

THE MODERATING ROLE OF GOVERNANCE IN THE GLOBALISATION-LIFE EXPECTANCY NEXUS: IMPLICATIONS FOR SOCIOECONOMIC DEVELOPMENT

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Received 15 November 2023; accepted 10 December 2023

Abstract

Research Purpose: One of the most recent global aims is to increase life expectancy since healthy people are seen as human capital that may boost the economy. The study investigates the role of governance in the globalisation-life expectancy nexus using 39 African countries between 1996 and 2019.

Design/Methodology/Approach: The study uses a Panel-Spatial Correlation Consistent augmented with the Least Square Dummy Variables (PSCC-LSDV) approach. The study uses a dynamic two-step system, the Generalised Method of Moments (GMM), as a robust model to solve the endogeneity problem.

Findings: The results from the PSCC-LSDV approach reveal that globalisation increases life expectancy in the selected African countries. The approach is more efficient since it can be used with cross-sectional dependent variables when other techniques like fixed and random effects methods may be ineffective. Likewise, the result from the GMM estimator is consistent with the PSCC-LSDV approach. The effect of globalisation on the life expectancy nexus without the inclusion of governance is positive. Meanwhile, the moderating (interactive) effect of governance on the relationship between globalisation and life expectancy is negative, indicating that globalisation and governance are substitutes for each other. This means that globalisation positively influences life expectancy, but the governance conditions in Africa weaken this positive effect.

Originality/ Value/ Practical Implications: Previous studies have shown that globalisation can have a negative, a positive or an insignificant effect on life expectancy in different countries. This discrepancy may arise from the use of different methods, different variables being measured, or different countries. None of these studies, to our knowledge, look at the moderating effect of governance on the globalisation-life expectancy nexus. Furthermore, unlike this study, most studies that look into the role of governance in the relationship between globalisation and life expectancy do not employ an aggregate index. The moderating role of governance from the two approaches confirms that governance interacts with globalisation to weaken the positive impact of globalisation on life expectancy. Put differently, the existence of poor governance in the African region drains the positive effect of globalisation on life expectancy in Africa. However, we expect life expectancy in African countries to improve in the face of good governance.

Keywords: Globalisation, Life Expectancy, Africa, Governance

JEL Classification: F63, I10, I18, P5

Introduction

Improved life expectancy is one of the most recent worldwide goals, as good health is considered human capital that can have a favourable effect on the economy. Rahman et al. (2022) explain that life expectancy is an important indicator in the Human Development Index. Raffin and Seegmuller (2014)

show that good health and longevity boost productivity, a key driver of long-term economic growth. According to the World Health Organization (WHO, 2023a), "life expectancy is the average number of years that a newborn could expect to live if he or she were to pass through life exposed to the sex- and age-specific death rates prevailing at the time of his or her birth, for a specific year, in a given county, territory, or geographic area." Macrotrends (2023) show that the average life expectancy worldwide between 2020 and 2023 is approximately 73 years. Improving life expectancy is linked to SDG 1 (no poverty), SDG 2 (zero hunger), and SDG 3 (good health and well-being) in terms of the Sustainable Development Goals (SDGs). Individuals who live in poverty are more likely to die at an earlier age, and poverty is a significant predictor of health outcomes. In addition, hunger and malnutrition can result in long-term health issues that reduce life expectancy and are significant causes of child mortality and morbidity. People of all ages would be guaranteed healthy lifestyles and promoted well-being through access to high-quality healthcare, preventive measures, and disease treatment, which would increase life expectancy.

Nevertheless, significant health inequalities exist in terms of life expectancy within and across countries. According to the World Development Indicators (World Bank, 2020), the world's most developed countries, such as Japan, Australia, Spain, Switzerland, and Italy, have life expectancies of nearly 85 years in 2019. In contrast, poor countries, particularly African countries, have 50 to 60 years of life expectancy. African countries like Algeria, Tunisia, Morocco, Mauritius, Seychelles, and Cabo Verde have the highest life expectancies ranging from 73 to 77 years, while the Central Republic of Africa, Chad, Lesotho, Nigeria, and Somalia have the lowest life expectancies between 53 and 55 years approximately. Numerous factors contribute to this disparity in these regions, such as exposure to infectious diseases, poor nutrition, and limited access to healthcare.

Several studies (Raffin & Seegmuller, 2014; Rahman et al., 2022) have demonstrated that improved life expectancy stimulates economic/human development. This suggests that life expectancy needs to be improved. Existing research indicates that life expectancy is significantly impacted by globalisation. Empirically, there are two strands in the literature regarding the effect of globalisation on life expectancy: the positive and the negative strands. The positive strand argues that globalisation spurs economic growth, leading to increased income (Lange & Vollmer, 2017); improved knowledge and information about various health issues and their solutions (Saker et al., 2004); free trade, technology transfer, and capital mobility (Rao & Vadlamannati, 2011). The negative strand argues that globalisation causes the importation of infectious or communicable diseases, increasing pricing (imported inflation) that reduces people's access to good health care (Bianchi & Civelli, 2015; Gamber & Hung, 2007), increased health inequalities (London & Schneider, 2012; Schrecker et al., 2008); and the promotion of economic inequality, insecurity, and vulnerability (Dreher & Gaston, 2008; Sutcliffe, 2005). Many scholars have described globalisation as a complex and varied phenomenon which includes economic, social, political, cultural, and environmental dimensions (Dreher, 2006; Dreher & Gaston, 2008; Ojeyinka & Osinubi, 2022; Osinubi & Asongu, 2020; Osinubi & Olomola, 2020a,b) having a long-term impact on world economies. Also, an unprecedented degree of interconnection and connectivity across nations, economies, and civilisations has resulted from globalisation, meaning that events occurring in one region of the world might also affect other regions. The Konjunkturforschungsstelle (KOF) globalisation index reveals that African countries have the lowest overall globalisation compared to other regions (KOF Globalisation Index, 2020). According to the World Bank (2020), African countries suffer from poor health conditions, with one of the health outcomes being life expectancy. Between 1996 and 2019, African countries' average globalisation index and life expectancy were approximately 48 per cent and 59 years, respectively. In comparison to other regions, these figures are relatively low.

