INVESTIGATING THE CAUSAL RELATIONSHIP BETWEEN POLITICAL STABILITY, FINANCIAL DEVELOPMENT, AND ECONOMIC DEVELOPMENT IN NIGERIA: EVIDENCE FROM COINTEGRATION AND TIME DOMAIN FREQUENCY TECHNIQUES

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Abstract

This study explores the causal effects of financial development and political stability on economic growth utilizing recent econometric techniques. The study utilizes yearly data spanning between 1996 and 2018. The study used Bayer and Hanck Cointegration, FMOLS, DOLS, and Breitung and Candelon frequency-domain causality techniques. The Breitung and Candelon technique's advantage is that it permits us to differentiate causality in the short term, medium-term, and long-term at different frequencies. The study's motive is to address the questions: What is the long-run and causal impact of political stability and financial development on economic growth? The findings from the FMOLS and DOLS long-run estimators revealed that political stability exerts a negative impact on economic growth while no evidence significant linkage between financial development and economic growth. Furthermore, the findings from the frequency-domain causality test revealed that in the short-run, medium-run, and long-run, political stability could predict economic growth in Nigeria, and there is no evidence of causality from economic growth to political stability in the short-run, medium-run, and long-run. Lastly, our findings reveal no causal interconnection from financial development to economic growth in the short-run, medium-run, and long-run, while there is no evidence of causality from economic growth.

Keywords: Political Stability, Financial Development, Economic Growth, FMOLS, DOLS, Time Domain Frequency.

JEL Classification: C01, O11, O23, O40

1. INTRODUCTION

In recent times, the investigation of political stability on economic development has been one of the prominent topics in the political economy that has received more significant attention from scholars. It is assumed in the literature that political stability plays an essential role in the economic development of a country (Dogan, 2018; Hassan, Sanches, & Yu, 2011; Katiricioglu, 2014; Odugbesan & Rjoub, 2019; Tang & Abosedra, 2014), and where there is instability, it has a detrimental impact on the sustainability of economic development (Odugbesan & Rjoub, 2019; Roe & Siegel, 2011) through several transmission channels such as uncertainty, risk, volatility, deterioration of the rule of law, and disruptive impact on productive activities and investments (Easterly, 2001). Political stability is described as a situation whereby a country can have a well conducive atmosphere political atmosphere that eventually may give room for promoting and attracting investments (Ramadhan et al. 2016). In addition, in a country where there is stability in their political system and good high governance, the donors and developing partners will be motivated to supply their funds to the country (Caliskan, 2018). Generally, it is believed that a country achieves a positive impact on its economy when there is political stability (Gurgul & Lach, 2013; Tabassam et al. 2016).

The Economic Community of West African States (ECOWAS), where Nigeria belongs to is generally agreed to be one of the least developed regions in the world (Nurudeen, Abd Karim, & Aziz, 2015). The region is characterized by increased corruption and political instability, affecting the region (Oto-Peralias, Romero-Avila, & Usabiaga, 2013). Though some studies have conducted an empirical investigation of political stability's influence on economic growth, these studies' results reveal a negative relationship between political instability and economic growth (Ramadhan et al. 2016). However, some studies demonstrated the positive effect of political stability on economic growth in their studies (Aisen, ve Veiga, 2012; Arslan, 2011; Gurgul & Lach, 2013; Kouba & Grochova, 2011). Some studies demonstrate a negative-oriented relationship, i.e., when there is an increase in political instability, growth will decrease (Ramadhan et al. 2016).

However, Nurudeen et al. (2015) noted that economic development plays a significant role in promoting or reducing political instability. This view corroborates Mauro (1995) position, who noted that less developed countries tend to be politically unstable. Hence higher-income countries with improved economic conditions do enjoy high political stability (Schumacher, 2013). Besides, the study of Roe & Siegel (2011) opined that political instability would slow down economic growth by mentioning the obstacles in front of financial development. Financial development is believed to be a significant way for countries to start and sustain a proper economic growth process, hence the need to avoid the political risks and uncertainties that will constitute an obstacle in the financial development. Moreover, the study of Compos et al. (2012) that investigate the effect of financial development on political instability as a dual dilemma on economic growth for Argentina economy found that the volatility in the growth of the country was increased by the financial development, while the study also discovered a significant relationship between political decisions and financial liberation and growth.

From the literature, it is observed that there are two contradictory answers to the relationship between political stability and economic growth. The first is the “good growth hypothesis," which posits that economic growth generates higher incomes, which would make it possible for people to approve the government; hence growth generates stability. The second is the "destabilizing growth hypothesis," which states that growth generates complex societal changes and instability. A part of the instability will be political so that where the political system is not well established; growth could lead to political instability (Paldam, 1998). About this, political stability introduces economic growth (vice versa) with the way of financial development. Several studies have attempted to defend both positions, but the problem is the scant evidence, and the available ones are anecdotal. To the best of our knowledge, no prior studies have investigated the causal relationship among these variables (political stability, financial development, and economic growth), especially within the context of Nigeria.

Nigeria has a strategically distinct geographical location in Africa and blessed with abundant resources, but facing economic, social, and political challenges. The situation in Nigeria has been further aggravated since the return to democratic government in 1999, with the waves of protests that culminated in civil unrest and terrorism. For instance, the World Governance Indicator (2020) reveals that Nigeria is ranked 15.96 percentile in the "political stability/absence of violence and terrorism" in 1996, while it dropped to 5.24 percentile in 2019. The rank is between 0 for the lowest and 100 to the highest rank. Similarly, in terms of "fragile state index (FSI)," as of 2020, Nigeria has a 97.3 score out of the maximum 120 scores for FSI, while the country is occupying 14th position out of 178 countries in the fragile states. Even though political instability poses a threat to economic development, the empirical studies investigating its implication in Nigeria are scant.

