



THE IMPACT OF ECONOMIC GROWTH, OIL PRICE, AND FINANCIAL GLOBALIZATION UNCERTAINTY ON FINANCIAL DEVELOPMENT: EVIDENCE FROM SELECTED LEADING AFRICAN COUNTRIES

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ABSTRACT

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A lack of financial scope has for long hinders the efficiency of the financial system in the African continent. In this paper, we investigate the effects of economic growth, oil price, and financial globalization uncertainty on financial development in six selected leading African countries, covering the period between 1976–2018. After the preliminary tests that confirmed the application of heterogeneous panel techniques, the paper was able used Larsson co-integration to establish the presence of long-run relationship among the variables, which the co-integration result confirms that. We further deployed Dynamic Common Correlated Effect (DCCE) for the elasticity estimation. The findings of the study based on the empirical analysis observed that both economic growth, financial globalization uncertainty and oil price affects the financial system of the sampled countries positively and statistically significant. We therefore, recommends that the sampled economies' policymakers should strategize and come up with suitable policies that will promote substantial economic growth, attracts more foreign investors and continue to be resilient in times of financial shocks.

Contribution/Originality: This study contributes to the literature by analyzing the impact of economic growth, oil price, and financial globalization uncertainty on financial development in six selected leading African countries.

1. INTRODUCTION

Africa is a vast continent with a wide variety of experiences. A lack of financial scope has long limited the efficiency of the financial system in this continent. These vary from emerging market economies such as Nigeria, Egypt, and South Africa, to industrialized countries such as Ghana, Kenya, and Uganda, and financially growing markets such as Chad or Congo, on the other side of the continuum. Financial depth indices – credit to the private sector concerning Growth and lending deposit intermediation indicate weak financial depth compared to other parts of the globe (World Bank, 2019).

In particular, Africa's banking systems are distinguished by a comparatively large margin of interest reflecting the lack of financial resources (such as credit rating agencies), inadequate investment in domestic banking, and risky lending coupled with weak property rights (Davoodi, Dixit, & Pinter, 2013). The average financial depth of Africa, when evaluated using credit by banks to the private sector, was 20.56 percent; meanwhile, only South Africa was somewhat doing well, while South Asia was above 46.8 percent on average. Were; Egypt had 25.5%, Nigeria paired with 10.9%, South Africa recorded 147.5%, Algeria got 24.1%, Morocco had 84.9%, Ethiopia with 17.7%, Ghana

11.7%, and Kenya 28% (International Monetary Fund, 2018). Such figures are what kept these countries behind other developing world.

Cross-country inflows of capital to Africa have exhibited several factors in recent years. Firstly, it has improved the macroeconomic output of the continent and its markets have become more resilient than in the past throughout the recent world financial downturn. Foreign investors have higher expectations about private-sector investment and Africa's economic potential. Second, Africa's capital markets have become rapidly integrated. This was supported by regional initiatives such as the Treaty on the East African Community signed in the year 2000 and the expansion of Pan-African banking groups.

These groups were driven by opportunities to broaden their businesses across borders, the potential for the dissemination of financial services and knowledge, the desire to serve their home customers on international markets, substantial improvements in capital requirements in the countries of origin and the liberalization of entry policies in the host nations. Although most of the credit provided by BIS reporting banks come from European banks (about 85 percent), cross-country credit from European banks contributes less than 25 percent of the overall lending to the African private sector, because financial depth has limited the reliance on foreign funding.

Extended work indicates that macroeconomic variables such as economic growth, oil prices, and financial globalization uncertainty are viable vehicles for financial development (Asongu, Koomson, & Tchamyou, 2017; Bongini, Iwanicz-Drozowska, Smaga, & Witkowski, 2017; Jamel & Maktouf, 2017; Lawal, Nwanji, Asaleye, & Ahmed, 2016; Ono, 2017; Shahbaz, Mallick, Mahalik, & Hammoudeh, 2018). However, given that financial development is poverty inhibiting (Efobi, George, Okoye, & Modebe, 2017) and the fact that between 2000 until 2015, African economies grew at an average rate of 5% (World Bank, 2019), poverty rates have not decreased in most of the African countries.

Approximately one billion people were rescued from poverty from 1990 to 2015 (Asadullah & Savoia, 2018). While African countries' average growth rate between 2000 and 2015 surpassed that of many other advanced nations in the West and certain parts of Asia, living standards and welfare in many African states remain low, even with the excess level of oil at their disposal, especially for the six selected leading African countries in the current study.

In this paper, we investigate the impact of economic growth, oil price, and financial globalization uncertainty on financial development in six selected leading African countries. Extant studies on the effects of economic growth, oil price, and financial globalization uncertainty, on financial development, presents mixed results (Assefa & Mollick, 2017; Bongini et al., 2017; Masten, Coricelli, & Masten, 2008; Musta, 2016; Ogwumike & Ofoegbu, 2012; Shahbaz et al., 2018).

The impact of economic growth, oil price, and financial globalization uncertainty has also been modeled and studied separately in most studies. Iheanacho (2016); Ncanywa and Mabusela (2019) and Kazar and Kazar (2016) for example, modeled the effects of economic growth on financial development without including oil price or financial globalization uncertainty in their models. Similarly, Asongu et al. (2017) and Farouq, Sulong, and Sambo (2020a) also model financial globalization uncertainty and financial development without including oil prices in their models. Also, most studies have been conducted using data from a single country or one African region (e.g., (Farouq, Sulong, Ahmad, Jakada, & Sambo, 2020b; Ncanywa & Mabusela, 2019)).

The motive for this work and its contribution to the ongoing research is therefore threefold. Firstly, this study contributes to the literature by analyzing the impact of economic growth, oil price, and financial globalization uncertainty on financial development in six selected leading African countries. This makes this study one of its kind, as existing findings determine the subject at hand in either single or regional African countries without taking the distinct characteristics of these leading African economies into cognizance. Secondly, the innovation of this study lies also in the way the subject is modeled.

For instance, existing studies mostly measure financial development using either broad money or credit to the private sector. These indices, however, do not take into account the overall picture of financial development. As a result, this study used five components of financial sector development using Principal Component Analysis as used by Farouq et al. (2020a) and Ahmad, Loganathan, Streimikine, and Hassan (2018). Finally, most existing studies favor the use of the Ordinary Least Square (OLS), Autoregressive Distributive Lags (ARDL) and Generalized Method of Moment (GMM) coefficient estimates.

