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Asymmetric Analysis of Causal Relations in the Informality–Globalisation Nexus in Africa

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Abstract: This study examines the causal relationship between informality and globalisation in 30 African countries. It deviates from traditional research by adopting a bi-directional framework to address reverse causality. By applying the DH causality method in both linear and nonlinear frameworks, this research challenges the assumption of a linear relationship and finds that the causal structure is better explained within a nonlinear asymmetric context. This paper provides recommendations based on the identified causal relationships. For countries in which globalisation leads to informality, such as Angola, Congo, Guinea, Gambia, Mozambique, Sierra Leone, Tunisia, Tanzania, Uganda, Zambia, and Zimbabwe, the paper suggests policy measures to integrate the informal sector into the formal economy. These measures include designing programmes to facilitate transition, implementing skill development initiatives, and establishing support mechanisms for entrepreneurship and small businesses. Additionally, this paper advises the development of social safety nets, improved market access, effective monitoring and regulation mechanisms, education on the benefits of globalisation, and international cooperation. For countries experiencing positive shocks from informality to globalisation, this paper recommends targeted support programs for entrepreneurship, initiatives to formalize the sector, the enhancement of market access, and skill development tailored to the needs of the informal sector. These policy recommendations aim to capitalize on the positive shocks in informality by fostering entrepreneurship, formalization, market access, and skill development. In the case of negative shocks in globalisation leading to positive shocks in informality, the paper suggests implementing resilience-building policies for the informal sector during economic downturns, establishing social safety nets, and adopting flexible labour policies.

Keywords: informal sector; globalization; Africa; asymmetric causality

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1. Introduction

In recent years, scholars in developing economies have dedicated significant attention to examining the intricate connection between informality and globalisation (Ajide and Dada 2023; Bolarinwa and Simatele 2024). The scholarly discourse surrounding globalisation primarily revolves around its impact on economic development. Proponents of globalisation argue that it stimulates economic growth by expanding market reach, attracting foreign direct investment (FDI), and facilitating the transfer of knowledge and technology. Enhanced trade and investment create job opportunities, improve productivity, and contribute to overall economic advancement (Gorodnichenko et al. 2010; Dau et al. 2017; Bolarinwa and Simatele 2024). Advocates also contend that globalisation plays a role in reducing poverty by generating employment and elevating living standards through specialization in areas of comparative advantage (Nguyen Canh et al. 2021). Nevertheless, critics assert that the benefits of globalisation are unevenly distributed, resulting in heightened income inequality within developing countries (Andreas 2011; Hopper et al. 2017). Furthermore, they highlight the potential for labour and resource exploitation, as well as the vulnerability of developing economies to global economic fluctuations. Additionally, critics argue that globalisation can exacerbate poverty, particularly when

traditional industries are displaced or when benefits are concentrated in specific sectors, thereby marginalizing others, especially in the informal sector.

Conversely, the informal sector has elicited a range of perspectives in the development literature. Supporters emphasize the substantial employment opportunities provided by informality in developing countries, serving as a coping mechanism for individuals lacking access to formal employment (Bellakhal et al. 2024; OECD 2023; Canh et al. 2021). Informal businesses often demonstrate entrepreneurialism and dynamism, promoting innovation and filling gaps in the formal sector. Informal employment also serves as a crucial avenue for the inclusion of marginalized groups, such as women, youth, and migrants, in the labour force (Galdino et al. 2023). However, detractors argue that informal employment is characterized by low wages, job insecurity, and limited access to social protection, providing individuals with meagre incomes and unstable livelihoods. They contend that informality poses obstacles to broader economic development efforts by evading regulations and taxes, and informal businesses encounter barriers in expanding operations and accessing formal financial systems, thereby constraining their potential contributions to the overall economy (Bolarinwa and Simatele 2024; Chletsos and Sintos 2021; Bellakhal et al. 2024).

Consequently, the informal sector is widely regarded as a significant obstacle to economic development. Furthermore, the existing body of literature on the relationship between globalisation and informality has primarily concentrated on the effects of globalisation on informality, as evidenced in Hanh (2011 previous studies (See Todaro 1992; Verick 2006; Carr and Chen 2002; Hanh 2011; Meagher et al. 2016; Siggel 2010; Pham 2017; Berdiev and Saunoris 2019; Bellakhal et al. 2024)). Employing a theoretical framework, numerous studies have explored the relationship between globalization and informality. Hanh (2011) utilized Bayesian Model Averaging and focused on 34 developing economies, concluding that globalization correlates positively with informality. Notably, various components of globalization—such as trade integration, trade reforms, de jure financial openness, and social globalization—are influential in determining the size of the informal sector. Carr and Chen (2002) investigated the linkages between globalization and informality, with a particular focus on women workers and producers in the developing world, especially within African economies. Their research determined that globalization enlarges the informal sector, disproportionately affecting women workers and producers.

Similarly, Verick (2006) examined this relationship, placing a special emphasis on African economies and the plight of women workers. The study recommended that African policymakers implement measures to provide social and employment security for women to shield them from the adverse effects of globalization. Meanwhile, Meagher et al. (2016) analysed the repercussions of COVID-19 on the informal sector, paying close attention to institutional, infrastructural complexities, and the dynamics of contemporary market economies. Similarly, Siggel (2010) explored the failures of the formal market that drive labour towards the informal sector, thereby elevating poverty levels. Analysing Indian economic reforms in the 1990s, Siggel concluded that the existing theoretical model does not fully apply in India, as the growth of the informal sector there is driven by an increase in both labour demand and supply—through outsourcing, skill transfer, and the emergence of new enterprises.

A recent work by Bellakhal et al. (2024) evaluated both formal and informal markets within autarkic and open economic frameworks. The study hypothesized that, depending on the level of social contributions, globalization could both increase and decrease the size of informality. Specifically, globalization is posited to increase informality at low and high levels of social contributions but decrease it at intermediate levels.

Few recent empirical studies have also addressed this nexus. Berdiev and Saunoris (2019) examined informal entrepreneurship using cross-sectional data, OLS, and instrumental variable techniques across 60 developed and developing economies. Their findings suggest that globalization substantially reduces informal entrepreneurship. Pham (2017) utilized Bayesian Model Averaging to investigate the nexus within a sample of 50 developing countries from Latin America, Africa, Asia, and Central and Eastern Europe between 1990 and 2010. The

results identified a set of potential covariates and a subset of globalization indicators with high inclusion probabilities in the informality model. One major observation from this literature review is that research on the nexus between globalization and informality is nascent, with most studies focusing predominantly on the effects of globalization and largely overlooking the reciprocal impact of informality on globalization. This study employed a dynamic causal framework to provide a balanced analysis of the nexus.

Asides from the literature, the connection between globalisation and informality is intricate and multifaceted, characterized by mutual influence and interdependence. To obtain a more comprehensive understanding of this connection, it is crucial to analyse the nexus within a causal framework, considering the complex interconnectedness that underlies it. Specifically, the question arises as to whether globalisation impacts informality. Conversely, can informality, in turn, affect globalisation? Addressing the former question reveals that globalisation can exacerbate the vulnerabilities inherent in the informal sector. This exacerbation can arise from the erosion of labour standards, increased competition, or exposure to global shocks. African economies experiencing economic restructuring due to a decline in comparative advantage often face job displacement and a rise in informal employment as individuals seek alternative sources of income (Bolarinwa and Simatele 2024; Bellakhal et al. 2024).

Consequently, individuals often turn to the informal sector to sustain their livelihoods when confronted with economic challenges or unemployment resulting from globalisation. The informal sector provides expeditious and adaptable employment opportunities, particularly in regions with limited formal job prospects. As a result, structural changes often lead to the expansion of the informal sector due to labour market dysfunction. Furthermore, globalisation presents opportunities for regulatory arbitrage, where businesses exploit discrepancies in labour regulations and standards between countries. This practice can result in increased informal employment, as companies seek to evade compliance with formal labour market regulations. Moreover, globalisation frequently coincides with technological advancements that disrupt and surpass local technologies, leading to automation and technological changes that displace workers from formal sectors and direct them towards informal work, which is typically less impacted by these transformations.

Additionally, policy responses to globalisation can inadvertently foster the growth and expansion of the informal sector. For instance, recent austerity measures and labour market reforms in African economies, aimed at enhancing competitiveness, may undermine labour protections and potentially stimulate a surge in informal employment. Furthermore, globalisation often exacerbates income inequality, with certain population segments benefiting more than others. As formal employment opportunities become concentrated in specific sectors or regions, those excluded may turn to informal work as a means of subsistence.

Conversely, globalisation can engender new opportunities for informal workers and spur the growth of informal labour demand. This can occur through participation in global value chains, such as subcontracting, outsourcing, or digital platforms. In certain cases, formal businesses may outsource specific tasks to informal or unregulated entities to reduce costs. Consequently, this can result in informal employment arrangements and a lack of job security for workers in the formal sector. Conversely, the prevalence of the informal sector in developing countries reflects the absorption level of globalisation in African economies. Developing countries with a substantial informal sector may offer lower labour costs compared to countries with a more formalized labour market. This cost advantage can make these countries appealing to multinational corporations seeking to reduce production expenses, thereby intensifying globalisation and the outsourcing of certain activities to regions with lower labour costs. Can informality play a role in explaining the absorption of globalisation in African economies? Indeed, informal sectors can contribute in various ways. First and foremost, informal sectors often demonstrate a higher level of adaptability and flexibility compared to formal sectors. This allows businesses operating in the informal sector to easily adjust to the changing conditions of the global industry. This adaptability can attract global players who are seeking agile partners or suppliers, particularly in

African economies with low costs. As a result, this enhances the absorption of globalisation. Furthermore, African economies with a significant informal sector may also play a role in global value chains, especially in industries where informal activities are prevalent. This further contributes to the attraction of globalisation.

Moreover, globalisation involves the integration of various production stages across different countries. In some cases, informal sectors can function as integral components of these global value chains. Informality may also arise due to market dynamics and the presence of a substantial informal consumer base. This captures the interest of global enterprises who are seeking to explore local consumer markets. Therefore, the degree of informality in an economy can greatly influence the attraction of global enterprises, ultimately leading to a higher level of globalisation. There is evidence to suggest a bidirectional causal relationship between globalisation and informality (Pham 2017; Petrova 2019). The nature and direction of this relationship, however, depend on various factors and contexts. As a result, a more nuanced and comprehensive analysis is required to fully understand the dynamics and implications of the relationship between globalisation and informality in different sectors and regions within the realm of economic development.

In African economies, this relationship may be influenced by the stage of economic development and income level. Middle–high-income African economies, such as South Africa, Gabon, and Namibia, demonstrate a noticeable absorption of globalisation and a low level of informality (Blanton et al. 2018). This can be attributed to factors such as diverse economies, high levels of industrialisation, extensive access to global markets, and policies and initiatives aimed at formalising and regulating economic activities. Consequently, government efforts to enhance labour market regulations and standards may result in a reduction in the size of the informal sector. The relationship between the size of the informal sector and income level plays a significant role in understanding this phenomenon. In high-income African economies, specialisation in specific industries and participation in global value chains lead to the close integration of the formal sectors with the global economy (Elgin and Oztunali 2012; Bolarinwa and Simatele 2022). On the other hand, areas that are less affected by globalisation tend to have a higher prevalence of informal sectors. As a result, the size of the informal sector, its regulation, and its connection to globalisation may exhibit distinct characteristics in high-income economies. Additionally, high-income African economies are better equipped to adopt and adapt to advanced technologies, potentially reducing the prevalence of informal labour in certain sectors.

Conversely, low-income African economies encounter unique challenges regarding the interplay between globalisation and informality. These challenges stem from limited access to global markets, infrastructure constraints, and trade barriers. These circumstances result in the dominance of the informal sector, as low levels of participation in global trade prevail. Subsistence agriculture and informal activities in rural areas play a substantial role in these economies. Globalisation indirectly impacts these sectors, and informality persists due to a scarcity of alternative opportunities. Within these economies, the informal sector serves as a vital survival strategy for individuals facing limited prospects for formal employment. Consequently, the relationship between globalisation and informality in African economies varies in accordance with different contextual factors. Such factors include economic development, governmental policies, and the nature of economic activities, all of which contribute to shaping this relationship.

Therefore, it is imperative to consider the specific circumstances and challenges faced by each individual country when studying the interaction between globalisation and informality. This comprehensive understanding is necessary to grasp the dynamic and multifaceted nature of this phenomenon. The present study primarily focused on a country-specific analysis of the globalisation–informality nexus, with particular emphasis on policy responses to shocks within this relationship. This analysis encompasses examining the impact of increases or decreases in the size of the informal sector (indicating positive or negative shocks) and increases or decreases in the absorption of globalisation in individual economies. Following the Introduction, Section 2 provides a literature review that encom-

passes theoretical and empirical perspectives. Section 2 elucidates the methodology, while Section 3 presents the empirical results. Finally, the study concludes with Section 4, which offers recommendations and conclusions.

2. Methods and Data

2.1. Empirical Model

This subsection is dedicated to discussing the models utilized for the preliminary analyses. These tests play a crucial role in revealing the characteristics of the data and guiding the selection of suitable estimation techniques. Specifically, the paper adopts cross-sectional dependence, the slope homogeneity test, the panel unit root, test and the causality test. Also, it employs the Granger non-causality test (Dumitrescu and Hurlin 2012), following extant studies (Hatemi-J 2020a; Hatemi-J and El-Khatib 2016, 2020; Hatemi-J et al. 2017; Ikhsan et al. 2022; Olaniyi 2020; Olaniyi and Olayeni 2020). This panel causality test uses a block bootstrapping method to generate robust critical values that consider both cross-sectional dependence and individual variations among countries. The causality model is specified as follows:

$$glob^{+}_{i,t} = \propto_{1i} + \sum_{k=1}^{K} \pi^{(k)}_{1\mathrm{i}} glob^{+}_{\mathrm{i},t-k} + \sum_{k=1}^{K} \beta^{(k)}_{1\mathrm{i}} inf^{+}_{\mathrm{i},t-k} + \mu^{+}_{1\mathrm{i,t}} \quad (1)$$

$$inf^{+}_{i,t} = \propto_{2i} + \sum_{k=1}^{K} \pi^{(k)}_{2i} inf^{+}_{\mathrm{i},t-k} + \sum_{k=1}^{K} \beta^{(k)}_{2i} glob^{+}_{\mathrm{i},t-k} + \mu^{+}_{2i,t} \quad (2)$$

where $i = 1, \ldots, N$ is the number of cross-sectional units, and $t = 1, \ldots, T$ stands for the time covered in the study. $glob_{i,0}$ and $inf_{i,0}$ are the initial values of both globalisation and informality, respectively. Error terms are defined as $\varepsilon_{1i,j}$ and $\varepsilon_{2i,j}$. The positive shocks' components of globalisation and informality are defined as $\varepsilon^{+}_{1i,t} = \max(\varepsilon_{1i,t}, 0)$, and $\varepsilon^{+}_{1i,t} = \max(\varepsilon_{2i,t}, 0)$, respectively. Also, the negative shocks' components of these variables are defined as follows: $\varepsilon^{-}_{1i,t} = \min(\varepsilon^{-}{}_{1i,t}, 0)$, $\varepsilon^{-}_{1i,t} = \min(\varepsilon^{-}{}_{1i,t}, 0)$. Thus, $\varepsilon_{1i,t} = \varepsilon^{+}_{1i,t} + \varepsilon^{-}_{1i,t}$, and $\varepsilon_{2i,t} = \varepsilon^{+}_{2i,t} + \varepsilon^{-}_{2i,t}$. Consistent with these definitions are the partial cumulative sums of the positive shocks of the variables. For a further description of process of DH causality within the asymmetric framework, please see (Hatemi-J 2020a, 2020b; Olaniyi 2020; Olaniyi and Olayeni 2020; Olaniyi and Ologundudu 2022; Olaniyi and Odhiambo 2024).

2.2. Data, Measurements, and Sources

This study utilized data obtained from 30 sub-Saharan African countries during the period from 1990 to 2018, considering data availability, as only these countries have data. The countries included in the analysis were categorized into three groups based on the income classifications established by the United Nations: high–middle-income countries (USD 3896–USD 12,055), lower–middle-income countries (USD 996–USD 3896), and lower-income countries (USD 996 or lower). For a comprehensive list of the countries included in the study and the data sources utilized, please refer to Tables 1 and 2.

Table 1. Countries adopted in the study.

High–Middle-Income Countries (USD 3896–USD 12,055)	Lower-Middle-Income Countries (USD 996–USD 3896)	Lower-Income Countries (USD 996 or Lower)
Gabon, Namibia, Tunisia, and South Africa.	Angola, Cameroon, Congo, Cote d'Ivoire, Ghana, Kenya, Nigeria, Madagascar, Guinea-Bissau, and Zambia.	Burkina Faso, Democratic Republic of Congo, Ethiopia, Gambia, Liberia, Malawi, Mali, Mozambique, Niger, Senegal, Tanzania, Togo, Sierra Leone, Uganda, and Zimbabwe.

Source: UN Economic Grouping (2023).

Table 2. Data, sources, and measurements.

Variables	Measurement	Sources
KOF Globalisation Index	Aggregate measure of globalisation covers all attributes of globalisation: economic, social, information, cultural, and political globalisation. The index varies between 1 and 100. The higher the globalisation, the closer to 100.	Gygli et al. (2019)
KOF Economic Globalisation Index	Economic globalisation covers two major areas: trade globalisation; involving trade in goods, services, and trade partner diversity; and financial globalisation, including foreign direct investment, portfolio investment, international debt, international reserve, and international income payments. The index varies between 1 and 100.	Gygli et al. (2019)
KOF Trade Globalisation index	This measure comprises trade in goods, trade in services, and trade partner diversity. The index varies between 1 and 100. The higher the globalisation, the close to 100.	Gygli et al. (2019)
Informality	Based on Multiple Indicators–Multiple Causes (MIMIC) model-based estimates of informal output.	Elgin and Oztunali (2012)

3. Empirical Results and Discussion

3.1. Descriptive Statistics, Correlation, Unit Root Cross-Sectional Dependence, and Homogeneity Tests

The empirical analysis begins with a comprehensive examination of the descriptive statistics concerning the key variables within the findings. These descriptive statistics are presented in Table 3. It is evident from the data that the average informality rate in sub-Saharan African countries is approximately 40% and 42% when measured using the DGE and MIMIC approaches to informality, respectively. This indicates that around 40% and 42% of economic activities within the region occur within the informal sector. Additionally, it is worth noting that the African economy with the highest level of informality exhibits 65% of its economic activities happening informally, whereas the economy with the least informality demonstrates a substantially lower percentage, with only 23% of economic activities occurring within the informal sector. Therefore, the analysis reveals a significant disparity between highly informal and least informal economies in Africa. Figure 1 further demonstrates that economies characterized by higher degrees of globalization and lower levels of informal economic activity generally exhibit greater prosperity. Conversely, those with lower levels of globalization and higher informality tend to experience lesser economic success.

Regarding the measures of globalisation, this study examined three measures of KOF globalisation (refer to Table 3 for specific details). The first measure is aggregate globalisation, which encompasses economic, political, social, and informational aspects. The second measure is economic globalisation, focusing specifically on trade in goods, services, and trade partner diversity. Using the measure of aggregate globalisation, Table 3 demonstrates that the average African country has a 45% level of globalisation absorption. In contrast, the country most affected by globalisation shows absorption rates of 71%, 83%, and 90% for overall globalisation, economic globalisation, and trade globalisation, respectively. Similarly, the average rates for economic and trade globalisation in Africa are 47% and 46%, respectively, indicating a deeper integration of economic and trade globalisation compared to other measures in Africa. The presented figure indicates a strong presence of economic and trade globalisation on the continent, as evidenced by foreign direct investment and trade in goods and services with other nations.

Table 3. Descriptive statistics.

Variables	Mean	Std. Dev.	Min.	Max
Overall globalisation	44.5286	9.6951	21.0029	71.0436
Economic globalisation	47.0586	13.3819	14.4378	83.3227
Trade globalisation	45.7554	15.1234	13.7771	89.9983
Informality	42.2631	7.5779	26.4107	63.2959

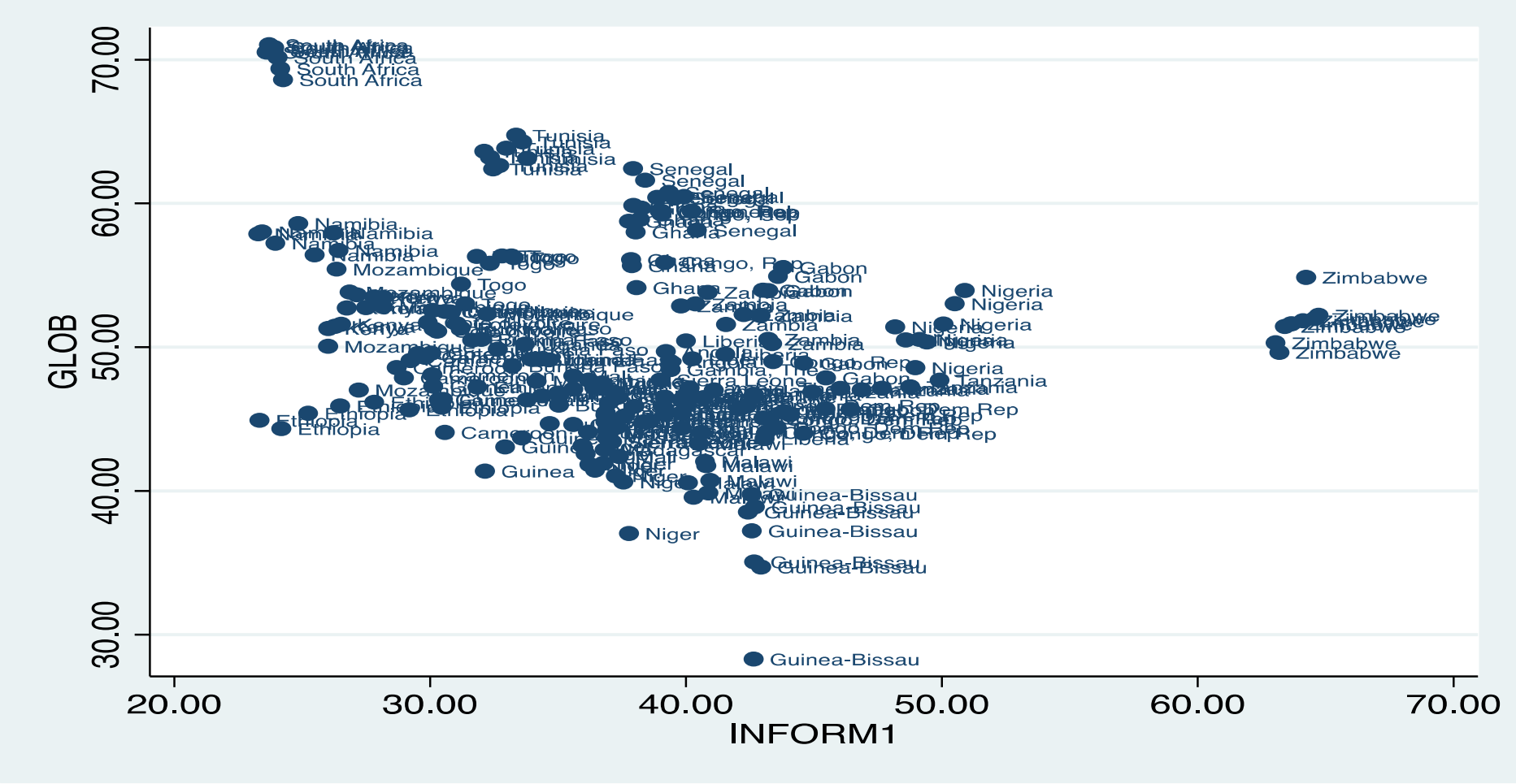

Figure 1. Informality and globalisation in Africa. GLOB on *y*-axis and INFORM1 on *x*-axis represent overall globalisation and informality, respectively, expressed in percentage.

Economically, the descriptive statistics show that the liberalization and deregulation policies implemented by Bretton Wood's institutions in the 1980s have contributed to the integration of the African economy into the global economy. The significant level of inequality in the continent serves as evidence of the high level of informality. On average, countries demonstrate a wide wealth gap of approximately 54%, as shown in Table 3. Considering the high inflation rate prevalent on the African continent, the average African country experiences an inflation rate of 65%. This indicates that even meagre incomes in Africa are significantly eroded by the high inflation rate. The country with the highest inflation rate reports a staggering 23.773%. However, despite the weak social-development indicators mentioned, economic growth in Africa exceeds that of Western and several Asian economies. From 1980 to 2020, the average African population grew by 7%. The low standard deviation suggests that most African countries fall within this range. A major contributing factor to this phenomenon is the weak quality of institutions prevalent on the continent.

As shown in Table 3, the average African country scores poorly in corruption, bureaucracy, democracy, law and order, and political stability. Considering the maximal values attainable, it becomes evident that most African countries have poor institutional quality. Consequently, a significant obstacle to African countries benefiting from globalisation is the substandard quality of institutions on the continent. Additionally, this study aimed to analyse the correlation between the variables under investigation. Moreover, this study examined the unit root properties of the variables. Furthermore, the presence of cross-sectional dependence was explored using four tests: Pesaran (2021), Pesaran et al. (2008), Breusch and Pagan (1980), and Baltagi et al. (2012). The results, presented in Table 4a, indicate that all tests reject the null hypothesis of cross-sectional independence among the economies. This suggests that policies related to globalisation and informality are formulated independently across African economies. Additionally, the presence of slope heterogeneity is assessed using Pesaran and Yamagata's (2008) robust test in the context of cross-sections with heterogeneity. The empirical findings in Table 4b confirm the presence of heterogeneity in slopes. Taken together, these results affirm the presence of cross-sectional independence, heterogeneity in slopes, and unit root stationarity, thus justifying the use of the system GMM, quantile method of moments, and the Dumitrescu and Hurlin (2012) causality tests for the estimation of the nexus.

Table 4. (**a**) Cross-sectional dependence test: Unit Root Test. (**b**) Slope homogeneity test results.

(a)				
Variables	**Breusch–Pagan LM**	**Pesaran Scaled LM**	**Bias-Correlated Scaled LM**	**Pesaran CD**
Overall globalisation	5624.49 ***	175.94 ***	175.44 ***	63.87 ***
Economic global	2722.76 ***	77.56 ***	77.06 ***	6.43 ***
Trade globalisation	2034.76 ***	54.24 ***	53.74 ***	6.94 ***
Informality	5541.37 ***	173.12 ***	172.62 ***	40.96 ***
(b)				
Models			**Test 1**	**Test 2**
$informality = f(Consump,\ Inflat,\ Urban,\ growth,\ Overall\ gobalisation)$			17.79 ***	20.84 ***
$informality = f(Consump,\ Inflat,\ Urban,\ growth,\ economic\ gobalisation)$			20.06 ***	23.51 ***
$informality = f(Consump,\ Inflat,\ Urban,\ growth,\ trade\ gobalisation)$			20.87 ***	24.45 ***
$Globalisation = f(informality)$			34.86 ***	36.68 ***
$informality = f(globalisation)$			18.80 ***	19.78 ***

Note: *** represent 1% significant levels.

3.2. Discussions on Causality Findings

3.2.1. Evidence from Symmetric Causality Framework

To investigate the causal relationship within the nexus, this study employed both linear/symmetric and nonlinear/asymmetric causality approaches from a homogeneous perspective. This choice is based on the recommendation of the dependency and slope

homogeneity test, which enables the identification of country-specific findings for appropriate policy implications. The outcomes of the linear and symmetric causality analyses are presented in Tables 5–7. In these analyses, three different measures of globalisation (i.e., overall, economic, and trade globalisation) are individually applied. Table 5 reveals evidence of a causal relationship from the informal sector to overall globalisation in Cote d'Ivoire, Ghana, Guinea Bissau, Liberia, Mozambique, Malawi, Namibia, Tunisia, and Zambia. This finding suggests that the current size of the informal sector in these economies is influenced by past absorption of globalisation policies (Bolarinwa and Simatele 2024; Pham 2017). The collective engagement of these countries with the global economy significantly impacts their informal economies. Changes in globalisation patterns directly affect the dynamics of informal businesses, self-employment, and non-formal economic activities (Bellakhal et al. 2024). Policymakers should be cognizant of the tangible effects that global economic shifts can have on local informal economies.

Table 5. Granger causality results for overall globalisation–informality nexus.

Overall Globalisation Does Not Granger Informality				**Informality Does Not Granger Cause Overall Globalisation**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	0.0666	0.328	Accept	−0.0753	0.579	Accept
Burkina Faso	−0.0576 **	0.050	Reject	−0.7089	0.121	Accept
Cote d'Ivoire	−0.1002	0.141	Accept	−1.112 **	0.036	Reject
Cameroon	−0.0465 **	0.049	Reject	−0.9404	0.228	Accept
Congo, Rep	0.0206	0.639	Accept	−0.4015	0.188	Accept
Ethiopia	−0.0419 ***	0.005	Reject	−0.0553	0.902	Accept
Gabon	0.0189	0.691	Accept	0.1182	0.667	Accept
Ghana	−0.0643 *	0.062	Reject	−0.5993 *	0.065	Reject
Guinea	−0.0186	0.479	Accept	−0.6463	0.177	Accept
Gambia, The	0.0097	0.825	Accept	−0.0812	0.775	Accept
Guinea-Bissau	−0.0473	0.281	Accept	−1.329 **	0.034	Reject
Kenya	−0.0693 *	0.100	Reject	−0.112	0.570	Accept
Liberia	0.0234	0.804	Accept	0.3430 *	0.069	Reject
Madagascar	0.0647 *	0.077	Reject	0.3871	0.197	Accept
Mali	−0.0484	0.143	Accept	−0.3372	0.385	Accept
Mozambique	−0.0255	0.182	Accept	−1.2522 **	0.045	Reject
Malawi	−0.1373 ***	0.005	Reject	−1.0328 **	0.018	Reject
Namibia	−0.0231	0.333	Accept	−1.7787 ***	0.009	Reject
Niger	−0.0759 ***	0.010	Reject	0.0179	0.969	Accept
Nigeria	−0.0604 **	0.050	Reject	−0.0097	0.984	Accept
Senegal	0.0371	0.260	Accept	0.0651	0.788	Accept
Sierra Leone	−0.1074 **	0.016	Reject	−0.6329	0.287	Accept
Togo	−0.0648 **	0.014	Reject	0.1940	0.708	Accept
Tunisia	0.0133	0.763	Accept	−0.7695 *	0.078	Reject
Tanzania	−0.0859 *	0.077	Reject	−0.1451	0.534	Accept
Uganda	−0.0561 **	0.024	Reject	−0.3415	0.603	Accept
South Africa	−0.0053	0.571	Accept	−0.4253	0.536	Accept
Congo, D Rep	−0.0457 **	0.042	Reject	0.2405	0.305	Accept
Zambia	0.0496	0.491	Accept	−0.3629 **	0.013	Reject
Zimbabwe	0.0379	0.539	Accept	0.0249	0.871	Accept
Panel Result	7.7121 **	0.037	Reject	4.0084 ***	0.0001	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Consequently, when formulating economic policies, authorities should carefully consider how globalisation influences the informal sector. Strategies must be implemented to address the challenges and opportunities posed by global economic trends on local informal enterprises. Achieving a balance between participation in the global economy and support for the growth and stability of the informal sector is essential for promoting sustainable economic development. Ultimately, these findings suggest that the informal economies of these countries are not isolated from the broader global economic landscape. By managing

the impact of globalisation on informal activities, more effective economic policies and development strategies can be formulated. Using economic globalisation as the primary indicator, this study confirms that Angola, Ethiopia, Gabon, Guinea, Guinea-Bissau, Liberia, Sierra Leone, Tunisia, and Tanzania provide evidence of Granger causality, indicating a causal relationship from globalisation to informality.

Table 6. Granger causality results for overall globalisation–informality nexus.

Trade Globalisation Does Not Granger Informality				**Informality Does Not Granger Cause Trade Globalisation**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0101	0.660	Accept	0.6868 **	0.033	Reject
Burkina Faso	−0.0216	0.135	Accept	−0.4139	0.407	Accept
Cote d'Ivoire	−0.0626	0.133	Accept	−0.0434	0.880	Accept
Cameroon	−0.0198	0.257	Accept	−0.1137	0.865	Accept
Congo, Rep	−0.0014	0.966	Accept	0.3088	0.399	Accept
Ethiopia	−0.0243 **	0.038	Reject	0.5713 *	0.080	Reject
Gabon	−0.0624	0.159	Accept	−0.7996 **	0.015	Reject
Ghana	−0.0151	0.281	Accept	−0.6415	0.302	Accept
Guinea	0.0082	0.584	Accept	−2.0179 **	0.021	Reject
Gambia, The	0.0113	0.796	Accept	−0.0789	0.890	Accept
Guinea-Bissau	−0.0674 *	0.085	Reject	−2.2329 ***	0.009	Reject
Kenya	0.0113	0.409	Accept	0.7651	0.178	Accept
Liberia	0.0021	0.923	Accept	0.9186 **	0.022	Reject
Madagascar	0.0800 **	0.028	Reject	0.0955	0.865	Accept
Mali	−0.0071	0.806	Accept	0.2819	0.634	Accept
Mozambique	−0.0083	0.428	Accept	−0.8382	0.131	Accept
Malawi	−0.0005	0.990	Accept	0.3035	0.693	Accept
Namibia	0.0021	0.885	Accept	−0.4926	0.341	Accept
Niger	−0.0617 **	0.046	Reject	0.0081	0.991	Accept
Nigeria	0.0002	0.994	Accept	2.8194	0.013	Accept
Senegal	−0.0505 *	0.087	Reject	−0.0479	0.938	Accept
Sierra Leone	−0.0378	0.165	Accept	−1.8249 **	0.038	Reject
Togo	−0.0241	0.241	Accept	0.7685	0.292	Accept
Tunisia	−0.0099	0.808	Accept	−1.043 *	0.085	Reject
Tanzania	−0.0207	0.384	Accept	0.4916 **	0.050	Reject
Uganda	−0.0177	0.227	Accept	−0.6858	0.245	Accept
South Africa	−0.0024	0.818	Accept	−0.3745	0.653	Accept
Congo, D Rep	−0.0205	0.309	Accept	0.3827	0.367	Accept
Zambia	0.0410 *	0.067	Reject	0.3424	0.494	Accept
Zimbabwe	0.0238	0.413	Accept	−0.5760	0.215	Accept
Panel Result	1.7615 *	0.0782	Reject	4.8908	0.0000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Furthermore, the measure of trade globalisation supports these findings in Angola, Ethiopia, Gambia, Guinea, Guinea-Bissau, Kenya, Madagascar, Mozambique, Nigeria, Togo, and Tanzania. These results suggest that the size of the informal sector is largely influenced by the absorption of globalisation, which significantly disrupts both formal and informal sectors within these African economies. These findings challenge the assumption of homogeneity in the existing literature on globalisation (Olaniyi and Odhiambo 2024), thereby justifying the use of the DH causality method and highlighting the need for country-specific policy measures to address the implications of overall, economic, and trade globalisation.

Conversely, the first three columns of Table 5 present evidence of causality from globalisation to informality. These results are reported for the overall globalisation measure and include Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Niger, Nigeria, Sierra Leone, Togo, Tanzania, Uganda, and Congo. The evidence suggests that the past economic activities and size of the informal sectors in these African economies explain the current levels of globalisation absorption. Therefore, changes in the informal sector have

a consequential impact on subsequent changes in overall globalisation levels. Policymakers should acknowledge that the vibrancy or challenges within the informal economy of these countries can significantly affect their integration into the global economy. Consequently, economic policies must consider the role of the informal sector in shaping a country's global engagement, with strategies addressing the impact of the informal economy on international economic relationships, trade patterns, and global integration. Moreover, evidence for economic globalisation causality is also validated in Ethiopia, Guinea-Bissau, Madagascar, Niger, Senegal, and Zambia.

Table 7. Granger causality results for trade globalisation–informality nexus.

Trade Globalisation Does Not Granger Informality				**Informality Does Not Granger Cause Trade Globalisation**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0107	0.564	Accept	0.9197 **	0.029	Reject
Burkina Faso	−0.0381 *	0.102	Reject	−0.2658	0.615	Accept
Cote d'Ivoire	−0.0114	0.619	Accept	0.2901	0.459	Accept
Cameroon	0.0012	0.927	Accept	−1.2349	0.2790	Accept
Congo, Rep	0.0019	0.934	Accept	0.4840	0.370	Accept
Ethiopia	−0.013 *	0.091	Reject	1.0145 **	0.032	Reject
Gabon	−0.0388	0.248	Accept	−0.4334	0.304	Accept
Ghana	0.0005	0.964	Accept	−0.6585	0.358	Accept
Guinea	−0.0137	0.122	Accept	−2.874 **	0.036	Reject
Gambia, The	−0.0025	0.958	Accept	1.1756 *	0.099	Reject
Guinea-Bissau	−0.0625 **	0.042	Reject	−2.6678 **	0.025	Reject
Kenya	0.0097	0.340	Accept	2.0828 **	0.031	Reject
Liberia	0.0083	0.630	Accept	0.2761	0.811	Accept
Madagascar	0.0273	0.319	Accept	2.3554 ***	0.002	Reject
Mali	−0.0025	0.894	Accept	−0.1629	0.876	Accept
Mozambique	−0.0004	0.947	Accept	−1.7519 **	0.049	Reject
Malawi	0.0538 **	0.023	Reject	0.2517	0.769	Accept
Namibia	0.0142	0.200	Accept	−0.6867	0.354	Accept
Niger	−0.0366	0.139	Accept	−0.0926	0.861	Accept
Nigeria	−0.0094	0.627	Accept	3.2302 ***	0.006	Reject
Senegal	−0.0401 *	0.064	Reject	−0.8108	0.138	Accept
Sierra Leone	−0.0203	0.359	Accept	−0.8214	0.352	Accept
Togo	−0.0231 *	0.077	Reject	0.8125 **	0.024	Reject
Tunisia	−0.0282	0.206	Accept	−0.8574	0.247	Accept
Tanzania	−0.0014	0.919	Accept	1.0089 ***	0.042	Reject
Uganda	−0.0177	0.222	Accept	−0.8680	0.226	Accept
South Africa	−0.0194	0.225	Accept	−0.8011	0.534	Accept
Congo, D Rep	−0.0184	0.468	Accept	0.4899	0.341	Accept
Zambia	0.0206	0.243	Accept	−0.1610	0.774	Accept
Zimbabwe	−0.0001	0.995	Accept	−0.5187	0.516	Accept
Panel Result	1.5718	0.6110	Accept	5.9058 **	0.036	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

3.2.2. Evidence from Asymmetric Causality Framework

One significant limitation of the symmetric causality analysis is its failure to incorporate shocks. To rectify this, the asymmetric analysis includes these shocks within the nexus. This section presents the findings of the asymmetric analysis. Following the established literature, such as the works of Hatemi-J (2020a, 2020b), Olaniyi (2020), Olaniyi and Olayeni (2020), Olaniyi and Ologundudu (2022), and Olaniyi and Odhiambo (2024), the asymmetric models employ 1000 bootstrapped iterations to adequately address shocks and policy responses. The results are shown in Tables 8–15.

Table 8. Granger causality results for overall globalisation–informality nexus.

Overall Globalisation (+) Does Not Granger Informality (+)				**Informality (+) Does Not Granger Cause Overall Globa (+)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	0.1028 **	0.038	Reject	0.2430	0.302	Accept
Burkina Faso	0.0123	0.363	Accept	1.1866 *	0.064	Reject
Cote d'Ivoire	0.0157	0.400	Accept	0.7566	0.128	Accept
Cameroon	0.0302	0.145	Accept	2.7177 ***	0.002	Reject
Congo, Rep	0.0403 **	0.051	Reject	0.3321	0.397	Accept
Ethiopia	−0.0011	0.900	Accept	0.8123	0.221	Accept
Gabon	0.0329	0.407	Accept	0.6466	0.115	Accept
Ghana	0.0333	0.128	Accept	1.8909 **	0.046	Reject
Guinea	0.0273 **	0.014	Reject	2.8637 **	0.047	Reject
Gambia, The	0.1117 **	0.042	Reject	0.0197	0.883	Accept
Guinea-Bissau	0.0218	0.372	Accept	0.2305	0.346	Accept
Kenya	0.0182	0.352	Accept	1.4359 **	0.016	Reject
Liberia	0.0173	0.646	Accept	0.2158	0.197	Accept
Madagascar	0.1152	0.155	Accept	0.6309 ***	0.005	Reject
Mali	0.0361	0.206	Accept	0.7563 *	0.083	Reject
Mozambique	0.0112 *	0.074	Reject	1.3579	0.272	Accept
Malawi	0.0353	0.203	Accept	−0.2038	0.746	Accept
Namibia	0.0059	0.455	Accept	1.2869	0.228	Accept
Niger	0.0376	0.225	Accept	0.8164 *	0.092	Reject
Nigeria	0.0228	0.381	Accept	1.5476 ***	0.002	Reject
Senegal	0.0474	0.115	Accept	0.4283	0.184	Accept
Sierra Leone	0.0332 *	0.100	Reject	0.1533	0.717	Accept
Togo	0.0114	0.495	Accept	1.2942 **	0.043	Reject
Tunisia	0.0411 **	0.030	Reject	−0.1308	0.507	Accept
Tanzania	0.0391 *	0.077	Reject	1.0225	0.259	Accept
Uganda	0.1165 *	0.102	Reject	2.1715 **	0.058	Reject
South Africa	0.0098	0.215	Accept	2.1564 **	0.034	Reject
Congo, D Rep	0.0042	0.751	Accept	0.3381	0.163	Accept
Zambia	0.0448 *	0.067	Reject	0.1921	0.713	Accept
Zimbabwe	0.1943 **	0.015	Reject	0.5012 ***	0.001	Reject
Panel Result	6.1066 ***	0.000	Reject	9.3682 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

The findings derived from the asymmetric causality framework contribute significantly to our comprehension of the relationship between globalisation and informality within the African countries under study. To ensure robustness, this study further investigated this relationship within an asymmetric/nonlinear framework, which helped address shocks within the causal framework for policy formation. The paper follows the established literature (Hatemi-J 2020a, 2020b; Olaniyi 2020; Olaniyi and Olayeni 2020; Olaniyi and Ologundudu 2022; Olaniyi and Odhiambo 2024) to analyse the asymmetric models and employs 1000 bootstrapped iterations. It is important to note that asymmetric causality effectively captures shocks and policy responses, making it more applicable for policy recommendations than the ordinary causality framework.

Accordingly, this paper presents the outcomes of the causal responses between positive shocks in globalisation (globalisation +, indicating an increase in globalisation absorption) and positive shocks in informality (informality +, suggesting an increase in the size of the informal sector), as shown in Table 8. These results indicate that a notable positive change or shock in the levels of globalisation in the studied countries, attributable to increased international trade, foreign direct investment, or other factors indicating greater integration into the global economy, is accompanied by a subsequent positive shock in the size of the informal sector. In simpler terms, as globalisation increases, the informal sector in these nations also experiences growth, and conversely, when globalisation decreases, the size of the informal sector tends to decrease as well. In Uganda for instance, the persistent globalization absorption expands the informal sector. Thus, Uganda's strategic initiatives

to boost tourism and agriculture have facilitated informal employment in these sectors. Increased global demand for agricultural products can lead to a more robust informal sector, as small-scale farmers and traders benefit indirectly from enhanced export opportunities.

Table 9. Granger causality results for total globalisation–informality nexus.

Overall Globalisation (−) Does Not Granger Informality (−)				**Informality (−) Does Not Granger Cause Overall Global (−)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0175	0.835	Accept	0.1819	0.116	Accept
Burkina Faso	0.1425	0.518	Accept	0.1862	0.135	Accept
Cote d'Ivoire	0.1013	0.373	Accept	0.1386	0.230	Accept
Cameroon	0.0312	0.152	Accept	0.3020 *	0.100	Reject
Congo, Rep	−0.0160	0.745	Accept	1.0816 ***	0.006	Reject
Ethiopia	0.0116	0.581	Accept	0.3224	0.157	Accept
Gabon	0.0136	0.576	Accept	0.5315	0.179	Accept
Ghana	0.0161	0.879	Accept	0.7383 **	0.050	Reject
Guinea	0.0249	0.335	Accept	0.1015	0.645	Accept
Gambia, the	0.0519	0.718	Accept	2.3623 ***	0.003	Reject
Guinea-Bissau	0.0195	0.326	Accept	2.108 **	0.018	Reject
Kenya	0.0290	0.213	Accept	0.0924	0.376	Accept
Liberia	−0.0241	0.776	Accept	0.4134 ***	0.001	Reject
Madagascar	0.3474 **	0.026	Reject	0.0613	0.494	Accept
Mali	0.0571	0.554	Accept	0.2332 *	0.100	Reject
Mozambique	0.0123	0.635	Accept	0.1857	0.409	Accept
Malawi	−0.0030	0.940	Accept	0.9264 ***	0.008	Reject
Namibia	0.0178	0.294	Accept	0.5723	0.172	Accept
Niger	0.0664	0.244	Accept	0.1144	0.289	Accept
Nigeria	0.0222	0.293	Accept	0.2866	0.110	Accept
Senegal	0.0128	0.893	Accept	0.1081 *	0.075	Reject
Sierra Leone	0.0596 *	0.065	Reject	0.0813	0.399	Accept
Togo	−0.0081	0.786	Accept	0.3498 *	0.080	Reject
Tunisia	0.0243	0.554	Accept	0.0791	0.717	Accept
Tanzania	−0.0332	0.710	Accept	0.3349 ***	0.006	Reject
Uganda	0.0476	0.581	Accept	0.5541 **	0.012	Reject
South Africa	−0.0229	0.681	Accept	0.1897 **	0.050	Reject
Congo, D Rep	0.0407	0.254	Accept	0.1196	0.343	Accept
Zambia	0.1662 **	0.011	Reject	−0.0695	0.676	Accept
Zimbabwe	0.0623	0.506	Accept	0.5045 **	0.017	Reject
Panel Result	0.2636	0.7921	Accept	10.628 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Furthermore, the study examined the causality flows from globalisation to informality using an overall measure of globalisation. The results of the asymmetric causality test reveal that the persistent and continuous absorption of globalisation has led to an expansion of the informal sector in Angola, Congo, Guinea, Gambia, Mozambique, Sierra Leone, Tunisia, Tanzania, Uganda, Zambia, and Zimbabwe. Therefore, these findings suggest a positive correlation between higher levels of globalisation and the growth of the informal sector. This trend could be attributed to the increased economic opportunities, changes in market dynamics, or shifts in labour patterns influenced by globalisation. It is important to note that positive shocks in globalisation can generate new economic prospects but can also contribute to the growth of the informal sector as individuals and businesses adapt to changing conditions.

In conclusion, the informal sector in the studied African countries is responsive to changes in globalisation levels, potentially playing a prominent role in labour absorption, providing employment opportunities, and adapting to market demands influenced by global economic trends. The validity of the results is supported by robustness checks using economic globalisation. This study investigated the reverse causal relationship between positive shocks in informality and positive shocks in globalisation. This relationship was

examined and confirmed in twelve countries: Burkina Faso, Cameroon, Ghana, Guinea, Kenya, Madagascar, Mali, Niger, Nigeria, Togo, Uganda, South Africa, and Zimbabwe. The findings indicate that a positive shock in informality leads to a significant expansion in the size and dynamics of the informal sector. This expansion can be attributed to various factors, such as the growth of informal businesses, self-employment, and changes in labour patterns. Furthermore, the study concludes that positive shocks in informality also contribute positively to globalisation in the specified countries. This suggests that, as the informal sector grows, there is a corresponding positive effect on the level of global economic integration.

Table 10. Granger causality results for total globalisation–informality nexus.

Overall Globalisation (−) Does Not Granger Informality (+)				**Informality (−) Does Not Granger Cause Overall Global. (+)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0765	0.185	Accept	−0.3096 ***	0.024	Reject
Burkina Faso	−0.2921 **	0.012	Reject	−0.6473 **	0.047	Reject
Cote d'Ivoire	−0.0560	0.334	Accept	−1.0282 **	0.031	Reject
Cameroon	−0.0443 *	0.100	Reject	−1.5957 ***	0.002	Reject
Congo, Rep	−0.0267	0.348	Accept	−0.7761 **	0.044	Reject
Ethiopia	−0.0383 *	0.077	Reject	−0.4402	0.393	Accept
Gabon	−0.0062	0.912	Accept	−0.8848 *	0.096	Reject
Ghana	−0.0414	0.165	Accept	−0.7283 **	0.038	Reject
Guinea	−0.0192 *	0.100	Reject	−0.7021	0.143	Accept
Gambia, The	−0.4056 **	0.017	Reject	−0.1221	0.669	Accept
Guinea-Bissau	−0.0423	0.250	Accept	−0.9051	0.127	Accept
Kenya	−0.0431 **	0.016	Reject	−0.3289 *	0.091	Reject
Liberia	−0.0887 **	0.050	Reject	−0.1167	0.190	Accept
Madagascar	−0.3663	0.230	Accept	−1.9143 ***	0.000	Reject
Mali	−0.1261	0.132	Accept	−0.3262	0.198	Accept
Mozambique	−0.0308 **	0.032	Reject	−0.5205	0.181	Accept
Malawi	−0.0569 *	0.091-	Reject	−1.0747 **	0.021	Reject
Namibia	0.0909	0.301	Accept	−0.8742 *	0.099	Reject
Niger	−0.0812 *	0.064	Reject	−0.2746	0.413	Accept
Nigeria	−0.0323	0.176	Accept	−0.6281 *	0.072	Reject
Senegal	0.0207	0.784	Accept	−0.0616	0.808	Accept
Sierra Leone	−0.0770	0.154	Accept	−0.0664	0.863	Accept
Togo	−0.0593 **	0.044	Reject	0.3202	0.371	Accept
Tunisia	−0.0831	0.135	Accept	−0.0769	0.791	Accept
Tanzania	−0.0353	0.303	Accept	−0.2885	0.307	Accept
Uganda	−0.0259	0.371	Accept	−0.9314	0.245	Accept
South Africa	−0.0390	0.598	Accept	−0.9561	0.224	Accept
Congo, D Rep	0.0189	0.702	Accept	0.1727	0.536	Accept
Zambia	−0.019	0.612	Accept	−0.3718	0.152	Accept
Zimbabwe	−0.0581	0.461	Accept	−0.4821 ***	0.005	Reject
Panel Result	5.3786 ***	0.000	Reject	10.085 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Conversely, the study also examined the causal relationship between negative shocks in globalisation and negative shocks in informality. The results of the asymmetric causality test, presented in Table 9, support this relationship in three countries: Madagascar, Sierra Leone, and Zimbabwe. These findings suggest that the informal sector in these countries is vulnerable to changes in globalisation levels (Canh and Thanh 2020; Canh et al. 2021). For instance, in Sierra Leone, reductions in global economic activities can lead to significant impacts on informal sectors, notably in urban areas, where informal trade is a major livelihood. Economic downturns in the global economy can lead to a decreased demand for raw materials like minerals, affecting local informal mining operations. Therefore, policymakers should take into consideration the potential effects of globalisation shocks on the informal sector when devising economic policies. It may be crucial to implement strategies that

support the resilience of informal businesses during periods of reduced globalisation. The study also emphasizes the responsiveness of the informal sector to changes in the global economic environment. As a result, policies that enhance the adaptability and resilience of the informal economy during economic contractions should be seriously considered.

Table 11. Granger causality results for total globalisation–informality nexus.

Overall Globalisation (+) Does Not Granger Informality (−)				**Informality (+) Does Not Granger Cause Overall Global (−)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0543	0.410	Accept	−0.3076 *	0.071	Reject
Burkina Faso	−0.0266	0.327	Accept	−0.2204	0.427	Accept
Cote d'Ivoire	−0.0264	0.703	Accept	−0.4404 **	0.041	Reject
Cameroon	−0.0259	0.161	Accept	−0.4506	0.210	Accept
Congo, Rep	0.0037	0.905	Accept	−0.8362 **	0.011	Reject
Ethiopia	−0.0273 **	0.027	Reject	−0.3729	0.449	Accept
Gabon	−0.8848 *	0.096	Reject	−0.0062	0.912	Accept
Ghana	−0.0650 *	0.100	Reject	−1.6503 ***	0.0001	Reject
Guinea	−0.0183	0.366	Accept	0.1455	0.790	Accept
Gambia, The	−0.1943 ***	0.005	Reject	−0.2090 **	0.049	Reject
Guinea-Bissau	−0.0292 **	0.050	Reject	−0.9652 **	0.029	Reject
Kenya	−0.0686 **	0.014	Reject	−0.1120	0.777	Accept
Liberia	0.0118	0.839	Accept	−0.1939	0.397	Accept
Madagascar	0.0291	0.706	Accept	−0.0561	0.385	Accept
Mali	−0.0178	0.542	Accept	−0.6506 ***	0.002	Reject
Mozambique	−0.0139	0.264	Accept	−1.1997	0.124	Accept
Malawi	−0.0710 **	0.023	Reject	−1.1781 ***	0.009	Reject
Namibia	−0.0143	0.291	Accept	−1.2983 *	0.097	Reject
Niger	−0.0964 ***	0.006	Reject	−0.1047	0.488	Accept
Nigeria	−0.0537 **	0.011	Reject	−0.3212	0.237	Accept
Senegal	−0.0270	0.522	Accept	−0.0920	0.289	Accept
Sierra Leone	−0.0486 **	0.032	Reject	−0.2619	0.178	Accept
Togo	−0.0409 **	0.051	Reject	−0.6057	0.233	Accept
Tunisia	−0.0587	0.263	Accept	−0.0769	0.791	Accept
Tanzania	−0.0710	0.136	Accept	−0.6536 **	0.049	Reject
Uganda	−0.0707 **	0.044	Reject	−0.7268 **	0.038	Reject
South Africa	−0.0101	0.561	Accept	−0.3006	0.181	Accept
Congo, D Rep	−0.0359 *	0.068	Reject	−0.5183 **	0.022	Reject
Zambia	−0.0855	0.147	Accept	−0.2481	0.344	Accept
Zimbabwe	−0.1239 *	0.074	Reject	−0.2316 *	0.092	Reject
Panel Result	7.4014 ***	0.000	Reject	9.4336 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Additional robustness checks using economic globalisation are presented in Table 10. This paper conducts an analysis of alternate causality, specifically exploring the transmission of negative shocks from the informal sector to negative shocks in globalisation. Empirical evidence supports this relationship in several African countries, including Cameroon, Congo, Ghana, Gambia, Guinea-Bissau, Liberia, Mali, Malawi, Senegal, Togo, Tanzania, Uganda, South Africa, and Zimbabwe. These findings indicate that significant negative changes or shocks have occurred in the informal sector in these countries, such as reduced informal economic activities, increased formalization, or changes in local economic conditions. Moreover, the causality results suggest that, following a negative shock in informality, there is a subsequent negative shock in globalisation in these nations. This implies that, as the prevalence of informality decreases, the level of globalisation in these countries also experiences a decline. For instance, Zimbabwe's economic policies, including land reform and sanctions, have led to a volatile economic environment where globalization shocks have a pronounced impact. For example, reduced trade or investment (negative globalization shocks) correlate with a contraction in the informal sector, possibly due to the decreased availability of goods to trade or reduced informal cross-border activities.

Table 12. Granger causality results for economic globalisation–informality nexus.

Economic Globalisation (+) Does Not Granger Informality (+)				**Informality (+) Does Not Granger Cause Economic Glo (+)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	0.0382 *	0.060	Reject	0.9388	0.144	Accept
Burkina Faso	−0.0008	0.893	Accept	1.0541	0.134	Accept
Cote d'Ivoire	0.0170	0.425	Accept	0.8194	0.137	Accept
Cameroon	0.0350 **	0.044	Reject	2.0499	0.207	Accept
Congo, Rep	0.0889 ***	0.001	Reject	0.0674	0.909	Accept
Ethiopia	−0.0004	0.950	Accept	0.7918	0.231	Accept
Gabon	−0.0228	0.535	Accept	0.2754	0.166	Accept
Ghana	0.0129	0.133	Accept	4.511 **	0.031	Reject
Guinea	0.01238 **	0.028	Reject	8.613 **	0.011	Reject
Gambia, The	0.1153 **	0.023	Reject	0.2465	0.519	Accept
Guinea-Bissau	0.0261	0.238	Accept	0.0205	0.945	Accept
Kenya	0.0099	0.247	Accept	3.1988 **	0.012	Reject
Liberia	0.1570 **	0.050	Reject	1.010 ***	0.005	Reject
Madagascar	0.1187 **	0.051	Reject	0.6340 *	0.083	Reject
Mali	0.0219	0.156	Accept	1.8790 **	0.028	Reject
Mozambique	0.0088 **	0.036	Reject	−0.4986	0.716	Accept
Malawi	0.0176	0.253	Accept	−0.1617	0.826	Accept
Namibia	0.0119	0.295	Accept	0.3557	0.816	Accept
Niger	0.0108	0.560	Accept	1.0105 **	0.044	Reject
Nigeria	0.0086	0.402	Accept	2.8069 ***	0.003	Reject
Senegal	0.0122	0.444	Accept	1.4564 **	0.018	Reject
Sierra Leone	0.0203 *	0.063	Reject	0.3866	0.670	Accept
Togo	0.0056	0.561	Accept	2.2098 **	0.023	Reject
Tunisia	0.1067	0.725	Accept	0.0295 **	0.040	Reject
Tanzania	0.0231 *	0.065	Reject	−0.2927	0.828	Accept
Uganda	0.0215 **	0.045	Reject	2.4335	0.216	Accept
South Africa	0.0139	0.113	Accept	0.2481	0.695	Accept
Congo, D Rep	0.0057	0.563	Accept	0.5558	0.244	Accept
Zambia	0.0140 *	0.097	Reject	0.7692	0.597	Accept
Zimbabwe	0.0990 ***	0.001	Reject	1.2387 ***	0.001	Reject
Panel Result	8.2219 ***	0.000	Reject	8.5932 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

To provide further validation, we present robustness checks in Table 10, employing economic globalisation as a control variable. Additionally, we investigate the causality within the framework of the policy mix. Specifically, we examine the effect of a surge in the size of the informal sector on globalisation, and vice versa. Firstly, we present the results of the nonlinear causal relationship between negative shocks in globalisation (i.e., decrease in globalisation absorption) and positive shocks in informality (i.e., increase in size of the informal sector) in Table 11. These results are verified for Burkina Faso, Cameroon, Ethiopia, Guinea, Gambia, Kenya, Liberia, Mozambique, Malawi, Niger, and Togo. From a practical perspective, the observed causal relationship suggests that a negative shock in globalisation leads to a significant decrease in the level or intensity of global economic integration, which may encompass factors such as reduced international trade, investment, or economic interconnectedness.

