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THE IMPACT OF GLOBALIZATION ON ECONOMIC GROWTH: INSIGHTS FROM SUB-SAHARAN AFRICA (1971-2019)

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ABSTRACT

As globalization continues to shape the global economic landscape, understanding its intricate relationship with economic growth remains paramount in regions like sub-Saharan Africa. Hence, this study presents a comprehensive analysis of globalization's impact on economic growth in sub-Saharan Africa from 1971 to 2019. Using panel data from reputable databases on Trade and Development (UNCTAD), World Development Indicators, Penn World Table 10.0, and Our World Data, the paper explores various dimensions of globalization, including economic, social, and political factors. The feasible generalized least square (FGLS) estimation technique was used to analyze data. Findings reveal nuanced dynamics, with social and financial globalization indices showing positive effects on economic growth and statistically significant at 1% significance level. Additionally, this study uncovers the influence of demographic indicators, government consumption, and the rule of law on economic growth. The result of the study revealed demographic indicators, government consumption, and the rule of law had statistically significant impacts on the economic growth of sub-Sahara Africa. In contrast, certain aspects of economic globalization exhibit negative impacts. However, political, trade, information, and cultural globalization had no significant impact on economic growth of the region. It is important to recognize that the absence of significant effects does not necessarily imply an absence of impact, but rather reflects the multifaceted nature of globalization's influence on economic growth. Several factors, including differences in the periods analyzed, may account for the differences in these results compared to previous studies. This study not only adds to the existing literature on globalization and economic growth but also offers valuable insights for policymakers tasked with promoting sustainable development in sub-Saharan Africa. By acknowledging the complexities of globalization's impact, policy makers can formulate more effective strategies to harness its benefits while mitigating its potential drawbacks. This research contributes to a deeper understanding of globalization's role in economic development, laying the foundation for evidence-based policy interventions tailored to the unique challenges and opportunities facing sub-Saharan Africa.

Key words: Social globalization, financial globalization, government consumption, economic growth

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INTRODUCTION

Globalization, a multifaceted and dynamic process [1,2], has emerged as a transformative force shaping economies worldwide [3]. Its influence extends beyond national borders, impacting societies, economies, and governance structures globally [4]. While globalization offers opportunities for economic expansion, market integration, and technological advancement, it also brings about challenges such as increased competition and widening income disparities [5]. The complex interplay between globalization and economic growth has garnered significant scholarly attention, illuminating the diverse outcomes observed across nations [6]. However, debates persist regarding globalization's overall impact due to its mixed outcomes [7]. While some countries experience economic gains and enhanced connectivity, others, particularly regions like Africa, Latin America, and Eastern Europe, grapple with domestic vulnerabilities and unequal access to global resources [8].

Sub-Saharan Africa, in particular, has encountered obstacles to economic progress exacerbated by globalization, amplifying existing disparities [9]. Despite globalization's emphasis on interconnectedness, it often disregards distributional inequities, perpetuating global inequalities [10]. While globalization has spurred economic growth in certain developing nations, theories like Wallerstein's world-system theory underscore the enduring inequality between developed and developing regions [11].

The phenomenon of globalization fosters interdependence among nations, with advanced economies reaping benefits from knowledge and technology spillovers at the expense of slower growth in developing countries [12, 13]. This dynamic has widened the gap between high- and low-income nations [14, 15], with sub-Saharan Africa facing unique challenges due to its sluggish economic growth and high poverty rates [16, 17]. Despite extensive research exploring economic growth determinants in the region, the specific role of globalization often remains understudied [18, 19, 20].

Traditionally, globalization literature has relied on single indicators, predominantly focusing on trade-related measures such as the ratio of exports to GDP [21, 22, 23, 24, 25, 26]. While previous research has examined globalization's impacts on developing countries [2, 27, 28, 29], it often neglects the nuanced effects within sub-Saharan Africa. Moreover, existing studies often lack updated globalization indices encompassing both *de jure* and *de facto* elements across economic, social, and political domains. Consequently, a critical knowledge gap exists in understanding globalization, particularly within the unique context of sub-Saharan Africa.

