Determinants of Financial Inclusion in Sub-Saharan Africa Countries: Does Institutional Infrastructure Matter?

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The paper examines the determinants of financial inclusion by specially accounting for the role of institutions in a panel of eighteen (18) sub-Saharan Africa (SSA) countries using a dynamic system of Generalized Method of Moments (SYS-GMM). The emanated findings consistently stress the importance of institutions together with other control variables like GDP per capita, inflation, bank concentration and z-score as key drivers of FI. In the final analysis, the paper emphasizes the importance of using dimension by dimension indicators of governance as well as a composite governance index instead of relying solely on the latter as a basis of informing policy decisions as both yield different policy outcomes.

1.0   Introduction

One of the most contentious economic issues that has consistently enjoyed increasing research attention centres on unravelling the nature, pattern and direction of causality between financial development[2] and economic growth. Empirical regularity between the two has abundantly been established in the literature on the one hand, the nexus between the duos is still largely characterized by contentious disagreements thus setting in motion the need for further probe into the issue on the other hand. The rationale behind the ensued contention is perhaps associated with the unclear mechanics and dynamics involved in the modus operandi of the financial intermediation. However, one such by-product of subsequent efforts at uncovering the missing link between finance-growth relations as well as its intermediations engenders the birth of the new concept of financial inclusion in the financial economics literature.

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[2] This could be conceived as a process that marks improvement in quantity, quality, and efficiency of financial intermediary services. This process involves the interaction of many activities and institutions and possibly is associated with economic growth. Thus, the term is more broadly encompassing than the financial inclusion.

Financial inclusion (FI) has been conceived as the process of broadening the accessibility of financial services for households and firms. Alternatively, Aduda and Kalunda (2012) defined FI broadly as the process of availing an array of required financial services, at a fair price, at the right place, form and time and without any form of discrimination to all members of the society. That is, the process of providing and enabling the firms and households in an economy to gain access to the formal credit market.

Recently, growth inclusiveness has formed the centre-stage of virtually every cardinal development policy goal, thus gaining more insights into understanding FI is imperative and timely. This is particularly so, at least when viewed and analyzed from the following standpoints. First, there has been explicit pronouncement by the World Bank president about the Universal Financial Access by 2020. Second, FI is being considered as a critical element that makes growth inclusive as access to finance can enable economic agents to make longer term consumption and investment decisions, participate in productive activities, as well as cope with unexpected short term shocks (Park and Mercado, 2015). Third, there is impact of FI on long-term economic growth and poverty reduction, and thus on macroeconomic environment (Burgess and Pande, 2005). Fourth, it is known to have implications for monetary and financial stability that form the core of central banking. Lastly, understanding the mechanics will assist policymakers in designing and formulating policies that will broaden access to financial services which will eventually help reducing poverty incidence and the perceived income inequality. As a corollary, Hannig and Jansen (2010), submit that reliable and comprehensive data that captures various dimensions of financial inclusion is a critical condition for evidence-based policymaking.

Arguably, financial deepening has accelerated in emerging markets and low-income countries over the past two decades. Unfortunately, the record on FI has not kept pace (Dabla-Norris, *et al*., 2015). Notably, Africa lags behind other developing regions with only 23% of adults holding an account at a formal financial institution, twice lower than the world average estimated at 50% (Demirguc-kunt and Klapper, 2012). More specifically, unlike other developing nations, sub-Saharan Africa (SSA) countries are characterized by poor performances in terms of financial inclusion indicators. Available statistics from Financial Access Survey, IMF, for instance, depicts that the number of automatic teller

machines (ATM), with the exception of South Africa, which has 60 ATMs per 100,000 adults on average, are fewer than 6 ATMs per 100,000 adults in sub-Saharan Africa, with a peak of 27 ATMS per 100,000 persons in Botswana and approximately 1 ATM per 100,000 persons in Burundi, Chad, the Central Africa Republic, the Democratic Republic of Congo, Liberia and Sierra Leone (total of more than 200 million adults). Also, with respect to bank branch per 1000km^2, statistics has it that on average, there is approximately 1 bank branch per 1000km^2 in SSA. Specifically, there are less than 5 branches per 100,000 adults (over age 15) with strong variations between countries, which range from 10 branches per 100,000 inhabitants in South Africa and Angola, to approximately 1 branch per 100,000 inhabitants in the Central Africa Republic, Chad and Democratic Republic of Congo (these three countries alone account for more than 90 million adults). In addition, only 24% of adults have an account with a formal financial institution, with the average of 50% worldwide and 89% in the high-income countries. This proportion also varies widely even within SSA, with averages ranging from 51% in Southern Africa to 11% in Central Africa, where countries like the Central African Republic, Chad and Democratic Republic of Congo have adult banking rates of less than 5%. Unarguably, the SSA countries are completely worse off with respect to financial inclusion indicators. The pertinent question remains: What do these poor FI statistics portend for SSA sustainable growth and development amid her bad institutional structure?

