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Financial Access, Governance and Insurance Sector Development in Sub-Saharan Africa [1]

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Abstract

Purpose –This study investigates the role of financial access in moderating the effect of governance on insurance consumption in 42 Sub-Saharan African countries using data for the period 2004-2014.

Design/methodology/approach – Two life insurance indicators are used, notably: life insurance and non-life insurance. Six governance measurements are also used, namely: political stability, "voice & accountability", government effectiveness, regulation quality, corruption-control and the rule of law. The empirical evidence is based on the Generalised Method of Moments (GMM) and Least Squares Dummy Variable Corrected (LSDVC) estimators.

Findings –Estimations from the LSDVC are not significant while the following main findings are established from the GMM. First, financial access promotes life insurance through channels of political stability, "voice & accountability", government effectiveness, the rule of law and corruption-control. Second, financial access also stimulates non-life insurance via governance mechanisms of political stability, "voice & accountability", government effectiveness, regulation quality, the rule of law and corruption-control.

Originality/value – This research complements the sparse literature on insurance promotion in Africa by engaging the hitherto unexplored role of financial access through governance channels.

JEL Classification: I28; I30; G20; O16; O55

Keywords: Insurance; Finance; Governance; Sub-Saharan Africa

1. Introduction

The insurance market is relevant for economic development because insurers provide leverage that can be used to hedge against negative macroeconomic shocks which substantially slow down economic activities. Hence, by offering financial protection to all segments of society involved in household and economic activities, uncertainty linked to the macroeconomic environment is reduced, and a favourable environment for doing business is provided because

investors prefer macroeconomic environments that are less ambiguous (Kelsey & le Roux, 2017, 2018). Against this background on the importance of insurance in economic development, the positioning of this research on the role of financial access is moderating the effect of governance on insurance market development in Sub-Saharan Africa (SSA) is motivated by three main factors in scholarly literature and policy-making circles, namely: the relatively low consumption of insurance in the sub-region; the importance of financial access in development outcomes and gaps in the attendant literature. These motivational factors are expanded in the following passages in the same chronology as they are highlighted.

First, in relation to other regions of the world that are more developed and associated with higher levels of insurance penetration, SSA is characterised by one of the lowest levels of insurance penetration in the world. As maintained by Kyerematen (2015), in the sub-region, with the exception of South Africa, only about 5% of the population subscribes to insurance services. Moreover, according to the narrative, a number of factors account for such low penetration of insurance in the sub-region, *inter alia*: the absence of infrastructure, poor doing business climate and low levels of financial access. This research, which is partly motivated by this strand, assesses the relevance of financial access is moderating the effect of governance on insurance penetration.

Second, financial development is fundamental in Africa's recent economic growth resurgence essentially because, *inter alia*, access to finance improves investment opportunities for corporations and households as well as living standards and economic development. The theoretical and empirical literature supporting this consensus include studies by Odhiambo (2010, 2013, 2014); Wale and Makina (2017); Iyke and Odhiambo (2017); Tchamyou (2019a, 2019b), and Tchamyou, Erreygers and Cassimon (2019). While financial development has also been recently documented to promote insurance penetration in Africa (Zerriaa, Amiri, Noubbigh & Naoui, 2017), the evidence is limited to a selected country (i.e. Tunisia) and a channel by which financial access influences insurance development is not engaged. This research focuses on a sample of countries in SSA and engages the governance channel as a mechanism by which financial access affects insurance penetration. Hence, the research question this study seeks to answer is the following: how does financial access modulate the effect of governance on insurance penetration in SSA? The positioning of this research question is also motivated by an apparent gap in the literature.

Third, as expanded in section 2, contemporary research on the progress of the insurance market in Africa has fundamentally focused on two main branches of the literature,

notably: (i) nexuses between economic growth and insurance consumption and (ii) drivers of insurance development. Some studies in the former branch of the literature are: Ioncică, Petrescu, Ioncica and Constantinescu (2012); Akinlo (2015); Alhassan and Biekpe (2015, 2016a); and Asongu and Odhiambo (2020). Moreover, researchers supporting the latter branch of literature include: Guerineau and Sawadogo, (2015); Alhassan and Biekpe (2016b); Zerriaa, Amiri, Noubbigh and Naoui (2017); and Asongu, Nnanna and Acha-anyi (2020). The second branch of the literature is closer to the positioning of this research. Furthermore, the departure of this research in the light of the attendant literature has been engaged in the previous paragraph. Accordingly, in departing from Zerriaa *et al*. (2017), the use of the governance channel in this study is motivated by the documented relevance of good governance in promoting a conducive environment for investment, economic prosperity and private sector development in Africa (Efobi, 2015; Ajide & Raheem, 2016a, 2016b).

The remainder of the research is structured as follows: The intuition motivating the study and the highlighted insurance literature in the introduction are expanded in section 2, while the data and methodology are covered in section 3. The empirical results and the corresponding discussion are disclosed in section 4. Section 5 concludes with implications and future research directions.

2. Intuition, theoretical insights and Insurance in Africa

Two main sub-sections are covered in this section. The first engages the intuition and theory underpinning an investigation into linkages between financial access, governance and insurance development while the second expands the insurance-centric literature highlighted in the introduction.

2.1 Intuition and theoretical insights

2.1.1 Intuition

In the primary strand, authors of this study are fully aware of the risks associated with an empirical exercise that is not consolidated with established theoretical underpinnings. However, the authors also argue that applied economics is a useful scientific activity, essentially because applied econometrics is not exclusively designed for the acceptance and rejection of established theoretical underpinnings. Within this framework, it can reasonably be argued that applied economics that is consolidated by sound intuition is not a useless scientific endeavour. This is essentially because it could pave the way to theory-building. In a nutshell, the arguments above are supported by a recent strand of applied econometrics

literature which maintains the usefulness of empirical exercises based on sound intuition (Costantini & Lupi, 2005; Narayan, Mishra & Narayan, 2011). The following passages discuss the intuition underlying nexuses between financial access, governance and insurance penetration.

Financial development is indispensable in building the insurance sector because insurance promotes economic prosperity, *inter alia*, by mobilising financial resources by means of insurance premia. Hence, the insurance sector also plays the role of financial intermediation within an economy because mobilized funds from the sector are ultimately invested in government securities and stock markets. Moreover, the mobilised funds are subsequently used to generate employment owing to their allocation to industrial development and productive investments. In summary, the insurance sector avails opportunities for the reduction of risks, growth of trade and consolidation of financial stability which are critical factors in the promotion of economic prosperity and sustainable economic development (Kumari, 2016). The role of the insurance sector in stabilising the economy and promoting macroeconomic certainty is not different from the role governance plays in promoting investment and economic development in a country.

