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The role of inclusive education in governance for inclusive economic participation: gender evidence from sub-Saharan Africa

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The role of inclusive education in governance for inclusive economic participation: gender evidence from sub-Saharan Africa

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Abstract

This study investigates the relevance of inclusive education in moderating the effect of good governance on female economic inclusion in sub-Saharan Africa. First, inclusive tertiary education modulates: (i) government effectiveness to induce a positive net effect on female labour force participation; (ii) political stability and corruption-control to induce negative net effects on female unemployment; (iii) government effectiveness for a positive net effect on female unemployment and (iv) regulation quality and the rule of law for positive net impacts on female employment. Second, inclusive secondary education moderates: (i) corruption-control for a positive net effect on female labour force participation; (ii) "voice and accountability", government effectiveness and corruption-control for negative net impacts on female unemployment; (iii) the rule of law for a positive net effect on female unemployment; (iv) "voice and accountability", government effectiveness and corruption-control for positive net effects on female employment. Policy implications are discussed. Inclusive education thresholds for complementary policy policies are also computed and discussed. At these thresholds, inclusive education becomes a necessary but not a sufficient condition to complement governance in order to promote female economic inclusion.

1. Introduction

It is a fact that good governance is an essential condition for the promotion of female economic participation and the underlying good governance is also a relevant channel through which inclusive gender education affects inclusive gender economic participation[1]. The first sentence summarises the logic underpinning the research question motivating this study: how does inclusive education modulate the effect of governance on gender economic inclusion? Accordingly, gender involvement in the formal economic sector is contingent on gender involvement in education and governance is a mechanism by which a policy of gender inclusiveness in education can be translated into formal gender economic participation. Hence, in the light of the research question, inclusive education is a policy variable, good governance is a channel, and gender economic inclusion is the targeted outcome. The positioning of this research is motivated by three fundamental elements in scholarly and policy literature, notably: (i) the importance of inclusive education and gender economic inclusion in the achievement of Sustainable Development Goals (SDGs); (ii) the relevance of governance in promoting inclusive development and (iii) gaps in the attendant literature. These critical elements are substantiated in the following passages in the same chronological order as they are highlighted.

First, inclusive education underpins many of the 17 SDGs because, in the absence of inclusive education, the achievement of other goals will be limited because the negative response of extreme poverty to economic growth reduces when inequality levels are high (McGeown 2017; Asongu and Kodila-Tedika 2017; Tchamyou 2019, 2021; Asongu and le Roux 2019; Opoku et al. 2020; Omwami and Rust 2020; Chankseliani and McCowan 2021; Asongu et al. 2021; Asongu and Odhiambo 2021a). Moreover, according to the narrative, inclusive education promotes innovation, skills, entrepreneurship, and self-esteem that are important in productive opportunities of employment. Hence, by assessing the relevance of inclusive education in gender economic participation through governance mechanisms, the problem statement underlying this research specifically articulates SDG 5(i.e.,*"achieve gender equality and empower all women and girls"*) and SDG 8 (i.e.,*"promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all"*).

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[1] 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

The discussed issues are particularly relevant in Sub-Saharan Africa (SSA) because, *inter alia*: (i) the sub-region is host to women with the highest poverty rate in the world (Efobiet al.2018); (ii) about half of the countries in thesub-region did not attain the Millennium Development Goals (MDGs) extreme poverty target (Tchamyouet al.2019); (iii) according to the conclusions of Bicabaet al. (2017), if inclusive development is not promoted in SSA, the SDG target of reducing extreme poverty to a critical mass of below 3% by 2030 will not be achieved and (iv) a recent World Bank report has established that gender inequality in Africa corresponds to an estimated loss of 2.5 trillion USD and recommended that governments should put in place conducive policies that promote the training of women and their corresponding engagement in the formal economic sector (Nkurunziza 2018; World Bank 2018; Ofori et al. 2021).These recommendations are consistent with the positioning of this study because while we have discussed the relevance of inclusive education and gender economic participation in the preceding paragraphs in the light of the SDGs, governance has also been documented as essential in promoting inclusive and sustainable development.

Second, good governance has been documented as an important mechanism for promoting inclusive human and economic developments in Africa (Efobi 2015; Asongu and Kodila-Tedika 2016; Ajideand Raheem 2016a, 2016b; Asongu and Odhiambo 2021b). The literature is consistent on the front that good governance initiatives are important for economic growth and the promotion of the private sector, which engenders opportunities for female economic participation. The definitions of various governance dynamics (political, economic and institutional) provided in the data section support this posited importance of governance in promoting a favorable environment for entrepreneurship and job creation. The positioning of this research on governance mechanisms by which inclusive gender education ultimately leads to inclusive gender employment is also partly motivated by an apparent gap in the scholarly literature.

Third, to the best of our knowledge, the contemporary African development literature relevant to the thematic of gender inclusion has not been aligned to address the research question being tackled in this study. Bongominet al. (2018) have focused on linkages between mobile money and access to finance contingent on the modulating role of social network and gender. Uduji and Okolo-Obasi (2018)have observed that it is important to integrate the female gender of rural zones into technology-driven agricultural programmes designed to foster economic development and bridge the rural-urban gap. Kairizaet al.(2017) articulate the

nexuses between inclusive finance and gender disparities,while Elu (2018) focusses on the relevance of boosting the participation of girls and women in science education. BayraktarandFofack (2018) assess the importance of gender within financial and informal productive sectors, while Mannah-Blankson (2018) is concerned with the relationship underlying access to finance and gender exclusion within a microfinance context. Some research strands have focused on the relevance of gender inclusion in the promotion of sustainable agricultural development (Theriaultet al.2017; Ofori et al. 2021), while others have been concerned with the use of information technology to promote the involvement of women in the formal economic sector either directly (Efobiet al.2018) or through financial access mechanisms (Asongu and Odhiambo 2018).