Ordinary Least Squares technique, however, faces the issue of heteroscedasticity and serial correlation errors, which makes the OLS estimator ineffective and incite bias in the matching standard errors while GMM been the first-generation estimate, assumes cross-sectional independence and homogeneity which is not always obtainable. As a result, this study applied the Dynamic common correlated estimate (DCCE) technique because it is considered as a viable method, which helps to overcome the problems of serial correlation, heteroscedasticity, cross-sectional dependency and heterogeneity.

The theoretical context and literature review of this study are first discussed in the remainder of the paper. A summary of the specification of the model, data, and methodology used for the analysis follows this. We then show the findings of the statistical analysis. The paper ends with a review of the findings and detailed policy suggestions.

2. THEORETICAL BACKGROUND AND LITERATURE REVIEW

The dynamics between economic growth, oil prices, financial globalization instability, and financial development tend to be the focus of the broad investigation. Besides, the results show a challenging degree of long-term causality relationship moving. Also, the difference in results may be due to heterogeneity in parameters across economies. Most of the earlier work on the impact of macroeconomic factors on national economies was geared towards growth.

However, the results of the economic growth, oil price, and financial globalization uncertainty on financial development remain mixed. While some studies found positive effects (e.g., (Achamoh & Baye, 2016; Costigan, 2016; Jamel & Maktouf, 2017; Karikari, 2010; Kassi, Sun, Gnangoin, Edjoukou, & Assamoi, 2019; Ohlan, 2017) others indeed found adverse effects (e.g., (Karikari, 2010; Musta, 2016; Ogwumike & Ofoegbu, 2012)).

2.1. Economic Growth

There are several longitudinal studies on the relationship between economic growth and the advancement of finance. Schumpeter's ground-breaking research found that efficient capital allocation to successful investors to invest in other successful sectors improves economic growth. The theory was later proven by Goldsmith (1969). Also, among the scholars who took part in this same definition were Greenwood and Jovanovic (1990); Ghirmay (2004); Agbetsiafa (2004); Abu-Bader and Abu-Qarn (2008); Levine and Zervos (1993).

Among others, Robinson (1952) and Odhiambo (2008) were the early contributors to demand following, whose point was economic growth triggers financial development as a due to increased demand for financial services. Furthermore, the likes of Demetriades and Hussein (1996); Akinboade (1998); Greenwood and Smith (1997) claim that economic growth and financial development has a bidirectional relationship. Some, however, also assumed that there might not be a relationship between the variables, like Atindéhou, Gueyie, and Amenounve (2005).

Taking into account the persistent inconsistencies in the broad conclusions of earlier studies as such, the present study reviews some of the recent past studies related to the relationship between finance and growth.

Iheanacho (2016) explored how financial depth has influenced Nigerian economic growth. The article focuses on the correlation between the creation of the financial intermediary and economic growth covering the years 1981-2011. The paper applied the distributed lag (ARDL) approach to the autoregressive distributive lag technique. The results reveal that the correlation between intermediary financial development and economic growth in Nigeria did not differ from the overall results in oil-rich nations. The paper considered the relationship to be negative and

insignificant in the long run and also negative and significant in the short run. That implied the Nigerian oil sector's dominant position in the real-sector activities.

A related study examined the impact of financial depth and trade openness on Nigerian economic growth by Lawal et al. (2016). For the data analysis between 1981 and 2013, they used the ARDL bound estimation method. Their findings showcase the two-way linkages between economic growth and financial advancement and between economic growth and openness to trade. This means there are short and long-term relationships among domestic credit and real GDP; market capitalization was also reported as having a substantial positive relationship with real GDP, whereas there is an insignificant association between money supply and real growth both in short and the long run.

Ncanywa and Mabusela (2019) analyzed the impact of financial development in selected Sub-Saharan African markets on economic growth. The article spans the year 1980 to 2014. They further applied the approach of the pooled mean group for the data analysis. The long-term result suggests that credit to the private sector by banks and liquid liabilities positively affect the sampled countries' economic growth. This means that domestic credit to the private sector by banks and liquid liabilities contributes positively to the economic growth of the sampled countries, whereas domestic savings have a negative impact on economic growth.

Kazar and Kazar (2016) analyzed the association for high-income OECD countries between globalization, financial progress, and economic growth from 1980 to 2010. It employed the co-integration of Pedroni, and a Dynamic ordinary least squares estimate for the data set analysis. The findings indicate a positive relationship between financial development and economic growth across the entire economic system communities, except for low-income countries. Since the financial sector is relatively small and undiversified, financial development is gaining ground at the cost of lower economic growth yields.

Likewise, Ohlan (2017) deployed the data set from the year 1960 to 2014 in an attempt to examine the associations between financial development, tourism, and economic growth in India. The Co-integration of Bayer and Hank, auto-regressive distributed lag, and the vector error correction model were applied for analysis in the article. The co-integration check demonstrated the long-run existence among the variables. Moreover, the ARDL estimate indicates that there was a positive and significant relationship between financial development, tourism, and economic growth in India. Also, the VECM causality indicates the existence of one-way causality from financial development to productivity growth and a one-way causality from tourism to growth.

Shahbaz et al. (2018) studied the asymmetric relationship between energy consumption and economic growth, using the quarterly data set from 1960Q1–2015Q4 to integrate financial development in India. The research applied nonlinear autoregressive distributed lag, bound test co-integration, and Hatemi-J and Uddin (2012) for the causal relationship. The symmetrical findings show that only negative energy consumption uncertainty has had a negative effect on economic growth, while the related positive shocks in energy consumption reported no impact on economic development. Whereas, given the asymmetrical shocks in financial development, a positive shock has no impact on growth, whereas the negative shock adversely affects the economic growth. Furthermore, financial depth and economic growth have a bidirectional relationship.

Hypothesis 1: economic growth has a significant positive impact on financial development in the sampled economies.

2.2. Financial Globalization Uncertainty

Throughout this review part, the author will review previous research on financial globalization/liberalization and a few current types of literature on financial globalization uncertainty that have been published. This is because, given financial development, only a few earlier studies recognized foreign direct investment uncertainty.

Elkhuizen, Hermes, Jacobs, and Meesters (2018) analyzes financial development, liberalization, and social capital in 82 countries using a random and fixed impact model, showing that liberalizing finance and social capital influence financial depth in advanced, emerging, and developing countries.

