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EFFECT OF FRAGILITY ON GROWTH AND POVERTY IN NIGERIA: A DISAGGREGATE STATE-LEVEL ANALYSIS

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ABSTRACT

Why some nations are wealthier than others are one of the most contentious and enigmatic questions in international development economics. This has necessitated plausible explanations for the reasons behind Africa's poor development record over the past 50 years. Among other factors, fragility arising from different conflicts in African countries has been ranked as a key factor that undermines the development of the continent. Nigeria found itself in this set due to growing conflicts in different parts of the country. Consequently, fragility worsened the country's development due to the huge associated economic and social costs. More so, conflict-affected countries are characterized by the worst socio-economic outcomes. Hence, existing studies have been preoccupied with the understanding of the relationship between fragility and economic growth as well as fragility and poverty. To provide evidence in the context of Nigeria, this paper, therefore, empirically investigated the fragility-growth nexus, as well as the fragility-poverty nexus, in a sample of 36 states and the Federal Capital Territory (FCT) in Nigeria. We further considered the macroeconomic and socio-political relationships in fragile and non-fragile states of Nigeria. Using data covering the period between 2011 and 2015, both the static approach (Ordinary Least Squares, Fixed Effect, and Random Effect) and the dynamic approach (Difference and System Generalized Method of Moments) were explored to provide answers to some key questions in the study. The results showed that the neoclassical and socio-political approaches complement each other. Specifically, fragility significantly weakened economic growth and further worsened poverty levels among the states. This suggests that conflict-related fragility creates an unstable environment that discourages economic activities and aggravates hunger among the population. More so, the results indicated that only debt enhances economic growth while income reduces poverty in both fragile and non-fragile states. Hence, conflict resolution is crucial to addressing conflicts in different parts of the country. Also, the country needs to explore various strategies (security infrastructure, and human capital) to overcome fragility, enhance economic growth, and combat poverty.

JEL Classifications: O10, O4 and I3

Keywords: Fragility, Growth, Poverty, Boko Haram, Nigeria

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INTRODUCTION

One of the most debated and seemingly elusive issues in international development economics is why some countries are richer than others. Therefore, myriads of understandings of the factors responsible for the overall weak development performance

of Africa in the last half-century have been put forth by different scholars and organizations. Although there appears to be a stain of optimistic growth for the continent, especially in the 2000s, this outset of an “Africa Rising” narrative pales when a much longer historical perspective serves as the basis for consideration. In a bid to figure out the supposed difference of Africa, several explanations have been advanced, ranging from the relics of colonial history, difficult geography (the notion of “landlocked” is prominent), ethnic fractionalization, civil unrest, to government repression, among other factors.

It is needless to say that an assortment of factors is responsible for the observed outcome. Fragility, which we operationalize as the inability of a state to steer the economy towards respectable growth and ensure equitable as well as societally inclusive allocation of the proceeds of growth, aptly captures several dimensions of these explanations. Hence, some studies have documented different dimensions of fragility in the literature. These studies include Alemayehu (2017), Hausken and Ncube (2012) Akresh et al. (2012) and Abadie and Gardeazabal (2003). The overall conclusion from these studies is that fragility can lead to macroeconomic instability, and war, conflict, and political violence can place countries in a fragile position. Recent studies have also demonstrated the effect of fragility on several economic indicators (such as Chacha and Edwards, 2019; Fowowe and Folarin, 2019; Nkrunziza, 2019; Chuku and Onye, 2017). These studies also concluded that fragility worsens inequality and poverty while stifling economic growth, inclusive growth, and financial inclusion. Therefore, the negative effect of fragility on growth and the alleviation of poverty is clearly demonstrated.

In the case of Nigeria, some studies (such as Howell et al., 2020; Chukwuma and Ekhator-Mobayode, 2019; Kotsadam and Ostby, 2019) examined the effect of conflict on health indicators. While these studies established the negative effects of conflict on health outcomes, there is limited evidence to show the effect of fragility on growth and poverty in Nigeria. Hence, this study is specifically aimed at an in-depth understanding of both the underlining dynamics and the eventual outcomes observable in these “pockets of fragility” (or fragility clusters). To put into perspective the gravity of the conundrum, between 1997 and 2016, the northern part of Nigeria recorded 94,339 fatalities, of which more than 80% were between 2009 and 2016. One of the major reasons for this can be attributed to the Boko Haram insurgency in the region. In contrast, the southern part of the country had 18,732 fatalities between 1997 and 2016, with 36.4% occurring between 2009 and 2016.