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To address these knowledge gaps, this study aims to conduct a comprehensive analysis tailored to the region's context. Specifically, it seeks to examine the effects of globalization on economic growth in sub-Saharan Africa, providing valuable insights into this complex relationship. This investigation aimed to answer the following research questions: How do different dimensions of globalization, including economic, social, and political, impact economic growth in sub-Saharan Africa? How do factors such as the rule of law, government consumption, and demographic indicators influence economic growth in sub-Saharan Africa? By addressing these questions, this study seeks to enhance understanding of the multifaceted relationship between globalization and economic growth in sub-Saharan Africa, thereby informing policymakers and practitioners in their efforts to promote inclusive and sustainable development in the region.

Literature review

The literature review section is divided into two subsections. The concept and definition of globalization section and the review of empirical studies section explore the impact of globalization on economic growth from various perspectives.

Concept of globalization

Globalization, as defined by the Organisation for Economic Co-operation and Development (OECD), denotes the progressive internationalization of markets, encompassing goods, services, finance, businesses, industries, technology, and competition [30]. In a broader context, globalization refers to the integration of nations into the global landscape, leading to transformative processes that transcend national boundaries and impact humanity as a whole [27]. It is essential to note that globalization does not inherently entail the establishment of a global governing structure or uniform social and political assimilation; instead, it involves diverse and sometimes contradictory trajectories [4]. At its essence, globalization signifies the evolution of market capitalism, beginning with privatization measures and culminating in economic liberalization [13].

The globalization index scores range from 1 to 100, with 1 representing the least globalized and 100 the most. In the context of globalization, as categorized by Nye & Keohane [31], three distinct dimensions emerge- Economic, Social, and Political. Economic globalization (EcGI) involves the long-distance flows of goods, capital, and services, along with the exchange of information inherent in market transactions [32]. It comprises trade and financial globalization, with each accounting for 50 percent of the weight [32, 33]. Social globalization (SoGI) encompasses the dissemination of ideas, information, images, and the movement of people [32], mainly consisting of sub-globalizations such as interpersonal, information, and cultural, each contributing one-third [32, 33]. Political globalization (PoGI) focuses on the diffusion and spread of government policies [32].

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Assessment of PoGI is conducted through both *de facto* (PoGIdf) and *de jure* (PoGIdj) measures, evaluating actual international flows and policy frameworks, respectively. PoGIdj specifically measures a nation's capacity for international political collaboration, utilizing metrics such as the number of multilateral treaties established since 1945, the extent of international organization memberships, and an indicator of diversity among treaty partners [32]. Table 1 provides a comprehensive definition of dependent and control variables, as well as globalization indexes.

Empirical literature review

A vast body of literature delves into the multifaceted dimensions of globalization and its implications for economic growth [2]. Ying *et al.* [28] conducted a comprehensive analysis investigating the effects of economic, social, and political globalization on the economic growth of ASEAN member countries from 1970 to 2018. Egbetunde & Akinlo [34] focused their study on the impact of financial globalization on economic growth across 21 countries in sub-Saharan Africa from 1980 to 2013. Türedi [35] examined the relationship between globalization and the economic growth of 40 developing countries from 1996 to 2014. Similarly, Kilic [2] investigated the influence of social and political globalization on the economic growth of 74 developing nations spanning from 1981 to 2011.

Dreher [36]'s analysis of data from 123 countries spanning 1970 to 2000 revealed a positive correlation between globalization and economic growth. Additionally, increased levels of globalization and economic integration have been linked to reductions in poverty [37]. However, according to Wade [38], the relationship between globalization, poverty, and inequality is complex, emphasizing the significance of local context in understanding its impact on economic development. Wade highlighted disparities across regions, noting that while some regions experienced rapid economic growth and poverty reduction, others faced stagnation or decline.