In an attempt to explore the effect of financial globalization uncertainty on financial depth using data collection from 53 African economies between 2000 and 2011, [Asongu et al. \(2017\)](#) based their empirical research on the generalized Method of Moments. Instead, the paper examined the effects of this uncertainty based on each aspect of the development in the financial sector. The results reveal that there exists an insignificance in the relationship between financial globalization uncertainty and money supply, financial size and financial deposit. Whereas a positive and significant relationship between the uncertainty and the banking sector activities, the efficiency of the banking sector and the financial system activities also exist.

[Shahbaz, Van Hoang, Mahalik, and Roubaud \(2017\)](#) have studied the connections between globalization and the development of the financial sector, thus incorporating economic growth, population density, institutional quality and inflation. The research covered the data collected for India through the year 1971 to 2013. [Bayer and Hanck \(2013\)](#) co-integration test, autoregressive distributed lag bound co-integration test and causality test through the vector error correction model. The co-integration result indicates the existence of a long-run association. The long and short estimates respectively suggest a negative relationship between globalization and financial development, although the product of causality shows a one-way causal relationship that runs from globalization to financial development.

[Asongu and De Moor \(2015\)](#) analyze whether the impact of financial globalization on the development of the financial system become beneficial after the financial globalization crosses some amount of a threshold stage. The authors had implemented the Generalized Method of Moments for the analysis. Moreover, it used the data collection of 53 African economies between 2000 to 2011. The results indicate that financial globalization would increase the supply of capital if it exceeds 16.00, above which it has called median rates of 20.50. The levels of financial globalization for the sampled nations were 13.29 and 13.81, respectively, to increase the banking activities and financial activities. While the financial size has a positive proof level of 21.30, it means that the threshold of financial globalization corresponds to a level at which it affects the financial development negatively.

[Bhetuwal \(2007\)](#) examined the data set from 1975 to 2006 in an attempt to examine the causality linkages between financial liberalization and the growth of the financial sector in Nepal. The research used the Granger causality test for the interpretation of the relationships. The paper's findings indicate a bidirectional causality relation between financial liberalization and the growth of the financial sector in Nepal.

[Karikari \(2010\)](#) analyzed the impact of financial liberalization and governance on the growth of the financial sector in 37 selected sub-Saharan African countries, using data from 1996 through 2008. The methodology of fixed-effect regression was employed in the study. The article's results indicate that financial liberalization favors financial growth not independently. This means financial liberalization, in general, has a negative impact on financial development, but enhanced growth of the financial sector could be achieved with the involvement of effective governance.

[Naghavi and Lau \(2016\)](#) in an attempt to explore the short and long- linkages between financial liberalization regarding the performance of the capital markets of the 27 emerging economies. The research covered the period from 1996 to 2011. Evidence analysis includes the Granger causality test; common correlated effect mean group, mean group and common correlated effect pooled estimator throughout the analysis. The findings established both the existence of a long-run relationship and cross-sectional data dependency across the region. This also reveals a negative long-run correlation between financial liberalization and return on the stock market, whereas a positive relationship exists between the short-run parameters.

Hypothesis 2: financial globalization uncertainty has a significant negative impact on financial development in the sampled economies.

2.3. Oil Price

Nwani, Iheanacho, and Okogbue (2016) studied the linkages between oil price and financial system intermediary development using the data set of Nigeria for the year 1975 until 2011. They used the autoregressive distributed lag (ARDL) technique for the analysis. The findings suggest that oil price is a primary engine of the Nigerian financial sector intermediary development. This implies that there exists a significant and positive long-term association between financial sector intermediary development and oil price; meanwhile, a negative relationship was also found in the short run.

Creti, Ftiti, and Guesmi (2014) analyze the effect of oil prices with regards to stock markets for basically four leading OPEC member economies, namely, throughout the year covering from 2000 to 2010. The paper employed a novel approach, such as the evolutionary co-spectral technique as proposed by Priestley and Tong (1973). It was found that relationships between oil and stock markets might be either negative or positive. This interrelationship is a half-lived issue, showed in 3 years and a 1 quarter, which is weak in the short-term. Shocks in oil prices during global turmoil cycles or international business cycle fluctuations (decline or growth, such as the financial crisis of 2007) have a direct effect on the linkages between oil price and stock markets in oil-exporting economies.

Evidence suggests that fluctuations in the price of crude oil deteriorate economic conditions that could adversely affect financial intermediaries' ability to increase their resources and make funds available to the private sector. In particular, oil price fluctuations on the global oil market impose macroeconomic instability in these countries (Mehrara & Oskoui, 2007) and windfall profits from rising oil prices promote rent-seeking worthy of shifting output factors away from organizations that promote private-sector economic activities (Beck, 2011).

Hou, Keane, Kennan, and Te Velde (2015) clarify that fluctuations in the price of crude oil on the global oil market would generate and raise the level of volatility in developing oil-exporting markets, leading to macroeconomic disruptions that could lead firms to lower their investment. Macroeconomic ambiguities resulting from changes in the price of crude oil on the global oil market may affect the extent to which economic activities stimulate opportunities in the private industry and demand for credit in the country.

This may lead to different economic classes in the economy to place their savings outside of the banking sector in other optional investment channels to mitigate macroeconomic shocks. These decisions by households, companies and other economic institutions in the economy will adversely affect the output of financial intermediaries which are heavily dependent on the deposits of the numerous economic divisions in order to be able to provide credit to private sectors in need of investments capital in the country.

Macroeconomic instabilities created by fluctuations in oil prices on the global oil market might also affect both the financing decisions and the systemic risk management of financial intermediaries in crude-exporting economies, which could hinder their ability to render loans to the private market in the country. Naceur, Cherif, and Kandil (2014) argue that financial institutions' decisions on controlling cash flow and matching risk and return may have a negative effect on their ability to make loans available to the private market.

Hypothesis 3: oil price has a significant positive impact on financial development in the sampled economies.

2.4. Empirical Model

The study analyses the association between economic growth, oil prices, uncertainty over financial globalization, and financial development. It should be noted that different metrics were used to calculate financial development, including banks' domestic credit to the private sector and significant capital. However, these indices do not take into account other financial sector components. As a result, the present study just like the work of Ahmad et al. (2018); Farouq et al. (2020a); Jakada, Mahmood, Ahmad, Farouq, and Mustapha (2020a) will compose the financial development index using domestic credit to the private sector by banks, domestic credit to the private sector by other financial institutions, broad money, market capitalization, and lending rate. Hence, this study employed the composed index using PCA as a proxy for financial development.

