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THE EFFECTS OF TRADE OPENNESS AND FOREIGN DIRECT INVESTMENT ON INCOME INEQUALITY IN SUB-SAHARAN AFRICA

BY

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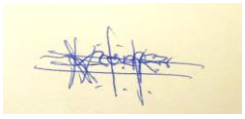
DECLARATION

I, KWAKU ASANTE, hereby declare that this thesis— "THE EFFECTS OF TRADE OPENNESS AND FOREIGN DIRECT INVESTMENT ON INCOME INEQUALITY IN SUB-SAHARAN AFRICA" is completely my own work except for the references used which have been duly acknowledged. This work has not been presented either in part or whole for a degree at this University or elsewhere.



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DEDICATION

I dedicate this work to the Almighty God for His strength and provisions, my family, and friends.

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ABSTRACT

Trade openness and foreign direct investment (FDI) has played a key role in the development and growth of many developing countries in the world. As such, most of the countries in the sub-Saharan Africa (SSA) region has promoted globalisation since the mid-1980s to increase economic growth, income, welfare and decrease inequality. According to the Heckscher-Ohlin-Stolper-Samuelson (HOSS) trade models, developed countries export capital-intensive goods in which they have a comparative advantage while developing countries export labour-intensive products in which they have a comparative advantage; as a result, demand for low-skilled labour increases and decrease income inequality in developing countries and inequality instead increases in the developed countries. While some theoretical and empirical studies agree with the basic HOSS trade model, opponents argue that globalisation deteriorates income inequality in developing countries including those in the SSA region. However, few research has examined the relationship between globalisation (trade openness and FDI) and income inequality in the SSA region. This study therefore sought to examine the effect of trade openness and foreign direct investment on income inequality in some selected countries in SSA. The study used the system generalized methods of moments technique to analyse secondary data for 37 SSA countries from 2000 to 2019.

The study revealed that foreign direct investment, education, and GDP per capita have a negative and significant effect on income inequality. However, trade openness and population growth have a positive and significant effect on income inequality.

The study recommends the adoption of policies to promote globalisation and investment in high-quality education and training facilities which helps to create more employment opportunities and increase the supply of skilled labour in the SSA region.

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LIST OF ABBREVIATIONS

ARDL	Autoregressive Distributed Lag
BRICS	Brazil, Russia, India, China, and South Africa
FDI	Foreign Direct Investment
FEM	Fixed Effect Model
GDP	Gross Domestic Product
HOSS	Heckscher-Ohlin-Stolper-Samuelson
IMF	International Monetary Fund
REM	Random Effect Model
SDGs	Sustainable Development Goals
SSA	Sub-Saharan Africa
SWIID	Standardized World Income Inequality Database
SYS-GMM	System Generalized Method of Moments
NARDL	Non-linear Autoregressive Distributed Lag
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.0 Background

The goal for trade openness by a country is to improve efficiency in production and increase economic growth (Kai & Hamoria, 2009). During the 1980s and 1990s, numerous developing countries opened their economies to trade, including countries in Sub-Saharan Africa (SSA). Most of the countries in the SSA region have promoted large-scale deregulation in trade and investment policies as part of structural adjustment programs since the mid- 1980s to increase economic growth, income, employment, and decrease inequality (Kai & Hamoria, 2009).

According to the Heckscher-Ohlin-Stolper-Samuelson (HOSS) trade models, developed countries export capital-intensive goods in which they have a comparative advantage while developing countries export labour-intensive products in which they have a comparative advantage; as a result, demand for low-skilled labour increases and decrease income inequality in developing countries and inequality instead increases in the developed countries. Few studies have supported this assertion; for instance, Franco & Gerussi (2013) found out that trade reduces income inequality when transition economies trade with developed countries in their research for 17 transition economies over 1990-2006.

Perera et al. (2014) found out that trade reduces income inequality in Sri Lanka; however, other empirical studies have also shown that trade liberalisation leads to increased income inequality in developing countries. Behrman et al. (2000)asserted that the globalisation policy widens wage disparities, but the degree of such differences gradually declines in 18 countries in Latin America. Trade with high-income countries was also found to worsen the income distribution in developing countries through their exports and imports (Meschi and Vivarelli, 2009). Also,

Mahesh (2016) asserted that the income inequality in Brazil, Russia, China, and India (BRIC) countries have worsened since these economies liberalised trade.

According to the IMF (1999) and UNCTAD (2005), FDI is one of Africa's policy instruments to aid in broad-based development. FDI is another channel of openness, and some empirical studies have shown the importance of trade openness in attracting FDI for developing countries (Babatunde, 2011; Liargovas & Skandalis, 2012). FDI refers to the investment made by multinational companies in a host country. FDI is an important source of capital for developing countries and brings technology, innovation and market information to developing countries (Khan & Nawaz, 2019).

Chen (2016) also asserts that FDI creates jobs for unskilled labour in developing countries, leading to a decline in income inequality in developing countries.

UNCTAD (2006) reported that the total FDI inflows into developing countries jumped up by 22% to $33 billion in 2005. In addition, they reported that total FDI inflows to developing economies reached $499 billion in 2007, of which SSA countries received about $33 billion. Despite the role of FDI in promoting economic growth, productivity, and welfare in the host country, some empirical studies on FDI have raised concerns regarding FDI effects on income inequality in the host countries. Choi (2006) found out that income inequality increases as FDI stocks as a percentage of GDP increases in his study, using 119 countries from 1993 to 2002.

Feenstra and Hanson (1997) performed a study on Mexico using data from 1975 to 1988, and they asserted that the rising wage inequality in Mexico is associated with foreign capital inflows. Few empirical studies have highlighted the impact of FDI on income inequality in the SSA region. Kaulihowa and Adjasi (2018), using data on 16 African countries from 1980-2013, found

out that there is a non-linear relationship between FDI and income inequality. FDI inflows initially reduce income inequality, but as FDI inflows increase, the effects on income inequality diminish.

In a study conducted by Mazumdar (1995), foreign manufacturing firms in Cameroon and Zambia were found to pay 24% and 18% more than domestic firms. This finding was in line with Te Velde and Morrissey (2001), who found that foreign firms pay more wages in Cameroon, Kenya, Ghana, Zimbabwe, and Zambia by 8%, 17%, 22%, 13% and 23%, respectively. Babatunde (2018) instead asserted that FDI inflows reduce income inequality in the short-run and the long-run for Nigeria from 1980 to 2016 when he used inequality estimates from the World Income Inequality Database.

High-income inequality is a developmental challenge for most developing countries, including those in the SSA region since it impedes welfare development policies. It also has important implications for macroeconomic stabilization policies (Kaulihowa & Adjasi, 2018). The SSA region remains one of the unequal areas globally (UNDP, 2017). Again, most of the literature on trade openness and FDI in the SSA region have focused on their impact on economic growth (Adams, 2009; Asamoah et al., 2019; M. K. Asiedu, 2013; Sakyi et al., 2017; Sakyi, Commodore, et al., 2015). Therefore, this study seeks to investigate the effects of trade openness and foreign direct investment(FDI) on income inequality in the SSA region empirically.

1.1 Problem Statement

High-income inequality has long been a developmental challenge for most developing countries globally, including those in sub-Saharan Africa (SSA) since income inequality impedes welfare development policies. According to UNDP (2017), the SSA region remains one of the unequal areas globally. Berg et al. (2012) assert that growth spells are longer in regions where income is

distributed more equally. As such, for society to achieve economic growth, there is a need to reduce income inequality. Economic growth must be accompanied by a decline in income inequality in an economy to enhance growth to impact poverty reduction (Fosu, 2015; Ravallion, 2004)

Reducing high-income inequality in developing countries like those in the SSA region has become a critical concern for both politicians and economists since the evidence shows that high-income inequality may result in social unrest and political instability, and this tends to decrease investments, which can lead to economic consequences for economies with high-income inequality (Alesina & Perotti, 1996; Berg & Ostry, 2011). Also, reducing inequalities is one of the UN's SDG goals since severe inequalities are detrimental to growth and development and peace and security (UNDP, 2017).

According to UNDP (2017), the determinants of income inequality in SSA are complex and multi-dimensional. To address this high-income inequality in the SSA region requires several responses from the government and its agencies. Empirical evidence in Africa and especially among West African countries shows that globalisation is one of the drivers of income inequality (Anyanwu, 2016). Globalisation (international trade and FDI) is regarded as economic growth and development source in developing countries, including countries in the SSA region. Due to this, countries in the SSA have promoted globalisation since the 1980s as a tool for economic growth and achieved high productivity in the sub-region (Kai & Hamoria, 2009).

According to UNCTAD (2019), FDI inflows to Africa increased by 11% to $46 billion in 2018, while that of the SSA region increased by 12% to $32 billion. With this increase in FDI inflows and growth in international trade over the years, the question that arises is how significantly have trade openness and FDI inflows in the SSA region affected income inequality in the region?

Empirical evidence in the SSA region shows that both trade and FDI significantly impact economic growth (Sakyi, Commodore, et al., 2015; Sakyi, Villaverde, et al., 2015; Zahonogo, 2016). Very few studies have directly tested the effects of trade openness and FDI on income inequality in the SSA region. A recent study by Xu et al. (2021) investigated the nexus between trade openness, FDI and income inequality in the SSA region. However, the study by Xu et al. (2021) did not consider the interactive effects of trade openness and FDI on income inequality in the SSA region. This study will examine how the interaction between trade openness and FDI in the SSA region will affect income inequality since the evidence shows that trade openness contributes positively to FDI inflows and leads to a sustained FDI inflow and welfare improvement of the people in the host country (Liargovas & Skandalis, 2012; Zaman et al., 2018)

Again, following studies by Franco and Gerussi (2013) and Khan and Nawaz (2019), this study will further decompose trade openness into exports and imports according to their origin and destination and examine how this will influence income inequality in the SSA region.

Finally, this study will employ the dynamic SYS-GMM methodology for a long panel data over the period of 2000 to 2019 and include the lag of both trade openness and FDI in the econometric model to be estimated to control for their delayed impact on income inequality in the SSA region, which was not considered by Xu et al. (2021) in their study.

1.2 Research Questions

In this study, we pose the following questions:

1. Does trade openness have any significant impact on income inequality in SSA?
2. Does FDI have any significant impact on income inequality in SSA?