Moreover, studies have revealed that subcomponents within the globalization index exert varying effects on economic growth, adding layers of complexity to the research landscape [2, 27, 28]. For instance, social globalization has been identified as a positive driver of economic growth in African and ASEAN member states by Nosier [39] and Savrul & Incekara [27], respectively. However, contrasting conclusions have emerged, with some studies suggesting that social globalization may hinder economic growth in certain regions, such as ASEAN and developing countries [2, 28]**.** Similarly, the impact of political globalization varies, with findings from Nosier [39] indicating a significant negative impact on African economies, while Ying *et al*. [28] report a non-significant negative impact on ASEAN economies. Furthermore, Savrul and Incekara [27] find an insignificant

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relationship between political globalization and economic growth in ASEAN countries.

Additionally, Bataka [40] examines the intricate relationship between globalization *de jure* and *de facto* and their influence on economic growth in sub-Saharan Africa, utilizing the KOF Index of Globalization from 1980 to 2015. His findings highlight the positive role played by economic and social globalization *de jure*, along with economic globalization *de facto*, in promoting economic growth in sub-Saharan Africa. Conversely, political globalization *de facto* is associated with impediments to economic progress in the region.

Data collection

Data for this study were meticulously gathered from a variety of sources. The KOF Globalization Index database, maintained by the Swiss Institute for Business Cycle Research at ETH Zurich, provides data on globalization indices. Indicators of economic growth, specifically the average annual growth rate of real gross domestic product (GDP) per capita, were sourced from the UNCTAD database. Data on life expectancy and fertility rates were retrieved from the World Development Indicator database, while information on government consumption as a percentage of GDP was accessed from Penn World Table 10.0. The Rule-of-Law Index utilized in this study was obtained from the Our World Data database. The study period spans from 1971 to 2019, chosen based on data availability and completeness for both globalization and economic growth metrics. The analysis encompasses 27 countries in sub-Saharan Africa, including Benin, Botswana, Burkina Faso, Burundi, Cameroon, the Central African Republic, the Democratic Republic of the Congo, Gabon, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mauritania, Niger, Nigeria, the Republic of the Congo, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zambia. To save space, we list and explain the variables of globalization as well as sub-globalization indices in the paper in Table 1.

Model specification

The panel data model aims to explore the intricate relationship between globalization and economic growth in sub-Saharan Africa during the period from 1971 to 2019. The foundation of analysis lies in the following linear equation:

$$\mathrm{Y}_{it} = \alpha_0 + \sum_{k=1}^{K} \beta_k Globalization_{it} + \sum_{j=1}^{J} \gamma_j Z_{it} + \mu_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where Y_{it} represents the annual average growth rate of GDP per capita, with GDP reflecting the economic output, the subscript *i* represents 27 sub-Saharan African countries and *t* denotes time period. The term “Globalization” denotes a

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globalization index, encompassing economic, social, and political dimensions, as well as sub-globalization indexes. The control variables Z_{it} include factors such as fertility rate, life expectancy, rule-of-law index, and government consumption. Coefficients β and γ capture the respective impacts of globalization and control variables, μ_{it} represents the residuals. The statistics of the variables in the model are shown in Table 2.

Diagnosis test

A panel unit root test was conducted before running the regression analysis to avoid spurious results. This unit root test was carried out using Augmented Dickey-Fuller (ADF) and Im, Pesaran, and Shin (IPS) [41] tests. As presented in Table 3, except for GDP, and financial globalization, all variables exhibited non-stationarity at I (0). However, those variables that were not stationary at I (0) were stationary after applying the first differencing I (1) for both the ADF and IPS tests. Consequently, to avoid spurious findings, conducted regression analyses for all explanatory variables after differencing.

