

## **Human Welfare and Transmission Channel of Globalisation: Empirical Evidence from Sub-Saharan African Regions**

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### **ABSTRACT**

Rapid globalisation has translated to growth, but the resulting gains have not been reflected in qualitative welfare for most developing countries and thus, have precipitated inconclusive debates on the precise directional link between globalisation dimensions and changes in human welfare. Thus, this study examines the regional impact of the transmission channels of globalisation on human welfare in 16 Sub-Saharan African countries from 1980 to 2014. Using the panel fixed effect method, the findings reveal that trade openness enhanced human welfare development and the access of people to infrastructural facilities for the regions. FDI is found to be predominantly enhancing to human welfare in the Eastern and Southern Africa regions. Also, high labour migration and emigration of experts as a dimension of globalisation is found to worsen human welfare development and hinder basic infrastructural development in the regions, and lead to bad and ineffective governance. The study finds that the high level of social globalisation via labour inflow, access of people to telephone and Internet facilities enhanced the development of human welfare changes as evidenced in Southern Africa. Appropriate policy options are recommended to enhance human welfare development in the region.

*Keywords:* Basic needs, foreign capital, human welfare, information technology, labour, trade

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### **INTRODUCTION**

In spite of the controversies surrounding the impact of globalisation on human welfare, evidence points to a high incidence of poverty in the era of intensive globalisation among poor nations especially in Sub-Saharan African (SSA). People in SSA,

as well as those in South Asia, are among the poorest in the world, in terms of real income, wellbeing status and access to social services. About 48.3% of the population of SSA live in poverty, with an average life expectancy of 47 years (World Bank Report, 2011). Since the Second World War, SSA has been relatively more integrated into the world economy, with high trade/GDP ratios (World Bank, 2006). In spite of the increasing degree of openness of the region to the global market, most of her social and human welfare indicators have recorded a downward trend (United Nations Development Programme [UNDP], 2009). If more openness stimulates growth, as pro-globalisation advocates claim, such integration should have led to greater sustained growth in the SSA region than in Latin America as well as South and East Asia. These regions have managed to lift their people out of abject poverty, deteriorating human welfare and high income inequality, which the SSA region to a large extent, has not.

This has been blamed on lack of institutional capacity, poor assets distribution, poor governance, persistence of civil strife and diseases, as well as a low technological base. All these tend to make SSA unattractive to foreign and domestic investors. In spite of the rapid changes in world trade in the past few decades, SSA is characterised by low value-added exports, especially agricultural commodities and minerals, which it exchanges for manufactured goods. The enclave nature of

mineral production in the region, not only accounts for the exposure of the economies to international price fluctuations and adverse effects of technological backwardness, it is also to be blamed for her current status in the global market (United Nations Conference on Trade and Development, 2006).

The literature on the impact of globalisation on poverty and human welfare points to highly variable outcomes (positive and negative) as well as multiple causalities, channels and mechanisms that link globalisation with human welfare. On the one hand, are those who find that globalisation worsens well-being (Fosu & Mold, 2008; Milanovic & Squire, 2005; Ravallion, 2006; Wagle, 2007). On the other hand, some authors point to evidence of human welfare improvements arising from globalisation (Bhagwati & Srinivasan, 2002; Dollar & Kraay, 2004). Yet, some economists argue that there is no specific link between them (Choi, 2006; Sylvester, 2005). Thus, there is no consensus on how the integration of developing economies into the global market affects the welfare of their people. Some empirical evidence confirm the submission of this school of thought that “more open economies are more prosperous and experience faster rate of progress (Chan & Dung, 2002; Hammed & Nazir, 2009; Harrison, 2006; Maertens, Colen, & Swinnen, 2011; Neutel & Heshmati, 2006). The antagonists of globalisation argue that world poverty has been rising and human welfare deteriorating due to the forces unleashed by the same wave of globalisation

(Gold, 2009; Guordon, Maystre, & De Melo, 2008; Hammoris & Kai, 2009; Heshmati, 2003; Khor, 2002; Santarelli & Figini, 2002).

However, the gap which this study aimed to fill is the analytical aspect identified in most earlier empirical studies (Dreher, 2006; Dreher & Gaston, 2008; Dreher, Gaston, & Martens, 2008; Guordon, et al., 2008). The studies neglected country and region specifics in their econometric analysis of the impact of globalisation on poverty and human welfare. This study therefore, attempts to determine the impact (magnitude and direction) of the major components of globalisation on human welfare in SSA regions. Also, most of the studies did not use broader measures that encompass peoples' access to the basic necessities of life such as access to safe water, basic health services, basic education, sanitation, decency of life and good standard of living. Therefore, this study incorporates the identified gaps in measuring and quantifying human welfare and how it is affected by globalisation. The pertinent question raised was: To what extent does globalisation affect human welfare indices like peoples' access to the basic necessities of life such as access to safe water, basic health services, basic education, sanitation, decency of life and good standard of living in the SSA region? Are there causal connections in their relationship?

The study comprises five sections. The first section is the introduction and the second section is the literature review. The third section presents the estimable model and estimation techniques. The fourth

section presents the results and ensuing discussion, while the last section concludes with some policy implications.

## LITERATURE REVIEW

This study relied on the poverty of globalisation theory and the endogenous growth model. The poverty of globalisation theory is based on the claim that in recent years there has been a reduction in poverty in the global order, and that this development is a product of nation states adopting "globalisation-friendly" policies (Department for International Development, 2012; World Bank, 2002). The World Bank argues that globalisation generally reduces poverty because more integrated economies tend to grow faster and this growth is usually widely diffused. This is because a reduction in world barriers to trade could accelerate growth, provide stimulus to new forms of productivity-enhancing specialisation and lead to a more rapid pace of job creation and poverty alleviation around the world.

An endogenous growth model is one in which the long run growth rate of output per worker is determined by variables within the model, not by an exogenous rate of technological progress as is the case in a neoclassical growth model. The influential early endogenous growth models were by Lucas (1988) and Rebelo (1991); Romer (1986). The endogenous growth theory ended most of the exogenous controversies by the neoclassical economists. Romer (1986) argued that the rate of investment and rate of return on capital might increase rather than decrease with an increase in

capital stock. In Romer's model, knowledge is taken as an input in the production function and new knowledge, the ultimate determinant of long run growth, is the investment in research technology that exhibits diminishing returns. The theory suggests that a higher long run rate of growth in output can be the result of more openness, especially when technology and knowledge diffuse freely among the participating countries. The theory does not, however, predict any positive link between openness and growth; the direction of the openness-growth relationship is not theoretically given.

Empirical reviews of past studies were presented based on time series and panel data studies; likewise, different methodologies were adopted. Using the time series data, Chan and Dung (2002) examined the variation and dispersion in the consumption of imported goods between the rich and the poor in Vietnam. Employing a single calibration to data for 1997 and forward projection, the findings indicated that trade policy change was pro-rich for consumption in Vietnam. Further, the data suggested that the rich bought proportionately more imported goods than the poor. Khor (2002) investigated the trade linkage as a determinant of poverty in relation to other openness link in Bangladesh over the periods of 1985-1996. Using the double calibration method, findings revealed that trade was a minor determinant of poverty change compared to technical change and endowment growth. Siddiqui and Kemal (2002) examined the

precise determinants of poverty through globalisation and non-globalisation channels in Pakistan over the period, 1989-1990. They found that non-globalisation variables were key to poverty measures.

On their part, Hammed and Nazir (2009) assessed the impact of economic globalisation on poverty and inequality in Pakistan by focussing on trade liberalisation as an aspect of globalisation for the period of 1970 to 2004. The study employed both Granger causality and the vector error correction model (VECM) methods. The results from Granger causality pointed out that trade liberalisation played a positive role in employment generation but had a negative influence on per capita GDP. The overall results seemed to suggest that globalisation, while leading to poverty reduction, had at the same time exacerbated income inequality. More so, Hai et al. (2006) assessed the impact of globalisation and liberalisation on the growth, incidence of poverty and inequality in Pakistan from 1973 to 2003. The time series estimates carried out were unit root test, maximum likelihood test for co-integration and the error correction model. The findings showed the existence of a long-run relationship between all the variables used. Therefore, globalisation can be used as an effective means through which the issue of poverty can be addressed in Pakistan.

Maertens, Colen and Swinnen (2011) contributed to empirical literature on globalisation and poverty using household data to study the effect of what many consider 'a worst-case scenario' in

Senegal. They employed the descriptive analyses, Ordinary Least Square (OLS) and instrumental variable estimation and Probit modelling. The findings reflected a positive welfare impact of globalisation through employment creation and labour market participation. Gold (2009) addressed the linkage of globalisation and poverty in the developing countries of Bangladesh and Nigeria in the period 1985 to 2006. Using descriptive analyses, the study concluded that the pace of poverty alleviation required policies that further integrated developing countries into the global economy to enable the poor to take the new opportunities offered by globalisation.