A cursory comparison of the foregoing statistics already places the northern part in a far more fragile matrix than its southern counterpart. This state of affairs is precarious, especially in a region that is faced with poor macroeconomic and socio-political indicators, including poor growth and extreme poverty. Thus, it is imperative to understand the relationship between macroeconomic factors and fragility (measured by conflict) as well as the connection between fragility and socio-political factors. All of these analyses are better appreciated and more policy-relevant at a disaggregated scale (state-level approach) in a federal system like Nigeria.

The study deploys a panel data set covering 36 states and the Federal Capital Territory (FCT) in Nigeria between 2011 and 2015. To deal with specific research questions, pooled Ordinary Least Squares (OLS), Fixed Effects (FE) or Random Effects (FE) and Generalised Method of Moments (GMM). The respective reasons for their adoption are detailed in the methodology section. The outline for the rest of this study is as follows: Section 2 focuses on a brief review of relevant studies. Section 3 offers details on

methodology. Section 4 focuses on the presentation and discussion of results. Section 5 provides the conclusion and policy implications of the study.

LITERATURE REVIEW

A large number of empirical studies have examined the impact of political conflict on economic variables using both panel and cross-sectional data. Among those who used a cross-section of countries are Abadie and Gardeazabal (2003) and Hausken and Ncube (2012). Hausken and Ncube (2012) explained that elections, as a critical factor in a democratic setting, may promote political violence, especially in the absence of fairness among the political contenders. Specifically, most African countries' experiences depict a situation where the incumbent and challengers direct their resources into election maneuvering, which in turn distracts the incumbent from providing public goods and decreases production necessary for economic growth.

Apart from the political aspect, some studies have also examined the economic effects of conflict, both from macro and micro perspectives. Akresh et al. (2012) studied the Nigerian civil war in the 1960s, and their result shows that several generations of Nigerian women, many of whom are alive today, carry the scars of their exposure to this war. They further explain that adult stature is more sensitive to the environment in adolescence than it is at younger ages. Also, Besley and Mueller (2012) argued that violence played a significant role in undermining the peace dividends. From the macro-level, Chauvet et al. (2011) considered three distinct costs of a failing state, which include: the costs of poor policy and governance to citizens of such states, the costs of civil war to these citizens, and the cost of both these types of failure to neighbors.

To obtain a deeper understanding of the issues related to fragility in Africa, many recent studies have contributed extensively to the literature on this area. These include Ngepah and Ngepah (2017); Chuku and Onye (2017); Chacha and Edwards (2019); Nkurunziza (2019); and Fowowe and Folarin (2019). Countries with greater fragility tend to suffer higher macroeconomic volatility and crises as well as weaker growth. State fragility conditions, on the other hand, were identified as being of first-order importance in explaining macroeconomic performance in fragile states but not necessarily macroeconomic policies (Chuku & Onye, 2021). This suggests that the fragility experienced by many states in Africa can be attributed to poor macroeconomic management, and fragile state conditions can account for poor macroeconomic performance.

In the context of inclusive growth in African countries, Fowowe and Folarin (2019) showed that fragility significantly weakens inclusive growth. Also, countries with lower levels of economic growth tend to experience fragility (Ngepah & Ngepah, 2017). Examining the relationship between fragility and poverty revealed that countries can be endangered through a vicious cycle of fragility traps and high levels of deprivation. Thus, the high level of fragility in sub-Saharan Africa shows that higher levels of deprivation, poor growth performance, and inequality are interrelated. More so, higher poverty rates are associated with fragility (Kebede et al., 2021).

From the above, there is no doubt that fragility is a serious challenge that many countries in the world are still battling, especially those in the African region. To fully understand fragility in countries in Africa, there is a need for country-specific studies to

identify the factors driving fragility. This gap is precisely addressed in this study using sub-national units in Nigeria, as this provides finer-grained insights, shows their implications, and suggests possible ways forward.

