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Impact of Globalization, Women's Empowerment, and Maternal Health in Sub-Saharan Africa (SSA)

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Abstract: The purpose of this study is to examine the impact of globalization and women's empowerment on maternal health in Sub-Saharan Africa. The study utilizes a dynamic panel model applied to a sample of 37 Sub-Saharan African countries, covering the period from 2000 to 2017. For a more granular analysis, the sample is divided into four regional subgroups. The Generalized Method of Moments (GMM) estimator is employed for the overall African context, while the Least Squares Dummy Variable (LSDV) corrected estimator is used for regional analyses. The findings reveal that both foreign direct investment (FDI) and women's empowerment significantly contribute to reducing maternal mortality rates across Sub-Saharan Africa, with distinct effects observed in the West, East, Central, and Southern regions. These results underscore the multifaceted nature of globalization, which now extends beyond the exchange of goods and services to include technological advancements, migration, and broader impacts across various sectors. The study concludes that enhancing women's empowerment and attracting FDI are crucial strategies for improving maternal health outcomes in the region. However, the research also highlights the challenges of accurately measuring the impact of service liberalization on health due to data limitations and the complexities of long-term effects. Implications of this study suggest that policymakers should focus on creating an enabling environment for FDI and promoting gender equality initiatives that empower women. Additionally, there is a need for more comprehensive data collection and long-term studies to better understand the enduring effects of globalization on health outcomes.

Keywords: Globalization, Women's Empowerment, Maternal Health, Sub-Saharan Africa, The GMM Estimator, The LSDV-Corrected Estimator

1. Introduction

Globalization has emerged as a pivotal aspect of international discourse due to its profound impact on various sectors of economic activity (Bolduc & Ayoub, 2000). The International Monetary Fund (IMF) defines globalization as the growing economic interdependence of countries, driven by increased transnational transactions of goods and services, the free flow of capital, cross-border migration, and the rapid diffusion of new technologies (Spilerman, 2009). It encompasses transnational movements of capital, technology, goods and services, human relations, knowledge, and cultural beliefs (Held et al., 2000). Additionally, globalization involves trade and market liberalization, the free movement of labor, and the greater integration of national economies into the global economy by dismantling barriers (Kumar, 2003; Mallavarapu, 2007). Thus, globalization is a process that integrates countries through common economic, trade, political, social, cultural, and technological ties.

While globalization has presented new opportunities, particularly for developing countries attracting foreign investments and capital (Kaur, 2018), its effects have not been uniformly positive. The benefits have been unevenly distributed, with disadvantaged countries, especially in the developing world, experiencing significant challenges (Harcourt, 2001). Globalization has accelerated negative trends in economic and social development for the most vulnerable populations, including women, who have faced increased burdens due to job cuts, deteriorating working conditions, and heightened economic precarity (Parida, 2011).

Concerning women's status, globalization has significantly improved lives worldwide, particularly in developing countries (Kaur, 2018). For instance, the increased profitability of cash crops in international markets has enhanced women's independence, employment opportunities, and contributions to household income. However, the positive effects of globalization on women vary significantly across different regions, with women in Sub-Saharan Africa facing unique challenges (Boyer & Guénard, 2014). Women in these regions are often more active in economic activities, especially in agriculture and informal sectors, where they play a crucial role but face significant barriers, including limited access to education and resources (Beneria, 2010).

Despite these advancements, globalization has not fully benefitted all population groups, with gender inequalities persisting due to differences in education, access to resources, and social roles (Sangappa & Kavle, 2010). The recent global health crisis

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due to COVID-19 has exacerbated these inequalities, particularly affecting women involved in sectors like markets, hotels, and restaurants, which were severely impacted by lockdowns and closures (Antipova, 2021; Ozili, 2020).

This paper's significance lies in its focus on the comprehensive impact of globalization, not only in terms of economic exchanges but also technological transfers and migration, which affect all sectors of activity. In the context of Sub-Saharan Africa, where economies are predominantly outward-looking, and the informal sector is a significant driver of economic growth, it is crucial to examine the impact of globalization on women's empowerment. Women's roles in these economies are vital, particularly in the informal sector, and understanding how globalization influences their empowerment and, consequently, maternal health is of paramount importance.

