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Inequality Thresholds, Governance and Gender Economic Inclusion in sub-Saharan Africa[1]

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Research Department

Inequality Thresholds, Governance and Gender Economic Inclusion in sub-Saharan Africa

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Abstract

Inequality and gender economic exclusion are major policy concerns facing sub-Saharan Africa in the post-2015 development agenda. The study provides critical masses of inequality that should not be exceeded if governance is to promote gender economic participation. The research focuses on 42 countries in sub-Saharan Africa using annual data spanning from 2004 to 2014. The empirical evidence is based on the Generalized Method of Moments. The following findings are established. First, inequality (i.e. the Gini coefficient) levels that completely nullify the positive effect of governance on female labour force participation are 0.708 for political stability, 0.601 for voice & accountability, 0.588 for government effectiveness, 0.631 for regulatory quality, 0.612 for the rule of law, and 0.550 for corruption-control. Second, inequality thresholds at which female unemployment can no longer be mitigated by governance channels include: 0.561 (for political stability) and 0.465 (for the rule of law). Third, inequality levels that completely dampen the positive impact of governance on female employment are 0.608 for political stability, 0.580 for voice & accountability, 0.581 for government effectiveness, and 0.557 for the rule of law. As the main policy implication, for good governance to promote gender economic inclusion, inequality levels should not exceed established thresholds.

JEL Classification: G20; I10; I32; O40; O55
Keywords: Africa; Gender; Inequality; Inclusive development

1. Introduction

According to the United Nations Development Programme (UNDP), it is exclusively by addressing the apparent issue of income inequality in Africa that the continent can achieve sustainable poverty reduction and progress significantly towards the attainment of Sustainable Development Goals (SDGs) in the post-2015 development agenda (UNDP, 2017). The conclusions of the UNDP are consistent with the contemporary empirical literature. For instance, Bicaba, Brixiova and Ncube (2017) have concluded that, it is unlikely for countries in Sub-Saharan Africa (SSA) to achieve the SDG threshold of reducing extreme poverty to below 3% unless inequality is addressed: "*This paper examines its feasibility for Sub-Saharan Africa (SSA), the world's poorest but growing region. It finds that under plausible assumptions extreme poverty will not be eradicated in SSA by 2030, but it can be reduced to low levels through high growth and income redistribution towards the poor segments of the society*" (p. 93). A significant contribution to the underlying inequality in SSA is the exclusion of the female gender from the formal economic sector[2] (Efobi, Tanakem & Asongu, 2018). While good governance is relevant in addressing female economic exclusion, existing levels of inequality can affect the effectiveness of such governance measures in the promotion of gender participation in the formal economic sector (Fosu, 2008, 2009, 2010a, 2015; Asongu & Odhiambo, 2019a)[3]. Such underpinnings motivate the positioning of this study on inequality thresholds that crowd-out the favourable effect of good governance on female economic inclusion in SSA. Having clarified the background for this research, it is relevant to critically engage and substantiate factors motivating the positioning of this study, notably: (i) the policy and scholarly concerns of inequality and gender exclusion in SSA in the light of the SDGs; (ii) the documented relevance of good governance in driving inclusive development outcomes and (iii) gaps in contemporary scholarly literature. The factors are substantiated in the same chronological order.

First, consistent with contemporary African scholarly and policy literature on inequality, inequality in SSA is a fundamental setback to sustainable development in the sub-region (McGeown, 2017; Asongu & Kodila-Tedika, 2017; Tchamyou, 2019a, 2019b; Asongu & le Roux, 2019). Within this framework of inequality, the concern of gender exclusion

[2] The terms "gender inclusion", "gender economic participation", "female labour force participation", "female employment", "female economic participation" and "gender economic inclusion" are used interchangeably throughout the study

[3] It is important to note that the conclusions of Fosu are consistent with the position that, government actions in the promotion of inclusive development are hampered by existing levels of inequality.

underlying this study pertains to at least two SDGs, notably: (i) SDG 5 (i.e. "*achieve gender equality and empower all women and girls*") and (ii) SDG 8 (i.e. "*promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*"). The concern of gender exclusion is particularly relevant to SSA because females in the sub-region are the poorest in the world (Hazel, 2010) and both the scholarly and policy research on the issue are consistent on the position that women in SSA are mostly involved in small trading activities, subsistence agriculture and domestic activities that are largely always unpaid (Ellis, Blackden, Cutura, MacCulloch & Seebens, 2007; FAO, 2011; International Labour Organisation, 2013; Tandon & Wegerif, 2013;World Bank, 2015; Efobi *et al*., 2018).

Second, good governance has been established to be an important channel through which economic and inclusive developments are enhanced in Africa (Efobi, 2015; Asongu & Kodila-Tedika, 2016; Ajide & Raheem, 2016a, 2016b). Moreover, the underlying literature broadly accords on the position that appropriate and robust governance initiatives are fundamental in the driving of economic prosperity and encouragement of private sector development, which entails job opportunities for the female gender in the formal economic sector. The governance variables which are defined in the data section logically attest to the fact that political, economic and institutional dimensions of governance are relevant in providing a favourable economic atmosphere for job creation and entrepreneurship. A recent World Bank report which has estimated the loss in income from the exclusion of women in the formal economic sector at about 2.5 trillion USD, has also recommended good governance in the formulation and implementation of appropriate policies that can curtail the exclusion of women in the formal economic sector (World Bank, 2018; Nkurunziza, 2018). The recommendations of the World Bank are taken on board in this study given that the governance channel is acknowledged and empirically engaged as a mechanism by which the participation of women in the formal economic sector can be enhanced, contingent on existing inequality levels. Moreover, the positioning of this research in light of the recommendation from the World Bank is also partly motivated by a gap in the extant literature.