Following the stationarity check of variables, a model diagnosis was conducted. Pair-wise correlation revealed strong interdependence among some variables, leading to biased results. To address this concern, three distinct equations were developed, each centered around the annual average growth rate of GDP per capita as the dependent variable, serving as a proxy for economic growth. Model (1) incorporated the Economic Globalization Index (EcGI), Social Globalization Index (SoGI), and Political Globalization Index (PoGI). Model (2) encompassed the Cultural Globalization Index (CuGI), Financial Globalization Index (FiGI), Information Globalization Index (InGI), Interpersonal Globalization Index (IpGI), and Trade Globalization Index (TrGI). Model (3) comprised Economic Globalization *de facto* (EcGIdf), Economic Globalization *de jure* (EcGIdj), Social Globalization *de facto* (SoGIdf), Social Globalization *de jure* (SoGIdj), Political Globalization *de facto* (PoGIdf), and Political Globalization *de jure* (PoGIdj). Additionally, in each equation control variables, such as life expectancy (LEX), Rule-of-law index (RLI), and Government consumption (% of GDP) (GOCO) were included.

Furthermore, tests were conducted to diagnose Cross-sectional dependency (CD) and serial correlation. As demonstrated in Table 4, both the Breusch-Pagan [42] LM test and the Wooldridge test were significant at 1%. This diagnostic analysis highlighted the presence of serial correlation and cross-sectional dependencies across all equations or models, rendering ordinary least square (OLS) estimation biased. Consequently, the Feasible Generalized least square estimation technique (FGLS) was utilized. utilize Parks [43]'s feasible generalized least square which is a widely recognized model that assumes (i) heteroscedasticity; (ii) first-order serial correlation; and (iii) interdependence among different cross-sectional units [44].

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Further, Parks [43]'s model was used because this model fits well when the period (T) exceeds cross-sections (N) and for balanced panels. When employing FGLS within Stata software packages, users can access a broad spectrum of command options, and conditions on the specific assumptions concerning heteroscedasticity, serial correlation, and cross-sectional dependence. Finally, among different command options, 'panels(correlated)' and 'corr(ar1)' were utilized to address serial correlation and cross-sectional dependency (CD) in data.

RESULTS AND DISCUSSION

This research investigates the impact of globalization on economic growth in sub-Saharan Africa, focusing on the intricate relationships at play. Various dimensions of globalization exhibit statistically significant impacts on economic growth. Globalization indexes such as social globalization, economic globalization *de jure*, social globalization *de facto*, social globalization *de jure*, financial globalization index, and interpersonal globalization index had a positive impact on the economic growth of sub-Saharan African countries. Economic globalization and economic *de facto* hurt the economic growth of the region.

Additionally, Table 4 presents the empirical results from the analysis, corresponding to a specific model (m#). These tables provide detailed insights into the estimated coefficients and their significance, further enriching our understanding of the relationship between globalization and economic growth in sub-Saharan Africa.

Impact of economic globalization on sub-Saharan Africa's economic growth

Many studies have explored the relationship between economic globalization and economic growth across different regions and periods. For instance, Gurgul and Lach [45] examined new EU member states from 1990 to 2009, Ying *et al.* [28] studied ASEAN countries spanning 1970 to 2008, Gygli *et al.* [32] analyzed 137 developed and developing nations from 1970 to 2018, and Cao *et al.* [46] investigated thirty-six OECD countries from 1985 to 2018. These studies collectively suggest that economic globalization tends to foster faster economic growth in emerging and developing economies compared to their advanced counterparts. Additionally, prior research has often highlighted a positive association between economic globalization and economic growth [28, 45].

Contrary to the prevailing positive narrative, analysis, as evidenced Model (1) in Table 4, unveils a statistically significant negative impact of economic globalization on economic growth in sub-Saharan Africa, albeit at a 10% significant level. Specifically, a unit increase in economic globalization corresponds to a decrease of 0.049 units in economic growth. This adverse effect may stem from speculative

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movements of goods, capital, and services, characterized by an unequal distribution of benefits.