For studies that used panel data, Santarelli and Figini (2002) investigated whether globalisation reduced or escalated poverty for selected developing countries using descriptive statistic and econometric analysis. The authors showed that financial openness, although not statistically significant, tended to be linked positively to poverty. However, trade openness tends not to significantly affect relative poverty, but financial openness does. Heshmati (2003) investigated the relationship between income inequality and globalisation in developing economies. Using multiple regression analysis, the empirical results showed that the low rank of the globalisation process was due to the political and personal factor with limited possibility for the developing countries to affect this. Thus, globalisation indices explained 7 to 11% in income inequality among the countries. Neutel and Heshmati (2006) examined the

relationship between globalisation inequality and poverty from cross-country evidence for selected developing countries. They employed linear and non-linear regression analyses and found that linear regression analysis showed that the relationship between globalisation and poverty remained significant when controlled for regional heterogeneity while non-linear analysis showed that poverty had diminishing returns on globalisation.

Nonetheless, Lee and Vivarelli (2006), for some selected developing countries, examined the social impact of globalisation using descriptive analysis. Their findings indicated that the optimistic Heckscher-Ohlin/Stolper-Samuelson predictions did not apply to the selected developing countries. Employment effect could be very diverse. Also, trade seemed to foster economic growth and absolute poverty alleviation, although some important counter-examples emerge. Guordon et al. (2008) established the link between openness, inequality and poverty for selected developing countries. Using panel data analysis, it could be seen that there was consistent evidence that the conditional effects of trade liberalisation on inequality were correlated with relative factor endowment. Ligon (2006) investigated poverty and the welfare costs of risk associated with globalisation for selected developed and developing countries in 2003. Using the Quantile Lorenz curve approach, the author found that global shocks were of less importance than country-level shocks in explaining variation in consumption growth.

Harrison (2006) surveyed the evidence on the linkage between globalisation and poverty using trade and international capital flows as two basic measures of globalisation for some developed countries. The author used multiple regression analysis and concluded that the poor were more likely to share in the gains from globalisation when there were complementary policies; trade and foreign investment reforms had produced benefits for the poor in exporting sectors and the sectors that receive foreign investment; financial crises were very costly to the poor. Heinrich (2009) estimated the effect of national symbols and globalisation on the well-being of 88 selected developing countries. The study used descriptive statistics and panel regression analysis and found that conventional determinants of production affect national well-being measured as Human Development Index (HDI). The effects on HDI of national symbols were unstable while those of globalisation were strong with social globalisation having the strongest effects.

For the entire Sub-Saharan Africa (SSA) regions in the period 1980-2002, Hammoris and Kai (2009) investigated the relationship between globalisation, financial deepening and inequality. Using the panel data regression method and unbalanced panel data model, the findings show that globalisation deteriorates inequalities and its effect depends on the level of development of the country. Also, globalisation deteriorates the equalising effects of financial depth, although it later helps to reduce inequality. Similarly, Geda and Shimeless (2006)

explored the relationship between openness, poverty and inequality in Africa. Using descriptive analyses, the results showed that Africa was marginalised from global markets given its degree of trade and financial integration with the rest of the world. Likewise, Adeyemi et al. (2006) examined the determinants of human development in Sub-Saharan Africa in the year 2003. Multiple regression analysis showed that factors like extent of conflicts, the occurrence of natural disaster, external debt crises, macroeconomic instability, international trade, lack of access to water and the prevalence of HIV/AIDS impacted negatively on human development in the sub-region. Also, Jeffery (2007) examined the macro evidence on the extent to which globalisation was taking place and poverty was reducing for selected countries in Africa in the period 1980 and 2004. Using the descriptive analyses, the study concluded that globalisation had generally been a gradual and indeed, a slow process in Africa relative to other global regions.

## **METHODS**

The theoretical foundation of this study hinged on the endogenous theory of growth adapted by Maku (2015) to examine the relationship between globalisation and human welfare development in SSA countries. The study used static fixed effects to model the relationship between globalisation and human welfare development. The major advantage of this technique is that it allows for variable intercepts to represent country effects. The

general form of the fixed effects model in respect to this study, where  $i$  indicates countries and  $t$  represents time, is stated as:

$$y_i = \beta' x_i + \varphi' c_i + v_i + e_i \quad [1]$$

where,  $y$  = human welfare development proxy by human development index (HDI), life expectancy at birth (LEI), infant mortality rate (IMR) and mean years of schooling of adults (MYS), whereas the indices of access to basic necessities were improved water (% of population with access) (WAT), improved sanitation facilities (% of population with access) (SAN) and healthcare services (% of population with access) (HCS);

$x$  = transmission channels of globalisation such as trade (TRD), portfolio investment (PFI), foreign direct investment (FDI), labour migration (LBM) and information and communication technology (ICT) as trade openness, capital flow, technology and labour mobility transmission channels as noted by Nissanke and

Thorbecke (2008; 2010) and used in Heinrich (2009) to proxy national symbols and global interactions;

$c$  = control variables;

$v_i$  = the effect of variables related to the  $i$ -th country that is invariant over time. The country effects are, however, treated as fixed rather than random because the differences between countries are due to the mean of the dependent variables than to their variance;

$e_i$  = stochastic term that is uncorrelated with the independent variables indicating that  $x_i$  is a strictly exogenous vector of variables;

$\beta$  is a vector of coefficients of the vectors of independent variables  $x_i$ ; and

$\varphi$  is a vector of control variables.

The fixed effects model also allows for an intuitive interpretation of the estimation results. This model is used to estimate seven multivariate regressions following the use of seven indicators of human welfare.

$$HDI_i = a_{i,0} + \beta \mathbf{h} FCF_i + \eta_1 \mathbf{h} TRD_i + \eta_2 \mathbf{h} PFI_i + \eta_3 \mathbf{h} FDI_i + \eta_4 \mathbf{h} LBM_i + \eta_5 \mathbf{h} ICT_i + \eta_6 \mathbf{h} GGI_i + \delta n_i + u_{1t} \quad [2]$$

$$LEI_i = a_{i,0} + \beta \mathbf{h} FCF_i + \eta_1 \mathbf{h} TRD_i + \eta_2 \mathbf{h} PFI_i + \eta_3 \mathbf{h} FDI_i + \eta_4 \mathbf{h} LBM_i + \eta_5 \mathbf{h} ICT_i + \eta_6 \mathbf{h} GGI_i + \delta n_i + u_{1t} \quad [3]$$

$$IMR_i = a_{i,0} + \beta \mathbf{h} FCF_i + \eta_1 \mathbf{h} TRD_i + \eta_2 \mathbf{h} PFI_i + \eta_3 \mathbf{h} FDI_i + \eta_4 \mathbf{h} LBM_i + \eta_5 \mathbf{h} ICT_i + \eta_6 \mathbf{h} GGI_i + \delta n_i + u_{1t} \quad [4]$$

$$MYS_i = a_{i,0} + \beta h FCF_i + \eta_1 h TRD_i + \eta_2 h PFI_i + \eta_3 h FDI_i + \eta_4 h LBM_i + \eta_5 h ICT_i + \eta_6 h GGI_i + \delta n_i + u_{1t} \quad [5]$$

$$WAT_i = a_{i,0} + \beta h FCF_i + \eta_1 h TRD_i + \eta_2 h PFI_i + \eta_3 h FDI_i + \eta_4 h LBM_i + \eta_5 h ICT_i + \eta_6 h GGI_i + \delta n_i + u_{1t} \quad [6]$$

$$SAN_i = a_{i,0} + \beta h FCF_i + \eta_1 h TRD_i + \eta_2 h PFI_i + \eta_3 h FDI_i + \eta_4 h LBM_i + \eta_5 h ICT_i + \eta_6 h GGI_i + \delta n_i + u_{1t} \quad [7]$$

$$HCS_i = a_{i,0} + \beta h FCF_i + \eta_1 h TRD_i + \eta_2 h PFI_i + \eta_3 h FDI_i + \eta_4 h LBM_i + \eta_5 h ICT_i + \eta_6 h GGI_i + \delta n_i + u_{1t} \quad [8]$$

where, HDI = human welfare development proxy by human development index;

LEI = life expectancy at birth;

IMR = infant mortality rate;

MYS = mean years of schooling of adults;

WAT = access to basic necessities were improved water (percentage of population with access);

SAN = improved sanitation facilities (% of population with access);

HCS = healthcare services (% of population with access);

FCF = fixed capital formation;

TRD = channels of globalisation such as trade;

PFI = portfolio investment;

FDI = foreign direct investment;

LBM = labour migration;

ICT = information and communication technology (ICT); and

GGI = good governance index. The specified panel regression Equation [2] to [8] is estimated for SSA on a regional basis.