More importantly, a growing body of research suggests that broad-based access to formal financial services which consequently enhances financial stability depends on how that access is managed within the regulatory and supervisory framework (see Mehrotral and Yetman, 2015). This lends credence to the importance of institutions in the process of financial intermediation. Thus, taking account of institutional roles in FI seemed plausible as SSA region is known to be plagued with poor track record with respect to institutional frameworks (Ajide et al, 2015). In addition, as most researchers tend to agree, the relationship between finance and growth is not formed in isolation from institutional framework that governs the process of policy making in a particular country. As a corollary, some research indicates that the positive growth impact from financial intermediation does not hold in economies with weak institutional frameworks (Demetriades and Law, 2006). This

observation raises important questions like: what determines FI in SSA region? How does institutional factor impact on FI in the region?

Undeniably, financial inclusion is relatively a new concept and/or is at best emerging in the financial economic literature. By implication, there is limited empirical work exploring the specific linkages between it and other socio-economic and political variables. Studies have only focused largely on the impact of financial development on growth, income inequality and poverty reduction. Thus, in order to further our understanding, the study contributes in the following ways. First, we are not aware of any empirical work that specifically relates institutional factors into FI discourse. This simply suggests that our study is one of the few empirical attempts in this regard. Second, most of the empirical studies on FI-related issues usually take a look at developing countries as it were, thus limiting any policy implications that may possibly emanate thereof. Also, using developing countries' experiences may well warrant the imposition of caveats on the policy messages when applied to region like SSA. The import of undertaking this study therefore lies in averting the possibility of extrapolating wrong policy choices on continents with different contextual arrangements.

2.0   Literature Review

2.1   Theoretical Framework

Studying the evolution of growth, relative income inequalities, as well as their level of persistence afforded the modern development theorists to identify financial market imperfections as constituting a major barrier to progress. This being the case, it is capable of influencing human and physical capital accumulation and occupational choices. For instance, in theories underpinning capital accumulation, financial market imperfections determine the extent to which the poor can borrow to invest in schooling or physical capital. Similarly, it determines the extent to which talented but poor individuals can raise external funds to initiate projects. Thus, finance influences not only the efficiency of resource allocation but also the comparative economic opportunities of individuals from relatively rich or poor households. The importance of finance has equally been stressed in the historical development of views showing the links between economic growth and income inequality. For instance, in the model of Galor and Zeira (1993), it was discovered that financial market frictions made it difficult for the poor people to invest

in their education despite their high marginal productivity of investment. Also, in Banerjee and Newman's model (1993), individuals' occupational choices are limited by their initial endowments. These models show clearly that lack of access to finance can be the critical mechanism for generating persistent income inequality or poverty traps, as well as lower growth. Several factors have been identified as representing key drivers of FI in the literature. These include: high transactions, poor infrastructural development, high poverty levels and banking charges, sparse population and illiteracy among others.

2.2   Empirical Literature

The term financial inclusion seems relatively new in the financial development literature, thus suggesting paucity in terms of the empirical literature. Hence, FI can be described as just emerging or at best at its infancy. Given the limited empirical literature, researchers have randomly examined such issues as the determinants of FI (Kuri and Laha,2011; Kumar, 2013;Allen et al, 2013; Akudugu,2013; Tuesta, 2015); Financial inclusion and development, (Sarma and Pais, 2008; Andrianaivo and Kpodar, 2011; Mihasonirina and Kangni, 2011); measures of financial inclusion (Charkravarty and Pal, 2010; Gupte *et al.* 2012; Demirguc-Kunt and Klapper, 2012; Morgan and Pontines, 2014); financial inclusion and stability (Hannig and Jansen, 2010; Khan, 2011; Demirguc-Kunt and Lyman, 2012; Han and Melecky, 2013); Mobile banking and financial inclusion (Martina, 2006; Klein and Mayer, 2011); foreign bank entry and financial inclusion (Gopalan and Rajan, 2015); Financial inclusion and the role of the post office (Anson *et al.*, 2013); Islamic finance and financial inclusion (Demirguc-Kunt, *et al.,* 2013); Financial inclusion, poverty and income inequality (Park and Mercado, 2015) and more recently Financial inclusion, productivity shocks and consumption volatility (Bhattacharya and Patrnaik, 2015).