The novelty of this study stems from its regional focus within Sub-Saharan Africa, capturing the specific effects of globalization and women's empowerment on maternal health across different regions. Unlike previous studies that often take a generalized approach, this research employs econometric tools tailored to each region, providing a nuanced understanding of the varied impacts of globalization within Sub-Saharan Africa. Thus, this study contributes to the empirical literature by offering a detailed analysis of the interplay between globalization, women's empowerment, and maternal health in Sub-Saharan African countries, with a specific focus on regional disparities.

2. Literature Review

Operational risk in Thailand has resulted in significant financial losses for organizations, businesses, individuals, and financial institutions, thereby negatively impacting the country's economy. For instance, the collapse of two microfinance service providers in Thailand in 2017 triggered public fear, leading to a loss of confidence in the sector. This loss of confidence has had a ripple effect on the success of these institutions and, consequently, on Thailand's economic growth. Given that credit and savings cooperative microfinance service providers hold substantial financial resources in Thailand, their collapse or inefficiency could have detrimental effects on the country's financial stability.

Turning to the health sector, globalization has played a pivotal role in strengthening health systems in developing countries, particularly in Sub-Saharan Africa (Bettcher & Lee, 2002; Bettcher, Yach, & Guindon, 2000). This strengthening has been facilitated by increased funding and investment in health infrastructure from international financial partners (Organization, 2018). According to the Organization for Economic Cooperation and Development (OECD), aid to the health sector in Sub-Saharan Africa increased by approximately 63% between 2010 and 2018 (OECD, 2020). These statistics underscore the considerable efforts made by the international community to improve health indicators in a region that continues to lag behind other parts of the world in terms of health outcomes.

Over the past few decades, the African region has seen notable improvements in the health status of its populations, particularly among women, although many targets have not been fully met. World Bank statistics indicate a 28% reduction in maternal mortality from 2000 to 2010 and a further 14% decline from 2010 to 2017, with the maternal mortality rate decreasing from 626 to 534 deaths per 100,000 live births (Indicator, 2021). In contrast, other regions of the world, including OECD countries, experienced smaller declines of 10% and 14%, respectively, during the same periods (Indicator, 2021). This significant achievement in Africa can be attributed to the strong commitment of policymakers to improve maternal health and the substantial aid provided by various health sector stakeholders. Additionally, the focus on achieving the Sustainable Development Goals (SDGs) has played a crucial role, as health and well-being are closely linked to nearly 50 of the 167 targets within the 17 SDGs, beyond the direct health-focused SDG3.

However, despite these health gains, Sub-Saharan Africa continues to record the highest maternal mortality rates globally, with approximately 529,000 women dying each year during pregnancy and childbirth (Organization, 2018). The region's maternal mortality rate of 534 deaths per 100,000 live births in 2017 starkly contrasts with the 18 deaths per 100,000 live births in OECD countries during the same period. This situation is largely due to the unavailability of health services, outdated health infrastructures, and a severe lack of financial and human resources. Key risk factors for maternal mortality include illiteracy, poverty, malnutrition, high fertility rates, low income, weak health systems, and complications during pregnancy and childbirth (Wamala & Kawachi, 2009). To sustainably improve women's health, it is crucial to address these structural barriers that hinder access to quality services for the most vulnerable populations, including women, children, and adolescents.

The importance of this paper lies in its focus on enhancing women's economic empowerment, which is essential for achieving sustainable development, pro-poor growth, and the Sustainable Development Goals (SDGs). Research in development economics suggests that international trade has increased women's employment in less developed countries. Over recent decades, women's participation in the labor market has dramatically increased in developing countries. Economic empowerment enables women to participate in, contribute to, and benefit from the growth process, providing them with opportunities to negotiate a more equitable distribution of the benefits of growth.

In this context, this paper aims to analyze the relationship between globalization, women's employability, and maternal health in Sub-Saharan Africa. It seeks to contribute to the existing literature by adopting a methodological

approach based on the Generalized Method of Moments (GMM) estimator and the Least Squares Dummy Variable (LSDV) correction.

