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Governance and financial development: does financial openness matter? Evidence from Sub-Saharan African countries

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Abstract

The objective of this study is to assess the mediating role of financial openness in the relationship between governance and financial development for 27 sub-Saharan African countries. To this end, the methodology used is based on the Generalized Method of Moments in System over 2000 to 2019. The following results are established. (i) total governance has unconditional positive and significant effect on financial development; (ii) Financial openness hinders the effect of governance on financial development; (iii) There is negative marginal and positive net effects from the interaction between total governance and financial openness; (iv) Policy thresholds at which the modulating variable reverses the net effect on financial development from negative to positive is 0.252 financial openness. These results, which are robust to an alternative measure of financial openness, call on policymakers to improve the quality of the institutional environment in the context of financial system modernization and to adopt adequate macroeconomic policies to ensure the success of international financial openness.

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1. Introduction

In recent decades, the role of finance has been widely discussed in the economics literature. Two main streams of research have been pursued. The first focuses on the effects of financial development, while the second deals with its determinants. Indeed, since Schumpeter's (1934) seminal work , many works have, for example, shown that finance promotes economic growth (De Gregorio and Guidotti 1995; Calderon and Liu 2003; Levine 2003; Caporale et *al*. 2015; Wu et *al*. 2020); By easing financial frictions and thereby enabling more poor people and entrepreneurs to access and obtain external finance, financial development can improve capital allocation and alleviate income inequality and poverty (Greenwood and Jovanovic 1990; Jeong and Towsend 2008; Kim and Lin 2011).

The second stream of analysis reveals that many factors determine financial development. Huang (2010), for example, distinguishes between macroeconomic policy, institutional, geographic, and non-economic determinants such as religion, language, and ethnicity. Other authors have noted the role of financial liberalization (Singh et *al*. 2009).

Sub-Saharan Africa (SSA) is considered as the least financially developed region in the world compared to other regions. Indeed, data from the World Bank (2021) confirms that the financial resource allocation role of financial intermediaries in SSA is less pronounced than in other countries. In 2010, bank deposit-to-GDP ratios in middle-income countries (MICs) averaged about 22.6 percent in SSA, compared to 121 percent outside Africa, while these ratios were 30 percent in low-income countries (LICs) in SSA and 34 percent in LICs in the rest of the world. These trends remained relatively unchanged in 2020. Credit to the economy as a percentage of GDP declined from 29.5 percent to 27 percent from 2010 to 2020, while this indicator increased in East Asia and the Pacific from 62.7 percent to 166.3 percent respectively over the same period[1] . This illustrates the problem of access to finance that is increasingly critical in Sub-Saharan African countries. In 2020, the ratio between narrow and broad money was 42.2% and 42.3 respectively for low and middle income countries in SSA compared to 209.6% and 195.5 respectively for LICs and MICs in East Asia and the Pacific. The M1/M2 ratio has remained virtually unchanged since 2000 and financial markets have a higher M1/M2 ratio. However, the financial development index (Svirydzenka 2016) illustrates an upward trend in financial development in SSA.

A recent analysis of governance in SSA shows that the average score of SSA on corruption and governance indicators is lower than in other regions. Eighty percent of SSA countries (36 out of 45) present score below the global average in the Transparency International's Corruption Perceptions Index (CPI) and only 3 of the 30 SSA countries included in the International Country Risk Guide's (ICRG) governance indicator have above average scores. However, there are significant inter-regional disparities (Hammadi et *al.* 2019).

In recent years, the effect of governance on financial development has been widely studied in the literature. On a theoretical perspective, research on the role of institutions in financial development has been substantial, especially research on the effects of the legal and regulatory environment on the functioning of financial markets. A legal and regulatory system involving protection of property rights, contract enforcement, and good accounting practices has been identified as essential for financial development. La Porta et *al*. (1998) have argued that the origins of the legal code substantially influence the treatment of creditors and shareholders, and the efficiency of contract enforcement.