Good governance is necessary for sustainable development because dynamics of governance are associated with various advantages and disadvantages that can: (i) either increase or decrease avenues of risk mitigation and (ii) provide people and investors with a stable macroeconomic environment that reduces the negative ramifications of macroeconomic shocks on economic activities and household welfare. In essence, the importance of good governance in putting in place appropriate policies that are favourable to the mobilisation and transformation of aggregate domestic capital into long term investment is consistent with the fundamental missions of the financial and insurance sectors. Hence: the intuitive connection between governance, financial development and insurance development. The channel of governance as a mechanism by which financial access affects the development of the insurance sector can be better articulated by conceptually clarifying the good governance measurements. Hence, governance (political, economic and institutional) provides favourable avenues for the development of the insurance sector because policy makers in the governance sectors are motivated by the rewards of insurance penetration in economic prosperity.

In the light of the above background, the conceptions and definitions of the underlying governance dynamics are in accordance with contemporary literature: "*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, Asongu & Amavilah, 2015, p. 1041).

2.1.2 Theoretical insights

Consistent with Iyawe and Osamwonyi (2017), there are well documented theoretical underpinnings linking economic activities and insurance sector development. Two of these are discussed in accordance with the authors, namely: (i) the Conventional Expected Utility Theory and (ii) the Cumulative Prospective Theory. According to the narrative, insurance is essential in developing countries such as Africa because of a plethora of associated development externalities.

Conventional Expected Utility Theory (CEUT)

From the simplest perspective, CEUT supposes that the utility of a consumer, U, is a function is disposable income, Y (Iyawe & Osamwonyi, 2017). From a health insurance perspective, a probability, p, exists that a consumer who can fall ill can allocate L expenditure to medical care. Otherwise, the consumer could also buy full insurance coverage pertaining to the actuarially fair premium of P = pL, for which a payoff transfer I will be received by the consumer, if he/she is ill. For the sake of simplicity, let us assume that L=I. Hence, the expected utility without insurance is:

$$EU_u = (1-p)U(Y) +_p U(Y-L) \quad (1)$$

With insurance, expected utility is:

$$EU_i = (1-p)U(YP) +_p U(YL+IP) = U(YP) \quad (2)$$

On the premise that there is a diminishing marginal income utility, the situation of the consumer is better if he/she avoids the risk of loss, L, by paying P for the insurance. It follows that the customer who is maximising expected-utility would buy insurance coverage for these underlying expenditure if EUi>EUu, or if

$$U(Y-P) > (1-p)U(Y) +_p U(Y-L) \quad (3)$$

In the light of the way the theory is mathematically specified, the choice between uncertainty and certainty of losses that are actuarially-equivalent is apparent. The choice pertaining to the purchase of insurance is linked with both a higher level of anticipated utility and certainty. Therefore, as documented by Nyman (2001), the demand for insurance is essentially motivated by the certainty associated with insurance subscriptions. Moreover, the underlying expected utility can be consolidated by factors that are favourable to insurance as those discussed in the intuition section of this study, *inter alia*: financial development and favourable governance and institutions.

Cumulative Prospective Theory (CPT)

The theory of choice which is also known as the prospect theory posits that from a particular point of reference, the value realised by individuals from income gains increases with gain in size, though at a diminishing rate (Tversky & Kahnemann, 1990, 1992). In the same vein, the value lost by individuals from income losses increases with the importance of loss at a decreasing rate.

The CPT supposes that a risk-oriented behaviour on losses is displayed by investors who are willing toaccept risks in view of achieving their investment goals. Such behaviour has been established in a multitude of experimental studies (Iyawe & Osamwonyi, 2017). Accordingly, risk-taking behaviour of managers of funds is associated with incentives of contracts (Tchamyou & Asongu, 2017a). Moreover, Dass, Massa, and Patgiri (2008) have concluded that managers of funds characterised by high contractual incentives are associated with strategies that involve riskier investments. The nexuses between insurance consumption and conditions favourable to such insurance penetration (e.g. financial development and good governance as is in the context of this study) surrounding the CEUT are broadly consistent with the CPT.

2.2 Insurance sector development

In the secondary strand, this research devotes space to expanding on the highlighted literature in the introduction, which has been documented in two main categories, notably: determinants of the development of the insurance market (Guerineau & Sawadogo, 2015; Alhassan & Biekpe, 2016b; Zerriaa *et al*., 2017) and linkages between insurance penetration and economic prosperity (Ioncică et *al*., 2012; Akinlo, 2015; Alhassan & Biekpe, 2015, 2016a). These stands are developed in the same chronology as they are highlighted.

In the category on determinants of insurance penetration, Guerineau and Sawadogo (2015) have examined twenty countries using data from 1996 to 2011. The authors have concluded using an endogeneity-robust empirical approach that a positive relationship between per capita income and the consumption of life insurance is apparent. Moreover, life insurance penetration is linked with young dependency ratio and life expectancy whereas factors that are positively associated with the phenomenon include: property rights, government stability and old dependency ratio. Zerriaa *et al.* (2017) have focused on the selected country (i.e. Tunisia) to investigate drivers of life insurance using data for the period 1990-2014 to conclude that rates of interest and inflation do not significantly promote the outcome variable. They also maintain that the consumption of life insurance is mitigated by pension expenditure while it is promoted by dependency, financial development, income, life expectancy and urbanisation. Alhassan and Biekpe (2016b) within this same category of the literature have assessed factors that stimulate life insurance in 31 African countries with data for the period 1996-2010. The results of the study show that relative to financial factors, demographic drivers more significantly elicit the outcome variable. Furthermore, life insurance is not stimulated by inflation, dependency and life expectancy while positive impacts are induced from institutional quality, health expenditure, insurance consumption and financial development.

In the second category of the insurance-centric literature, Alhassan and Biekpe (2015) investigate connections between efficiency, productivity and returns to scale economies in the non-life insurance market of the most developed insurance sector in Africa (South Africa) using data for the period 2007-2012. Corresponding results show that about 20% of insurers carry-out their tasks with optimality whereas about 50% inefficiency is associated with non-life insurance operations. The related findings demonstrate that improvements in productivity are contingent on technological ameliorations as well as non-monotonic effects from constant returns to scale and size. In another study, using data for the period 1990-2010, Alhassan and Biekpe (2016a) examine the nexuses between insurance penetration and economic development in selected African countries, namely: Algeria, Gabon, Kenya, Madagascar, Mauritius, Morocco, Nigeria and South Africa. The results from an autoregressive distributed lag (ARDL) approach show that long term connections between insurance penetration and economic growth are apparent in Kenya, Mauritius, Morocco, Nigeria and South Africa. As for the findings from the vector error correction model (VECM): Gabon shows mixed causality, Morocco reflects bi-directional causality while unidirectional causality is apparent

in Madagascar and Algeria. Akinlo (2015) within this category of the literature has examined causal linkages between economic development and insurance in 33 countries in SSA using data from 1995 to 2011. The findings based on an estimation approach that controls for heterogeneity show evidence of bidirectional causality between insurance development and economic prosperity.

