Social Insurance Coverage, Economic Factors and Vulnerability to Corruption in Nigeria: A Non-Linear Cointegration Approach

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ABSTRACT

Social insurance is a critical component of social security but may not have been well defined in Nigeria. Since insurance is noted to have tacit claims on regulating human behaviour; social insurance should impel and compel public attitudes against the vulnerability of being drawn to the sin of corruption- an economic risk to society. Against this backlash, this study examined any linkage of the incidence of corruption in the Nigerian socio-economic life to the level of social insurance cover (SIC) while noting some intervening economic factors –inflation and interest rates. A non-linear ARDL technique was applied and is considered to be more predictive than my previous studies on social insurance. It is found that corruption is strongly linked to low SIC concomitantly with high inflation rate particularly from 2005 to date. Government should target innovative policies that will drive social insurance inclusion. These include attracting the informal sector to take-up micro life insurance, micro health insurance, and micro pension schemes. Government at various levels should design social interventions and financial assistance for less privilege. Monetary policy watchers should ingeniously work out low inflation regimes and low coupon fixed income instruments that moderate the interest rate spread in Nigeria to sustain SIC and reduce corruptive tendencies.

1. Introduction

Social insurance is a critical component of social security (Belinda & Mandgima, 2016; Kaseke, 2000). World Bank (2017) articulates that social insurance includes publicly provided or mandated insurance schemes against risks of old age, disability, death of bread winner, maternity leave, sickness cash benefits and social health insurance. Social insurance can therefore regulate loss aversion behaviour (Outreville, 2014), which this study posits will make individuals to be motivated to explore corruption. By tacit claims, insurance is noted to be human behavioural regulator (Simon, 2002 and Ericsson et al, 2003 cited in Scordis, Suzawa, Zwick & Ruckner, 2014). Hence, social insurance should impel public attitudes against the vulnerability of being drawn to the sin of corruption, petty or grand. Belinda and Mandigma (2016) citing International Labour Organization (2000) defined social security as "the protection which society provides for its members through a series of public measures namely: social insurance, social assistance and social allowance." Social Insurance Coverage (SIC) is the percentage of population participating in programs mitigating the risks mentioned earlier (World Bank, 2017). In countries having well entrenched (SIC), the corruption indices are quite low when compared to Nigeria which has consistently been described as one of the worst corrupt nations of the world (Transparency International Reports, 2015). There is little research that connects prevalence of social ills such as corruption to lack of wide SIC. To the best of author's knowledge, research on SIC is yet to be empirically linked with vulnerability to corruption. Possibly in this void, Eugster, Lalive, Steinhaüer and Zwimuller (2011) questioned; should a society insure individuals against economic shocks such as corruption? The subtlety of corruption in Nigeria requires further research into why and how it could be mitigated with institutional structures that can moderate an importunity behavior or incentive for self-insurance on the planks of corruption. It is thus hypothesized that the degree of SIC will mitigate a hidden self-insurance motive to acquire illegal wealth in the form of corruption. In other words low levels of SIC is significantly contributing to the prevalence of corruption. The study sets out to investigate whether changes in SIC provides any mitigation against corruption in the face of macroeconomic factors. The study contributes to academic and social discourse on SIC as well as its relationship with corruption risk management in developing countries particularly in Nigeria.

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2. Review of Related Literature

The literatures on social insurance are linked to other economic variables while corruption on the other hand focused on different relationships. This literature is therefore reviewed by relating strands of literatures conceptually linking social insurance to economic insecurity and social risks in which corruption is one of them. The operationalization of corruption as economic insecurity provides grounds for the study to align with other studies on its influence on demand for social insurance. Corruption is a devourer that ravages all the values of a society (Clammer, 2012); because it encourages laziness (catalyst for corruption) and lack of competition which slows down economic development (Schwab & Werker, 2018). Corruption is an economic risk to society. There are many definitions of corruption. The commonest are "the abuse of entrusted power for private gain or illegal benefit (Shleifer & Vishny, 1993; Hansen, Lunde, & Nason, 2011); "an inducement to gain favour" and "taking of bribe" (Svensson, 2002); Alt & Lassen (2003) and Hwang & Greenford (2005).