Conversely, positive shocks in informality indicate an increase in the size or activities of the informal sector. This could be attributed to a surge in informal businesses and self-employment or changes in labour patterns within these African economies. The findings of this study reveal that there is a relationship between negative shocks in globalisation and positive shocks in the informal sector. These shocks refer to a decrease in globalisation absorption and an increase in the size of the informal sector, respectively. Several factors can account for this phenomenon, including economic downturns that lead individuals to seek informal activities for their livelihoods after experiencing job losses in the formal sector. From an economic perspective, this nonlinear and asymmetric causal relationship suggests

that the response of the informal sector to positive and negative shocks in globalisation may differ. During periods of economic downturns, the informal sector may serve as a safety net, absorbing individuals who have been displaced from the formal sector. However, the reverse may not be true during periods of positive economic growth, as the informal sector may not shrink to the same extent.

Table 13. Granger causality results for economic globalisation–informality nexus.

Economic Globalisation (−) Does Not Granger Informality (−)				**Informality (−) Does Not Granger Cause Economic Glob. (−)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0089	0.647	Accept	0.5228 *	0.078	Reject
Burkina Faso	0.0254	0.696	Accept	0.6168 *	0.094	Reject
Cote d'Ivoire	0.0238	0.525	Accept	0.3171	0.272	Accept
Cameroon	0.0106	0.497	Accept	1.6821 **	0.023	Reject
Congo, Rep	−0.0275	0.260	Accept	0.7236 **	0.049	Reject
Ethiopia	−0.0206	0.322	Accept	1.5510 ***	0.004	Reject
Gabon	0.7024	0.162	Accept	0.0316	0.257	Accept
Ghana	0.0162	0.616	Accept	1.8768 *	0.100	Reject
Guinea	0.0290 **	0.015	Reject	0.2543	0.705	Accept
Gambia, the	0.0230	0.527	Accept	1.0722 **	0.013	Reject
Guinea-Bissau	0.0192	0.218	Accept	1.8485 **	0.038	Reject
Kenya	0.0156 *	0.062	Reject	0.2839	0.466	Accept
Liberia	−0.0112	0.617	Accept	0.6698 **	0.012	Reject
Madagascar	0.1169 **	0.020	Reject	0.4352	0.255	Accept
Mali	−0.0010	0.957	Accept	0.9965 ***	0.006	Reject
Mozambique	−0.0426	0.483	Accept	0.9688 ***	0.001	Reject
Malawi	0.01873	0.306	Accept	0.8615	0.326	Accept
Namibia	0.0301 *	0.060	Reject	0.7153	0.347	Accept
Niger	0.1636 ***	0.003	Reject	0.9804 **	0.017	Reject
Nigeria	0.0132 *	0.080	Reject	0.9107 *	0.094	Reject
Senegal	0.0216	0.626	Accept	0.5002 **	0.022	Reject
Sierra Leone	0.0244 **	0.048	Reject	0.3328	0.306	Accept
Togo	0.0269	0.295	Accept	0.6003	0.256	Accept
Tunisia	0.0068	0.765	Accept	0.6472	0.193	Accept
Tanzania	0.0026	0.933	Accept	2.0187 ***	0.0000	Reject
Uganda	0.0321	0.208	Accept	2.3253 ***	0.006	Reject
South Africa	0.0150	0.486	Accept	0.7258 **	0.047	Reject
Congo, D Rep	0.0285 *	0.100	Reject	0.6508	0.142	Accept
Zambia	0.0397 **	0.020	Reject	−0.4295	0.517	Accept
Zimbabwe	0.0311	0.376	Accept	1.2141 **	0.028	Reject
Panel Result	4.1237 ***	0.000	Reject	13.9635 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

Furthermore, this study found evidence of asymmetric shocks between negative shocks in informality (indicating a reduction in the size of the informal sector) and positive shocks in globalisation (representing an increase in globalisation adoption) in several African countries, namely Angola, Burkina Faso, Cote d'Ivoire, Congo, Cameroon, Ghana, Gabon, Kenya, Madagascar, Malawi, Namibia, Nigeria, and Zimbabwe. These findings have important implications for the economic context, suggesting that when there are negative shocks in informality resulting in a decrease in the size of the informal sector, there tends to be a positive response in the adoption of globalisation. One possible explanation for this relationship is that a decrease in informality may be associated with a more formalized and globalized economic environment. Additionally, the results indicate that a decrease in informality is associated with an increased embrace of globalisation, likely driven by factors such as improved regulatory frameworks, greater access to formal markets, or efforts to align with global standards.

Table 14. Granger causality results for economic globalisation–informality nexus.

Economic Globalisation (−) Does Not Granger Informality (+)				**Informality (−) Does Not Granger Cause Economic Glob (+)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0125	0.354	Accept	−0.06298 **	0.051	Reject
Burkina Faso	−0.0750 **	0.015	Reject	−0.3694	0.263	Accept
Cote d'Ivoire	−0.0605 **	0.030	Reject	−0.2171	0.585	Accept
Cameroon	−0.0325 **	0.047	Reject	−0.8370	0.169	Accept
Congo, Rep	−0.0155	0.392	Accept	−1.1436 ***	0.004	Reject
Ethiopia	0.0002	0.979	Accept	−0.4259	0.410	Accept
Gabon	−0.0071	0.830	Accept	−1.2534 **	0.037	Reject
Ghana	−0.0182 *	0.064	Reject	−2.0196 ***	0.010	Reject
Guinea	−0.0097	0.130	Accept	−1.5057	0.268	Accept
Gambia, The	−0.1028 **	0.050	Reject	−0.6408	0.195	Accept
Guinea-Bissau	−0.0768 **	0.026	Reject	−1.1069	0.110	Accept
Kenya	−0.0161 **	0.021	Reject	−0.8095 *	0.063	Reject
Liberia	−0.0125	0.347	Accept	−0.1377	0.305	Accept
Madagascar	−0.0991	0.278	Accept	−1.1444 *	0.080	Reject
Mali	−0.0152	0.365	Accept	−0.5295	0.284	Accept
Mozambique	−0.0170	0.336	Accept	−0.3214	0.458	Accept
Malawi	−0.0209 *	0.099	Reject	−1.2859 **	0.041	Reject
Namibia	−0.0062	0.384	Accept	−1.4953 **	0.028	Reject
Niger	−0.0099	0.770	Accept	0.0870	0.883	Accept
Nigeria	−0.0145 *	0.076	Reject	−1.4322 **	0.020	Reject
Senegal	−0.0173	0.604	Accept	−0.7238	0.237	Accept
Sierra Leone	−0.0327 *	0.068	Reject	−0.2412	0.756	Accept
Togo	−0.0178	0.193	Accept	0.2179	0.808	Accept
Tunisia	−0.0562 **	0.031	Reject	−1.2493 *	0.073	Reject
Tanzania	−0.0115	0.215	Accept	−0.4628	0.186	Accept
Uganda	−0.0057	0.497	Accept	−1.0302	0.176	Accept
South Africa	−0.0294	0.226	Accept	−1.3447 **	0.024	Reject
Congo, D Rep	0.0024	0.860	Accept	0.2144	0.608	Accept
Zambia	−0.0023	0.670	Accept	−1.3716	0.157	Accept
Zimbabwe	−0.0050	0.861	Accept	−1.2398 ***	0.002	Reject
Panel Result	4.6218 ***	0.000	Reject	7.8953 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5%, and 10% significant levels, respectively.

This study examined the causal relationship between positive shocks in globalisation, signifying an increase in the absorption of globalisation, and negative shocks in informality, indicating a decrease in the size of the informal sector. These findings are validated in a sample of African countries consisting of Ethiopia, Gambia, Guinea-Bissau, Kenya, Malawi, Niger, Nigeria, Sierra Leone, Togo, Uganda, Congo, and Zimbabwe, as indicated in Table 10. From an economic perspective, this implies that when positive shocks in globalisation occur, such as an increase in globalisation absorption, there tends to be a negative response in informality within these economies, resulting in a reduction in the size of the informal sector. This suggests that a more globally integrated economy is associated with a decline in informal economic activities in these countries. The presence of a nonlinear and asymmetric causal relationship suggests that an increase in globalisation absorption may be accompanied by policies, economic conditions, or regulatory changes that contribute to a reduction in the size of the informal sector.