METHODOLOGY

Using the neoclassical approach, we relied on augmented Solow growth model with human capital, while we relied on the simple poverty model for the socio-political approach. As discussed by Bourguignon (2004), poverty rate is explained by growth elasticity (income effect) and inequality elasticity (distributional effect). Thus, we specify the functional forms for both approaches as follows:

Neoclassical approach

$$Y_{it} = f(K, L, AH) \quad (1)$$

Socio-political approach

$$Po v_{it} = f(Income, Gini) \quad (2)$$

As established in the foregoing, state fragility reduces economic activities vis-a-vis increased poverty, thus functional forms can be rewritten as:

Neoclassical approach

$$Y_{it} = f(K, L, AH, Fra) \quad (3)$$

Socio-political approach

$$Po v_{it} = f(Income, Gini, Fra) \quad (4)$$

Equations 3 and 4 were specified in baseline models as follows:

Neoclassical approach

$$Y_{it} = \beta_0 + \beta_1 cap_{it} + \beta_2 lab_{it} + \beta_3 fra_{it} + \beta_4 sch_{it} + \beta_5 lif_{it} + \beta_6 debt_{it} + \beta_7 M2_{it} + \varepsilon_{it} \quad (5)$$

Socio-political approach

$$Po v_{it} = \alpha_0 + \alpha_1 Y_{it} + \alpha_2 Gini_{it} + \alpha_3 lif_{it} + \alpha_4 sch_{it} + \alpha_5 fra_{it} + \varepsilon_{it} \quad (6)$$

The logs of the variables of the models are taken to normalize them, thus the log-linearization of equations 1 and 2 are presented as:

Neoclassical approach

$$\begin{aligned}\log(Y)_{it} = & \beta_0 + \beta_1 \log(cap)_{it} + \beta_2 \log(lab)_{it} + \beta_3 \log(fra)_{it} + \\ & \beta_4 \log(sch)_{it} + \beta_5 \log(lif)_{it} + \beta_6 debt_{it} + \\ & \beta_7 M2_{it} + \varepsilon_{it}\end{aligned}\quad (7)$$

Socio-political approach

$$\begin{aligned}\log(Pov)_{it} = & \alpha_0 + \alpha_1 \log(Y)_{it} + \alpha_2 \log(Gini)_{it} + \alpha_3 \log(lif)_{it} + \\ & \alpha_4 \log(sch)_{it} + \alpha_5 \log(fra)_{it} + \varepsilon_{it}\end{aligned}\quad (8)$$

More so, the states are classified into fragile^{iv} and non-fragile states^v using Boko Haram insurgency. Thus, equations 7 and 8 are estimated for both fragile and non-fragile states. The study explores pooled OLS with comparison with the fixed-effects model and GMM. The approaches help to evaluate the robustness of the findings across different techniques. The models in equations 3–8 may yield biased estimates because of endogeneity problems and measurement error. However, fixed-effects and random-effects models control for all time-invariant differences among the cross sections (i.e., states) for unbiased estimated coefficients. Although the fixed or random effects approach, unlike pooled OLS, can resolve individual effects as well as time effects and can account for heteroscedasticity, certain assumptions must be met, most notably strict exogeneity assumptions. To handle potential endogeneity, the GMM proposed by Arellano and Bond (1991), but later modified by Blundell and Bond (1998), is suitable for panel data sets with “small T and large N” Also, the GMM estimation technique uses the set of equations in first differences coupled with suitable lagged levels of variables as an instrument, and an additional set of equations in levels with lagged first differences as an instrument. To summarize, if the lagged dependent variable is irrelevant, a fixed-effects model or a random-effects model is selected. To choose between a fixed-effects or random-effects model and a pooled OLS model, Levene's robust test statistic is used.

The compact form of the equations above can be transformed into static panel form as follows:

Neoclassical approach

$$\begin{aligned}\log(Y)_{it} = & \beta_0 + \beta_1 \log(cap)_{it} + \beta_2 \log(lab)_{it} + \beta_3 \log(fra)_{it} + \\ & \beta_4 \log(sch)_{it} + \beta_5 \log(lif)_{it} + \beta_6 debt_{it} + \\ & \beta_7 M2_{it} + \lambda_i + \varepsilon_{it}\end{aligned}\quad (10)$$

Socio-political approach

$$\begin{aligned}\log(Pov)_{it} = & \alpha_0 + \alpha_1 \log(Y)_{it} + \alpha_2 \log(Gini)_{it} + \alpha_3 \log(lif)_{it} + \\ & \alpha_4 \log(sch)_{it} + \alpha_5 \log(fra)_{it} + \lambda_i + \varepsilon_{it}\end{aligned}\quad (11)$$