Mares (2003) argued profusely how perception of economic insecurity led employers and employees in high- risk industries to prefer social insurance more than those in low- risk industrial sector in Germany. Economic insecurity was measured by volatility of unemployment across different countries (Rodrik, 1998). The opposite was in the case of France whose workforce is dominated by low- risk workers (Mitchell, 1998) who did not initially jostled for social insurance. It is arguable that volatility of unemployment induces a high risk environment which will extricate fear of possibility of hunger in future, which motivates the need to seek protection instrument albeit even in the illegal corruption device. The import of this is the degree of insecurity leads to demand of social insurance (Mares, 2004), otherwise high insecurity prevails.

A fundamental departure on the reasons for existence of corruption was the perspicacity of Osoba's (1996) declaration that corruption in Nigeria is used as private wealth accumulation. This implicitly linked corruption as an illicit investment instrument of wealth management in Nigeria or means of poverty reduction. In the same vein Clammer (2012) relied on psychological construct of the need for individual to manage insecurities as the basis of corruption even though this interacts with the psychological construct of moral weakness. Thus the theoretical transmutation of corruption to a social vice or risk operating as an illegal social risk management device is implicit under the economics of risk (Meyer, 2003). It is plausibly arguable that the prevalence of corruption may be controllable to good extent in the presence of a risk management device like insurance which Simon (2002) described as tacit means of government regulating behavior through insurance. The tenets and theory of insurance rests on its risk management mechanics – transfer of risk and protection of the unfortunate few by the redistribution of resources to them from a pool of funds from a large group. On the plane of social insurance, it is a form of insurance sponsored by government that compliments private insurance, and leverages on this concept of reducing vulnerability to poverty (Holzmann & Jorgessen, 2000). According to Modigliani and Muralidhar (2005), social insurance being a public insurance project is the undertaking of a social obligation to ensure all citizens, especially the old and poor, have the financial requisites to meet contingencies of life. In the view of Aaron and Reischauer (1998), it is a paternalistic venture by government to prevent the government having to take care of large army of retired senior citizens of which majority are from the civil service particularly the armed forces, police and judiciary. Social insurance therefore responds to occurrence of earning loss occasioned by work-related and life-cycle risks such as retirement, premature death, injury, sickness; and is not just aimed at the poor only (Wibbels & Ahlquist, 2011).

Dixon (1982) had linked the need for social insurance as a natural consequence of economic development. Dixon asserted that the mechanism of self-insurance by depending on traditional family or tribal ties has weakened. Demographic transition to modern state supports the principle of atomization of consanguinity ties. In the absence of risk management devices in any society, how else do the individuals protect themselves? The origin and concept of social insurance is tractable to the end of 18th century and 1900 -1934 where various governments in Europe and America introduced various forms of health insurance, disability insurance, old age and survivor/dependants benefits for workers and sometimes covering the whole population (Cutler & Johnson, 2004). As if in contrivance, countries that are considered low on corruption indices such as Germany, Austria, UK, and most European countries (Transparency International, 2015), were the earliest to deploy social insurance (old age and medical insurance program) by 1880s in response to different theoretical premises such as productivity (Cutler & Johnson, 2004); but not corruption. Modigliani and Muralidhar (2005) agreeing with the view of some experts differentiated social insurance from pension scheme because the former tend to redistribute resources from well -to –do to poorer segments of the society who cannot afford to accumulate adequate reserves. Hence, increase in SIC may stem the tendency to seek all means of accumulating wealth through corruption. For example, the Nigerian National Social Health Insurance Scheme requires contribution based on percentage of salary but the benefit is determined by health risk. One of the canonical objectives of public insurance suggested by Modigliani and Muralidhar (2005) is the inducement of desired social behavior among the citizenry. Do these elements of social insurance in Nigeria leveraged by government to improve SIC such that vulnerability to corruption is modified?

Many pundits and scholars in the twentieth century have also researched and found that social insurance reduces the pangs of poverty which was feared to be the crucible for criminal behavior (Glennerster, Hills, Piachaud & Webb, 2004). Does pervasiveness of corruption in Nigeria make SIC tenuous?

Anti-corruption efforts in Nigeria had been mainly by enforcement and compliance with laws (Hansen, 2011); but a case of new strategies that discourage corruption is being sought to make businesses and economies more competitive (KPMG, 2007a; KPMG 2007b; PWC, 2008). SIC may be a renewed strategy to spurn corruption in a poor country. For the developed economy SIC existed as a weapon of social stability against volatility of unemployment, sickness and old age that came from the ravages of capitalism and industrialization (Tabellini, 2000).