Third, as far as we have reviewed, the contemporary scholarly literature on gender equality in Africa has failed to engage the relevance of good governance in promoting economic inclusion with particular emphasis on how income inequality affects the "good governance"-"female inclusion" nexus. In the attendant literature, Ntayi, Munene and Malinga (2018) provide nexuses between financial access and mobile money with emphasis

on moderation from gender and social networks. As argued by Uduji and Okolo-Obasi (2018), it is relevant to take women into consideration when implementing technology-driven policies designed to boost agricultural productivity in rural areas. Kairiza, Kiprono and Magadzire (2017) study the relationship between gender gaps and inclusive finance whereas Elu (2018) investigates the relevance of improving girls' and women's involvement in science studies. The importance of gender within informal and financial sectors is investigated by Bayraktar and Fofack (2018) while Mannah-Blankson (2018) focuses on the nexus between gender exclusion and financial access within the framework of microfinance. A strand of studies has investigated the importance of gender participation in agricultural development that is sustainable (Theriault, Smale & Haider, 2017) whereas another strand of research has been oriented towards the importance of information and communication technology (ICT) in driving female employment either directly (Efobi *et al.*, 2018) or indirectly by means of the financial access channel (Asongu & Odhiambo, 2018a).

Among the engaged literature, the study closest to this research is Efobi *et al.* (2018) who have concluded that ICT positively affects female employment in the following increasing order of magnitude: mobile phone penetration, internet penetration, and fixed broadband subscriptions. This study departs from Efobi *et al.* (2018) from two main perspectives. On the one hand, contrary to the use of ICT, inequality and governance are employed as the independent variables of interest, in the light of the motivation underpinning this research. On the other, the thresholds of inequality that dampen the positive effect of good governance on female employment are provided. Furthermore, on the latter departure from Efobi *et al.* (2018), this study argues that it is not enough to provide policy makers with findings based on magnitudes of direct effects between macroeconomic variables. In essence, in order to provide policy makers with more policy options, actionable policy measures should result from the findings. To this end, this research provides critical masses of inequality that should not be exceeded if governance is to promote female economic participation.

This is an applied economics study. Hence, the authors are fully cognizant of the issues related to engaging empirics without established theoretical underpinnings. However, the authors also posit that applied economics should not exclusively be based on the premise of accepting or rejecting existing theoretical underpinnings. Accordingly, conforming to a growing branch of the literature, this research is premised on the importance of applied

econometrics in theory-building (Costantini & Lupi, 2005; Narayan, Mishra & Narayan, 2011; Asongu & Nwachukwu, 2016a). According to the attendant literature, applied econometrics that proceeds from sound intuition is a useful scientific activity. As substantiated throughout this introduction, the intuition underlying this research is simple to follow: existing levels of inequality affect the role of governance in promoting gender economic participation. Hence, it is relevant to assess maximum levels of inequality at which, good governance no longer promotes female economic inclusion.

It is worthwhile to further substantiate the intuition for the study by providing clarifications to two more tendencies motivating this study, notably: that economic inequality can affect governance structures and economic inequality can also affect the participation of women in the formal economic sector. Accordingly, the attendant literature is consistent on the position that the responsiveness of government-tailored inclusive policies to economic prosperity is hampered by existing levels of income inequality. To put this intuition into more perspective: "*The study finds that the responsiveness of poverty to income is a decreasing function of inequality*" (Fosu, 2010b, p. 818); "*The responsiveness of poverty to income is a decreasing function of inequality, and the inequality elasticity of poverty is actually larger than the income elasticity of poverty*" (Fosu, 2010c, p. 1432); and "*In general, high initial levels of inequality limit the effectiveness of growth in reducing poverty while growing inequality increases poverty directly for a given level of growth*" (Fosu, 2011, p. 11). These conclusions from Fosu are relevant in motivating the study because income-driven policies from governments are designed to ultimately promote inclusive development.

In light of the above, the corresponding research question this study aims to answer is the following: what levels or thresholds of inequality completely nullify the positive incidence of governance on female economic inclusion? Two hypothetical premises are necessary to answer the question, notably: governance should positively affect inclusive economic participation while the interaction between governance and inequality should have the opposite effect.

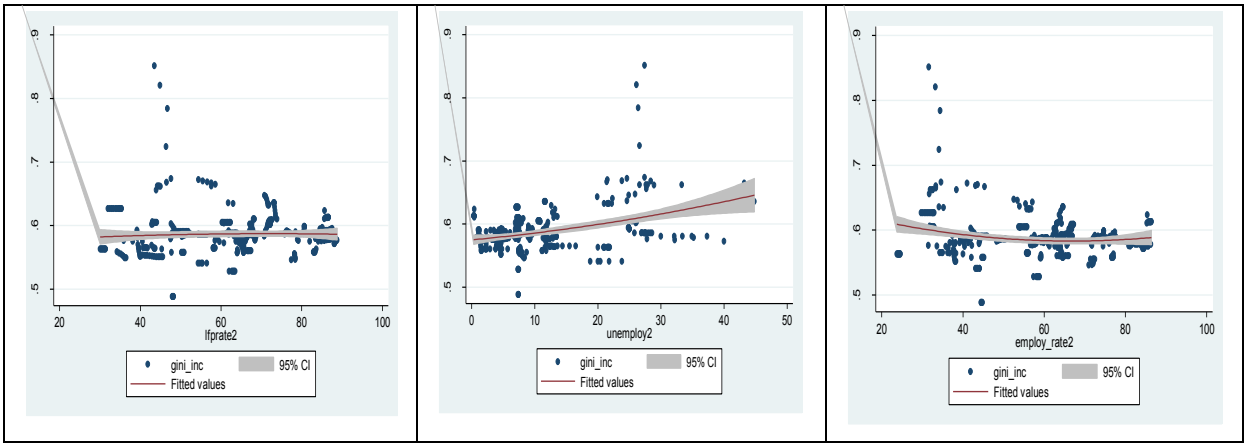
Hypothesis 1: there are positive unconditional effects from the incidence of governance on female economic inclusion.