The study sample size consisted of 16 SSA countries over a period of 35 years. The World Development Indicators, 2016 covering the time period of 1980-2014 were selected based on data availability. The SSA countries are Gabon, Central Africa Republic, Cameroon, Rwanda, Kenya, Tanzania, Mauritius, Tanzania, South Africa, Malawi, Botswana, Mozambique, Nigeria, Ghana, Benin and Niger.

## RESULTS, DATA ANALYSIS AND INTERPRETATION

### Descriptive Statistics

Table 1 shows the descriptive statistics of the variables for the regional pooled data of the four Sub-Saharan African regions.



Among the regions in the SSA, the Eastern Africa region has the highest mean of HDI, LEI and MYS, followed by Southern Africa. Southern Africa has the highest proportion of people who have access to basic necessities such as improved sanitation, water supply and healthcare services compared with other sub-regions. This reflects the huge infrastructural investment in the selected Southern African countries, Botswana, South Africa, Malawi and Mozambique. The average economically active population as a share of total population size (POP) for Central, Eastern, Southern and Western Africa (between 1980 and 2014) stood at 53.6%, 54.7%, 55.1% and 52.2%, respectively showing that Southern and Eastern Africa regions have the highest productive workforce compared with other SSA regions in this period.

The Southern Africa is the most globalised region in SSA, followed by the Eastern Africa region. The Western Africa region, which consists of Benin, Ghana, Niger and Nigeria, is the least globalised region in SSA in terms of trade flows. Also, Cameroon, Central African Republic, Gabon and Rwanda that make up Central Africa are relatively less globalised compared with Eastern and Southern Africa.

Comparatively, the regional descriptive statistics indicated that regions with the highest share of working age population (POP) also have better human welfare development and access to basic necessities, and they are more economically integrated through trade flows compared with regions with a less economically active population.

Table 1  
*Descriptive statistics for regional pooled data*

| Variables | Central Africa | Eastern Africa | Southern Africa | Western Africa | Obs. | Cross Sections |
|-----------|----------------|----------------|-----------------|----------------|------|----------------|
| HDI       | 40.38          | 44.49          | 42.48           | 34.43          | 140  | 4              |
| LEI       | 53.05          | 57.48          | 51.58           | 51.73          | 140  | 4              |
| IMR       | 82.52          | 64.01          | 82.96           | 97.65          | 140  | 4              |
| MYS       | 3.09           | 4.39           | 3.26            | 2.08           | 140  | 4              |
| SAN       | 31.67          | 36.74          | 41.35           | 14.09          | 140  | 4              |
| WAT       | 61.15          | 61.19          | 65.98           | 53.53          | 140  | 4              |
| HCS       | 49.94          | 56.38          | 48.09           | 48.29          | 140  | 4              |
| TRD       | 61.09          | 65.71          | 66.84           | 56.92          | 140  | 4              |
| POP       | 53.63          | 54.69          | 55.08           | 52.20          | 140  | 4              |
| FDI       | 1.81           | -0.56          | 0.08            | -0.12          | 140  | 4              |
| PFI       | -0.10          | 1.60           | 2.27            | 2.35           | 140  | 4              |
| CFC       | 17.62          | 19.17          | 20.50           | 12.75          | 140  | 4              |
| LBM       | -0.03          | -0.59          | 0.04            | 0.05           | 140  | 4              |
| TEL       | 23.25          | 43.60          | 35.52           | 5.22           | 140  | 4              |
| GGI       | -27.47         | -15.20         | 10.45           | -29.25         | 140  | 4              |

Source: Authors' computation (2018)

The results further revealed that Southern Africa and Eastern Africa are more economically globalised compared with other regions. A plausible inference from the descriptive analysis is that SSA sub-regions that are more economically globalised (Southern and Eastern Africa) are less engulfed by deteriorating human welfare development and inadequate access to the basic necessities of life.

Based on the mean value of FDI-GDP ratio as a component of globalisation, Central Africa as first and then Southern Africa are the most globalised regions in SSA in terms of capital flow. The Eastern Africa region, which consists of Kenya, Mauritius, Tanzania and Uganda, is the least globalised region in SSA in terms of capital flow. Also, in terms of PFI as a share of GDP, the proxy for financial channel of globalisation, its mean average value stood at -0.10%, 1.6%, 2.27% and 2.35% for Central, Eastern, Southern and Western Africa, respectively in this period. This suggests that Western Africa and Southern Africa are the most financially globalised region among the SSA countries compared with the Eastern Africa region, in which the financial system constitutes a marginal portion of their channels of globalisation, while Central Africa is the least financially globalised in the SSA region. This indicated that the region lacks a vibrant financial structure and system to expand and attract PFIs for human welfare development.

Also, in assessing the extent of domestic capital formation for investment deepening in SSA, the mean of gross capital formation

(as a share of GDP) for Central, Eastern, Southern and Western Africa regions correspondingly stood at 17.6%, 19.2%, 20.1% and 12.8%. This shows that Southern and Eastern Africa had the most productive domestic capital for investment expansion during the reviewed period.

An inference that can be deduced from this analysis is that high domestic capital formation attracts huge capital inflows and enhanced access to improved sanitation, water and healthcare services, while low domestic capital deepening attracts low foreign PFI. Thus, in this instance, it resulted in grave incidence of human welfare deterioration. Comparatively, the relatively high financial globalised regions (Eastern and Southern Africa) recorded better human welfare development and adequate access to basic necessities of sustenance, while the highly capital globalised region (Central Africa) is characterised by grave incidence of deteriorating human welfare development and lack of access to basic necessities of life.

The mean value of net LBM as a component of social globalisation stood at -0.03%, -0.59%, 0.04% and 0.05% for Central, Eastern, Southern and Western Africa, respectively. This indicated a lot of active work flow out of Central and Eastern Africa, while more working emigrants entered Southern and Western Africa in the SSA region. Eastern Africa, consisting of Kenya, Mauritius, Tanzania and Uganda, is the least socially globalised region in SSA in terms of net LBM. Also, in terms of telephone line users per 1000 people (TEL) as a proxy for information flows of

globalisation, the mean average value stood at 23.25, 43.60, 35.52 and 5.22 for Central, Eastern, Southern and Western Africa regions, respectively. This suggests that Eastern and Southern Africa are the most socially globalised region in SSA countries compared with Central and Western Africa regions with respect to information flow. This contradicts the descriptive outcome of LBM for Eastern Africa. Likewise, the mean value of the governance index as an institutional control variable of globalisation and human welfare development for Central, Eastern, Southern and Western Africa regions, respectively stood at -27.5%, -15.2%, 10.5% and -29.3%. This reveals that Southern Africa was the only region with good governance performance compared with other regions in the SSA in the period under review. An inference that can be deduced from this analysis is that a high level of social globalisation via labour inflow complements evidence of deteriorating human development and limited access to HCS in Western Africa, while a high access to telephone facilities enhanced the development of human welfare changes as evidenced in Southern and Eastern Africa.

#### **Estimated Panel Regression Results on Regional Basis**

This section of the analysis was based on the sub-regional groups that make up the sub-Saharan Africa. The rationale for this was to examine whether there was conformity in the pooled regional analysis (SSA) and the sub-regional groups. It is also meant to verify if the pooled analysis for the SSA is influenced by any of the sub-regional data.

#### **Estimated Panel Regression Results: Central Africa**

The fixed effect regression results of human welfare, other welfare measures and access to basic necessity models for the Central Africa region that constitutes Cameroon, Central Africa Republic, Gabon and Rwanda are presented in Table 2. The results reveal that trade openness as economic dimension of globalisation was found to exert a negative effect on HDI, LEI, MYS, access to improved WAT, SAN and HCS, while it showed a positive effect on only IMR in the Central Africa region between 1980 and 2014. These effects were not in tandem with theoretical expectations. In terms of effect size, a 10% change in TRD lowered HDI, LEI, IMR, access to improved WAT, SAN and HCS by 0.72%, 0.33%, 3%, 4.3% and 0.47%, respectively, while increasing IMR by 2.52%. At 1% significance level, TRD as a channel of globalisation was found to statistically and significantly worsen human welfare, other welfare measures (LEI and MYS), and access to basic necessities (WAT, SAN and HCS) in the Central Africa region in the three decades under review.