3. Does the interaction of trade openness and FDI have any significant impact on income inequality in SSA?
4. Does the destination and origin of exports and imports have any significant impact on income inequality in SSA?

1.3 Research Objectives

The objectives of this study are:

1. To examine the effect of trade openness on income inequality in SSA.
2. To estimate the effect of FDI on income inequality in SSA.
3. To explore the effect of the interaction between trade openness and FDI on income inequality on countries in SSA.
4. To investigate whether the destination and origin of exports and imports, respectively, have any effect on income inequality in SSA.

1.4 Significance of the study

This study examines the impact of trade openness and FDI on income inequality and how the interactions between trade openness and FDI will affect income inequality in the SSA region. The existing empirical literature on the SSA region is limited in this subject and to the best of my knowledge, no study has been conducted that focused exclusively on the SSA region. The few available empirical works do not consider the effect of the interactions between trade openness and FDI. Again, a lot of prior studies on trade openness and FDI in the SSA and Africa have focused on their impact on economic growth (Adams, 2009; Asamoah et al., 2019; M. K.

Asiedu, 2013; A. Babatunde, 2011; Sakyi, 2011; Sakyi et al., 2017; Sakyi, Commodore, et al., 2015)

The study will also add to the existing empirical literature by employing income inequality estimates from the Standardised World Income Inequality Database (SWIID) for the countries in the SSA region, which assures comparability between countries and across time (Solt, 2020).

1.5 Organisation of the study

This thesis comprises six chapters. Chapter one contains an introduction. Chapter two covers the overview of the topic. Chapter three discusses the theoretical and empirical literature on trade openness, FDI and income inequality. The methodology of the study is in chapter four. In chapter five, we will present the analysis of data, empirical results, and discussion. In chapter six, we outline the conclusion, policy recommendations, and limitations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of both theoretical and empirical literature on the relationship between trade openness, FDI and income inequality. The first part entails the theoretical literature review of theories on trade openness, FDI and income inequality. The last part will focus on the empirical review of the literature concerning the relationship between trade openness and income inequality and followed by the relationship between FDI and income inequality.

2.2 Theoretical Literature Review

This section provides a review of theoretical literature that explain how trade openness and FDI inflows affect income inequality in a developing country.

2.2.1 Trade and Income inequality

Many researchers have widely investigated the effect of trade on income distribution, and the findings from these studies have not been conclusive. The starting point is the traditional trade theory expressed by Heckscher-Ohlin and Stolper-Samuelson (HOSS). According to these trade models, trade openness will increase the real gains of the abundant factor and a decrease in the gains of the scarce factor in a country. Thus, for developing countries with an abundant supply of unskilled labour and export goods that are low-skill-intensive goods, openness to trade will lead to an increase in the wages of the unskilled workers, thereby reducing income inequality.

Similarly, for the developed countries with an abundant supply of skilled labour, globalisation will lead to an increase in the skilled labour's real wages and, as a result, an increase in income inequality in the developed country. Many scholars have found evidence that supports this

traditional trade theory (Franco & Gerussi, 2013; Mundell, 1957; Perera et al., 2014; Rybczynski, 1995).

However, it is not always the case that trade liberalisation benefits developing countries like SSA countries. In their study, Kai and Hamoria (2009) found out that globalisation worsens inequality in the SSA region and this disequalizing, effect depends on the level of development in the country.

2.2.2 FDI and Income inequality

There are contending theories regarding the relationship between FDI and income inequality in developing countries. Modernisation theory, dependency and world-systems theory, and international trade theory are all discussed in this study.

2.2.2.1 Modernisation Theory: This theory postulates that a country's development passes through different stages; first, a country moves from a traditional stage to a modern stage, and these stages of development affect income distribution differently. This theory dates back to the 1950s and is based on neoclassical economics (Kuznets, 1955; Rostow, 1959). It states that FDI will produce positive direct and spill-over effects for the host country like job creation, production efficiency and economic growth. When a country is in the early stages of development, a rise in FDI inflow will exacerbate income inequality, according to the modernisation theory. However, income inequality declines when a country reaches the modernisation stage. This income inequality is an essential condition during the early stages of a country's development.

This theory is consistent with the Kuznets (1955) inverted U-curve hypothesis, which states that, at the early stages of development, income inequality increases, but once a country reaches a

certain level of development, it declines. As such, this modernisation theory indirectly predicts that FDI and income inequality may follow Kuznets (1955) hypothesis since FDI-induced growth may decrease income inequality in the long run. Finally, this theory predicts that developing countries can catch up with the advanced economies in terms of development if they adopt the path used by the advanced economies and it is also essential to integrate the developing countries into the world economy.

2.2.2.2 Dependency and World-Systems Theory

The dependency and world-system theory emerged in the 1960s and 1970s, respectively, and contradict the modernisation theory. According to Mihaylova (2015), the relationship between FDI and income inequality is centred around the differentiation between a core and a periphery country. The core country represents the advanced economies with an abundant supply of skilled labour, whilst periphery is developing countries with an abundant supply of unskilled labour.

This body of theories argues that developing countries' development processes depend on advanced economies, which is driven mainly through international trade and the inflow of FDI (Firebaugh & Beck, 1994). Proponents of this theory argue that developing countries depend on the core, which could hinder economic growth and increase income inequality since the peripheral countries are denied the opportunity to follow their development path.

2.2.2.3 International Trade Theory

Many authors also use the standard Heckscher-Ohlin and Stolper-Samuelson (HOSS) trade model to explain the link between FDI and income inequality. They argue that the effect of FDI on income distribution is like that of trade under HOSS trade theory. According to this model, trade openness and FDI inflows increases the demand for unskilled labour in developing countries and therefore raises their wages leading to a decrease in income inequality. However,

there is an increase in income inequality in developed countries due to the inflow of FDI from developed nations with an abundant supply of skilled labour.

2.3 Empirical Literature Review

This section provides a review of empirical studies on the relationship between trade openness, FDI and income inequality.

2.3.1 Trade and Income inequality

Empirical literature that has examined the impact of trade openness on income inequality vary in results. Some studies have found that trade increases inequality, while others found no evidence that trade increases income inequality.

First, Mahesh (2016) examined the relationship between trade openness and income inequality in Brazil, Russian Federation, China, and India (BRIC) after these countries liberalized their trade regimes. The study argued that income inequality in these countries had worsened due to an increase in trade as a percentage of GDP when the Generalised Method of Moments for dynamic models of panel data analysis was used to estimate data from 1991 to 2013.

Also, Franco and Gerussi (2013) examined whether trade and inward FDI affect income distribution in 17 transition countries from 1990 to 2006 using fixed effects (FE) estimator, with a dynamic one, that is through Least Squares Dummy Variable Corrected (LSDVC) estimator. In this study, FDI did not have any significant effects on income inequality, but trade, primarily when it occurs with developed countries, positively impacted income inequality. Again, they also asserted that imports from developed countries result in income inequality in the transition economies because new technologies are skills intensive in the short-run whilst income inequality reduces in the long-run.

In their study on China, Wei and Wu, (2013) asserted that exports decrease rural-urban income inequality, which is the major component of the overall inequality using data on 100 Chinese cities over the period of 1988 to 1993. The authors argued that cities with greater openness to trade tend to experience a huge decrease in rural-urban income inequality.

Again, Silva (2007) investigated the relationship between trade and income inequality in Mozambique and the primary focus of this study was on the regional differences that exist in Mozambique. The study adopted the ordinary least squares (OLS) technique to estimate cross-sectional data from the period of 1996 to 2000. The key findings argued that the southern part of Mozambique which is more developed relative to the northern part experiences a fall in income inequality since they export cash crops, but income inequality is high in the northern sector since they only engage in domestic trade.

Furthermore, Khan and Nawaz (2019) examined the relationship between trade, FDI and income inequality for the Commonwealth of Independent States (CIS) using annual data from 1990 to 2016. A System-Generalized Moments of Methods (SYS-GMM) estimation technique was used in this study. The key findings from this study asserted that trade openness and FDI have a significant effect on income inequality and as such the inverted U-shaped curve holds for trade but not for FDI. That is, income inequality initially increases, reaches a maximum point, and afterwards reduces when trade openness increases.

This study also argued that export to both advanced and developing countries leads to a decrease in income inequality while imports from advanced countries were insignificant when trade openness was decomposed into export and imports with respect to their origin and destination.

Besides, Zakaria and Fida (2016) employed a two-stage least square estimation technique in their study to examine the impact of trade openness on income inequality in China and the South Asian Association of Regional Cooperation Countries (SAARC) using data from 1973 to 2012. The study concluded that trade liberalization policies have increased in income inequality in these economies and these findings are robust against other liberalization measures.

Further, Kai and Hamoria (2009) used panel data on 29 Sub-Saharan African (SSA) countries from 1980 to 2002 to examine the effect of globalisation (trade and FDI) on income inequality. The key findings from this study asserted that globalisation has resulted in an increase in income inequality and as a result, this unequal effect of globalisation decreases as these countries economic development increases.

Moreover, Goh and Law (2019) conducted a study to examine the relationship between trade openness and income inequality for 65 developed and developing countries from 1984 to 2012. The study employed the panel system of Generalised Moments of Methods. The key findings from the study asserted that trade openness tends to increase income inequality and as such the quality of institutions in the country tends to offset some of the positive impact trade openness has on income inequality. However, this corrective effect that quality institution has on a country's income inequality has a certain threshold level. Again, the authors suggested that countries should make policies that tend to improve their institutional quality a priority.

Mah (2013) assessed the impact of trade liberalization on income inequality in China using data from 1985 to 2007 using the Stock and Watson Dynamic OLS (DOLS) estimation technique. The results from the study show that trade liberalization leads to an increase in income inequality in China.

Jalil (2012) uses the Auto Regressive Distributed Lag (ARDL) estimator to examine the impact of trade openness on income inequality in China under the Kuznets curve framework using data from 1952 to 2009. The study established a long-run relationship between trade openness and income inequality. The author argued that income inequality in China increases with an increase in trade openness, then starts to decrease after getting to a maximum point. Again, the author asserted that financial development and GDP per-capita growth also helps to reduce income inequality in China.