Besides Acemoglu et *al*. (2001), Beck et *al*. (2003) defend the settlers mortality hypothesis stating that the colonizers, often named as extractive colonizers, associated with an inhospitable environment aim to establish institutions that privilege the small elite group and potentially ignore private property rights, while the colonizers, often named as settler colonizers, in more

[1] The figures mentioned are from the World Bank (2021).

favorable environments are more likely to create institutions that support private property and balance the power of the state. Accordingly, institutions in the extractive environment tend to block financial development, while those in settler colonies are more conducive to financial development. The new political economy approach regards regulation and its enforcement as a result of the balance of power between social and economic constituencies (Pagano and Volpin 2001). Rajan and Zingales (2003) emphasize the role that the interest groups, especially the incumbent industrial firms and the domestic financial sector, can play in the process of financial development.

Empirically, Mayer and Sussman (2001) emphasize that regulations concerning information disclosure, accounting standards, permissible practices of banks, and deposit insurance do appear to have material effects on financial development. Girma and Shortland (2008) study the impact of democracy chrematistics and regime change on financial development, showing that both democracy and regime change promote financial development.

There are several ways by which governance could potentially affect financial development. Financial openness as well as institutional and educational variables explain much of the variation in financial development between countries and over time (Ozkok 2015). Two approaches can be raised.

The first strand of the literature indicates that only countries with good quality institutions and a good quality legal system benefit from financial openness in the face of the financial sector development objective. In this vein, Beji (2015) argues that financial openness makes it possible to accelerate the movement to modernize domestic financial sectors, improve the quality of the institutional environment and strengthen the rigor and discipline of macroeconomic policies in developing countries. Law and Habibullah (2009) study the impact of trade and financial openness on financial development in a sample of 27 developed and developing countries over the period 1980-2001. They find that financial openness positively stimulates financial development in countries with better quality institutions. Calderon and Kubota (2009), carried out the same study but widened the sample to 145 developed and developing countries during the period 1975-2007. It emerges from their empirical study that only countries benefiting from a medium or high level of institutional quality and an effective legal apparatus for the protection of investors are able to take advantage of international financial openness.

The second strand indicates that a country can benefit from high financial development even if the institutional mechanisms are weak. Using data on the case of Lebanon, a country of the North, Creane et *al*. (2007) find that a high financial development is not necessarily corroborated by a high level of institutional development in a context of financial globalization in the case of the Middle East and North Africa between 1991 and 2007. They concluded that globalization (in its three dimensions: economic, political and social) does not seem to have a significant effect on the quality of institutions. Therefore, globalization has no effect on financial development (Kutan et *al*. 2017).

From the above, it is clear that empirical evidence on the role of financial openness in the relationship between institutional quality and financial development has not yet reached a consensus in either developed or developing countries. Thus, SSA countries provide a framework for assessing this issue in a context where there is a lack of empirical investigation in the case of these countries. Moreover, this work is relevant to the achievement of the Sustainable Development Goals as a whole, as a well-developed financial system would provide resources to fund specific actions. Thus, the results of this study will therefore help to promote governance necessary for financial development. It is precisely at this level that the scientific contribution of this article is situated.

Following this introduction, the structure of the article is as follows. Section 2 presents the methodological framework. In section 3, we present the results. Section 4 is devoted to the conclusion of the article.

2. Data and methodology

2.1. Data

The dataset consists of cross-country observations for 27 Sub-Saharan African economies over the period 2000 to 2019. All data were extracted from the World Bank database and are expressed as a percentage of GDP, with the exception of institutional variables and financial openness which scores were assigned according to the contextual reality of SSA countries.

