THE NEXUS BETWEEN FINANCIAL INTEGRATION AND INTERNATIONAL TRADE FLOWS IN SUB-SAHARAN AFRICA

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ABSTRACT

This study examines the linkages between financial integration and international trade flows in Sub-Saharan Africa (SSA) countries. It applies the two- stage least square (2SLS) technique to examine the contribution of financial integration on trade of goods and services using panel data on 20 SSA countries over the period 2001 to 2015. results indicate most financial integration indicators (liabilities, assets, foreign direct investment, and debts) have positive and significant effects on trade of goods and services. This result is robust to alternative notably trade of goods and services into import and export of goods and services. We therefore recommend that policy-makers of SSA countries put in place appropriate macroeconomic policies that will improve the quality of financial markets.

KEYWORDS: Financial Integration, International trade, least square technique, and SSA.

1. CONTEXT AND JUSTIFICATION

Over the past decades, there has been an increasing plethora of literature on financial integration and international trade flows in Africa and Sub-Saharan Africa (Ibrahim and Vo, 2020; Vo and Ellis, 2018; African Development Bank Group, 2017; Montinari and Stracca, 2016; Kose et al; 2009). Financial integration has reignited the fierce debate about the merits of international trade flows and its implications for development in Africa, especially in Sub-Saharan Africa (Kose, Prasad and Taylor, 2009). A strand of underlying literature assesses if initial conditions are essential to materialize the benefits of financial integration, notably threshold conditions of financial development benefits from financial integration (Asongu, 2014). The debate is skewed towards financial integration. Thought some degree of consensus establishes rewards of trade openness, the debate on benefits of financial openness or integration witnesses a renewed interest after the recent financial crisis (Rodrik & Subramanian, 2009). The debate on initial conditions has been partly motivated by cautious positions from some researchers (Kose et al.,2011; Prasad and Rajan,2008; Henry,2007). The pre-crisis economic literature highlights some insights on some effects of financial integration on international

trade flows. Most studies consider the role of financial integration on trade flow (Frankel and Cavallo, 2004) or on their transmission (Kaminsky and Reinhart, 2000, Glick and Rose, 1999). The previous showed in particular that financial integration linkages may explain international trade flow contagion and their regional character. Furthermore, some literature (Berman, 2009, Campa, 2000) examined the impact of financial integration on trade flows even though the focus is generally on the currency crises. From the existing literature, it is not plausible to conclusively establish the presumed benefits of financial integration (Kose, 2004; Eswar,2003). Some economists (Blyde et al, 2015; Mishkin, 2006; Ando, 2006; Yeats, 2001) argue that financial integration is essential for export trade. Other (Stiglitz, 2002) claim that financial integration is associated with greater instability, and therefore it exacerbates economic fluctuations. However, for Kose et al. (2010) or Prasad et al. (2003), financial integration augments domestic savings, improves allocation of capital, reduces the cost of external capital, and generates technological and managerial expertise. From the forgone, the nexus of financial integration and international trade flows is quite mixed and even controversial. Furthermore, Klein (2005), Alfaro et al (2004), Edison et al (2002), or Edwards (2001)) analysed whether the growth impact of financial integration on export was conditional on third factors such as a sound institutional framework or income levels, but the results remained mixed as well. Despite the rich contributions of Wälti, 2011; Yeyati et al. (2009), the literature remains inconclusive with regards to the financial integration and international trade nexus. Given the emphasis placed on financial integration as a key strategy for development and the high level of interest and commitment by many African leaders, intra-regional trade remains low (Jorge et al, 2016). For Edison et al (2002), Kraay (1998), Grilli and Milesi-Ferretti (1995), it has not been confirmed that there is a robust long-term impact of financial integration on international trade flow. On the contrary, some studies including those of Henry (2000) and Quinn (1997) established a relationship between openness to financial integration and international trade flow. From the forgone discussions, it is imperative to conduct studies to bring forth more empirical evidence on the nexus between financial integration and trade flows in goods and services. Given the policy considerations and the theoretical as well as empirical research controversies, the all-embracing objective of the analysis in this paper is to analyse the nexus between financial integration and international trade flows in Sub-Saharan Africa. In light of the above, the research question that runs throughout the analysis in this paper is 'how does financial integration affect international trade flows in Sub-Saharan African Countries'?

The paper is organized in four sections. The first section presents the context and justification of the research. Section two of the paper focuses on the theoretical and empirical review of relevant literature. The third section presents the methodology and data while section four presents' results, discussions, conclusions and policy implications.

2. THEORETICAL AND EMPIRICAL REVIEW OF LITERATURE

2.1. Stylized Facts

The Pan-African Banks (PABs) are undoubtedly one of the most defining features of regional financial integration over the past decade (Mlachila, 2017; Asongu, 2015). They have expanded rapidly, often by way of acquiring existing local banks. The scale of their operations has become larger than that of traditional European and American Banks, as the latter reduced their operations in Africa in the aftermath of the global financial crisis in part because of the need to recapitalize their units operating in advanced economies (Ravin, 2003). PABs have filled the void and created market-based financial integration. PABs have a broad geographical outreach; of the seven PABs, all have a presence in at least 10 countries, and Eco-bank has subsidiaries in more than 30 countries. In addition, in many countries, they have become systemic (Schimmelfenning and Winzen, 2019).

These banks have been particularly active in syndicated loans, especially in the financing of infrastructure, and supporting local markets. Thus, some of them have gone beyond traditional banking activities to embrace operations in capital markets, insurance, pensions, money transfers, and micro-finance (Adler-Nissen, 2014).

The growth of PABs has undoubtedly contributed to financial sector development. It has promoted competition for deposits and loans. The clientele has also expanded beyond large domestic and multinational entities to reach underserved segments of the market, including SMEs (Leuffen et al, 2013).

But PABs are not the only movers and shakers in regional financial integration. At a regional level, some banks have also been active (Winzen and Schimmelfennig, 2016). Kenyan banks have embarked on cross-border expansion, and they now have over 300 branches in East Africa. Both push and pull factors have played a role: the Kenyan banking sector has over 40 banks, while the neighboring countries have much fewer (Kalemli-Ozcan et al, 2010).

For SSA countries, let us take a look at two case studies: Angola and Mozambique. They offer quite interesting and contrasting perspectives on regional financial integration, although they both have relatively similar levels of the financial development index developed at the IMF (Fornaro, 2018). The Angolan banking system is dominated by domestic (and some of them public) banks, which hold about ