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The Dual Impact of the Informal Economy on Formal Growth in Nigeria: Evidence from ARDL Bounds Testing

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About Article

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ABSTRACT

Nigeria's informal economy (IE) employs a sizable portion of the labour force. It contributes more than half of the nation's gross domestic product (GDP), but little is known about how it interacts with the formal economy. This study aims to bridge that gap by examining the short-term and long-term effects of informality on Nigeria's formal economy. The autoregressive distributed lag (ARDL) model and annualized data analysis were used to establish a nuanced interaction between informality and the formal economy. According to the findings, a one percent increase in the size of the IE is associated with a 0.38 percent increase in long-run formal GDP per capita, but a 0.03 percent decrease in the short run. The IE has a significant impact on the formal economy over the long run, promoting growth through job creation, increased demand, and entrepreneurial endeavors. Conversely, IE activities typically have a negative impact in the short term, highlighting issues such as unfair competition, limited access to financing, and tax evasion. These results underscore the importance of policymakers to distinguish between short-term and long-term impacts when developing policies. Based on the study, policymakers should consider a dual-horizon strategy that addresses short-term issues while leveraging long-term growth prospects, supported by institutional reforms, financial inclusion, and the gradual integration of informal enterprises into the formal economy, rather than striving for total eradication.

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1. INTRODUCTION

This study analyses the interactions between the informal and formal economies in Nigeria. It investigates whether the informal economy contributes to job creation, income generation, and increased demand for goods and services, as well as how these effects influence the performance of the formal sector. It considers the impact of macroeconomic conditions such as poverty, unemployment, inflation, governance, and financial inclusion on the relationship between the informal and formal economies. The study examines whether the expansion of the informal economy complements or substitutes for the formal economy in Nigeria, while assessing policy strategies for integrating the informal sector into national economic development frameworks to promote inclusive and sustainable growth.

Over the past forty years, there has been a noticeable increase in interest surrounding the informal economy (the author will call it IE from now on). Most of the attention has focused on understanding its main drivers, causes, and effects (indicators), as well as estimating its size and impact using various approaches (Bouriche & Bennihi, 2020; Hassan & Schneider, 2016). However, there has been a dearth in the literature on how the informal economy interacts with the formal (or official) economy. The IE is a crucial component of economies worldwide, significantly influencing formal economies and playing a decisive role in promoting economic growth.

The study examines the interplay between informal and formal sectors, drawing lessons and strategies for developing nations. The informal economy, often characterized by unregulated and independent activities, contributes to job creation and economic dynamics (Meagher, 2013). Nigeria presents a multifaceted economic scenario characterized by a dichotomy between its formal and informal sectors. The economy is strongly faced with macroeconomic challenges, such as a high poverty rate, high unemployment, and infrastructural decay, among others, which hold a crucial position in the broader discourse on economic development and growth in the context of developing economies. In Nigeria, the IE, which encompasses a broad spectrum of unregistered and unregulated economic activity, accounts for a sizable amount of the nation's economic output and provides a significant source of income for a sizable percentage of the populace. It employs a sizable majority of the labour force, especially in urban and semi-urban areas, and accounts for roughly 57 percent of Nigeria's gross domestic product (Chukwu *et al.*, 2024; Medina & Schneider, 2017; Friedrich Schneider *et al.*, 2010; Tonuchi & Idowu, 2020). A crucial component of Nigeria's economy, the informal economy has a profound impact on the dynamics and operation of the formal economy.

The importance of IE in creating jobs and generating revenue cannot be overestimated. The informal economy serves as a crucial safety net for a sizable portion of the population that cannot be guaranteed official employment in a nation where the youth unemployment rate is believed to be above 30 percent. People can engage in self-employment endeavours that would not be possible within the official economic framework, thanks to the IE's freedom and entrepreneurial options. The IE is a vital source of income for millions of people. Workers in the sector typically lack benefits and labour security, which creates complex problems. The informal economy also boosts the demand for goods and services, which benefits the formal economy.

For instance, Chen (2003) suggested that small, informal enterprises often form relationships with larger, formal businesses, resulting in mutually beneficial partnerships that enhance growth and productivity. The complex interplay between the informal and formal economies has a significant influence on economic policy and employment. Despite being frequently seen as a parallel industry, the informal economy plays a vital role in sustaining the formal economy, which gives many people who might not otherwise be able to find formal work jobs and income Chen (2012). This overlap emphasizes the necessity of policies that acknowledge and include the significant contributions made by informal workers Godfrey (2011). Additionally, because informal institutions significantly influence the sector's formal prospects, the interaction between these economies can affect FDI flows (Holmes Jr *et al.*, 2013).

The macro-level determinants of commercial activity are characterized by the relationship between formal and informal economies, with factors like governance and economic conditions having a significant impact on the capacity of formal versus informal enterprises (Thai & Turkina, 2014). Academics have emphasized the importance of improving financial inclusion to improve connectivity between these economies, which helps address income inequality and promote sustainable economic growth (Kim & Kim, 2016). Furthermore, these dynamics have profound implications for local and national policy frameworks. For example, recognizing the resilience of the informal economy during economic recessions emphasizes the need for adaptable regulatory measures (Klapper & Love, 2011). Existing literature reveals that recognizing the informal economy is crucial for fostering entrepreneurial spirit and economic growth. Understanding this interdependence is essential for implementing effective policies that promote balanced economic development (Elgin & Oztunali, 2014; Schwens *et al.*, 2011; Webb *et al.*, 2013).

The traditional theories of the dual labour market, coming from (Lewis, 1954), suggest that the informal sector serves as a refuge for workers who escape unemployment when they are excluded from the formal sector with higher wages, where wages are maintained above market protection levels (Harris & Todaro, 1970) and (Fields, 1990). It is generally believed that workers in the informal sector earn less than their formal sector counterparts. Many studies support this perspective, examining the entrance barriers and the implications for wage disparities and market segmentation (Batini *et al.*, 2010; Clement, 2015; Heintz & Slonimczyk, 2007; Maloney, 2004; Satchi & Temple, 2009; Temple, 2005).

As informal economies expand, they also encounter challenges such as accessing financing and integrating into global supply chains. (Dell'Anno, 2022) highlights the need for integral definitions and theories that surround the informal economy, contributing to a better understanding of its substantial role. Developing countries can leverage these findings to design more inclusive economic policies, ensuring that even smaller companies have access to the necessary resources and networks. Over the last two decades, the informal economy in Nigeria has been analyzed (Figure 1), revealing a size ranging from 51.3% to 72.9% of GDP (ILO, 2020). Oduh, Eboh, Ichoku, and Ujah (2008) observed that from 1970 to 2005, the average size of the informal economy was approximately 58.22%. In a subsequent study, Ogbuabor and Malaolu (2013) found that the number increased to an average of 64.58 % from 1970 to 2013. More recently, Tonuchi and Idowu (2020) further quantified the informal sector, highlighting its significant impact on Nigeria's general economy.

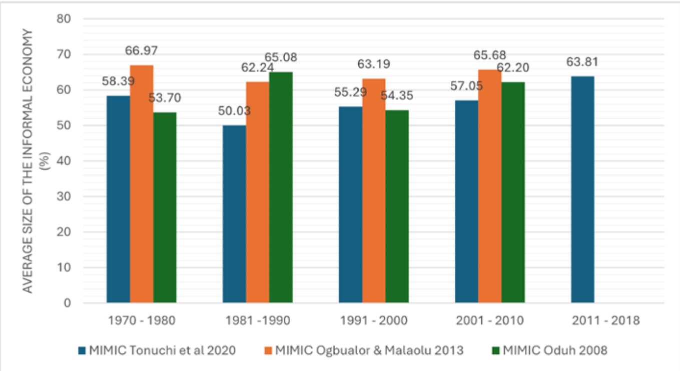

Figure 1. Some existing estimates of the informal economy in Nigeria.
Source: Author's computation

However, its contribution to the global economies has been recognized and discussed in the literature (Chen, 2003; Guha-Khasnobis & Kanbur, 2006; Kraemer-Mbula & Wunsch-Vincent, 2016; Luque, 2021; Firedrich Schneider, 2022). The IE incorporates a considerable diversity of economic experiences, expressing itself in various forms across continents and nations. For example, in OECD-developed nations, it is low due to robust market and political systems, the independence of the judiciary, and strong institutions, among other factors (Andrews *et al.*, 2011; Boitano & Abanto, 2019; Venn, 2008). Thus, this is reflected in Figure 2 below, capturing the diverse levels of the informal economy across economic regions.

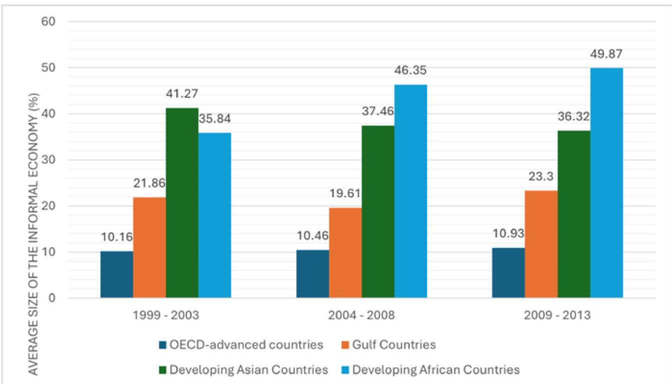

Figure 2. Size of the informal economy across regions using the MIMIC model.
Source: Author's computation

Recognizing the significance of IE within Nigeria's broader economic framework is crucial for policy formulation aimed at promoting sustainable economic growth. A comprehensive understanding of the synergies between the two sectors can help in developing informed political strategies that capitalize on the potential of the informal sector while simultaneously integrating it into the formal economic structure. In addition, lessons learned from Nigeria's experience may have broader implications for other developing economies facing similar challenges. By examining how the informal sector can improve or hinder formal economic activities, this research aims not only to contribute to the academic literature, but also to provide practical information for policy formulators in developing regions facing the realities of widely informal economies.

There have been various estimates regarding Nigeria's informal economy (Dell'Anno & Adu, 2020; Oduh *et al.*, 2008; Ogbuabor & Malaolu, 2013; Tonuchi & Idowu, 2020), but it's important to point out that most studies focus solely on measuring the economy. However, to the best of the author's knowledge, no prior studies have argued the interaction between the two economies across two time periods. The study argues that the effect of informality on the formal economy may be asymmetric in character both in the long and short run. The study applied the autoregressive distributed lag (ARDL) model to quantitative data from Nigeria from 1990 to 2023. I deliberately chose the dataset from a Sub-Saharan African economy for the following reasons: First, the auto-regressive distributed lag (ARDL) model offers a robust framework for analyzing both the short-run and long-run interactions between Nigeria's informal and formal economies. Second, when addressing immediate and lasting economic relations, ARDL facilitates a nuanced understanding of how the dynamics of the informal economy influence the official economy.

This study aims to assess the long-run cointegration between the informal economy (IE) and the formal economy using the autoregressive distributed lag (ARDL) bound testing approach. In addition, for the first time, the study assigns variables to their respective long-run (LR) and short-run (SR) coefficients from the ARDL output report and plots them side by side. Thus, this approach allows the study to compare their effects visually. The remainder of this article is organized as follows: the literature review is articulated in section 2, while the methodology and explanation of variables are provided in section 3. Section 4 is devoted to results and discussions. The article presents the conclusion and possible policy implications in section 5.

2. LITERATURE REVIEW

The IE plays a vital role in today's economies, both in developed and developing countries. Broadly, it encompasses all economic activities not regulated by the government, including self-employment, unregistered businesses, and casual work (Chen, 2012). These jobs usually lack formal employment, legal protections, and tax oversight, which affects the economy in various ways. Gerxhani (2004) notes that developing countries often rely on the informal sector as a safety net for employment and social security. In contrast, in developed countries, it tends to provide extra income rather than being the primary source of income. This suggests that the informal sector is adaptable to varying social and economic contexts, assuming different roles in different locations.

Chen (2012) synthesizes fundamental theories related to the informal economy (IE) and examines conceptual structures that clarify its role in economic resilience, labour market flexibility, and income generation. Castells and Portes (1989) expand on this foundation by emphasizing the dual nature of informal economies in urban settings, where informal work coexists and competes with formal labour markets, influencing wage dynamics and employment conditions. In developing economies, where formal employment is often limited, the informal sector plays a crucial role in poverty alleviation, allowing individuals to establish businesses when formal options are unavailable (Schneider, 2016). In developed countries, the informal economy introduces specific regulatory complexities, such as tax evasion and labour law circumvention, while also providing alternative sources of income for marginalized populations.

The existing literature provides limited analysis of the interaction between the formal and informal economies. However, few studies focus on this interaction. Mughal and Schneider (2020) contribute to this discourse. Their analysis identified short-run negative impacts on the formal sector through tax evasion and reduced public spending in Pakistan. Conversely, their findings indicate that the IE contributes positively to the long run by generating employment, income, and consumption linkages that enhance GDP per capita. Furthermore, their study recommends implementing institutional reforms, reducing corruption, and lowering the costs associated with formalization, rather than pursuing policies that aim solely to suppress informality.

Additionally, Meagher (2013) notes that the informal economy in developing countries is diverse and has a significant influence on socioeconomic conditions. Factors contributing to informality include poverty, weak institutional structures, gender inequality, and insufficient social protection. The study analyses employment patterns, income distribution, productivity, and gender roles. It emphasizes the importance of enhancing social protection, reducing obstacles to formal employment, and implementing context-specific reforms.

Kiaga and Leung (2020) analyses the transition of African economies from informal to formal structures. The study identifies structural barriers, restricted financial access, and inadequate regulatory frameworks as primary factors sustaining informality. The authors propose that digital platforms can facilitate the formalization of processes. The research evaluates variables including firm size, industry sector, employment classification, technology implementation, and regulatory context. They recommend policy measures to increase financial inclusion, simplify business registration processes, strengthen social protection systems, and employ digital technologies to support the integration of informal enterprises into the formal economy. These measures aim to foster inclusive economic growth and enhance living standards.

Islam and Alam (2019) investigates the linkage between the IE and GDP growth in eight South Asian developing countries. Using secondary data and linear regression, they find a significant positive relationship. That is, the IE employment, which accounts for an average of 70.18 percent of the labour force, makes a notable contribution to GDP growth. Key findings suggest that while informality fosters job creation and supports economic development, workers often face poor working conditions and lack adequate protection. The study recommends policies enhancing financial access, training, infrastructure, and social security to sustain growth and improve workers' welfare in South Asia.

Additionally, the IE serves as a vital social safety net for marginalized populations. Hussmanns (2004) articulates this function, emphasizing how the informal economy helps facilitate a level of income that would otherwise be inaccessible through formal means. Many people turn to informal activities by necessity to fill the gaps left by formal labour markets, which often fail to meet the needs of the most vulnerable. The dependence on informal employment reveals a complex relationship in which individuals navigate economic survival amidst limited regulatory protection, thereby promoting resilience within these communities despite the risks associated with informal work.

These dynamics also affect social stratification, as Godfrey (2011) explains. According to Godfrey, the informal economy tends to reinforce existing social hierarchies. Workers in the formal sector may look down on those in informal jobs, which helps maintain social divisions. This makes it more difficult for people to advance. Those in informal work face ongoing barriers that make it challenging to secure stable, formal employment. Limited access to education, training, and resources exacerbates the challenges faced by informal workers in improving their situation.

When examining the determinants of informality, Dabla-Norris *et al.* (2008) argue that the characteristics of the regulatory environment, ranging from the application of laws to the general quality of governance, are fundamental in shaping companies' adaptations to regulatory challenges. Thus, the study suggests that variations in regulatory application led to the persistence of informal practices, particularly in developing countries where institutions are weaker. For example, in many nations of sub-Saharan Africa, an excessive regulatory load discourages the use of formal records, pushing artisans and small businesses to operate informally. On the contrary, in developed economies, informal activities can arise from niche markets or from people seeking flexibility that is not provided by formal employment structures.

To address these social dimensions, it is crucial to recognize informal workers and support their integration into the formal economy. Policymakers can create labour policies that value the informal economy's role in GDP and protect the rights of all workers. Government agencies can help informal businesses obtain legal status, access social protections, and participate in the economy. Offering skills training and better financial access to informal workers can also support social inclusion and a fairer economy. Thus, the complex relationship between the informal sector and the formal economy underscores the need for targeted policy interventions that recognize the socio-economic contributions of informal workers, promote social equity, and address barriers to access in both sectors.

The regulatory framework plays a critical role in shaping the interaction between informal and formal sectors, influencing the prevalence of informality and its impact on the broader economy. For instance, strict labour regulations, high tax burdens, and complex bureaucratic requirements often drive companies and workers to operate outside the formal economy to avoid regulatory costs. These barriers contribute to the expansion of the informal sector, which can impede overall economic growth and reduce tax revenues. In summary, the IE sector represents a challenge and an opportunity for both developing and developed countries. Through specific fiscal interventions that promote integration and offer support frameworks, the potential for mutually beneficial relations between informal and formal economies can be realised. As indicated by existing studies, the effective participation of informal companies within formal structures not only encourages economic growth but also contributes to the fulfilment of social equity and regulatory compliance, paving the way for holistic approaches to economic development.

3. METHODOLOGY

I estimated a growth model using the Autoregressive Distributed Lag (ARDL) approach. Thus, the growth model is specified to capture the effect of the IEs on the formal economy. In line with the economic theory, all variables were log-transformed; hence, the model can be expressed mathematically as follows:

$$Lgdppc_t = \lambda_0 + \lambda_1 LIE_t + \lambda_2 Lgfcf_t + \lambda_3 Llabf_t + \lambda_4 Lhexp_t + \lambda_5 Ledu_t + \lambda 6\, Linf_t + \mu_t \quad ....(1)$$

Lgdppc_t represents the GDP per capita at purchasing power parity (PPP), while LIE_t is the informal economy, which is the variable of interest expressed as a percentage of GDP. Using the classical growth framework wherein gross fixed capital formation, $Lgfcf_t$ is taken as a proxy for capital, $Llabf_t$, $Lhexp_t$, and $Ledu_t$ represents the labour force, health expenditure per capita (in PPP), and budgetary allocation to the education sector, respectively. Linf_t is the inflation rate, λ_0 is the intercept, $\lambda_1,\lambda_2,\lambda_3,\lambda_4,\lambda_5,\lambda_6$ are the regression coefficients and μ_t is the error term. Annualized data on these macroeconomic variables are sourced from the World Development Indicator (WDI) for the period 1990 to 2023, except for the informal economy series, which are the estimates of (Asllani *et al.*, 2024; Tonuchi & Idowu, 2020).

To estimate the model and differentiate between the long-run and short-run effects of the informal economy on the formal economy in Nigeria, I estimate equation (1) using the autoregressive distributed lag (ARDL) setup developed by Pesaran *et al.* (1996), and subsequently modified by Pesaran *et al.* (2001). Thus, equation (1) is written as follows:

$$\Delta Lgdppc_t = \delta_0 + \delta_1 Lgdppc_{t-1} + \delta_2 LIE_{t-1} + \delta_3 Lgfcf_{t-1} + \delta_4 Llabf_{t-1} + \delta_5 Lhexp_{t-1} + \delta_6 Ledu_{t-1} + \delta_7 Linf_{t-1} + \Sigma_{i=1}{}^{p}\beta_{1i}\, \Delta Ingdppc_{t-i} + \Sigma_{i=0}{}^{q}\, \beta_{2i}\, \Delta LIE_{t-i} + \Sigma_{i=0}{}^{q}\, \beta_{3i}\, \Delta Lgfcf_{t-i} + \Sigma_{i=0}{}^{q}\, \beta_{4i}\, \Delta Llabf_{t-i} + \Sigma_{i=0q}\, \beta_{5i}\, \Delta Lhexp_{t-i} + \Sigma_{i=0}{}^{q}\, \beta_{6i}\, \Delta Ledu_{t-i} + \Sigma_{i=0}{}^{q}\, \beta_{7i}\, \Delta Linf_{t-i} + \mu_t \quad ....(2)$$

Where, δ_0 is the constant, δ_k represents the short-term dynamics, and β_k means the long-term coefficients. Thus, the ARDL approach requires all variables to be integrated of order zero (1(0) and one (1(1)), but not of order two (1(2). The Augmented Dickey-Fuller and Phillips and Perron tests were carried out to ensure that all variables are integrated of order one 1(1) in the growth model. Furthermore, the lag length for each variable is determined using the Akaike information criterion (AIC), assuming a maximum lag length of 2 lags. To establish cointegration among the variables in Equation (2), the author employs the bounds cointegration approach proposed by (Pesaran *et al.*, 2001).

I apply the F-statistic test of the joint null hypothesis of no cointegration H_0: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq 0$ against the alternate hypothesis of the existence of cointegration $H_1 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = 0$. Under the bounds testing methodology, cointegration among the variables in the model is indicated when the calculated F-statistic exceeds the upper critical bound. Conversely, if the F-statistic falls below the lower critical bound, it suggests that no cointegration is present. However, when the value is situated between the upper and lower critical bounds, the outcome cannot be definitively determined.

Thus, once cointegration is established among the variables, then the long-run impact of the informal economy on the formal economy can be computed by $-\delta_2/\delta_1$. Thus, the short-run effect can be captured by $\Sigma_{i=0}{}^{q}\beta_{2i}$. The variables Lgfcf,Lhexp,Llabf,and Ledu are anticipated to have a positive impact in the long run, whereas Linf is expected to influence the growth of the formal economy negatively.

4. RESULTS AND DISCUSSION

The results from the Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests for unit root are shown in Table 1 below, thus indicating that all variables are I(1). This means I can apply the ARDL bounds testing approach for the estimations. Furthermore, the comprehensive ARDL estimates, along with the bounds test for cointegration, are presented in Table 2 below. The table illustrates the impact of the informal economy, also known as the shadow economy, on the formal economy. It makes a clear distinction between long-run (LR) and short-run (SR) relationships. The LR coefficients highlight the persistent/structural effects, while the SR coefficients capture temporary effects related to adjustments. It is observed that the significance levels are marked (*p < 0.1, **p < 0.05, ***p < 0.01).

Table 1. Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests

Variables	ADF		PP		Decision
	Levels	**1st difference**	**Levels**	**1st difference**	
GDP	0.841	-3.056	-0.593	-3.028	1(1)
	(0.778)	(0.040)	(0.859)	(0.043)	
IE	2.501	-2.910	-1.373	-7.200	1(1)
	(0.126)	(0.054)	(0.583)	(0.000)	
LabF	1.677	-0.816	0.316	-0.766	1(1)
	(0.999)	(0.042)	(0.976)	(0.034)	

GFCF	0.923	-10.631	-2.497	-11.198	1(1)
	(0.767)	(0.000)	(0.125)	(0.000)	
HEA	2.428	-5.086	-2.969	-5.086	1(1)
	(0.147)	(0.001)	(0.055)	(0.001)	
EDU	3.979	-8.943	-3.807	-9.065	1(1)
	(0.089)	(0.000)	(0.067)	(0.000)	
INF	2.425	-4.745	-2.712	-4.687	1(1)
	(0.143)	(0.001)	(0.083)	(0.001)	

Source: Author's own calculations

An R^2 value of 0.7995 indicates that the model accounts for about 80 percent of the variations in the formal economy, which is quite impressive. Additionally, the co-integration test supports the existence of a long-run equilibrium (the F-statistic of 6.979 exceeds the upper bound critical value) relationship between informal and formal economies. The analysis reveals an adjustment coefficient of -0.193 (p = 0.014), indicating that deviations from the long-term equilibrium are corrected by 19 percent per period. This implies that the system can recover to a steady state relatively quickly in response to shocks. As expected, the long-run coefficient is 0.3848 (p = 0.000), indicating that the informal economy has a positive impact on the formal economy. In contrast, the short-run coefficient is -0.0322 (p = 0.552), suggesting an adverse effect on the formal economy. The IE often undermines public finances by eroding the tax base and creating regulatory gaps. Additionally, there's the challenge of unfair competition and compliance risks; formal businesses that pay taxes, adhere to standards, and provide protections find themselves competing against untaxed and unregulated rivals, which can squeeze their profit margins and deter growth. In Nigeria, while informality can serve as a safety net for employment and income during tough times, as macroeconomic stability, infrastructure, and market access improve, some segments of the informal economy gradually shift towards becoming formalized.

Table 2. Effect of the informal economy on the formal economy

	Variable	Coefficient	Std Error	p > t
ADJ	L1.lgdppc	-0.1930417***	0.0728509	0.014
LR	L1.lIE	0.3847932***	0.0412318	0.000
	L1.lgfcf	0.2577078***	0.0287477	0.007
	L1.llabf	0.8051750***	0.1633678	0.000
	L1.lhexp	0.0224408	0.3361014	0.751
	L1.ledu	0.2792043*	0.0738204	0.071
	L1.llnf	-0.0592288**	0.2578895	0.031
SR	L1D.lgdppc	0.3386462**	0.1407229	0.024
	D1.lIE	-0.0322144	0.0534034	0.552
	L1D.	-0.0761555	0.0502292	0.142
	D1.lgfcf	-0.1709532**	0.2473010	0.040
	L1D.	-0.2972352	0.1887422	0.131
	L2D.	-0.1621709**	0.1695779	0.031
	D1.llabf	-0.3573557**	0.1424219	0.026
	L1D.	0.1017248	0.6631112	0.149
	D1.lhexp	-0.0544636	0.0387975	0.179
	D1.ledu	0.2457461***	0.1576872	0.001
	D1.llnf	0.0099715	0.0140918	0.487
	L1D.	0.0405724***	0.0137106	0.007