2.2. Model specification and estimation technique

The theoretical model of our study is based on the modern approach to understanding the effects of financial openness. This is specifically the model of Kose et *al.* (2009). In this model, financial development is a function of financial openness (kaopen), the quality of institutions (INS) and the improvement of the macroeconomic environment (Envimacro). That is:

$$idf = f(kaopen, INS, Envimacro) \qquad \text{“(1)”}$$

The equation to be estimated is based on the work of Ito (2006), who conducted a study on the effect of international financial openness on the relationship between legal and institutional development and financial development. The model was applied to 87 developing countries from 1982 to 2005, with a focus on the case of Southern Asian countries. The results found in the framework of his study support our hypotheses that a high degree of financial openness stimulates financial development in the case of countries with quality institutions. This model therefore looks like this:

$$idf_{it} = \beta_0 + \beta_1 Gov_{it} + \beta_2 Kaopen_{it-1} + \beta_3 Gov * Kaopen_{it-1} + \beta W_{it} + \varepsilon_{it} \qquad \text{“(2)”}$$

Where: $idf_{i,t}$ is financial development index in country i at period t. $Gov_{i,t}$ is a governance indicator (political, economic, institutional and total governance) of country i at period t. $Kaopen_{i,t}$ is the financial openness indicator of country i at period t ; W is the vector of controls variables (GDP growth rate, investment and inflation) and $\varepsilon_{i,t}$ the error term.

It is worth noting that financial development index is the recent financial development index developed by the IMF Staff (Svirydzenka 2016). It’s a composite measure that overcomes the limits of partial measures of financial development (Chang and Caudill, 2005; Adu et *al*. 2013) This indicator summarizes how developed financial institutions and financial markets are in terms of their depth (size and liquidity), access (ability of individuals and companies to access financial services) and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues and the level of activity of capital markets).

2.3. Construction of Kaopen

In this section, we construct a financial openness captured by KAOPEN, following Chinn and Ito (2008). KAOPEN is based on the binary dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions. Up to 1996, we assign dummy variables for the four major categories on the restrictions on external accounts. These variables are:

- variable indicating the presence of multiple exchange rates (k1);
- variable indicating restrictions on current account transactions (k_2);
- variable indicating restrictions on capital account transactions (k_3); and
- variable indicating the requirement of the surrender of export proceeds (k_4).

In order to calculate the effect of financial openness, rather than capital controls, the authors inverted the values of these binary variables, so that the variables k_i (with $i = 1, 2, 3, 4$) become equal to *1* when the restrictions are not existing (whereas originally they are equal to 1 when there are restrictions). This does not preclude also considering financial openness as an indicator of capital controls.

2.4. The Generalized Method of Moments

The Generalized Method of Moments technique is used for six reasons. *First* the dependent variable should be persistent. As displayed in table 3, the correlation between the dependent

variable and its first lag is 0.9354 higher than the rule of thumb threshold of 0.800 that is required to establish persistence in dependent variable. *Second*, the GMM specification which is dynamic enables us to control for past financial development in the specification (Efobi and Asongu 2016). *Third*, the number of countries (N) is higher than the number of years per country (T). Hence, the sample of the study is consistent with the $N(27) \succ T(20)$ criterion.

Fourth, the estimation strategy accounts for endogeneity in the all regressors. *Fifth,* cross-country variations are not eliminated with the estimation approach. *Sixth*, the system GMM technique corrects for biases in small samples that are inherent in the difference estimator. It is fundamentally for this fifth reason that Bond et al. (2001) have recommended that the system GMM estimator (Arellano and Bover 1995; Blundell and Bond 1998) be preferred to the difference estimator (Arellano and Bond 1991).

Within the specific context of this study, the Arellano and Bover (1995) extension by Roodman (2009a, 2009b) is adopted. The strategy employs forward orthogonal deviations in place of first difference. The estimation strategy has been documented to restrict over-identification (or limit instrument proliferation) and account for cross sectional dependence (Baltagi 2008). In the specification strategy, a two-step approach is adopted in place of the one-step because it controls for heteroscedascticity.