Further dissecting the nuances between *de facto* and *de jure* aspects of economic globalization, Model (3) in Table 4, delineates intriguing patterns. Economic globalization *de facto* exhibits a negative impact on economic growth, while economic globalization *de jure* demonstrates a positive and statistically significant effect at a 1% probability level. Notably, for each unit increase in economic globalization *de facto*, economic growth diminishes by 0.061 units, whereas a unit increase in economic globalization *de jure* corresponds to an economic growth increase of 0.068 units.

Comparing findings with those of Bataka [40], who examined data from 40 sub-Saharan African countries spanning 1980 to 2015, reveals both similarities and disparities. Consistent with Bataka [40], economic globalization *de jure* showcases a positive impact on the economic growth of sub-Saharan Africa. Contrary to Bataka [40] findings of a positive effect of economic globalization *de facto*, our analysis indicates a negative trend. This discrepancy may arise from inequitable distribution of goods and services, along with external influences such as global economic dynamics and geopolitical factors.

Impact of financial globalization on sub-Saharan Africa's economic growth

The analysis sheds light on the role of financial globalization in shaping economic growth within sub-Saharan Africa, as detailed Model (2) in Table 4. Notably, the financial globalization index emerges as statistically significant at a 1% significance level, echoing the findings of Gygli *et al.* [32]. The model indicates a positive association between the financial globalization index and economic growth, with a unit increase in the index corresponding to a growth increase of 0.046 units. This aligns with prior research conducted by Afzal [47] on Pakistan's economy from 1960 to 2006, Egbetunde & Akinlo [34] covering the period 1980 to 2013 in sub-Saharan Africa (SSA), and Vo *et al.* [48] on China from 2010 to 2017. These studies have consistently linked financial integration with long-term economic growth.

This finding underscores the positive effects of unhindered integration into global financial markets (financial globalization) on sub-Saharan African economies. Effective legal and regulatory frameworks governing financial markets, coupled with sound monetary policies, play pivotal roles in reducing volatility and enhancing the competitiveness of financial institutions. These factors collectively contribute to fostering a conducive environment for economic growth in the region.

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Impact of social globalization on sub-Saharan Africa's economic growth

The result reveals the significant influence of social globalization on economic growth within sub-Saharan Africa, as evidenced Model (1) in Table 4. Notably, social globalization emerges as a positive driver of economic growth at a 1% probability level, with a unit increase in social globalization associated with an economic growth increase of 0.296 units. This finding aligns with prior research by Gurgul & Lach [45] and Haini *et al*. [49], which similarly reported a positive impact of social globalization on economic growth. Consistently, Gygli *et al.* [32] highlighted the benefits of social globalization for emerging economies. However, it is important to note that previous studies, such as the one conducted by Ying *et al.* [28], have suggested the negative effects of social globalization on economic growth, underscoring the complexity of the relationship between social globalization and economic growth.

The analysis delves deeper into the nuanced dimensions of social globalization, distinguishing between globalization *de facto* and *de jure*. As depicted in Model (3) in Table 4, both social globalization *de facto* and *de jure* exhibit positive and significant impacts at a 1% significance level. Specifically, a unit increase in social globalization *de facto* contributes to a growth increase of 0.172 units, while a similar increase in social globalization *de jure* results in a growth increase of 0.140 units. This finding is consistent with the observations of Bataka [40] for *de jure* social globalization and Gygli *et al.* [32] for *de facto* social globalization. The positive impact observed in these dimensions suggests that social interactions, including cultural exchanges and international social networks, positively contribute to economic growth in sub-Saharan Africa.

Impact of interpersonal globalization on sub-Saharan Africa's economic growth

The analysis reveals the substantial impact of interpersonal globalization on the economic growth of sub-Saharan Africa, as elucidated Model (2) in Table 4. Notably, the interpersonal globalization index exhibits a positive effect, with economic growth increasing by 0.350 units for each unit increase in the index. This finding underscores the pivotal role of interpersonal interactions in driving economic growth. The interpersonal dimensions of globalization, encompassing both the movement of people across borders (*de facto*) and the influence of legal frameworks (*de jure*), significantly contribute to the economic development of countries. These interactions facilitate crucial economic activities such as knowledge exchange and foreign investment, thereby promoting sustained growth in sub-Saharan Africa.