Within this second category of the extant literature, there is also a substantial body of non-African-centric literature that has focused on the nexus between insurance consumption and income levels. Hugues, Mota, Nunez, Sehgal and Ortega (2019) assess the impact of income and insurance on the probability of leg amputation to establish that across different types of insurance, there was a substantial reduction in odd rations linked to amputation. Levere, Orzol, Leininger and Early (2019) are concerned with the long-term and contemporaneous impacts of the expansion of children's public health insurance on Supplemental Security Income (SSI) participation to conclude that: (i) enhanced eligibility to Medicaid decreases the participation on children's SSI in states that are not characterised by automatic grants associated with SSI and (ii) in the long term, increased eligibility to Medicaid during childhood decrease the SSI participation of young adults to a certain degree. Finkelstein, Hendrenand Shepard (2019) investigate how much individuals with low income are willing to pay to obtained health insurance as well as the corresponding implications for the development of the insurance market. The authors estimate that even with generous subsidies, take-up will be substantially incomplete. Teusner, Brennan and Spencer (2015) have analysed nexuses between favourable dental visiting according to household income and the level of cover in private dental insurance. They conclude that whereas the height of cover was not linked to dental visiting, the results, however, showed that insurance could ameliorate orientation of and access to dental care for adults in lower socioeconomic status and engender less effect on access patterns for adults with higher socioeconomic status. Sackey and Amponsah (2017) examine if income levels matter in the willingness to accept capitation payment system within the framework of Ghana's National Health Insurance Policy. The findings, *inter alia*: show that within an individual setting, the following are significant factors: high income, awareness, employment and smaller household size.

3. Data and methodology

3.1 Data

This research focuses on 42 countries in SSA using data from 2004 to 2014[2]. The motivation for the selection of sampled countries is contingent on constraints in the availability of data at the time of the study. The variables used in the empirical analysis are obtained from three main sources, namely: (i) World Governance Indicators of the World Bank for the governance variables (political stability, "voice & accountability", government effectiveness, regulation quality, corruption-control and the rule of law); (ii) the Financial Development and Structure Database (FDSD) of the World Bank for the insurance dynamics (life insurance and non-life insurance) and the financial access variable (private domestic credit); (iii) the World Development Indicators of the World Bank for the control variables (mobile phone penetration and remittances).

The governance variables which have been conceptually clarified in section 2 are motivated by contemporary African governance literature (Andrés *et al.*, 2015; Oluwatobi, Efobi, Olurinola, Alege, 2015; Ajide & Raheem, 2016a, 2016b) while the adopted insurance variables are also consistent with the insurance-centric literature highlighted in the introduction and critically engaged in section 2 (Ioncică et *al.*, 2012; Guerineau & Sawadogo, 2015; Akinlo, 2015; Alhassan & Biekpe, 2015, 2016a, 2016b; Zerriaa *et al.*, 2017). Moreover, it is worthwhile to emphasise that this research uses all the insurance indicators provided by the FDSD of the World Bank. The credit channel as a measurement of financial access is preferred to the deposit channel because credit availment is intuitively more associated with financial access, given that deposits are only a measure of financial depth and can only promote access to finance when transformed into credit for economic operators.

The selection of variables in the conditioning information set (i.e. remittances and mobile phone penetration) is motivated by the discussed literature on determinants of insurance penetration. On the one hand, the burgeoning information technology is facilitating the expansion of the insurance market in Africa. On the other, remittances have been documented to be largely used for consumption purposes (including insurance consumption)

[2] 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".

by Ssozi and Asongu (2016). Hence the expected signs from the two control variables are positive.

It is also worthwhile to emphasise that only two control variables are adopted in the conditioning information set for the purpose of avoiding concerns pertaining to instrument proliferation that can considerably bias estimated coefficients owing to the invalidity of corresponding estimated models. In essence, the purpose of limiting control variables in order to ensure the validity of estimated models (even when instruments are collapsed in the estimation exercise) is consistent the attendant empirical literature based on the generalised method of moments (GMM). An example of a study that has used two control variables is Bruno, De Bonis and Silvestrini (2012). Moreover, there are also GMM-centric studies in the literature that are based on no control variable, notably: Osabuohien and Efobi (2013). Appendix 1 provides the definitions and sources of variables while Appendix 1 discloses the summary statistics. The correlation matrix is provided in Appendix 3.

3.2 Methodology

3.2.1 GMM Specification

Drawing on the narrative in the data section, the GMM empirical strategy is adopted for this study. The empirical approach is also based on four main justifications which are consistent with the relevant GMM-centric literature (Efobi, Tanaken & Asongu, 2018; Fosu & Abass, 2019). (i) In accordance with the attendant literature, an elementary condition for the employment of the estimation technique is that the number of cross sections should exceed the number of time periods within each cross section. Such is the case with the data structure of this research because the study is dealing with 42 countries with data spanning 11 years (i.e. 2004 to 2014) in each country. (ii) Persistence is reflected in the adopted insurance indicators because of apparent correlation coefficients (i.e. between level and first lags) that are higher than 0.800 which is the established rule of thumb for confirming the presence of persistence in the literature (Meniago & Asongu, 2018; Tchamyou *et al*., 2019). Accordingly, the corresponding correlations are respectively, 0.975 and 0.992 for non-life insurance and life insurance. (iii) Given that the data structure of the research is panel, it is obvious that cross-country variations are taken onboard in the estimation exercises. (iv) Issues pertaining to endogeneity are also considered and addressed on two main fronts. On the one hand, reverse causality or simultaneity is tackled with the use of internal instruments in the

estimation process. On the other, the unobserved heterogeneity is accounted for by controlling for time-invariant omitted variables.

In the light of available GMM options (i.e. *difference* versus *system* estimators) in the empirical literature, this research follows the Roodman (2009a, 2009b) improvement of Arellano and Bond (1995) which has been established in contemporary development literature to produce more efficient estimates and restrict the proliferation of instruments (Tchamyou et al., 2019).