3. Methodology

3.1. Data And Model

The dataset primarily originates from the World Bank database (Indicator, 2021). The sample encompasses 37 Sub-Saharan African countries, with annual observations spanning from 2000 to 2017. For a more comprehensive analysis, this study focuses on different regions of Africa to specifically assess the effects of globalization and women's employability on maternal health across these regions.

Table 1: List of countries

No	Country	No	Country	No	Country
1	Angola	15	Gabon	29	Rwanda
2	Benin	16	Gambia	30	South Africa
3	Botswana,	17	Ghana	31	Sudan
4	Burkina Faso	18	Guinea	32	Senegal
5	Burundi	19	Guinea-Bissau	33	Sierra Leone
6	Cameroon	20	Kenya	34	Tanzania
7	Chad	21	Lesotho	35	Togo
8	Central Africa	22	Liberia	36	Uganda
9	Comoros	23	Madagascar	37	Zambia
10	Cape Verde	24	Mali		
11	Congo	25	Mozambique		
12	Congo (Republic)	26	Namibia		
13	Côte d'Ivoire	27	Niger		
14	Eswatini	28	Nigeria		

Source: World Development Indicator (Indicator, 2021)

The model chosen is the health production model as defined by Phelps (1995) and formulated as follows :

$H = f(M, X)$ --------- (1)

Where **H** represents the health measure, **M** represents the medical care consumption, and **X** represents the consumption of goods and services. Referring to the studies of Azemar and Desbordes (2009), Okafor and Oseghale (2019), and (Nagel, Herzer, & Nunnenkamp, 2015a/201b, this theoretical model leads us to the general empirical formulation as follows:

$MM = f(TO, FDI, EMPF, SEE)$--------- (2)

Where **MM** is the maternal health indicator; **TO** represents the openness rate; easing and increasing trade can allow governments to obtain more resources to improve the well-being of their populations, including health actors in trade negotiations and agreements related to public health, and take steps to remove import duties on health-related products (Byaro, Nkonoki, & Mayaya, 2021). FDI represents a foreign direct investment. **FDI** can act as a catalyst to improve the health sector, increase educational opportunities, and create a better lifestyle (Golkhandan, 2017; Siddique, Hasan, Chowdhury, Rahman, Raisa, & Zayed, 2021). **EMPF** represents the employment rate of women; the literature has shown the importance of the level of employment synonymous with an increase in resources to facilitate access to care and thus to mortality reduction (Gjerdingen, McGovern, Bekker, Lundberg, & Willemsen, 2001; Waldron, 1980). **SEE** represents the vector of socioeconomic and environmental variables (Wang, 2014).

However, the methodological approach follows a panel data model for African countries.

Equation (1) is specified as follows:

$$MM_{it} = \beta i + \beta_1 TO_{it} + \beta_2 FDI_{it} + \beta_3 EMPF_{it} + \beta_4 DPS_{it} + \beta_5 URB + \beta_6 TMNN_{it} + \beta_7 INF_{it} + \varepsilon_{it} \text{ ---------(3)}$$

Where β_i represents the country-specific effect; **i** and **t** represent the number of individuals (country) and time period (year), respectively; **DPS** represents public health expenditure. Increased public investment in health would improve healthcare provision and thus health status (Boachie & Ramu, 2017; Nwankwo, 2018; Rana, Alam, & Gow, 2018). **URB** represents the rate of urbanization. High urbanization accompanied by sanitation infrastructure and health services would improve health status (Kamal, Curtis, Hasan, & Jamil, 2016; Matthews, Channon, Neal, Osrin, Madise, & Stones, 2010). ***TMNN*** indicates neonatal mortality rate. The literature has shown a correlation between neonatal mortality and maternal mortality. Thus a high level of neonatal mortality increases the maternal morbidity rate (Moucheraud, Worku, Molla, Finlay, Leaning, &Yamin, 2015). **INF** represents the level of inflation. Rising food prices negatively affect nutrition and lead to higher mortality levels as food represents a larger share of household expenditures (Bourne, Sharpe-Pryce, Francis, Solan, Hudson-Davis, Campbell-Smith, & Coleman, 2014; Lee, Lim, & Park, 2016).