This study adopts the endogenous growth model used among others: Arif and Rawat (2019) and Lawal et al. (2016) Due to the lack of finance model. The overall output in the Pagano (1993) AK model is a linear function:

$$Y = AK \tag{1}$$

The empirical functional model of this study is thus specified as:

$$FD_{it} = f(GDP_{it}, OP_{it}, FGU_{it}) \tag{2}$$

Where

FD_{it} denotes financial development.

GDP_{it} represents the gross domestic product and its proxy economic growth.

OP_{it} stands for oil price.

FGU_{it} represents financial globalization uncertainty.

i denotes country.

t denotes time.

The functional model of Equation 1 is transformed into an econometric model in Equation 2

$$FD_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 OP_{it} + \beta_3 FGU_{it} + \epsilon_{it}$$

The a priori expectations are specified as follows:

$$\beta_0 > 0, \beta_1 > 0, \beta_2 > 0, \beta_3 < 0$$

3. DATA AND METHODOLOGY

The study used data of 6 leading African countries covering the period of 1976–2018. Table 1 shows the detail of the sources of data used and how we measured each of the variables. The study employed the dynamic common correlated effect (DCCE) to analyze the data. The rationale for employing the DCCE technique of estimation is because it deals with the problem of serial correlation and heteroscedasticity, as well as heterogeneity and cross-sectional dependency issues.

Table-1. Data sources and variables measurement.

Variables	Description	Measurement	Expectation	Source
GDP	Economic growth	It is measured as GDP percentage annual growth	positive	World Development Indicators, 2019
OP	Oil Price	Crude Oil Price/ Consumer Price Index	Positive	West Texas Intermediate, 2019 (Author's computation)
FGU	Financial globalization uncertainty	The actual residuals values will be obtained as a result of regressing the foreign direct investment inflows on its lagged value with time trend	Negative	WDI, 2019 (Author's computation)

4. EMPIRICAL RESULTS

4.1. Descriptive statistics and Correlation Matrix

The descriptive statistics are given in Table 2, while the matrix for the correlation is shown in Table 3. The 'descriptive statistics' reveal that the variables follow the same means and that the associated variations indicated by the standard deviations are substantial. The latter implies that we can be positive about building adequate estimated linkages. The correlation matrix is intended to demonstrate potential problems of multi-collinearity among the parameters. Through an initial evaluation, the variables are not characterized by excessive quantities of substitutes. As such, based on the correlation values, we can conclude that none of the variables suffers from the issue of multi-collinearity in the model.

Table-2. Descriptive summary.

Variables	Mean	Std. Dev.	Min	Max
FD	1.012323	-0.015780	2.227401	5.212168
GDP	1.317014	0.809916	2.729760	4.026610
FGU	1.973476	-0.075095	2.364840	-4.781500
OP	39.66814	26.44745	12.23000	99.06000

Table-3. Correlation matrix.

	FD	OP	FGU	GDP
FD	1			
OP	0.121166	1		
FGU	0.049642	-0.182446	1	
GDP	0.267537	-0.050119	0.057777	1

4.2. Cross-Section Dependence and Homogeneity Tests

Table-4. Cross-sectional dependence tests.

Variables	Pesaran CD test	Pesaran LMCD test	Breush-Pagan (LM) test
LNFD _{it}	6.235* (0.000)	8.487* (0.000)	61.486* (0.000)
LNGDP _{it}	2.348** (0.012)	6.320* (0.000)	49.618* (0.000)
LNOP _{it}	25.396* (0.000)	115.021* (0.000)	645.000* (0.000)
LNFGU _{it}	2.665* (0.007)	2.450** (0.014)	21.895** (0.019)

Note: * and ** significant at 1 and 5% levels. Figures in () denote *p*-values. Pesaran (2004) CD test takes cross-dependence as the null, and the *p*-values are for the single test based on the normal distribution.

Table-5. Slope homogeneity tests.

Group	Test	Statistic	P-value
	Delta	2.762**	0.020
	Adjusted Delta	2.507*	0.006

Note: * shows statistical significance at 1% and ** signifies 5% level.

Based on the above Table 4, the likelihood values in the brackets depict that the independence of the null hypothesis is firmly rejected at 1% and 5%, respectively. The research must consider cross-sectional dependency when calculating panel statistics in order to prevent misleading assumptions, concluding that all variables are consistent with the presumption of second-generation techniques (cross-sectionally dependent) and that the collection of panel data is statistically significant for empirical analysis.

Furthermore, Table 5 shows the results of the homogeneity test. Therefore, taking into account the calculated values of the delta and the adjusted delta as well as their respective P-values, we reject the null hypothesis coefficients of homogeneity at a point of 1% significance, which implies that all the parameters in the sampled economies under this analysis are in no way homogeneous; but rather heterogeneous.

As such, it is necessary to consider the heterogeneous panel econometric techniques in which variables differ among the panels across the individual markets. Therefore, the presence of cross-sectional dependence and heterogeneity for the chosen variables within the panel data of these sampled nations needs the use of a second-generation econometric method.

4.3. Unit Root Test Result

Concerning such a need to investigate the existence of possible non-stationarity in the series, the current study employs panel unit root approaches from the second generation classification, which assume cross-sectional dependence, although the first generation was usually used in panel data studies on the factors of financial development. In particular, the cross-sectional ImPesaran developed by Pesaran (2007) the Pesaran (2006) proposed a cross-sectional augmented dickey fuller, etc. Whose premises were that the parameters were heterogeneous and distinct throughout the series.

We consider the fact that Table 6 illustrates that all the variables in question are both stationary at the level and at the first difference, provided the P-values are less than 1 percent. As such, we reject the non-stationary null hypothesis. Furthermore, as a result of this, conclude based on the results that all the variables are stationary at both I(0) and I(1).

Table-6. Panel unit root test.

Variables	CIPS		CADF	
	At level	At first different	At level	At the first diff
<i>LNFD_{it}</i>	-4.794* (0.000)	-6.420* (0.000)	-4.520* (0.000)	-6.253* (0.000)
<i>LNGDP_{it}</i>	-4.734* (0.000)	-6.234* (0.000)	-3.902 (0.000)	-6.092* (0.000)
<i>LNOP_{it}</i>	1.700* (0.000)	2.520* (0.000)	-4.586 (0.000)	-5.726* (0.000)
<i>LNFGU_{it}</i>	-5.907* (0.000)	-6.420* (0.000)	-4.433* (0.004)	-6.327 (0.000)

Note: *, ** and *** Denotes rejection of the null hypothesis at 1% and 5% and 10% significance level.