The following equations in level (4) and first difference (5) summarise the standard *system* GMM estimation procedure.

$$I_{i,t} = \sigma_0 + \sigma_1 I_{i,t-\tau} + \sigma_2 C_{i,t} + \sigma_3 G_{i,t} + \sigma_4 CG_{i,t} + \sigma_5 M_{i,t} + \sigma_6 R_{i,t} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (4)$$

$$\begin{aligned} I_{i,t} - I_{i,t-\tau} = {} & \sigma_1 (I_{i,t-\tau} - I_{i,t-2\tau}) + \sigma_2 (C_{i,t} - C_{i,t-\tau}) + \sigma_3 (G_{i,t} - G_{i,t-\tau}) + \sigma_4 (CG_{i,t} - CG_{i,t-\tau}) \\ & + \sigma_5 (M_{i,t} - M_{i,t-\tau}) + \sigma_6 (R_{i,t} - R_{i,t-\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \end{aligned} \quad (5)$$

where, $I_{i,t}$ reflects an insurance indicator (i.e. life insurance and non-life insurance) of country i in period t, σ_0 is a constant. C is credit access of country i in period t. G is a governance dynamic (encompassing political stability, "voice & accountability", regulation quality, government effectiveness, corruption-control and the rule of law) of country i in period t. CG reflects interactions between credit access and governance indicators("credit access" × "political stability"; "credit access" × "voice & accountability"; "credit access"× "regulation quality"; "credit access" × "government effectiveness"; "credit access" × "corruption control" and "credit access"× "the rule of law "). M is mobile phone penetration of country i in period t. R denotes remittances of country i in period t. τ represents the lagged value which is one within the framework of this study because a year lag is enough to capture past information, ξ_t is the time-specific constant, η_i is the country-specific effect and $\varepsilon_{i,t}$ the error term[3].

The interaction term is used to capture the conditional impact or associated effect from financial access and governance. This is consistent with the problem statement of the

[3] The variables enter the GMM estimations in level, lag, orthogonal formats, *inter alia*, and transformation in the GMM is done automatically with the Roodman command during the estimation process. For instance the following is the first specification of Table 1: "*xtabond2 inslife l.inslife pols pcrdbof polfin mobilephone remit yr1 yr2 yr3 yr4 yr5 yr6 yr7 yr8 yr9 yr10 yr11, gmm(l.inslife l(0/1).pols l(0/1).pcrdbof l(0/1).polfin l(0/1). mobilephone l(0/1).remit, collapse lag(1 1)) iv(yr1 yr2 yr3 yr4 yr5 yr6 yr7 yr8 yr9 yr10 yr11, eq(diff)) twostep small orthog*" where, *xtabond2* is the Roodman (2009a, 2009b) Stata command, *inslife* is life insurance, *l.inlife* is the lag of life insurance, *pols* is political stability, *pcrdbof* is private domestic credit, *polfin* is the interaction between political stability and private domestic credit, *mobile* is mobile phone penetration, *remit* is remittances, yr1 yr2....yr11 denote year dummies, *inter alia*.

study which is to assess the role of financial access in moderating the effect of governance on insurance consumption. Hence, the estimated interaction term captures the conditional role of financial access in moderating governance for insurance penetration.

3.2.2 Identification and exclusion restrictions

Still in accordance with contemporary GMM literature, clarifying concerns pertaining to identification and exclusion restrictions is particularly relevant for a robust GMM specification (Tchamyou & Asongu, 2017b). Going by the literature, years are acknowledged as strictly exogenous whereas elements in the conditioning information set (i.e. control variables) and the independent variables of interest (i.e. governance and credit access variables) are acknowledged as predetermined or endogenous-explaining (Tchamyou *et al.*, 2019). This identification and exclusion restriction properties are consistent with Roodman (2009b) who has argued that the identified strictly exogenous variables (i.e. years) are not likely to be endogenous upon a first difference[4].

The Difference in Hansen Test (DHT) is used to assess the assumption underlying the strategy of identification and corresponding exclusion restriction properties. Based on this criterion, the null hypothesis of the test should not be rejected in order for the identification process and exclusion restrictions assumptions to hold. This null hypothesis reflects the position that the identified strictly exogenous indicators affect insurance penetration exclusively via the predetermined variables. The procedure for validating exclusion restrictions is broadly consistent with the less contemporary instrumental variable (IV) approach in which a rejection of the null hypothesis corresponding to the Sargan/Hansen test, implies that the engaged instruments do not affect the outcome variables exclusively via the exogenous components of the identified predetermined variables (Beck, Demirgüç-Kunt & Levine, 2003).

4. Empirical results

4.1 Presentation of results

The empirical findings are presented in this section in Tables 1-2. Table 1 presents results on linkages between governance, financial access and life insurance while Table 2 shows findings on nexuses between governance, financial access and non-life insurance. In each table, there are six main specifications pertaining to each governance channel, namely:

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

political stability, "voice & accountability", government effectiveness, regulation quality, rule of law and corruption control (in this order). For all six specifications in both tables, four information criteria as employed to examine the validity of estimated models[5].In the light of these criteria, all the estimated models are overwhelmingly valid.

In order to investigate the total influence of financial access on the relevance of good governance in promoting the consumption of life insurance and non-life insurance, net impacts are computed from the unconditional effect of government quality and the conditional effect from the interaction between government quality and financial access. This computation is consistent with contemporary literature based on interactive regressions (Tchamyou & Asongu, 2017b). For the purpose of illustration and clarity, in the third column of Table 1, the net impact from the importance of financial access in modulating the effect of "voice & accountability" on life insurance is 0.031([-0.007 × 20.913] + [0.178]). In this calculation, the mean value of private domestic credit is 20.913; the unconditional impact of "voice & accountability" is 0.178 whereas the conditional impact from the interaction between private domestic credit and "voice & accountability" is -0.007.

As documented in Brambor, Clark and Golder (2006) and in contemporary interactive regressions literature (Tchamyou, 2019b; Agoba, Abor, Osei & Sa-Aadu., 2019), the constituents of the interactive regressions should not be interpreted in isolation, but net effects should be computed based interactive and unconditional effects. The interactive effect is the conditional effect multiplied by the mean value of the moderating variable whereas the unconditional effect is the effect of the main independent variable of interest (i.e. governance). In this study, we are assessing the role of finance in modulating the effect of governance on insurance penetration. Hence, the unconditional effect should be associated with governance while the interactive effect is the conditional effect of governance multiplied by the mean value financial access or the moderating variable.

The following findings can be established from Tables 1-2. First, credit access promotes life insurance through channels of "voice & accountability", government effectiveness, the rule of law and corruption-control. This is essentially because net effects are

[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 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).

apparent from the attendant specifications. Second, access to credit also stimulates non-life insurance via governance mechanisms of political stability, regulation quality, government effectiveness and corruption-control. The significant control variables largely display the expected signs.