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Impact of control variables on economic growth in sub-Saharan Africa

Table 4 presents the analysis of control variables, including fertility rate (FER), life expectancy (LEX), rule-of-law index (RLI), and government consumption (GOCO) across the three model equations. The analysis reveals significant insights into their impact on economic growth in sub-Saharan Africa. Both the fertility rate and government consumption emerge as significant hindrances to economic growth, demonstrating statistical significance at a 1% level. Specifically, a one-unit increase in the fertility rate leads to a decrease in economic growth within the region, ranging from 2.969 to 3.441 units. Similarly, a one-unit increase in government consumption results in a decrease in economic growth, ranging from 0.310 to 0.326 units. These findings resonate with Dreher [36], who revealed that both the fertility rate and government consumption impede economic growth. High fertility strains resources, constraining economic opportunities and negatively impacting the region's growth. Likewise, government consumption restricts private sector growth and investment, thus impeding economic growth in sub-Saharan Africa.

Conversely, the Rule-of-Law Index and life expectancy demonstrate significant and positive influences on economic growth in sub-Saharan Africa. A one-unit increase in both the Rule-of-Law Index and life expectancy corresponds to an increase in economic growth, ranging from 12.063 to 12.742 and 1.255 to 1.258, respectively. Consistent with findings, Dreher [36] and Gygli *et al.* [32] show that the rule of law index and life expectancy positively influence economic growth. The rule of law facilitates economic growth in sub-Saharan Africa by fostering fair legal systems that attract investments and maintain stability. Additionally, longer life expectancy implies a more productive workforce, which can boost economic growth in the region.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

A comprehensive analysis of globalization's impact on economic growth in sub-Saharan Africa from 1971 to 2019 reveals a nuanced relationship, with both significant and insignificant effects across different dimensions of globalization. While social and financial globalization showed positive impacts, certain economic dimensions exhibited negative effects. The complexity of these findings underscores the need for policymakers to recognize the multidimensionality of globalization's influence. Longer study periods are essential for capturing its lasting effects. Moving forward, policymakers must develop a nuanced understanding of globalization's components to promote inclusive and sustainable economic development. This requires policies that leverage globalization's positives while mitigating its negatives, ensuring equitable growth in the region.

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Conflict of interest

The authors have not declared any conflict of interest.

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Table 1: Description of Variables

Variables	Definition	Encompasses dimensions	Source
GDP	Gross Domestic Product per capita	change in real GDP per capita between two consecutive years, expressed as %	UNCTAD
FER	Fertility rate	total births per woman throughout her reproductive years, measured in the number of births	World development indicator
LEX	Life expectancy at birth	The average lifespan of a newborn is measured in years.	World development indicator
RLI	Rule-of-law index	On a scale from 0 to 1, with 1 indicating the highest reliance on rules.	Our world data
GOCO	Government consumption	Government spending on goods and services divided by GDP, expressed %	Penn World Table
Globalization indexes			
Economic			
EcGI	Economic globalization	The broad flow of goods, capital, and services, as well as the exchange of information and shared perceptions related to market activities.	[31]
FiGI	Financial Globalization	the unrestricted integration of global financial markets, allowing for the unrestricted movement of capital and the ownership of foreign assets and liabilities across national borders.	[32, 50]
TrGI	Trade Globalization	Assessing diversity in trading partners for goods and the proportion of GDP derived from both exports and imports of goods and services.	[32]
Political			
PoGI	Political globalization	Concepts and information concerning authority and the management of societies, or it encompasses the dissemination of governmental strategies and practices.	[31]
Social			
SoGI	Social globalization	Dissemination of ideas, data, images, and individuals.	[31]
CuGI	Cultural globalization	encompasses the proliferation of McDonald's restaurants and IKEA stores, in addition to the accumulation of trademark applications filed by non-residents.	[32]
InGI	Informational Globalization	assessed through indicators like patent applications from non-residents, the influx of international students, and the export of high-tech products per capita.	[32]