4.4. Larsson Co-Integration Result

The research uses this method to predict the relationship between the variables over the long term. The approach by Larsson, Richardson, and Steckler (2001) is almost a replica of the co-integration test by Johansen (1988) in a vector error correction model (VECM) process. More useful, however, for the residual-based analysis like Pedroni (2004); Pedroni (1999). Larsson et al. (2001) gives room for much more than one vector of co-integration, but Pedroni (2004); Pedroni (1999) allows only the co-integration of the panel.

Until then, as the co-integration is for each cross-section, the model solution is then unregulated, paving the way for short-run dependency between the groups; the most enticing is the cross-sectional dependency of the error terms. With the central limit theorem in the cross-sectional context and the appropriate mean and variance adjustment factors demonstrates under the null hypothesis as:

$$LLL^H(l/x) = \frac{\sqrt{S^2 \sum_{i=1}^S (\mathcal{M}G_i^v(l/x) - E(\mathcal{M}G_i^v(l/x)))}}{\sqrt{Var(\mathcal{M}G_i^v(k/x))}} \rightarrow N(0,1) \quad (4)$$

In the serial limit $Q \rightarrow \infty$ tailed by $N \rightarrow \infty$. $E(\mathcal{M}Z_i^v(\frac{l}{x}))$ and $Var(\mathcal{M}G_i^v(\frac{l}{x}))$ denotes the mean and variance of the asymptotic trace statistics, found from a stochastic simulation (Johansen, 1995). For $Q \rightarrow \infty$ the

expressions $E(\mathcal{M}G_{i_i}^v(\frac{l}{x}))$ and $Var(\mathcal{M}G_{i_i}^v(\frac{l}{x}))$ Converge to the estimated value limit and the trace statistic

variance equivalent, accordingly, to the intentional case v. The null hypothesis, $r=0$, is checked for each country in the panel using the trace statistics observed. The null hypothesis, $r=1$, is evaluated if we reject the null hypothesis. This serial testing technique ends when $r = r$ is not rejected the null hypothesis, which decides the rank assessment of r .

The dependent probability methodology developed by Larsson et al. (2001) stands as the heterogeneous panel method co-integrating applied in the present analysis. Following the null hypothesis, each economy has a co-integrating relation across the panel. After hitting the mean individual trace statistics of a long-run association (LR-bar statistics to be précised), we then copied the LR-bar test statistics to serve as the basis for the rank approach to the co-integration panel.

Nevertheless, the co-integration result from the Larsson et al. (2001) reveals a regular normal distribution in Table 7. The critical values of 53.792, 47.181, and 43.964 are correlated respectively with 1%, 5% and 10%. The results suggest the co-integrating vector of an individual nation between economic growth, oil price, financial globalization uncertainty and financial development at a 1 percent significance level. The outcome of the panel rank (LR) test rejects the no co-integration of the null hypothesis between the variables, which means that the homogeneous co-integrating vector's null hypothesis is rejected at a level of 1 percent significance since the LR test 55.392 exceeds the critical value 53.792.

Table-7. Larsson's heterogeneous panel co-integration.

Countries	r=0	r=1	r=2	r=3
NIGERIA	57.237*	29.434**	12.535	2.333
ALGERIA	74.377*	36.257**	15.873	2.076
EGYPT	50.864*	27.138*	13.562*	1.383**
S-AFRICA	51.784*	30.604*	12.768*	1.530*
GHANA	62.864*	31.599*	12.955**	1.222
MORROCO	35.232**	15.592	6.990	1.078
LR-NT	55.392*	28.437	12.447	1.604
LR-test	10.071	6.640	4.814	0.769
$E(Z_i)$	27.729	14.955	6.068	1.137
$Var(Z_i)$	45.264	24.733	10.535	2.212

Note: The values of $E(Z_i)$ and $Var(Z_i)$ are from Larsson et al. (2001). LR-NT=Average Trace statistics and LR-test is the Larsson test statistics. * denote statistically significant at 1%. Critical value based on Larsson et al. (2001)

5. ESTIMATION

This latest Chudik and Pesaran (2015) methodology takes into account three significant problems, the first being cross-sectional dependents that can be solved by averaging the cross-sectional as well as lagging the cross-sectional averages of dependent parameters on one side of the equation with explanatory variables.

The second is the heterogeneity aspect, which can be taken care of using mean group (Eberhardt & Presbitero, 2015). The third is the dynamics that can be solved by integrating the dependent variable's explanatory lag into the model. This solution solves all of the problems mentioned above. This contains the following equations:

$$FD_{it} = j_i + \lambda FD_{it-1} + q_1 GDP_{it} + q_2 FGU_{it} + OP_{it} + \vartheta'_{0i} EV_{it} + u_{it}$$

$$u_{it} = \varphi'_i r_t + \varepsilon_{it}$$

$$h_{it} = \frac{EV_{it}}{z_{it}} = j h_i + \gamma_i FD_{it} + w'_i r_t + k_{it}$$

where i = economies t = period ; FD_{it} = explained variable which represents financial development; GDP_{it} = economic growth; FGU_{it} = financial globalization uncertainty, OP_{it} = oil price and EV_{it} denotes other explanatory variables for extended model.

Having established the presence of co-integration between economic growth, oil price, financial globalization uncertainty, and financial development for the sampled economies, the next thing is to find the extent of this relationship, and we intend to do that using DCCE estimates. The Standard Error is presented in a parenthesis. The short-run coefficient for $LGDP_{it}$ is positive and significant at 5%. Meanwhile, the LOP_{it} coefficient is negative and significant at 5%. However, the coefficient of $LFGU_{it}$ remains negative and statistically, not significant.

Whereas, the long-run findings of this study based on the above [Table 8](#) records that $LGDP_{it}$ is positively and statistically significant at a 5 % level, also the negative sign of LOP_{it} persist even in the long run, which shows a negative and 5% level of significance. On the other hand, $LFGU_{it}$ result indicates a positive and significant relationship.

Besides, the R^2 value given as 49 percent shows how well the model fits the data; it can also be viewed as the percentage of the variance in financial development which the model can explain. The present study's explanatory variables may explain the dependent variable (financial development) by 49%. However, the F-value 5.72 indicates a degree of significance at 1 percent, which informs us that the variables are collectively significant, the statistics compared the joint influence of all variables. In other words, the model describes the variance in financial development over its mean better than the mean.