Therefore, this study will address the gaps by contributing to the political economics literature by providing answers to the following questions: i) is there a co-integration between political stability, financial development, and economic growth in Nigeria? ii) What is the direction of the causal relationship between political stability and economic growth? iii) What is the direction of the causal relationship between political stability and financial development?. The investigation of the causal relationship among the political stability, financial development, and economic growth in Nigeria, which will provide answers to the questions posed in this question, will be carried out using some new econometrics techniques like Bayer-Hanck co-integration test, Toda-Yamamato causality test, and Breitung-Candelon causality test. The advantage of the Breitung and Candelon (2006) technique permits us to differentiate causality in the short term, medium-term, and long-term at different frequencies. This study's findings will guide Nigeria's policymakers in the formulation of policies that will address political instability, dealing with the root causes to mitigate its effects on the quality and sustainability of economic policies that will engender economic growth. The rest of this paper's structure is as follows: Section 2 presents the relevant literature; the data and model are presented in Section 3; Section 4 consists of empirical findings. The discussion and conclusion are presented in Section 5.

2. THEORETICAL GRASP AND EMPIRICAL REVIEW

This segment is devoted to summarizing the studies conducted on the nexus between political instability, economic growth, and financial development.

2.1. THE RELATIONSHIP BETWEEN POLITICAL INSTABILITY AND ECONOMIC GROWTH

Political stability implies the presence of peace, political order, and sustained political change over time. Therefore, political instability refers to the occurrence of an unstable political environment marked by structural crises and volatility that threaten the political system's safe functioning (Okoli & Iortyer, 2014). The fundamental indexes reflect the prospect of a chaotic transition of governmental power, military intervention, mass protests, civil unrest, international tensions, insurgency, and racial, religious, or regional clash. According to Okoli (2009), the Nigerian state's defining characteristic encourages revitalizing politics in which the politician pursues to be elected by all means they can and entirely in charge of the state power. Nigeria politics has been the opposite of what it is in the developed nations (Ene et al. 2013). Politics thus attracts inestimable prices in this context; hence, in a bid to seize state power, the ruling elite tend to restrict or vitiate political competition rather than foster opportunities (Okoli, 2008). Thus, it becomes a matter of war by factions of the elite of influence and leads to high corruption. Corruption has a significant negative effect on Nigerians' social, political, and economic life, resulting in political instability, deterioration of respected cultural values, economic hardship, and lack of development (Ene et al. 2013). As political stability and economic sustainability mean real economic growth and enhance the average people's quality of life in a nation (Ojimba, 2013).

Political instability is a critical source of risk for a well-structured country, as it can deepen institutional differences and increase confusion about government policies (Witte, Burger, & Pennings, 2020). Aisen and Veiga (2010) empirically analyse the effects of political instability on economic growth using the system-GMM estimator for linear dynamic panel data models on a sample covering up to 169 countries, and 5-year periods from 1960 to 2004, and found that there is a higher degree of political instability associated with lower growth rates of GDP per capita. Another study by Nazeer & Masih (2017) employs an autoregressive distributed lag (ARDL) approach to co-integration on a time series data over 30 years ranging from 1984 to 2013, to investigate the impact of political instability on foreign direct investment (FDI) and economic growth. The empirical findings revealed the long and short-run relationship between political instability, FDI, and economic growth in Malaysia, with economic growth being the most vital driver for political instability and FDI. Tabassam, Hashmi, and Rehman (2016) also employ ARCH and GARCH models to examine the outcome of political uncertainty on economic growth, and the results of their revealed that political instability has a significant negative effect on economic growth. Similarly, Tang and Abosedra (2014) adopted the static panel data approach and the dynamic generalized method of moments (GMM) estimator to examine the impacts of tourism, energy consumption, and political instability on the economic growth of 24 countries in the Middle East and North African (MENA) region from 2001 to 2009, and it was revealed that political instability impedes the process of economic growth and development in the MENA region. Several other studies have also documented political instability adversely affects economic growth (Gurgul & Lach, 2013; Yu & Jong-A-Pin, 2020). Political stability is commonly believed to have instrumental economic importance. In a well-structured society, people simply assume it is a requisite condition for development and prosperity, but hardly ever feel a need to test this proposition. The study of Nomor and Iorember (2017) on political stability and economic growth in Nigeria revealed a constructive and significant relationship, both in the long and short term, between political stability and economic development. The study concludes that a stable political environment is an integral element of economic development.