The studies in the literature closest to this paper areEfobiet al. (2018) and Asongu and Odhiambo (2020). Efobiet al. (2018)have concluded that information and communication technology (ICT) enhances female economic participation in SSA. Accordingly, using: (i) data for the period 1990-2014 on countries in SSA; (ii) three ICT proxies (i.e., fixed-broadband subscriptions, internet penetration and mobile phone penetration); (iii) three indicators of gender inclusion (female unemployment, female employment and female labour force participation) and (iv) ordinary least squares, fixed effects and generalized method of moments regressions; the study concludes that the participation of women in the formal economic sector is enhanced by ICT, with the following order of importance: mobile phone penetration, internet penetration and fixed broadband subscriptions.

This research extends Efobiet al. (2018) by considering governance channels and inclusive education policy variables. Hence instead of focusing directly on the impact of ICT on gender economic inclusion, in the light of the motivation of this research, indirect linkages are considered, involving channels that are moderated by policy variables to affect policy outcomes. Moreover, this research argues that contrary to Efobiet al. (2018), it is not enough to simply provide linkages between the independent variable and the macroeconomic variables from the perspectives of signs and magnitude of estimated effects. Accordingly, it is more policy-relevant to engage mechanisms by which such effects are apparent in order to provide space for more policy outcomes. Asongu and Odhiambo (2020), which is also closest to this study, have provided inequality thresholds that should not be exceeded in order for governance to positively affect gender economic inclusion.

The motivations and logic underlying the research question have been clearly articulated in the above passages. Against this background, the research proceeds with the

assessment of whether the corresponding research question withstands empirical scrutiny. In so doing, we are fully aware of concerns that may arise when a problem statement is not consolidated with established theoretical underpinnings. However, on a more practical and applied economicsfront, the research argues that the use of applied economics is not specifically designed for the acceptance and rejection of existing theoretical models. This is essentially because; applied economics based on sound intuition is a useful scientific activity that could be used for theory-building[2]. As substantiated in the first paragraph of this introduction, the intuition and logic of the problem statement underlying the post-2015 SDGs agenda are simply to follow: governance channels are necessary for gender-inclusive education policies to promote gender formal economic participation. In summary, the motivation underlying the empirical nature of this scientific exercise is consistent with a growing body of literature on the relevance of applied economics that is substantiated by sound intuition in the light of daunting global policy challenges such as SDGs (Costantiniand Lupi 2005; Narayan et al. 2011; Asongu and Nwachukwu 2016a).

The rest remainder of the research proceeds as follows. The data and methodology are covered in section 2, while the empirical results are presented in section 3. Section 4 concludes with implications and future research directions.

2. Data and methodology

2.1 Data

The geographical and temporal scopes of the study are, respectively, forty-two countries in SSA and annual data for the period 2004-2014[3]. The temporal and geographical scopes are both motivated by data availability constraints at the time of the study, as well as justifications for the research question outlined in the introduction. Data relevant for the research are obtained from three principal sources, notably: (i) the gender economic participation measurements are from the International Labor Organization (i.e.,female labor force

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[2]There are two main types of research: inductive research and deductive research. Applied economics is either based on inductive research or deductive research. Our case is inductive research because while it is not aimed at testing an existing theory, it can be used to develop a theory (Asongu and Nwachukwu 2016a).

[3]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".

participation, female unemployment rate andfemale employment rate); (ii) the gender parity education variables (i.e., secondary school education and tertiary school education) and a control variable (i.e.,mobile phone penetration) are from the World Development Indicators of the World Bank and (iii) the six governance dynamics (i.e. political stability, "voice and accountability", regulation quality, government effectiveness, corruption-control and the rule of law) are from the World Governance Indicators of the World Bank.

Gender parity education measures are from the secondary and tertiary levels of education because these are intuitively more associated with the development of skills that are relevant for engagement in the formal economic sector, while the three gender inclusion indicators are in accordance with Efobiet al. (2018) which is a study on which this research is partly positioned.

All governance indicators documented in the World Governance Indicators of the World Bank are employed in this study. Hence, concerns of variable omission bias in the selection of governance variables are not apparent. Moreover, the choice of the governance indicators is motivated by a growing body of African governance literature on the need to engage more governance dynamics in empirical analysis in order to avail room for more policy implications (Oluwatobi et al. 2015; Andres et al.2015; Ajideand Raheem 2016a, 2016b; Tchamyou 2017; Asongu et al. 2019). Hence, in the light of the attendant governance literature, political, economic and institutional dimensions of governance capture different subtleties that are essential in promoting female economic participation based on ex-ante policies of gender inclusion. In essence: *"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): the rule of law and control of corruption"* (Andres et al.2015, p. 1041).

The adopted control variable is consistent with contemporary inclusive development literature (Efobi et al. 2018; Asonguand Nwachukwu 2018; Asongu and Odhiambo 2019a; Tchamyou et al. 2019). In light of the attendant literature supporting the relevance of mobile phones in promoting inclusive development, this research expects mobile phone penetration to (i) increase female labour force participation and female employment and (ii) reduce female unemployment.

It is also relevant to note that the adoption of one variable in the conditioning information set is not uncommon in the scholarly literature using the generalised method of moments (GMM), provided that the purpose of doing so is to avoid instrument proliferation that could substantially bias estimated coefficients, even when the "collapse option" is used in the estimation exercise. Accordingly, there are GMM-centric studies in the empirical literature that have used no control variable (Osabuohienand Efobi 2013; Asongu and Nwachukwu 2017) or as few as two control variables (Brunoet al. 2012). 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

In the light of the contemporary GMM-centric literature, this research adopts the attendant estimation approach in assessing the underpinning research question because of at least four main motivations (Meniagoand Asongu 2018; Tchamyou 2019, 2021; Tchamyou et al. 2019). First and foremost, the choice of the GMM strategy is informed by the data structure in which the number of cross sections exceeds the number of time periods within each cross section. The data structure of this research aligns with the specificity because the study focuses on 42 countries covering a time period from 2004 to 2014. Second, the GMM-centric literature is also relevant when an outcome variable is persistent; such that the correlations between series' in level and first difference of the corresponding outcome variable are higher than 0.800, which is established as the rule of thumb for assessing evidence persistence in a variable (Asongu and Odhiambo 2019b). Third, the panel data structure informs the research that cross-country variations are considered in the regressions. Fourth, endogeneity is controlled in the empirical exercise for two main reasons: (i) the issue of simultaneity or reverse causality is taken on board by using internal instruments,and (ii) the unobserved heterogeneity is also addressed because time-invariant omitted variables are accounted for.