Alternatively, the study explores the causal relationship between positive shocks in informality, indicating an increase in the size of the informal sector, and negative shocks in globalisation, suggesting a decrease in the adoption of globalisation, in a selected group of African countries, including Angola, Congo, Cote d'Ivoire, Ghana, Gambia, Guinea-Bissau, Mali, Malawi, Namibia, Tanzania, Uganda, Congo DR, and Zimbabwe. The results indicate that when positive shocks in globalisation occur, such as an increase in globalisation absorption, in these African economies, there is a negative response in informality, indicating a decrease in the size of the informal sector. This suggests a potential association between a

more globally integrated economy and a decrease in informal economic activities. It also suggests that an increase in globalisation absorption could be linked to policies, economic conditions, or regulatory changes that result in a reduction in the size of the informal sector. The robustness of these findings is further supported by additional analyses using economic globalisation, presented in Tables 12–15.

Table 15. Granger causality results for economic globalisation–informality nexus.

Economic Globalisation (+) Does Not Granger Informality (−)				**Informality (+) Does Not Granger Cause Economic Glob (−)**		
Countries	**Wald Stat**	**Prob.**	**Decision**	**Wald Stat**	**Prob.**	**Decision**
Angola	−0.0168	0.467	Accept	−0.8531 **	0.049	Reject
Burkina Faso	−0.0079	0.473	Accept	−1.0178	0.166	Accept
Cote d'Ivoire	−0.1477 ***	0.005	Reject	−1.4788 *	0.073	Reject
Cameroon	−0.0164	0.110	Accept	−1.9799	0.121	Accept
Congo, Rep	−0.0355	0.268	Accept	−0.9230 **	0.016	Reject
Ethiopia	−0.0250 **	0.016	Reject	−0.4650	0.153	Accept
Gabon	−0.1629 ***	0.000	Reject	−0.4679 **	0.050	Reject
Ghana	−0.0195	0.230	Accept	−5.1923 ***	0.002	Reject
Guinea	−0.0184	0.120	Accept	−1.2633	0.498	Accept
Gambia, The	−0.0776 *	0.057	Reject	−0.9861 **	0.013	Reject
Guinea-Bissau	−0.0176	0.208	Accept	−0.5554	0.323	Accept
Kenya	−0.0293 **	0.024	Reject	−1.9754	0.201	Accept
Liberia	−0.0918	0.275	Accept	−0.6401	0.816	Accept
Madagascar	−0.0714 *	0.090	Reject	−0.5027 **	0.043	Reject
Mali	−0.0044	0.778	Accept	−1/2478 **	0.038	Reject
Mozambique	−0.0094	0.269	Accept	−1.1811 **	0.031	Reject
Malawi	−0.0391 **	0.050	Reject	−1.5419 *	0.091	Reject
Namibia	−0.0282	0.115	Accept	−1.8229 *	0.098	Reject
Niger	−0.0810 **	0.023	Reject	−0.9191 **	0.029	Reject
Nigeria	−0.0139 *	0.096	Reject	−1.1500	0.139	Accept
Senegal	−0.0248	0.359	Accept	−0.3448	0.258	Accept
Sierra Leone	−0.0314 ***	0.004	Reject	−0.7127	0.215	Accept
Togo	−0.0321	0.133	Accept	0.7845	0.253	Accept
Tunisia	−0.0392	0.244	Accept	−0.2310	0.694	Accept
Tanzania	−0.0412 *	0.068	Reject	−2.6393 **	0.036	Reject
Uganda	−0.0486 ***	0.010	Reject	−2.8487 **	0.031	Reject
South Africa	−0.0063	0.671	Accept	−0.5225	0.468	Accept
Congo, D Rep	−0.0129	0.264	Accept	−0.5180	0.272	Accept
Zambia	−0.0466 *	0.080	Reject	−0.3041	0.750	Accept
Zimbabwe	−0.0347	0.201	Accept	−0.5999 *	0.080	Reject
Panel result	9.10.7819 ***	0.000	Reject	8.7306 ***	0.000	Reject

Note: ***, **, and * represent 1%, 5% and 10% significant levels, respectively.

4. Conclusions and Policy Recommendations

The present study examined the causal relationship between informality and globalisation across 30 African countries. Departing from previous research that assumes a linear causality and examines the impact of globalisation on informality from a unidirectional standpoint, this study adopted a bi-directional framework to address reverse causation. To achieve this objective, the study employed the DH causality method within a linear and nonlinear framework. The findings indicate that the causal relationship is not linear, but rather explained adequately within a nonlinear asymmetric causal structure. Based on these findings, the following policy recommendations are put forth:

For the countries where causality is observed to run from globalisation to informality, namely Angola, Congo, Guinea, Gambia, Mozambique, Sierra Leone, Tunisia, Tanzania, Uganda, Zambia, and Zimbabwe, the following recommendations are suggested: Firstly, these countries should formulate policies aimed at integrating the informal sector into the formal economy. Recognizing the role of the informal sector in absorbing labour and providing employment opportunities, these policies should concentrate on facilitating the

transition of informal businesses into the formal economy, ensuring that they can benefit from legal protections and access formal financial systems.

Secondly, these countries should implement skills development and training programs tailored to the requirements of the informal sector. By improving the adaptability of informal businesses through relevant skills and training, individuals and businesses can seize the economic opportunities generated by globalisation and effectively navigate changing market dynamics. Thirdly, it is recommended that these economies establish support mechanisms specifically designed for entrepreneurship and small businesses. This would create an environment that fosters entrepreneurship and facilitates the growth of small businesses. Such mechanisms can include providing access to financing, offering mentorship programs, and simplifying regulatory procedures to aid in the formalisation of informal businesses.

Additionally, it is proposed to develop social safety nets to assist individuals in the informal sector during times of economic transition. Enhancing market access and infrastructure for informal businesses and implementing effective monitoring and regulation systems for this sector are also crucial steps to take. Furthermore, efforts should be made to promote education and awareness regarding the benefits and challenges of globalisation. Encouraging international cooperation and partnerships can enable informal businesses to participate in global value chains. Lastly, investing in data collection and conducting research on the informal sector will contribute to a better understanding of its dynamics. This article presents a set of recommendations aimed at harnessing the positive aspects of the informal sector's response to globalisation, while also addressing potential challenges. Adherence to these recommendations is crucial for policymakers who seek to promote sustainable and inclusive economic development, as it calls for tailoring them to the unique economic, social, and cultural contexts of each country.

Moreover, the article proposes investing in initiatives aimed at enhancing market access for informal businesses as a key policy. This strategy involves improving infrastructure, connectivity, and digital platforms to facilitate the connection between informal businesses and larger markets. By expanding the reach and opportunities available to informal businesses, this approach amplifies the positive impact of the informal sector on globalisation.

Additionally, it stresses the importance of implementing skills development programs specifically designed to cater to the needs of the informal sector. Such programs would enhance the adaptability of individuals engaged in informal businesses by equipping them with relevant skills and training. This, in turn, enables them to effectively respond to changing market dynamics and contributes to increased global competitiveness. Policymakers are encouraged to customize these policy recommendations based on the specific economic, social, and cultural contexts of their respective countries to ensure comprehensive and sustainable economic development.

To mitigate the negative effects of shocks in globalisation and convert them into positive outcomes for informality, the article suggests policy measures aimed at building resilience within the informal sector. These policies recognize the role of the informal sector as a safety net during economic downturns and propose support mechanisms for individuals transitioning from the formal to the informal sector. This support includes initiatives such as skill development opportunities, access to resources, and financial assistance during challenging economic periods.

Furthermore, the article advocates for the establishment of social safety nets to aid during the transition from the formal to the informal sector in times of negative shocks caused by globalisation. This policy acknowledges that economic downturns resulting from the negative effects of globalisation can result in job losses in the formal sector. To aid individuals seeking employment in the informal sector, safety-net programs should be developed to provide temporary support, including unemployment benefits, retraining programs, and healthcare. Furthermore, it is imperative for these economies to enact flexible labour policies and training initiatives that facilitate transitions between formal

and informal employment. Recognizing the dynamic nature of employment patterns during economic shocks, policies that allow for flexibility in employment arrangements and provide relevant training can empower individuals to adapt to changing economic conditions. These measures aim to address the uneven response of the informal sector to positive and negative shocks caused by globalisation. Through the implementation of targeted policies, governments can enhance the resilience of the informal sector and support individuals in navigating economic challenges, thereby contributing to overall economic stability and inclusive growth.

Lastly, in relation to the causal relationship between positive shocks in globalisation and negative shocks in informality, which suggests that an increase in globalisation is associated with a reduction in the size of the informal sector, three policy recommendations are proposed. Firstly, it is advised that these economies implement incentives and support programs to encourage the formalization of informal businesses. Such policies acknowledge the potential benefits of a more globally integrated economy with a formalized economic structure. Incentives such as tax breaks, simplified regulatory processes, and improved access to financial services should be provided to encourage informal businesses to transition to the formal sector. Secondly, these economies should invest in skills development programs that align with the demands of formal employment sectors. The reduction in the size of the informal sector may indicate a shift towards formal employment opportunities.

Therefore, it is crucial to enhance the employability of individuals by offering training programs that match the skill requirements of formal sectors, thus facilitating a smoother transition from informal to formal employment. Lastly, it is recommended that these economies develop and implement economic diversification strategies to create formal job opportunities. This is because an increase in globalisation is often associated with the growth of formal sectors. The implementation of strategies that diversify the economy, with a focus on industries capable of absorbing labour from the informal sector, such as technology, manufacturing, and service sectors that are in line with global economic trends, can pave the way for the creation of formal jobs. These policy recommendations seek to harness the potential advantages of heightened globalisation by advocating for formalization, harmonizing skills training with the requirements of formal employment, and fostering economic diversification. Policymakers should consider the distinct economic, social, and cultural circumstances of each nation to effectively tailor these recommendations and foster inclusivity. This study was limited to the selected African countries and depended on data availability. It is advisable to include evidence from other African countries as more data become available. Similarly, incorporating evidence from other continents, such as Asia and Europe, is recommended for future studies. Also, another measure of informality is advised for further evidence.

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