Kumar (2013) examined the status as well as the determinants of financial inclusion in India using both the fixed effects and dynamic panel generalized methods of moments (GMM) methodologies on 29 major states and union territories between 1995 and 2008. The results showed that branch network has unambiguous beneficial impact on financial inclusion. More specifically, the proportion of factories and employee base turned out to be significant determinants of penetration

indicator. In addition, the findings further revealed the importance of a region's socio-economic and environmental setup in shaping banking habit of masses. In a similar vein, Devlin (2005) undertook a study to understand determinants of range of banking financial services in UK. Results indicated that although factors vary according to kind of financial service, however certain variables portray consistent and significant influence across an array of financial services. Variables concomitantly affecting dependent variable turned out to be employment status, household income and housing tenure.

Kumar and Laha (2012) attempted measuring the inter-state variations in the access to finance using a composite index of financial inclusion. In their paper, they identified the underlying factors that constituted obstacles in the process of financial inclusion in rural West Bengal. Using Binary Probit Regression Model, it was established that the greater degree of awareness of basic banking services, diversification of rural non-farm sector, literacy drive to rural households and an expansion of household level assets were some of the crucial factors which have significant bearings, creating an enabling environment in reducing the obstacles in the process of financial inclusion. However, the land reform measures, which have created significant impact on landless, small and marginal farmers in West Bengal, especially in providing economic security, failed to augment the process of financial inclusion by bringing them in the network of financial services.

In spite of these empirical investigations, it is apparent that the literature on FI is yet recent and just emerging. In light of the foregoing, this section is not intended to offer and/or repeat narratives of the previous studies with respect to each of the previously identified issues but to rather x-ray the related strand of literature to the issue at hand.

On account of this, to the best of our knowledge and empirical exposures, the only study that appears to be similar in spirit to the present work is that of de Sousa (2015) which used the 2011 Global Findex database for a panel of 90 developing and emerging economies, two indices of FI consisting of both traditional and innovative instruments were constructed on a set of explanatory variables like natural log of GDP per capita, inflation, real interest rate, bank credit to the private sector, z-score and the level of concentration of the financial system. The results of the cross-country regressions show that the

inclusion of macroeconomic factors in regulators' evaluation of systemic risks constitutes a hindrance to inclusive financing.

3.0   Data and Model Specification

The section aims at examining the role of institutional infrastructure in the determination of financial inclusion for a sample of eighteen (18) sub-Saharan Africa countries over the period spanning 2004 to 2010. The countries selection as well as the coverage period is largely influenced by data availability. In an attempt to achieve the above stated objective, this section is divided into two parts: the first part deals with data-related issues, while the second part showcases the model specification as well as methodology.

3.1   Data

A balanced data set covering 18 countries[3] in sub-Saharan region is used, covering the period 2004-2010. The scope of the study is based on data availability. The three sources of our data are the World Bank's World Development Indicators (WDI), World Governance Indicators (WGI) and World Bank's Financial Structure Dataset (Cihak, 2012b).

Theoretically, FI has been conceived as all initiatives that make formal financial services available, accessible and affordable to all segments of the population. Hence, the paper utilizes three accessible measures for capturing financial inclusion. They are namely: Automatic Teller Machines (ATMs) per 100,000 Adults[4]; Bank Branches per 100,000 Adults[5] and ATMs per 1000km$^{2(6)}$. The corollary lies in the submission of Alliance for Financial Inclusion (AFI) that data on the level of service provision is more easily obtained than usage and quality data. In Africa, many countries are now at the level of collecting mostly access and some usage data.

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[3] Angola, Botswana, Burundi, Cameroun, Kenya, Lesotho, Madagascar, Ethiopia, Gabon,   Mauritius, Mozambique, Nigeria, Rwanda, South Africa, Swaziland, Tanzania, Uganda and Zambia

[4] Captures demographic penetration; this measure proxies physical outreach dimension

[5] Same as ATM per capita

[6] Captures geographic penetration; this measure proxies physical outreach dimension

Further, on institution data, the World Bank definition of institution comprises six indices[7], which are Voice and Accountability (VA), Regulatory Quality (RQ), Rule of Law (RL), Control of Corruption (CC), Government Effectiveness (GE) and Political Stability (PS). Each of these indices ranges from -2.5 to +2.5, with both extremes representing the worst and best institutional quality in that order. The six aggregate indicators are based on 30 underlying data sources reporting the perceptions of governance of a large number of survey respondents and expert assessments worldwide.