Still building on the GMM-centric empirical literature, this research uses the Roodman (2009a, 2009b) approach, which is an extension of Arellano and Bover (1995) because it has been documented in contemporary literature to take into account cross-sectional dependence and instrument proliferation.

The following equations in level (1) and first difference (2) summarise the standard *system* GMM estimation procedure.

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

$$FE_{i,t} - FE_{i,t-\tau} = \sigma_1(FE_{i,t-\tau} - FE_{i,t-2\tau}) + \sigma_2(G_{i,t} - G_{i,t-\tau}) + \sigma_3(E_{i,t} - E_{i,t-\tau}) + \sigma_4(GE_{i,t} - GE_{i,t-\tau})$$
$$+ \sigma_5(M_{i,t} - M_{i,t-\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \quad (2)$$

where, $FE_{i,t}$ is a female economic participation indicator (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 and accountability", regulation quality, government effectiveness, rule of law and corruption-control), E denotes gender parity education (secondary school education and tertiary school education), GE denotes interactions between governance and education indicators("political stability" $\times$ "secondary school education"; "voice and accountability" $\times$ "secondary school education"; "regulation quality"$\times$"secondary school education";"government effectiveness" $\times$ "secondary school education"; "the rule of law"$\times$"secondary school enrolment" and "corruption-control"$\times$ "secondary school education"; "political stability" $\times$ "tertiary school education"; "voice andaccountability"$\times$"tertiary school education"; "regulation quality"$\times$ "tertiary school education";"government effectiveness" $\times$ "tertiary school education"; "the rule of law" $\times$ "tertiary school enrolment" and "corruption-control"$\times$"tertiary school education"), M is mobile phone penetration, 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.

2.2.2Identification and exclusion restrictions

It is very imperative to outline the identification strategy and corresponding exclusions restrictions associated with the identification strategy for a GMM specification to be robust. Hence, aligning with contemporary GMM-centric literature, the study adopts years as strictly exogenous variables while the corresponding independent variables of interest (governance dynamics and education proxies) are acknowledged as predetermined or endogenous explaining (Asongu and Nwachukwu 2016c; Tchamyou and Asongu 2017; Boateng et al. 2018; Tchamyou et al. 2019). Roodman (2009b) is sympathetic to this approach of

identification and exclusion restrictions because the author has posited that years cannot be endogenous after a first difference[4].

Cognizant of the narrative above, the identification and exclusion restrictions are examined with the Difference in Hansen Test (DHT), which is a test for the exogeneity of instruments. Accordingly, its null hypothesis argues for the stance that the instruments are not strictly exogenous and, therefore, the alternative hypothesis should be rejected in order for the assumptions underpinning the exclusion restrictions to hold. In other words, the null hypothesis maintains that the identified strictly exogenous variable affects the outcome variable (or female economic participation) exclusively via the exogenous components of the predetermined variables. Such a narrative on identification and exclusion restriction is in accordance with less contemporary instrumental variable (IV) techniques which support the perspective that the instruments are valid when the corresponding null hypothesis of the Sargan/Hansen test is not rejected (Beck et al. 2003; Asongu and Nwachukwu 2016d).

3. Empirical results

3.1 Presentation of results

The findings of the study are provided in this section. While Tables 1-3 focus on linkages between tertiary education, governance and gender economic inclusion, Tables 4-6 are concerned with nexuses between secondary school education, governance and gender economic inclusion. The employment of various gender inclusion, governance and education dynamics is a form of robustness checks. Accordingly: (i) Table 1and Table 4 focus on female labour force participation; (ii) Table 2 and Table 5 are concerned with female unemployment, while (iii) Table 3 and Table 6 focus on female employment. Each table is divided into three main categories, with each category encompassing two governance variables, notably: political governance (entailing political stability and "voice and accountability"), economic governance (reflecting regulation quality and government effectiveness) and institutional governance (engendering corruption-control and the rule of law). For all the estimated models, four principal information criteria are employed to assess the validity of the estimated models[5].Based on these criteria, the estimated models are overwhelmingly valid with the

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

[5] "*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*

exceptions of Column 3 and Column 5 of Table 4, in which the Hansen test is significant. It should be noted that priority is accorded to the Hansen test because it is more robust than the Sargan test. Conversely, it is influenced by concerns of instrument proliferation which is not the case with the corresponding Sargan test. A means to deal with the conflicting criteria is to adopt the Hansen test and then ensure that the concern pertaining to instrument proliferation is not apparent by cross-checking that the number instruments is lower than the corresponding number of countries in each specification.

"Insert Tables 1-6 here"

In order to assess the overall impact of inclusive education in modulating the effect of governance on female economic participation, net impacts are computed from unconditional governance effects and conditional governance effects (i.e.,estimated effects from the interaction between inclusive education and governance) in accordance with contemporary literature based on interactive specifications (Asongu and Odhiambo 2019c; Tchamyou 2019b). For instance, in the fifth column of Table 1, the net effect of inclusive tertiary education in moderating the effect of government effectiveness on female labour force participation is $0.078([-0.563 \times 0.775] + [0.514])$. In the corresponding computation, the mean value of gender-parity tertiary education is 0.775, the unconditional effect of government effectiveness is 0.514, while the conditional effect from the interaction between inclusive tertiary education and government effectiveness is -0.563.