Capturing equations 1 and 2 in dynamic form gives:

$$\begin{aligned} \log(Y)_{it} = & \beta_0 \log(Y)_{it-1} + \beta_1 \log(cap)_{it} + \beta_2 \log(lab)_{it} + \\ & \beta_3 \log(fra)_{it} + \beta_4 \log(sch)_{it} + \beta_5 \log(lif)_{it} + \\ & \beta_6 debt_{it} + \beta_7 M2_{it} + \mu_{it} \end{aligned} \quad (10')$$

$$\begin{aligned} \log(Pov)_{it} = & \alpha_0 \log(Pov)_{it-1} + \alpha_1 \log(Y)_{it} + \alpha_2 \log(Gini)_{it} + \\ & \alpha_3 \log(lif)_{it} + \alpha_4 \log(sch)_{it} + \alpha_5 \log(fra)_{it} + \mu_{it} \end{aligned} \quad (11')$$

$$\mu_{it} = \varepsilon_i + v_{it}$$

Where, $\varepsilon_i \sim \text{IID}(0, \sigma_\mu^2)$ and $v_{it} \sim \text{IID}(0, \sigma_v^2)$

Therefore, the component ε_i represents individual (country-specific) fixed effects that are invariant and v_{it} represents country-specific shocks and varies over time. The latter shocks are heteroscedastic and are correlated over time within individuals but not among them. Then, we assume that:

$$E(\varepsilon_i) = E(\pi_{it}) = E(\varepsilon_i, \pi_{it}) = 0$$

$$E(v_{it}, v_{js}) = 0 \text{ for each } i, j, t, s \text{ with } i \neq j$$

$$\begin{aligned} \Delta \log(Y)_{it} = & \beta_0 \Delta \log(Y)_{it-1} + \beta_1 \Delta \log(cap)_{it} + \beta_2 \Delta \log(lab)_{it} + \\ & \beta_3 \Delta \log(fra)_{it} + \beta_4 \Delta \log(sch)_{it} + \beta_5 \Delta \log(lif)_{it} + \\ & \beta_6 \Delta debt_{it} + \beta_7 \Delta M2_{it} + \mu_{it} \end{aligned} \quad (10'')$$

$$\begin{aligned} \Delta \log(Pov)_{it} = & \alpha_0 \Delta \log(Pov)_{it-1} + \alpha_1 \Delta \log(Y)_{it} + \alpha_2 \Delta \log(Gini)_{it} + \\ & \alpha_3 \Delta \log(lif)_{it} + \alpha_4 \Delta \log(sch)_{it} + \alpha_5 \Delta \log(fra)_{it} + \mu_{it} \end{aligned} \quad (11'')$$

This implies that strictly exogenous variables are not influenced by their current or past errors v_{it} and the pre-determined ones, including the lagged dependent variable, are possibly correlated with the past errors v_{it} and thus may correlate with the individual fixed effects ε_i . Equations 10'' and 11'' have accounted for the elimination of individual fixed effects through first differencing transformation. Also, the characterization of first difference GMM with weak instruments has been taken into consideration in equations 1'' and 2'' to increase the efficiency of the models through the inclusion of more instruments and, therefore, the variables are instrumented with their available lags level. Table 1 shows the definitions and sources of variables

TABLE 1: VARIABLE DEFINITION AND DATA SOURCES

Variables of interest	Definition	Source
GDP per capita ^{vi}	It measures the income per person in the total population. That is GDP per capita	United Nations Development Programme (2008) Nigeria Human Development Report and CBN, 2016
Fragility	The natural log of conflict intensity	Fund for Peace, 2016
Debt	Domestic debt (% of Gross Domestic Product)	Debt Management Office Database
Life expectancy	Log of life expectancy	Demographic Health Survey, National Bureau of Statistics (various years)
School enrollment	Secondary school enrollment	Universal Basic Education Commission Database
Poverty index	Multidimensional Poverty Index	Oxford Poverty and Human Development Initiative (OPHI) briefings (various years)
Labor	The natural log of labor force	National Bureau of Statistics (NBS), 2016
Capital	The natural log of consumption of fixed capital	National Bureau of Statistics (NBS), 2016
Gini coefficient	The natural log of Gini coefficient	Aigbokhan (2017)
Money supply	Money supply as a percentage of GDP	CBN, 2016

EMPIRICAL RESULTS AND DISCUSSIONS

This section presents the empirical results and gives a detailed discussion of the findings from the study. Table 2 presents the descriptive statistics of the variables in the estimated models. From the table, all series have positive average values (i.e., mean values), which suggests that all the series exhibit upward trends. Among the series, LAB and SCH exhibit high volatility, while GINI exhibits the lowest. Subsequently, we considered different estimation approaches to verify if the dynamic aspect is relevant to our results. The results show that the lagged terms are statistically insignificant under GMM. Thus, we focus on the static models. The statistical significance of the Hausman test shows the rejection of the null hypothesis (of the random effects estimator). However, Levene's robust statistic test reveals the acceptance of the null hypothesis of equality of variances at 5%. This suggests that the fixed-effects assumption is weak. Moreover, the statistical significance of the F-stat under pooled OLS justifies its choice over fixed effects. Both Levene's robust test statistic and F-statistic supported the validity of pooled OLS. Hence, we focus on pooled OLS results.