3.2   Model Specification

For empirical specification of the model, the paper adopts Gopalan and Rajan (2015) with some little modifications. Thus, it is specified as follows:

$$y_{it} = \phi + \gamma I_{it} + \varpi X_{it} + \eta_i + \varepsilon_{it} \tag{1}$$

where y_{it} represents the measures of financial inclusion in country i at time t; I_{it} is the institutional infrastructure in country i at time t; X_{it} is a matrix of control variables in country i measured at time t; η_i stands for time invariant country specific effects and ε_{it} is the error term. For estimation purposes, equation (1) becomes

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[7] Each is conceptualized by Kaufmann et al., (2010) as follows: **Control of Corruption** (CC) captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. **Political Stability and Absence of Violence** (PS) measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. **Government Effectiveness** (GE) captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. **Regulatory Quality** (RQ) captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. **Rule of Law** (RL) captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. **Voice and Accountability** (VA) captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media

$$FI_{it} = \phi + \gamma INT_{it} + \varpi X_{it} + \eta_i + \varepsilon_{it} \qquad (2)$$

FI is a measure of financial indicators like Automatic Teller Machines (ATMs) per 100,000 adults (ATMADU), Bank Branches per 100,000 adults (BKBR) and Automatic Teller machines per 1000km^2 (ATMKM) respectively. INT measures governance index and this includes Voice and Accountability (VA), Political Stability (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL) and Control of Corruption (CC). Thus, in computing a composite index, the study takes averages of the six components of governance variables[8]. X is a set of explanatory variables that affect FI. They are as follows: GDP per capita (GDPPC), inflation rate (INF), real interest rate (RINT), credit to the private sector (PCRE), bank concentration (BC) and z-score. These are standard explanatory variables in the literature. The summary of definitions is provided on the table below.

Table 1: Variables' Definition

Independent Variables	Brief Description	Expected Relationship with Financial Inclusion
GDPPC	GDP per capita (constant 2005 US$); gross domestic product divided by population	Positive and negative
INF	Inflation (annual percentage): as measured by the consumer price index, it shows annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals.	Positive
RINT	Real interest rate (%): the lending interest adjusted for inflation as measured by the GDP deflator.	Negative
PCRE	Private Credit: Private credit extend to the private sector to GDP	Positive
CONC	Concentration: assets of three largest banks as a share of assets of all commercial banks	Negative
Z-SCORE	Bank z-score: estimated as (ROA +equity/assets)SD(ROA)	Negative
GOVINDEX	Composite Governance Index: computed using principal component	Positive
VA	Voice and accountability	Positive
PS	Political Stability	Positive
GE	Government Effectiveness	Positive
RQ	Regulatory Quality	Positive
RL	Rule of Law	Positive
CC	Control of Corruption	Positive

Source: Adapted from Gopalan and Rajan, (2015)

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[8] This approach is similar to studies like Kaasa (2013) and Abdioglu, et al (2013).

3.2.1   Estimation Technique

The paper employs a System GMM of Arellano and Bond (1998), Arellano and Bover (1995). This is based on the intuition that OLS might not be able to account for endogeneity-related issues, such as data measurement error, omitted variable bias etc.

4.0   Analysis of Results

The Descriptive Statistics in Table 2 presents the characteristics of the variables used in the estimation. For the financial inclusion indicators, the Automatic Teller machines (ATMs) per 100,000 adults averaged 8.74 for the SSA countries with maximum and minimum values of 57.02 and 0.02. While the former goes to South Africa in 2010 on the one hand, the latter value is claimed by Ethiopia in 2004 on the other hand. The mean value of alternative financial inclusion indicator includes bank branches per 100,000 adults which averaged 4.33 with the values ranging from as high as 20.79 (for Mauritius in 2010) and for as low as 0.39 (Rwanda in 2004). Interestingly, the dispersion from the mean is not too significantly different from that of the actual mean value. This simply goes to show the deplorable state of accessing bank services in the region judging by the wide gap between the maximum and minimum values. In terms of ATMs per 1000km^2, another alternative measure of financial inclusion indicator, has a mean value 11.47 but with a wide dispersion of 39.65 from the average value. This is not too surprising considering the maximum value of 196.55 for Mauritius in 2010 and the minimum value of 0.01 for Ethiopia in 2006. By and large, these descriptive statistics simply depict that financial inclusion indicators for the region leave so much to be desired.

This apart, what does the data tell about other socio-economic indicators? In term of per capita GDP, the average for SSA is $1,835.46 while the value of the standard deviation stands at $2,182.32. The maximum per capita GDP is credited to Gabon with $6,394.29 in 2007 while Burundi is identified with the minimum value of $143.78 in 2005. Also, the turbulent macroeconomic environment in SSA region as captured by inflation rate averaged 9.38% with the maximum and minimum rates of 44.39% and -1.41% for Ethiopia and Gabon in 2008 and 2006, respectively. For the real interest rate, the average equals 7.67% but as high as 36.27% for Madagascar in 2010 and as low as -17.12% for Ethiopia in 2008. In terms of credit extended to the private

sector, the mean value for the region is 27.48% while the maximum and minimum values are 167.54% and 5.39%. South Africa takes a lead in this respect in 2007 while Angola lags behind other countries in the region. Also, the banking concentration averaged 75.96 with the maximum and minimum being 100.00 and 40.66 respectively. The Z-score which is a measure of banking stability averaged 13.16 between 2004 and 2010 but has a maximum value of 36.6 (Cameroun in 2005) and a minimum value of -4.14 (Nigeria in 2009).