The work of Meschi and Vivarelli (2009) conducted a study on the relationship between trade and income inequality in 65 developing countries using data from 1980 to 1999. This study employed the Least Square Dummy Variable Corrected (LSDVC) estimator. The authors asserted that trade openness, that is, both exports and imports to and from developed countries significantly worsen income inequality in the developing countries while globalisation had no effect on the income inequality within these developing countries. When trade was decomposed into exports and imports based on their origin and destination, the study asserted that income inequality worsens when developing countries trade with the developed countries but income inequality within developing countries decreases when developing countries trade among themselves.

Faustino and Vali (2011) investigated the relationship between globalisation and income inequality from 1995 to 2007 for the Organisation for Economic Cooperation and Development (OECD) countries using a static and dynamic panel analysis for the data which was sourced from the World Income Inequality Database. The study asserted that trade openness results in a decrease in income inequality while FDI increases income inequality under the static analysis. For the dynamic analysis, trade openness led to a decrease in income inequality whiles FDI was

found not to be significant. Economic growth was suggested by the authors to increase income inequality both from the static and dynamic analysis in OECD countries.

Asteriou et al. (2014) investigated the relationship between globalisation and income inequality for 27 EU countries over the period of 1995 to 2009. The study employed the Generalized Moments of Methods (GMM) technique and the findings from the study are that trade openness leads to a reduction in income inequality while FDI has been increasing income inequality since 1995 in the EU region.

Ehrhart (2005) examined the relationship between international trade and income inequality using the random-effect model for panel data of 17 Latin American and 7 East Asian countries from 1995 to 2007. The study asserted that trade openness tends to decrease income inequality in these countries but the FDI inflows into these countries increase income inequality. Again, the Kuznets hypothesis-income inequality increases in the early stages of economic development and decreases at the later stages of economic growth- was found to hold for the Latin American countries but not the East Asian countries.

Çelik and Basdas (2010) in their study examined how globalisation affect income inequality using the Fully Modified Ordinary Least Squares (FM-OLS) technique. They asserted that trade openness has a positive impact on income inequality, that is, income inequality worsens as trade openness increases but FDI inflows improve the income inequality in developing countries.

Székely and Sámano (2012) conducted a study in 18 Latin America countries using panel data from 1980 to 2010 to examine if trade openness in Latin America affects income distribution. This study employed the random effects specification over the fixed effects model. The main findings from the study show that greater openness, that is, lower average tariffs in these

countries, leads to income inequality whiles larger tariffs lead to a decrease in income inequality. The authors suggest that in Latin America when the process of trade openness is stabilized in the medium-term, it leads to a significant decrease in income inequality.

Chakrabarti (2000) investigated the relationship between trade and income inequality using ordinary least squares (OLS) and instrumental variables (IV) for 73 countries. The sample of countries includes 24 high-income, 9 higher middle-income, 22 lower middle-income and 18 low-income countries using Gini coefficients data sourced from World Development Indicators (WDI).

The main findings from the study suggest that there is a negative significant relationship between trade and income inequality, meaning, income inequality is significantly reduced by trade when a country increases its participation in international trade with other countries. Again, economic growth serves as an important conduit through which income inequality is lowered by trade by increasing initial income and successive growth.

Bukhari and Munir (2016) examined the relationship between globalization and income inequality using panel data over the period of 1980 to 2014. The sample of countries used in this study includes Bangladesh, China, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Singapore, South Korea, and Thailand. This study utilized pooled OLS and instrumental variable least square (IVLS) estimation techniques for the estimation of panel data sourced from the World Development Indicators (WDI), International Financial Statistics (IFS), World Income Inequality Databases (WIID), World Trade Integration and Pakistan Economic Survey. The findings from the study indicate that income inequality in these 11 Asian countries is significantly reduced through trade openness and education and there is significant evidence in

support of the Kuznets hypothesis. However, FDI inflows and financial development have increased in income inequality.

Reuveny and Li (2003) in their study examined the relationship between economic openness, democracy, and income inequality in 69 countries over the period of 1960 to 1996. This study employed the ordinary least squares (OLS), fixed and random effects techniques for estimation. The main findings from the study show that greater openness and high democracy levels within a country lead to a decrease in income inequality while FDI inflows worsen income inequality within countries. However, the effects of financial capital inflows on income inequality within the sample of countries was found to be insignificant.

Many studies have examined the impact of trade openness and FDI on economic growth in Sub-Saharan Africa (SSA) (Asamoah et al., 2019; Sakyi et al., 2015). However, very few studies have been found on the relationship between trade openness, FDI and income inequality in the SSA region.

Lastly, Xu et al. (2021) examine the impact of trade openness and FDI on income inequality in 38 Sub-Saharan African countries using panel data from 2000 to 2015 and the System-Generalized Moments of Methods (SYS-GMM) technique was employed by this study. The key findings from this study show that trade openness has a positive significant relationship with income inequality, that is as trade increases, income inequality also increases. However, as FDI and GDP per capita increase, income inequality decreases in these SSA countries. The study also asserted that the Kuznets hypothesis does not hold in the SSA region.

2.3.2 FDI and Income inequality

Empirical studies on the relationship between FDI and income inequality have yielded mixed results: that is, a positive relationship, a negative relationship and those with no links.

Using pooled ordinary least squares regression, Choi (2006) investigated the impact of foreign direct investment on domestic income inequality using a panel dataset from World Development Indicators (WDI) from 1993 to 2002 on 119 countries comprising of Latin American and Caribbean countries and some selected Asian countries. The study found that income inequality increases as the stock of FDI (as a percentage of GDP) increases but income inequality reduces when GDP per capita increases. Again, the author asserted that outward FDI especially had a more negative effect on income distribution than inward FDI in these countries and income inequality was higher in the Asian countries compared to the Latin American and Caribbean countries.

The work of Kaulihowa and Adjasi (2018) examined the effect of inward FDI on income inequality in 16 African countries from 1980 to 2013 using the pooled mean group (PMG) estimator. The findings from the study confirms a nonlinear relationship between FDI and income inequality, where FDI inflows initially reduce inequality; however, the inequality diminishes with a further increase in FDI inflows.

Also, Jensen and Rosas (2007) in their study on Mexico, examined the relationship between foreign direct investment (FDI). The study employed the instrumental variable technique using data from 1990 to 2000. The key findings from the study show that an increase in FDI inflows leads to a fall in income inequality within the 32 states in Mexico.

Again, Chintrakarn et al. (2012) conducted a study to examine the relationship between inward FDI and income inequality in the United States (U.S) using panel data at the state level. The study employed a panel cointegration techniques to estimate the state-level panel data for 48 states in the United States from 1977 to 2001. The result from the study shows that inward FDI leads to a decrease in income inequality in the long run in the U.S. The study also asserted that income inequality tends to increase in some of the states, that is, 21 states out of the 48 states because of the long run heterogeneity effects FDI has on income inequality.

Further, Mihaylova (2015) used panel data from 1990 to 2012 to investigate the effects of FDI and government policy on income inequality in ten (10) Central and Eastern Europe (CEE) nations. The study used panel fixed effects regression models to examine the link between FDI and income inequality. The author suggests that the impact FDI will have on income inequality depends on the country's level of human capital and economic development. That is, at higher levels of economic development and human capital, FDI tends to reduce income inequality but when the spread of education and GDP per capita levels are low, an increase in FDI inflows tend to worsen income inequality in these countries.

Herzer and Nunnenkamp (2011) examined the macroeconomic relationship between FDI and income inequality for a sample of 10 European countries using data from 1980 to 2000. The study adopted panel co-integration and causality techniques. The findings from the study suggest that there is an increase in income inequality in the short run because of an increase in FDI. However, in the long-run FDI tends to decrease income inequality on average. Again, the authors suggest that in the long-run higher income inequality contributes to a lower inflow of FDI into these selected European countries.

Herzer et al. (2014) conducted a study to examine the impact of FDI on income inequality Latin America. This study employed the panel co-integration techniques to investigate the long-run effect of inward FDI stocks on income inequality among households in Latin America since the 1980s. The results show that FDI has a positive significant effect on income inequality, that is, an increase in FDI leads to an increase in income inequality among households in Latin America in the long run. However, the findings from this study did not find any significant evidence that higher income inequality also leads to a lower FDI inflow in Latin America.

Using pooled ordinary least squares (OLS) and instrumental variables (IV) estimation techniques, Couto (2018) examine the relationship between FDI and income inequality over the period of 1990 to 2013 for a sample of 96 countries based on their levels of economic development. These 96 countries comprising of 34 high-income countries, 29 upper-middle-income countries, 22 lower-middle-income countries and 11 low-income countries according to World Bank classifications using the income thresholds for each income group. The key findings from the study suggest that generally inward FDI leads to an increase in income inequality in the host country. Again, the author suggests that FDI tends to reduce income inequality in low-income countries whiles inward FDI leads to higher income inequality for lower-middle-income and upper-middle-income countries as well as among the high-income countries. Although, this FDI-induced inequality effect is much stronger in the middle-income countries compared to the high-income countries.

Aigheyisi (2020) conducted a study to examine the relationship between FDI and income inequality in Nigeria using the dynamic ordinary least squares (DOLS) estimator to estimate annual time series data from 1981 to 2015. The result from the study shows that income inequality is positively affected by FDI inflows, that is, as FDI inflows in Nigeria increases,

income inequality also worsens. However, income inequality was found to be reducing in Nigeria when FDI was interacted with trade openness, that is when the Nigerian economy is more opened to international trade, FDI inflows into the country tends to reduce income inequality. The study suggests that economic development and financial development also tends to reduce income inequality in Nigeria.

Bhandari (2007) conducted a study to examine the impact of inward FDI stock on income inequality in 19 transition countries from Eastern Europe and Central Asia. The study employed ordinary least squares (OLS) and fixed effects models to estimate data from 1990 to 2012. The key findings from the study showed that inward FDI stock has no significant impact on income inequality. However, the study suggests that stock of inward FDI leads to an increase in wage income inequality whiles capital income inequality is reduced in these countries.

Mahutga and Bandelj (2008) examined the relationship between foreign investment and income inequality in 10 countries from Central and Eastern Europe (CEE) using fixed effects regression models on panel data from the period of 1990 to 2001. The result from the study shows that FDI has a positive significant effect on income inequality, that is, an increase in foreign investment in these countries will lead to an increase in income inequality. Again, the study suggests that income inequality tends to reduce when education and economic development were interacted with FDI in these countries.