Besides Africans' poor health conditions, the region also suffers from weak governance, as revealed by most studies (Ajide & Osinubi, 2020; Guzel et al., 2021; Ibukun, 2020). Meanwhile, other studies, like Bousmah et al. (2016), Farag et al. (2013), Ibukun (2020), Kim and Wang (2019), and Olatunde et al. (2019), have found that weak governance reduces life expectancy. Succinctly, poor governance in Africa shortens people's lives. More specifically, poor governance can amplify globalisation's adverse effects while severely impeding its beneficial effects on life expectancy. Inefficient resource allocation can result in medical personnel and supplies shortages, poor access to healthcare facilities, and a lack

of preventive measures to control infectious diseases. Weak regulatory frameworks can lead to the production of substandard products and services that pose health risks. Poor governance can prevent people with low incomes from making decisions, which can lead to disparities in access to healthcare and health outcomes inequalities. Lack of accountability and corruption can also cause funds allocated for healthcare to be diverted into personal gains. The study's primary goal is to examine if Africa's low life expectancy is attributable to the region's low level of globalisation and poor governance. As a result, the study investigates the role of governance (moderating role) in the link between globalisation and life expectancy in some selected African countries. The findings of this study would help African countries comprehend how increased globalisation combined with strong governance can increase life expectancy.

Thus, the study adds to the literature on globalisation and life expectancy nexus in the following ways. First, this study focuses on life expectancy rather than other health outcomes. The reason for this is that life expectancy is a more comprehensive indicator for measuring population health than other health outcomes. Life expectancy deals with mortality throughout the course of a person's life and provides information on the average age of death in a population. In contrast to the traditional measure of globalisation, the study uses a composite indicator of globalisation, which integrates different dimensions of globalisation. Third, the study investigates the moderating effect of governance on globalisation-life expectancy nexus in Africa, in addition to determining the direct influence of globalisation on life expectancy. This is premised on the fact that the level of governance is poor in African countries. Fourth, the study employs a methodology that accounts for cross-sectional dependence across the variables/countries selected. This is because variables from different cross-section units may be associated due to unobserved factors or spatial or spillover effects, and wrong conclusions can be avoided by employing estimating approaches that account for cross-sectional dependence in those countries.

The remainder of this work is sectioned as follows: section two focuses on the literature review. Section three details the methodology employed. Section four contains the study's empirical results, while section five concludes the study.

Literature Review

Conceptual Framework

The study utilises Huynen et al.'s (2005) conceptual framework, which establishes that population health is a product of globalisation. This focus is on this framework as it provides the nexus between health and globalisation. In this study, we measure population health by life expectancy; thus, the focus is on the impact of globalisation on life expectancy. The relationship between globalisation and life expectancy is a subject on which there is no consensus. On the one hand, globalisation, in its various forms, can have a detrimental impact on life expectancy for a variety of reasons (Lee, 2000; Lanbonte et al., 2011; Nguea et al., 2020; Pang & Guindon, 2004; Saker et al., 2004). First, (i) globalisation poses a new challenge to health systems in the areas of communicable diseases due to uncontrollable human mobility. In the twenty-first century, the main human factors on the origin, re-emergence, and transmission of infectious diseases are thought to be globalisation in trade, international travel, as well as increased population mobility (Jones et al., 2017; Tatem et al., 2006). As a result, lives are lost, resulting in a reduction in life expectancy; (ii) because globalisation leads to increasing pricing (imported inflation), it poses a threat to access to innovative medications, especially for people with low incomes in developing nations (Bianchi & Civelli, 2015); and (iii) globalisation tends to promote economic/health inequalities, insecurity and vulnerability, all of which have significant health implications (London & Schneider, 2012; Schrecker et al., 2008; Sutcliffe, 2005).

Nevertheless, globalisation has the potential to enhance population health (life expectancy) because (i) it comes with increased knowledge and information about different health issues and their solutions (Saker et al., 2004), and (ii) it spurs economic growth, which leads to higher incomes. Increased incomes can lead to increased access to health services, calories, and micronutrient consumption, which are especially helpful for better health outcomes in poor nations (Lange & Vollmer, 2017).

As demonstrated in Figure 1, globalisation has political, economic, and social components, all of which are strongly linked to birth life expectancy. Strong governance is thought to have a favourable influence on life expectancy through the government's many health programs and health-related policies. For instance, Ibukun (2020), Kim and Wang (2019), and Olatunde et al. (2019), amongst others, all point out that effective governance has a considerable favourable impact on health outcomes, including life expectancy, because efficient health policies can raise life expectancy if the quality of an institution is strong. The World Health Organization (WHO, 2023b) states that because a variety of factors outside the direct control of the health sector (such as education, income, and personal living conditions) influence health, decisions made in other sectors may have an impact on an individual's health as well as patterns of disease distribution and mortality. For better health outcomes, utilising the advantages of globalisation can be greatly aided by effective governance. Effective resource allocation, robust regulatory frameworks, accountability and transparency, inclusive engagement, and addressing the socioeconomic determinants of health are all facilitated by good governance. Countries may make the most of the benefits of globalisation on life expectancy and guarantee that they are distributed fairly among the populace by encouraging good governance. Meanwhile, globalisation is widely acknowledged as one of the most significant concerns confronting health authorities and practitioners (McMichael & Beaglehole, 2000; Yach & Bettcher, 1998).