The following findings can be established from Tables 1-6. First, inclusive tertiary education modulates: (i) government effectiveness to induce a positive net effect on female labour force participation; (ii) political stability and corruption-control to induce negative net effects on female unemployment; (iii) government effectiveness for a positive net effect on female unemployment and (iv) regulation quality and the rule of law for positive net impacts on female employment. Second, inclusive secondary education moderates: (i) corruption-control for a positive net effect on female labour force participation; (ii) "voice and accountability", government effectiveness and corruption-control for negative net impacts on female unemployment; (iii) the rule of law for a positive net effect on female unemployment; (iv)

"voice and accountability", government effectiveness and corruption-control for positive net effects on female employment.

In the light of the above, the findings broadly show that good governance is an effective channel through which inclusive education policies can lead to inclusive economic participation. Within the context of the study, gender-parity education can improve gender economic inclusion through the proposed governance channels. The sparse significance of mobile phone penetration, which is adopted in the conditioning information set, while unexpected, can be explained by the fact there is also a strand of the literature documenting that the inclusive benefits of mobile phone penetration are yet to be significantly apparent in Africa from a macroeconomic perspective (Ejemeyovwi and Osabuohien2020).

3.2 Thresholds for complementary policies

With the exception of Table 2, where net effects on employment are contrary to expectation, the effect inthe remaining five tables is broadly consistent with expectation, notably: inclusive secondary and tertiary education modulates governance dynamics to promote employment and reduce unemployment. While the net effects are consistent with intuition for the attendant tables, the interactive effects are evidence that beyond certain thresholds or critical masses of inclusive education, inclusive education becomes a necessary but not a sufficient condition for the promotion of inclusive economic participation via governance dynamics. These critical masses are thresholds for complementary policies because, beyond the established thresholds, inclusive education has to be complemented with other policy variables in order to modulate governance for an overall favorable incidence on gender economic participation.

To put the above into more perspective, in the fifth column of Table 1, the inclusive tertiary education threshold for complementary policy is 0.913(0.514/0.563). Hence, above tertiary school enrolment gender parity index of 0.913, inclusive tertiary education becomes a necessary but not a sufficient condition to modulate government effectiveness in order to promote female labour force participation. This is essentially because, at the attendant threshold, the net effect computed previously becomes zero or $0.000([-0.563 \times 0.913] + [0.514])$. In the computation, the threshold value of gender-parity tertiary education is 0.913; the unconditional effect of government effectiveness is 0.514, while the conditional effect from the interaction between inclusive tertiary education and government effectiveness is -0.563. Over the tertiary education threshold, the net effect on female labour force participation changes from positive to negative. Hence, complementary policies are

worthwhile above the threshold. Thethreshold has economic meaning and makes policy sense because the computed threshold is within policy range or between the minimum and maximum variables of inclusive tertiary education in the summary statistics of Appendix 2 (0.064 to 3.295).

The following thresholds for complementary policies are established: (i) 0.913 (1.183) tertiary (secondary) school enrolment gender parity index in the nexus between government effectiveness (corruption-control) and female labour force participation. (ii) 1.033 (for voice & accountability), 0.945 (for government effectiveness), 0.983 (for corruption-control) and 0.854 (for the rule of law) are secondary school enrolment gender parity index thresholds for complementary policies in the effect on unemployment. (iii) For the positive incidence on female employment to be maintained, complementary policies are needed, on the one hand at 0.156 (for regulation quality) and 1.190(for the rule of law) tertiary school enrolment gender parity index thresholds and on the other hand,1.241 (voice and accountability), 0.905 (government effectiveness), 1.222 (corruption-control) secondary school enrolment gender parity index thresholds. The computed thresholds for complementary policies have economic meaning and make policy sense because they are within the critical ranges of inclusive tertiary education and inclusive secondary education disclosed in the summary statistics.

The computation of thresholds for complementary policies is consistent with the extant contemporary literature on the relevance of improving room for policy implications by providing avoidable thresholds for expected macroeconomic outcomes and/or maximum thresholds for complementary policies (Asongu and Odhiambo 2021a, 2021c; Amari et al. 2021); minimum thresholds required for the policy variables to modulate the main channel in order to engender the expected outcomes (Peprah et al. 2019; Aurelien et al. 2019; Endoh et al. 2021) as well as synergy effects in interactive regressions (Adegboye et al. 2021).

4. Concluding implications and future research directions

This study investigates the relevance of inclusive education in moderating the effect of good governance on female economic inclusion. The geographical and temporal scopes of the study are, respectively, 42 countries in sub-Saharan Africa and data for the period 2004-2014. The empirical evidence is based on the Generalised Method of Moments. The findings broadly show that good governance can be an effective channel through which inclusive education policies can lead to inclusive economic participation. Within the context of the study, gender-

parity education can improve gender economic inclusion through the proposed governance channels.

It is important to recall that, in the light of the motivation of this study, the results are particularly relevant to two main 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*"). Hence, in the post-2015 development era, the adoption of inclusive development policies is not enough to drive the underlying SDGs. Accordingly, in order for measures of inclusive development to contribute to more female participation in the formal economic sector, it will be worthwhile to promote good governance in the sampled countries. This is essentially because the findings broadly imply that inclusive education promotes female economic participation when: (i) the election and replacement of political leadersare transparent and associated with accountability, non-violence and less political strife (i.e.,improved political governance); (ii) appropriate measures are formulated and implemented for the provision of public goods and services (i.e.,better economic governance) and (iii) citizens and the State have respect for institutions that govern interactions between them which influences entrepreneurial activities and a conducive environment for doing business (i.e.,enhanced institutional governance).

Improving inclusive gender education and governance standards simultaneously is also likely to improve the overall net effects on female economic participation because governance standards in sub-Saharan Africa are comparatively low. Hence, *ceteris paribus*, enhancement of both the policy variables (i.e., inclusive education) and the channel by which the effect of such inclusive education is transmitted (i.e., good governance) will go a long way to have cross-cutting positive externalities in socio-economic development because improvement in gender inclusion in the formal economic sector is not exclusively a concern of women's rights but also because more equity in the labour market for women and girls have positive human and economic development outcomes. Accordingly, putting the concern of human rights aside, it is not feasible for any society to be sustainably developed (i.e.,socially, politically and economically) when the majority of its population (i.e.,women and girls) are consigned to margins of the formal labour market and the informal economic sector.