Many studies devoted attention to the socio-economic causes and remedies of corruption while omitting the lack of risk management institutions such as insurance. For example, Mauro (1996); Shleifer and Vishny (1993) listed causes of corruption as; government subsidies, multiple exchange rates, trade restrictions, price controls, low wages in the public service, countries rich in natural resource endowments and sociological factors of ethno linguistic fractionalization. Although, Esarey, Salmon, & Barrilleaux, (2012) demonstrated experimentally that smoothing inequality or income redistribution is a major function of social insurance; there is no link to reduction of corruption risk. In Africa, Kaseke (2017) concluded that SIC have not done enough to mitigate poverty in Zimbabwe and South Africa, implying corruption risk may be ravaging these countires. In Nigeria most researches hinged the existence of corruption on moral weakness and poverty but none focused on the low SIC.

There were two parallel approaches in the views of Wibbels and Ahlquist, (2011). In the developed economies the emergence of social insurance is empirically linked to compensation hypothesis where the risks of capitalism are reduced by providing for individual losses (Adsera & Boix, 2002) and Iversen, 2005). Wibbels & Ahlquist, (2011) leveraged on the positions taken by Mares (2005); Rudra (2007) and Haggard and Kaufman (2008), to show domestic economic strategies prioritized the crafting of social insurance based on peculiarities. Advancing further on the arguments of Angell (2002), Wibbels and Ahlquist, (2011) show inequality and labour market risks shaped the preferences for social insurance mostly in developing economies. This paper draws on the implications of this recent finding to understand the embedded reasons for social insurance coverage and the prevalence of vulnerability to petty corruption or economic insecurity in Nigeria. This is more or less an obverse of previous researches which had sought to establish the rationale for the demand of social insurance or high SIC.

In the case of Nigeria, social insurance is fragmented into different social policies in the last 56 years. The forms of social insurances are: (i) the defunct Nigeria Provident Fund established in 1961 Laws of the Federation of Nigeria (1990), and subsequently amended in 1962; 1974, 1979, 1993 and scrapped in 2004; (ii) the compulsory defined benefit pension schemes starting from 1959 backdated to 1946 with the various parametric reforms through the years and the recent systemic reform of 2004 to defined contributory scheme and the subsequent parametric reform of 2014 with the elements of group life insurance, but many of the state governments are reluctant to comply; (iii) the National Health Insurance Scheme (NHIS) that took effect from 2005 mainly among federal public servants because the state government are reluctant to comply; workers' compensation which was reviewed in 2010 for the protection of workers for work-related injuries, sickness and death, which has very insignificant to date. Since these schemes are compulsory for employers having a minimum of three workers it is expected that SIC would have trended in the last 14 years with the attendant possible reduction in corruption.

3. Methods and Data

Data on SIC was obtained from World Bank (2017); inflation and interest rates from Central Bank of Nigeria Statistical Bulletin (2017), and corruption index from Transparency International Corruption Index (2017). The methodological framework is derived from the specifications of Belinda and Mandigma (2016). After modification, the expression on the linkage of corruption to SIC is defined as.

$$cpi_t = b_0 + b_1 sic_t + b_2 ins_t + b_3 \inf_t + w_t \tag{3.1}$$

Where: cpi_t-corruption perspective index, sic_t-social insurance cover, ins_t-interest rate spread, $\inf_t$-inflation, $b's$-long run coefficients, and w_t-disturbance error term. Shin, et al. (2014) debunked the constancy or linearity of the long run coefficients in the traditional level equation defined in 3-1. In this regard, the asymmetric long run version of 3.1 can be expressed as.

$$cpi_t = a_0 + a_1 sic_t^+ + a_2 sic_t^- + a_3 ins_t^+ + a_4 ins_t^- + a_5 \inf_t^+ + a_6 \inf_t^- + u_t; u_t \sim N(0,1) \tag{3.2}$$

Where: $a's$-row vector of long run asymmetric coefficients, sic_t^+ and sic_t^--partial sum of positive and negative changes in social insurance cover, ins_t^+ and ins_t^--partial sum of positive and negative changes in interest rate spread, $\inf_t^+$ and $\inf_t^-$-partial sum of positive and negative changes in inflation.