2.2. THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

Financial development enables businesses' access to the funds needed to promote research & development activities that can contribute to economic growth. According to Abu-Bader and Abu-Qarn (2008), growing investment capital and improving output quality are conducive to financial development (Odugbesan et al. 2020). Furthermore, Hassan et al. (2011) suggested that financial development is essential, though not sufficient, for developing countries to achieve steady economic growth. Bittencourt (2012) argues that financial development allows entrepreneurs to invest in production practices that are more profitable and thus improve economic growth. Wu et al. (2020) adopted the bootstrap autoregressive-distributed lag (ARDL) test with structural breaks to test for co-integration and causality across major Asian economies, and they found that financial development is a mechanism to stimulate economic growth and that economic growth is regarded as a driving force for sustainability financial development in Japan and India. Contrarily, Cheng, Chien, and Lee's (2021) study on the relationship between financial development, information and communication technologies (ICT) diffusion, and economic growth revealed that financial development's impact on economic growth is consistently negative panel data covering 72 countries from 2000 to 2015. Song, Chang, and Gong (2020) also investigated the relationship between economic growth, corruption, and financial development in 142 countries from 2002 to 2016, and the panel FMOLS estimations indicate that economic growth has a positive effect on financial development. The authors further stressed that the policy implications of developed countries stimulate economic growth and can lead to financial development, but the elimination of corruption has adverse effects on financial development. Nevertheless, Wang et al. (2019) investigate the impact of regional financial development on economic growth in the Beijing–Tianjin–Hebei region, with panel data collected from 2007 to 2016, considering two indicators for financial development, namely, regional financial development depth (CREDIT) and regional financial intermediaries accessibility (BRANCH); found out that CREDIT has a positive effect on regional economic growth, while the BRANCH has no impact on regional economic growth. Boubaker, Nguyen, Piljak, and Savvides (2019) explore the effects of financial developments on government bond returns in developed and emerging markets under various market conditions. Their findings show that the financial development's impact on the return of government bonds (changes in bond prices), depending on the market conditions and between developed and emerging markets, differs through a quantile regression method for quarterly panel data from 28 countries for the period 1999–2015. Similarly, Roe & Siegel (2011) measure political instability's effects on financial markets across time and nations; four indices of instability were considered not only to see if the results persist over different steps, but also because the indices span different time ranges and to validate whether the results persist over time. Multiple metrics have also been used to assess financial development. The results of their study revealed that political instability hinders financial development.

2.3. THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND POLITICAL INSTABILITY

Political institutions are essential to economic growth in financial reform, which is because they provide a favourable environment for growth-enhancing financial development (Law, Azman-Saini, & Ibrahim, 2013). There is a more market-based financial system in countries with a more democratic system. The efficiency of political institutions when setting an optimum threshold has reduced political risk, and, as a result, economic growth can be achieved by financial development (Mercado, 2019). Thus, when the political system is above a threshold and relative stability; the economy benefits from financial development. However, if political turmoil happens, it affects international investors' inflow and survival, such as the shock of all their investment channels and the sudden change in the political arena. Economic stability that affects one country's welfare level has many determinants, such as macroeconomic indicators: aggregate rates, jobs rate, output level, pay balance, the consistency of the political system, military control, corruption, political accountability, political openness, and equal distribution of revenue. However, we discussed in this study how financial development affects political stability. Few studies have been conducted in regard to the linkage between political stability and financial development. For instance, Haseeb, Wattanapongphasuk & Jermsittiparsert (2019) researched the linkage between financial development and political stability in ASEAN countries. The investigators utilized the Johansen co-integration and OLS estimator. Their empirical findings revealed co-integration between the variables and positive interconnection. Using Turkey as a case study, Çalışkan (2018) explored the linkage between Political Stability and Financial Development using yearly data between 1970 and 2017. The author used the conventional Granger causality technique, and the empirical finding revealed a one-way causality running from financial development to political stability. Using panel data between 1970 and 2016, Yakubu et al. (2020) investigated the connection between financial development and political stability. The study used the quantile unit root test to examine the stationary properties of the time series. Furthermore, the study provides evidence of co-integration between the variables in the long run. Empirical literature review shows that the findings are not definitive, and various studies have applied various criteria to measure political stability or instability and financial development influence on economic growth. As an endogenous or exogenous variable, political stability has been viewed as both. Deeply intertwined are economic growth and political stability. Nevertheless, it can be argued that uncertainty linked to an unpredictable political situation may reduce investment and reduce economic growth speed. Poor economic performance, on the other hand, could result in government collapse and political unrest. While the theoretical basis has been reinforced, contradictory empirical results may have resulted from the lack of an acceptable variable to quantify political stability and political risk. Also, previous research included cross-country and single-country studies showing mixed outcomes. Therefore, this study focuses on analysing Nigeria's political stability, financial development, and economic growth connection using Bayer-Hanck Cointegration, FMOLS, DOLS, and Breitung and Candelon frequency-domain causality techniques.

3. DATA, METHODOLOGY SPECIFICATION, AND TECHNIQUES

3.1. DATA

The study focuses on political instability (PS) and financial development (FD) on economic growth (GDP) using yearly data between 1996 and 2018. The dependent variable is economic growth (GDP) is measured as GDP per capita constant US$ while the independent variables are political instability is measured as the level of stability in a country and financial development, which is measured as financial development index. Economic growth is gathered from the World Bank database, political stability is obtained from the Centre for Systemic Peace, and the financial development index is collected from the IMF database. Table 1 illustrates the utilized variables of descriptive statistics. The kurtosis reveals that FD and PS do not conform to normality, while GDP shows normality signs. The skewness illustrates that all the variables are normally distributed. Furthermore, the Jarque-Bera probability reveals that FD and GDP conform to normality with PS's exemption, which does not show normality signs. The correlation matrix reveals a negative correlation between GDP and PS In addition, there is evidence of a positive correlation between GDP and PS.