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IpGI	Interpersonal Globalization	encompass personal interactions comprising both the actual and legal dimensions of interpersonal globalization.	[32]
Globalization, *de facto*			
Economic *de facto*			
EcGIdf	Economic globalization, *de facto*	It is the combined outcome of actual trade and financial activities.	[32]
Political *de facto*			
PoGIdf	Political Globalization, *de facto*	assessed by examining factors such as the number of embassies, involvement in UN peacekeeping missions, and the presence of international non-governmental organizations (NGOs) within a country.	[32]
Social *de facto*			
SoGIdf	Social globalization, *de facto*	Globalization comprises tangible aspects of interpersonal interactions, information exchange, and cultural dissemination.	[32]
Globalization, *de jure*			
Economic *de jure*			
EcGIdj	Economic globalization, *de jure*	It represents the combination of legal or formal trade and financial globalization.	[32, 33]
Political *de jure*			
PoGIdj	Political Globalization, *de jure*	A country's formal and legal participation in global politics is assessed by its membership in international organizations, adherence to treaties since 1945, and the variety of partners in bilateral investment agreements.	[32]
Social *de jure*			
SoGIdj	Social globalization, *de jure*	The legal or formal aspects of global interactions in interpersonal, informational, and cultural realms encompass specific legal factors such as telephone subscriptions, freedom of travel, international airport accessibility, television, and internet access, press freedom, gender equality, human capital, and civil liberties within the global context.	[32]

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Table 2: Statistical Descriptions

Variable	Mean	Max	Min	Observation
GDP	1.191	91.583	- 50.311	1,323
Control variables				
FER	5.840	8.250	1.360	1,323
LEX	53.385	74.514	14.098	1,323
RLI	0.409	0.915	0.027	1,323
GOCO	15.092	43.658	0.757	1,323
Globalization indexes				
Economic				
EcGI	39.030	84.907	12.111	1,323
FiGIdf	41.969	99.186	4.213	1,323
TrGIdf	44.730	89.921	9.525	1,323
Political				
PoGI	48.994	85.934	15.488	1,323
Social				
SoGI	29.273	78.350	9.030	1,323
CuGIdf	16.841	68.879	1.000	1,323
InGIdf	32.447	83.326	3.627	1,323
IpGIdf	28.298	72.891	7.104	1,323
Globalization, *de facto*				
Economic *de facto* (EcGIdf)	43.350	89.022	9.398	1,323
Political *de facto* (PoGIdf)	45.307	84.881	17.294	1,323
Social *de facto* (SoGIdf)	25.933	72.052	7.594	1,323
Globalization, *de jure*				
Economic *de jure* (EcGIdj)	34.656	81.091	9.384	1,323
Politcal *de jure* (PoGIdj)	52.681	87.296	8.583	1,323
Social *de jure* (SoGIdj)	32.540	85.571	4.656	1,323

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Table 3: Panel Unit root test result