The estimated theoretical model augmented with percentage share of working population to total population size ( $n$ ) as control variable was found to enhance HDI, LEI, MYS, access to improved WAT, SAN and HCS, as well as reduced incidence of IMR in Central Africa. These effects conformed with the *a priori* expectations in terms of signs. The value of estimates reported in Table 2 indicated that a 1% increase in the share of the economically

active population increased HDI, LEI, MYS, WAT, SAN and HCS by 3.23%, 0.58%, 0.08%, 3.95%, 4.51% and 3.07%, respectively, while reducing IMR by 6.35% in Central Africa. Also, the t-statistic values indicate that at 1% critical level, working population (n) statistically and significantly improved human welfare, other welfare measures (LEI, IMR and MYS) and access

to basic necessities (WAT, SAN and HCS) in the Central Africa region between 1980 and 2014.

The estimated augmented panel regression model further revealed that with the consideration of TRD as a component of globalisation along with other factors accounted for an average of 95.3%, 90.2% and 85.4% variation in human welfare, other

Table 2  
*Fixed effects regression of human welfare and transmission channel of globalisation in Central Africa*

| Variables       | HDI      | LEI      | IMR      | MYS      | WAT      | SAN      | HCS      |
|-----------------|----------|----------|----------|----------|----------|----------|----------|
| <b>Constant</b> | -126.7   | 25.80    | 412.9    | -3.602   | -140.3   | -181.6   | -110.1   |
|                 | -39.45** | 7.61**   | 55.65**  | -43.05** | -29.95** | -30.85** | -21.35** |
| <b>CFC</b>      | 0.017    | -0.037   | -0.168   | 0.001    | 0.028    | 0.102    | 0.122    |
|                 | 1.05     | -2.64**  | -5.64**  | 1.49     | 0.97     | 3.49**   | 5.11**   |
| <b>TRD</b>      | -0.072   | -0.033   | 0.253    | -0.005   | -0.300   | -0.430   | -0.047   |
|                 | -10.44** | -5.12**  | 18.10**  | -26.55** | -24.26** | -30.78** | -4.13**  |
| <b>PFI</b>      | -0.280   | -0.574   | 0.740    | 0.005    | 0.182    | 1.802    | -0.500   |
|                 | -3.35**  | -7.36**  | 4.90**   | 2.43*    | 1.34     | 8.71**   | -3.36**  |
| <b>FDI</b>      | -0.184   | -0.054   | 0.297    | -0.001   | -0.006   | -0.489   | -0.545   |
|                 | -5.08**  | -1.63    | 4.13**   | -0.94    | -0.10    | -7.59**  | -10.12** |
| <b>LBM</b>      | -0.139   | -0.047   | 0.604    | -0.004   | -0.174   | -0.125   | -0.030   |
|                 | -18.28** | -3.97**  | 22.83**  | -19.81** | -17.32** | -8.65**  | -2.19*   |
| <b>GGI</b>      | 0.001    | 0.031    | -0.008   | -0.001   | -0.053   | 0.008    | 0.030    |
|                 | 0.48     | 19.06**  | -2.28*   | -19.62** | -18.36** | 2.12*    | 10.45**  |
| <b>TEL</b>      | 0.143    | 0.048    | -0.661   | 0.010    | 0.979    | 0.216    | -0.099   |
|                 | 12.82**  | 4.61**   | -25.53** | 28.39**  | 37.86**  | 10.76**  | -5.82**  |
| <b>N</b>        | 3.228    | 0.576    | -6.354   | 0.080    | 3.953    | 4.506    | 3.068    |
|                 | 50.46**  | 8.55**   | -43.43** | 47.96**  | 42.02**  | 38.16**  | 29.80**  |
| Adj. R-squared  | 0.953    | 0.869    | 0.958    | 0.879    | 0.858    | 0.851    | 0.854    |
| S.E. of reg.    | 2.813    | 3.565    | 8.286    | 0.077    | 5.075    | 5.255    | 4.608    |
| F-statistic     | 3896.9** | 1274.2** | 4333.6** | 1400.1** | 1159.5** | 1097.4** | 1125.3** |
| Observation     | 140      | 140      | 140      | 140      | 140      | 140      | 140      |
| Cross-sections  | 4        | 4        | 4        | 4        | 4        | 4        | 4        |

Note: [1]. \*\* denotes significant at 5%; \* denotes significant at 10%. [2]. Absolute t-statistics are shown below the coefficients. [3]. All regressions use the fixed cross-section effects, cross-section weights, standard errors and covariance (d.f. corrected)

Source: Authors' computation (2018)

welfare measures (LEI, IMR and MYS) and access to basic necessities (WAT, SAN and HCS), respectively in the Central Africa region.

The results equally revealed that FDI as capital flow channel of globalisation was found to exert a negative effect on HDI, SAN and HCS, while having a positive effect on IMR in the Central African region. These effects are not in tandem with theoretical expectations. In terms of effect size, a 10% change in FDI lowered HDI, IMR, SAN and HCS by 1.84%, 4.89% and 5.45%, respectively and increase IMR by 0.297%.

More so, the results presented in Table 2 reveal that PFI as financial dimension of globalisation exerts a negative effect on HDI, LEI, and HCS, while it exerts a positive effect on IMR in Central Africa. These effects were not in tandem with the theoretical expectations. For a 10% change in financial flow of globalisation (PFI), HDI, LEI, IMR and HCS declined by -2.8%, -5.74%, 7.4% and -5%, respectively. Similarly, PFI was found to enhance positively the IMR, MYS, and SAN in Central Africa region. In terms of signs, these effects conform with the *a priori* expectations. In magnitude terms, a 10% increase in financial channel of globalisation (PFI) enhanced MYS, WAT and SAN by 0.05%, 1.82% and 18.02%, respectively.

Gross fixed capital stock as a theoretical baseline input variable and measure of domestic capital formation was found to exert a positive effect on SAN and HCS, but a negative effect on LEI and IMR in the

region. These effects were in conformity with theoretical expectations based on signs of the reported estimates. In terms of intensity of effects, a 10% increase in fixed capital stock enhanced HDI, MYS, WAT, SAN and HCS by 0.17%, 0.01%, 0.28%, 1.02% and 1.22 %, while reducing LEI and IMR by 0.37% and 1.68%, respectively. Although, domestic capital formation was found to exert a negative effect on LEI in the Central Africa region, this is not in consonance with the theory. In terms of partial significance, the reported t-statistic values in Table 2 indicated that it was only the effect of fixed capital stock on LEI, IMR, SAN and HCS that were found statistically significant at the 1% critical level.

Comparatively, the analysis indicated that in the Central Africa region, capital and financial flows of globalisation worsened human welfare development, while it is only domestic capital formation that enhanced human welfare status in the region. The estimated augmented panel regression model further revealed that with the consideration of FDI and PFI as components of globalisation, other factors accounted for an average 95.3%, 90.2% and 85.4% variation in HDI, other welfare measures (LEI, IMR and MYS), and access to basic necessity (WAT, SAN and HCS) changes in the Central Africa region.

The results also showed that the net LBM as a labour flow dimension of globalisation exerted a negative effects on HDI, LEI and MYS access to improved WAT, SAN and HCS, while exerting a positive effect on IMR in Central Africa in the period under

consideration. These effects were not in tandem with the theoretical expectations, but were statistically significant at the 1% critical level. For a 10% increase in labour migration flow of globalisation (labour migration), HDI, LEI, MYS and access to improved WAT, SAN and HCS were lowered by 1.39%, 0.47%, 0.04%, 1.74%, 1.25% and 0.30%, respectively. However, IMR was raised by 6.04% for a 10% increase in labour migration.

Telephone access (TEL) as the information dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT and SAN, but exerted a negative effect on IMR and HCS in Central Africa. These effects were in tandem with the *a priori* expectations except for access to HCS and were statistically significant at the 1% critical level. In terms of magnitude, a 10% change in information channel of globalisation (TEL) enhanced HDI, LEI, MYS and access to improved WAT and SAN by 1.43%, 0.48%, 0.10%, 9.79%, 2.16%, but caused a reduction in IMR, and lack of access to HCS by 6.61% and 0.99%, respectively in Central Africa during the review period.

Also, GGI as a theoretical baseline control variable and measure of institutional quality was found to exert a positive impact on LEI, access to improved SAN and HCS, but it had a negative effect on IMR, MYS and access to improved WAT in Central Africa. These were in consonance with the expected signs except for the effects on MYS and access to improved WAT. A 10% increase in GGI, enhanced LEI, SAN

and HCS by 0.31%, 0.08% and 0.30%, respectively, but it lowered IMR, MYS and access to improved WAT by 0.08%, 0.01% and 0.53%, respectively in the reviewed period.

Comparatively, the analysis indicated that in the Central Africa region, labour flow of globalisation and governance effectiveness worsened and lowered human welfare development, while only information flow of globalisation enhanced human welfare status in the region. The estimated augmented panel regression model further revealed that the consideration of net LBM and telephone access (TEL) as components of globalisation and other factors accounted for an average 95.3%, 90.2% and 85.4% variation in HDI, other welfare measures and access to basic necessities (WAT, SAN and HCS) in the Central Africa region.