Hypothesis 2: there are negative conditional effects from the interaction between governance and inequality on female economic inclusion.

The underlying hypotheses are partly supported with stylized facts on the nexuses between inequality (i.e. the Gini coefficient) and the dynamics of female economic participation. Accordingly, as apparent in Figure 1 from the left to the right, while the relationship between inequality and female economic participation is not very apparent (i.e. first graph): (i) there is a positive nexus between inequality and female unemployment (i.e. second graph) and (ii) a negative nexus between inequality and female employment (i.e. third graph).

The rest of the research is organised in the following manner. Section 2 covers the data and methodology whilst the empirical findings are presented and discussed in section 3. The study concludes in section 4 with implications and future research directions.

Figure 1: Inequality and Female Economic Participation



2. Data and methodology

2.1 Data

This research focuses on 42 countries in sub-Saharan Africa using annual data spanning from 2004 to 2014[4]. These scopes of geography and periodicity are motivated by the justifications for the research articulated in the introduction as well as data availability constraints at the time of the study. The data are obtained from four main sources. First, the inequality indicator which is the Gini coefficient is from the Global Consumption and Income Project (GCIP).

[4] The 42 countries include: "Angola, Benin, Botswana, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Djibouti, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda and Zambia".

Second, borrowing from Efobi *et al*. (2018) which is partly motivating this research, three gender economic inclusion indicators from the International Labor Organisation are used, namely: female labor force participation, female unemployment rate and female employment rate[5]. Third, in line with recent African governance literature (Oluwatobi, Efobi, Olurinola, Alege, 2015; Andres, Asongu & Amavilah 2015; Ajide & Raheem, 2016a, 2016b; Tchamyou, 2017; Asongu, le Roux, Nwachukwu & Pyke, 2019), six governance indicators are sourced from World Governance Indicators of the World Bank, namely: (i) political stability, "voice & accountability" (components of political governance), (ii) regulatory quality, government effectiveness (constituents of economic governance), (iii) corruption-control and the rule of law (components of institutional governance). Accordingly: "*The first concept is about the process by which those in authority are selected and replaced (Political Governance): voice and accountability and political stability. The second has to do with the capacity of government to formulate and implement policies, and to deliver services (Economic Governance): regulatory quality and government effectiveness. The last, but by no means least, regards the respect for citizens and the state of institutions that govern the interactions among them (Institutional Governance): rule of law and control of corruption*" (Andres *et al*., 2015, p. 1041).

Fourth, two main control variables are adopted from the World Development Indicators of the World Bank, namely: mobile phone penetration and remittances. These indicators are motivated by contemporary African inclusive development literature (Efobi *et al*., 2018; Asongu & Nwachukwu, 2018; Asongu & Odhiambo, 2018b; Tchamou *et al*., 2019). The expected signs are contingent on country-specific effects that are not considered in the estimation exercise because the adopted GMM approach is designed such that country-specific effects are eliminated in order to prevent the concern of endogeneity which results from the correlation between the lagged outcome variable and country-specific effects. However, in accordance with the attendant empirical literature, mobile phone penetration is expected to increase female labour force participation and female employment while it is also anticipated to decrease female unemployment. Concerning remittances, Meniago and Asongu (2018) have recently established that they increase inequality in Africa because majority of the population moving abroad from the continent are from rich households. Consequently,

[5] While the gender economic inclusion indicators are obtained from a credible source such as the International Labour Organisation, the claim that three indicators of gender economic inclusion are used may also be doubtful. For example, the measurement of female unemployment rate can simply be the opposite of female employment rate (i.e. 100 minus female employment rate).

when funds are remitted to Africa, these funds end-up improving the financial standing of rich households, *ceteris paribus*. The narrative on inequality has been confirmed within the framework of female exclusion by Asongu and Odhiambo (2018a).

Concerns may arise as to why variables in the conditioning information set are limited to two. It is worthwhile to note that, such restriction of elements in the conditioning information set in order to avoid concerns of instrument proliferation is not uncommon in the empirical literature, in so far as the motivation for such restriction is to obtain valid models and robust coefficients. Cases in GMM-centric literature that are relevant in substantiating this perspective include: (i) Bruno, De Bonis and Silvestrini (2012) who have used two control variables as in this study and (ii) Osabuohien and Efobi (2013) and Asongu and Nwachukwu (2017) who have not used any control variable. The definitions and sources of variables are provided in Appendix 1 whereas the summary statistics is disclosed in Appendix 2. The correlation matrix is covered in Appendix 3.