TABLE 2: DESCRIPTIVE STATISTICS

Variables	Observation	Mean	Std. Deviation	Min	Max
Capital	185	103.7	92.73	14.32	557.6
Labour	185	1.932e+06	1.701e+06	315,289	9.646e+06
School enrollment	185	118,632	66,038	24,042	363,811
GDP per capita	185	351.8	216.9	101.6	1,823
Debt	185	3.173	3.444	0.0199	27.35
Fragility	185	352.6	1,479	0	14,805
Life expectancy	185	53.69	3.258	42.57	58.80
Gini coefficient	185	0.338	0.0864	0.157	0.924
Money supply	185	19.51	0.408	18.93	20.08
Multidimensional Poverty Index	185	0.447	0.278	0.0260	0.919

Source: Authors' Computation

Table 3 presents the effect of fragility on economic growth. From the result, the coefficient of capital is negative and statistically insignificant. This suggests that capital serves as a direct drag on growth in Nigeria, contrary to the theoretical proposition. This further shows the existing dearth of capital stock in the states and country as a whole. This result supported the findings of Adeniyi et al. (2020) and Ogundari and Awokuse (2018).

Furthermore, the coefficient of labor is positive and statistically significant. This reveals that labor largely contributes to productivity among the states. On domestic debt, which captures the extent of fiscal sustainability, the coefficient is positive and statistically significant. Surprisingly, this implies that domestic borrowing by state governments to finance public spending improved productivity, thereby promoting growth in subnational units. This finding supported previous studies by Yusuf et al. (2021), Thao (2018) and Anyanwu and Erhijakpor (2015), which found a positive relationship between domestic debt and economic growth.

Focusing on school enrollment, its coefficient is negative and statistically significant. The development of human capital with respect to education has a drag effect on economic growth. This shows a lack of access to quality education in terms of the skills and knowledge that are necessary for growth. In contrast, the coefficient of life expectancy is positive and statistically significant. Thus, the result appears to suggest that as people live longer, they tend to contribute to production at a higher rate. Access to quality healthcare services had a beneficial effect on improving the health of the population, thereby accelerating their contribution to the production process. The findings aligned with extant studies such as Oyinlola et al. (2021), Raheem et al. (2018), and Ogundari and Awokuse (2018). The coefficient of money supply is negative and statistically insignificant. In essence, the financial sector has not played a significant role in spurring economic activity in the states.

TABLE 3: STATE GROWTH MODEL FOR ALL STATES

VARIABLES	POLS	FEM	DGMM	SGMM
L.GDP per capita			-0.00415 (0.0146)	0.303 (0.252)
Capital	-0.0522 (0.299)	-0.352 (0.256)	2.947*** (0.336)	0.488*** (0.182)
Labour	0.785** (0.303)	0.668 (0.714)	-2.054*** (0.268)	0.0307 (0.183)
Debt	0.0124*** (0.00280)	-0.00247 (0.00308)	-1.42e-05 (0.000274)	0.00266 (0.00315)
Fragility	-0.0488*** (0.00991)	0.0118 (0.0129)	-0.000248 (0.00551)	0.0534* (0.0315)
School enrolment	-0.286*** (0.0440)	0.0430 (0.0451)	0.00114 (0.00756)	-0.154 (0.124)
Life expectancy	0.641* (0.341)	0.385 (0.642)	-0.0158 (0.0830)	1.090*** (0.396)
Money supply	-0.0106 (0.0274)	0.0189 (0.0197)	-0.129*** (0.0146)	-0.0308*** (0.0150)
Constant	-1.699 (1.790)	-2.235 (4.170)		
Observations	185	185	111	148
R-squared	0.789	0.029		
F-test	94.55	0.591		
Prob > F	0.000	0.762		
Levene's robust test statistics	0.942 (0.568)			
Hausman Test		79.94 (0.00)		
Number of crossid		37	37	37
Wald-chi2				
Prob > chi2				
Hansen_test			2.998	6.652
Hansen Prob			0.558	0.466
AR(1)_test			1.035	-1.267
AR(1)_P-value			0.301	0.205
AR(2)_test			1.029	-0.524
AR(2)_P-value			0.304	0.600