Using panel data from 1980 to 2009 period on 13 Latin American economies, Suanes (2016) estimated the impact of FDI on income inequality using the fixed effect models, two-stage least squares (TSLS) and the first difference Generalized Method of Moments (GMM) estimation techniques. The key findings from the study found a positive relationship between FDI and income inequality. That is, FDI inflows worsens income inequality in Latin America. However,

when FDI inflows were disaggregated into sectors namely the primary, manufacturing and service sectors, the author suggest that income inequality tends to increase in both the manufacturing sector and the service sector.

Babatunde (2018) using inequality estimates from the World Income Inequality Database (WDI) for Nigeria over the period of 1980 to 2016 conducted a study to examine the effects of inward FDI on income inequality in Nigeria. The study employed the auto-regressive distributed lag (ARDL) and non-linear ARDL (NARDL) to examine both the short-run and long-run relationship between inward FDI and income inequality. The key findings from the study suggest that in both the short-run and long-run ARDL, the inward FDI tends to decrease income inequality, but this only occurs after the first year. This suggests that income inequality decreases due to FDI inflow from the previous year but current inflows of FDI causes income inequality to increase. Again, the author suggests that, for NARDL in the short-run, positive FDI shocks reduce income inequality whiles negative FDI shocks increases income inequality in Nigeria after the inflows of FDI was decomposed into positive and negative FDI series. However, the empirical results for the long-run NARDL were insignificant and inconclusive. Also, an increase in domestic investment and population growth were found to increase income inequality in Nigeria.

The findings from the study conclude that the relationship between FDI and income inequality in Nigeria is a short-run phenomenon.

Figini and Gorg (2006) conducted a study to investigate the impact of foreign direct investment (FDI) on wage inequality using panel data from the period of 1980 to 2002 for 103 countries consisting of both developed and developing countries. The study applied the fixed effects regression and Generalized Moments of Method (GMM) techniques to estimate the relationship

between FDI and wage inequality and check whether this link is non-linear in both developed and developing countries. The main empirical findings show that a country's level of development determines the effects of inward FDI stock on wage inequality. FDI inward stock was found to increase wage inequality in developing countries but with a further increase in FDI, the wage inequality diminishes, and this suggests the presence of non-linear effect in developing countries. However, for developed countries, there was no significant evidence of non-linear relationship between FDI and wage inequality and as such an increase in FDI inward stock leads to a decrease in income inequality.

Using panel data over the period of 1970 to 1999 for 119 developing countries, Basu and Guariglia (2007) conducted a study to examine the interactions between FDI and educational inequality. The study suggests that there is a positive relationship between FDI and inequality, that is FDI fosters inequality and growth in these developing countries using the fixed-effects panel data specifications. The authors suggest FDI worsens inequality because of the inability of the poor to get access to modern FDI-based technologies because the poor cannot finance the cost of schooling.

Wu and Hsu (2012) conducted a study to examine the relationship between FDI and income inequality using cross-country data for 54 countries consisting of 33 developing countries and 21 developed countries from the period of 1980 to 2005. This study used the endogenous threshold regression and the instrumental variable threshold regression techniques to estimate data sourced from the World Development Indicators (WDI) database. The study suggests that an increase in FDI worsens income inequality. Again, the authors suggest that countries with lower absorptive capacity levels, that is countries with low ability to absorb and adopt modern technology from a foreign country, have more unequal income distribution while FDI has minimum effect on

income inequality for countries with high infrastructure levels which increase their absorptive capacity levels. However, trade openness was found to increase income inequality in these countries.

Tsai (1995) examined the relationship between foreign direct investment (FDI) and income inequality over the period of 1968 to 1981 using cross-country data on a sample of 33 developing countries from Latin America, Asia, and Africa. The study employed the ordinary least squares (OLS) technique. The key findings from the study show that FDI stock in developing host countries leads to higher income inequality and a host country's geographical location significantly influence its income inequality levels. Again, less-developed host countries in East and South Asia were found to be significantly affected by the inflows of FDI stocks.

Zhang and Zhang (2003) in their study investigated the effect of globalisation on regional inequality in 28 provinces in China using panel data over the period of 1986 to 1998. The study argued that globalisation, that is trade openness and FDI, is one of the significant factors that contributed to the worsening of regional inequality in China. This increasing regional inequality in China is because of the more developed coastal provinces relative to the inland provinces receiving most of the domestic and foreign capital investment which has led to the rapid growth and development in the coastal areas.

Mah (2002) conducted a study to examine the impact of globalization, that is, trade and FDI on income inequality in Korea using annual data from the period of 1975 to 1995. This study employed the Johansen–Juselius cointegration test. The results from the study suggest that increased trade values and FDI inflows in Korea tend to increase income inequality. That is globalization in Korea has contributed to a more unequal distribution of income in Korea.

Mah (2012) investigated the relationship between foreign direct investment (FDI) inflows and income inequality in Korea. The study used the cointegration test and the error correction model regression techniques to estimate annual data from Korea during the period of 1982-2008. The key findings from this study suggest that an increase in FDI inflows in Korea due to globalization policies pursued by the government has resulted in an increase in income inequality. Again, this study suggests that a decrease in labour unionization ratio in Korea under the period of study has also worsened income inequality in the country.

Ucal et al. (2016) conducted a study to examine the short-run and long-run impact of FDI on income inequality in Turkey. The study utilized the nonlinear autoregressive distributed lag (NARDL) technique to estimate time series data for Turkey from the period of 1970 to 2008. The results show that increased FDI stocks in Turkey have led to a decrease in income inequality in both the short-run and the long-run, but the impact is quantitatively small despite being statistically significant and symmetric in both the short-run and the long-run. Again, the study asserted that GDP growth initially increases income inequality in Turkey in the short-run but in the next period its effects on income inequality is overturned, however, GDP growth was found to be insignificant in the long-run.

Moreover, in an attempt to examine the relationship between FDI and income inequality, the following studies did not confirm the FDI and income inequality hypothesis.

Sylwester (2006) conducted a study to examine the relationship between FDI and income inequality in 29 developing countries using data from the period of 1970 to 1990. The study employed the ordinary least squares (OLS) technique and suggest that FDI do not have any significant effect on income inequality, that is an increase in FDI do not lead to an increase in income inequality in the sample of developing countries used in this study.

Te Velde and Morrissey (2004) investigated the impact of FDI on wage inequality in a panel of 5 countries (Hong Kong, Korea, Singapore, Philippines, and Thailand) in East Asia over the period of 1985 to 1998. This study did not find any significant evidence that FDI has a strong influence on wage inequality in these countries using the pooled ordinary least squares (OLS) estimation technique. However, when country specific FDI effects were added to the estimation, inward FDI was found to increase wage inequality in Thailand whiles there was no significant evidence in the other countries in the sample.

Similarly, Milanovic (2005) conducted a study to examine the effect of globalization on income inequality in both developed and developing countries. This study employed the simultaneous decile and IV-GMM regression techniques to estimate cross-sectional data sourced from the World Income Distribution (WYD) database for 95 countries in 1988 and 113 countries in 1993 and 1998

The result from the study shows that direct foreign investment did not have any significant effect on income inequality.

Again, the author asserted that trade increases income inequality while financial depth and democracy improve inequality. However, the author suggests that a country's level of income determines how trade openness affects income distribution within that country. That is when a country's participation in trade is high, it's the rich that benefits from this trade openness when a country's income levels are low, but trade openness benefits the poor and middle class in a country relative to the rich when national income levels start to rise.

Finally, Mah (2003) conducted an investigation to examine the effects of globalization on income inequality in Korea using time series data over the period of 1975 to 1995. The study

adopted the OLS regression technique and found out that globalization, that is increased trade values and FDI inflows do not have any significant effect on income distribution in Korea during the period of study. Also, the study suggests that the evidence in support for the Kuznets hypothesis, which postulates that- GDP per capita increases income inequality in the early stages of a country's development, gets to a maximum, then income inequality begins to fall, is weak.

2.4 Concluding Remarks

This chapter reveals that evidence from the empirical studies on the effects of trade openness and foreign direct investment on income inequality is inconclusive. While some studies proved empirically the existence of the standard Heckscher-Ohlin and Stolper-Samuelson (HOSS), others argued that this trade theorem does not hold. Even in the advanced economies that most of the empirical studies are done, some have positive relationship while others are negative and some even did not find any significant evidence in support of the HOSS trade hypothesis. Sub-Saharan Africa has received less attention in bridging the gap in the empirical works on the relationship trade openness, FDI and income inequality. Most attention has been on the relationship between trade, FDI and economic growth in the SSA region. The reasons gives room to undertake this study to fill these gaps by proving empirically the effects of trade openness and FDI on income inequality in the SSA region

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter of the study presents the empirical model used to achieve the objectives of the study.

Specifically, it provides the appropriate econometric techniques for estimating the effect of trade openness and FDI on income inequality. The section also provides the data sources, definition and measurement of variables and the diagnostic test used in the study.