	L2D.	0.0109332	0.0122316	0.381
	L3D.	0.0131718	0.0128104	0.315
			R^2	0.7995382
	F-Statistics Calculated	Upper Bound Critical value at	Lower Bound Critical value at	Co-integration Exists
		95%	95%	
	6.979	4.04	3.78	

Source: Author's own calculations.
*Notes: * p < 0.1; ** P < 0.05; *** p < 0.01. Dependent variable: D.lgdppc. Number of observations: 32.*

Taking a closer look at the interesting findings from Table 2 above. It reveals that variables such as investment, labour force, health spending, and education funding have a positive impact on the economy in the long run. However, in the short term, their effects on the formal economy are adverse. In contrast, while inflation tends to hurt the formal economy in the long run, it can have a positive impact in the short term. These patterns are plausible for Nigeria, especially considering issues such as financing frictions, mismatches in skills and capacity, and the lagged nature of human capital returns, while persistent inflation can hinder long-term growth.

Investment is positive and significant in the long run, at 0.258, but negative and significant in the short run, at 0.171. Thus, a one percent increase in investment size is associated with a 0.258 percent increase in formal GDP per capita in the long run, but a 0.171 percent decrease in the short run. This suggests that shocks to investment may temporarily hinder growth. Furthermore, the results reveal that a one percent increase in the size of the labour force is associated with a 0.805 percent increase in long-term formal economic growth. In comparison, a 0.357 percent decrease is observed in the short term, possibly due to underemployment or absorption limits.

Similarly, education spending is positive and marginally significant in the long run but highly significant in the short run, thus revealing that education spending yields immediate benefits in the economy. Conversely, a one percent decrease in inflation is associated with a 0.059 percent decrease in formal GDP per capita, suggesting that excessive reliance on informal finance may crowd out or destabilize the growth of the formal economy in the long run. The effect of health expenditure is insignificant, indicating that public health spending does not have a clear long-term growth impact in the model.

When public investment is funded domestically, it can end up crowding out private credit because banks often prefer to lend to the government. This situation can drive up borrowing costs and put pressure on formal businesses. However, once those projects (such as power, roads, and logistics) are operational, they can boost productivity and output in the formal economy, provided the investment is made efficiently. A sudden increase in the labour force can lead to more people taking on low-productivity informal jobs if there's weak demand in the formal sector or if their skills don't align with the available formal positions. Nigeria's own assessments point out these skill mismatches and the prevalence of low-productivity household enterprises in the short term. However, in the long run, with the right skills and effective job-matching systems, a larger labour force can become a genuine demographic advantage for the formal economy.

Health spending can initially shift fiscal resources with limited productivity effects; inefficiencies and execution delays can add a short-term lag. In the long run, however, investing in health boosts worker productivity and participation. In Nigeria, for instance, there is evidence that higher public health spending leads to better outcomes (Awoyemi *et al.*, 2023; Iyakwari *et al.*, 2023; Oladosu *et al.*, 2022) like lower infant mortality rates and longer life expectancies, which aligns with the global trend of growth benefits. In the short term, education spending has a long gestation period. While students are busy learning, they are not part of the workforce, and funds are diverted from immediate economic needs. However, in the long run, robust investment in education shows a strong connection to growth and the development of the formal economy, as building human capital enhances productivity, wages, and the ability to absorb more workers in formal jobs.

In the short run, a rise in inflation might seem like a good sign for formal business activity, as prices adjust and some companies might clear out their stock and pay off debts at a lower real cost. However, persistent high inflation erodes real incomes, deters investment, and stifles long-term growth. These findings align with Nigeria's realities: while investment and spending on human capital can struggle in the short run if financing and execution are not robust, they tend to pay off in the long run. Inflation may provide a temporary boost, but it can harm the formal economy in the long run (Ayeni & Omobude, 2018; Badiru, 2016; Gwaison *et al.*, 2021; Mejebi *et al.*, 2023; Nwobia *et al.*, 2023).

To give a clearer picture of Table 2, in Figure 2 below (effects of the informal economy and macroeconomic variables on the formal economy), I assign these variables to their respective long-run (LR) and short-run (SR) coefficients from the table and plot them side by side. Thus, this way, I can visually compare their effects. The blue bars represent the Long-run (LR) effects, while the red bars show the Short-run (SR) effects, making it easy to see the differences in magnitude and direction between the two horizons.

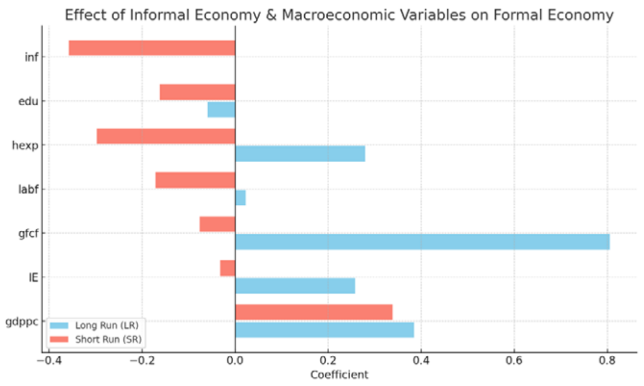

Figure 3. Effect of informal & macronomic variables on economy.
Source: Author's computation

5. CONCLUSION

The results of this study provide a substantial understanding of the interaction between the informal economy and the formal economy in Nigeria. The study employed the autoregressive distributed lag (ARDL) bounds testing framework to investigate both the short-run and long-run effects of informality on formal economic growth. The simulation also accounted for the impact of IE activities on GDP per capita as reported in national statistics. The study suggests that the informal economy serves a dual function: it yields a considerable and positive effect on the formal economy over the long run, but its short-run consequences are adverse and lack statistical significance. The dual nature of informality highlights the complexity of informal economies in Nigeria and other developing countries.

From a structural perspective, the long-term positive effects highlight the informal economy as the hidden engine of growth. That is because it absorbs a significant portion of the workforce, creates entrepreneurial opportunities, and boosts demand for goods and services that benefit formal businesses. Data show that as informal activities become more stable over time, they contribute to improvements in investment, education, health, and labour participation. The IE is therefore not merely a secondary form of employment, but a critical system that provides livelihoods and supports the resilience of the broader economy in periods of economic downturns. In Nigeria, where the informal economy accounts for over half of the GDP and the majority of jobs, this is even more true. The sector serves as a crucial safety net for millions who might otherwise face unemployment, helping to mitigate the social costs associated with joblessness.

Yet, the short-run dynamics tell a less promising tale, signalling some real challenges. Results from the adverse short-run effects of informality mean that informal activities can retard the performance of the formal economy. This occurs through tax evasion, regulatory gaps, unfair competition, and ineffective implications of human capital. Informal enterprises are typically constrained by difficulties in accessing financial capital, labouring with low productivity technologies, and dealing with uncertain income opportunities, which preclude them from being potential contributors to a more sustainable development in the short run. In addition, as labour and capital increasingly move to the informal sector, tax revenue can also decline – leaving governments unable to provide basic public services. These insights are consistent with theoretical models, for example, the Lewis dual economy model, in which the IE is perceived as a sanctuary for the underemployed.

The study also has an additional main implication, which is the heterogeneous influence of other macroeconomic factors. Investment, labour force expansion, education, and health expenditure are found to be positively related to the formal economy in the long run, while they have adverse short-run effects. This difference indicates that investment in human and physical capital, although it ultimately raises productivity, takes time for the benefits to materialize. In the short run, inefficiencies, fiscal crowding-out, and skills-mismatch can slow economic activity before the long-run benefits of growth are felt. On the other hand, one may also argue that inflation can provide a temporary boost. Still, it ultimately leads to adverse long-term effects, as it erodes incomes, discourages investments, and undermines macroeconomic stability.

These nuanced findings provide further evidence that the informal economy should be viewed as more than just an evil to be eradicated, but as a multifaceted ecosystem characterized by both opportunities and barriers. The evidence suggests that attempting to eliminate informality outright may be counterproductive, as it could damage people's livelihoods, exacerbate inequality, and foster bureaucratic corruption in weak institutional contexts. Instead, effective policy should seek to gradually integrate informal activities with the formal economy with the real help of institutional reforms, improved infrastructure, and broader-based financial systems.

In the context of Nigeria, these findings provide valuable insights. These levels of dependency on informality as a cushion to absorb shocks (from unemployment or poverty) lay bare the issue of public policy design. The immediate challenges highlight the need for targeted support to reduce inefficiencies, while the long-term benefits identify policies that enhance the strengths of the IE as an engine of formal growth. Ultimately, this study reinforces the fact that sustainable development in Nigeria cannot be achieved without a balance of implementing short-term policies to reduce distortions and medium- to long-term policies capable of capitalizing on the growth potential of the informal economy.

Beyond Nigeria, the implications align with experiences of developing or transition economies with high levels of informality. The uneven implications explored here support the argument that informality has a twin character. Recognizing its role as both a stabilizer and a constraint can help reframe the discussion from one of elimination to that of integration and reforms. Using a robust methodological technique such as ARDL, the current study demonstrates that distinguishing between short-run and long-run effects when examining informal economies is crucial. The approach of simulating GDP results with an informal economy boost also provides a more comprehensive view of national economic performance.

In conclusion, this study shows that the IE in Nigeria presents both challenges and opportunities. Its long-run payoffs reveal a treasure trove of untapped capacity to foster inclusive growth. At the same time, the short-term constraints underscore the pressing need for institutional reforms, enhanced governance, and targeted investments. Instead of treating informality as necessarily a negative perspective, we must affirm it as a crucial characteristic of the development process, one that demands pragmatic, nuanced, and contextualized policies.

RECOMMENDATIONS

The findings from this study have important implications for policymakers in Nigeria and other developing countries plagued by entrenched informal economies. The results reveal that, even though the informal economy can have positive long-term effects on the formal economy, it may also bring short-term problems. This implies that policies should be approached in a two-horizon manner: they must address short-run distortions while leveraging the long-run growth opportunities that informality offers. To achieve this, policy interventions must strike an appropriate balance among inclusiveness, institutional reforms, and structural investment, such that the informal economy becomes a positive partner in formal development.

i. Macroeconomic management and stabilization: The study suggests that in the long run, inflation may be a destabilizing force, even if it appears to offer some short-run benefits. Long-term inflation is dematerialising formal growth by eroding purchasing power and discouraging investment while perpetuating uncertainty. Hence, Nigerian policymakers should prioritise the pursuit of macroeconomic stability through inflation targeting. Therefore, a credibility-based anti-inflation strategy should be introduced, with clear communication to manage public expectations in the CBN's mission to sustain price stability.