#### **Estimated Panel Regression Results: Eastern Africa**

The theoretical augmented fixed regression results that captured the effect of TRD on HDI, other welfare measures (LEI, IMR and MYS) and access to basic necessities (WAT, SAN and HCS) in Eastern Africa, comprising Kenya, Mauritius, Tanzania and Uganda, are shown on Table 3. The results indicated that the economic dimension of globalisation via trade flow proxy by TRD was found to be positively related to the HDI, LEI and access to improved WAT, SAN and HCS in Eastern Africa. These effects conformed with the theoretical expectations and were found to be statistically significant at 1% critical level. Also, TRD was found

to exert a negative effect on IMR and MYS, but it is only the effect of the latter that is not in tandem with theoretical expectation. At 1% critical level, TRD exerted a significant negative effect on IMR and MYS in Eastern Africa.

In terms of magnitude, a 10% change in percentage share of total exports and imports as ratio of GDP improved HDI, LEI and access to improved WAT, SAN and HCS in East Africa by 0.49%, 0.75%, 1.97%, 0.59% and 0.83%, respectively as well as reduced IMR and MYS by -0.74% and -0.01%, respectively.

Table 3

*Fixed effects regression of human welfare and transmission channel of globalisation in Eastern Africa*

| Variables             | HDI      | LEI      | IMR      | MYS      | WAT      | SAN       | HCS      |
|-----------------------|----------|----------|----------|----------|----------|-----------|----------|
| <b>Constant</b>       | 17.03    | 67.16    | 103.70   | -1.07    | -60.25   | -19.84    | 65.98    |
|                       | 8.92**   | 53.61**  | 22.31**  | -36.06** | -21.82** | -16.97**  | 30.33**  |
| <b>CFC</b>            | 0.156    | 0.062    | -1.219   | 0.006    | -0.046   | 0.016     | 0.123    |
|                       | 9.66**   | 5.48**   | -21.42** | 23.29**  | -1.63    | 1.20      | 8.43**   |
| <b>TRD</b>            | 0.049    | 0.075    | -0.074   | -0.001   | 0.197    | 0.059     | 0.083    |
|                       | 6.94**   | 15.15**  | -3.13**  | -7.67**  | 15.37**  | 9.48**    | 13.88**  |
| <b>PFI</b>            | -0.010   | -0.016   | -0.007   | 0.0003   | 0.033    | 0.001     | -0.018   |
|                       | -3.41**  | -8.10**  | -0.57    | 5.29**   | 5.42**   | 0.21      | -8.14**  |
| <b>FDI</b>            | 1.514    | 0.569    | -4.304   | 0.019    | 1.702    | 1.099     | 0.904    |
|                       | 37.54**  | 18.59**  | -29.18** | 24.88**  | 20.82**  | 28.93**   | 23.95**  |
| <b>LBM</b>            | 0.276    | 0.023    | 0.873    | -0.005   | 1.811    | 1.188     | -0.189   |
|                       | 5.83**   | 0.67     | 5.09**   | -6.49**  | 20.08**  | 26.41**   | -4.35**  |
| <b>GGI</b>            | -0.035   | 0.031    | 0.037    | -0.001   | -0.142   | -0.030    | 0.030    |
|                       | -12.81** | 14.34**  | 4.13**   | -26.50** | -26.60** | -13.72**  | 9.71**   |
| <b>TEL</b>            | 0.045    | 0.011    | -0.017   | 0.000    | 0.020    | 0.026     | 0.030    |
|                       | 31.98**  | 10.79**  | -3.47**  | -0.06    | 7.30**   | 16.11**   | 22.97**  |
| <b>N</b>              | 0.302    | -0.305   | -0.050   | 0.029    | 1.915    | 0.910     | -0.362   |
|                       | 8.27**   | -12.62** | -0.56    | 51.24**  | 35.44**  | 39.78**   | -8.70**  |
| <b>Adj. R-squared</b> | 0.971    | 0.964    | 0.932    | 0.911    | 0.963    | 0.991     | 0.979    |
| <b>S.E. of reg.</b>   | 2.572    | 1.856    | 8.474    | 0.044    | 4.691    | 2.264     | 3.093    |
| <b>F-statistic</b>    | 6476.1** | 5139.1** | 2639.7** | 1973.0** | 5061.5** | 21957.7** | 8914.3** |
| <b>Observation</b>    | 140      | 140      | 140      | 140      | 140      | 140       | 140      |
| <b>Cross-sections</b> | 4        | 4        | 4        | 4        | 4        | 4         | 4        |

*Note:* [1]. \*\* denotes significant at 5%; \* denotes significant at 10%. [2]. Absolute t-statistics are in next line to the coefficients. [3]. All regressions use the fixed cross-section effects, cross-section weights, standard errors and covariance (d.f. corrected)

*Source:* Authors' computation (2018)

Similarly, working age population ( $N$ ) as a control variable was found to exert positive and significant impact on HDI, MYS, access to improved WAT and SAN in East Africa at 1% critical level. The effects were in line with the theoretical expectations. Likewise, the economically active population share ( $n$ ) at 1% critical level exerted a negative and statistically significant effect on LEI, IMR and access to HCS in East Africa. It is only the effect on IMR that was found to conform with the *a priori* expectation. On the basis of the effect size, a 10% change in working age population share ( $n$ ) enhanced HDI, MYS, WAT and SAN by 3.02%, 0.29%, 19.2% and 9.1%, respectively as well as reduced LEI, IMR and HCS by -3.1%, -0.5% and -3.62%, respectively during the reviewed period.

The theoretical augmented fixed regression results that captured the effect of FDI and PFI on HDI, other welfare measures (LEI, IMR and MYS) and access to basic necessities (WAT, SAN and HCS) in Eastern Africa indicated that the financial dimension of globalisation exerted a negative effect on HDI, LEI, IMR and access to improved HCS. These are not in consonance with the expected signs, excluding IMR. In magnitude terms, a 10% change in PFI deteriorates HDI, LEI and HCS by -0.10%, -0.16% and -0.18%, respectively, while it enhances reduction in IMR by 0.07%. Also, the financial channel of globalisation was found to exert a positive effect on MYS, access to improved WAT and SAN in the Eastern Africa region. These effects were in tandem with the expected signs.

The reported t-statistic results in Table 3 indicated that it was only the effect of PFI on HDI, LEI, MYS, WAT and HCS that were found to be statistically significant at 1% critical level.

Foreign direct investment as a capital dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, while it exerted a negative effect on IMR in Eastern Africa. These effects were in line with the *a priori* expectations and were statistically significant at 1% critical level. In terms of magnitude, a 1% change in the financial channel of globalisation (FDI) enhanced HDI, LEI, MYS, WAT, SAN, HCS and reduced IMR by 1.51%, 0.57%, 0.02%, 1.7%, 1.1%, 0.9%, and -4.3%, respectively.

Also, the gross fixed capital stock as a measure of domestic capital formation had a positive impact on HDI, LEI, MYS and access to improved SAN, and HCS, but had a negative effect on IMR and access to improved WAT in East Africa. These were in tandem with the expected signs excluding the effect of access to improved water. Based on the reported t-statistic values, it was only the effect of fixed capital stock on HDI, LEI, IMR, MYS and HCS that were statistically significant at 1% critical level. In magnitude terms also, a 10% change in fixed capital stock enhanced HDI, LEI, MYS, SAN and HCS but reduced the infant mortality rate by 1.56%, 0.62%, 0.06%, 0.16%, 1.23% and -12.19%, respectively, while it lowered access to WAT by -0.46% within the reviewed period.



On the basis of the foregoing analysis, it can be deduced that domestic capital formation (fixed capital stock) and capital dimension of globalisation (FDI) enhance human welfare development in Eastern Africa compared with the deteriorating effect of the financial dimension of globalisation (PFI) on human welfare status during the review period. In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared in Table 3 shows that the independent variables explained about 97.1%, 96.4%, 93.2% and 91.1% changes in HDI, LEI, IMR, and MYS. Also, about 96.3%, 99.1% and 97.9% changes in WAT, SAN and HCS respectively.

The theoretical augmented fixed regression results that captured the effect of net LBM and TEL on HDI, other welfare measures (LEI, IMR and MYS) and access to basic necessities (WAT, SAN and HCS) in Eastern Africa indicated that net LBM as a labour mobility flow of globalisation had a positive impact on HDI, LEI, IMR and access to improved WAT and SAN, while it had a negative effect on MYS and access to improved HCS in Eastern Africa. These were in tandem with the expected signs except for the effect on IMR, MYS and HCS. Based on the reported t-statistic values, the effect of LBM on HDI, LEI, IMR, MYS and access to basic necessities was statistically significant at 1% critical level. In magnitude terms also a 10% change in labour migration enhanced HDI, LEI, IMR and access to improved WAT and SAN by 2.76%, 0.23%, 8.73%, 18.11%

and 11.9%, respectively, while it lowered MYS and HCS by -0.05% and -1.89%, respectively over the reviewed period.

Access to telephone network (TEL) as the information dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, while it exerted a negative effect on IMR in Eastern Africa. These effects were in tandem with the *a priori* expectations and were statistically significant at 1% critical level except for the MYS parameter estimate. In terms of magnitude, a 10% change in the information channel of globalisation (TEL) enhanced HDI, LEI, MYS, WAT, SAN and HCS but caused a reduction in IMR by 0.45%, 0.11%, 0.001%, 0.20%, 0.26%, 0.30% and -0.17%, respectively as presented in Table 3.

The results further indicated that GGI as a measure of institutional quality exerted a positive effect on LEI, IMR and access to improved HCS in Eastern Africa. This was in tandem with theoretical expectation (except for IMR) and was statistically significant at 1% critical level. Also, GGI at 1% critical level had a negative but a significant impact on HDI, MYS and access to improved WAT and SAN in Eastern Africa. These effects were not supportive of theoretical expectations. In magnitude terms, a 10% change in GGI lowered HDI, MYS and access to improved WAT and SAN by -0.35%, -0.01%, -1.42% and -0.30%, respectively, while it enhanced LEI, IMR and HCS by 0.31%, 0.37% and 0.30%, respectively in Eastern Africa.

It can be deduced that information flow in terms of access to telephone lines enhanced human welfare development in Eastern Africa compared with the relatively deteriorating effect of LBM flow of globalisation on human welfare status during the reviewed period. In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared results revealed that LBM flow, information channel of globalisation and other factors accounted for an average 97.1%, 93.6% and 97.8% variation in human welfare, other welfare measures and access to basic necessities in the Eastern Africa region.

#### **Estimated Panel Regression Results: Southern Africa**

The impact of trade openness as a channel of globalisation on human welfare development for Botswana, Malawi, Mozambique and South Africa that made up the Southern Africa region is discussed in this sub-section. The fixed effect theoretical augmented models' estimates are shown in Table 4. The results indicated that in Southern Africa, trade openness (TRD) exerted a positive effect on the human development index (HDI), life expectancy index (LEI), mean year of adult schooling (MYS), access to improved water (WAT), sanitation (SAN) and healthcare services (HCS), while it exerted a negative effect on infant mortality rate (IMR). These effects conformed with the theoretical expectations and were found to be statistically significant at 1% critical

level based on the reported t-statistic values under each welfare model.

On the basis of intensity of the effects, 10% change in TRD enhanced HDI, LEI, MYS and access to improved WAT, SAN and HCS by 1.21%, 0.68%, 0.01%, 1.66%, 0.78% and 0.79%, respectively as well as reduced IMR by -6.97% during the reviewed period.

Table 4 further indicated that working age population share ( $N$ ) at 1% critical level exerted a positive and significant effect on HDI, IMR, MYS and access to WAT and SAN in Southern Africa. The effects are in consonance with theoretical expectation, excluding the effect of IMR. Also, at 1% critical level, economically active population size ( $N$ ) was found to be negative and significantly related to the LEI and access to HCS in Southern Africa. In magnitude terms, 1% change in working age population share ( $N$ ) enhanced HDI, IMR, MYS and access to WAT and SAN by 0.34%, 0.63%, 0.012%, 1.18% and 1.58%, respectively, while it reduced LEI and access to HCS in Southern Africa by -1.04% and -1.20%, respectively.

In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared results in Table 4 revealed that with TRD as a channel of globalisation and other factors account for an average of 97.2%, 91.8%, and 92.8% variation in HDI, other welfare measures (LEI, IMR, and MYS), and access to basic necessities (WAT, SAN and HCS) changes in Southern Africa region.

Table 4

*Fixed effects regression of human welfare and transmission channel of globalisation in Southern Africa*

| Variables             | HDI      | LEI      | IMR      | MYS       | WAT      | SAN       | HCS      |
|-----------------------|----------|----------|----------|-----------|----------|-----------|----------|
| <b>Constant</b>       | 11.46    | 105.09   | 104.33   | -0.32     | -17.45   | -57.71    | 105.09   |
|                       | 5.74**   | 55.54**  | 12.00**  | -13.36**  | -4.73**  | -25.10**  | 42.85**  |
| <b>CFC</b>            | -0.002   | -0.003   | 0.388    | -0.002    | -0.051   | -0.002    | 0.108    |
|                       | -0.11    | -0.21    | 4.79**   | -6.38**   | -1.81*** | -0.12     | 6.37**   |
| <b>TRD</b>            | 0.121    | 0.068    | -0.697   | 0.001     | 0.166    | 0.078     | 0.079    |
|                       | 21.24**  | 13.50**  | -22.29** | 14.43**   | 16.07**  | 12.41**   | 12.06**  |
| <b>PFI</b>            | 0.171    | -0.071   | -0.693   | 0.002     | -0.033   | 0.140     | 0.109    |
|                       | 4.16**   | -1.99*   | -3.77**  | 3.35**    | -0.41**  | 3.05**    | 2.05*    |
| <b>FDI</b>            | 0.248    | 0.071    | -2.192   | 0.004     | 0.399    | 0.201     | 0.372    |
|                       | 11.61**  | 3.97**   | -18.54** | 9.66**    | 10.28**  | 8.81**    | 14.74**  |
| <b>LBM</b>            | 0.072    | -0.001   | -0.623   | 0.002     | 0.379    | 0.186     | 0.025    |
|                       | 4.85**   | -0.04    | -6.72**  | 7.91**    | 12.32**  | 10.39**   | 1.48     |
| <b>GGI</b>            | -0.055   | -0.005   | 0.369    | -0.001    | -0.051   | -0.050    | -0.048   |
|                       | -17.36** | -1.82*** | 21.23**  | -12.77**  | -8.36**  | -13.69**  | -12.96** |
| <b>TEL</b>            | 0.127    | -0.019   | -0.455   | 0.003     | 0.222    | 0.195     | 0.039    |
|                       | 16.37**  | -2.80**  | -12.57** | 23.42**   | 14.70**  | 22.51**   | 3.90**   |
| <b>N</b>              | 0.336    | -1.043   | 0.629    | 0.012     | 1.182    | 1.580     | -1.203   |
|                       | 8.42**   | -27.74** | 3.59**   | 25.10**   | 16.01    | 34.45**   | -24.60** |
| <b>Adj. R-squared</b> | 0.972    | 0.872    | 0.895    | 0.989     | 0.955**  | 0.982     | 0.848    |
| <b>S.E. of reg.</b>   | 2.910    | 2.448    | 16.805   | 0.056     | 7.858    | 3.602     | 3.887    |
| <b>F-statistic</b>    | 6665.3** | 1307.1** | 1635.0** | 16642.0** | 4032.7** | 10538.6** | 1073.5** |
| <b>Observation</b>    | 140      | 140      | 140      | 140       | 140      | 140       | 140      |
| <b>Cross-sections</b> | 4        | 4        | 4        | 4         | 4        | 4         | 4        |

Note: [1]. \*\*\* denotes significant at 1%; \*\* denotes significant at 5% and \*denotes significant at 10%. [2]. Absolute t-statistics are in next line to the coefficients. [3]. All regressions use the fixed cross-section effects, cross-section weights, standard errors and covariance (d.f. corrected)

Source: Authors' computation (2018)

The impact of capital and financial channels of globalisation on human welfare development for the Southern Africa region indicated that in Southern Africa, financial dimension of globalisation (PFI) exerted a positive effect on HDI, MYS and access to improved SAN and HCS, while it exerted a negative effect on IMR. These were in tandem with the expected signs. In magnitude terms, a 10% change in PFI

enhanced HDI, MYS, SAN and HCS and reduced the infant mortality rate by 1.71%, 0.02%, 1.40% and 1.09%, respectively, while it deepened the reduction in infant mortality rate by -6.93%. Also, financial channel of globalisation (PFI) was found to exert a negative effect on LEI and access to improved WAT in the Southern Africa region. These effects were not in tandem with the expected signs. At 10% change

in PFI, LEI and access to improved WAT were lowered by -0.71% and -0.33%, respectively. The reported t-statistic results indicated that the effect of PFI on HDI, IMR, MYS and access to improved WAT, SAN and HCS were found to be statistically significant at 1% critical level and at 5% critical level for LEI.