No. of Instruments

12

16

Source: Authors' Computation

Notes: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Shifting attention to the role of fragility in economic growth, the result shows a negative and statistically significant coefficient of fragility. Additionally, the coefficient gives an insight into the multiplier effect of fragility on growth. This result reveals that, as conflict intensity magnifies, overall economic activities are disrupted, thereby reducing states' growth rates. This result further corroborates the report of the Fund for Peace (2014), where Nigeria was ranked 17th with the highest alert. Several studies, such as Fowowe and Folarin (2019) and Hausken & Ncube (2012), found a similar result.

Table 4 focuses on the effect of fragility on poverty. The coefficient of income is negative and statistically significant. This implies that, as income increases, the poverty level declines. This can be attributed to several efforts at the state level to address poverty (such as the Lagos State Employability Support Project, the Rivers State Sustainable Development Agency (RSSDA), and the Kaduna Start-up Entrepreneurship program). Expectedly, the result is in line with existing studies such as Wan et al. (2021), and Warr and Suphannachart (2020). On the Gini coefficient, which measures inequality, the coefficient is negative and statistically significant in the model. The result appears to suggest that as inequality increases, poverty reduces across the state; however, this is counterintuitive. Also, the coefficient of school enrollment is positive but statistically insignificant. In contrast, the coefficient of life expectancy is negative and statistically significant. This implies that when people live longer and can contribute to the production process, there will be more incentives available to meet their needs, which would reduce poverty. The findings support the argument of Olopade et al. (2019).

TABLE 4: STATE POVERTY MODEL FOR ALL STATES

VARIABLES	POLS	FEM	DGMM	SGMM
GDP per capita	-0.713*** (0.050)	0.016 (0.034)	1.073 (1.023)	0.182 (0.736)
Gini Coefficient	-0.388*** (0.121)	-0.020 (0.0422)	0.059 (0.150)	0.308 (0.617)
School enrollment	0.063 (0.050)	-0.008 (0.018)	-0.076 (0.120)	-0.008 (0.121)
Life expectancy	-2.929*** (0.459)	-0.046 (0.272)	-0.691 (0.741)	1.124 (4.558)
Fragility	0.030** (0.013)	0.0008 (0.005)	-0.104 (0.083)	-0.054 (0.136)
L. Multidimensional poverty index			-1.463 (4.903)	1.323 (1.160)
Constant	6.726*** (0.797)	0.516 (0.469)		-2.232 (9.155)

Observations	185	185	111	148
R-squared	0.700	0.004		
F-test	83.56	0.117		
Prob > F	0.000	0.988		
Levene's robust test statistic	0.837 (0.728)			
Hausman Test		69.5 (0.00)		
Number of crossid		37	37	37
Hansen_test			15.10	12.84
Hansen Prob			0.004	0.046
AR(1)_test			-0.866	-0.192
AR(1)_P-value			0.387	0.847
AR(2)_test			-0.821	-0.188
AR(2)_P-value			0.412	0.851
No. of Instruments			10	13

Source: Authors' Computation

Notes: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Also, fragility was found to aggravate poverty levels. This supports the notion that fragility does not only affect economic activities but also creates social problems. As conflict intensifies, poverty persists. This is evident in most parts of the country. In the presence of conflicts arising from violence or crisis, economic activities are dampened and access to a good livelihood is curtailed, thereby making it difficult for people to meet their basic needs. The result is consistent with existing studies such as World Bank (2011) and Cosgrove (2021).

The subsequent narration examines the comparative analysis of economic performance in fragile and non-fragile states using the Boko Haram terrorist attack criterion due to the timeframe of the study. Table 5 presents the results of the growth model in both categories. Comparatively, the result shows the negative effect of capital on economic growth and its statistical insignificance. This result supports our previous findings in the full sample that capital serves as a direct drag on growth. Nevertheless, the coefficient of labor is positive and statistically significant for both categories, but its contribution to growth is relatively higher for non-fragile states. Compared to areas where insurgency is a problem, labor is expected to contribute significantly to the production process in peaceful states. Also, the coefficient of debt is positive and statistically significant in both categories. The effect is higher in fragile states relative to non-fragile states. Overall, the coefficient is relatively small for both categories. This shows that borrowing benefits both categories.