In terms of the institutional variables, the composite index averaged 0.02 while the maximum and minimum index ranges from as high as 4.86 and as low as -3.82. On a dimension by dimension basis, it was observed that the mean values are in negatives which sharply contrast dispersion from the mean with positive values. Of the countries in the region, however, Mauritius takes a lead in virtually all governance dimensions namely: Voice and Accountability (VA), Government Effectiveness (GE), Regulatory Quality (RQ) and Rule of Law (RL) while Botswana and Swaziland head for the first positions among the comity of nations in Political Stability (PS) and Control of Corruption (CC) respectively. The extreme ends on a continuum of the negative governance dimensions apply to Burundi (in PS, RQ and RL), Angola (in GE and CC) and Swaziland (in VA) in that order.

Table 2: Descriptive Statistics

Variables	Mean	Standard Deviation	Maximum	Minimum
FINANCIAL INCLUSION INDICATORS				
Atmadu	8.74	12.38	57.05	0.02
Bkbr	4.33	4.29	20.79	0.39
Atmkm	11.47	39.65	196.55	0.01
MACROECONOMIC VARIABLES				
Gdppc	1835.46	2182.32	6394.29	143.78
Inf	9.38	6.58	44.39	-1.41
Rint	7.67	8.66	36.27	-17.12
Pcre	27.48	34.55	167.54	5.39
BANKING VARIABLES				
Conc	75.96	17.80	100	40.66
Zscore	13.16	7.01	36.60	-4.14
INSTITUTION VARIABLES				
COMPOSITE INDEX				
Govindex	0.02	2.12	4.46	-3.85
GOVERNANCE DIMENSIONS				
Va	-0.45	0.66	0.90	-1.42
Ps	-0.39	0.85	1.06	-2.51
Ge	-0.48	0.56	0.85	-1.37
Rq	-0.42	0.54	0.90	-1.36
Rl	-0.52	0.60	1.01	-1.60
Cc	-0.30	0.85	2.19	-1.42

The correlation matrix in Table 3 depicts an existence of high level of association between each dimension of governance indicator, thus precluding them from being included in the same financial inclusion models. Hence, each dimension was plugged in a separate regression model. Similar behaviour is observed among the financial inclusion indicators.

Table 3:   Correlation Matrix

	ATMADU	BKBR	ATMKM	GDPPC01	INF	RINT	PCRE	BC	ZSCORE	GOVINDEX	VA	PS	GE	RQ	RL	CC
ATMADU	1	0.83	0.59	0.77	-0.21	-0.07	0.8	-0.09	0.06	0.75	0.63	0.5	0.73	0.73	0.69	0.56
BKBR		1	0.87	0.7	-0.16	-0.02	0.56	-0.28	0.16	0.66	0.55	0.47	0.62	0.63	0.66	0.45
ATMKM			1	0.4	-0.13	0.06	0.42	-0.29	0.29	0.55	0.49	0.34	0.54	0.51	0.6	0.26
GDPPC01				1	-0.24	0	0.49	-0.07	0.18	0.59	0.41	0.6	0.5	0.57	0.51	0.45
INF					1	-0.08	-0.17	-0.04	-0.26	-0.28	-0.17	-0.28	-0.22	-0.27	-0.25	-0.23
RINT						1	-0.1	-0.09	0.11	0	0.06	0.13	-0.09	0.03	-0.03	-0.09
PCRE							1	-0.06	-0.05	0.55	0.57	0.19	0.62	0.61	0.47	0.28
BC								1	-0.18	-0.07	-0.18	0.07	-0.1	-0.24	-0.04	0.21
ZSCORE									1	0.08	0	0.17	0.05	0.07	0.1	0.01
GOVINDEX										1	0.85	0.77	0.94	0.93	0.96	0.64
VC											1	0.58	0.79	0.82	0.81	0.28
PS												1	0.58	0.59	0.71	0.53
GE													1	0.9	0.92	0.53
RQ														1	0.87	0.51
RL															1	0.59
CC																1

Table 4 presents the results of the determinants of financial inclusion with and without accounting for a composite governance index. From the table, we observe that similar to what previous studies have found, inclusive financing is larger in more affluent countries as measured by GDP per capita. This cuts across all measures of financial inclusions. These results are consistent with the findings of Horohan (2008) and Park and Mercado, (2015). Inflation is positively correlated with financial inclusion. This is intuitively appealing as the increased circulation of money (possibly occasioning higher levels of inflation) as well as creation of additional demand would lead people to use financial services more often. This appears to be statistically significant (mostly at conventional levels of significance of 1 and 5 percent) across the three financial inclusion indicators but mostly without accounting for governance factor.