Foreign direct investment as a capital dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, while it exerted a negative effect on IMR in Southern Africa. These effects were in tandem with the *a priori* expectations and were statistically significant at 1% critical level. In terms of magnitude, a 10% change in financial channel of globalisation (FDI) enhanced HDI, LEI, MYS and access to improved WAT, SAN, HCS but reduced IMR by 2.48%, 0.71%, 0.04%, 3.99%, 2.01%, 3.72% and -21.92%, respectively.

The results further indicated that gross fixed capital stock as a measure of domestic capital formation exerted a positive effect on access to improved HCS in Southern Africa. This was in tandem with theoretical expectation and was statistically significant at 1% critical level. Also, domestic capital formation (fixed capital stock) had a negative impact on HDI, LEI, MYS and access to improved WAT and SAN, while its impact on IMR was positive in Southern Africa in the period under review. These effects were not in tandem with theoretical expectations. In magnitude terms, a 10% change in fixed capital stock deepened deterioration of HDI, LEI, MYS and access to improved WAT,

SAN and IMR by -0.02%, -0.03%, -0.02%, -0.51%, -0.02% and 3.88%, respectively. The reported t-statistic values indicated that it was only the effect of fixed capital stock on IMR, MYS and HCS that were statistically significant at 1% critical level, while at 5% critical level, access to WAT was improved.

The above analysis indicated that financial and capital dimensions of globalisation (PFI and FDI) enhanced human welfare development in Southern Africa compared with the deteriorating effect of domestic capital formation (fixed capital stock) on human welfare status during the review period. In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared results revealed that with financial and capital channels of globalisation and other factors account for an average 97.2%, 91.8%, and 92.8% variation in HDI, other welfare measures (LEI, IMR, and MYS), and access to basic necessities (WAT, SAN and HCS) changes in Southern Africa region.

The impact of LBM and information channels of globalisation on human welfare development of Botswana, Malawi, Mozambique and Southern Africa indicated that in Southern Africa, net LBM as labour flow dimension of globalisation was found to exert a positive effect on HDI, MYS and access to improved WAT, SAN and HCS, but it had a negative effect on IMR in the Southern Africa region in the period under review.

These effects were in line with theoretical expectations based on signs of the reported estimates. In terms of intensity of effects, a 10% change in labour migration enhanced HDI, MYS and access to improved WAT, SAN and HCS, but reduced IMR by 0.72%, 0.02%, 3.79%, 1.86%, 0.25% and 6.23%, respectively. Also, net LBM was found to exert a negative effect on LEI in the Southern Africa region by a magnitude of -0.01% with a 10% change. This was not in tandem with the expected sign. In terms of partial significance, the reported t-statistic values in Table 4 indicated that it was only the effect of LBM on HDI, IMR, MYS, WAT and SAN that were statistically significant at 1% critical level.

Also, access to telephone network (TEL) as the information flow dimension of globalisation exerted a positive effect on HDI, MYS and access to improved WAT, SAN and HCS, but exerted a negative effect on LEI and IMR in Southern Africa. These effects were in tandem with the *a priori* expectations (except for LEI) and were statistically significant at 1% critical level. In terms of magnitude, a 10% change in information channel of globalisation (TEL) enhanced HDI, MYS and access to improved WAT, SAN, HCS, but reduced LEI and IMR by 1.27%, 0.03%, 2.22%, 1.95%, 0.39%, -0.19% and -4.55%, respectively.

The results presented in Table 4 further reveal that GGI as an institutional control variable was found to exert a negative effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS and a positive effect on IMR in the Southern Africa region. These

effects were not in tandem with theoretical expectations. In terms of effect size, a 10% change in GGI lowered HDI, LEI, MYS and access to improved WAT, SAN and HCS by -0.55%, -0.05%, 3.69%, -0.01%, -0.51%, 0.50% and 0.48%, respectively. The reported t-statistic values indicated that the GGI effect on HDI, LEI, IMR and access to improved WAT, SAN and HCS was statistically significant at 1%, while it was at 10% critical level for LEI in Southern Africa.

The above analysis indicated that the labour mobility and information dimensions of globalisation (LBM and TEL) enhanced human welfare development in Southern Africa compared with the deteriorating effect of GGI on human welfare status during the reviewed period. In assessing the overall fitness of the estimated augmented regression models, the adjusted R-squared reveal that labour and information channels of globalisation and other factors account for an average 97.2%, 91.8%, and 92.8% variation in human welfare, other welfare measures (LEI, IMR, and MYS), and access to basic necessities (WAT, SAN and HCS) changes in Southern Africa region.

#### **Estimated Panel Regression Results: Western Africa**

The theoretical augmented fixed regression results that captured the effect of TRD on HDI, other welfare measures (LEI, IMR, and MYS) and access to basic necessities (WAT, SAN and HCS) in Western Africa, comprising Benin, Ghana, Niger and Nigeria, are shown in Table 5. The results

indicated that at 1% critical level, TRD as a channel of globalisation exerted a positive and significant effect on the HDI, IMR, MYS and access to improved WAT. Only the effect on IMR was found not to conform with the theoretical expectations in Western Africa. Similarly, at 1% critical level, TRD as the economic dimension of globalisation was found to exert a negative and significant effect on the LEI, access to improved SAN and HCS in Western Africa. These effects were not in tandem with theoretical expectations. Also, in terms of the magnitude, a 10% change in TRD enhanced HDI, IMR, MYS and access to improved WAT by 0.16%, 0.95%, 0.01% and 0.92% respectively, but reduced LEI, access to improved SAN and HCS by -0.29%, -0.28% and -0.17%, respectively.

Economically active population share ( $N$ ) as a theoretical control variable was found to be significantly and negatively related to the HDI, LEI, MYS and access to HCS in the Western Africa region at 1% critical level. The effects were not in consonance with the theoretical expectations. Also, the percentage share of working age population of total ( $N$ ) was found to be significant and positively related to the IMR and access to WAT and SAN in West Africa at 1% critical level. At 1% change in economically active population ( $N$ ), HDI, LEI, MYS and access to HCS dropped by -0.36%, -0.65%, -0.07% and -0.46%, respectively, but IMR and access to WAT and SAN were improved by 4.23%, 2.56% and 0.44%, respectively.

In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared revealed that with TRD as a channel of globalisation and other factors account for an average 94%, 90%, and 93.6% variation in HDI, other welfare measures (LEI, IMR, and MYS), and access to basic necessities (WAT, SAN and HCS) changes in West Africa region in the period under review.

The theoretical augmented fixed regression results that captured the effects of capital and financial openness (PFI and FDI) on HDI, other welfare measures (LEI, IMR and MYS) and access to basic necessities (WAT, SAN and HCS) in Western Africa indicated that PFI as the financial dimension of globalisation exerted a negative effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS and a positive effect on IMR in Western Africa. These effects were not in tandem with the theoretical expectations. For a 1% change in financial flow of globalisation (portfolio investment), HDI, LEI, IMR, MYS and access to WAT, SAN and HCS lowered by -1.69%, -1.09%, 6.19%, -0.05%, -2.28%, -0.24% and -1.66%, respectively. Based on the reported t-statistic values in Table 5, it can be seen that only the effect of PFI on HDI, LEI, IMR, MYS and access to improved WAT, SAN and HCS were statistically significant at 1% critical level in Western Africa.

Foreign direct investment as a capital dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, while exerting a negative effect on IMR in Western

Table 5

*Fixed effects regression of human welfare and transmission channel of globalisation in Western Africa*