Furthermore, Figure 1 shows that there may be a causal relationship between globalisation and life expectancy. This is premised on the idea that poor health can have a considerable impact on globalisation. Woodward et al. (2001) back up the evidence of a two-way causality between globalisation and health.

In sum, the conceptual framework, as depicted in Figure 1, shows that globalisation can significantly influence life expectancy as well as life expectancy having a considerable impact on globalisation. Also, governance has a way of influencing the relationship between globalisation and life expectancy.

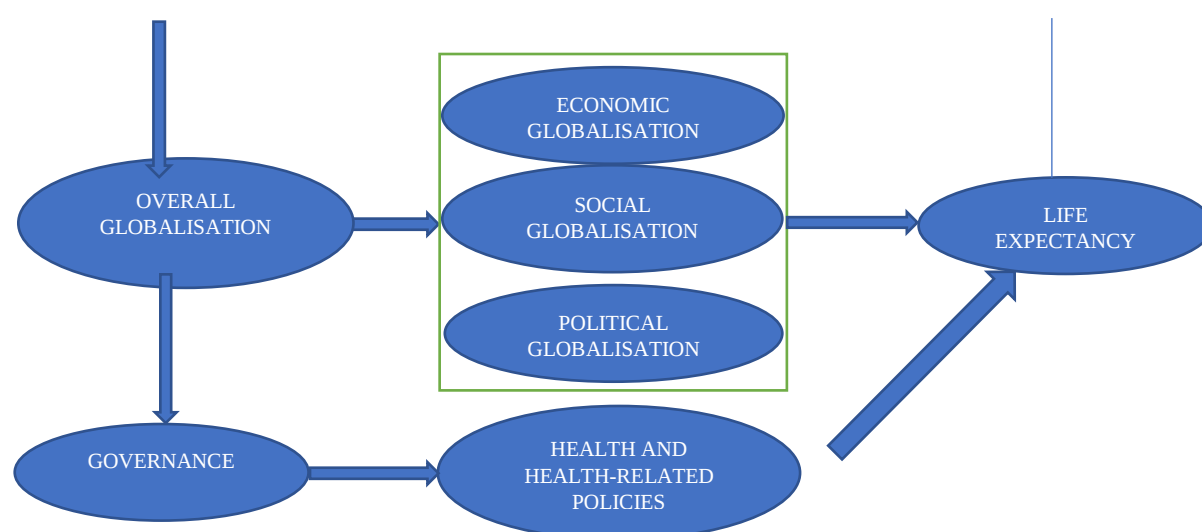


Fig. 1. Globalisation-Life Expectancy Link (Source: Adapted from Huynen et al., 2005)

Empirical Review and Hypotheses

There are limited studies on the link between globalisation and health, particularly in Africa, which could result from data scarcity and limited research capacity. Cornia (2001) opines that if globalisation is effectively handled, it can result in significant health benefits. In a recent study, Guzel et al. (2021) use methodologies that account for cross-sectional dependence to analyse the impact of globalisation and democracy on life expectancy in 16 low-income countries. The findings suggest that globalisation and democracy positively affect globalisation (see also Alam et al., 2016; Welander et al., 2015).

Shahbaz et al. (2019) use a nonlinear time series analysis in 16 Sub-Saharan African (SSA) countries to find a positive association between globalisation and life expectancy in 14 of the 16 countries studied.

Using a panel of 92 countries, which consists of 23 low-income countries, 28 high-income countries, and 41 middle-income countries, Bergh and Nilsson (2010) evaluate the impact of economic, political and social globalisation on life expectancy. The study employs various panel estimation techniques to find that only economic globalisation significantly affects life expectancy in the selected countries, even when other determinants such as income, nutritional intake, number of physicians, and literacy are controlled for. This agrees with Rafat's et al. (2013) findings, which show that social and political globalisations are positively associated with life expectancy. According to Owen and Wu (2007), the impact of globalisation on life expectancy, as measured by trade openness, depends on the country's level of development.

Clearly, few studies are conducted on a single country. In examining the effect of economic globalisation on life expectancy in Nigeria, Timothy (2018) uses the Johansen Cointegration test to examine the long-run relationship. The findings show that people in Nigeria will live longer due to economic globalisation. Also, Ali and Audi (2016) use Autoregressive Distributed Lag (ARDL) and Granger Causality approaches to investigate the relationship between globalisation and life expectancy in Pakistan with the findings that globalisation has a significant positive impact on life expectancy.

Conversely, Rafat et al. (2013) study the association between globalisation and life expectancy in developing countries using a multivariate model. The findings show that economic globalisation has a detrimental effect on life expectancy. Similarly, Tausch (2015) examines the effect of globalisation on life expectancy using 99 countries. Ordinary Least Square (OLS) estimation results reveal that globalisation increases income inequality, which affects health performance. However, the findings further reveal that just 19 of the 99 countries benefit from globalisation in terms of public health. The work of Bergh and Nilsson (2010) also shows that political globalisation has a significant negative effect on life expectancy. The same finding was established in 32 sub-Saharan African countries, according to Nguea et al. (2020). Apart from the negative and positive effects of globalisation on life expectancy, some studies have established that the two have an insignificant relationship. These studies include Cervantes et al. (2020) and Bergh and Nilsson (2010).

Based on other health outcomes such as mortality rate, Patterson and Veenstra (2016), in 168 countries, reveal that electoral democracy has a negative impact on infant mortality. Also, Welander et al. (2015), in 70 countries, show that globalisation and democracy reduce child mortality. Additionally, Nguea et al. (2020) report that economic and social globalisation reduce infant and child mortality rates in 32 sub-Saharan African countries. According to Milner et al. (2011), who empirically investigate the effect of globalisation on suicide in 35 countries, globalisation increases total suicide rates in the selected countries. However, the significance of this effect decreases with economic and social variables.

Several studies concentrate on other factors that can influence life expectancy apart from the process of globalisation and governance/institutional quality. They include government spending on social protection, health and environmental protection, gross national income, and education level (Cervantes et al., 2020); per capita income (Guzel et al., 2021); excellent public health, the provision of universal high-quality health care, and favourable social and economic conditions (Taylor & Salkeld, 1996); sanitation, improved economic growth, clean water, healthcare spending, and carbon emissions (Rahman et al., 2022); average years of schooling, urban population, the number of physicians, and nutrition (Bergh & Nilsson, 2010); higher levels of economic growth and financial development (Shahbaz et al., 2019); malnutrition and number of physicians (Kabir, 2008); health expenditure (Arthur & Oaikhenan, 2017; Ranabhat et al., 2018); and transportation (Jones et al., 2016).

In summary, evidence has it that globalisation can have both positive and negative impacts on life expectancy. Also, it is observed from the literature that there are other factors (such as economic growth, education level, healthcare spending, sanitation, and urban population, amongst others) that can significantly influence life expectancy apart from globalisation and governance. Based on this, we hypothesise that:

Hypothesis 1: Globalisation promotes life expectancy in African regions

Hypothesis 2: Governance significantly moderates the nexus between globalisation -life expectancy in Africa

Research Gaps in the Literature

While previous studies have shown conflicting effects of globalisation on life expectancy, they (Nguea et al., 2020; Rafat et al., 2013; Timothy, 2018) fail to examine the moderating impact of governance on the globalisation-life expectancy nexus. Examining this effect is crucial due to poor governance in African countries, which, if not addressed, can stifle the positive effects of globalisation on life expectancy. Furthermore, unlike this study, most studies that look into the role of governance in the relationship between globalisation and life expectancy do not employ an aggregate index. Data accessibility, methodological issues, the applicability of policies, and focused initiatives could all contribute to this. The aggregate index enables us to examine not just one aspect of governance but all aspects, which include control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and voice and accountability. Another key gap observed is the issue of methodology. Most previous panel studies do not account for cross-sectional reliance among nations, and if this is not taken into account, the estimates produced may be inconsistent. This study uses a Panel-Spatial Correlation Consistent enhanced with the Least Square Dummy Variables (PSCC-LSDV) technique to prevent inconsistencies in estimations. However, this method does not control for endogeneity, and to do this, we use a two-step system generalised method of moments (GMM) approach. The GMM approach is used to test the PSCC-LSDV estimate technique's robustness.

Research Methodology

Data Explanation

This study examines the role of governance in the globalisation-life expectancy nexus in 39 African countries from 1996 to 2019. The selected countries are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Comoros, Cote d'Ivoire, Democratic Republic of Congo, Egypt, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Togo, Tunisia, and Uganda. These countries were chosen based on data availability. The countries are chosen based on data availability. Furthermore, the study uses variables such as overall globalisation (GBI) life expectancy at birth. To control for other variables, we employ gross domestic product per capita growth (GDP), consumption per capita growth (CPC), basic sanitation (SAN), rate of inflation (INF) and governance index (GOI). Governance index is an index generated from six governance variables gathered from the World Bank's World Governance Indicators (World Bank, 2020). The governance index is obtained by averaging the six indicators. The globalisation index (GBI) is sourced from the Konjunkturforschungsstelle (KOF) globalisation index (KOF Globalisation Index, 2020) based on Gygli et al. (2019) and Dreher's (2006) works, while other variables are obtained from the World Bank's World Development Indicators (World Bank, 2020). The descriptions of the variables are presented in Table 1.

Table 1. Measurements and Sources of Data (Source: Authors' Compilations)

Variable	Abbreviation	Measurements	Sources
Globalisation index	GBI	Overall globalisation capturing economic, social and political indicators of globalisation	KOF Globalization Index (2020)
Life expectancy	LEB	Life expectancy at birth, total (years)	

Economic growth	GDP	Gross domestic product per head (annual growth rate)	World Bank (2020)
Consumption	CPC	Household consumption per capita (annual growth rate)	
Sanitation	SAN	Proportion of population using basic sanitation services	
Inflation rate	INF	Inflation, change in consumer prices index (annual %)	World Bank (2020)
Governance index	GOI	A composite index was generated from six governance indicators after taking the aggregate average. The indicators include control of corruption (CCR), government effectiveness (GOV), political stability and absence of violence/terrorism (PAV), regulatory quality (REG), rule of law (LAW), and voice and accountability (VAC)	

Model Formulation

Previous research (Huynen et al., 2005; Nguea et al., 2020; Rafat et al., 2013; Timothy, 2018) has shown that globalisation has an important impact on affecting life expectancy, as seen in Figure 1. This suggests that, as given in equation 1, life expectancy is a function of globalisation.

$$LEB_{it} = f(GBI_{it}, X_{it}) \quad (1)$$

where LEB stands for life expectancy at birth, which is a proxy for health outcome, GBI is overall globalisation, i represents the 39 African countries used in the study, and t stands for the study period, 1996-2019. The control variables are represented by X . To test hypothesis 1, the equation 2 specifies the relationship with the control variables.

$$LEB_{it} = \pi_0 + \pi_1 GBI_{it} + \pi_2 GDP_{it} + \pi_3 CPC_{it} + \pi_4 SAN_{it} + \pi_5 INF_{it} + \mu_{it} \quad (2)$$

where π_i for $i = 0, 1, 2, 3, 4, 5$ are the parameters to be estimated, and μ represents the error term.