3.2. MODEL SPECIFICATION

The study focuses on the impact of political instability (PS) and financial development (FD) on economic growth using yearly data between 1996 and 2018 in Nigeria. In this study, the natural logarithm of economic growth is taken. This is carried out for time-series to comply with normality (Adebayo & Akinsola, 2021; Shahbaz, Tiwari, & Nasir, 2013). Based on the study purpose, the study formulates the economic function, economic model, and econometric model as follows in Equation 1, 2, and 3 respectively:

$$GDP = f(PS, FD) \quad (1)$$

$$GDP_t = \vartheta_0 + \vartheta_1 PS_t + \vartheta_2 FD_t \quad (2)$$

$$GDP_t = \vartheta_0 + \vartheta_1 PS_t + \vartheta_2 FD_t + \varepsilon_t \quad (3)$$

In Equations 1, 2, and 3, GDP represents economic growth, PS depicts the political instability index, and FD illustrates the financial development index. Furthermore, ϑ_0 depicts the constant term, ϑ_1 ......2 are the long-run elasticities of political instability and financial development, respectively. Besides, t and ε illustrate the time and error term, respectively.

3.3. TECHNIQUES EMPLOYED

3.3.1. UNIT ROOT TESTS

Although several traditional unit-root tests can implement the stationarity characteristics of the variables, they are not included in this research because Katircioglu (2014), Kalmaz & Kirikkaleli (2019), Eminer et al. (2020); and, Shahbaz et al. (2019) asserted that they yield ambiguity and erroneous outcomes due to the lack of structural break in the variables. Towards this purpose, the study utilized unit root tests that can identify structural break(s) in the series. In this regard, the study employed the Zivot-Andrew and Lee-Strazicich unit root tests to capture the series of stationary features in the presence of structural break(s).

Zivot-Andrew Unit-Root Test

There are three options when implementing the ZA unit root test. They are; at the intercept, trend, and both intercept and trend. The preceding model can be captured:

$$\Delta x_t = \varphi + \varphi x_{t-1} + \pi t + \delta DU_t + \sum_{j=1}^{k} d_j \Delta x_{t-j} + \mu_t \quad (4)$$

$$\Delta x_t = \varphi + \varphi x_{t-1} + \pi t + \gamma DT_t + \sum_{j=1}^{k} d_j \, \Delta x_{t-j} + \mu_t \qquad (5)$$

$$\Delta x_t = \beta + \beta x_{t-1} + \beta t + \theta DU_t + \theta DT_t + \sum_{j=1}^{k} d_j \, \Delta x_{t-j} + \mu_t \qquad (6)$$

Where the dummy variable is depicted by DU_t, which demonstrates the shift occurred at a breakpoint. The trend in shift is illustrated byDT_t. The empirical analysis utilizes model 7

Therefore:

$$DU_t = \begin{cases} 1 \ldots\ldots if \;\; t > TB \\ 0 \ldots\ldots if \;\; t < TB \end{cases} \text{ and } DU_t = \begin{cases} t - TB \ldots . if \;\; t > TB \\ \;\; 0 \ldots\ldots \quad\quad if \;\; t < \end{cases} TB \; (7)$$

The null hypothesis of the unit root break date is β = 0, which implies non-stationary with a drift that does not have structural breakpoint information, whereas the alternative hypothesis is β < 0, which demonstrates stationary with one unidentified time break.

Lee-Strazicich Unit-Root Test

Lee & Strazicich (2003) developed the Lagrange Multiplier (LM) based structural break test to Prevent the incorrect rejection issues connected with the Zivot & Andrews (2002) and endogenous break test of Perron (1989). Considering the data generation phase (DGP):

$$y_t = \delta^{\iota} Z_t + e_t, e_t = \beta e_{t-1} + e_t, \qquad (8)$$

Where a vector of exogenous variables is depicted by Z_t and $\varepsilon_t \backsim IID\ N(0, \sigma^2)$. Two structural breaks can be interpreted as follows: Model A enables two shifts in the level and is defined as $Z_t = [1, t, D_{1t}, D_{2t}]$. Where $D_{jt} = 1$ for $t \geq T_{Bj} + 1, j = 1, 2, and$ 0 otherwise represents the timeframe when a break happens. Model C $Z_t = [1, t, D_{1t}, DT_{2t}, DT_{2t},]^{\iota}$ describe two changes in level and trend and is described. Where $DT_{jt} = t - T_{Bj}$ for $t \geq T_{Bj} + 1,\ j = 1, 2, and$ 0 otherwise. Remember, DGP contains breaks underneath the null (β=1) and alternative (β<1) hypotheses in a clear way. For example, in Model A (the same claim may be extended to Model C), based on the meaning of β, we have the same claim in Equations 9 and 10 respectively as follows:

$$y_t = \mu_o + \delta_1 \beta_{1t} + \delta_2 \beta_{2t} + y_{t-1} + v_{it} \qquad (9)$$

$$y_t = \mu_o + \gamma_t + \delta_1 D_{1t} + \delta_2 D_{2t} + v_{2t} \qquad (10)$$

Where error terms are denoted by v_{it} and v_{2t}, respectively. β_{jt}=1 for $t = T_{Bj} + 1$, 2 and 0 otherwise; and $d = (\delta_1, \delta_1)$ and y is the trend parameter. The two-break Lee & Strazicich unit-root test is implemented utilizing the regression in Equation 11:

$$\Delta y_t = \delta^{\iota} \Delta Z_t + \emptyset \tilde{S}_{t-j} + \sum_{i-1}^{k} \lambda_i \, \Delta \tilde{S}_{t-j} + \varepsilon_t \qquad (11)$$