It is important at the junction to emphasize that this is more applicable to ATMs per 1000 km^2 than any other measures. The impact of real interest rates is mixed among the measures. While it conforms with bank

branches per 100,000 adults on the one hand, it contradicts the other two measures on the other hand. In terms of level of significance, a higher rate of interest fails to hurt financial inclusion in the region as against what was hypothesized in theory. This may be explained in part to the convenience such services confer on the users rather having to queue up in the banking halls for hours. Reasonably, bank customers prefer paying higher interest charges on ATMs to lining up endlessly in the banking halls. This is plausibly logical as banking services are generally poor in the region. The same variable is insignificant in other measures amid mixed a priori signs. In the case of credit to the private sector, similar behaviour in terms of hypothesized signs is observed. That is, the signs are mixed for each of the measure used. Expectedly, financial systems that are deeply penetrated are more likely to deliver access for all.

For banking variables, a negative relationship is hypothesized between financial inclusion variables and bank concentration. This may be attributed with large operation inefficiencies reflected, among other things, in a high degree of bank concentration, financial services might only be offered at high costs, above those found in more competitive systems. Thus, the feature typically characterizes the banking experiences in the region. The signs for bank stability measured by z-score conforms with all measures of financial inclusion with the exception of bank branches when governance factor is accounted for. This is equally statistically significant at both conventional levels of 1 and 5 percent, respectively.

To cap it up, a composite governance index reduces amount of financial inclusions for the region. This is true for both ATMs per 100,000 adults and bank branches per 100,000 adults. However, contrary result is obtained for ATMs per $1000km^2$.

Gauging access to financial inclusion via ATMs per 100,000 adults is found to be negatively affected by governance dimensions like voice and accountability, political stability and rule of law as can be seen in Table 5. This occurs both at 1 and 5 percent levels of significance, respectively. The use of ATMs is favourably disposed to government effectiveness dimension as indicated by 1 percent level of significance.

Table 4: Composite Institutional Index in Financial Inclusion Model: Panel Regression (Dynamic SYS-GMM)

Variables	FINANCIAL INCLUSION INDICATORS						
	ATMADU			BKBR		ATMKM	
ATMADU(-1)	0.77	0.71	BKBR(-1)	0.82	1.03	ATMKM(-1) 0.5	0.46
	(42.92)***	(14.81)***		(13.10)***	(5.74)**	(4.12)***	(2.82)**
Macroeconomic Variables							
GDPPC	14.64	23.39	GDPPC	4.42	3.49	GDPPC 50.69	69.15
	(4.78)***	(6.15)***		(3.46)***	(3.19)***	(4.30)***	(5.90)**
INF	0.11	0.12	INF	0.04	0.05	INF 0.27	0.3
	(2.37)**	-1.27		(2.31)**	-1.62	(6.71)***	(5.23)***
RINT	0.03	0.04	RINT	-0.01	-0.01	RINT 0.14	0.19
	-0.8	-1.22		(-1.52)	(-0.86)	(2.01)**	(2.06)**
PCRE	-0.18	-0.16	PCRE	-0.04	-0.09	PCRE 0.02	0.17
	(-2.47)**	(-1.32)		(-2.48)***	(-1.74)*	-0.26	(2.17)**
Banking Variables							
CONC	-0.55	-0.35	CONC	-0.08	-0.14	CONC -0.48	-0.35
	(-9.52)***	(-5.49)***		(-6.80)***	(-5.23)***	(-3.95)***	(-1.54)
Z-SCORE	0.13	0.19	Z-SCORE	0.09	-0.01	ZSCORE 0.51	0.62
	-1.65	-1.18		(4.78)***	(-0.16)	(3.73)***	(2.54)**
Institution Variable							
GOVINDEX	-	-4.98	GOVINDEX	-	2.22	GOVINDEX -	-3.92
		(-5.67)***			(5.41)***		-1.78
J-Statistics	7.32	7.3	J-Statistics	5.4	7.04	J-Statistics 6.95	5.72
S.E	3.41	3.27	S.E	0.92	1.34	S.E 4.36	4.77
Number of Observations	89	89	Number of Observations	90	90	Number of Observations 89	89

Of control variables, however, the bank concentration appeared to have exerted more influence than any other as its level of statistical significance runs through every dimension of governance. The variable, GDP per capital which captures the level of each country's development, is statistically related to the inclusive financing across three governance dimensions namely: regulatory quality, rule of law and control of corruption occurring at the highest degree of statistical significance. Inflation is statistically related to financial inclusion via ATMs per 100,000 in two major areas - direction and extent of impacts. That is, it is found to have conformed to theoretical a priori expectations as well as statistical significance at 5 percent levels. The same cannot be said about real interest rate whose direction of impact keeps changing in signs.