Table 1: Governance, Financial Access and Life Insurance (GMM 1)

	Dependent variable: Life Insurance (LifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
LifeI (-1)	**0.953*** **	**0.858*** **	**0.781*** **	**0.938*** **	**0.868*** **	**0.758*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Private Domestic Credit (Credit)	-0.0001	**0.005***	0.003	0.002	**0.004***	0.001
	(0.910)	**(0.083)**	(0.222)	(0.221)	**(0.053)**	(0.541)
Political Stabiility (PolS)	0.039	---	---	---	---	---
	(0.164)					
Voice & Accountability(VA)	---	**0.178** **	---	---	---	---
		(0.014)				
Government Effectivenss (GE)	---	---	**0.264*** **	---	---	---
			(0.000)			
Regulation Quality (RQ)	---	---	---	**0.173** **	---	---
				(0.025)		
Rule of Law (RL)	---	---	---	---	**0.192*** **	---
					(0.000)	
Corruption-Control (CC)	---	---	---	---	---	**0.165*** **
						(0.006)
Credit×PolS	0.00004	---	---	---	---	---
	(0.961)					
Credit× VA	---	**-0.007*** **	---	---	---	---
		(0.000)				
Credit× GE	---	---	**-0.004*** **	---	---	---
			(0.000)			
Credit× RQ	---	---	---	0.001	---	---
				(0.136)		
Credit× RL	---	---	---	---	**-0.003*** **	---
					(0.000)	
Credit× CC	---	---	---	---	---	**-0.006*** **
						(0.000)
Mobile Phone Penetration	-0.0001	-0.00003	0.0005	**-0.001***	0.00008	**0.001*** **
	(0.631)	(0.952)	(0.411)	**(0.099)**	(0.861)	**(0.006)**
Remittances	0.001	**0.016*** **	**0.017*** **	0.003	**0.008*** **	**0.023*** **
	(0.377)	**(0.000)**	**(0.000)**	(0.124)	**(0.000)**	**(0.000)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	0.031	0.180	na	0.129	0.039
AR(1)	(0.086)	(0.068)	(0.076)	(0.084)	(0.078)	(0.073)
AR(2)	**(0.446)**	**(0.438)**	**(0.439)**	**(0.455)**	**(0.438)**	**(0.409)**
Sargan OIR	(0.000)	(0.003)	(0.089)	(0.000)	(0.002)	(0.003)
Hansen OIR	**(0.628)**	**(0.310)**	**(0.286)**	**(0.338)**	**(0.402)**	**(0.422)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	(0.066)	**(0.661)**	**(0.229)**	**(0.275)**	**(0.381)**	**(0.169)**
Dif(null, H=exogenous)	**(0.951)**	**(0.209)**	**(0.352)**	**(0.384)**	**(0.396)**	**(0.590)**
(b) IV (years, eq(diff))						
H excluding group	**(0.193)**	**(0.343)**	**(0.394)**	**(0.168)**	**(0.286)**	**(0.245)**
Dif(null, H=exogenous)	**(0.888)**	**(0.318)**	**(0.257)**	**(0.553)**	**(0.490)**	**(0.565)**
Fisher	**228120*** **	**35913.95*** **	**334766.51*** **	**18283.99*** **	**33379.63*** **	**29632.82*** **
Instruments	32	32	32	32	32	32
Countries	35	35	35	35	35	35
Observations	250	250	250	250	250	250

***,**,*: 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 of private domestic credit is 20.913.na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. Constants are included in all regressions. Values in brackets are p-values.

Table 2: Governance, Financial Access and Non-Life Insurance (GMM 2)

	Dependent variable: Non-Life Insurance (NLifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
NLifeI (-1)	**0.755*** **	**0.643*** **	**0.696*** **	**0.788*** **	**0.808*** **	**0.663*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Private Domestic Credit (Credit)	0.001	0.0002	0.0002	**0.001***	-0.0002	0.0005
	(0.178)	(0.800)	(0.773)	**(0.055)**	(0.572)	(0.416)
Political Stabiility (PolS)	**0.117*** **	---	---	---	---	---
	(0.000)					
Voice & Accountability(VA)	---	**0.175*** **	---	---	---	---
		(0.004)				
Government Effectivenss (GE)	---	---	**0.137*** **	---	---	---
			(0.005)			
Regulation Quality (RQ)	---	---	---	**0.140*** **	---	---
				(0.006)		
Rule of Law (RL)	---	---	---	---	**0.137*** **	---
					(0.000)	
Corruption-Control (CC)	---	---	---	---	---	**0.146*** **
						(0.002)
Credit×PolS	**-0.002*** **	---	---	---	---	---
	(0.000)					
Credit× VA	---	-0.001	---	---	---	---
		(0.100)				
Credit× GE	---	---	**-0.001** **	---	---	---
			(0.034)			
Credit× RQ	---	---	---	**-0.001*** **	---	---
				(0.000)		
Credit× RL	---	---	---	---	-0.0007	---
					(0.172)	
Credit× CC	---	---	---	---	---	**-0.001***
						(0.063)
Mobile Phone Penetration	-0.0003	-0.0006	-0.0003	-0.0006	**-0.0006** **	-0.0003
	(0.279)	(0.295)	(0.551)	(0.135)	**(0.033)**	(0.385)
Remittances	**0.009*** **	0.006	**0.013***	**0.008*** **	**0.007*** **	**0.012** **
	(0.000)	(0.311)	**(0.059)**	**(0.000)**	**(0.000)**	**(0.036)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	0.075	na	0.116	0.119	na	0.125
AR(1)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
AR(2)	**(0.244)**	**(0.146)**	**(0.132)**	**(0.145)**	**(0.146)**	**(0.137)**
Sargan OIR	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen OIR	**(0.263)**	**(0.253)**	**(0.133)**	**(0.422)**	**(0.301)**	**(0.212)**
DHT for instruments						
(a)Instruments in levels						
H excluding group	(0.095)	**(0.229)**	**(0.130)**	**(0.280)**	**(0.156)**	**(0.120)**
Dif(null, H=exogenous)	**(0.487)**	**(0.310)**	**(0.218**	**(0.482)**	**(0.445)**	**(0.359)**
(b) IV (years, eq(diff))						
H excluding group	**(0.488)**	**(0.102)**	(0.056)	(0.090)	**(0.225)**	**(0.136)**
Dif(null, H=exogenous)	**(0.190)**	**(0.545)**	**(0.427)**	**(0.846)**	**(0.414)**	**(0.392)**
Fisher	**711.86*** **	**2913.06*** **	**4198.79*** **	**9816.76*** **	**9694.06*** **	**10636.50*** **
Instruments	32	32	32	32	32	32
Countries	36	36	36	36	36	36
Observations	270	270	270	270	270	270

***,**,*: 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 of private domestic credit is 20.913.na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. Constants are included in all regressions. Values in brackets are p-values.

It is worthwhile to articulate that the insignificance of political stability in the first column of Table 1 may be traceable to outliers, given that four observations from the dataset slightly exceed the maximum negative limit of -2.5. These outlier observations are Burundi in

2004 and 2007 and Sudan in 2009 and 2011. However, after removing these outliers, the result of political stability remained insignificant.