Intuitively, the inclusion of control variables becomes critical. For example, improved economic growth is expected to improve health outcomes, according to Guzel et al. (2021) and Ibukun (2020). This is because rising economic growth enhances human health through increased access to health care. Similarly, consumption and sanitation are established to have a positive effect on health outcomes, in which life expectancy is one of the measures. The argument, according to Lange and Vollmer (2017), is that people's health will improve if they have access to good food, and having access to good basic sanitation will also have a positive influence on life expectancy (Ibukun, 2020; Rahman et al., 2022; Weibo & Yimer, 2019). Inflation, on the other hand, exerts a negative effect on life expectancy. This comes from the fact that inflation will reduce people's purchasing power, and life expectancy is adversely affected by limiting access to good food, sanitation, and health services. This is supported by Kamal and Bailey (2003), who argue that globalisation leads to higher prices (inflation), which can undermine access to new medicines, particularly for people with low incomes in developing countries.

Studies have established that governance in Africa is weak (Ajide & Osinubi, 2020; Ibukun, 2020), whereas weak governance is known to influence life expectancy adversely (Ibukun, 2020; Kim & Wang, 2019). Then, what is the role of governance in the globalisation-life expectancy nexus in

Africa(hypothesis 2)? As mentioned in equation 3, this is accomplished by interacting with both globalisation and governance index to become a variable. Equation 3 enables us to examine a separate effect of the interaction between globalisation and governance on life expectancy in Africa. The rationale for this is not far-fetched, as good governance is related to globalisation. Simply put, governance has a way of impacting globalisation. This is consistent with Fischer's study (2001).

$$LEB_{it} = \pi_0 + \pi_1 GBI_{it} + \pi_2 GDP_{it} + \pi_3 CPC_{it} + \pi_4 SAN_{it} + \pi_5 INF_{it} + \pi_6 GOI_{it} + \pi_7 (GBI * GOI)_{it} + \mu_{it} \quad (3)$$

where $GBI * GOI$ is the interactive term of globalisation and governance, and π_6 and π_7 are the estimated parameters of GOI and $GBI * GOI$, respectively.

However, the role of governance in influencing how globalisation affects life expectancy is investigated by partially differentiating equation 3 with respect to globalisation. This is done in line with other studies such as Ehigiamusoe et al. (2019; 2020), Olagbaju and Akinlo (2018), and Olaniyi and Oladeji (2021).

$$\frac{\partial LEB_{it}}{\partial GBI_{it}} = \pi_1 + \pi_7 GOI_{it} \quad (4)$$

Equation 4 is known as the marginal effect of globalisation on life expectancy, and it is based on two parameters: π_1 and π_7 . These parameters produce four possibilities:

- (i) If $\pi_1 > 0$ and $\pi_7 > 0$, it implies that globalisation has a positive effect on life expectancy, and governance encourages and complements the positive effect.
- (ii) If $\pi_1 > 0$ and $\pi_7 < 0$, it shows that globalisation has a positive effect on life expectancy, and governance is a substitute for globalisation by weakening its positive effect.
- (iii) If $\pi_1 < 0$ and $\pi_7 > 0$, it means that globalisation has a negative effect on life expectancy, and governance mitigates and lessens the negative effect.
- (iv) If $\pi_1 < 0$ and $\pi_7 < 0$, it implies that globalisation has a negative effect on life expectancy, and governance aggravates or worsens the negative effect.

Technique of Analysis

This study employs the Panel-Spatial Correlation Consistent augmented with Least Square Dummy Variables (PSCC-LSDV) technique. The model is more efficient in this study since it can be used with cross-sectional dependent variables when other techniques like fixed and random effects methods may be ineffective. The issue of cross-sectional dependence is vital in this panel study because variables from different cross-section units might be associated due to unobserved factors or spatial or spillover effects. Also, this approach is based on Driscoll and Kraay's (1998) robust standard error and its calculated spatial correlation consistent standard errors for linear panel models (Ajide et al., 2021). Despite its advantages, this technique has a flaw in that it does not account for endogeneity. The argument is that poor health, indicating a low life expectancy, can harm globalisation (Lee, 2004). Also, there could be a bi-directional causal link between economic growth, as measured by GDP per capita and health outcomes, implying that health outcomes can as well affect economic growth (Akinbode et al., 2021; Ibukun, 2020; Yildirim et al., 2020).