3.2 Data Sources and Variable Description

The study will be carried out using panel data for 37 countries in the SSA region from 2000 to 2019 (20 years) mainly because of data availability. Selected countries were based on the availability of data. The countries used are Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of Congo, Côte D'Ivoire, Eswatini (Swaziland), Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Madagascar, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

The definitions and sources of the variables are described in the table below:

Table 3.1 Variables Description and Sources

Variable	Description	Source
GINI (Dependent Variable)	Income inequality index measured by Gini-net	Standardized World Income Inequality Database

		(SWIID)
TRADE (Independent Variable)	Trade Openness (ratio of the sum of imports and exports to GDP)	World Development Indicators (WDI)
FDI (Independent Variable)	Inward FDI stock as a percentage of GDP	United Nations Conference on Trade and Development (UNCTAD)
EXPED(Independent Variable)	Exports to developed countries	World Development Indicators (WDI)
IMPED(Independent Variable)	Imports from developed countries	World Development Indicators (WDI)
EXPING(Independent Variable)	Exports to developing countries	World Development Indicators (WDI)
IMPING(Independent Variable)	Imports to developing countries	World Development Indicators (WDI)
GDP (Control Variable)	Annual Real GDP per capita	World Development Indicators (WDI)
EDUCATION (Control Variable)	Gross secondary school enrolment rate	World Development Indicators (WDI)
POPULATION GROWTH (Control Variable)	Annual population growth (%)	World Development Indicators (WDI)
INFLATION (Control Variable)	Inflation, GDP deflator (annual %)	World Development Indicators (WDI)

3.3 Estimation Technique

Due to the insertion of the lagged of the dependent variable (Gini) as a regressor in our econometric model gives us a dynamic panel regression model. The lagged of Gini is added to control for the fact that the past values of income inequality may have an effect on its present values since it is continual across time and may depend on several factors that change slowly (Anyanwu, 2016; Franco and Gerussi, 2013; Khan and Nawaz, 2019). Therefore, estimating dynamic panel equations with ordinary least squares can yield biased, inefficient and inconsistent estimators due to the presence of endogeneity, simultaneity bias, autocorrelation and unobserved heterogeneity in our panel data (Bond, 2002). This study therefore employs the dynamic panel GMM estimation technique to address the presence of endogeneity, simultaneity bias and unobserved heterogeneity in our panel data to obtain estimates which are consistent, efficient, and unbiased. However, one can employ the panel fixed effects and random effects estimation models, but the problem of endogeneity will still be present since these models only get rid of the unobserved heterogeneity effects in our panel dynamic model (Bond, 2002; Judson and Owen, 1999). According to Roodman (2009), there are two types of dynamic panel GMM estimation, that is, Difference GMM (DIFF-GMM) and System GMM (SYS-GMM). The difference GMM was proposed by Arellano and Bond (1991). The difference GMM eliminates the unobserved heterogeneity by taking the first difference of the dynamic panel equation. Again, the simultaneity bias is also eliminated from the panel data by using the levels of the lagged regressors as instruments (Goh & Law, 2019). However, the difference GMM has a weakness of magnifying the gaps in the unbalanced panel data and as such this can lead to invalid estimates (Roodman, 2009). Again, Arellano and Bover (1995) argues that the difference GMM could lead to one making incorrect inferences from the inconsistent and inaccurate estimates obtained in

situations where the explanatory variables are persistent and instruments used are weak. To address the problems associated with the difference GMM, Arellano and Bover (1995) and Blundell and Bond (1998) proposed the system GMM panel estimation technique. According to Faustino and Vali (2011), the system GMM produces two system of equations, that is, the first difference equation where the lagged of the levels are used as instruments and level equations where the first differences are used as instruments and this helps to solve the problem of weak instruments in the difference GMM and also improves efficiency. Roodman (2009) argues that the SYS-GMM minimises the gaps in the panel data by subtracting the averages of all future available observations from the current values and controls for the presence of endogeneity in the panel data by introducing more instruments. The SYS-GMM is made up of one-step and two-step estimators (Goh and Law, 2019). This study employs the two-step estimator since it uses optimal weighting matrices, thereby, making it more efficient than the one-step estimator and also robust to autocorrelation and heteroskedasticity (Goh & Law, 2019; Roodman, 2009). Moreover, the Hansen test of overidentifying restrictions will be used to test the validity of the instruments used in our models. The Arellano and Bond (1991) autocorrelation test will also be used to test for the null hypothesis of no second order serial correlation AR(2) in the error terms.

3.4 Empirical Models Specifications

To examine the effect of trade openness and FDI on income inequality, this study adopts the models specified by Khan and Nawaz (2019) and Meschi and Vivarelli (2009). The basic model below will be used:

$$Gini_{it} = \beta_0 + \beta_1 Gini_{it-1} + \beta_2 Trade_{it} + \beta_3 FDI_{it} + \sum \beta_k X_{ikt} + \mu_i + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where:

Gini represents the income inequality in country i at time t.

$Gini_{it-1}$ is the observation in the same country in the previous year

Trade represents trade openness.

FDI represents inward FDI stock as a percentage of GDP.

X_k is a vector of control variables,

μ_i measures time invariant country-specific effects

ε_{it} is the error term.

To examine the impact of trade openness and FDI interactions on income inequality, since trade openness is believed to be one of the important channels to attract FDI into a country

(Babatunde, 2011; Kandiero and Chitiga, 2006; Liargovas and Skandalis, 2012).

The model below will be estimated in the second step:

$$Gini_{it} = \beta_0 + \beta_1 Gini_{it-1} + \beta_2 Trade_{it} + \beta_3 FDI_{it} + \beta_4 (Trade_{it} * FDI_{it}) + \sum \beta_k X_{ikt} + \mu_i + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

Finally, following the works of Franco and Gerussi (2013) and Meschi and Vivarelli (2009) trade openness is further split into imports and exports with respect to their origin and destination to examine their effect on income inequality in the SSA region.

The basic model below will be employed:

$$Gini_{it} = \beta_0 + \beta_1 Gini_{it-1} + \beta_2 EXPED_{it} + \beta_3 EXPING_{it} + \beta_4 IMPED_{it} + \beta_5 IMPING_{it} + \sum \beta_k X_{ikt} + \mu_i + \varepsilon_{it} \ldots\ldots\ldots (3)$$

where :

EXPED: Exports to developed countries.

IMPED: Imports to developed countries.

EXPING: Exports to developing countries.

IMPING: imports to developing countries.

3.5 Definition and Measurement of Variables

This section of the study will describe the main variables used for the estimation of the effect of trade openness and FDI on income inequality and the units of measurement (proxies) for all variables are stated.

3.5.1 Dependent Variable (Income Inequality)

The most widely used index for income inequality in the standard literature is the Gini index (Franco and Gerussi, 2013; Kaulihowa and Adjasi, 2018; Khan and Nawaz, 2019) relative to other indices such as the Atkinson index and Coefficient of Variation. Gini index measures the extent to which a country's income distribution deviates from a hypothesized situation of perfect equality (Sharma and Abekah, 2017). The value of Gini index ranges between 0 and 100, where 0 means there is perfect equal income distribution and 100 means there is a perfect inequality level. The Gini index data is sourced from the SWIID database which is very useful since it addresses the issue of comparability to a higher extent compared to other inequality datasets and provides consistent data on income inequality for almost all the countries in the world and for a longer period. The SWIID measure for Gini is based on income data and it is consistent for all the countries in the SWIID database. The criteria for the imputation process is based on the Luxembourg Income Study definitions of income (Solt, 2020). The SWIID's estimates of income inequality are based on thousands of reported Gini indices from hundreds of published sources,

such as the OECD Income Distribution Database, the Socio-Economic Database for Latin America and the Caribbean produced by CEDLAS and the World Bank, Eurostat, the World Bank's PovcalNet, the UN Economic Commission for Latin America and the Caribbean, national statistical offices around the world, and academic studies. The SWIID database reduces dependence on problematic assumptions by using as much information as possible from proximate years within the same country for the imputation of missing values (Solt, 2020).

The SWIID database contains Gini market (that is market income inequality estimates for household's income before taxes and transfers) and Gini disposable which represents estimates for household disposable (after taxes and transfers) income inequality. This study uses Gini disposable as a measure of income inequality for the selected countries in the Sub-Saharan Africa region following the study by Kaulihowa and Adjasi (2018).

3.5.2 Independent Variables

3.5.2.1 Trade Openness (Trade)

Trade Openness is measured as the sum of exports and imports as a percentage of GDP and the data is sourced from the World Development Indicators (WDI). Following the works of Franco and Gerussi (2013) and Khan and Nawaz (2019), this proxy will be adopted for trade openness since it is assumed to capture the direct impact of trade openness on income inequality. From the standard trade theories, trade openness is expected to reduce income inequality in developing countries since trade leads to an increase in wages of the abundant unskilled labour in developing countries. Therefore, this study expects trade openness to have a negative relationship with income inequality. In line with studies by Franco and Gerussi (2013), Khan and Nawaz (2019) and Meschi and Vivarelli (2009), trade openness will further be separated into their origin and destination areas since the total impact of trade on income inequality may differ from its

components. According to Franco and Gerussi (2013) the level of technology embedded into products imported from advanced countries may differ from products imported from developing countries. Also, Khan and Nawaz (2019) argue that the technology in these developed countries are more skill intensive relative to the technology used in developing countries. This idea can therefore be extended to exports developing countries send to the developed countries. Again, the data on imports and exports are also sourced from the WDI.

3.5.2.2 Foreign Direct Investment (FDI)

FDI refers to the investment made by multinational companies in a host country. FDI also serves as another channel of trade openness since an open economy has been known to attract FDI. Evidence from various literature shows that the benefit a country experiences from FDI depends on the level of openness in the economy (Babatunde, 2011) and economic openness is one of the important determinants of FDI in SSA (Asiedu, 2002). FDI can accelerate growth in developing countries like those in the SSA region if efficiently utilized. Again, the standard literature on FDI argues that, FDI plays an important role in welfare development and productivity in the host countries and also promotes growth through the provision of capital, increased employment and a competitive environment in the host country (Kaulihowa & Adjasi, 2018; Xu et al., 2021).

This study adopts the stock value of inward FDI as a proxy for FDI following the works of Herzer and Nunnenkamp (2011) and Khan and Nawaz (2019). The inward stock value of FDI refers to the total amount of capital by foreign investors in the host country. The data on inward stock of FDI relative to GDP are sourced from the UNCTAD database. According to Herzer and Nunnenkamp (2011), FDI stocks are permanent investments in the receiving country and therefore are more effective in capturing the long run effects of FDI on income inequality. The

coefficient of FDI is expected to be either positive or negative since the evidence of the effects of FDI on income inequality has been mixed

3.5.3 Control Variables

3.5.3.1 GDP per capita

Following the works of Figini and Gorg (2006), Kaulihowa and Adjasi (2018), Khan and Nawaz (2019) and Xu et al. (2021), GDP per capita is used as a proxy for economic growth. GDP per capita measures the average income of a person in a country and this gives us an indication about whether that country is progressing or not. The Kuznets (1955) hypothesis asserts that there is an inverted U-shaped relationship between economic growth and income inequality and therefore one will expect that developing countries in the SSA region will have high unequal income distribution as they develop economically. However, the empirical evidence from the standard literature on the Kuznets (1955) hypothesis has been inconclusive. The coefficient of economic growth may be positive or negative. Economic growth may lead to an increase in income inequality if it's not pro-poor (Aghion et al., 2002).