Therefore, the findings suggest that economic growth is good for the financial development. The positive relationship between economic growth and financial stability is in line with the results of most previous researchers who have carried out work on African economies; such as [Lawal et al. \(2016\)](#); [Salahuddin and Gow \(2016\)](#); [Fernandez-Sainz, Torre-Olmo, López-Gutiérrez, and Sanfilippo-Azofra \(2018\)](#); [Bist \(2018\)](#) and [Iyke and Odhiambo \(2017\)](#).

As predicted, the outcome of [Table 8](#) shows that at the long-run 1-unit increase in economic growth would lead to an increase in FD by 0.842 percent, while the short-run outcome also indicates that 1-unit rise in GDP directly increases FD by 0.196 percent. This implies that, as these economies continue to improve their economic growth through economic investment, it will have a positive effect on financial activities, which in return will create demand for more financial services and lead in the development of the financial sector.

Meanwhile, FGU short-term result shows an insignificant relationship concerning their financial development, which is very consistent with the work of [Asongu et al. \(2017\)](#). That financial globalization uncertainty is indifferent (insignificant) on its own to the financial development of the sampled countries, because whether or not there exist shocks in capital flow, these countries' financial sectors have enough liquid liabilities as well as being inefficient as a result of high lending rate and coupled with less economic activities that will enhance channeling the mobilized savings to economic operators as credit.

Whereas, in the long-run, a 1-unit increase in FGU will bring about a corresponding rise in financial development by 0.347 percent. The result also goes well with the findings of [Asongu et al. \(2017\)](#) and [Farouq et al. \(2020a\)](#). The rationale behind this is the fact that these sampled economies seem to take advantage of this uncertainty, thereby utilizing and channeling their available excess liquidities towards more productive sectors to avert any external shocks that might inflict a negative impact on their financial system as a whole.

Meanwhile, the oil price at both the short and long-term displays a statistically positive and significant relationship with regards to financial development. Meaning, a 1-unit increase in oil price would surely increase financial development by 0.030%. Similarly, should oil price increase by 1-unit, there will be a corresponding rise in financial development by 0.412%. The findings go in line with the results of [Hou et al. \(2015\)](#) and [Nwani et al.](#)

(2016) whose argument was that should there be a fall in the price of oil, that would instigate the fear of uncertainty in the minds of these economies, leading to macroeconomic distortions that could lead firms to cut down their investments, and consequently affect the rate at which economic activities promotes opportunities in the private sector as well as credit demand.

Table-8. Dynamic common correlated effect.

Short-run Estimate			
DCCE			
Variables	Coefficient	Z	P-value
LGDP_{it}	0.196 (0.092)	2.13	0.033
LOP_{it}	0.030 (0.002)	10.42	0.000
LFGU_{it}	0.011 (0.089)	0.12	0.902
Long-run Estimate			
LOP_{it}	0.842 (0.179)	4.69	0.000
LOP_{it}	0.412 (0.132)	3.11	0.002
LFGU_{it}	0.347 (0.153)	2.27	0.023

Note: Cross-section 6
 Observations 2
 R-squared 0.49
 Adj. R-squared 0.41
 F-Stat (p) 5.72 (0.000).

6. CONCLUSION AND POLICY RECOMMENDATION

The present study employed data set of 6 selected leading African economies, namely; Nigeria, Algeria, Egypt, South-Africa, Ghana, and Morocco, covering the period between 1976–2018. The primary aim of this paper is to investigate the effects of economic growth, financial globalization uncertainty and oil price on the financial development of the sampled countries. Based on the empirical results, we can now conclude that both economic growth, financial globalization uncertainty and oil price affects these sampled countries' financial sectors positively.

Although the results are amazing, they, at the same time, make available some exciting thoughts and triggers further research on the subject matter. As such, the results of this paper gives some justifications as probable reasons with regards to these findings. One, the sampled countries are mostly oil-producing states, which makes them so prom to the dominant role of the public sector in their respective financial system. Two, their increased diversification in terms of other productive activities that have a direct impact on the real sector and in return, brings about increased financial activities in the various countries might be the rationale behind the positive effect of financial globalization uncertainty towards their financial development. Three, as seen in the review of this paper, there has been several empirical and theoretical studies that have proven economic growth to be an engine of financial sector development, so we found in this study and these economies' rate of growth contributes massively to the development of their financial system.

To this final stage, the paper recommends that the sampled economies' policymakers should strategize and come up with suitable policies that will promote substantial channeling of available surplus resources to the real sectors that will always improve the economic activities in the countries and not holding on to only oil sector and the public sector should not dominate the market as this is seriously affecting diversification in the countries. There should also be a continues process of making resilient in the event of either internal or external shocks, this is because in as much as these economies want to develop their financial system, there must be an integration of their financial system with the rest of the globe, as such, financial globalization uncertainty is unavoidable and that calls

for preparedness. Besides, having seen how crucial economic growth is to their financial system, then there has to be a precise device towards encouraging and improving economic growth in their respective countries.