To validate the results from the aforementioned technique and tackle the problem of endogeneity, the study uses the two-step system generalised method of moments (GMM) of Blundell and Bond (1998). This method could be used to solve not just endogeneity but also heteroscedasticity and autocorrelation problems. To make it a dynamic model, the study employs the lagged value of the explained variable (life expectancy) as the instrumental variable. The Sargan test verifies the validity of the instrumental

variables used. In contrast, the Arellano and Bond test {AR(2)} confirms the absence of second-order serial correlations in the residuals, indicating that the estimated parameters are consistent. This approach is recommended over the one-step system GMM because it allows for optimal weighting matrices that produce more consistent and efficient estimated parameters (Hassan et al., 2019). The dynamic model is shown in equation 5.

$$LEB_{it} = \pi_0 + \alpha LEB_{i,t-1} + \pi_1 GBI_{it} + \sum_{j=2}^7 \pi_j X_{it} + \mu_{it} \quad (5)$$

where $LEB_{i,t-1}$ represents the lagged value of life expectancy, α is the parameter estimate of $LEB_{i,t-1}$, and X_{it} denotes a vector of the control variables to be considered.

Descriptive Statistics and Correlation Analysis

The descriptive statistics of the variables employed are shown in Table 2. The average values stand at approximately 59 years, 47, 2, 2, 36 and 19 per cent for life expectancy at birth, overall globalisation, GDP per capita growth, consumption per capita growth, basic sanitation as a percentage of population and inflation rate, respectively. LEB values of 35 years in Rwanda in 1996 and 77 years in Algeria in 2019 are the lowest and highest, respectively. Specifically, the lowest year in Rwanda could be due to the fact that the RPF-led Rwanda Government launched an offensive against refugee camps in Zaire which triggered the First Congo War (Prunier, 1999), while the highest year in Algeria points to the fact that the country underwent a peaceful protest that can bring about longevity. For overall globalisation, Burundi had the minimum value of roughly 22 per cent in 1998, while Mauritius recorded the highest value of approximately 72 per cent in 2019.

Table 2. Descriptive statistics (Source: Authors' Computations)

Variable	Observation	Mean	Std. Dev.	Min.	Max.
LEB	936	58.66	8.07	35.38	76.88
GBI	936	47.59	9.85	22.53	72.43
GDP	936	1.80	3.88	-31.33	21.03
CPC	936	2.09	8.16	-45.41	87.01
SAN	936	35.81	25.36	-1.65	95.51
INF	936	18.86	8.16	-34.53	4800.53
GOI	936	-0.58	0.58	-2.26	0.88

Table 3 reports the correlation analysis. The explanatory variables are not highly linked with the explained variable, life expectancy at birth. In the same vein, the explanatory variables do not have a strong linear relationship with one another, indicating the absence of multicollinearity. Precisely, overall globalisation, economic growth, basic sanitation, and the governance index all have a positive relationship with life expectancy at birth. In contrast, consumption and inflation have a negative relationship with it.

Table 3. Pairwise Correlation (Source: Authors' Computations)

	LEB	GBI	GDPCG	CPCG	SAN	INF	GOI
LEB	1.0000						
GBI	0.6328*	1.0000					
GDP	0.0416*	0.0931*	1.0000				
CPC	-0.0137	0.0487*	0.2076*	1.0000			

SAN	0.6855*	0.6257*	0.0607	-0.0109*	1.0000		
INF	-0.0961*	-0.0744*	-0.0036*	0.0076 *	-0.0396*	1.0000	
GOI	0.3497*	0.4824*	0.1871*	0.0628*	0.3793*	-0.1193*	1.0000

* denotes significance at 5%)

Research Results

Cross-sectional dependence and unit root tests

We perform a cross-sectional dependence (CD) test on all variables using Pesaran's Cross-Sectional Dependence (PCSD) test. Except for consumption and the governance index, practically all the variables under investigation have cross-sectional dependence, as seen in Table 4. The study uses both first-generation (Im-Pesaran-Shin, IPS) and second-generation (cross-sectional dependence version of IPS, CIPS) unit root tests based on the CD test results. The former test ignores cross-sectional dependence in the variables, but the latter does not. The results of both tests in Table 1 reveal that all variables are I(0). This indicates that the null hypothesis that the variables contain unit roots has been rejected. The stationary test shows that the variables have a long-run relationship, obviating the requirement for cointegration analysis.

Table 4. Cross-sectional Dependence (CD) and Panel Unit Root Tests (Source: Authors' Computations)

Variable	Pesaran CD test	Im-Pesaran-Shin unit-root test	Panel Unit root tests based on CIPS
LEB	122.343***	-4.144***	-4.180***
GBI	106.636***	-2.394***	-2.327***
GDPCG	4.368***	-5.369***	-3.922***
CPCG	0.243	-8.070***	-3.898***
SAN	81.508***	-4.366***	-4.508***
INF	10.118***	-6.1702***	-3.984***
GOI	0.707	-6.0271***	-4.636***

. ***, **, * denote significance at 1%, %5 and 10% respectively

Globalisation-Life Expectancy Nexus: The Role of Governance

The association between globalisation and life expectancy, using the PSCC-LSDV technique, is presented in Table 5. Model 1 presents the effect of globalisation on life expectancy without including the governance index. Model 2 details the moderating effect of governance in the link between globalisation and life expectancy. The Wald test results show that the explanatory factors are jointly significant in explaining life expectancy in the two models.

Globalisation has a positive influence on life expectancy in Models 1-2. This explains why an improved globalisation process in Africa would boost people's life expectancy. The findings show that, due to globalisation, African countries now have more access to information and health services than previously when people were unaware of many health conditions and how to treat them. Sharkey et al. (2004) reinforce this positive relationship by arguing that the process of globalisation would improve health outcomes. Also, this confirms the findings of Ali and Audi (2016), Guzel et al. (2021), Owen and Wu (2007), and Shahbaz et al. (2019). Globalisation can improve life expectancy by increasing the chances for improved population health surveillance, monitoring, and reporting through global information and communication technology, and improved economic growth (income level), which can boost life expectancy by providing access to high-quality health services and ensuring that people eat the right foods. Despite probable inequality impacts of globalisation, the net effect of globalisation on development is largely positive (Dreher, 2006), and our empirical evidence backs this up.