The following equation in levels (3) and first difference (4) summarize the estimation procedure.

$$idf_{i,t} = \sigma_0 + \sigma_1 idf_{i,t-\tau} + \sum_{j=1}^{4} \sigma_j Gov_{j,i,t-\tau} + \gamma Kaopen_{i,t-\tau} + \sum_{g=1}^{4} \delta_g Gov_{g,i,t-\tau} * \text{Kaopen}_{i,t-\tau} + \sum_{h=1}^{2} \varphi_h W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad \text{“(3)”}$$

$$\begin{aligned} idf_{i,t} - idf_{i,t-\tau} = {} & \sigma_0 + \sigma_1 (idf_{i,t-\tau} - idf_{i,t-2\tau}) + \sum_{j=1}^{4} \sigma_j (Gov_{j,i,t-\tau} - Gov_{j,i,t-2\tau}) + \gamma (Kaopen_{i,t-\tau} - Kaopen_{i,t-2\tau}) \\ & + \sum_{g=1}^{4} \delta_g (Gov_{g,i,t-\tau} * \text{Kaopen}_{i,t-\tau} - Gov_{g,i,t-2\tau} * \text{Kaopen}_{i,t-2\tau}) \\ & + \sum_{h=1}^{2} \varphi_h (W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + \varepsilon_{i,t-\tau} \end{aligned} \quad \text{“(4)”}$$

where: $idf_{i,t}$ is financial development index in country i at period t ; σ_0 is a constant; τ represents Tau which is the coefficient of autoregression; $Gov_{i,t}$ is a governance indicator (political, economic, institutional and total governance) of country i at period t ; $Kaopen_{i,t}$ is the financial openness indicator of country i at period t ; W is the vector of controls variables (GDP growth rate, investment and inflation); η_i is the country-specific effect; ξ_t is the time-specific constant and $\varepsilon_{i,t}$ the error term.

In order to assess the overall effect of the modulating variables, and hence avoid pitfalls of interactive regressions documented in Brambor et *al*. (2006), net effects and/or thresholds are computed as in contemporary literature (Tchamyou 2019; Asongu et *al*. 2017). The net effects and/or thresholds entail both the unconditional and conditional effects and hence, avoid interactive regressions being interpreted as in linear additive models.

3. Empirical results

According to the principle of the panel threshold model, we estimate the model under the hypothesis of no threshold, single threshold and double thresholds at the significance level of 1%, 5% and 10%, respectively. We present respectively the results of the descriptive statistics of our variables (table 1), the matrix of correlation of our variables (Table 2), the persistence test of the dependent variable (table 3), the estimates deriving from the GMM method and the robustness of our results using fixed and random effects.

Table 1 Descriptive statistics for the main variables.

Variables	Obs	Mean	SD	Min	Max
idf	540	0.163	0.130	0.0291	0.646
kaopen	540	-0.429	1.419	-1.924	2.322
lngdp	513	7.113	1.035	5.351	9.576
inf	540	9.050	31.66	-9.616	513.9
investment	504	21.27	8.584	1.097	81.02
ecogov	534	-5.09e-09	1.380	-2.861	3.923
pogov	534	-1.81e-09	1.285	-3.101	2.656
instgov	534	-2.32e-09	1.376	-2.889	3.558
govindex	534	-2.12e-09	1.644	-3.443	3.947

Source : Authors

Table 2 Correlation matrix

	Idf	Kaopen	Lgdp	Inf	Investment	Ecogov	Pogov	Instgov	govindex
idf	1.0000								
kaopen	-0.1570	1.0000							
lngdp	0.7759	-0.1667	1.0000						
inf	-0.0649	-0.0569	0.0640	1.0000					
investment	0.0188	0.0459	0.1482	0.0560	1.0000				
ecogov	0.6820	0.0810	0.5719	-0.0855	-0.0150	1.0000			
pogov	0.5505	0.2257	0.5163	-0.1184	0.0105	0.7743	1.0000		
instgov	0.6433	0.1602	0.5837	-0.0947	0.0113	0.9018	0.8751	1.0000	
govindex	0.6592	0.1637	0.5874	-0.1047	0.0026	0.9403	0.9298	0.9763	1.0000