Variable	I (0)		Variable	I (1)	
	Statistics (Prob.)			Statistics (Prob.)	
	ADF	IPS		ADF	IPS
Dependent variable					
GDP	-16.530***	-17.684***	ΔGDP	-34.725***	-27.109***
Control variables					
FER	6.684	21.619	ΔFER	-5.060***	-4.734***
LEX	3.033	6.865	ΔLEX	-6.901***	-11.149***
RLI	-0.381	1.526	ΔRLI	-17.797***	-18.991***
GOCO	-1.629 *	-1.804**	ΔGOCO	-21.648***	-21.438***
Globalization indexes					
Economic					
EcGI	-0.265	-0.957	ΔEcGI	-23.490***	-22.904***
FiGI	-1.795**	-2.423***	ΔFiGI	-23.928***	-23.009***
TrGI	-0.020	-1.243	ΔTrGI	-23.555***	-23.075***
Political					
PoGI	2.425	2.997	ΔPoGI	-23.426***	-21.165***
Social					
SoGI	11.271	16.254	ΔSoGI	-12.357***	-17.265***
CuGI	5.102	4.821	ΔCuGI	-20.959***	-22.051***
InGI	11.903	17.020	ΔInGI	-14.230***	-17.831***
IpGI	7.933	10.700	ΔIpGI	-14.267***	-18.008***
Globalization, *de facto*					
Economic *de facto* (EcGIdf)	-0.034	-0.924	ΔEcGIdf	-23.136***	-22.952***
Political *de facto* (PoGIdf)	-1.514	-0.228	ΔPoGIdf	-24.826***	-21.534***
Social *de facto* (SoGIdf)	9.250	11.507	ΔSoGIdf	-15.886***	-19.311***
Globalization, *de jure*					
Economic *de jure* (EcGIdj)	0.106	-0.848	ΔEcGIdj	-23.073***	-22.994***
Political *de jure* (PoGIdj)	1.699	1.002	ΔPoGIdj	-19.150***	-18.251***
Social *de jure* (SoGIdj)	10.289	13.620	ΔSoGIdj	-14.891***	-18.682***

Note: ***, **, *denote the significance level at 1%, 5%, and 10%, respectivly. The first difference is represented by Δ

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Table 4: FGLS Estimation results: Model (1)-Model (3)

	Models (m#)		
Variable	**(1)**	**(2)**	**(3)**
ΔEcGI	-0.049* (0 .027)		
ΔPoGI	-0.007 (0 .029)		
ΔSoGI	0.296*** (0.068)		
Δ FiGI		0.046*** (0 .009)	
ΔTrGI		-0.023 (0 .021)	
ΔCuGI		0.017 (0 .040)	
ΔInGI		0.051 (0 .039)	
ΔIpGI		0.350*** (0.055)	
ΔEcGIdf			-0.061*** (0 .016)
ΔEcGIdj			0.068*** (0.026)
ΔPoGIdf			-0.009 (0.016)
ΔPoGIdj			0.054 (0 .038)
ΔSoGIdf			0.172*** (0 .049)
ΔSoGIdj			0.140*** (0 .050)
ΔFER	-3.441** (1.730)	-2.969* (1.727)	-3.260* (1.726)
ΔLEX	1.255*** (0 .056)	1.258*** (0 .057)	1.255*** (0.057)
ΔRLI	12.182*** (2.046)	12.063*** (2.053)	12.742*** (2.052)
ΔGOCO	-0.322*** (0.039)	-0.310*** (0 .038)	-0.326*** (0.039)
Constant	0.544*** (0.178)	-1.428*** (0.395)	0.501*** (0.181)
Observation	1,296	1,296	1,296
Wald chi2	689.120***	733.990***	726.490***
Model diagnosis test			
Breusch-Pagan LM test	499.571***	480.163***	501.497***
Pearson CD	5.824***	5.229***	5.814***
Wooldridge test	31.100***	33.307***	39.138***
Breusch-Pagan	0.360	1.570	0.330

Note: ***, **, *denote the significance level at 1%, 5% and 10%, respectively. Value in parenthesis is standard error; first difference (Δ); Economic globalization (EcGI); Political globalization (PoGI); Social globalization (SoGI); Financial globalization (FiGI); Trade globalization (TrGI); Cultural globalization (CuGI); Information globalization (InGI); Interpersonal globalization (IpGI); fertility rate (FER); Economic globalization, *de facto* (EcGIdf); Economic globalization *de jure* (EcGIdj); Political globalization *de facto* (PoGIdf); Political globalization *de jure* (PoGIdj); Social globalization *de facto* (SoGIdf); Social globalization *de jure* (SoGIdj); life expectancy (LEX); Rule-of-law index (RLI) and Government consumption (% of GDP) (GOCO). The first-row number indicates the equation number

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