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REFERENCES

- Abu-Bader, S., & Abu-Qarn, A. S. (2008). Financial development and economic growth: Empirical evidence from six MENA countries. *Review of Development Economics*, 12(4), 803-817.
- Achamoh, N. V., & Baye, F. M. (2016). Implications of foreign direct investment, financial development and real exchange rate for economic growth in Cameroon. *EuroEconomica*, 35(1), 149-163.
- Agbetsiafa, D. (2004). The finance growth nexus: Evidence from Sub-Saharan Africa. *Savings and Development*, 28(3), 271-288.
- Ahmad, A. U., Loganathan, N., Streimikine, D., & Hassan, A. A. G. (2018). financial instability, trade openness and energy prices on leading african countries sustainable growth. *Economic Computation And Economic Cybernetics Studies And Research*, 52(1), 127-142.
- Akinboade, O. A. (1998). Financial development and economic growth in botswana: A test for causality. *Savings and Development*, 22(3), 331-348.
- Arif, I., & Rawat, A. S. (2019). Trade and financial openness and their impact on financial development. *South Asian Journal of Business Studies*, 8(1), 26-39.
- Asadullah, M. N., & Savoia, A. (2018). Poverty reduction during 1990–2013: Did millennium development goals adoption and state capacity matter? *World Development*, 105, 70-82. Available at: <https://doi.org/10.2139/ssrn.3082925>.
- Asongu, S., & De Moor, L. (2015). Financial globalisation and financial development in Africa: Assessing marginal, threshold and net effects. African Governance and Development Institute WP/15/040. African Governance and Development Institute.
- Asongu, S. A., Koomson, I., & Tchamyu, V. S. (2017). Financial globalisation uncertainty/instability is good for financial development. *Research in International Business and Finance*, 41, 280-291. Available at: <https://doi.org/10.1016/j.ribaf.2017.04.042>.
- Assefa, T. A., & Mollick, A. V. (2017). Financial development and economic growth in Africa. *Journal of African Business*, 18(3), 320-339.
- Atindéhou, R. B., Gueyie, J. P., & Amenounve, E. K. (2005). Financial intermediation and economic growth: Evidence from Western Africa. *Applied Financial Economics*, 15(11), 777-790. Available at: <https://doi.org/10.1080/09603100500108030>.
- Bayer, C., & Hanck, C. (2013). Combining non-cointegration tests. *Journal of Time Series Analysis*, 34(1), 83-95. Available at: <https://doi.org/10.1111/j.1467-9892.2012.00814.x>.
- Beck, T. (2011). Finance and oil: Is there a resource curse in financial development? (pp. 38). European Banking Center Discussion Paper, No. (2011-004).
- Bhetuwal, K. R. (2007). Financial liberalization and financial development in Nepal. *Economic Review*, 19(2), 23-41.
- Bist, J. P. (2018). Financial development and economic growth: Evidence from a panel of 16 African and non-African low-income countries. *Cogent Economics & Finance*, 6(1), 1449780. Available at: <https://doi.org/10.1080/23322039.2018.1449780>.
- Bongini, P., Iwanicz-Drozowska, M., Smaga, P., & Witkowski, B. (2017). Financial development and economic growth: The role of foreign-owned banks in CESEE countries. *Sustainability*, 9(3), 1-25. Available at: <https://doi.org/10.3390/su9030335>.

- Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models with weakly exogenous regressors. *Journal of Econometrics*, 188(2), 393-420. Available at: <https://doi.org/10.1016/j.jeconom.2015.03.007>.
- Costigan, J. (2016). *The effect of financial sector development on FDI led growth in China*. The University of San Francisco, Master's Theses. 177.
- Creti, A., Ftiti, Z., & Guesmi, K. (2014). Oil price and financial markets: Multivariate dynamic frequency analysis. *Energy Policy*, 73, 245-258. Available at: <https://doi.org/10.1016/j.enpol.2014.05.057>.
- Davoodi, M. H. R., Dixit, M. S., & Pinter, G. (2013). Monetary transmission mechanism in the East African Community: An empirical investigation. (No. 13/39). International Monetary Fund.
- Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411. Available at: [https://doi.org/10.1016/s0304-3878\(96\)00421-x](https://doi.org/10.1016/s0304-3878(96)00421-x).
- Eberhardt, M., & Presbitero, A. F. (2015). Public debt and growth: Heterogeneity and non-linearity. *Journal of International Economics*, 97(1), 45-58. Available at: <https://doi.org/10.1016/j.jinteco.2015.04.005>.
- Efobi, U., George, T., Okoye, L. U., & Modebe, N. J. (2017). Financial decision and poverty: Examining the financial behavior of the extreme poor in Nigeria. *Nigerian Journal of Management Technology & Development*, 8(2), 1-10.
- Elkhuizen, L., Hermes, N., Jacobs, J., & Meesters, A. (2018). Financial development, financial liberalization and social capital. *Applied Economics*, 50(11), 1268-1288.
- Farouq, I. S., Sulong, Z., & Sambo, N. U. (2020a). An empirical review of the role economic growth and financial globalization uncertainty plays on financial development. *Innovation*, 3(1), 48-63.
- Farouq, I. S., Sulong, Z., Ahmad, A. U., Jakada, A. H., & Sambo, N. U. (2020b). The effects of economic growth on financial development in Nigeria: Interacting role of foreign direct investment: An application of NARDL. *International Journal of Scientific & Technology Research*, 9(3), 6321-6328.
- Fernandez-Sainz, I., Torre-Olmo, B., López-Gutiérrez, C., & Sanfilippo-Azofra, S. (2018). Development of the financial sector and growth of microfinance institutions: The moderating effect of economic growth. *Sustainability*, 10(11), 1-16. Available at: <https://doi.org/10.3390/su10113930>.
- Ghirmay, T. (2004). Financial development and economic growth in Sub-Saharan African countries: evidence from time series analysis. *African Development Review*, 16(3), 415-432. Available at: <https://doi.org/10.1111/j.1017-6772.2004.00098.x>.
- Goldsmith, S. (1969). A symbol for disabled people: The report of a research study: RIBA Publications. *British Journal of Medical Education*, 3, 232-236.
- Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98(5, Part 1), 1076-1107.
- Greenwood, J., & Smith, B. D. (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamics and Control*, 21(1), 145-181.
- Hatemi-J, A., & Uddin, G. S. (2012). Is the causal nexus of energy utilization and economic growth asymmetric in the US? *Economic Systems*, 36(3), 461-469. Available at: <https://doi.org/10.1016/j.ecosys.2011.10.005>.
- Hou, Z., Keane, J., Kennan, J., & Te Velde, D. W. (2015). *The oil price shock of 2014. Technical report, Working Paper*. London, UK: Overseas Development Institute.
- Iheanacho, E. (2016). The impact of financial development on economic growth in Nigeria: An ARDL analysis. *Economies*, 4(4), 1-12. Available at: <https://doi.org/10.3390/economies4040026>.
- International Monetary Fund. (2018). World economic outlook. Cataloging-in-Publication Data Joint Bank-Fund Library. *LCC HG230.3.E96*.
- Iyke, N. B., & Odhiambo, N. M. (2017). Inflationary thresholds, Financial development and economic growth: New evidence from two West African countries. *Global Economy Journal*, 13(1), 20160042. Available at: <https://doi.org/10.1515/gej-2016-0042>.