Source: Authors' calculation

Table 3 Persistence of financial development index

	idf
Idf (1)	0.9354

Source: Author's from Stata 16.0

Before proceeding to the econometric analysis, it seems appropriate to determine the series integration properties to avoid spurious regression problem. The choice of the panel unit root tests is based on the dependency test (Pesaran 2021). The Pesaran (2021) test is adapted for small size samples, compatible with unbalanced panels and allow for the existence of one or more structural breaks. The various tests make different assumptions about the rates at which the number of panels, *N*, and the number of time periods, *T*, tend to infinity or whether *N* or *T* is fixed. The size of one's sample will in large part determine which test is most appropriate in a given situation. Our panel contents 20 years (*T*) and 27 countries (*N*) invalidating the usage of Pesaran (2021). The stationary of variables is checked by employing the Fisher-type test for at least two reasons. First, it allows for unbalanced panel datasets and secondly, it takes heterogeneity into account using individual effects and individual linear trends. This heterogeneity in sub-Saharan African countries arises because of the differences in the economic conditions and the degree of development in each country. The null hypothesis of the Fisher-type test requires that all the panels contain unit roots. In other to have a healthy check, and following Twerefou et *al*. (2017), all four unit root test statistics associated with the Fisher test are reported. Table 4 displays the Fisher-type stationarity unit root test. Given the finite number of panels for this study, the null hypothesis of unit roots is rejected for all the variables on the basis of the inverse chi-square test statistic as argued by Choi (2001).

Table 4 Fisher-type stationarity unit root test

Variable	**Inverse Chi-squared**		**Inverse normal**		**Inverse logit t**		**Modified inv. Chi-squared**	
	Statistic	p-value	Statistic	p-value	Statistic	p-value	Statistic	p-value
Idf	129.10	0.0000	-6.335	0.0000	-6.273	0.0000	7.227	0.0000
Kaopen	143.117	0.0000	-7.368	0.0000	-7.322	0.0000	8.575	0.0000
lngdp	150.415	0.0000	-6.349	0.0000	-7.107	0.0000	9.277	0.0000
Inflation	345.421	0.0000	-14.391	0.0000	-18.126	0.0000	28.042	0.0000
Investment	142.231	0.0000	-7.498	0.0000	-7.447	0.0000	8.847	0.0000
Ecogov	152.257	0.0000	-7.366	0.0000	-7.616	0.0000	9.454	0.0000
Pogov	154.151	0.0000	-7.642	0.0000	-7.798	0.0000	9.637	0.0000
Instgov	142.080	0.0000	-6.619	0.0000	-6.917	0.0000	8.475	0.0000
Govindex	144.895	0.0000	-7.022	0.0000	-7.227	0.0000	8.746	0.0000

Source: Authors' own calculation using Stata 16.0

Table 5 The mediating effect of financial openness in governance-financial development relationship in SSA.

Variables	Model 1	Model 2	Model 3	Model 4
L.idf	0.938***	0.998***	0.934***	0.769***
	(0.0606)	(0.0548)	(0.0449)	(0.160)
kaopen	-0.00193*	-0.00197***	-0.00211*	-0.00277**
	(0.00113)	(0.000562)	(0.001146)	(0.00115)
lngdp	0.00840*	0.000196	0.00622*	0.0350*
	(0.0044)	(0.00758)	(0.00322)	(0.0207)
inf	3.57e-05	-6.05e-05	3.08e-05	0.000108
	(0.000119)	(0.000118)	(9.46e-05)	(0.000287)
investment	0.000203	0.000375	0.000338	0.000415
	(0.000381)	(0.000250)	(0.000232)	(0.000398)
ecogov	0.00137			
	(0.00337)			
pogov		0.00508		
		(0.00510)		
instgov			0.00336	
			(0.00329)	
govindex				**0.00581****
				(0.00230)
Kaopen *ecogov	-0.00390			
	(0.00296)			
kaopen*pogov		-0.00558**		
		(0.00234)		
kaopen*instgov			-0.00458	
			(0.00370)	
kaopen*govindex				**-0.0230***
				(0.0136)
Constant	-0.0526	-0.00571	-0.0384	-0.210
	(0.0689)	(0.0457)	(0.0493)	(0.150)
Net effects	na	na	na	**0.0157**
Thresholds (-/+)	nsa	nsa	nsa	**0.252**
AR(1)	(0.010)	(0.012)	(0.010)	(0.048)
AR(2)	(0.130)	(0.104)	(0.116)	(0.270)
Sargan OIR	(0.631)	(0.712)	(0.785)	(0.000)