On school enrollment, the result indicates a negative effect of school enrolment on economic growth in both categories. Judging by the coefficients, the decline in the growth rate is relatively high for the fragile states. Nonetheless, the coefficient of life expectancy is positive for both categories but is not statistically significant. In general, the two categories face the challenge of human capital development. On the money supply, the result shows a negative coefficient for fragile states and otherwise for non-fragile states.

The coefficients are not statistically significant. The implication of this is that the financial sector may find it difficult to play its catalytic role in spurring growth in the region facing terrorist attacks.

The next discussion focuses on the results presented in Table 6. The coefficient of income is negative and statistically significant. This implies that, as income grows, the poverty level declines. Surprisingly, poverty reduction is relatively high in fragile states. This can be attributed to the migration of people to non-fragile states. On the Gini coefficient, the result shows a positive relationship between inequality and poverty for non-fragile states but otherwise for fragile states. High inequality aggravates a high level of poverty. On human capital, the pattern is not significantly different from previous findings. In sum, the findings show that the neoclassical and socio-political approaches complement each other. Low growth is always associated with a high poverty level.

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TABLE 5: STATE GROWTH MODEL FOR FRAGILE AND NON-FRAGILE STATES

VARIABLES	Non-Fragile				Fragile			
	POLS	FEM	DGMM	SGMM	POLS	REM	DGMM	SGMM
Capital	-0.630 (0.391)	-0.507 (0.442)	2.845*** (0.031)	3.001*** (0.670)	-0.205 (0.399)	0.020 (0.048)	2.771*** (0.00006)	1.841*** (0.240)
Labour	1.244*** (0.396)	0.702 (1.304)	-1.984*** (0.0245)	-2.296*** (0.670)	0.874** (0.407)	0.419*** (0.112)	-2.445*** (3.42e-05)	-1.779*** (0.239)
Debt	0.007** (0.003)	-0.004 (0.005)	-0.00005 (0.00006)	0.005** (0.002)	0.017*** (0.005)	-0.0004 (0.0009)	-0.0000007 (0.0000001)	0.0007 (0.0006)
School enrollment	-0.215*** (0.066)	0.161 (0.122)	0.001 (0.0008)	-0.191** (0.093)	-0.239*** (0.058)	-0.007 (0.008)	-0.000002** (0.0000008)	-0.028*** (0.008)
Life expectancy	0.0177 (0.585)	0.525 (1.595)	-0.0504 (0.040)	-0.576 (0.592)	0.116 (0.461)	0.208* (0.118)	0.000003 (0.00002)	-0.009 (0.065)
Money supply	0.014 (0.037)	0.034 (0.036)	-0.125*** (0.001)	-0.132*** (0.024)	-0.019 (0.038)		-0.126*** (0.000003)	-0.079*** (0.010)
L.GDP per capita			0.001 (0.004)	-0.057 (0.064)			1.000*** (1.52e-05)	0.902*** (0.017)
Constant	-3.191 (2.409)	-3.136 (7.886)		15.62*** (3.635)	-1.283 (2.370)	-0.550 (0.658)		9.393*** (1.278)
Observations	100	100	60	80	85	85	51	68
R-squared	0.662	0.059			0.660			
F-test	30.37	0.768			25.23			
Prob > F	0.000	0.597			0.000			
Levene's robust statistic	0.894 (0.591)				1.673 (0.074)			
Hausman Test		13.98				0.98		

	(0.020)			(0.099)		
Number of crossid	20	20	20	17	17	17
Wald-chi2				67.28		
Prob > chi2				0.000		
Hansen_test		10.55	5.324		2.858	13.28
Hansen Prob		0.061	0.722		0.582	0.102
AR(1)_test		2.978	-1.275		0.508	-1.268
AR(1)_P-value		0.002	0.202		0.611	0.205
AR(2)_test		2.807	0.872		0.831	-1.355
AR(2)_P-value		0.005	0.383		0.406	0.175
No. of Instruments		12	16		11	16

Source: Authors' Computation

Notes: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

TABLE 6: STATE POVERTY MODEL FOR FRAGILE AND NON-FRAGILE STATES

VARIABLES	Non-Fragile				Fragile			
	POLS	FEM	DGMM	SGMM	POLS	FEM	DGMM	SGMM
GDP per capita	-0.505*** (0.082)	0.0138 (0.036)	0.436* (0.249)	0.160 (0.227)	-0.667*** (0.081)	0.195 (0.320)	0.384 (0.371)	-0.350 (0.594)
Gini coefficient	0.109 (0.204)	-0.058 (0.074)	-0.119 (0.176)	0.556 (0.767)	-0.426*** (0.140)	-0.017 (0.056)	-0.059* (0.033)	0.099 (0.189)
School enrollment	0.030 (0.075)	-0.016 (0.038)	0.001 (0.058)	-0.049 (0.069)	0.063 (0.063)	-0.006 (0.021)	0.026 (0.057)	0.027 (0.101)
Life expectancy	-2.022** (0.822)	0.257 (0.520)	0.147 (0.944)	1.205 (0.892)	-2.357*** (0.548)	-0.220 (0.331)	-0.629** (0.291)	-0.892 (0.838)
L.Multidimensional poverty index			-1.070	1.119***			-16.76***	0.443