Even though the OLS estimators in equation 3.1 may be super consistent, their asymptotic distribution may follow a non-Gaussian process. Therefore, it could become illogical testing hypothesis without dealing with the problem of endogenous regressors. In considering this underlying fact inherent in the violation of serial correlation associated with linear regression, a flexible NARDL framework is proposed that captures dynamic short run and long run asymmetric cointegrating relation between corruption index, SIC, interest rate spread and inflation respectively. Given y as 1 x 1 vector of dependent variable and x as k x 1 vector of covariates, The NARDL is defined as.

$$y_t = con + \sum_{i=1}^{p} \eta_i y_{t-i} + \sum_{j=1}^{q} (x_{t-j}^{+} {}' \theta_j^{+} + x_{t-j}^{-} {}' \theta_j^{-}) + \varepsilon_t \qquad 3.3$$

Decomposing the parent regressors to have:

$$x_t{}' = x_0 + x_{t-j}^{+} {}' + x_{t-j}^{-} {}' \qquad 3.4$$

In the expression 3.3, $x_t{}'$ is $kx1$ vector of observable regressors identified as the augments of this study, η_i are the autoregressive coefficients, θ_j^{+} and θ_j^{-} are the non-linear coefficients of the autoregressive distributed lag framework and ε_t is disturbance white noise term. In addition it implies that $x_t{}'$s are decomposed into x_{t-j}^{+}'s and x_{t-j}^{-}'s components around the threshold of zero, which alternatively represent increase and decrease in the growth rates of $x_t{}'$s. Based on equation 3.3, unrestricted NARDL- ECM can be constructed as follows.

$$y_t = \gamma y_{t-i} + x_{t-j}^{+} {}' \lambda^{+} + x_{t-j}^{-} {}' \lambda^{-} + \sum_{i=1}^{p} \phi_i \Delta y_{t-i} + \sum_{j=1}^{q} (\Delta x_{t-j}^{+} {}' b_j^{+} + \Delta x_{t-j}^{-} {}' b_j^{-}) + w_t \qquad 3.5$$

Where: $-\dfrac{\lambda^{+}}{\gamma}$ and $-\dfrac{\lambda^{-}}{\gamma}$ are long run coefficients

4. Results

The method applied in this study precludes that none of the time series data defined in section three is I(2), and that these series are not all I(1). These apparent inevitable conditions are verified, using the popular ADF unit root test under the assumption of trends and intercept. Table 1 gives the outputs of the test.

Table 1-Unit Root Test for Log Series of CPI, SIC, INT & INF

Series	ADF-Stat	5% Critical Value	P-Value
LNCPI	-2.0711	-3.5806	0.5387
DLNCPI	-4.2912	-3.5806	0.0108
LNSIC	-3.8319	-3.5806	0.0296
LNINT	-6.659	-3.5742	0
LNINF	-3.7125	-3.5806	0.0381

Source: E-view 10 ADF Test Output

The ADF statistics for each of these variables is given in Table 1with their corresponding critical values at 5%. From this table, it is obvious that the ADF statistics for all of these variables at level are larger than the critical values in absolute term, except in the case of corruption perception index. However, the ADF statistic for this index at first difference (DLNCPI) is larger than the critical value at 5%. This means that the variables are mixed integrated, but none of them is I (2).

The short run dynamic and long run coefficients under the nonlinear ARDL are now obtained and stated in Table two.

Table 2: Short Run and Long Run Dynamic Relationship				
	Regressors	Coefficient	T-Stat	P-Value
DLNINS_P	0.279803	0.22598	1.238179	0.251
DLNINF_N	-0.20609	0.09547	-2.15857	0.063
DLNSIC_P	7.988488	19.9988	0.399448	0.7

LNINS_N	-0.51733	0.26973	-1.91796	0.091
DLNINF_P	0.08294	0.20596	0.4027	0.698
DLNSIC_N	-7.6983	19.3993	-0.39683	0.702

LNSIC_P(-1)/LNCPI(-1)	-76.6031	Jarque-Bera	1.57(0.46)
LNSIC_N(-1)/LNCPI(-1)	0.231516	ARCH	0.12(0.54)
LNINF_P(-1)/LNCPI(-1)	-0.02063	LM	5.42(0.05)
LNINF_N(-1)/LNCPI(-1)	-0.02482	Ramsey	2.65(0.46)
LNINS_P(-1)/LNCPI(-1)	-37.7597		
LNINS_N(-1)/LNCPI(-1)	-2.77303		