Hansen OIR	(0.245)	(0.109)	(0.353)	(0.287)
DHT for instruments (a)				
Instruments in levels				
H excluding group	(0.387)	(0.438)	(0.905)	(0.219)
Dif (null, H=exogenous)	(0.210)	(0.069)	(0.192)	(0.453)
(b) IV (years, eq[diff]				
H excluding group	(0.504)	(0.273)	(0.956)	(0.156)
Dif (null, exogenous)	(0.113)	(0.077)	(0.050)	(0.843)
Fisher	172015.45***	14900.96***	8352.37***	354.96***
Instruments	16	17	16	22
Observations	429	429	429	429
Number of countries	26	26	26	26

Note: *The dependent variable is financial development index*

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: authors' estimation

Preliminary tests to validate the relevance or not of our estimation method (GMM method) have been carried out. These are mainly the Sargan test and the Hansen test, which allow us to validate the instruments used in this work.

Indeed, the Hansen test is preferred to the Sargan test and such a preference is justified by the rule of thumb that the number of instruments is less than the corresponding number of cross sections in each specification. It is important to note that the Sargan test is non-robust but not instrument-weakened, whereas the Hansen test is robust and instrument-weakened. Therefore, the robust test can be adopted and the rule of thumb of avoiding instrument proliferation followed.

In light of the information criterion discussed, three main conclusions can be drawn from Table 5. With regard to unconditional effect, first, financial openness has a significant negative impact on financial development in all the models estimated. Indeed, a one-point increase in financial openness hinders financial development by 0.00193, 0.00197, 0.00211 and 0.00277, respectively for models 1, 2, 3 and 4. Thus, financial account liberalization is be detrimental to financial development in SSA. This result is consistent with Karikari (2010) who found that financial liberalization efforts have reduced financial development in SSA between 1996 and 2002 but diverts from Bhetuwal (2007) who found that financial liberalization improves the functioning of financial system by increasing the availability of funds and allowing risk diversification and increased investment or Ahmed (2013) who found that financial liberalization does indeed impact positively on financial deepening and resource mobilization in SSA region. It is also consistent with Aluko and Ayayi (2018) who concluded that capital openness promotes banking sector development.

Second, two types of results are obtained from the disaggregated governance. On the one side total governance positively and significantly affects financial development in column 5 of table 5. This result shows that, taken globally, governance have positive and significant impact on financial development in SSA. In others words, a combination of governance dimensions better affect the development of financial sector than taken individually. Theoretically, this result supports the law and finance theory (Laporta et *al*. 1988) which stresses that legal institutions influence corporate finance and financial development. Empirically, it is consistent with Law and Azman-Saini (2012) who found that a high-quality institutional environment is important in explaining financial development. On the other side, economic, political and institutional governances do not have significant effect on financial development as display in columns 2, 3 and 4 of table 5. Despite the institutional reforms carried out, the level of institutional development is not sufficient to significantly boost financial systems in Sub-Saharan African

countries. This result can be explained by many institutional dysfunctions found in most SSA countries. Our results show that the current state of institutional development is not conducive to improving the effectiveness and even the efficiency of financial systems. This can be justified by the persistent problems such as the relatively high level of corruption, political instability or terrorism in many SSA, and misappropriation of public funds, which remain major obstacles to development in these countries. This result is supported by De Soto (2000) who claimed that the lack of property rights is a serious impediment to financial development.