Unlike the financial inclusion indicator (ATMs per 100,000 adults), the alternative measure namely: bank branches per 100,000 adults present a different picture with respect to governance indicators. For instance, in Table 6, dimensions like regulatory quality, rule of law and control of corruption conform to a priori expectations - positive signs and statistical significance - in promoting financial inclusion for the region.

Table 5: Governance Dimensions in Financial Inclusion Model: Panel Regression (Dynamic SYS-GMM)

Variables	ATMs PER 100,000 ADULTS: DEPENDENT VARIABLE					
	Voice and Accountability	**Political Stability**	**Government Effectiveness**	**Regulatory Quality**	**Rule of Law**	**Control of Corruption**
ATMADU(-1)	0.78	0.68	0.83	0.75	0.8	0.76
	(14.59)***	(9.55)***	(25.77)***	(23.88)***	(38.70)***	(33.32)***
Macroeconomic Variables						
GDPPC	0.59	18.13	-2.85	14.62	14.87	15.79
	-0.11	(1.89)*	(-0.44)	(4.47)***	(3.66)***	(4.42)***
INF	0.16	0.16	0.14	0.01	0.12	0.11
	(3.18)***	-0.97	(2.18)**	-0.15	(2.21)**	(2.25)**
RINT	-0.14	0.05	-0.07	0	0.01	0.03
	(-4.21)***	-0.71	(-1.31)	(-0.02)	-0.62	-0.84
PCRE	-0.23	-0.06	-0.15	-0.21	-0.14	-0.16
	(-2.49)**	(-0.47)	(-2.20)**	(-2.18)**	(-1.89)*	(-1.28)
Banking Variables						
CONC	-0.47	-0.55	-0.65	-0.45	-0.47	-0.53
	(-8.48)***	(-7.63)***	(-6.44)***	(-2.69)**	(-15.94)***	(-8.17)***
ZSCORE	-0.28	0.39	0.14	-0.01	0.15	0.18
	(-1.45)	-1.66	-1.24	(-0.09)	(2.52)**	(2.40)**
GOV	-5.69	-6.66	7.95	-3.97	-7.41	-1.16
	(-5.09)***	(-2.75)**	(3.80)***	(-1.31)	(-2.92)***	(-0.65)
Institution Variables						
J-Statistics	6.71	5.98	7.1	5.27	8.46	7.46
S.E	4.83	4.2	4.14	3.02	3.38	3.42
Number of Observations	89	89	89	89	89	89

Voice and accountability, political stability and government effectiveness negatively impacted on inclusive financing with only voice and accountability being significant at 5 percent. GDP per capita, though it conforms to hypothesized signs but statistically significant only in political stability, government effectiveness and rule of law. In terms of control variables, the two most important determinants are credit to the private sector and bank concentration.

Quite interestingly, GDP per capita, inflation, bank concentration and z-score remain the main determining variables driving inclusive financing, with respect to ATMs per 1000 Km^2 across all dimensions of governance indicators in SSA region as shown in Table 7. Unlike other measures of financial inclusion, dimensions of governance as it were, are statistically significant in only two namely: political stability and regulatory quality. This may be attributed to the prevalence of political

unrest across the countries within the region as well as failing regulatory environment within which financial institutions operate.

Table 6: Governance Dimensions in Financial Inclusion Model: Panel Regression (Dynamic SYS-GMM)

Variables	ATMs PER 100,000 ADULTS: DEPENDENT VARIABLE					
	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
BKBR(-1)	0.91	0.63	0.87	0.93	0.71	1.74
	(6.04)***	(3.75)***	(8.08)***	(4.26)***	(3.52)***	(3.36)***
Macroeconomic Variables						
GDPPC	0.78	8.96	4.16	0.54	4.08	-3.92
	-0.31	(1.80)*	(2.04)**	-0.17	(2.80)**	(-0.69)
INF	0.05	-0.01	0.03	0.06	0.02	0.14
	-1.64	(-0.16)	(1.85)*	(1.99)*	-0.59	-1.61
RINT	-0.05	0	-0.02	-0.02	-0.01	0.01
	(-2.85)***	(-0.08)	(-1.44)	(-0.97)	(-1.15)	(-0.26)
PCRE	-0.07	-0.04	-0.05	-0.11	-0.07	-0.22
	(-4.75)***	(-1.99)**	(-3.47)***	(-2.23)**	(-1.17)	(-3.45)***
Banking Variables						
CONC	-0.14	-0.03	-0.09	-0.13	-0.11	-0.24
	(-3.66)***	(-0.36)	(-5.23)***	(-4.19)***	(-4.66)***	(-2.84)**
ZSCORE	-0.01	0.13	0.08	0.11	0.04	-0.07
	(-0.24)	(2.18)**	(3.89)***	-1.33	-0.73	(-0.56)
Institution Variables						
GOV	-4.59	-3.79	-0.97	4.99	5.72	8.35
	(-2.06)**	(-1.43)	(-0.69)	(4.82)***	(8.02)***	(2.26)**
J-Statistics	3.86	4.84	4.72	4.14	5.27	3.95
S.E	1.19	1.07	0.97	1.27	1.09	2.22
Number of Observations	90	90	90	90	90	90