Similarly to the two break(s) counterpart of Perron (1989), Model C, Z_t is demarcated by $[1, t, D_{1t}, DT_{2t}, DT_{2t},]^{\iota}$, to permit for a constant term, linear time-trend, and two breaks in level and trend. The null hypothesis is illustrated as $\emptyset = 0$, and the LM T-statistics are portrayed by Equation 12:

$$\tilde{P} = T\widetilde{\emptyset} \qquad (12)$$

In order to determine the endogenous breakpoints T_{Bj}, the minimum LM unit root test utilizes a grid search described in Equations 13 and 14 as follows:

$$LM_p = inf \tilde{p}(\widetilde{\lambda}) \qquad (13)$$

$$LM_p = inf \tilde{\tau}(\widetilde{\lambda}) \qquad (14)$$

T_b/T and T are the sample size. In applying the LM test, the studentized version $\tilde{\tau}$ considers the capriciousness of the coefficients estimated is more potent than the coefficient test $\tilde{p}$ (Vougas, 2003). The breakpoints are observed to be where the T-statistic is minimized. As anticipated in the endogenous break test, a trimming region of (0.15T, 0.85T) is utilized to eradicate end-points.

3.3.2. ARDL BOUNDS TESTING

Pesaran et al. (2001) bounds tests to detect the long-term co-integration of variables due to three primary advantages than traditional co-integration frameworks. It can be used first when variables are integrated in mixed order; secondly, for small sample sizes, it is rather more robust (Narayan & Narayan, 2004; Odugbesan, 2019); and thirdly for long-term framework impartial evaluations (Harris & Sollis, 2003; Odugbesan & Rjoub, 2020). The bounds test adopts F distribution, with Pesaran and Timmermann (2005) developing the critical values. If the computed F-statistic is below the lower bond critical value, the null hypothesis is of no co-integration hypothesis is rejected. Furthermore, if the f-stat surpasses the lower and upper bound value, we fail to accept the null hypothesis and confirm a long-run interconnection among the variables. Pesaran and Shin (1995) and Pesaran et al. (2001) initiated the Bounds test. The ARDL bounds testing approach to co-integration has several advantages compared to other traditional co-integration techniques (Adebayo & Kalmaz, 2020; Balsalobre-Lorente et al. 2018; Odugbesan, 2019; Odugbesan & Rjoub, 2020; Shahbaz et al. 2016). Therefore, this study utilized the ARDL bounds test to ascertain the co-integration among the long-run variables. The ARDL bounds test approaches for this study is specified in Equation 14 as follows:

$$\Delta GDP_t = \vartheta_0 + \sum_{i=1}^{t} \vartheta_1 \, \Delta GDP_{t-i} + \sum_{i=1}^{t} \vartheta_2 \, \Delta \mathrm{PS} + \sum_{i=1}^{t} \vartheta_3 \, FD_{t-i} + \beta_1 GDP_{t-1} + \beta_2 PS_{t-1} + \beta_3 FD_{t-1} + \varepsilon_t \qquad (15)$$

The corresponding long-run multipliers are depicted by parameters ϑ (i = 1, 2, and 3), while the short-run dynamic coefficients are represented by parameters β_1 (i = 1, 2, and 3) of the basic ARDL model. Exploring the existence of a long-term interconnection amongst variables in Eq. (7) and (8) utilizing Fisher (F) or Wald (W) stat is the first phase in the ARDL-bounds testing method to co-integration. F-stat is compared to Narayan's upper and lower critical bounds because it is better suitable for small samples (Narayan & Narayan, 2004; Odugbesan, 2019). The null hypothesis will be rejected if the F-stat is greater than the lower and upper bounds critical value, which indicates the existence of long-run co-integration among the variables.

3.3.3. BAYER AND HANCK COINTEGRATION TEST

The study further utilizes the Bayer and Hanck (2013) as a robust co-integration test, which is a combination of Banerjee et al. (1998), Boswijk (1995), Johansen (1991), and Engle and Granger (1987) co-integration tests. According to Kirikkaleli & Kalmaz (2020), the Bayer and Hanck (2013) co-integration test focus on removing unnecessary multiple test techniques to give adequate estimations of the typical problem created by other co-integration tests. Bayer and Hanck (2013) utilize the Fisher's formula to construct the co-integration test to strengthen the test. The fisher's equation is illustrated by Bekun et al. (2019) as follows;

$$EG - JOH = -2[ln\,(PEG) + ln(PJOH)] \qquad (16)$$

$$\mathrm{EG - JOH - BO - BDM} = -2[\ln(\mathrm{PEG}) + \ln(\mathrm{PJOH}) + \ln(\mathrm{PBO}) + \ln(\mathrm{PBDM})] \qquad (17)$$

PEG indicates the level of significance for the Engle and Granger (1987), and PJOH represents the significance of Johansen (1991). The significance level for Boswijk (1995), and Banerjee et al. (1998) co-integration PBO and PBDM, respectively depict co-integration tests.

3.3.4. LONG-RUN ELASTICITIES (FMOLS AND DOLS)

To analyse the long-term interconnection, a single cointegrating vector will be estimated. In this respect, several econometric methods can explore the long-run interaction among the variables estimated. This analysis thus uses the Fully Modified OLS (FMOLS) initiated by Phillips and Hansen (1990) and Dynamic OLS methods initiated by Stock & Watson (1993), respectively. These techniques allow asymptotic coherence to be obtained by considering the impact of serial correlation, as well as the endogeneity test those results from the existence of a cointegrating interaction. FMOLS and DOLS can only be implemented if the criterion of co-integration amongst the variables is met. Thus, long-term elasticity is estimated in this analysis utilizing FMOLS and DOLS estimators.