4.2 Robustness checks with a change in the conditioning information set

In this section, we assess whether the established findings in the previous section withstand empirical scrutiny by involving per capita income in the conditioning information set. The choice of this alternative control variable is consistent with the insurance literature documented in Section 2 which maintains that there are significant correlations between income levels, economic growth and insurance penetration. Given that not more than two variables can be involved in the conditioning information set in order to curtail concerns pertaining to instrument proliferation that substantially bias estimated coefficients, the mobile phone penetration variable is replaced with the GDP per capita growth variable. The overall incidence of financial access in modulating governance dynamics for insurance development is assessed from net effects as in Tables 1-2. While Table 3 focuses on nexuses between governance, finance and life insurance penetration, Table 4 is concerned with linkages between governance, finance and non-life insurance penetration. It is apparent from Table 3 that financial access significantly modulates most governance dynamics from an overall positive incidence on life insurance, namely: political stability, "voice & accountability", government effectiveness and the rule of law. From the findings in Table 4, the following governance mechanisms are modulated by financial access to induce a positive effect on life insurance, namely: political stability, "voice & accountability", regulation quality and rule of law.

When the findings in Tables 1-4 are compared and contrasted, financial access significantly modulates governance dynamics to positively affect both life insurance and non-life insurance with one exception: only regulation quality is not significantly modulated by financial access to positively influence life insurance. The negative effect of GDP per capita in Table 3 can be traceable exclusive growth in Africa. Accordingly, despite the recent growth resurgence experienced by most countries in SSA, there are still growing levels of inequality which reflect the fact that the fruits of economic growth have not been equitably distributed across the population (Tchamyou et al., 2019). Hence, growth in income levels is skewed in favour of the wealthy fractions of society.

Table 3: Governance, Finance and Life Insurance (GMM 3)

	Dependent variable: Life Insurance (LifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
LifeI (-1)	**0.992*** (0.000)**	**0.757*** (0.000)**	**0.766*** (0.000)**	**0.711*** (0.000)**	**0.762*** (0.000)**	**0.646*** (0.000)**
Private Domestic Credit (Credit)	**0.002* (0.098)**	**0.011*** (0.001)**	**0.008*** (0.005)**	**0.011** (0.011)**	**0.009*** (0.000)**	**0.010*** (0.000)**
Political Stabiility (PolS)	**0.113*** (0.000)**	---	---	---	---	---
Voice & Accountability(VA)	---	**0.528*** (0.000)**	---	---	---	---
Government Effectivenss (GE)	---	---	**0.282*** (0.000)**	---	---	---
Regulation Quality (RQ)	---	---	---	**0.501*** (0.000)**	---	---
Rule of Law (RL)	---	---	---	---	**0.391*** (0.000)**	---
Corruption-Control (CC)	---	---	---	---	---	**0.345*** (0.004)**
Credit × PolS	**-0.005*** (0.000)**	---	---	---	---	---
Credit × VA	---	**-0.017*** (0.000)**	---	---	---	---
Credit × GE	---	---	**-0.005*** (0.000)**	---	---	---
Credit × RQ	---	---	---	**-0.005*** (0.000)**	---	---
Credit × RL	---	---	---	---	**-0.007*** (0.000)**	---
Credit × CC	---	---	---	---	---	**-0.014*** (0.000)**
GDP per capita growth	**-0.003** (0.015)**	**-0.008** (0.033)**	-0.0002 (0.914)	0.001 (0.673)	-0.003 (0.196)	**-0.006*** (0.005)**
Remittances	0.0007 (0.668)	**0.030*** (0.000)**	**0.019*** (0.000)**	**0.025*** (0.000)**	**0.015*** (0.000)**	**0.034*** (0.000)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	0.008	0.172	0.177	nsa	0.396	nsa
AR(1)	**(0.163)**	**(0.143)**	**(0.168)**	**(0.167)**	**(0.173)**	**(0.162)**
AR(2)	**(0.507)**	**(0.583)**	**(0.492)**	**(0.482)**	**(0.481)**	**(0.424)**
Sargan OIR	(0.002)	(0.089)	(0.000)	(0.000)	(0.001)	(0.000)
Hansen OIR	**(0.435)**	**(0.316)**	**(0.189)**	(0.075)	**(0.103)**	(0.089)
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.128)**	**(0.247)**	**(0.216)**	**(0.101)**	**(0.311)**	**(0.137)**
Dif(null, H=exogenous)	**(0.667)**	**(0.378)**	**(0.236)**	**(0.142)**	(0.098)	**(0.141)**
(b) IV (years, eq(diff))						
H excluding group	**(0.153)**	**(0.708)**	**(0.470)**	**(0.252)**	**(0.337)**	**(0.340)**
Dif(null, H=exogenous)	**(0.725)**	**(0.163)**	**(0.129)**	(0.076)	(0.085)	(0.070)
Fisher	**25584.67*** **	**22950.72*** **	**16816.89*** **	**10384.24*** **	**5724.60*** **	**11122.30*** **
Instruments	32	32	32	32	32	32
Countries	35	35	35	35	35	35
Observations	252	252	252	252	252	252

***,**,*: 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 of private domestic credit is 20.913. 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 estimated model is not valid. Constants are included in all regressions. GDP: Gross Domestic Product. Values in brackets are p-values.

Table 4: Governance, Finance and Non-Life Insurance (GMM 4)