- Jakada, A. H., Mahmood, S., Ahmad, A. U., Farouq, I. S., & Mustapha, U. A. (2020a). Financial development and the quality of the environment in Nigeria: An application of non-linear ARLD approach. *Journal of Environmental Treatment Techniques*, 8(1), 403-409.
- Jamel, L., & Maktouf, S. (2017). The nexus between economic growth, financial development, trade openness, and CO₂ emissions in European countries. *Cogent Economics & Finance*, 5(1), 1341456. Available at: <https://doi.org/10.1080/23322039.2017.1341456>.
- Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic dynamics and control*, 12(2-3), 231-254. Available at: [https://doi.org/10.1016/0165-1889\(88\)90041-3](https://doi.org/10.1016/0165-1889(88)90041-3).
- Johansen, S. (1995). *Likelihood-based inference in cointegrated vector autoregressive models*: Oxford University Press on Demand.
- Karikari, J. A. (2010). *Governance, financial liberalization, and financial development in Sub-Saharan Africa*. Paper presented at the In African Economic Conference.
- Kassi, D. F., Sun, G., Gngain, Y. T., Edjoukou, A. J. R., & Assamoi, G. R. (2019). Dynamics between Financial development, Energy consumption and Economic growth in Sub-Saharan African countries: Evidence from an asymmetrical and nonlinear analysis. Munich Personal RePEc Archive. Retrieved from <https://mpa.ub.uni-muenchen.de/93462/>.
- Kazar, A., & Kazar, G. (2016). Globalization, financial development and economic growth. *International Journal of Economics and Financial Issues*, 6(2), 578-587.
- Larsson, J. E., Richardson, A., & Steckler, P. A. (2001). *U.S. Patent No. 6,226,747*. Washington, DC: U.S. Patent and Trademark Office.
- Lawal, A. I., Nwanji, T. I., Asaley, A., & Ahmed, V. (2016). Economic growth, financial development and trade openness in Nigeria: An application of the ARDL bound testing approach. *Cogent Economics & Finance*, 4(1), 1258810. Available at: <https://doi.org/10.1080/23322039.2016.1258810>.
- Levine, R., & Zervos, S. J. (1993). What we have learned about policy and growth from cross-country regressions? *The American Economic Review*, 83(2), 426-430.
- Masten, A. B., Coricelli, F., & Masten, I. (2008). Non-linear growth effects of financial development: Does financial integration matter? *Journal of International Money and Finance*, 27(2), 295-313.
- Mehrrara, M., & Oskoui, K. N. (2007). The sources of macroeconomic fluctuations in oil exporting countries: A comparative study. *Economic Modelling*, 24(3), 365-379. Available at: <https://doi.org/10.1016/j.econmod.2006.08.005>.
- Musta, E. (2016). Financial development influence on economic growth in Albania. *European Journal of Economics and Business Studies*, 2(2), 59-65. Available at: <https://doi.org/10.26417/ejes.v5i1.p59-65>.
- Naceur, S. B., Cherif, M., & Kandil, M. (2014). What drives the development of the MENA financial sector? *Borsa Istanbul Review*, 14(4), 212-223. Available at: <https://doi.org/10.1016/j.bir.2014.09.002>.
- Naghavi, N., & Lau, W.-Y. (2016). Financial liberalization and stock market efficiency: Causality analysis of emerging markets. *Global Economic Review*, 45(4), 359-379. Available at: <https://doi.org/10.1080/1226508x.2016.1198921>.
- Ncanywa, T., & Mabusela, K. (2019). Can financial development influence economic growth: The sub-Saharan analysis? *Journal of Economic and Financial Sciences*, 12(1), 1-13.
- Nwani, C., Iheanacho, E., & Okogbue, C. (2016). Oil price and the development of financial intermediation in developing oil-exporting countries: Evidence from Nigeria. *Cogent Economics & Finance*, 4(1), 1185237. Available at: <https://doi.org/10.1080/23322039.2016.1185237>.
- Odhiambo, N. M. (2008). Financial depth, savings and economic growth in Kenya: A dynamic causal linkage. *Economic Modelling*, 25(4), 704-713. Available at: <https://doi.org/10.1016/j.econmod.2007.10.009>.
- Ogwumike, F. O., & Ofoegbu, D. I. (2012). Financial liberalization and domestic savings in Nigeria. *The Social Sciences*, 7(4), 635-646. Available at: <https://doi.org/10.3923/sscience.2012.635.646>.
- Ohlan, R. (2017). The relationship between tourism, financial development and economic growth in India. *Future Business Journal*, 3(1), 9-22. Available at: <https://doi.org/10.1016/j.fbj.2017.01.003>.

- Ono, S. (2017). Financial development and economic growth nexus in Russia. *Russian Journal of Economics*, 3(3), 321-332. Available at: <https://doi.org/10.1016/j.ruje.2017.09.006>.
- Pagano, M. (1993). Financial markets and growth: An overview. *European Economic Review*, 37(2-3), 613-622.
- Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric Theory*, 20(3), 597-625. Available at: <https://doi.org/10.1017/s0266466604203073>.
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(S1), 653-670. Available at: <https://doi.org/10.1111/1468-0084.61.s1.14>.
- Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels: Institute of Labor Economics (IZA).
- Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312. Available at: <https://doi.org/10.1002/jae.951>.
- Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica*, 74(4), 967-1012. Available at: <https://doi.org/10.1111/j.1468-0262.2006.00692.x>.
- Priestley, M. B., & Tong, H. (1973). On the analysis of bivariate non-stationary processes. *Journal of the Royal Statistical Society: Series B (Methodological)*, 35(2), 153-166. Available at: <https://doi.org/10.1111/j.2517-6161.1973.tb00949.x>.
- Robinson, A. (1952). An Introduction to economic analysis Office of Naval Research Contract. *N8onr-520/m Project NR 083 012 January 1952*.
- Salahuddin, M., & Gow, J. (2016). The effects of Internet usage, financial development and trade openness on economic growth in South Africa: A time series analysis. *Telematics and Informatics*, 33(4), 1141-1154. Available at: <https://doi.org/10.1016/j.tele.2015.11.006>.
- Shahbaz, M., Mallick, H., Mahalik, M. K., & Hammoudeh, S. (2018). Is globalization detrimental to financial development? Further evidence from a very large emerging economy with significant orientation towards policies. *Applied Economics*, 50(6), 574-595. Available at: <https://doi.org/10.1080/00036846.2017.1324615>.
- Shahbaz, M., Van Hoang, T. H., Mahalik, M. K., & Roubaud, D. (2017). Energy consumption, financial development and economic growth in India: New evidence from a nonlinear and asymmetric analysis. *Energy Economics*, 63, 199-212. Available at: <https://doi.org/10.1016/j.eneco.2017.01.023>.

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