Surprisingly, economic growth and consumption have no significant impact on life expectancy. The insignificant impact of economic growth on life expectancy confirms Kabir's work (2008). However, it contradicts the conclusions of Bokhari et al. (2007), Guzel et al. (2021), Ibukun (2020), Kim and Wang (2019), Makuta and O'Hare (2015), and Shahbaz et al. (2019), who all agree that economic expansion can help people live longer. This is because African countries are unaware of their status, especially in the face of greater economic progress. Furthermore, the findings show that an increase in per capita GDP does not always imply an increase in life expectancy in Africa, as the region has seen increases in GDP per capita but decreases in life expectancy over the years. On consumption, the region's high poverty level may have a negative impact on its citizens' food intake through consumption, resulting in an insignificant negative association between consumption and life expectancy. To this purpose, Lange and Vollmer (2017) concur that calorie and micronutrient consumption is especially advantageous for improving health outcomes in impoverished nations, including Africa.

As expected, adequate basic sanitation enhances life expectancy in Africa, whereas inflation decreases life expectancy, as demonstrated by the two models. In terms of sanitation, the findings are consistent with those of Ibukun (2020), Makuta & O'Hare (2015), Rahman et al. (2022), and Weibo and Yimer (2019), who also find a positive link between sanitation and life expectancy. According to Soliman (2019), just 27 per cent of sub-Saharan Africans have access to basic sanitation, and according to the Borgen Project (2019), poor sanitation is a key cause of several common diseases in Africa, including diarrhoea, dysentery, cholera, and typhoid (Rahman et al., 2022). Statistics show that 16 of the 54 countries in Africa have less than 25% sanitation coverage, and 45% of Africans will endure unsanitary circumstances at some point throughout their lives. Also, according to the report, more than 315,000 children in Africa die each year from diarrheal infections caused by a lack of sanitation, whereas the provision of clean water and proper sanitation could reduce diarrhoea by 15 to 20 per cent (Borgen Project, 2019). Also, WHO (2019) estimates that 827,000 people in low- and middle-income countries die as a result of inadequate water, sanitation, and hygiene each year, representing 60 per cent of all diarrhoea deaths. Poor sanitation is believed to be the primary cause of 432,000 deaths. The implication is that if African countries do not have adequate sanitation, life expectancy will continue to decline.

The significant negative impact of inflation on life expectancy supports the claims of Kamal and Bailey (2003). The findings suggest that high inflation levels in Africa lower the consumers' purchasing power, negatively impacting life expectancy. To put it another way, rising inflation equals lower consumption and access to healthcare services, which negatively impact life expectancy. To confirm this, Kamal and Bailey (2003) argue that globalisation leads to higher prices (inflation). As a result, higher prices reduce access to new medicines, particularly for people with low incomes in developing countries, reducing life expectancy.

Finally, the relationship between globalisation and life expectancy still remains positive and significant with an increased coefficient while moderating the effect of governance in the globalisation-life expectancy nexus in Model 2. Even though governance has a lower coefficient, it still positively and significantly impacts life expectancy. This implies that the separate effects of globalisation and governance are insensitive to the interacting terms of globalisation and governance in terms of the direction of the existing relationship. However, the moderating effect of governance and globalisation on life expectancy is negative and significant (that is, $\frac{\partial LEB_{it}}{\partial GBI_{it}} = 0.876 - 0.005GOI_{it}$). This suggests that governance does not encourage globalisation to contribute positively to life expectancy, but rather, it weakens the positive life expectancy effect of globalisation. This could be a result of the existence of poor governance in Africa, implying that poor governance constitutes itself a drag on the positive effect of globalisation on life expectancy. This result contradicts the earlier findings, which establish separate strong positive effects on life expectancy in Africa as we expect governance to spur globalisation in improving life expectancy. This finding implies that globalisation and governance are substitutes for each other, meaning that globalisation and governance should be pursued in different ways to improve life expectancy in African countries. This result further suggests that globalisation and governance work independently to reduce life expectancy in African countries. This submission, however, contradicts the notion that governance will positively influence globalisation, according to Fischer (2001). Most notably, including the interactive effect of globalisation and governance does not influence the life expectancy effects of the control variables.

Table 5. Results from PSCC-LSDV (Explained Variable: LEB) (Source: Authors' Computations)

Variable	(1)	(2)
GBI	0.516*** (0.000)	0.876*** (0.000)
GDPCG	-0.003 (0.910)	-0.018 (0.420)
CPCG	0.001 (0.781)	-0.007 (0.280)
SAN	0.153*** (0.000)	0.158*** (0.000)
INF	-0.001*** (0.000)	-0.0003*** (0.014)
GOI		3.922*** (0.000)
GOI*GBI		-0.005*** (0.000)
Constant	28.587*** (0.000)	24.769*** (0.000)
Wald test	101.06*** (0.000)	661.81*** (0.000)
within R-squared	0.654	0.7629
Number of obs.	936	936
Number of groups	39	39

***, **, * denote significance at 1%, 5% and 10% respectively

Sensitivity Analysis

The results in Table 6 are robust to the PSCC-LSDV estimation technique in Table 5. The study employs a dynamic approach in equation 4 to re-estimate equations 2-3. The dynamic approach is suitable for addressing the issue of endogeneity, which was absent in our previous analysis. The diagnostic estimates reveal an improvement in the Wald test in the two models. The insignificant values of the Sargan test further confirm the validity of the instrumental variables used, while the insignificant values of the AR(2) test confirm the absence of second-order serial correlations in the residuals, which in turn confirm the consistency of the estimated parameters.