In order to assess the overall effect of the modulating variables, and hence avoid pitfalls of interactive regressions documented in Brambor et *al*. (2006), net effects and/or thresholds are computed as in contemporary literature (Tchamyou 2019; Asongu et *al*. 2017). The net effects and/or thresholds entail both the unconditional and conditional effects and hence, avoid interactive regressions being interpreted as in linear additive models. The net effects of governance on financial development is computed on the bases of average values of the policy or moderating variables, notably: the average value financial openness is -0.429. This average value is apparent in the summary statistics in table 1.

It is also important to note that for some instances, net effects and/or thresholds cannot be computed for the following reasons: *(i)* "na" or "not applicable" is assigned to the corresponding spaces(s) because at least one estimated coefficient needed for computation of net effects and/or thresholds is not significant and *(ii)* "nsa" (not specifically applicable) is also assigned because synergy effects are apparent instead (Asongu and Nchofoung 2021). Synergy effects are apparent when both the unconditional and conditional estimates reflect the same signs and hence, the computation of a threshold is technically not feasible (Asongu and Acha-Anyi 2019; Asongu and Nchofoung 2021).

Net impact is computed to assess the overall effect from the complementarity between governance and financial openness in influencing financial development. The net effect is computed with the marginal and unconditional effects (Tchamyou and Asongu 2017). In the fifth column of table 5, the interaction between total governance and financial openness is $0.0157[(-0.0230)\times(-0.429)+[0.00581]$. In the underlying computation, 0.00581 is the unconditional effect of total governance, -0.429 is the average value of financial openness while -0.0230 is the conditional effect linked to the interaction between governance and financial openness.

For the computed positive net effect, the corresponding conditional is negative, which is an indication the adopted modulating variable financial openness can reverse the positive incidence of total governance on financial development when a certain threshold of the attendant modulating variable is attained. The threshold is computed accordingly. The financial openness threshold at which the positive effect is nullified is 0.252 $(0.00581/0.0230)$ .It follows that when financial openness is 0.252 , the corresponding net effect is 0.0000 . The computed threshold makes economic sense essentially because it is within the range of financial openness $(-1.924;2.322)$ provided by descriptive statistics. It is worth noting that the conception of threshold is consistent with the theory of critical mass that has been considerably documented in the economic development literature (Ashraf and Galor 2013; Tchamyou and Asongu 2017). This conception of "threshold" is in accordance with the literature, notably: minimum conditions for desired impacts (Cummins, 2000); critical masses for appealing effects (Batuo 2015) and requirements for inverted U-shaped and U-shaped patterns (Ashraf and Galor 2013). The result that looks at the threshold at which financial openness improves the effect of governance on financial development points to a conclusion following models 4. According to model 4, the threshold at which financial openness in SSA improves the effect of total governance on financial development is 0.252. This suggests that SSA countries need to be financially opened to take advantage of total governance to develop their financial systems.

According to model 4, this threshold is 0.252, which also reflects the effort required to neutralize the negative effects of financial openness in the relationship between institutional development and financial development.

With respect to macroeconomic variables, inflation has a positive but insignificant influence on financial development. This result can be explained by the fact that, in most of the Sub-Saharan African countries, inflation is under control. Economic growth**,** on the other hand, has a positive and significant effect on financial development. It can be said that in SSA, increased economic growth encourages financial intermediation activity and the attractiveness of financial markets.