3.2. Analysis Of The Descriptive Statistics Of The Variables

The descriptive statistics of the variables show heterogeneity between countries in Sub-Saharan Africa. The level of maternal mortality is estimated to average 580 deaths per 100,000 live births, with a maximum of 2480 deaths

per 100,000 live births. The variation in maternal mortality from country to country is estimated at 331 deaths per 100,000 live births. Other statistics can be seen in the table (2) below.

Table 2: Descriptive statistics of variables

Variable	Observations	Average	Standard deviation	Minimum	Maximum
MM	684	579,958	330,528	53	2480
TO	684	68,404	33,559	16,141	311,354
FDI	684	4,493	8,474	-6,057	103,337
EMPF	684	45,364	5,727	27,838	55,248
DPS	684	1,597	1,010	0,062	5,275
URB	684	39,363	15,533	8,246	88,976
TMNN	684	30,574	9,817	5,6	54,7
INF	638	8,976	29,297	-8,975	513,907

Source: Calculated by the author based on WDI data, 2021

3.3. Estimation Technique

To analyze the relationship between globalization, women's employability, and maternal health in SSA, the econometric approach is based on a panel model of 37 countries in SSA covering the period from 2000 to 2017, for which the GMM estimator is used to control for unobserved fixed effects, endogenous independent variables, the presence of heteroskedasticity, and autocorrelation across or within the panel (Arellano & Bond, 1991). For further analysis, the sample is divided according to the different regions of Sub-Saharan Africa. For the analysis of these areas, the LSDVC bias correction estimator was used for the regressions through a dynamic approach. However, the LSDVC estimator is preferred to the GMM estimator because the latter becomes inefficient when the study period is greater than the number of observations. Thus to have unbiased estimates in a small panel data context, the appropriate estimator is the LSDVC.

This method is an appropriate estimation technique for small sample dynamic panel data where GMM cannot be applied effectively. Okeke and Okeke (2016), referring to the study by Bruno (2005), showed the effectiveness of the LSDVC estimator under conditions where the number of observations (N) and sample size (T) is small or in situations where T ≥ N for panel data (Bun & Kiviet, 2003). Thus, we use the Least Squares Corrected Dummy Variable (LSDVC) estimator for the country-level analysis of the different regions. The inclusion of lagged values allows us to control for potentially important variables omitted in the model. Thus, in its dynamic form, the operational model in equation (3) can be rewritten as follows :

$$MM_{it} = \beta i + \beta_1 MM_{it} + \beta_1 TO_{it} + \beta_2 FDI_{it} + \beta_3 EMPF_{it} + \beta_4 DPS_{it} + \beta_5 URB + \beta_6 TMNN_{it} + \beta_7 INF_{it} + \varepsilon_{it} \text{ ---------} (4)$$

MM_{it-1} Represents the lagged variable of maternal mortality.

4. Results And Data Analysis

Table (3) below presents the overall results of the relationship between globalization, women's employability and women's health in SSA. The results show that an increase in FDI of 1% leads to a reduction in maternal mortality of about 0.23%. Similarly, increasing women's employability leads to an improvement in maternal health of about 5.4%. The results also show that increasing the level of urbanization by 1% leads to a reduction in maternal mortality of about 1.23%.

For an in-depth analysis, table (4) below presents the results of the relationship between globalization, women's employability, and women's health in the different regions of Sub-Saharan Africa. The results reveal that globalization affects maternal health overall. Indeed, the coefficients associated with the degree of trade exchange (openness rate) and FDI are significant and negative, which shows that they respectively allow a reduction in the level of maternal mortality, especially in West Africa, of about 0.13% and 0.48%. While in the South African region, the degree of openness increases the level of maternal mortality by about 0.03%, in the Central African region, FDI contributes to improving maternal health by about 0.52%. However, while women's employability allows a reduction in maternal mortality by about 2.42% and 9.22%, respectively, in West and Central Africa, it contributes to the deterioration of maternal health by about 4.68% in East Africa.

The low level of public investment in health contributes to a deterioration of maternal health by about 2.03% and 9.23% in East and Central Africa. Similarly, the accelerating level of urbanization unaccompanied by basic health care services increases the level of mortality in West and East Africa by about 0.76% and 3.19%, respectively. However, controlling the level of neonatal mortality in East Africa leads to an improvement in maternal health of about 3.54%.