Fiscal discipline is imperative to avoid excessive government borrowing, which can crowd out private investment. Nigeria must consolidate its fiscal policies by streamlining subsidies, boosting non-oil revenue streams, and ensuring spending efficiency to stabilize mounting debt levels and ease inflationary pressures plaguing the economy. Moreover, exchange rate reforms are exigent. Multiple exchange rates and acute foreign currency shortages disrupt both formal and informal economies, allowing for rampant arbitrage and undermining trade stability. A unified market-based exchange rate regime can minimize speculation while helping to stabilize commerce across industries.

ii. Labour market and human capital development: The findings suggest that while growth in the labour force, spending on education, and health expenditures may have adverse effects in the short term, they contribute significantly in the long run. This implies that investing in human capital can be expensive initially and may divert resources from immediate needs, but over time, it boosts productivity, increases wages, and helps absorb more people into formal employment. These can be achieved through targeted skills development, as it is essential to address the gap between the skills needed in the formal economy and those possessed by informal workers. Expanding vocational training, apprenticeships, and digital literacy programs can facilitate the transition of informal workers into higher productivity roles.

Furthermore, education financing efficiency, rather than focusing on how much is spent, Nigeria should prioritize improving the quality of education, which includes reforming curricula, enhancing teacher training, and establishing accountability measures to ensure that education leads to better job opportunities. Health system strengthening; the public health spending should prioritize preventive care, maternal and child health, and universal health coverage. By minimizing productivity losses due to illness, investments in health can help amplify the long-term benefits identified. These strategies will help alleviate short-run inefficiencies in human capital investments while maximizing the long-run demographic dividend.

iii. Integrating both informal and formal economies: The complex interplay between informality and formality highlights the need for gradual, rather than abrupt, integration of the two economies. To motivate informal operators to transition into the structured economy, the government should enact regulations that reduce the costs of formalization and offer genuine incentives, such as simplified business registration through streamlined digital systems that minimize operational costs and bureaucratic red tape. Another possible incentive could be tax breaks and thresholds tailored to micro and small-scale enterprises. Establishing progressive taxation systems that exempt the smallest ventures or offer preliminary tax holidays would encourage formalization while continuing to support modest entrepreneurs in their starting stages.

Microcredit, mobile banking, and cooperative loans can expand access to capital for informal enterprises wishing to evolve. Such financing options may enable marginal operations to modernize equipment and practices, enhancing productivity. Meanwhile, registration can connect underground workers to beneficial social programs, including health plans, retirement funds, and financial support in times of need. By linking registration with very real rewards, the idea of formalization becomes more palatable. Therefore, by appropriately incentivizing the transition from an off-the-books existence driven by bare survival needs to a legitimate pathway towards improved standards of living, Nigeria may gradually draw its informal market participants into the formal economy and tax base.

iv. Institutional and governance reforms: Weak institutions and regulations magnify the short-run costs of informality. Thus, strengthening governance is crucial to reaping those positive long-run gains. These advantages include anti-corruption measures, decentralized governance, and improvements in judicial and property rights. Entrepreneurs in the informal sector often avoid the formal system to evade rent-seeking bureaucrats. And so, by increasing transparency, reducing the discretion of regulators, and digitizing the platforms for permits and taxes, these measures will help to reduce corruption.

Providing local governments with the necessary resources and accountability will enable policies to be better tailored to the realities of informal workers nationwide. In addition, entrepreneurs may be motivated to formalize, invest more, and seek more formal partners if they have secure property rights and access to effective dispute resolution. Better institutions do more than mitigate adverse short-term effects; they also provide a stronger platform for the informal economy to coexist alongside formal businesses.

v. Boosting infrastructure and productivity: The results suggest that although investment may be associated with an initial reduction in private credit, once infrastructure projects are completed, they drive up productivity and formal economic activity. These can be made possible through efficient project implementation, Public-private partnerships (PPPs), and linkage of rural and urban areas. Utilizing private funding for infrastructure projects can ease fiscal pressures and mitigate crowding-out effects. Informal activities are prevalent in urban and peri-urban economies. Thus, enhancing logistics, market access, and energy reliability will directly improve productivity in both sectors. Strategic investments in infrastructure enable informal businesses to move up the value chain, thereby establishing stronger connections with the formal economy.

vi. Long-term vision: from informality to inclusive growth: The lesson here is not to eradicate the informal economy but to harness it as a valuable partner toward inclusive development. Thus, short-run disruptions should be addressed through macroeconomic stabilization, enhancing skills, and efficient investments. Meanwhile, long-term strategies should prioritize financial inclusion, institutional reforms, and a gradual move toward formalization. By embracing this dual-horizon approach, Nigeria can transform the informal economy into a launchpad for a more diverse, resilient, and inclusive economy.

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