Table 7: Governance Dimensions in Financial Inclusion Model: Panel Regression (Dynamic SYS-GMM)

Variables	ATMs PER 100,000 ADULTS: DEPENDENT VARIABLE					
	Voice and Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption
ATMKM(-1)	0.51	0.5	0.54	0.35	0.5	0.52
	(2.85)**	(4.12)***	(3.34)***	(2.31)**	(4.12)***	(3.58)***
Macroeconomic Variables						
GDPPC	37.93	76.47	47.61	29.13	46.42	55.25
	(1.94)*	(5.69)***	(3.99)***	(16.33)***	(3.36)***	(4.62)***
INF	0.27	0.19	0.28	0.38	0.29	0.36
	(4.55)***	(1.96)*	(5.46)***	(3.74)***	(4.80)***	(8.37)***
RINT	0.04	0.17	0.15	0.23	0.12	0.17
	-0.56	-1.58	(1.71)*	(2.36)**	(1.79)*	(2.21)**
PCRE	0.05	0.23	0.02	0.32	0.01	0.12
	-0.57	(2.80)**	-0.24	(2.21)**	-0.12	(1.83)*
Banking Variables						
CONC	-0.46	-0.46	-0.43	-0.37	-0.55	-0.43
	(-2.54)**	(-1.82)*	(-2.57)**	(-2.69)**	(-5.36)***	(-2.51)**
ZSCORE	0.51	0.39	0.51	0.4	0.52	0.71
	(2.77)**	-1.43	(2.80)**	(3.01)***	(2.96)**	(3.51)***
Institution Variables						
GOV	-15.86	-16.33	-0.32	-28.2	-2.22	-6.37
	(-1.12)	(-3.86)***	(-0.12)	(-5.26)***	(-0.05)	(-1.61)
J-Statistics	5.45	4.23	6.46	5.35	6.64	5.38
S.E	4.44	5.56	4.2	4.78	4.49	4.87
Number of Observations	89	89	89	89	89	89

5.0   Conclusion and Policy Implications

The paper's contribution to the ongoing discourse on financial inclusion stems from its inclusion of institutional variables into FI model. Thus, the outcome of the findings can be viewed from the levels of a composite governance index as well as dimension by dimension governance indicators. It was observed that the impactful roles of institutions differ from one measure of FI to another. On a composite governance index basis, three different outcomes can be distilled. First, governance negatively impacts on the number of Automatic Teller Machines (ATMs) per 100,000 adults. Second, it has a positive influence on the number of bank branches per 100,000 adults and lastly, no discernable impacts are observed in the case of ATMs per 1000km^2. This aside, the important roles of GDP per capita, Inflation and bank concentration are well entrenched even when governance factor is accounted for.

However, on a dimension by dimension basis, it was observed that while voice and accountability, political stability and rule of law variables negatively impacted on FI (ATMs per 100,000 adults) on the one hand, government effectiveness enhances it on the other hand. Interestingly, the important role of bank concentration is more pronounced than other control variables. In the case of alternative measure of FI (like Bank Branches per 100,000 adults), the positive roles of governance dimensions like regulatory, rule of law and control of corruption far outweighs that of the negative effect of voice and accountability. Considering the importance of other control variables in enhancing FI, the roles of credit to the private sectors and bank concentration appear more visible than other control variables.

In terms of ATMs per 1000km^2, two governance dimensions out of six have significant negative impacts on this measure of FI. Also, variables like GDP per capita, inflation, bank concentration and z-score constitute the main drivers of this measure of FI. Arising from the findings are a few policy messages for the attention of the policymakers and other stakeholders alike. These include: enhancement of per capita GDP; each country in the sub-Saharan Africa should benchmark her domestic institutional policies and frameworks to aligning with international best

practices and standards and, lastly maintaining and promoting financially stable environment.

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