2.2 Methodology

2.2.1 GMM Specification

Borrowing from recent GMM-centric literature, the GMM empirical approach is adopted for this study because of four main fundamental factors (Meniago & Asongu, 2018; Tchamyou, 2019a, 2019b; Tchamyou *et al.*, 2019; Agoba, Abor, Osei, & Sa-Aadu, 2019; Fosu & Abass, 2019). (i) In this research, the number of sampled countries (i.e. N) far exceeds the number of periods in each cross section (i.e. T). Hence, the N>T condition warranted for the employment of the strategy is met. (ii) Persistence is exhibited by the outcome variables of female economic inclusion because the correlations between first lag and level series' are higher than 0.800 which is the rule of thumb threshold for confirming persistence in a variable (Asongu & Odhiambo, 2019b, 2019c). (iii) The panel data strucure of the research informs the study that cross-country differences are taken on board in the estimations. (iv) The concern of endogeneity is also addressed by the study because, on the one hand, reverse causality or simultaneity is tackled with the use of internal instruments and on the other; the unobserved heterogeneity is controlled by means of time-invariant omitted indicators.

The GMM approach adopted in this study is the Roodman (2009a, 2009b) strategy which has been documented to limit the proliferation of instruments. The following equations in level (1) and first difference (2) summarise the standard *system* GMM estimation procedure.

$$FE_{i,t} = \sigma_0 + \sigma_1 FE_{i,t-\tau} + \sigma_2 G_{i,t} + \sigma_3 I_{i,t} + \sigma_4 GI_{i,t} + \sigma_5 M_{i,t} + \sigma_6 R_{i,t} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$\begin{aligned} FE_{i,t} - FE_{i,t-\tau} = {} & \sigma_1 (FE_{i,t-\tau} - FE_{i,t-2\tau}) + \sigma_2 (G_{i,t} - G_{i,t-\tau}) + \sigma_3 (I_{i,t} - I_{i,t-\tau}) + \sigma_4 (GI_{i,t} - GI_{i,t-\tau}) \\ & + \sigma_5 (M_{i,t} - M_{i,t-\tau}) + \sigma_6 (R_{i,t} - R_{i,t-\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \end{aligned} \quad (2)$$

where, $FE_{i,t}$ is an indicator of gender economic inclusion (i.e. female labour force participation, female unemployment rate and female employment rate) of country i in period t, σ_0 is a constant, G entails governance (political stability, "voice & accountability", regulatory quality, government effectiveness, rule of law and corruption-control), I denotes the income inequality indicator or the Gini coefficient, GI reflects interactions between governance and inequality indicators ("political stability" × "the Gini coefficient"; "voice & accountability" × "the Gini coefficient"; "regulatory quality"×"the Gini coefficient";"government effectiveness" × "the Gini coefficient"; "the rule of law"×"the Gini coefficient" and "corruption-control"× "the Gini coefficient"), M is mobile phone penetration, R is remittances, τ represents the coefficient of auto-regression which is one within the framework of this study because a year lag appropriately captures past information, ξ_t is the time-specific constant, η_i is the country-specific effect and $\varepsilon_{i,t}$ the error term.

2.2.2 Identification and exclusion restrictions

For a robust GMM specification, it is relevant to articulate the identification strategy as well as the exclusion restrictions that underpin the identification approach. This research is in accordance with contemporary GMM-centric literature in considering years as strictly exogenous and the independent variables (i.e. governance channels, inequality policy syndrome and control indicators) are predetermined or endogenous explaining (Asongu & Nwachukwu, 2016c; Tchamyou & Asongu, 2017; Boateng *et al.*, 2018; Tchamyou *et al.*, 2019). Roodman (2009b) also argues in favour of this strategy by maintaining that years cannot become endogenous in a difference series[6].

In light of the explanation above, the identification and exclusion restrictions are assessed on the basis of the Difference in Hansen Test (DHT) for instrument exogeneity. The alternative hypothesis of this test is the position that the instruments are not exogenous whereas the corresponding null hypothesis is the stance that such instruments exhibit strict exogeneity. Therefore, in the findings that are reported in the empirical section, for this exclusion restriction assumption to hold, the null hypothesis of the DHT should not be rejected. The

[6]Hence, the procedure for treating *ivstyle* (years) is 'iv (years, eq(diff))' whereas the *gmmstyle* is employed for predetermined variables.

clarifications on identification and exclusion restrictions pertaining to validating the adopted instruments is not different from the criterion in traditional instrumental variable (IV) techniques which require that the null hypothesis of the Sargan/Hansen test should not be rejected in order for the instruments to be valid (Beck,Demirgüç-Kunt& Levine, 2003; Asongu & Nwachukwu, 2016d).

3. Empirical results

3.1 Presentation of results

This section discloses the regressions results in Tables 1-3. Table 1 focuses on the nexus between inequality, governance and female labour force participation while Table 2 is concerned with linkages between inequality, governance and female unemployment. Table 3 focuses on connections between inequality, governance and female employment. The use of various governance and female economic inclusion variables is also a measure of robustness check. Each table is partitioned into three main fractions of governance, consisting of the following order: (i) political stability and "voice & accountability" (in the first category of political governance); (ii) government effectiveness and regulatory quality (in the second category on economic governance) and (iii) the rule of law and corruption-control (in the third category for institutional governance).

Four information criteria are used to examine the validity of estimated models[7]. In the light of these criteria, specifications in the 3rd and 4th columns of Table 2 are invalid. The invalidity is essentially based on the fact that the null hypotheses of the Hansen overidentifying restrictions tests are rejected. It is relevant to note that the Hansen test which is more robust than the Sargan test is weakened by the proliferation of instruments. This is not the case with the Sargan test which is not sensitive to instrument proliferation. Hence, an approach through which the underlying conflict of interest is avoided is to adopt the Hansen test and ensure that instrument proliferation is limited. A criterion of limiting instrument proliferation is that instruments should be less than the number of cross sections in each specification.

