regulation & Compliance*, 30(5), 646–664. https://doi.org/10.1108/JFRC-12-2021-0106
- Ofoeda, I., Agbloyor, E. K., & Abor, J. Y. (2022a). Financial sector development, anti-money laundering regulations and economic growth. *International Journal of Emerging Markets*. https://doi.org/10.1108/IJOEM-12-2021-1823
- Ofoeda, I., Agbloyor, E. K., & Abor, J. Y. (2022b). How do anti-money laundering systems affect FDI flows across the globe? *Cogent Economics & Finance*, 10(1). https://doi.org/10.1080/23322039.2022.2058735
- Ofoeda, I., Agbloyor, E. K., Abor, J. Y., & Achampong, K. O. (2022). Foreign direct investment, anti-money laundering regulations and economic growth. *Journal of International Development*, 34(3), 670–692. https:// doi.org/10.1002/jid.3582
- Ofoeda, I., Agbloyor, E. K., Abor, J. Y., & Osei, K. A. (2020). Anti-money laundering regulations and financial sector development. *International Journal of Finance* and Economics, 27(4), 4085–4104. https://doi.org/10. 1002/ijfe.2360
- Ofosu-Mensah Ababio, J., Attah-Botchwey, E., Osei-Assibey, E., & Barnor, C. (2021). Financial inclusion

and human development in frontier countries. International Journal of Finance and Economics, 26 (1), 42–59. https://doi.org/10.1002/ijfe.1775

Ongo Nkoa, B. E., & Song, J. S. (2020). Does institutional quality affect financial inclusion in Africa? A panel data analysis. *Economic Systems*, 44(4), 100836. https://doi.org/10.1016/j.ecosys.2020.100836

Park, C.-Y., & Mercado, R. V. (2018). Financial inclusion: New measurement and cross- country impact assessment. ADB Economics Working Paper Series, No. 539. https://www.econstor.eu/bitstream/10419/ 203379/1/1016259859.pdf

- Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*, 9(1), 86–136. https://doi.org/10.1177/ 1536867x0900900106
- Schoch, M., & Lakner, C. (2020). The number of poor people continues to rise in Sub-Saharan Africa, despite a slow decline in the poverty rate. Data Blog: World Bank Group, 2020(Figure 1), 19. https://blogs. worldbank.org/opendata/number-poor-people-con tinues-rise-sub-saharan-africa-despite-slow-declinepoverty-rate
- Seo, M. H., Kim, S., & Kim, Y. J. (2019). Estimation of dynamic panel threshold model using Stata. Stata Journal, 19(3), 685–697
- Sethi, D., & Acharya, D. (2018). Financial inclusion and economic growth linkage: Some cross country evidence. Journal of Financial Economic Policy, 10(3), 369–385. https://doi.org/10.1108/JFEP-11-2016-0073
- The Sustainable Development Goals Center for and Sustainable Development Solutions Network (2020). Africa SDG Index and Dashboards Report 2020: Leave No One Behind to Achieve the SDGs in Africa (pp. 1– 248). SDG Center for and Sustainable Development Solutions Network. https://s3.amazonaws.com/sustai nabledevelopment.report/2020/2020_africa_index_ and_dashboards.pdf
- Tchamyou, V. S. (2020). Education, lifelong learning, inequality and financial access: Evidence from African countries. Contemporary Social Science, 15, 7–25.
- Tolzmann, B. M., & Tomilova, O. (2021). Africa is top recipient of financial inclusion funding. *The consultative group to assist the poor, June*, 1–11. https:// blogs.worldbank.org/opendata/number-poor-peoplecontinues-rise-sub-saharan-africa-despite-slowdecline-poverty-rate/
- UNDPI. (2015). The millennium development goals report. In United Nations. https://www.un.org/millennium goals/2015_MDG_Report/pdf/backgrounders/ MDG2015PRBGSSA.pdf
- Van der Zahn, M., Makarenko, M. I., Tower, G., Kostyuk, A. N., Barako, D., Chervoniaschaya, Y., Brown, A. M., & Kostyuk, H. (2007). The anti-money laundering activities of the central banks of Australia and Ukraine. *Journal of Money Laundering Control*, 10 (1), 116–133. https://doi.org/10.1108/ 13685200710721908
- Van, L. T. H., Vo, A. T., Nguyen, N. T., & Vo, D. H. (2019). Financial inclusion and economic growth: An international evidence. *Emerging Markets Finance and Trade*, 1–25. https://doi.org/10.1080/1540496X.2019. 1697672
- Xu, X. (2020). Trust and financial inclusion: A cross-country study. Finance Research Letters, 35, 101310. https://doi.org/10.1016/j.frl.2019.101310