The net effects are overwhelmingly consistent with expectations, notably: inclusive secondary and tertiary education modulating governance dynamics to promote employment and reduce

unemployment. However, interactive effects are evidence of the perspective that beyond certain thresholds or critical masses of inclusive education, inclusive education becomes a necessary but not a sufficient condition for promoting inclusive economic participation through governance dynamics. These critical masses are thresholds for complementary policies because, beyond the established thresholds, inclusive education has to be complemented with other policy variables in order to modulate governance for an overall positive incidence on gender economic participation.

It will be worthwhile for future research to investigate if the established findings withstand empirical scrutiny within the country-specific settings. Idiosyncratic research is particularly worthwhile for country-specific policy implications. Unfortunately, cross-specific effects are eliminated from the GMM as required by theory in order to address concerns about endogeneity pertaining to the correlation between country-specific effects and the lagged female economic participation dependent variable. Furthermore, while this research has been based on aggregate measures of governance, extending the analysis with relevant indicators of corporate governance within the context of case studies will improve extant scholarship on the issues motivating this study.

Table 1: Governance, inclusive tertiary education and female labour force participation

	Political Governance		Economic Governance		Institutional Governance	
	Political Stability (PolS)	**Voice and Accountability (VA)**	**Regulation Quality (RQ)**	**Government Effectivenss (GE)**	**Corruption-Control (CC)**	**Rule of Law(RL)**
FLFpart(-1)	**0.957*****	**0.957*****	**0.961*****	**0.964*****	**0.959*****	**0.970*****
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Tertiary Education (TSE)	-0.813	**-0.981*****	**-1.270****	**-0.818***	**-0.966****	**-2.071*****
	(0.119)	**(0.006)**	**(0.019)**	**(0.060)**	**(0.026)**	**(0.000)**
Political Stability (PolS)	0.411	---	---	---	---	---
	(0.171)					
Voice andAccountability (VA)	---	0.516	---	---	---	---
		(0.131)				
Regulation Quality (RQ)	---	---	0.554	---	---	---
			(0.106)			
Government Effectiveness (GE)	---	---	---	**0.514***	---	---
				(0.059)		
Corruption-Control (CC)	---	---	---	---	0.235	---
					(0.512)	
Rule of Law (RL)	---	---	---	---	---	**0.899****
						(0.019)
TSE ×PolS	-0.296	---	---	---	---	---
	(0.638)					
TSE×VA	---	-0.614	---	---	---	---
		(0.254)				
TSE×RQ	---	---	**-0.750****	---	---	---
			(0.018)			
TSE×GE	---	---	---	**-0.563***	---	---
				(0.078)		
TSE×CC	---	---	---	---	-0.133	---
					(0.796)	
TSE×RL	---	---	---	---	---	-0.415
						(0.358)
Mobile Phone Penetration	-0.0001	0.002	0.003	-0.0001	0.001	0.003
	(0.974)	(0.672)	(0.410)	(0.961)	(0.711)	(0.299)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	na	na	0.078	na	na
TSE Thresholds	na	na	na	0.913	na	na
AR(1)	(0.070)	(0.088)	(0.085)	(0.086)	(0.092)	(0.098)
AR(2)	**(0.232)**	**(0.227)**	**(0.209)**	**(0.233)**	**(0.226)**	**(0.201)**
Sargan OIR	(0.050)	(0.007)	(0.042)	(0.000)	(0.000)	(0.000)
Hansen OIR	**(0.742)**	**(0.621)**	**(0.859)**	**(0.651)**	**(0.352)**	**(0.561)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	(0.061)	(0.237)	(0.470)	(0.506)	(0.632)	(0.284)
Dif(null, H=exogenous)	**(0.990)**	**(0.727)**	**(0.860)**	**(0.604)**	**(0.259)**	**(0.622)**
(b) IV (years, eq(diff))						
H excluding group	**(0.552)**	**(0.263)**	**(0.613)**	(0.076)	**(0.409)**	**(0.302)**
Dif(null, H=exogenous)	**(0.690)**	**(0.705)**	**(0.814)**	**(0.935)**	**(0.321)**	**(0.609)**
Fisher	**3566.40*****	**105307.72*****	**57214.52*****	**2729.28*****	**3759.25*****	**210407.99*****
Instruments	28	28	28	28	28	28
Countries	37	37	37	37	37	37
Observations	206	206	206	206	206	206

***,**,*: 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Table 2: Governance, inclusive tertiary education and female unemployment