[7] "*First, the null hypothesis of the second-order Arellano and Bond autocorrelation test (AR (2)) in difference for the absence of autocorrelation in the residuals should not be rejected. Second the Sargan and Hansen over-identification restrictions (OIR) tests should not be significant because their null hypotheses are the positions that instruments are valid or not correlated with the error terms. In essence, while the Sargan OIR test is not robust but not weakened by instruments, the Hansen OIR is robust but weakened by instruments. In order to restrict identification or limit the proliferation of instruments, we have ensured that instruments are lower than the number of cross-sections in most specifications. Third, the Difference in Hansen Test (DHT) for exogeneity of instruments is also employed to assess the validity of results from the Hansen OIR test. Fourth, a Fischer test for the joint validity of estimated coefficients is also provided*" (Asongu& De Moor, 2017, p.200).

This research follows the approach of Asongu (2018) in establishing thresholds of inequality that crowd-out the favourable impact of good governance on female economic inclusion. For instance in the last column of Table 1, the maximum value of inequality at which corruption-control positively affects female labour force participation 0.550 (2.559/4.646). In this computation, 2.559 is the unconditional effect of corruption-control on female labour force participation while 4.646 is the absolute value of the conditional effect from the interaction between corruption-control and the Gini coefficient. Hence, above a Gini coefficient threshold of 0.550, the Gini coefficient completely crowds-out the positive unconditional effect of corruption-control (i.e. 2.556) on female labour force participation.

The following findings can be established from Tables 1-3. First, inequality levels that completely nullify the positive effect of governance on female labour force participation are: 0.708 (for political stability); 0.601 ("voice & accountability"); 0.588 (government effectiveness); 0.631 (regulatory quality); 0.612 (rule of law) and 0.550 (for corruption-control). Second, inequality thresholds at which female unemployment can no longer be mitigated by governance channels are 0.561 (for political stability) and 0.465 (for the rule of law). Third, inequality levels that completely dampen the positive effect of governance on female employment are 0.608 (for political stability), 0.580 for voice & accountability, 0.581 for government effectiveness, and 0.557 for the rule of law. Most of the significant control variables display the expected signs.

Table 1: Governance, Inequality and Female Labour Force Participation

	Dependent variable: Female Labour Force Participation (FLFP)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectivness	Regulation Quality	Rule of Law	Corruption-Control
FLFP (-1)	**0.959*** **	**0.942*** **	**0.966*** **	**0.969*** **	**0.954*** **	**0.949*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Gini Coefficient (Gini)	-0.523	**4.658***	1.054	2.025	-2.785	3.158
	(0.806)	**(0.085)**	(0.638)	(0.452)	(0.560)	(0.220)
Political Stabiility (PolS)	**1.486** **	---	---	---	---	---
	(0.042)					
Voice & Accountability(VA)	---	**7.818*** **	---	---	---	---
		(0.000)				
Government Effectivenss (GE)	---	---	**4.151*** **	---	---	---
			(0.005)			
Regulatory quality (RQ)	---	---	---	**4.887** **	---	---
				(0.011)		
Rule of Law (RL)	---	---	---	---	**6.821** **	---
					(0.038)	
Corruption-Control (CC)	---	---	---	---	---	**2.559***
						(0.051)
Gini × PolS	**-2.097***	---	---	---	---	---
	(0.097)					
Gini × VA	---	**-13.005*** **	---	---	---	---
		(0.000)				
Gini × GE	---	---	**-7.048*** **	---	---	---
			(0.006)			
Gini × RQ	---	---	---	**-7.742** **	---	---
				(0.015)		
Gini × RL	---	---	---	---	**-11.143** **	---
					(0.039)	
Gini × CC	---	---	---	---	---	**-4.646** **
						(0.037)
Mobile Phone Penetration	**-0.004** **	**-0.007***	-0.002	-0.002	-0.006	-0.006
	(0.029)	**(0.050)**	(0.500)	(0.511)	(0.124)	(0.102)
Remittances	**-0.076*** **	**-0.040*** **	**-0.045*** **	**-0.045*** **	-0.011	**-0.040*** **
	(0.000)	**(0.008)**	**(0.000)**	**(0.000)**	(0.580)	**(0.003)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Thresholds	0.708	0.601	0.588	0.631	0.612	0.550
AR(1)	(0.042)	(0.048)	(0.056)	(0.057)	(0.067)	(0.036)
AR(2)	**(0.343)**	**(0.222)**	**(0.292)**	**(0.319)**	**(0.216)**	**(0.429)**
Sargan OIR	(0.000)	**(0.191)**	**(0.231)**	(0.015)	(0.000)	(0.006)
Hansen OIR	**(0.419)**	**(0.299)**	**(0.368)**	**(0.588)**	**(0.428)**	**(0.351)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.109)**	**(0.167)**	**(0.158)**	**(0.171)**	**(0.175)**	**(0.120)**
Dif(null, H=exogenous)	**(0.680**	**(0.429)**	**(0.536)**	**(0.781)**	**(0.590)**	**(0.568)**
(b) IV (years, eq(diff))						
H excluding group	**(0.295)**	**(0.410)**	**(0.698)**	**(0.481)**	**(0.364)**	**(0.470)**
Dif(null, H=exogenous)	**(0.504)**	**(0.263)**	**(0.206)**	**(0.561)**	**(0.451)**	**(0.288)**
Fisher	**245055*** **	**66215*** **	**3246.97*** **	**61249*** **	**1931.54*** **	**1626.71*** **
Instruments	32	32	32	32	32	32
Countries	39	39	39	39	39	39
Observations	366	366	366	366	366	366

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests; and b) the validity of the instruments in the Sargan and Hansen OIR tests. The mean value of the Gini coefficient is 0.586. na: not applicable because at least one estimated coefficient needed for the computation of the net effects is not significant. Constants are included in all regressions.