In order to check the robustness of our results, we use an alternative measure of financial openness, namely de jure financial globalization index (*finopen*) (Dreher 2006; Gygli et *al*. 2019) obtained from the principal component analysis. This index is made up of investments restrictions (Gwartney et *al*. 2022), capital account openness (Chinn and Ito 2006; 2008) and international investments agreements (UNCTAD 2022). The estimation from GMM in system provides quite similar results. It is still apparent that financial openness negatively influences the relationship between governance and financial development. The results of this study are therefore robust to the use of an alternative measure of financial openness.

Table 6: Estimation with an alternative measure of financial openness

Variables	(1)	(2)	(3)	(4)
L.idf	0.883***	0.959***	0.832***	0.915***
	(0.159)	(0.0545)	(0.221)	(0.126)
lngdp	0.0137	0.0138*	0.0393	0.0232
	(0.0158)	(0.00830)	(0.0313)	(0.0202)
inf	-2.52e-05	1.07e-05	0.000135	1.22e-05
	(0.000241)	(0.000203)	(0.000309)	(0.000301)
investment	0.00106	0.000981***	0.00161*	0.00119
	(0.000819)	(0.000364)	(0.000978)	(0.00122)
finopen	**-0.00146*** **	-0.000285	-0.000301	**-0.000474***
	(0.00006)	(0.000349)	(0.00114)	**(0.00028)**
ecogov	**0.0943*** **			
	(0.0201)			
pogov		0.0195		
		(0.0188)		
instgov			**0.150*** **	
			(0.0410)	
govindex				**0.0622****
				(0.0252)
ecogov. finopen	-0.00170			
	(0.00168)			
pogov. finopen		-0.000502		
		(0.000411)		
instgov.finopen			**-0.00316***	
			(0.00192)	
govindex.finopen				**-0.00140*** **
				(0.0004)
Constant	-0.0156	-0.123*	-0.276	-0.182
	(0.0747)	(0.0628)	(0.205)	(0.143)
AR(1)	(0.007)	(0.013)	(0.014)	(0.014)
AR(2)	(0.074)	(0.055)	(0.116)	(0.068)
Sargan OIR	(0.000)	(0.000)	(0.000)	(0.000)
Hansen OIR	(0.083)	(0.360)	(0.117)	(0.098)

DHT for instruments (a)				
Instruments in levels				
H excluding group	(0.132)	(0.195)	(0.125)	(0.115)
Dif (null, H=exogenous)	(0.149)	(0.586)	(0.234)	(0.205)
(b) IV (years, eq[diff]				
H excluding group	(0.086)	(0.137)	(0.095)	(0.102)
Dif (null, exogenous)	(0.242)	(0.907)	(0.340)	(0.250)
Fisher	1419.11***	11189.12***	730.59***	1199.47***
Instruments	19	19	19	19
Observations	394	394	394	394
Countries	26	26	26	26

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4. Conclusion

Our study begins with the observation that Sub-Saharan Africa (SSA) is considered as the least financially developed region in the world compared to other regions (World Bank 2021). This economic problem has been addressed in the literature in terms of the determinants of financial development. One of the specificity of our contribution is that we highlight a fundamental aspect of the relationship between institutional development and financial development, namely financial openness, which has not really been taken into account in the literature on the link between governance and financial development. This literature remains divided to this day, as there are oppositions both theoretically (traditional and modern approaches) and empirically. The SSA countries have provided us with a framework for assessing this issue. Interactive regressions draws three major tendencies. First, governance dynamics consistently have unconditional positive and no effect on financial development in SSA. More specifically, only total governance has positive and significant effect on financial development, while economic, political and institutional governances do not have significant effect on financial development. Second, financial openness dynamics modulates the total governance to broadly induce a positive net effect on financial development. Third, policy threshold at which the modulating variable reverse the net effect on financial development is 0.252 financial openness. The computed threshold makes economic sense because it is within the statistical range.

Our results show that the current state of institutional development is not conducive to improving the activity and efficiency of financial systems. Improving the quality of the policy environment and institutions is a necessary precondition for successful international financial openness, along with modernizing the financial system and adopting appropriate macroeconomic policies.

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