| | Dependent variable: Female unemployment (FU) | | | | | |
| | Political Governance | | Economic Governance | | Institutional Governance | |
	Political Stability (PolS)	Voice and Accountability (VA)	Regulation Quality (RQ)	Government Effectivenss (GE)	Corruption-Control (CC)	Rule of Law(RL)
FU(-1)	**0.932*** **	**1.022*** **	**1.009*** **	**0.996*** **	**0.986*** **	**0.987*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Tertiary Education (TSE)	**3.109*** **	**2.850** **	**3.945*** **	**4.739*** **	**2.708** **	3.025
	(0.000)	**(0.026)**	**(0.009)**	**(0.005)**	**(0.011)**	(0.141)
Political Stability (PolS)	**-1.641*** **	---	---	---	---	---
	(0.001)					
Voice and Accontability (VA)	---	**-1.752** **	---	---	---	---
		(0.039)				
Regulation Quality (RQ)	---	---	-1.650	---	---	---
			(0.103)			
Government Effectiveness (GE)	---	---	---	**-2.492** **	---	---
				(0.015)		
Corruption-Control (CC)	---	---	---	---	**-1.993** **	---
					(0.011)	
Rule of Law (RL)	---	---	---	---	---	**-1.855* **
						(0.074)
TSE ×PolS	**1.943*** **	---	---	---	---	---
	(0.000)					
TSE ×VA	---	1.716	---	---	---	---
		(0.139)				
TSE ×RQ	---	---	0.633	---	---	---
			(0.550)			
TSE ×GE	---	---	---	**3.487*** **	---	---
				(0.006)		
TSE ×CC	---	---	---	---	**2.098*** **	---
					(0.005)	
TSE ×RL	---	---	---	---	---	1.857
						(0.152)
Mobile Phone Penetration	-0.010	0.0009	0.0003	**-0.013* **	**-0.007* **	-0.004
	(0.139)	(0.894)	(0.972)	**(0.060)**	**(0.095)**	(0.687)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	-0.135	na	na	0.210	-0.367	na
TSE Thresholds	0.845	na	na	0.715	0.950	na
AR(1)	(0.064)	(0.089)	(0.058)	(0.073)	(0.049)	(0.042)
AR(2)	**(0.608)**	**(0.657)**	**(0.545)**	**(0.501)**	**(0.499)**	**(0.491)**
Sargan OIR	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen OIR	**(0.649)**	**(0.384)**	**(0.476)**	**(0.551)**	**(0.586)**	**(0.633)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.162)**	**(0.215)**	**(0.374)**	**(0.319)**	**(0.258)**	**(0.262)**
Dif(null, H=exogenous)	**(0.828)**	**(0.469**	**(0.470)**	**(0.587)**	**(0.670)**	**(0.719)**
(b) IV (years, eq(diff))						
H excluding group	**(0.376)**	**(0.164)**	**(0.157)**	**(0.153)**	**(0.278)**	**(0.236)**
Dif(null, H=exogenous)	**(0.663)**	**(0.522)**	**(0.647)**	**(0.738)**	**(0.654)**	**(0.741)**
Fisher	7080.88***	6357.82***	1519.32***	4530.71***	14369.96***	2358.21***
Instruments	28	28	28	28	28	28
Countries	35	35	35	35	35	35
Observations	195	195	195	195	195	195

***,**,*: 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Table 3: Governance, inclusive tertiary education and female employment

	Dependent variable: Female Employment (FE)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability (PolS)	Voice and Accountability (VA)	Regulation Quality (RQ)	Government Effectivenss (GE)	Corruption-Control (CC)	Rule of Law(RL)
FE(-1)	**0.992*****	**0.984*****	**0.986*****	**0.989*****	**1.007*****	**0.996*****
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Tertiary Education (TSE)	1.131	0.145	**-1.518****	-0.449	-0.098	-0.867
	(0.356)	(0.838)	**(0.024)**	(0.668)	(0.930)	(0.543)
Political Stability (PolS)	**0.548***	---	---	---	---	---
	(0.085)					
Voice andAccontability (VA)	---	0.443	---	---	---	---
		(0.317)				
Regulation Quality (RQ)	---	---	**1.249****	---	---	---
			(0.018)			
Government Effectiveness (GE)	---	---	---	0.949	---	---
				(0.100)		
Corruption-Control (CC)	---	---	---	---	0.807	---
					(0.201)	
Rule of Law (RL)	---	---	---	---	---	**1.325****
						(0.010)
TSE ×PolS	-0.536	---	---	---	---	---
	(0.245)					
TSE×VA	---	-0.787	---	---	---	---
		(0.213)				
TSE×RQ	---	---	**-1.080*****	---	---	---
			(0.008)			
TSE×GE	---	---	---	---	---	---
TSE×CC	---	---	---	-1.130	---	---
				(0.117)		
TSE×RL	---	---	---	---	---	**-1.113***
						(0.051)
Mobile Phone Penetration	-0.002	-0.00007	0.002	0.0004	0.0004	0.001
	(0.670)	(0.980)	(0.590)	(0.941)	(0.927)	(0.750)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	na	0.412	na	na	0.462
TSE Thresholds	na	na	1.156	na	na	1.190
AR(1)	(0.023)	(0.051)	(0.039)	(0.036)	(0.029)	(0.026)
AR(2)	**(0.272)**	**(0.275)**	**(0.283)**	**(0.200)**	**(0.200)**	**(0.219)**
Sargan OIR	(0.010)	**(0.228)**	(0.009)	**(0.209)**	(0.005)	(0.000)
Hansen OIR	**(0.601)**	**(0.769)**	**(0.593)**	**(0.982)**	**(0.861)**	**(0.348)**
DHT for instruments (a)Instruments in levels						
H excluding group	**(0.447)**	**(0.436)**	**(0.633)**	**(0.385)**	**(0.255)**	**(0.333)**
Dif(null, H=exogenous)	**(0.573)**	**(0.769)**	**(0.494)**	**(0.996)**	**(0.944)**	**(0.350)**
(b) IV (years, eq(diff))						
H excluding group	**(0.103)**	**(0.373)**	**(0.179)**	**(0.463)**	**(0.619)**	**(0.116)**
Dif(null, H=exogenous)	**(0.862)**	**(0.799)**	**(0.752)**	**(0.992)**	**(0.815)**	**(0.545)**
Fisher	**72058.84*****	**10234.11*****	**7733.85*****	**101754.82*****	**582.04*****	**6390.12*****
Instruments	28	28	28	28	28	28
Countries	35	35	35	35	35	35
Observations	195	195	195	195	195	195

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Su bsets. 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Table 4: Governance, inclusive secondary education and female labour force participation