Table 2: Governance, Inequality and Female Unemployment

	Dependent variable: Female Unemployment (FU)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectivness	Regulation Quality	Rule of Law	Corruption-Control
FU (-1)	**0.910*** (0.000)**	**0.918*** (0.000)**	**0.884*** (0.000)**	**0.906*** (0.000)**	**0.841*** (0.000)**	**0.949*** (0.000)**
Gini Coefficient (Gini)	**7.943*** (0.000)**	**8.021*** (0.000)**	**4.849** (0.037)**	**6.596*** (0.000)**	**9.648*** (0.001)**	3.158 (0.220)
Political Stabiility (PolS)	**-2.798** (0.024)**	---	---	---	---	---
Voice & Accountability(VA)	---	**-5.841*** (0.000)**	---	---	---	---
Government Effectivenss (GE)	---	---	-1.215 (0.465)	---	---	---
Regulatory quality (RQ)	---	---	---	-1.677 (0.212)	---	---
Rule of Law (RL)	---	---	---	---	**-6.075** (0.011)**	---
Corruption-Control (CC)	---	---	---	---	---	**2.559* (0.051)**
Gini × PolS	**4.987** (0.028)**	---	---	---	---	---
Gini × VA	---	**10.121*** (0.000)**	---	---	---	---
Gini × GE	---	---	2.876 (0.346)	---	---	---
Gini × RQ	---	---	---	3.065 (0.197)	---	---
Gini × RL	---	---	---	---	**13.061*** (0.002)**	---
Gini × CC	---	---	---	---	---	**-4.646** (0.037)**
Mobile Phone Penetration	-0.0002 (0.938)	**0.002** (0.039)**	0.003 (0.170)	**0.003** (0.017)**	-0.003 (0.429)	-0.006 (0.102)
Remittances	**0.083*** (0.000)**	0.010 (0.209)	**0.017* (0.091)**	0.0002 (0.965)	0.027 (0.190)	**-0.040*** (0.003)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Thresholds	0.561	0.577	na	na	0.465	0.550
AR(1)	**(0.202)**	**(0.196)**	**(0.198)**	**(0.198)**	**(0.201)**	(0.036)
AR(2)	**(0.378)**	**(0.365)**	**(0.382)**	**(0.385)**	**(0.351)**	**(0.429)**
Sargan OIR	(0.000)	(0.057)	(0.019)	(0.001)	(0.000)	(0.006)
Hansen OIR	**(0.698)**	(0.032)	(0.069)	**(0.109)**	**(0.416)**	**(0.351)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.264)**	**(0.292)**	**(0.279)**	**(0.417)**	**(0.422)**	**(0.120)**
Dif(null, H=exogenous)	**(0.810)**	(0.029)	(0.067)	(0.084)	**(0.390)**	**(0.568)**
(b) IV (years, eq(diff))						
H excluding group	**(0.333)**	**(0.032)**	**(0.328)**	**(0.228)**	**(0.536)**	**(0.470)**
Dif(null, H=exogenous)	**(0.825)**	**(0.164)**	(0.053)	**(0.128)**	**(0.322)**	**(0.288)**
Fisher	**19656.61***	**15366.52***	**5546.38***	**61088***	**2526.32***	**1626.71***
Instruments	32	32	32	32	32	32
Countries	37	37	37	37	37	37
Observations	346	346	346	346	346	346

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests; and b) the validity of the instruments in the Sargan and Hansen OIR tests.The mean value of the Gini coefficient is 0.586.na: not applicable because at least one estimated coefficient needed for the computation of the net effects is not significant.Constants are included in all regressions.