3.5.3.2 Education (Human Capital)

The number of secondary school enrolments is used as a proxy for human capital. The use of this control variable is consistent with existing literature such as Figini and Gorg (2006), Khan and Nawaz (2019), Ucal et al. (2016) and Xu et al. (2021). This is computed as the total number of secondary students as a percentage of the total population. The coefficient is expected to be negative.

Education is said to be an important factor in reducing income inequality since it leads to an increase in the supply of skilled labour and increases the chances of getting a high paying job. This helps to reduce the wage differential between skilled and unskilled labour (Figini and Gorg,

2006; Meschi and Vivarelli, 2009). Again, higher levels of education increase the demand for skilled labour and it plays an important role in the ability of the country to attract FDI since it leads to the employment of skilled workers with technological knowledge (Basu and Guariglia, 2007). Further, access to higher levels of education by the poor helps in offsetting the negative distributional effects of FDI on income distribution and also serves as one of the important determinants of FDI (Zhuang, 2017).

3.5.3.3 Inflation

Inflation refers to the persistent increase in the general price levels of goods and services over a period. Following the works of Franco and Gerussi (2013) and Khan and Nawaz (2019), inflation rate will be computed as the annual growth rate of GDP implicit deflator and the data is sourced from the WDI database. Evidence from the standard literature shows that developing countries are characterized by high inflation rate and therefore it is necessary to include inflation rate as a control variable for this study. According to Franco and Gerussi (2013) and Meschi and Vivarelli (2009), higher levels of inflation leads to an increase in income inequality by increasing wages.

Again, higher levels of inflation reduce real wages and this negatively affects those in the lowest percentile on the income distribution (Meschi and Vivarelli, 2009). According to the UNDP (2017) report, rising inflation rates is one of the drivers of high income inequality in the SSA region. The coefficient is therefore expected to be positive.

3.5.3.4 Population Growth

Population growth measures the annual percentage growth in population. The data on population growth is sourced from WDI. According to WDI (2015), the de facto definition for population growth requires that all residents of a country are counted irrespective of their legal citizenship or status. Population growth is calculated as the exponential growth rate of midyear population

from year t-1 to t, expressed as a percentage. Anyanwu (2016) in his study argues that population growth significantly led to an increase in income inequality for countries in Southern Africa. In Turkey, Ucal et al. (2016) found out that a decrease in population growth led to a decrease in income inequality in the short run. However, Kunawotor et al., (2020) found out that the population growth rate was insignificant in affecting income inequality based on their study in Africa. The assumption is that higher rates of population growth will prevent workers from earning higher incomes since this will increase labour supply which in turn decrease wages and income of workers (Anyanwu, 2016; Babatunde, 2018). Therefore, we expect the coefficient of population growth to be positive.

3.6 Diagnostic Test

3.6.1 Stationarity (Unit Root) Test

In time series analysis, we say the data is stationary or the data has a unit root if its mean, variance, and autocorrelation do not vary systematically over time (Gujarati and Porter, 2009). To avoid spurious regression coupled with high R^2 and adjusted R^2 values, we need to check for the presence of stationarity in our panel data. Following the works of Çelik and Basdas (2010) and Kaulihowa and Adjasi (2018), this study employs the Im, Pesaran and Shin (IPS) panel unit root test developed by Im et al., (2003). Kaulihowa and Adjasi (2018) argue that the IPS test can account for the heterogeneity across all the panel units. The IPS test have the null hypothesis that all the panels contain a unit root and also allows for unbalanced panels and is built upon the Augmented Dickey Fuller (ADF) unit root test (Çelik and Basdas, 2010).

3.6.2 Hansen Test

This study employs Hansen (1982) test of overidentifying restrictions to evaluate the validity of the additional instruments included in the model by the SYS-GMM estimation procedure. These

additional instruments are assumed to be exogenous and are added by the SYS-GMM estimation technique to improve the consistency of the estimates in the model (Roodman, 2009). The Hansen (1982) test has the null hypothesis that all instruments are jointly valid and the vector of empirical moments are randomly distributed around zero (Roodman, 2009). According to Roodman (2009), when the model is exactly identified, mostly it becomes difficult to detect the instruments which are valid. Hence a model which is overidentified is required to test for the joint validity of the instruments. The test statistic for overidentifying has the degree of overidentification equal to the degrees of freedom. The test statistic for the Hansen (1982) test is distributed as a χ^2 and we fail to reject the null hypothesis when a high p-value is obtained, that is, greater or equal to 0.05. However, if the p-value is lower than 0.05 we reject the null hypothesis and conclude that the instruments used in the model are not valid (Roodman, 2009).

3.6.3 Autocorrelation and Heteroskedasticity

Autocorrelation (Serial correlation) and heteroskedasticity may exhibit in statistical equations for panel data. The presence of autocorrelation and heteroskedasticity could lead to making inferences from an estimated model with inefficient and biased standard errors for the coefficients with unbiased and consistent estimated coefficients (Reuveny and Li, 2003). To deal with these potential problems, this study employs the Arellano and Bond (1991) autocorrelation test. To confirm for the absence of autocorrelation in the error terms, we expect the first order autoregressive process, AR (1) to be significant at 5% and the second order autoregressive process AR (2) to be insignificant at 5%. When we fail to reject the null hypothesis when the probability is greater than 0.05, then it means the error terms are not autocorrelated. However, autocorrelation does exist when we reject the null hypothesis if the probability is less than 0.05.

Again, this study uses the SYS-GMM as the main estimation technique to address the possibility of the presence of heterogeneity in our study. The presence of heterogeneity in our data could be because of the use of panel data comprising of different countries in the SSA region with different economic, socio-cultural, political, and technological characteristics and hence the need for it to be addressed with the appropriate estimation technique.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings from the study. The descriptive statistics, correlation matrix and diagnostic test of the variables used in this study are provided in sections 5.2 to 5.6. Section 5.7 discusses the effect of trade openness and FDI on income inequality in the SSA region

4.2 Descriptive Statistics

Table 5.1 below provides summary statistics of the variables used in the study. The study is made up of 37 selected countries in the SSA region from the period of 2000 to 2019. The average value for the Gini coefficient (GINI_DISP) is 46.97. This shows that income inequality is relatively high for the selected SSA countries under the period of study. Namibia, South Africa, Eswatini and Botswana are the countries with higher levels of income inequality in the SSA region.

For trade openness (trade), the average value is 68.02% of GDP over the study period and this shows that the SSA region is more engaged in international trade. Trade recorded a minimum value of 20.72% and a maximum value of 311.35% of GDP. The average value of inward FDI stock as a percentage of GDP in the SSA region is 42.79. On average, the SSA region exports to the developed world (EXPED) is 52.73, while that of exports to the developing countries (exping) is 44.37. However, the average imports from the developing world (imping) are 48.1 compared to imports from the developed countries (IMPED)which is 42.25 on average.

Also, GDP per capita for the selected countries in the SSA region ranges from 208.07 to 10170.26. On average, the GDP per capita is 1803.65 which is relatively low. The average population growth rate for the SSA region was 2.57% over the study period. The highest

population growth rate is 5.60% and the lowest is 0.23%. The gross secondary school enrolment rate (education) has an average of 42.11. This shows the level of human capital development in the SSA region. It has a minimum of 6.197 and a maximum of 143.73.

Lastly, inflation has an average of 12.60, with a minimum of -21.17 and a maximum of 2630.12.

Table 4. 1 Descriptive Statistics of Variables

Variable	Observation	Mean	Std. Dev.	Min	Max
GINI_DISP	707	46.969	6.975	37.1	66.9
trade	740	68.017	31.968	20.723	311.354
FDI	736	42.786	83.473	.224	789.905
GDP	740	1803.653	2115.850	208.075	10170.26
education	740	42.111	25.219	6.197	143.725
Population growth	740	2.572	.757	.233	5.605
inflation	740	12.608	99.447	-21.165	2630.123
exping	739	44.369	24.898	0.790	98.865
imping	740	48.096	18.454	6.931	94.340
EXPED	740	52.733	25.225	1.135	98.968
IMPED	740	47.255	18.525	3.738	99.591

Source: Authors' computation using Stata.

4.3 Stationarity (Unit Root) Test

Stationarity test was performed using the IPS unit root test to avoid spurious regression in our results. The results of the IPS unit root test presented in Table 5.2 below rejects the null hypothesis that all panels contain unit roots. The Z-bar tilde statistic shows that all variables are

statistically significant at 1% and stationary at levels except GDP and population growth (POP) which are stationary at first difference.

Table 4. 2 Im-Pesaran-Shin (IPS) Unit Root Test

Variable	Z-bar tilde statistic	P-Value	Conclusion
GINI_DISP	-3.8548***	0.0001	Stationary
trade	-4.1168***	0.0000	Stationary
FDI	-2.9872***	0.0014	Stationary
GDP	-7.6388***	0.0000	Stationary at first difference
education	-2.5325***	0.0057	Stationary
Population growth	-6.1551***	0.0000	Stationary at first difference
inflation	-11.5991***	0.0000	Stationary
exping	-5.1830***	0.0000	Stationary
imping	-4.3388***	0.0000	Stationary
EXPED	-4.0340***	0.0000	Stationary
IMPED	-4.9849***	0.0000	Stationary

Source: Authors' computation using Stata.

***, ** , * denote 1%, 5% and 10% level of significance respectively.

4.4 Correlation Matrix

Table 5.3 below shows the Pearson's correlation coefficient matrix among all the variables used in the study. The correlation coefficient is used to measure the direction and strength of linear association between two variables. There exists a strong correlation between two variables when the coefficient lies between ±0.5 and ±1. However, correlation does not suggest causation. The

correlation matrix can be used to determine the presence of multicollinearity among the variables used in the study.

According to Gujarati and Porter (2009), multicollinearity exist between two when the variables are highly correlated, that is has a correlation coefficient in excess of ±0.8 and this can lead to inaccurate estimation results.

Table 5.3 below shows that the correlation coefficient between exports to the developing countries (exping) and exports to the developed countries (EXPED) is -0.8303 and this indicates the existence of multicollinearity. Also, the correlation coefficient between imports from developing countries (imping) and imports from developed countries is -0.8663.