3.3.5. FREQUENCY-DOMAIN CAUSALITY TEST

The current research also tends to catch the causal effects of political instability and financial development on economic growth at different frequencies in Nigeria. Thus, Breitung and Candelon (2006) frequency-domain causality test is utilized in this study. The key distinction between the time domain method and the frequency-domain method is; the 'time-domain' method informs us where a particular change arises inside a time series, while the 'frequency-domain' method evaluates the extent of a specific variation in time series (Gokmenoglu et al. 2019). The frequency-domain enables the removal of seasonal fluctuations in the small sample data (Breitung & Candelon, 2006). Additionally, the frequency domain test may identify non-linearity and causality phases, while the test often facilitates the detection of causality between variables at low, medium, and long frequencies (Breitung & Candelon, 2006). Furthermore, the Breitung & Candelon (2006) frequency-domain causality test enables us to differentiate long-term causality from short-term causality between time-series. The Breitung & Candelon (2006) frequency domain test is illustrated as follows;

Xt = [Ht, Ct, Dt], where Xt is the three-dimensional vector of the endogenous and stationary variables noticed at time t = 1, …, T. Xt is assumed to have a finite-order VAR illustration procedure as;

$$\Theta(L)X_t = \boldsymbol{\epsilon_t} \tag{18}$$

Where ΘL which denotes 3x3 polynomial lag order of p( ), is illustrated as $\Theta(L) = I - \Theta_1 L^1 \ldots - \Theta_p L^p$ with $L^K X_t = X_{t-k}$. ϵ_t illustrates the error term, which follows the process of white noise with zeros expectancy and $(\epsilon_t\ \epsilon_t^{\iota}) = \Sigma$. Σ denotes the positive and symmetric. For simplicity of analysis, in line with Breitung & Candelon's [18] analysis, no deterministic terms are applied to the Eq. (12). $G^{\iota}G = \Sigma^{-1}$ is Cholesky decomposition, while G stands for the lower triangle-matrix. Also, G^{ι} stands for the upper triangle-matrix. $E(n_t n_t^{\iota}) = I$ and $n_t = G\epsilon_t$. Utilizing the decomposition of Cholesky, the MA description of the framework is defined as:

$$X_t = \begin{bmatrix} H_t \\ C_t \\ D_t \end{bmatrix} = \Theta(L)\varepsilon_t = \begin{bmatrix} \Theta_{11}(L) & \Theta_{12}(L) \\ \Theta_{21}(L) & \Theta_{22}(L) \\ \Theta_{31}(L) & \Theta_{32}(L) \end{bmatrix} \begin{bmatrix} \varepsilon_t \\ \varepsilon_t \\ \varepsilon_t \end{bmatrix} \tag{19}$$

$$X_t = \begin{bmatrix} H_t \\ C_t \\ D_t \end{bmatrix} = \Phi(L)\Pi_t = \begin{bmatrix} \Phi_{11}(L) & \Phi_{12}(L) \\ \Phi_{21}(L) & \Phi_{22}(L) \\ \Phi_{31}(L) & \Phi_{32}(L) \end{bmatrix} \begin{bmatrix} \Pi_t \\ \Pi_t \\ \Pi_t \end{bmatrix} \tag{20}$$

Where $\Theta(L) = \Theta(L)^{-1}$ and $\Phi(L) = \Phi L)G^{-1}$. By utilizing this depiction, the spectral density of H_t can be illustrated as follows:

$$f_H(\psi) = \frac{1}{2\pi}\left\{|\Phi_{11}(e^{-i\varphi})\,|^2 + |\Phi_{12}(e^{-i\varphi})|^2\right\} \tag{21}$$

In Eq. 14 and 15, H_t can be defined as the sum of two uncorrelated MA procedures: an integral part guided by previous Ht implementation and an element containing the predictive ability of the C_t D_t variables. The C_t and D_t variables predictive power can be calculated regarding the spectrum's predictive portion at each frequency of the Ct and Dt variables. The Granger causality null hypothesis is checked in the series. For example, Ct does not Granger because H_t at the frequency ψ if the Ht spectrums predictive factor at the frequency ψ is 0. This is the explanation for the estimate of causality proposed by Hosoya [71] and Geweke [72] and described as

$$M_{x\to y}(\psi) = In\left[\frac{2\pi f_y(\psi)}{|\Phi_{11}(e^{-i\varphi})|^2}\right] \quad (22)$$

$$= In\left[+\frac{|\Phi_{12}(e^{-i\varphi})|^2}{|\Phi_{11}(e^{-i\varphi})|^2}\right] \quad (23)$$

The above equations linked to Geweke's estimation would be zero (0) when$|\Phi_{11}(e^{-i\varphi})|^2 = 0$. A simple linear constraint is extended to the VAR equation (1), as described as follows;

$$GDP_t = \theta_1 PS_{t-1} + \theta_\delta PS_{t-\delta} + \gamma_1 FD_{t-1} + \gamma_\delta FD_{t-\delta} + \varepsilon_t \quad (24)$$

Where the coefficients of the lag polynomials are illustrated by $\theta's \ and \ \gamma's$. The null hypothesis $M_{x\to y}(\psi) = 0$ equal to the linear constraint,

$$H \quad O: R(\psi)\gamma = O \quad (25)$$

Where $\gamma = [\gamma_1, \ldots\ldots \gamma_\delta]^\iota$ is the vector coefficient, whereas R(ψ) is explained below:

$$R(\psi) = \left[\frac{\cos(\psi)\cos(2\psi)\ldots\cos(\delta\psi)}{\sin(\psi)\sin(2\psi)\ldots\sin(\delta\psi)}\right] \quad (26)$$

The standard F-stat is estimated as F (2, T− 2p) for $\psi\ \varepsilon(0, \pi)$, where 2 is the number of limitations, and T is the number of the observations utilizes to calculate the VAR framework of order p.