Table 3: Governance, Inequality and Female Employment

	Dependent variable: Female Eemployment (FE)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectivness	Regulation Quality	Rule of Law	Corruption-Control
FE (-1)	**0.976*** **	**0.953*** **	**0.963*** **	**0.988*** **	**0.954*** **	**0.971*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Gini Coefficient (Gini)	**-3.651*** **	-1.717	-2.445	**-3.474*** **	**-5.964*** **	**-3.773***
	(0.001)	(0.429)	(0.135)	**(0.000)**	**(0.000)**	**(0.082)**
Political Stabiility (PolS)	**2.034** **	---	---	---	---	---
	(0.035)					
Voice & Accountability(VA)	---	**6.750*** **	---	---	---	---
		(0.000)				
Government Effectivenss (GE)	---	---	**3.725** **	---	---	---
			(0.041)			
Regulatory quality (RQ)	---	---	---	1.561	---	---
				(0.221)		
Rule of Law (RL)	---	---	---	---	**6.107*** **	---
					(0.000)	
Corruption-Control (CC)	---	---	---	---	---	2.552
						(0.193)
Gini × PolS	**-3.341***	---	---	---	---	---
	(0.055)					
Gini × VA	---	**-11.637*** **	---	---	---	---
		(0.003)				
Gini × GE	---	---	**-6.411** **	---	---	---
			(0.052)			
Gini × RQ	---	---	---	-1.938	---	---
				(0.376)		
Gini × RL	---	---	---	---	**-10.952*** **	---
					(0.001)	
Gini × CC	---	---	---	---	---	-4.050
						(0.288)
Mobile Phone Penetration	-0.0005	**-0.007** **	-0.004	-0.002	-0.002	**-0.007***
	(0.834)	**(0.030)**	(0.155)	(0.261)	(0.268)	**(0.056)**
Remittances	**-0.049*** **	-0.015	-0.010	**-0.014** **	0.0009	-0.012
	(0.000)	(0.112)	(0.192)	**(0.011)**	(0.884)	(0.214)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Thresholds	0.608	0.580	0.581	na	0.557	na
AR(1)	**(0.140)**	**(0.152)**	**(0.145)**	**(0.143)**	**(0.141)**	**(0.148)**
AR(2)	**(0.276)**	**(0.309)**	**(0.304)**	**(0.289)**	**(0.249)**	**(0.300)**
Sargan OIR	(0.006)	**(0.242)**	(0.087)	(0.007)	(0.000)	(0.000)
Hansen OIR	**(0.757)**	**(0.784)**	**(0.858)**	**(0.875)**	**(0.321)**	**(0.726)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.178)**	**(0.396)**	**(0.189)**	**(0.434)**	**(0.340)**	**(0.109)**
Dif(null, H=exogenous)	**(0.923)**	**(0.821)**	**(0.976)**	**(0.902)**	**(0.326)**	**(0.955)**
(b) IV (years, eq(diff))	**(0.288)**	**(0.412)**	**(0.622)**	**(0.403)**	**(0.405)**	**(0.451)**
H excluding group	**(0.919)**	**(0.863)**	**(0.830)**	**(0.957)**	**(0.290)**	**(0.764)**
Dif(null, H=exogenous)						
Fisher	**440766*** **	**370965*** **	**2379.24*** **	**794776*** **	**119202*** **	**2472.08*** **
Instruments	32	32	32	32	32	32
Countries	37	37	37	37	37	37
Observations	346	346	346	346	346	346

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Wald statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests; and b) the validity of the instruments in the Sargan and Hansen OIR tests.The mean value of the Gini coefficient is 0.586. na: not applicable because at least one estimated coefficient neededfor the computation of the net effects is not significant. Constants are included in all regressions.

3.2 Further discussion of results

The research question motivating this study has centred on the assessment of the levels of income inequality that reduce the effectiveness of governance in tailoring conducive policies that ultimately promote the participation of more women in the formal economic

sector. In order to make this assessment, two main hypotheses have been tested. The empirical findings have largely validated the tested hypotheses because: (i) governance standards unconditionally increase female participation in the labour force and female employment (i.e. in Table 1 and Table 3) and also unconditionally decrease female unemployment (i.e. Table 2). The positive unconditional effect of governance validates *Hypothesis* 1. (ii) As for *Hypothesis* 2, it is apparent that income inequality interacts with governance to reduce female participation in the labour force and female employment (i.e. in Table 1 and Table 3) and also increase female unemployment (i.e. Table 2). This negative conditional effect thus validates *Hypothesis* 2.

The validation of the tested hypotheses is broadly consistent with the literature supporting the perspective that government-led actions that are designed to boost economic development in view of increasing inclusive development can be attenuated by the existing level of income inequality (Fosu, 2008, 2009, 2010a, 2015; Tchamyou, 2019c; Asongu & Kodila-Tedika, 2018) are some studies broadly supporting the validated hypotheses. The corresponding policy implications are discussed in the concluding section.

4. Concluding implications and future research directions

The study assesses critical thresholds of inequality at which good governance is no longer relevant in promoting gender economic inclusion. The scope of the study consists of 42 countries in sub-Saharan Africa with data for the period 2004-2014. Three gender economic indicators are used, namely: female labour force economic participation, female unemployment and female employment. Inequality is proxied with the Gini coefficient while the six governance indicators used are: (i) political governance (consisting of political stability and "voice & accountability); (ii) economic governance (entailing government effectiveness and regulatory quality) and institutional governance (encompassing corruption-control and the rule of law). The empirical evidence is based on Generalised Method of Moments (GMM).

The following findings are established. First, inequality levels that completely nullify the positive effect of governance on female labour force participation are: 0.708 (for political stability); 0.601 ("voice & accountability"); 0.588 (government effectiveness); 0.631 (regulatory quality); 0.612 (rule of law) and 0.550 (for corruption-control). Second, inequality thresholds at which female unemployment can no longer be mitigated by governance channels

are 0.561 (for political stability) and 0.465 (for the rule of law). Third, inequality levels that completely dampen the positive impact of governance on female employment are: 0.608 (for political stability); 0.580 ("voice & accountability"); 0.581(government effectiveness) and 0.557 (rule of law). As a main policy implication, in order for good governance to continue promoting female economic inclusion, inequality levels should not exceed established thresholds.

It is important for policy makers to, therefore, limit inequality because such reduction will not only boost the participation of women in the formal economic sector but will also enhance the negative response of extreme poverty to economic growth in the post-2015 sustainable development agenda in SSA. This inference is consistent with the premise of this research – which is that the effectiveness of governance in promoting inclusive development is hampered by existing levels of income inequality. It is relevant to recall that about half of countries in the sub-region failed to attain the MDG extreme poverty target in spite of the sub-region having experienced more than two decades of growth resurgence. Hence, reduction of income inequality will not exclusively contribute towards the achievement of the SDGs motivating this study, notably: (i) SDG 5 (i.e. "*achieve gender equality and empower all women and girls*") and (ii) SDG 8 (i.e. "*promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*"). Moreover, policies designed to promote gender economic participation also have externalities in the structural distribution of labour, reduction of poverty and improvement in the general welfare. In a nutshell, these will go a long way to addressing most poverty- and inequality-related SDGs in the sub-region.