Due to the presence of high collinearity between some of the variables, the study performed a multicollinearity test using the Variance Inflation Factor (VIF). The results from the VIF test are presented below in Table 5.4. According to Kleinbaum et al. (1988), if VIF for a variable is more than 10, then there is the existence of high multicollinearity. From the VIF table below, all variables have a VIF below 10 indicating the absence of high multicollinearity among the variables.

Table 4. 3 Correlation Matrix

	GINI_DISP	trade	FDI	GDP	education	inflation	exping	imping	EXPED	IMPED	Population growth
GINI_DISP	1										
trade	0.080	1									
FDI	-0.133	-0.131	1								
GDP	0.553	0.190	-0.046	1							
education	0.151	0.120	-0.086	0.132	1						
Inflation	0.137	0.031	0.0724	0.042	0.005	1					
Exping	-0.034	-0.016	-0.045	-0.169	-0.048	-0.018	1				
Imping	0.244	0.040	0.160	-0.032	-0.061	0.045	0.301	1			
EXPED	-0.029	-0.033	0.270	0.120	0.039	-0.030	-0.830	-0.285	1		
IMPED	-0.287	-0.055	-0.099	0.038	0.051	-0.093	-0.298	-0.866	0.318	1	
Population growth	-0.582	-0.064	0.093	-0.333	-0.256	-0.075	0.016	-0.147	0.029	0.1818	1

Table 4.4 Variance Inflation Factor

Variable	VIF	1/VIF
IMPED	4.32	0.232
imping	4.28	0.233
EXPED	3.95	0.253
exping	3.64	0.275
Population growth	1.27	0.786
FDI	1.26	0.793
GDP	1.20	0.832
education	1.10	0.908
trade	1.09	0.919
inflation	1.02	0.980
Mean VIF	2.31	

4.5 Heteroskedasticity

To check for the presence of heteroskedasticity in our panel, the White test for heteroskedasticity was performed for our model. Table 4.5 below presents the results from our White test. The null hypothesis of constant variance (homoskedasticity) was rejected at 5% significant level, therefore confirming the presence of heteroskedasticity in our panel data. Estimating our model with OLS will yield inconsistent and biased estimates due to the presence of heteroskedasticity. Hence, the system GMM estimation technique is used since it is robust to heteroskedasticity (Roodman, 2009).

Table 4. 5 White for Heteroskedasticity

White's test for Ho: homoskedasticity

against Ha: unrestricted heteroskedasticity

chi2(77) = 165.36

Prob > chi2 = 0.0000

4.6 Endogeneity Test

The study employed the Hausman test to choose between the fixed effect model (FEM) and the random effect model (REM) and to test for the possible existence of endogeneity in our data due to the insertion of the lagged of the dependent variable in the panel models. The results from Table 4.6 below shows that the null hypothesis of REM is rejected since p-value of 0.0000 is less than 5%. Thus, the fixed effect model (FEM) should be employed as the appropriate estimation technique instead of the random effect model. However, this study employs the system GMM as the main estimation technique instead of the fixed effect model due to the dynamic nature of the panel models and the system GMM is used to address the endogeneity problem in our models.

Table 4.6 Hausman Test for Fixed effect and Random effect

Test: Ho: difference in coefficients not systematic

chi2(11) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 148.67

Prob>chi2 = 0.0000

4.7 Presentation and Discussion of Results

This section of the study discusses the effects of trade openness and FDI on income inequality in some selected countries in the SSA region. The system GMM estimation technique was employed in this study due to the dynamic nature of our panel models, and the findings reported from our diagnostic test confirms the use of the system GMM as the appropriate technique.

The presence of autocorrelation in our data was tested using the Arellano and Bond (1991) autocorrelation test. This test requires AR (1) to be significant at 5% and AR (2) insignificant at 5%. The results from Table 4.7 below show the absence of serial autocorrelation in our panel models. Also, the result from our table shows that the instruments used in our study are valid since the p-value for the Hansen test of overidentification of restrictions is greater than 0.05. Finally, the F-test in Table 4.7 below has a p-value of 0.000 for all our panel models, implying that the coefficients in our model are jointly statistically different from zero.

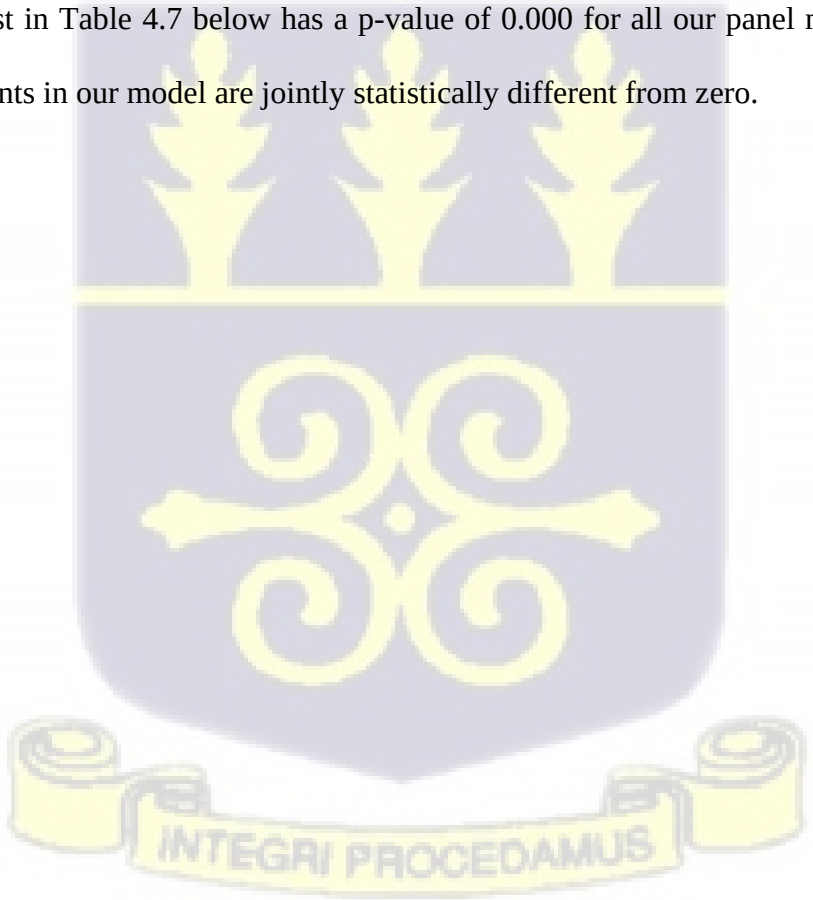

Table 4. 7 The Effects of Trade Openness and FDI on Income inequality in SSA

Variables	(1)	(2)	(3)	(4)
lagGINI_DISP	1.039***	1.045***	1.007***	1.043***
	(0.00197)	(0.00203)	(0.000614)	(0.00301)
trade	0.0003***		0.0003***	
	(0.0000586)		(0.0000499)	
FDI		-0.0012***	0.0011***	
		(0.000199)	(0.000139)	
OPEN			-0.000002***	
			(0.000000781)	
EXPED				-0.0084***
				(0.00133)
IMPED				0.0033**
				(0.00153)
exping				-0.0004**
				(0.000151)
imping				-0.0002*
				(0.000103)
GDP	-0.00009***	-0.0001***	-0.00002***	-0.0001***
	(0.0000047)	(0.00000546)	(0.00000170)	(0.0000695)
education	-0.00009	-0.0003***	0.00004**	-0.00006
	(0.0000724)	(0.0000716)	(0.0000194)	(0.000109)
Population growth	0.0933***	0.121***	0.0086*	0.0979***
	(0.0167)	(0.0164)	(0.00444)	(0.0230)
inflation	-0.00003	-0.0001***	-0.000000558	-0.0002***
	(0.00004)	(0.0000388)	(0.0000120)	(0.0000544)
Constant	-2.038***	-2.136***	-0.470***	-1.511***
	(0.116)	(0.115)	(0.0436)	(0.190)
Observations	670	670	633	670
Countries	37	37	37	37
F-test: p value	0.000	0.000	0.000	0.000
AR(1): p value	0.000	0.000	0.004	0.000
AR(2): p value	0.171	0.129	0.350	0.835
Hansen: p value	0.697	0.443	0.815	0.876

Notes: Standard Errors in parentheses. *,,*** represents significant level at 10%,5% and 1% respectively**

lagGINI_DISP: first lag of Gini coefficient, FDI: Foreign Direct Investment, OPEN: the interactive effect between trade and FDI. EXPED: Exports to developed countries, IMPED: Imports to developed countries, exping: Exports to developing countries, imping: imports to developing countries.

From our results in Table 4.7 above, the first lag of income inequality positively impacts the current income inequality levels in the SSA region, and it is significant at 1% in all our models. This implies that income inequality in the SSA region is persistent and does not change rapidly over time. The results show that inequality is relatively high in the selected countries in the SSA region.

The result is in line with the findings of Anyanwu (2016) and Kunawotor et al. (2020) in related studies on income inequality.

To address the study's first objective, the positive coefficient of trade openness in Model 1 in the table above indicates that an increase in trade openness in the SSA region leads to an increase in income inequality. The estimates suggest that a percentage point increase in trade openness will increase income inequality by 0.0003. This finding contradicts the standard trade theory, which predicts that openness to trade should decrease income inequality in developing countries like those in the SSA region because of abundant unskilled labour. However, the magnitude of the impact of trade openness on income inequality is minimal. From the standard HOSS trade theory, one will expect that a region like the SSA with abundant supply of unskilled labour should see their levels of income inequality reducing when they engage in trade with the advanced economies, but this is not the case here. This positive relationship between trade openness and income inequality in the SSA region could result from countries in the SSA region importing more than they export and this could lead to the creation of job opportunities in the countries we trade with and increase the wages of their skilled labour. Again, most of the goods exported by these countries are primary products. This finding is consistent with that of Goh and Law (2019) and Mahesh (2016). On the contrary, Khan and Nawaz (2019) found a negative

relationship between trade openness and income inequality in their study on Commonwealth Independent States (CIS).