Table 3: Estimates Results of the Effect of Globalization and Women's Employability on Maternal Health in Sub-Saharan Afric

Variables	GMM Estimator
L.MM	0.782***
	(0.0141)
TO	-0.0353
	(0.0305)
FDI	-0.233***
	(0.0684)
EMPF	-5.397***
	(1.323)
DPS	0.757
	(1.735)
URB	-1.226***
	(0.387)
Tmneonatal	3.858***
	(0.413)
INFLATION	-0.00694
	(0.0378)
Constant	288.4***
	(57.08)
Observations	570
Number of ID	37

Standard errors in parentheses, **Note** : *** p<0.01, ** p<0.05, * p<0.1

Source: Author's estimate based on WDI data, 2021

Table 4: Results of estimates of the effect of globalization and women's employability on maternal health in Sub-Saharan Africa regions

	LSDVC Estimator			
Variables	**West**	**East**	**Center**	**South**
L.MM	0.875***	1.044***	0.947***	0.865***
	(0.0377)	(0.0276)	(0.0132)	(0.0292)
TO	-0.130***	-0.194	-0.0338	0.0326***
	(0.0400)	(0.140)	(0.412)	(0.00201)
FDI	-0.481***	1.008	-0.516***	-0.132
	(0.0758)	(1.003)	(0.198)	(0.402)
EMPF	-2.419***	4.697**	-9.219***	-0.494
	(0.581)	(2.303)	(0.912)	(0.388)
DPS	-2.507	2.032***	9.230**	0.0103
	(4.477)	(0.0358)	(4.419)	(2.365)
URB	0.756***	-0.628	3.185***	-1.695
	(0.230)	(0.702)	(1.204)	(1.143)
Tmneonatal	1.803*	-3.539***	4.887***	0.669***
	(1.004)	(0.0697)	(1.689)	(0.0655)
INFLATION	-0.391	-0.141	0.0168	-0.00917
	(0.580)	(0.180)	(0.0548)	(0.0458)
Observations	244	85	101	177
Number of ID	15	5	6	11

Standard errors in parentheses, **Note**: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's estimate based on WDI data, 2021

5. Discussion

The analysis of the results presented in the tables above indicates that, overall, globalization plays a crucial role in improving maternal health, especially in the East and West African regions. The effect of Foreign Direct Investment (FDI) on health can be attributed to the fact that an increase in FDI leads to an increase in income, which subsequently improves well-being. This finding aligns with the work of Alam, Raza, Shahbaz, and Abbas (2016), who observed that FDI positively influences health by increasing life expectancy. The influx of FDI brings substantial benefits to recipient countries, including strategies for economic improvement, development promotion, new production methods, technology transfer, domestic competition among firms, and skill enhancement (Osano & Koine, 2016). This is particularly vital for countries in Sub-Saharan Africa that are pursuing strategies for the structural transformation of their economies.

Similarly, trade liberalization can enhance health status through the acquisition of new healthcare technologies (such as devices, equipment, or infrastructure), pharmaceutical products, and food (Oberlander, Disdier, & Etilé, 2017). This confirms the significant impact of trade openness on reducing maternal mortality in West Africa.

However, according to the study by Nagel et al. (2015), there is a non-linear relationship between FDI and health. They found that FDI positively affects population health at lower income levels, but this effect diminishes as income increases and eventually becomes negative at higher income levels. These findings underscore the importance of FDI in improving health status.

Regarding the effect of women's empowerment, the results demonstrate that higher female employability improves maternal health. Increased female employability leads to higher income for women, particularly in the African region, where women head most households. The importance of women's empowerment is highlighted in Goal 3 of the MDGs, which aims to "Promote gender equality and empower women." Women's empowerment involves elevating women's political, social, and economic status, enabling them to access resources on par with men and guaranteeing them the right to make strategic decisions about their lives (WHO, 2008). However, women's empowerment must be coupled with gender equality, ensuring that men and women of all ages have equal opportunities to access and utilize resources and services within the family, community, and society. Promoting gender equality creates the conditions for these vital services to exist by ensuring that public policies and budget allocations benefit women.