Constant	5.005*** (1.377)	-0.165 (0.877)	(1.862)	(0.362)	-2.037 (1.524)	5.710*** (1.018)	0.615 (0.806)	(3.967)	(0.846)	2.642 (2.277)
Observations	100	100	60	80	85	85	51	68		
R-squared	0.330	0.019			0.574	0.012				
F-test	11.69	0.359			27	0.197				
Prob > F	0.000	0.837			0.000	0.939				
Levene's robust statistic	0.678 (0.830) (0.097)				1.988 (0.026)					
Hausman Test		43.02 (0.00)				28.31 (0.00)				
Number of crossid	20	20	20	20	17	17	17	17		
Hansen_test			11.11	11.37			7.812	11.47		
Hansen Prob			0.0493	0.123			0.0987	0.0750		
AR(1)_test			-0.179	0.411			-1.090	0.214		
AR(1)_P-value			0.858	0.681			0.276	0.831		
AR(2)_test			-1.226	0.487			-2.613	0.943		
AR(2)_P-value			0.220	0.627			0.009	0.346		
No. of Instruments			10	13			9	12		

Source: Authors' Computation

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

CONCLUSIONS AND POLICY IMPLICATIONS

This study examined the effect of fragility on growth and poverty in 36 states and the Federal Capital Territory (FCT) in Nigeria using pooled OLS and other estimation techniques. Also, the analysis was considered under the fragile and non-fragile states dichotomy. The key findings largely show an indication of fragility reducing growth while promoting poverty. In essence, fragility tends to record unstable growth over time. This suggests that the pockets of fragility in terms of political violence, civil and communal conflicts, violence against civilians, rioting and protesting, and militia interactions among these states may weaken their growth potential. The findings also suggest that economic growth and poverty are major challenges in both fragile and non-fragile states. However, the fragile states have a weak economic framework. Labor, as expected, plays a significant role in boosting growth, its contribution is relatively low in fragile states. Conflict creates instability, which forces workers to commit maximum hours to productivity.

More so, human capital is not large enough to drive growth in fragile states compared to non-fragile states. However, debt is pro-growth in fragile states relative to non-fragile states. On poverty, our findings suggested that income is a good driver of poverty reduction in both fragile and non-fragile states. Hence, high income per person pushed the population above the poverty trap. More so, the finding indicated that poverty reduction is relatively high in fragile states. Further, the result revealed that high inequality is a major contributor to poverty levels in non-fragile states relative to fragile states. As the gap between the poor and the rich gets wider, the level of poverty continues to increase.

From the foregoing, both federal and state governments need to take proactive measures to address growing conflicts across the states. Conflict resolution may serve as a useful tool in this regard. Also, a national committee on conflict resolution can be initiated to consider the concerns of different groups across the states. Special attention should be given to conflict-affected areas in terms of strategic and reliable security infrastructure and poverty alleviation programs.

ENDNOTES

ⁱ We acknowledge support from the African Economic Research Consortium under grant no. RC17514.

ⁱⁱ For more discussion on these approaches see Alemayehu (2017).

ⁱⁱⁱ Number of fatalities in a conflict as reported in Armed Conflict Location and Event Data (ACLED) Project definition, armed conflict comprehensively measured to include death resulting from political violence on civil and communal conflicts, violence against civilians, terrorism rioting and protesting and militia interactions (see Raleigh and Dowd, 2016).

^{iv} Adamawa, Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Katsina, Kogi, Nassarawa, Niger, Plateau, Sokoto, Taraba, Yobe, Zamfara, FCT (Abuja).

^v Abia, Akwa Ibom, Anambra, Bayelsa, Benue, Cross River, Delta, Ebonyi, Edo, Ekiti, Enugu, Imo, Kebbi, Kwara, Lagos, Ogun, Ondo, Osun, Oyo, Rivers.

^{vi} See AERC Working paper for the computation at state level.

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