	Dependent variable: Non-Life Insurance (NLifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
NLifeI (-1)	**0.714*** (0.000)**	**0.432*** (0.000)**	**0.507*** (0.000)**	**0.766*** (0.000)**	**0.753*** (0.000)**	**0.645*** (0.000)**
Private Domestic Credit (Credit)	**0.003*** (0.000)**	**0.005*** (0.001)**	**0.002** (0.021)**	0.0006 (0.572)	**0.001** (0.016)**	0.0008 (0.390)
Political Stabiility (PolS)	**0.128*** (0.000)**	---	---	---	---	---
Voice & Accountability(VA)	---	**0.449*** (0.000)**	---	---	---	---
Government Effectivenss (GE)	---	---	**0.343*** (0.000)**	---	---	---
Regulation Quality (RQ)	---	---	---	**0.331*** (0.000)**	---	---
Rule of Law (RL)	---	---	---	---	**0.160*** (0.000)**	---
Corruption-Control (CC)	---	---	---	---	---	**0.245*** (0.000)**
Credit × PolS	**-0.004*** (0.000)**	---	---	---	---	---
Credit × VA	---	**-0.010*** (0.000)**	---	---	---	---
Credit × GE	---	---	**-0.004*** (0.000)**	---	---	---
Credit × RQ	---	---	---	**-0.003*** (0.000)**	---	---
Credit × RL	---	---	---	---	**-0.003*** (0.000)**	---
Credit × CC	---	---	---	---	---	**-0.005*** (0.000)**
GDP per capita growth	-0.001 (0.607)	-0.003 (0.262)	-0.0009 (0.709)	-0.002 (0.338)	0.0003 (0.874)	-0.001 (0.469)
Remittances	**0.008*** (0.008)**	0.005 (0.347)	**0.026*** (0.004)**	**0.019*** (0.000)**	**0.010*** (0.008)**	**0.023*** (0.001)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	0.044	0.239	nsa	0.268	0.097	nsa
AR(1)	(0.001)	(0.006)	(0.004)	(0.001)	(0.001)	(0.000)
AR(2)	**(0.212)**	**(0.196)**	(0.080)	**(0.120)**	**(0.150)**	**(0.106)**
Sargan OIR	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hansen OIR	**(0.233)**	**(0.171)**	(0.039)	**(0.114)**	**(0.198)**	(0.084)
DHT for instruments						
(a)Instruments in levels						
H excluding group	**(0.135)**	**(0.241)**	(0.116)	**(0.268)**	**(0.436)**	**(0.100)**
Dif(null, H=exogenous)	**(0.371)**	**(0.199)**	(0.067)	**(0.120)**	**(0.162)**	**(0.161)**
(b) IV (years, eq(diff))						
H excluding group	**(0.260)**	**(0.455)**	(0.098)	**(0.521)**	(0.061)	**(0.110)**
Dif(null, H=exogenous)	**(0.280)**	**(0.117)**	(0.083)	(0.060)	**(0.571)**	**(0.174)**
Fisher	**3185.46*** **	**98.81*** **	**4661.50*** **	**1787.19*** **	**4325.16*** **	**7335.08*** **
Instruments	32	32	32	32	32	32
Observations	272	272	272	272	272	272

***,**,*: 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 of private domestic credit is 20.913. 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 estimated model is not valid. Constants are included in all regressions. GDP: Gross Domestic Product. Values in brackets are p-values.

4.3 Robustness checks with an alternative estimation technique

Consistent with Bogliacino, Pivaand Vivarelli (2012), the adopted GMM-estimation can poorly perform when a panel is characterised by a small number of cross sections. This research, therefore, employs an alternative estimation technique that can address the issues

associated with small cross sections in dynamic panel regression based on unbalanced data, notably: the Least Squares Dummy Variable Corrected (LSDVC) estimator (Kiviet, 1995; Judson &Owen, 1999; Bun & Kiviet, 2001, 2003).

The LSDVC methodology is appropriate when outcome variables are persistent, as observed in the methodology section of this research on the one hand and on the other, builds on recursive correction of the bias of the fixed effects estimator (Bogliacino et al., 2012). According, the LSDVC methodology has been extended to unbalanced panels by Bruno (2005a, 2005b) because the author has improved the original Least Squares Dummy Variable (LSDV) estimator to an LSDVC estimator. Accordingly, the LSDVC is appropriate for this research because the number of cross sections is not large and the dataset is unbalanced

Table 5: Governance, Finance and Life Insurance (LSDVC1)

	Dependent variable: Life Insurance (LifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice &Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
LifeI (-1)	**0.246*** (0.000)**	**0.270*** (0.000)**	**0.238*** (0.000)**	**0.259*** (0.000)**	**0.267*** (0.000)**	**0.264*** (0.000)**
Private Domestic Credit (Credit)	**0.016*** (0.000)**	**0.016*** (0.000)**	**0.016*** (0.000)**	**0.016*** (0.000)**	**0.016*** (0.000)**	**0.015*** (0.000)**
Political Stabiility (PolS)	-0.030 (0.656)	---	---	---	---	---
Voice &Accountability (VA)	---	0.062 (0.628)	---	---	---	---
Government Effectivenss (GE)	---	---	0.027 (0.849)	---	---	---
Regulation Quality (RQ)	---	---	---	0.060 (0.723)	---	---
Rule of Law (RL)	---	---	---	---	-0.090 (0.537)	---
Corruption-Control (CC)	---	---	---	---	---	0.113 (0.364)
Credit × PolS	0.002 (0.311)	---	---	---	---	---
Credit × VA	---	-0.002 (0.395)	---	---	---	---
Credit × GE	---	---	**0.005* (0.084)**	---	---	---
Credit × RQ	---	---	---	-0.0002 (0.908)	---	---
Credit × RL	---	---	---	---	0.004 (0.208)	---
Credit × CC	---	---	---	---	---	**-0.008*** (0.008)**
Mobile Phone Penetration	-0.001 (0.365)	-0.001 (0.409)	-0.001 (0.363)	-0.001 (0.336)	-0.001 (0.268)	-0.0006 (0.623)
Remittances	-0.001 (0.913)	-0.003 (0.704)	-0.001 (0.895)	-0.002 (0.784)	-0.001 (0.834)	-0.006 (0.449)
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	na	na	na	na	na
Observations	211	211	211	211	211	211

***,**,*: significance levels at 1%, 5% and 10% respectively. The mean of private domestic credit is 20.913. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. Constants are included in all regressions. Values in brackets are p-values.

Table 6: Governance, Finance and Non-Life Insurance (LSDVC 2)

	Dependent variable: Non-Life Insurance (NLifeI)					
	Political Governance		**Economic Governance**		**Institutional Governance**	
	Political Stability	Voice & Accountability	Government Effectiveness	Regulation Quality	Rule of Law	Corruption-Control
NLifeI (-1)	**0.466*** (0.000)**	**0.451*** (0.000)**	**0.454*** (0.000)**	**0.455*** (0.000)**	**0.440*** (0.000)**	**0.452*** (0.000)**
Private Domestic Credit (Credit)	**0.003* (0.086)**	**0.004** (0.032)**	0.003 (0.095)	0.003 (0.100)	0.003 (0.139)	0.003 (0.104)
Political Stabiility (PolS)	0.030 (0.379)	---	---	---	---	---
Voice & Accountability(VA)	---	0.081 (0.198)	---	---	---	---
Government Effectivenss (GE)	---	---	-0.004 (0.953)	---	---	---
Regulation Quality (RQ)	---	---	---	0.090 (0.270)	---	---
Rule of Law (RL)	---	---	---	---	0.035 (0.627)	---
Corruption-Control (CC)	---	---	---	---	---	-0.0005 (0.993)
Credit × PolS	**-0.002** (0.018)**	---	---	---	---	---
Credit × VA	---	**-0.004** (0.014)**	---	---	---	---
Credit × GE	---	---	**-0.003** (0.045)**	---	---	---
Credit × RQ	---	---	---	**-0.002* (0.060)**	---	---
Credit × RL	---	---	---	---	-0.003 (0.037)	---
Credit × CC	---	---	---	---	---	**-0.003** (0.037)**
Mobile Phone Penetration	-0.0004 (0.446)	-0.0002 (0.689)	-0.0004 (0.460)	-0.0004 (0.477)	-0.0003 (0.559)	-0.0002 (0.740)
Remittances	**0.008** (0.046)**	**0.009** (0.029)**	**0.009** (0.020)**	**0.010** (0.013)**	**0.009** (0.025)**	**0.008** (0.034)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	na	na	na	na	na	na
Observations	230	230	230	230	230	230

***,**,*: significance levels at 1%, 5% and 10% respectively. The mean of private domestic credit is 20.913. na: not applicable because at least one estimated coefficient needed for the computation of net effects is not significant. Constants are included in all regressions. Values in brackets are p-values.