Table 6 shows that the past value of life expectancy has a positive and significant impact on its current value, implying that life expectancy is a stable indicator of health outcomes. Globalisation continues to have a positive and significant impact on life expectancy in the two models, as seen in the table, indicating that the results are consistent with the earlier findings. Intriguingly, the magnitudes of the coefficients increase in the two models, while economic growth and consumption significantly enhance life expectancy. According to Rahman et al. (2022), the positive impact of economic growth on life expectancy using this method supports the existence of the Preston Curve. Also, the impact of governance becomes negative, while the interactive effect of globalisation and governance remains unchanged. Specifically, the moderating effect of governance and globalisation on life expectancy is negative and significant (that is, $\frac{\partial LEB_{it}}{\partial GBI_{it}} = 0.867 - 0.001GOI_{it}$).

In conclusion, globalisation's moderating (interactive) effect on life expectancy is negative, suggesting that globalisation and governance are mutually exclusive. This means that while globalisation increases

life expectancy, its beneficial effects are mitigated by Africa's weak governance. In other words, the positive impact of globalisation on life expectancy in Africa is undermined by the presence of inadequate governance in the region.

Table 6. Two-step System GMM (Explained Variable: LEB) (Source: Authors' Computations)

Variable	(1)	(2)
LEB(-1)	0.972*** (0.000)	0.867*** (0.000)
GBI	0.015*** (0.000)	0.155*** (0.000)
GDP	0.024*** (0.000)	0.016*** (0.000)
CPC	0.0006*** (0.000)	0.0009** (0.036)
SAN	-0.004*** (0.001)	0.016*** (0.004)
INF	-0.0003*** (0.007)	-0.0001*** (0.002)
GOI		-2.268*** (0.000)
GOI×GBI		-0.001*** (0.000)
Constant	1.516*** (0.000)	1.186*** (0.001)
Wald test	461716.36*** (0.000)	164950.95*** (0.000)
Sargan test/p-value	0.766	0.869
Arellano-Bond test(2)	0.701	0.077
Number of obs	897	897
Number of groups	39	39

***, **, * denote significance at 1%, %5 and 10% respectively

Conclusions

The study examines the role of governance in the globalisation-life expectancy link in 39 African countries between 1996 and 2019 using a PSCC-LSDV estimation technique. This technique simply accounts for cross-sectional dependence among the variables, but it does not solve the issue of endogeneity. The study uses a dynamic two-step system GMM as a robust model to the PSCC-LSDV approach to solve the endogeneity problem. The results from the PSCC_LSDV reveal that globalisation enhances life expectancy in selected African countries. Likewise, the result from the GMM estimator is consistent with the PSCC-LSDV approach. This shows that a better globalisation process would boost life expectancy in Africa. The effect of globalisation on the life expectancy nexus without the inclusion of governance is positive. Meanwhile, the moderating (interactive) effect of globalisation on life expectancy is negative, indicating that globalisation and governance are substitutes for each other, indicating that globalisation positively influences life expectancy. However, the poor governance conditions in Africa weaken this positive effect. Put differently, the existence of poor governance in the

African region drains the positive effect of globalisation on life expectancy in Africa. However, we expect life expectancy in African countries to improve in the face of good governance, meaning that good governance would not weaken the positive effect of globalisation on life expectancy.

The study, therefore, concludes that globalisation will increase life expectancy in Africa. This implies that globalisation can help in the improvement of life expectancy. The reason for this may be found in globalisation's capacity to raise income levels through more significant economic growth. Higher income levels can improve access to good (quality) health services and consumption of the required diet, both of which are beneficial to better life expectancy in Africa. The globalisation process, aided by global information and communication technology, can help understand the nature of a disease/pandemic and, thus, proffering solutions to the disease/pandemic. Furthermore, the study confirms that governance interacts with globalisation to undermine the positive impact of globalisation on life expectancy due to poor governance in Africa. Therefore, African countries should implement policies to enhance good governance so as to enjoy the benefits of globalisation.

In conclusion, the study recommends that policymakers in African countries pursue policies/activities that would promote globalisation to reap the benefits of globalisation, including improved life expectancy. Specifically, overall globalisation can be improved through technological advancement (such as information, communication, industrial and manufacturing technologies), market-oriented economic reforms and contributions by multinational corporations, encouraging cultural sensitivity, fostering peace with other developed countries, and adopting global institutions. Increased life expectancy has an impact on the socioeconomic conditions of an economy, particularly in Africa. This suggests that extending life expectancy can result in higher economic growth and productivity, lower healthcare expenses, and better quality of life—all of which are advantageous to African economies.

Finally, one of the primary drawbacks of this study is the lack of data, which limits the scope of the study to only 39 African countries. For future research in Africa and other regions, the study suggests other studies focus on other measures of health outcome such as infant mortality rate, maternal mortality rate and under-5 mortality rate in order to unravel the effect of globalisation on other aspects. This is explained by the fact that mortality statistics can be utilised as a pillar in creating health programs and policies to decrease premature mortality and enhance quality of life, indicating improved life expectancy.

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