	Dependent variable: Female labour force participation (FLFpart)					
	Political Governance		Economic Governance		Institutional Governance	
	Political Stability (PolS)	Voice and Accountability (VA)	Regulation Quality (RQ)	Government Effectivenss (GE)	Corruption-Control (CC)	Rule of Law(RL)
FLFpart(-1)	0.962***	0.978***	0.965***	0.942***	0.961***	0.955***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Secondary Education (SSE)	-2.624***	-4.950***	-0.904	-3.102**	-3.328***	-3.555***
	(0.003)	(0.000)	(0.627)	(0.041)	(0.004)	(0.004)
Political Stability (PolS)	-0.338	---	---	---	---	---
	(0.398)					
Voice and Accontability (VA)	---	2.026*	---	---	---	---
		(0.088)				
Regulation Quality (RQ)	---	---	-1.828	---	---	---
			(0.269)			
Government Effectiveness (GE)	---	---	---	0.877	---	---
				(0.493)		
Corruption-Control (CC)	---	---	---	---	3.344**	---
					(0.036)	
Rule of Law (RL)	---	---	---	---	---	1.421
						(0.220)
SSE ×PolS	1.391***	---	---	---	---	---
	(0.008)					
SSE×VA	---	-0.774	---	---	---	---
		(0.535)				
SSE×RQ	---	---	3.971	---	---	---
			(0.029)			
SSE×GE	---	---	---	0.080	---	---
				(0.954)		
SSE×CC	---	---	---	---	-2.826*	---
					(0.066)	
SSE×RL	---	---	---	---	---	0.039
						(0.975)
Mobile Phone Penetration	-0.006	-0.007*	-0.007	-0.005	-0.007*	-0.013***
	(0.175)	(0.094)	(0.182)	(0.340)	(0.068)	(0.003)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	na	na	na	0.894	na
SSE Thresholds	na	na	na	na	1.183	na
AR(1)	(0.040)	(0.060)	(0.088)	(0.060)	(0.047)	(0.037)
AR(2)	(0.184)	(0.245)	(0.276)	(0.181)	(0.198)	(0.166)
Sargan OIR	(0.005)	(0.029)	(0.001)	(0.000)	(0.000)	(0.459)
Hansen OIR	(0.253)	(0.096)	(0.327)	(0.063)	(0.306)	(0.288)
DHT for instruments						
(a)Instruments in levels						
H excluding group	(0.461)	(0.362)	(0.891)	(0.309)	(0.608)	(0.799)
Dif(null, H=exogenous)	(0.208)	(0.081)	(0.199)	(0.057)	(0.224)	(0.180)
(b) IV (years, eq(diff))						
H excluding group	(0.120)	(0.052)	(0.220)	(0.024)	(0.027)	(0.145)
Dif(null, H=exogenous)	(0.400)	(0.244)	(0.395)	(0.247)	(0.782)	(0.418)
Fisher	44505.11***	103757.87***	52527.54***	44655.68***	463402.85***	212278.44***
Instruments	28	28	28	28	28	28
Countries	38	38	38	38	38	38
Observations	247	247	247	247	247	247

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Su bsets. 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Table 5: Governance, inclusive secondary education and female unemployment

	Dependent variable: Female Unemployment (FU)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability (PolS)	**Voice and Accountability (VA)**	**Regulation Quality (RQ)**	**Government Effectivenss (GE)**	**Corruption-Control (CC)**	**Rule of Law(RL)**
FU(-1)	**0.980*****	**0.993*****	**0.904*****	**0.894*****	**0.985*****	**0.909*****
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Secondary Education (SSE)	2.311	2.760	**6.465****	**6.758*****	1.767	**6.393*****
	(0.103)	(0.139)	**(0.018)**	**(0.002)**	(0.195)	**(0.001)**
Political Stability (PolS)	**-1.162****	---	---	---	---	---
	(0.013)					
Voice and Accontability (VA)	---	**-3.158****	---	---	---	---
		(0.026)				
Regulation Quality (RQ)	---	---	-3.532	---	---	---
			(0.134)			
Government Effectiveness (GE)	---	---	---	**-4.694*****	---	---
				(0.002)		
Corruption-Control (CC)	---	---	---	---	**-3.124*****	---
					(0.000)	
Rule of Law (RL)	---	---	---	---	---	**-4.946*****
						(0.002)
SSE ×PolS	1.497	---	---	---	---	---
	(0.025)					
SSE×VA	---	**3.057****	---	---	---	---
		(0.020)				
SSE×RQ	---	---	1.919	---	---	---
			(0.442)			
SSE×GE	---	---	---	**4.965*****	---	---
				(0.004)		
SSE×CC	---	---	---	---	**3.178*****	---
					(0.000)	
SSE×RL	---	---	---	---	---	**5.790*****
						(0.004)
Mobile Phone Penetration	-0.006	-0.004	0.004	-0.006	-0.001	-0.009
	(0.113)	(0.194)	(0.546)	(0.200)	(0.747)	(0.071)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	-0.507	na	-0.389	-0.369	0.074
SSE Thresholds	na	1.033	na	0.945	0.983	0.854
AR(1)	(0.029)	(0.038)	(0.035)	(0.029)	(0.038)	(0.034)
AR(2)	**(0.832)**	**(0.751)**	**(0.729)**	**(0.769)**	**(0.807)**	**(0.903)**
Sargan OIR	(0.016)	**(0.696)**	**(0.799)**	**(0.248)**	**(0.580)**	**(0.338)**
Hansen OIR	**(0.371)**	**(0.651**	**(0.223)**	**(0.548)**	**(0.250)**	**(0.151)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	(0.077)	**(0.207)**	**(0.826)**	**(0.197)**	**(0.103)**	**(0.142)**
Dif(null, H=exogenous)	**(0.659)**	**(0.786)**	**(0.130)**	**(0.683)**	**(0.423)**	**(0.222)**
(b) IV (years, eq(diff))						
H excluding group	**(0.243)**	**(0.203)**	**(0.463)**	(0.061)	(0.035)	(0.072)
Dif(null, H=exogenous)	**(0.430)**	**(0.790)**	**(0.180)**	**(0.896)**	**(0.638)**	**(0.312)**
Fisher	**748.97*****	**16495.00*****	**1038.48*****	**438.08*****	**691.51*****	**5448.34*****
Instruments	28	28	28	28	28	28
Countries	36	36	36	36	36	36
Observations	230	230	230	230	230	230

***,**,*: 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Table 6: Governance, inclusive secondary education and female employment