Unfortunately, as apparent in the findings of Tables 5-6, within the LSDVC framework, significant net effects are not apparent even when: (i) GDP per capita growth and remittances are considered as control variables such as in Tables 3-4 and (ii) mobile phone penetration; GDP per capita growth and remittances are involved in the conditioning information set.

5. Concluding implications and future research directions

This study has investigated the role of access to credit in moderating the effect of good governance on insurance consumption in 42 Sub-Saharan African countries using data for the period 2004-2014. Two life insurance indicators are used, notably: life insurance and non-life insurance. All six governance dynamics from World Governance Indicators of the World

Bank are also used, namely: political governance (i.e. political stability and "voice &accountability"), economic governance (i.e. government effectiveness and regulation quality) and institutional governance (i.e. corruption-control and the rule of law). The empirical evidence is based on the Generalised Method of Moments. The following main findings are established. The empirical evidence is based on the Generalised Method of Moments (GMM) and Least Squares Dummy Variable Corrected (LSDVC) estimators.

Estimations from the LSDVC are not significant while the following main findings are established from the GMM. First, financial access promotes life insurance through channels of political stability, "voice & accountability", government effectiveness, the rule of law and corruption-control. Second, financial access also stimulates non-life insurance via governance mechanisms of political stability, "voice & accountability", government effectiveness, regulation quality, the rule of law and corruption-control.

The findings broadly show that policies should be designed with the understanding that increasing insurance consumption is an additional benefit from improving governance standards and access to finance. Hence, the main policy implication is that governments of sampled countries should continue to implement measures that are designed to improve both governance standards and access to finance given that increasing insurance consumption is an associated benefit from enhancing standards of governance and financial access. This is essentially because financial access promotes the insurance industry when: (i) the election and replacement of political leaders is smooth and accompanied with stability, non-violence and accountability (representing political governance); (ii) conducive policies are formulated and implemented for the delivery of public commodities and private sector development which includes the insurance sector (denoting economic governance) and (iii) the State and citizens respect institutions that govern interactions between them, which affect the doing business environment (reflecting institutional governance).

After comparing the magnitude of net effects across specifications: (i) financial access can more effectively modulate governance to positively affect life insurance through the mechanisms of government effectiveness and the rule of law and (ii) financial access can most (least) effectively moderate governance to induce positive effects on non-life insurance via regulation quality (political stability). On the one hand, the relevance of government effectiveness and rule of law show how economic governance and institutional governance are fundamental in promoting life insurance in Africa. On the other hand, while the comparative importance of economic governance is further confirmed for the promotion of

non-life insurance (i.e. in the perspective of regulation quality), the fact that political stability is the least effective channel is intuitive and logical. Accordingly, in the absence of violence and political instability, incentives for insurance subscription may decrease because of a promising political and socio-economic outlook.

Future studies can be devoted to assessing whether the established findings withstand empirical scrutiny from country-specific frameworks. Such idiosyncratic frameworks are relevant for more targeted policy implications. Moreover, given that the conception of governance in this study is based on aggregated macroeconomic observations, it will also be worthwhile to extend the analysis with an assessment of how corporate governance practices affect the insurance industry of sampled countries. Another caveat of the study is that the findings can be situated between correlations and causality. Hence, as more data become available, it would be worthwhile for future studies to employ alternative estimation techniques from which findings that are assimilated to causality can be established.

Appendices

Appendix 1: Definitions of Variables

Variables	Signs	Definitions of variables (Measurements)	Sources
Life Insurance	LifeIns	Life Insurance Premium Volume to GDP (%)	FDSD
Non-Life Insurance	NonLifeIns	Non-life Insurance Premium Volume to GDP (%)	FDSD
Financial Credit	Credit	Privates Domestic Credits (% of GDP)	FDSD
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
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
Mobile Phones	Mobile	Mobile cellular subscriptions (per 100 people)	WDI
Remittances	Remit	Remittance inflows to GDP (%)	WDI
GDP per capita	GDPpcg	GDP per capita growth (% of annual)	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 Bank.

Appendix 2: Summary statistics (2004-2014)

	Mean	SD	Minimum	Maximum	Observations
Life Insurance	0.798	1.978	0.0006	12.220	405
Non-Life Insurance	0.799	0.531	0.005	2.774	428
Private Domestic Credit	20.913	24.628	0.873	150.209	440
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
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
Mobile Phone Penetration	48.455	38.082	0.209	171.375	524
Remittances	4.313	6.817	0.00003	50.818	416
GDP per capita growth	2.680	4.243	-37.925	30.342	462

S.D: Standard Deviation.

Appendix 3: Correlation matrix (uniformsample size: 285)

Credit	PolS	VA	GE	RQ	CC	RL	Mobile	Remit	GDPpcg	LifeIns	NonLifeIns	
1.000	0.242	0.302	0.136	0.219	0.197	0.239	0.190	-0.071	0.165	0.853	0.772	Credit
	1.000	0.754	0.660	0.584	0.747	0.763	0.268	0.034	0.092	0.227	0.323	PolS
		1.000	0.836	0.789	0.806	0.855	0.391	0.086	0.109	0.207	0.293	VA
			1.000	0.878	0.872	0.907	0.460	-0.031	0.141	0.106	0.190	GE
				1.000	0.769	0.836	0.446	-0.088	0.041	0.165	0.250	RQ
					1.000	0.910	0.413	0.107	0.099	0.159	0.273	CC
						1.000	0.404	0.045	0.120	0.166	0.289	RL
							1.000	-0.075	-0.025	0.131	0.070	Mobile
								1.000	-0.012	-0.001	0.412	Remit
									1.000	0.160	0.179	GDPpcg
										1.000	0.790	LifeIns
											1.000	NonLifeIns

Mobile: Mobile phone penetration. Internet: Internet penetration. BroadB: Fixed broadband subscriptions. PolS: Political Stability. VA: Voice & Accountability. GE: Government Effectiveness. RQ: Regulation Quality. CC: Corruption-Control. RL: Rule of Law. Mobile: Mobile Phone Penetration. Remit: Remittances. GDPcpg: Gross Domestic Product per capita growth. LifeIns: Life Insurance. NonLifeIns: Non-Life Insurance.

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