| Variables             | HDI      | LEI      | IMR      | MYS      | WAT      | SAN      | HCS      |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|
| <b>Constant</b>       | 44.16    | 80.99    | -89.77   | 3.42     | -97.12   | -11.30   | 64.60    |
|                       | 10.26**  | 24.03**  | -5.55**  | 19.11**  | -13.39** | -4.88**  | 13.53**  |
| <b>CFC</b>            | 0.072    | 0.217    | -1.040   | 0.003    | 0.273    | 0.121    | 0.175    |
|                       | 4.81**   | 18.51**  | -18.55** | 4.48**   | 10.72**  | 13.66**  | 11.25**  |
| <b>TRD</b>            | 0.016    | -0.029   | 0.095    | 0.001    | 0.092    | -0.028   | -0.017   |
|                       | 3.60**   | -10.55** | 6.56**   | 3.45**   | 14.69**  | -11.12** | -4.31**  |
| <b>PFI</b>            | -1.692   | -1.086   | 6.186    | -0.050   | -2.278   | -0.242   | -1.660   |
|                       | -26.54** | -27.96** | 28.44**  | -20.63** | -25.18** | -5.81**  | -26.84** |
| <b>FDI</b>            | 0.401    | 0.285    | -1.225   | 0.003    | 0.761    | 0.198    | 0.482    |
|                       | 18.01**  | 15.81**  | -14.19** | 3.18**   | 19.70**  | 17.12**  | 18.93**  |
| <b>LBM</b>            | -0.053   | -0.057   | 1.640    | 0.0002   | 0.848    | -0.046   | -0.092   |
|                       | -1.01    | -1.34    | 8.28**   | 0.07     | 9.02**   | -1.47    | -1.79*** |
| <b>GGI</b>            | -0.045   | -0.018   | 0.138    | -0.002   | -0.050   | -0.012   | -0.033   |
|                       | -28.95** | -18.25** | 25.85**  | -32.15** | -21.36** | -11.59** | -22.95** |
| <b>TEL</b>            | 0.906    | 0.441    | -3.442   | 0.035    | 0.945    | 0.321    | 0.828    |
|                       | 34.47**  | 24.06**  | -36.88** | 29.43**  | 22.74**  | 22.34**  | 32.03**  |
| <b>N</b>              | -0.359   | -0.652   | 4.229    | -0.066   | 2.556    | 0.439    | -0.463   |
|                       | -4.23**  | -9.81**  | 13.26**  | -18.71** | 17.89**  | 9.58**   | -4.91**  |
| <b>Adj. R-squared</b> | 0.940    | 0.889    | 0.880    | 0.929    | 0.923    | 0.963    | 0.920    |
| <b>S.E. of reg.</b>   | 2.384    | 1.984    | 9.005    | 0.107    | 4.065    | 1.720    | 2.841    |
| <b>F-statistic</b>    | 2987.7** | 1543.8** | 1410.4** | 2526.1** | 2293.5** | 5053.2** | 2222.3** |
| <b>Observation</b>    | 140      | 140      | 140      | 140      | 140      | 140      | 140      |
| <b>Cross-sections</b> | 4        | 4        | 4        | 4        | 4        | 4        | 4        |

Note: [1]. \*\*\* denotes significant at 1%; \*\* denotes significant at 5% and \*denotes significant at 10%. [2]. Absolute t-statistics are in next line to the coefficients. [3]. All regressions use the fixed cross-section effects, cross-section weights, standard errors and covariance (d.f. corrected)

Source: Authors' computation (2018)

Africa. These effects were in tandem with the *a priori* expectations and were statistically significant at 10% critical level. In terms of magnitude, a 10% change in the financial channel of globalisation (FDI) enhanced HDI, LEI, MYS and access to

improved WAT, SAN and HCS but reduced IMR by 4.01%, 2.85%, 0.03%, 7.61%, 1.98%, 4.82% and -12.3%, respectively.

Similarly, gross fixed capital stock as a theoretical baseline input variable and measure of domestic capital formation

was found to exert a positive effect on HDI, LEI, MYS and access to improved WAT supply, SAN and HCS, while having a negative effect on IMR in the Western Africa region. These effects were in tandem with theoretical expectations based on signs of the reported estimates. In terms of intensity of effects, a 10% change in fixed capital stock enhanced HDI, LEI, MYS and access to improved WAT supply, SAN and HCS but reduced IMR by 0.72%, 2.17%, 0.03%, 2.73%, 1.21%, 1.75% and -10.4%, respectively. In terms of partial significance, the reported t-statistic values indicated that the effect of fixed capital stock on HDI, LEI, IMR, MYS and access to improved WAT, SAN and HCS were found to be statistically significant at the 1% critical level.

In comparative terms, the entire analysis revealed that domestic capital formation and capital channel of globalisation enhanced human welfare development, while the financial dimension of globalisation worsened human welfare development in the Western Africa region during the reviewed period. In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared results reveal that with PFI and FDI as channels of globalisation and other factors accounts for an average 94%, 90%, and 93.6% variation in HDI, other welfare measures (LEI, IMR, and MYS), as well as access to basic necessities (WAT, SAN and HCS) changes in West Africa region.

The theoretical augmented fixed regression results that captured the effect of LBM and information flow on human

welfare, other welfare measures and access to basic necessities in Western Africa indicated that net LBM as a channel of labour flow and a dimension of globalisation exerted a negative effect on HDI, LEI and access to improved SAN and HCS, while exerting a positive effect on IMR, MYS and access to improved WAT in Western Africa in the period under review. These effects were not in consonance with the theoretical expectations (except for MYS and WAT). A 10% change in labour flow of globalisation (LBM), HDI, LEI, IMR and access to improved WAT, SAN and HCS dropped by -0.53%, -0.57%, 16.4%, -0.46% and -0.92%, respectively, while MYS and access to improved WAT were enhanced by 0.002% and 8.48%, respectively during the reviewed period in Western Africa. In terms of partial significance as reported by the t-statistic values shown in Table 5, only the effect of LBM on IMR and access to improved WAT were found significant at 1% critical, while for HCS it was significant at 10% critical level.

Access to telephone network (TEL) as the information dimension of globalisation exerted a positive effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, but exerted a negative effect on IMR in Western Africa. These effects were in consonance with the *a priori* expectations and were statistically significant at 1% critical level. In terms of magnitude, a 1% change in information channel of globalisation (TEL) enhanced HDI, LEI, MYS and access to improved WAT, SAN and HCS but reduced IMR by 9.06%,



4.41%, 0.35%, 9.45%, 3.21%, 8.28% and -34.42%, respectively as reported in Table 5.

Institutional and governance quality as measured by GGI was found to exert a negative effect on HDI, LEI, MYS and access to improved WAT, SAN and HCS, but a positive effect on IMR in the Western Africa region. These effects were not in tandem with theoretical expectations. In terms of effect size, a 10% change in GGI lowered HDI, LEI, MYS and access to improved WAT, SAN and HCS by -0.45%, -0.18%, 1.38%, -0.02%, -0.50%, -0.12% and -0.33%, respectively. The reported t-statistic values indicated that GGI effects on HDI, LEI, IMR and access to improved WAT, SAN and HCS were found statistically significant at 1% in Western Africa during the period under review.

Comparatively, the entire analysis revealed that the information flow channel of globalisation enhanced human welfare development, while the LBM dimension of globalisation and governance quality worsened human welfare development in the Western Africa region during the reviewed period. In assessing the overall fitness of the estimated augmented panel regression models, the adjusted R-squared revealed that the consideration of net LBM and access to telephone lines (TEL) as channels of globalisation and other factors accounted for an average 94%, 90% and 93.6% variations in other welfare measures and access to basic necessity changes in the Western Africa region.

## DISCUSSION AND CONCLUDING IMPLICATIONS

Africa, especially the Sub-Saharan Africa (SSA) region, is one of the areas among developing and emerging nations that has witnessed an increased and intensive level of globalisation through trade relations, capital flows, labour migration and technological transfers in the last three decades. This degree of globalisation has been further accelerated by political participation of the region, which lessened restrictions to free flow of information and technological transfer among globalising countries. This high degree of globalisation has translated to growth, but these gains have not been reflected in qualitative welfare for most developing countries and thus, have precipitated inconclusive debates on the precise directional link between globalisation dimensions and human welfare changes. Therefore, this study examined the regional impact of the transmission channel of globalisation on human welfare in 16 SSA countries from 1980 to 2014.

The findings indicated that trade openness enhanced human welfare development and the access of people to infrastructural facilities for the Central, Eastern, Southern and Western Africa sub-regions. In addition, it showed that among the indices, FDI was found to be predominantly human-welfare enhancing in the Eastern and Southern Africa regions in the SSA. Evidence from the sub-regions revealed that information flow via number of telephone line subscribers as a dimension of globalisation exerted a positive impact

on human welfare development, infant mortality ratio and improved access to basic necessities (water) in Central, Eastern, Southern and Western Africa. In addition, high labour migration and emigration of experts as a dimension of globalisation was found to worsen human welfare development and hinder basic infrastructural development in the Central, Eastern and Western Africa regions of Africa. The study found that the high level of social globalisation via labour inflow, access of people to telephone and Internet facilities enhanced the development of human welfare changes as evidenced in Southern Africa. However, bad and ineffective governance was found to have the highest negative impact on human wellbeing improvement in terms of magnitude and statistical significance in all the sub-regions.

There is need for policy-makers in each SSA country to continuously increase the adoption and utilisation of inclusive growth-orientated trade policy tools such as moderate tariffs and non-tariff barriers to guide trade interactions with the global world, especially via export promotion to facilitate development of human wellbeing. Also, harmonisation of trade tariffs and reforms among SSA countries will further improve future multilateral trade negotiations, break down structural constraints emanating from open trade regimes and reduce restrictive trade measures such as import duties and taxes to enhance the capability of people through domestic production and reduction in demand for imported goods. Lastly, governance as a crucial determinant of human welfare development in the SSA

region requires guided and transparent operations in its implementation of policies that directly affect people, eradicate corruption, foster political stability and further enhance the adherence to the rule of law.

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