Source: E-view 10 SR and LR Dynamic Test Output

Table two gives the values of the short run coefficients in the first compartment, while in the second compartment; it shows the outputs of the long run coefficients and model fitness results. In this context, there is evidence in the short run that an increase in inflation raises corruption perspective index and a decrease in inflation is reduces corruption index. Furthermore, within the scope of short run dynamic changes, a rise in interest rate spread increases corruption and a decrease in interest rate spread appears to be a negative determinant of corruption. Corruption steps up with a decrease in SIC in the short run. The short run results are consistent with expectation. However, the long run results are for example a bit inconsistent; both increase and decrease in inflation have inverse relationship with corruption. This suggests that an increase in inflation reduces corruption, while decrease in inflation also reduces corruption in the long run. This is in tandem with the thinking that inflation reduces money balance of government, which can simultaneously lead to reduction in contract/contract spiting and embezzlements in the long run expected time. It is noted that a decrease in inflation should have opposite effects. In the long run, any increase in interest rate spread reduces corruption but a shrink in the spread lead to a rise in corruption particularly in the financial sector. These results are somewhat perturbing for the monetary policies, but empirically arguable in a market driven economy without risk management instruments such as social insurance. That is if interest rate margin increases due to a rise in inflation, more savings are encouraged; and more funds are available in the banking system and a large proportion of available credits is actively engaged in domestic investments. Thus, a reduction in idle funds may decrease the level of corruption. Finally it is found that increase in SIC reduces corruption, while a reduction in SIC increases corruption in the long run. A plausible argument can now be posited from insurance theory that where there is high uncertainty and there is no insurance to cover uncertainty, there will be attraction to reduce fear of tomorrow's uncertainty through corruption no matter the laws put in place. This provides enough evidence to support the argument of prevalence of corruption in Nigeria concomitant with low SIC. The ARCH, JB and LM tests indicate that the model is well fitted, and the Ramsey reset test shows that the model is functionally non-linear. This is important since the long run parameters shown in Table two can only be valid if there is evidence of non-linear cointegrating relationship among the variables. Following Shin et al (2014), Wald's test conducted attests for this relationship. Table three presents the results.

Table 3-The Results of Non-linear ARDL Approach to Cointegration

Test Stat	Value	DF	P-Value
F-statistic	3.617099	(7, 8)	0.0459
X^2-statistic	25.31969	7	0.0007

Source: E-view 10 WLR Test Output

Table 3 reports the results of the two statistical versions of Wald's test- F and X^2 version- The F statistics value is 3.62 and X^2 statistic is 25.32 approximately. The Pesaran's statistics under the assumption of constant and no trend are 3.23 for the lower bond and 4.35 for the upper bond (see Pesaran et, al 2012, 300). The observed F statistic is in-between the lower and upper bonds, making test inclusive. Conversely, the Chi-squared statistic falls above the upper bond. This means the Chi-squared version provides evidence of

long run relationship. Therefore, there is presence of asymmetric long run relationship between corruption, insurance cover, inflation and interest rate spread in Nigeria.

5. Conclusion

This study found fresh evidence that the sustenance of corrupt practices in the long run stem from low SIC. Further, other macro-economic factors like high inflation and low interest regimes exacerbate propensity to corruption or by implication reduces SIC. In line with theoretical underpinnings, extensive SIC can moderate behavior of Nigerians to preponderantly back-off from corrupt practices in its contingent awareness. This finding could be further tested in a cross-country analysis. Although the current government in Nigeria is testing the waters of new forms of social insurance such as the social intervention on feeding school children and "Trader Moni", it is recommended that government should work out innovative market-oriented policies that will drive SIC. These include attracting the informal sector to micro life insurance, micro health insurance and micro pension schemes. Monetary policy watchers should ingeniously work out low inflation regimes and low coupon fixed income instruments that moderate the interest rate spread in Nigeria to sustain SIC and reduce corruptive tendencies

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