4. EMPIRICAL RESULTS AND DISCUSSIONS

The time-series integration order is reported in the current analysis as an initial assessment. As is well-established, traditional unit-root tests often reject the null hypothesis of unit root disproportionately. Although several traditional unit-root tests are utilized to ascertain the stationarity characteristics of variables, however, they are not included in this research because Shahbaz et al. (2013), Katircioglu (2014), Kalmaz & Kirikkaleli (2019), and Adebayo & Beton (2020) asserted that they yield ambiguity and erroneous outcomes due to structural break(s) in the variables. Towards this purpose, the study utilized unit root to identify a single structural break in the series. In this regard, the study employed the Zivot-Andrew and Lee & Stracwich unit root tests to capture the series stationary features in the presence of a structural break. Tables 2 and 3 demonstrate the result of the unit root tests. The empirical findings reveal that the variables are stationary at a mixed level, i.e., I(1) and I(0).

We utilized the ARDL bounds testing technique to explore the long-run co-integration between economic growth, political instability, and Nigeria's financial development. The ARDL bound test is advantageous because it is appropriate regardless of the order of integration of the series. This removes prejudice based on a pre-testing of the variable's integration order. The table's findings demonstrate that none of the indicators is stationary at I (2) when estimating the ARDL F-statistic to be valid. In doing so, we adapted Zivot & Andrews (2002) and Lee & Strazicich (2003) that can detect one and two break(s), respectively. The outcome of the Zivot-Andrew and Lee & Strazicich are depicted in Table 3 and 4 correspondingly. Our empirical findings demonstrate that all variables are stationary at a mixed level I(0) and I(1). Hence, it is conceivable to test the presence of a long-run co-integration between economic growth, political instability, and financial development. Table 4 illustrates the co-integration outcome of the co-integration test. The empirical result revealed co-integration evidence since the F-statistics (6.518) is higher than the lower bound and upper bound critical value.

To verify the ARDL bounds test findings, the investigators employed the Bayer-Hanch combined co-integration test as a robustness check. Table 5 illustrates the result of the Bayer-Hanch (2013) combined with the co-integration test. The findings reveal that at a 1% level of significance, the tests reveal that there is evidence of long-run co-integration amongst the variables used in this study.

The study also employs the fully modified OLS (FMOLS) and dynamic OLS (DOLS) to impact financial development and political instability on economic growth in Nigeria. The empirical findings of the FMOLS and DOLS are depicted in Table 6. The findings from the two long-run estimators revealed a negative connection between economic growth and political instability. This implies that political instability in Nigeria is causing a detrimental effect on economic growth. This effect can be felt in Nigeria, most especially in the Northern part of Nigeria, where there is a high political instability rate, hence, no evidence of significant interconnection between financial development and economic growth. Furthermore, the R^2 for FMOL and DOLS are 0.99 and 0.99, which indicates that 99% of the variation in the dependent variable can be explained by the regressors, while the remaining 1% is attributed to the error term. This study's findings confirm the significance of all the variables employed as determinants of Nigeria's economic growth between 1996Q1-2018Q4. This indicates the vulnerability of political instability and financial development is significant for predicting Nigeria's economic growth.

After exploring the interconnections between economic growths, political instability, and financial development by utilizing the FMOLS and DOLS tests, the study further employs the Breitung-Candelon frequency-domain spectral causality test to explore the causal impact of political instability and financial development on economic growth. Table 7 represents the causal interconnection between economic growth (GDP), political instability (PS), and financial development (FD) in Nigeria. The finding reveals causal interconnection from political instability to economic growth in the short-run, medium-run, and long-run. This illustrates that the null hypothesis is rejected at a significance level of 5% and 10%. As anticipated, this outcome shows that political instability can predict economic growth in Nigeria. This finding corresponds to prior studies (Cox & Weingast, 2018; Nomor & Iorember, 2017; Tabassam et al. 2016) who found unidirectional *causality* running from political instability to economic growth. In addition, there is no evidence of causality from economic growth to political instability in the short-run, medium-run, and long-run. This outcome corresponds to Witte, Burger, and Pennings (2020) who found no causality from economic growth to political instability. Table 7 also reveals no causal interconnection from financial development to economic growth in the short-run, medium-run, and long-run. This illustrates that we fail to reject the null hypothesis. This result is similar to Abu-Bader and Abu-Qarn (2008); and, Prochniak, and Wasiak (2017). Furthermore, there is no evidence of causality from economic growth. This outcome corresponds with other past studies (Abu-Bader & Abu-Qarn, 2008; Opoku et al. 2019; Shan & Morris, 2002) who found no evidence of causality from economic growth to financial development. In addition, no evidence of causality surfaced between financial development and political instability in the short-run, medium-run, and long-run. This illustrates that we fail to reject the null hypothesis at a significance level of 5% and 10%.