Future studies can improve the extant literature by assessing the established findings within country-specific frameworks in order to provide room for more targeted policy implications. It is also worthwhile to clarify that the GMM approach used in this study is designed to eliminate country-specific effects in order to avoid a correlation between the lagged dependent variable and such country-specific effects which is a cause of endogeneity. Another caveat is that the Gini coefficient which, is used to measure income inequality because of its wide usage in the literature, has the shortcoming of not capturing tails or extreme points of the inequality distribution. Hence, it would be worthwhile for future studies to take on board measures of inequality that are sensitive to outliers of inequality, *inter alia*: the Atkinson index and the Palma ratio. Within this framework, alternative estimation

techniques that are designed to capture outliers of outcome variables such as quantile regressions are also recommended. Given that the robustness of these alternative techniques is not constrained by instrument proliferation like in the GMM estimation technique, other key variables such as output or output components and real wage rate should be included in the conditioning information set.

Appendices

Appendix 1: Definitions of Variables

Variables	Signs	Definitions of variables (Measurements)	Sources
Female Economic Participation	FLFP	Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate)	ILO
	FU	Unemployment, female (% of female labor force) (modeled ILO estimate)	ILO
	FE	Employment to population ratio, 15+, female (%) (modeled ILO estimate)	ILO
Political Stability	PolS	"Political stability/no violence (estimate): measured as the perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional and violent means, including domestic violence and terrorism"	WGI
Voice & Accountability	VA	"Voice and accountability (estimate): measures the extent to which a country's citizens are able to participate in selecting their government and to enjoy freedom of expression, freedom of association and a free media"	WGI
Government Effectiveness	GE	"Government effectiveness (estimate): measures the quality of public services, the quality and degree of independence from political pressures of the civil service, the quality of policy formulation and implementation, and the credibility of governments' commitments to such policies".	WGI
Regulatory quality	RQ	"Regulatory quality (estimate): measured as the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development".	WGI
Corruption-Control	CC	"Control of corruption (estimate): 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"	WGI
Rule of Law	RL	"Rule of law (estimate): 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, the courts, as well as the likelihood of crime and violence"	WGI
Gini Coefficient	Gini	"*The Gini coefficient is a measurement of the income distribution of a country's residents*".	GCIP
Mobile Phones	Mobile	Mobile cellular subscriptions (per 100 people)	WDI
Remittances	Remit	Remittance inflows to GDP (%)	WDI

WDI: World Bank Development Indicators of the World Bank. FDSD: Financial Development and Structure Database of the World Bank. WGI: World Governance Indicators of the World. ILO: International Labour Organisation. GCIP: Global Consumption and Income Project.

Appendix 2: Summary statistics (2004-2014)

	Mean	SD	Minimum	Maximum	Observations
Female Labor Force participation	130.03	83.996	1.000	287.00	462
Female Unemployment, female	58.273	44.334	1.000	152.00	462
Female Employment	113.19	69.850	1.000	256.00	462
Political Stability	-0.490	0.867	-2.687	1.182	528
Voice & Accountability	-0.509	0.683	-1.780	0.970	462
Government Effectiveness	-0.711	0.599	-1.867	1.035	462
Regulatory quality	-0.608	0.529	-1.879	1.123	462
Corruption-Control	-0.577	0.590	-1.513	1.139	462
Rule of Law	-0.651	0.604	-1.816	1.007	462
Gini Coefficient	0.586	0.034	0.488	0.851	461
Mobile Phone Penetration	45.330	37.282	0.209	171.375	558
Remittances	4.313	6.817	0.00003	50.818	416

S.D: Standard Deviation.

Appendix 3: Correlation matrix (uniform sample size: 378)

FLFP	FU	FE	PolS	VA	GE	RQ	CC	RL	Gini	Mobile	Remit	
1.000	-0.281	0.946	0.079	-0.120	-0.005	-0.004	-0.040	-0.038	-0.039	-0.224	-0.185	FLFP
	1.000	-0.568	0.311	0.260	0.366	0.306	0.399	0.369	0.376	0.237	0.270	FU
		1.000	-0.043	-0.206	-0.118	-0.101	-0.163	-0.151	-0.148	-0.267	-0.255	FE
			1.000	0.724	0.656	0.674	0.736	0.778	0.335	0.293	0.070	PolS
				1.000	0.721	0.741	0.712	0.797	0.241	0.375	0.058	VA
					1.000	0.915	0.840	0.902	0.308	0.423	-0.124	GE
						1.000	0.781	0.879	0.323	0.508	-0.159	RQ
							1.000	0.892	0.342	0.381	0.092	CC
								1.000	0.270	0.424	0.008	RL
									1.000	0.145	0.055	Gini
										1.000	-0.032	Mobile
											1.000	Remit

FLFP: Female Labour Force participation. FU: Female Unemployment. FE: Female Employment. PolS: Political Stability. VA: Voice & Accountability. GE: Government Effectiveness. RQ: Regulatory quality. CC: Corruption-Control. RL: Rule of Law. Gini: Gini Coefficient. Mobile: Mobile Phone Penetration. Remit: Remittances.

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