Again, FDI, another main variable of interest, correlated with income inequality negatively and was statistically significant at 1% in Model 2. Table 4.7 above indicates that income inequality in the SSA region reduces by 0.001 when inward FDI inflows increase by one percentage point. This is consistent with the International Trade theory that argues that income inequality will decreases since FDI increases the demand for unskilled labour and their wages also increase as well in developing countries like those in the SSA region. Also, this finding from the study is consistent with Kaulihowa and Adjasi (2018) and Sharma and Abekah (2017).

Also, Jensen and Rosas (2007) validate this finding in their study in Mexico, where they found that FDI inflow led to a decrease in income inequality.

In Model 3, we interact with the two main variables of interest: trade openness and FDI, to determine how openness to FDI affects income inequality in the SSA region. The result shows that the interactive term (Trade*FDI) coefficient is negative and statistically significant at 1%. That is, more openness by countries in the SSA to international trade could help in attracting more FDI and this can lead to a decrease in income inequality through the creation of jobs and improvement in wages. The net effect on income inequality of the interaction between trade openness and FDI is (0.0003 + -0.00002(42.786)) = -0.0005. In this computation, the effect of trade openness on income inequality is 0.0003 given that FDI is "0". -0.0002 is the conditional effect from the interaction between trade openness and FDI , whereas 42.786 is the mean of our FDI variable see (Asongu et al., 2017; Kriese et al., 2019; Tchamyou, 2018). We can, therefore, establish that the interaction of trade openness and FDI has a negative impact on income inequality. The net effect confirms that more openness by the countries in the SSA to

international trade could help in attracting more FDI and this could lead to a decrease in income inequality in the region.

This conclusion is consistent with the finding of Ucal et al. (2016) and Wei and Wu (2013) and the International Trade Theory hypothesis.

According to Aseidu (2005) and Okafor et al. (2017), trade openness is one of the significant determinants of FDI in the SSA region due to the lower transaction cost associated with countries liberalized trade. Openness to FDI could lead to economic growth and improvement in income distribution in the host country (Liargovas and Skandalis, 2012; Zaman et al., 2018).

Further, trade openness was disaggregated into exports and imports with respect to their origin and destination to examine their impact on income inequality in the SSA region in Model 4. With respect to exports to advanced countries (EXPED), the coefficient is negative and significant at 1%. Exports from the SSA countries to the developed countries consist of mainly primary goods which use low technology, and this can lead to an improvement in the income distribution in SSA. Also, the coefficient of exports to developing countries (exping) is negative and significant at 5%. That is, goods exported to other developing countries uses low skilled-biased technologies and this can lead to an increase in the demand and wages of unskilled labour, thereby helping in reducing income inequality. These results are not consistent with that of Meschi and Vivarelli (2009) in their study on developing countries.

Also, for imports from advanced countries (IMPED), the coefficient is positive and statistically significant at 5%. This finding is in line with that of Franco and Gerussi (2013) in their study on transition economies. Imports from advanced countries involves product with high level

technology and innovation which requires skilled labour. This leads to an increase in the demand for skilled labour thereby increasing the wage differential and so an increase in inequality.

However, there exists a negative relationship between imports from developing countries (exping) and income inequality in the SSA region. This result is statistically significant at 10%. This implies that goods imported from other developing countries are mainly primary products and this can lead to an increase in the demand and wages of unskilled labour.

The study controlled for GDP per capita, population growth rate, inflation, and education which could also have an impact on income inequality in the SSA region.

The results from the study show that population growth has a positive impact on income inequality in the selected countries in the SSA region and is statistically significant in all our models. This result is in line with the findings of Anyanwu (2016) and Babatunde (2018), which argues that higher population growth rates increase income inequality due to lower wages received by workers because of an increase in labour supply. This indicates that a percentage increase in population growth worsens income inequality by 0.0933% in Model 1, 0.121% in Model 2, 0.00864% in Model 3 and 0.0979% in Model 4.

GDP per capita has a negative coefficient in all our models, and it is statistically significant at 1%. This finding implies that income inequality decreases when there is an increase in the GDP per capita of the selected countries in the SSA region. This result is consistent with the findings of Choi (2006) and Xu et al. (2021). Also, Fosu (2015) also asserted that GDP per capita plays an essential role in reducing inequality in the SSA region in his study on growth and inequality. However, this finding contradicts Kaulihowa and Adjasi (2018), which found GDP per capita to worsen income inequality in their study on Africa.

Again, the result from the table above shows that there is a negative relationship between education and income inequality in the SSA region, but this is only significant in Model 2 and 3. This result conforms to our a priori expectation and is consistent with the findings of Anyanwu et al. (2016), Kaulihowa and Adjasi (2018) and Kunawotor et al. (2020). Our findings imply that education leads to an increase in the supply of skilled labour, hence a decrease in the wage differential between skilled and unskilled labour (Anyanwu et al., 2016; Figini and Gorg, 2006).

Finally, Table 4.7 above shows that inflation leads to a decline in income inequality in the SSA region. However, this finding contradicts Goh and Law (2019) and Meschi and Vivarelli (2009). Our result is significant in Model 2 and 4. This result does not confirm our a priori expectation since we expected higher inflation rates to decrease workers' real wages.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of our findings. It concludes our findings and gives policy recommendations and suggestions for future research.

5.2 Summary

This study sought to examine the relationship between trade openness, foreign direct investment (FDI) and income inequality in some selected countries in sub-Saharan Africa (SSA), where income inequality has been continuously high over the past few years. To achieve this objective, the study used a sample of 37 countries in SSA from 2000 to 2019 due to data availability. The study employed the system-GMM (SYS GMM) panel estimation technique using data from UNCTAD and WDI.

First, our findings from the study show that trade openness, measured as the ratio of the sum of imports and exports to GDP, has a positive impact on the level of income inequality in the SSA region. This means that income inequality is worsened for countries in the SSA region due to an increase in international trade. This finding contradicts the predictions of the basic HOSS trade theory.

Second, inward FDI stock as a percentage was found to reduce the level of income inequality in the SSA region. Also, the result in the case of trade openness interaction with FDI was found to have a negative impact on income inequality and was statistically significant.

Finally, when trade openness was further divided into exports and imports with respect to their origin and destination, exports to advanced and developing countries had a negative and

significant impact on income inequality. However, imports to developed countries had a positive impact on income inequality whilst imports to developing countries had a negative and significant effect on income inequality.

5.3 Conclusion

Income inequality has remained high in the SSA region, even in the presence of economic growth over the past few years. The SSA region remains one of the unequal areas globally (UNDP, 2017). Many studies have investigated the causes of income inequality in the SSA region and Africa as a whole, and economic openness (openness to international trade and foreign direct investments) is one of the determinants of income inequality. The role of economic openness in economic growth and development has been widely investigated and established in the literature. The basic HOSS trade theory predicts that international trade increases the demand for abundant labour supply in developing countries, thereby increasing their earnings, and decreasing inequality.

Despite many studies on the relationship between economic openness and income inequality, a limited study on the SSA region exists. Therefore, the result from this study seeks to investigate the effects of trade openness and FDI on income inequality using a panel data of 37 sub-Saharan African countries. The findings from this study shows that trade openness increases the level on income inequality in the SSA region since these countries export mostly primary products and our imports from the advanced economies exceed our export.

Also, the study found a negative and significant relationship between FDI inflows and income inequality in the SSA region. Thus, FDI inflows leads to the creation of jobs and human capital development, thereby, increasing the wages of the abundant unskilled labour supply in the SSA region.

Furthermore, when trade was interacted with FDI inflows, the study confirmed that openness to FDI could lead to an improvement in income distribution in the countries in the SSA region. Hence, the Governments of the countries within the SSA region should adopt policy measures to help in attracting more inflow of FDI into their economies.

5.4 Recommendations

International trade and foreign direct investment (FDI) play an important role in the development and growth of most developing countries including those in the SSA region. Based on the findings of this study, the following recommendations are offered.

First, the study found a negative relationship between FDI and income inequality in the SSA region. Therefore, countries in the SSA region should adopt policy measures to help in attracting more FDI inflows into their economies. These FDI inflows can help in creating employment opportunities, developing human capital and managerial skills, and promoting advanced technology and innovation in the host countries resulting in a decrease in income inequality.

Also, the study suggests that more openness to international trade by the countries in the SSA region could help in attracting more FDI and creation of job to help in reducing income inequality. Therefore, the various Ministries of Trade and Industry in the SSA region should promote the elimination of tariffs and non-tariff barriers to trade in goods and liberalise trade in services which is also one of the main objectives of the African Continental Free Trade Area (AfCFTA).

Second, the study found a positive relationship between trade openness and income inequality which is unfortunate development especially considering the efforts countries in the SSA region has put into liberalising trade. This could be due to countries in the SSA region importing more

than their exports. Therefore, the various countries government together with their Ministries of Trade and Industry should formulate pragmatic pro-poor trade policies.

Again, the quality of education contributes significantly to the level of income distribution in these economies. Therefore, the government of these SSA countries should adopt socio-economic policies geared toward investments in high-quality education, training and to help increase the supply of skilled labour. For instance, the introduction of "Free Senior High School Education" policy and reforming the Technical, Vocational Education and Training (TVET) sector by the Ministry of Education in Ghana. Other nations in the SSA region can learn from it and adopt similar policies that are pertinent to their economies and can ensure an improvement in the level of human capital.

This investment in higher education in the SSA region will equip the labour force with the technical know-how to implement advanced technology and adopt international standards in their trading dealings with the developed economies.

Last, the government in these SSA countries should promote policies that helps in attaining a stable exchange rate and low and stable inflation to help them remain competitive in the international market. Hence, the Central Banks and other regulatory authorities in the SSA region should constantly come up with practical solutions to maintain the stability of these macroeconomic indicators. Governments in these economies must improve the independence of their central banks to achieve this.

5.5 Limitations of the Study and Areas for Further Research

Due to the unavailability of data only 37 countries in the SSA region were used in the study. Also, future studies can make a meaningful contribution to globalisation-inequality nexus in SSA

by including variables like financial development, natural resources rent, domestic investment and the role of institutional quality. Also, the study did not look at other aspects of foreign direct investment (FDI), that is market seeking and resource seeking FDI and their effects on income inequality. These areas of study could also make very meaningful contributions to the existing literature.

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