The results, however, indicate that in East Africa, increased female employability correlates with higher maternal mortality. Poor working conditions for women jeopardize their survival, and wage labor prevents married women from fully attending to their natural obligations. Apart from those employed formally, most women work in the informal sector, which is heterogeneous by nature, requiring these women to devote more time to market production. In Africa, the proportion of women in the informal sector is often higher than that of men, and these women typically come from low-income families. In many countries, circumstances such as changes in marital status, widowhood, abandonment, repudiation, or separation often compel women to become heads of households.

Concerning the effect of urbanization on health status, the results reveal a negative and significant impact of this variable on maternal mortality in Sub-Saharan Africa. This can be attributed to urban areas' access to sanitation, electricity, and health services (Filmer & Pritchett, 1999). However, the increase in urbanization rates must be accompanied by policies for sanitation, provision of clean water, and improvement of the living environment for the poor living on the urban periphery to prevent a rapid increase in urban poverty that could negate the health benefits of rural living (Anyanwu & Erhijakpor, 2009).

The Organization (2014) reported that the rate of urbanization in Africa is among the highest globally and is one of the main contributors to increased pollution. Other contributing factors include fiscal policies that encourage the use of adulterated fuels, the surge in imports of often antiquated used cars, and inefficiencies in industrial manufacturing processes. Access to improved sanitation facilities (such as better toilets) is limited in most countries, particularly in rural areas. Open defecation remains a problem in Sub-Saharan Africa due to the lack of improved facilities, especially in rural areas. This situation contributes to the deterioration of maternal health due to the consequences of heavy urbanization in West and Central Africa.

Regarding the effect of public health expenditure on maternal health, the results show that the low level of public health expenditure contributes to the increase in maternal mortality in East and Central Africa. This result can be explained by the low level of health spending or poor governance (Farag, Nandakumar, Wallack, Hodgkin, Gaumer, & Erbil, 2013). In existing literature, health spending is recognized as crucial for improving health (Boachie & Ramu, 2017). Public investment in health should focus on building healthcare centres to improve access to services, enhancing healthcare infrastructure, improving the quality of healthcare delivery, and purchasing necessary equipment. These factors are essential for maintaining and improving population health. Fortunately, public spending has been gradually increasing in recent years, albeit slowly, in all countries. This may reflect the willingness of public decision-makers to ensure better health for the population (Arthur & Oaikhenan 2017). However, further efforts are needed to fulfil the commitment made at the Abuja meeting of heads of state in 2000 to allocate at least 15% of their budgets to the health sector.

6. Conclusion

This study has examined the impact of globalization and women's empowerment on maternal health in Sub-Saharan Africa (SSA) and other regions, employing an econometric approach with a panel model covering 37 SSA countries from 2000 to 2017. The findings reveal that Foreign Direct Investment (FDI) plays a significant role in reducing maternal mortality. Additionally, the study underscores the critical importance of women's empowerment in enhancing maternal health by improving women's overall well-being. These findings have substantial policy implications, highlighting that further trade liberalization and the attraction of FDI can create substantial opportunities for improving health outcomes in low-income countries. Policymakers are encouraged to implement policies that actively promote women's employability and empowerment across the region. While the globalization of markets and commercial investments presents both challenges and opportunities for public health, trade liberalization in health services can yield positive benefits by attracting foreign investment, facilitating technology transfer, and increasing access to healthcare providers.

7. Limitations And Further Recommendations

A key limitation of this study is the challenge in precisely determining the effects of health service liberalization on health status, as measuring the volume of trade in health services and accurately estimating the degree of market openness is inherently complex. The availability of long-term data also presents a limitation, as more

comprehensive and extended datasets would provide deeper insights. Future research should, therefore, focus on exploring the long-term impacts of globalization and women's empowerment on health outcomes.

From a policy perspective, addressing these gaps is crucial to providing decision-makers with accurate information to shape effective policies. Policymakers in these regions must prioritize the implementation of strategies to attract FDI and facilitate inter-country trade, which will encourage the adoption of new technologies and the opening of domestic markets. These efforts should be accompanied by the establishment and enforcement of good governance policies. As an extension of this study, future research could benefit from analyzing the effects of globalization on the quality of care through structural transformation, with a focus on both short-term and long-term impacts.

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