5. CONCLUSION

The significance of political instability and financial development effects on economic growth cannot be over-emphasized, as the literature suggests a direct and indirect causal relationship among them. Most countries had stable economic growth has been attributed to their political instability, but the reverse is the case for Nigeria, which is facing challenges of political instability. Given this, our study investigates the causal relationship among political instability, financial development, and economic growth using Bayer-Hanck co-integration test and demonstrates a significant co-integration among the variables. The long-run relationship was examined using FMOL and DOLS, which found a significant long-run political instability influence on economic growth. As expected, the financial development effect on economic growth was found to be positive but insignificant. In addition, the frequency-domain causality test result shows that political instability significantly causes economic growth in the short, medium, and long-term.

In respect of the causal relationship between political instability and financial instability, that shows no significance, and it is an indication that the policymakers in Nigeria should re-strategize on how to achieve political instability in the country because the instability of the political system in the country can outweigh the influence of financial development on the economic growth. Thus, this study suggests that Nigeria policymakers should consider the need for the economic policy that will be designed to explicitly rest on the need to strengthen the state institutions.

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Annex

Table1: *Descriptive statistics*

Variable	Political Stability Index	Financial Development Index	Economic growth
Sign	PS.	FD	GDP
Mean	-1.651304	0.214981	1969.038
Median	-1.880000	0.210000	1993.097
Maximum	0.870000	0.290754	2563.900
Minimum	-2.210000	0.177779	1350.984
Std. Dev.	0.681844	0.030033	446.9631
Skewness	2.468219	0.779596	-0.155329
Kurtosis	9.307225	3.046882	1.495890
Jarque-Bera	61.47662	2.331891	2.260570
Probability	0.000000	0.311628	0.322941
Sum	-37.98000	4.944569	45287.87
Sum Sq. Dev.	10.22806	0.019844	4395072.
Correlation Matrix			
PS.	1	-0.4456	-0.7014
FD	-0.44565	1	0.6497
GDP	-0.7014	0.6497	1

Source: The investigator's Compilation.

Table 2. *Zivot–Andrews unit-root test*

Variables		Level		First Difference		Decision
		T-statistic	Break-Year	T-statistic	Break-Date	
GDP	K &T	-3.776	2014	-6.591*	2014	I(1)
PS.		-5.428*	2001	-7.277*	1995	I(1)
FD.		-6.622*	2007	-5.739*	2009	I(1)

Note: [B & C] stands for 1%, 5% significance level respectively

Source: Authors Compilation with EVIEWS 11

Table 3. *Lee & Strazicich unit-root test*

Variables		Level		First Difference		Decision
		T-statistic	Break-Years	T-statistic	Break-Date	
GDP	K &T	-7.764*	2003 & 2011	-6.975*	2003 & 2012	I(0)I(1)
PS		-13.75*	2002 & 2009	-16.691**	2002 & 2013	I(0)I(1)
FD		-9.365*	2005 & 2011	-7.277*	2002 & 2010	I(1)

Note: [B, C & D] stands for 1%, 5% and 10% significance level respectively

Source: Authors Compilation with EVIEWS 11

Table 4. *Bounds Test*

Model specification	GDP=f(PS,FD)	
F-statistic	6.518*	
Co-integration	Yes	
	Lower-Bound	Upper-Bound
Significance Level	1%	4.68
	5%	3.79
	10%	3.35

Note: [B] stands for 1%, significance level

Source: The investigator's Compilation.

Table 5. *Bayer-Hanck co-integration test*

Models	Fisher Statistics	Fisher Statistics	Co-integration Decision
	EG-JOH	EG-JOH-BAN-BOS	
GDP=f(PS, FD)	105.64*	211.062*	Yes
	CV	CV	
Significance level at 5%	10.576	20.143	

Note:* *illustrates 1% significance level.* CV stands for the critical value.

Table 6. *Long-run estimators*

Variables	FMOLS	DOLS
PS	-0.0149	-0.0151
	(-4.1085)	(-3.133)
	[0.000]*	[0.0061]*
FD	0.0302	0.0327
	(0.3726)	(0.3036)
	[0.7143]	[0.7652]
R-squared	0.99	0.996
S.E. of Regression	0.010	0.009

Note: *, indicate significance level at 1%. [] includes p-values. () includes t-statistics

Table 7: *Frequency Domain Causality Test*

	Long-term		Medium-term		Short-term	
Path of causality	$\omega_i = 0.01$	$\omega_i = 0.05$	$\omega_i = 1.00$	$\omega_i = 1.50$	$\omega_i = 2.00$	$\omega_i = 2.50$
PS→GDP	6.0650**	6.0645**	5.7958**	5.5895**	6.6105**	7.0297**
GDP →PS	4.4165	4.4192	3.0501	3.0264	3.0312	3.0350
FD →GDP	0.2713	0.2718	0.3412	0.0937	0.0565	0.0535
GDP→FD	2.2210	2.2365	2.4470	2.2268	2.1563	2.1283
FD→PS	0.3062	0.3072	0.5779	0.2091	0.1077	0.0812
PS→FD	2.8339	2.8331	1.8661	0.2134	0.1411	0.4508

Note: The path of causality is represented by →. %5 levels of significance is illustrated by **. SIC is used to verify the VAR models lag lengths.