	Political Governance		Economic Governance		Institutional Governance	
	Political Stability (PolS)	**Voice and Accountability (VA)**	**Regulation Quality (RQ)**	**Government Effectivenss (GE)**	**Corruption-Control (CC)**	**Rule of Law(RL)**
FE(-1)	**0.964***	**0.990***	**0.970***	**0.990***	**0.990***	**0.948***
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Secondary Education (SSE)	**-2.390**	**-1.754**	**-4.027**	-1.275	-0.946	**-4.133**
	(0.048)	**(0.016)**	**(0.016)**	(0.346)	(0.437)	**(0.016)**
Political Stability (PolS)	0.598	---	---	---	---	---
	(0.185)					
Voice and Accontability (VA)	---	**1.861**	---	---	---	---
		(0.017)				
Regulation Quality (RQ)	---	---	1.576	---	---	---
			(0.321)			
Government Effectiveness (GE)	---	---	---	**2.490**	---	---
				(0.022)		
Corruption-Control (CC)	---	---	---	---	**2.254***	---
					(0.059)	
Rule of Law (RL)	---	---	---	---	---	**2.381***
						(0.056)
SSE ×PolS	-0.036	---	---	---	---	---
	(0.950)					
SSE×VA	---	**-1.500***	---	---	---	---
		(0.076)				
SSE×RQ	---	---	-0.232	---	---	---
			(0.887)			
SSE×GE	---	---	---	**-2.750**	---	---
				(0.035)		
SSE×CC	---	---	---	---	**-1.845***	---
					(0.087)	
SSE×RL	---	---	---	---	---	-1.590
						(0.184)
Mobile Phone Penetration	-0.004	-0.0001	-0.005	0.0001	-0.003	**-0.007**
	(0.056)	(0.969)	(0.377)	(0.968)	(0.245)	**(0.043)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	0.560	na	0.106	0.654	na
SSE Thresholds	na	1.241	na	0.905	1.222	na
AR(1)	(0.017)	(0.016)	(0.014)	(0.016)	(0.014)	(0.014)
AR(2)	**(0.978)**	**(0.966)**	**(0.966)**	**(0.853)**	**(0.915)**	**(0.962)**
Sargan OIR	**(0.187)**	**(0.932)**	**(0.963)**	**(0.470)**	**(0.939)**	**(0.907)**
Hansen OIR	**(0.586)**	**(0.336)**	**(0.976)**	**(0.562)**	**(0.492)**	**(0.794)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.203)**	**(0.281)**	**(0.805)**	**(0.252)**	**(0.146)**	**(0.116)**
Dif(null, H=exogenous)	**(0.720)**	**(0.364)**	**(0.949)**	**(0.648)**	**(0.681)**	**(0.973)**
(b) IV (years, eq(diff))						
H excluding group	**(0.403)**	**(0.241)**	**(0.497)**	**(0.311)**	**(0.488)**	**(0.784)**
Dif(null, H=exogenous)	**(0.578)**	**(0.389)**	**(0.984)**	**(0.605)**	**(0.438)**	**(0.681)**
Fisher	**10133.23***	**251661.10***	**53103.79***	**251726.74***	**5781.98***	**101053.54***
Instruments	28	28	28	28	28	28
Countries	36	36	36	36	36	36
Observations	230	230	230	230	230	230

***,**,*: 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 secondary school enrollment is 0.867 while the mean value of tertiary school enrollment is 0.775. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. nsa: not specifically applicable because the conditional effect between ICT and financial access is not significant. Constants are included in all regressions.
Source: Authors

Appendices
Appendix 1: Definitions of Variables

Variables	Signs	Definitions of variables (Measurements)	Sources
Female Economic Participation	FLFpart	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 and 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
Regulation Quality	RQ	"Regulation 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
Secondary School	SSE	School enrollment, secondary (gross), gender parity index (GPI)	WDI
Tertiary School	TSE	School enrollment, tertiary (gross), gender parity index (GPI)	WDI
Mobile Phones	Mobile	Mobile cellular subscriptions (per 100 people)	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 LabourOrganisation.
Source: Authors

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 and Accountability	-0.509	0.683	-1.780	0.970	462
Government Effectiveness	-0.711	0.599	-1.867	1.035	462
Regulation 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
Secondary School Enrollment	0.867	0.214	0.333	1.422	287
Tertiary School Enrollment	0.775	0.437	0.064	3.295	293
Mobile Phone Penetration	45.330	37.282	0.209	171.375	558

S.D: Standard Deviation.
Source: Authors

Appendix 3: Correlation matrix (uniformsample size: 165)

FLFPart	FU	FE	PolS	VA	GE	RQ	CC	RL	SSE	TSE	Mobile	
1.000	-0.272	0.949	0.003	-0.111	-0.090	-0.061	-0.040	-0.135	-0.177	-0.404	-0.234	FLFPart
	1.000	-0.550	0.179	0.149	0.139	0.088	0.183	0.171	0.491	0.556	0.170	FU
		1.000	-0.075	-0.172	-0.130	-0.092	-0.097	-0.180	-0.287	-0.499	-0.253	FE
			1.000	0.842	0.801	0.814	0.825	0.853	0.567	0.430	0.425	PolS
				1.000	0.812	0.829	0.774	0.873	0.516	0.411	0.486	VA
					1.000	0.929	0.876	0.938	0.622	0.510	0.494	GE
						1.000	0.823	0.905	0.537	0.446	0.535	RQ
							1.000	0.903	0.702	0.584	0.473	CC
								1.000	0.649	0.552	0.519	RL
									1.000	0.882	0.460	SSE
										1.000	0.530	TSE
											1.000	Mobile

FLFpart: Female Labour Force participation. FU: Female Unemployment. FE: Female Employment. PolS: Political Stability. VA: Voice and Accountability. GE: Government Effectiveness. RQ: Regulation Quality. CC: Corruption-Control. RL: Rule of Law. SSE: Secondary School Enrolment. TSE: Tertiary School Enrolment. Mobile: Mobile Phone Penetration.
Source: Authors

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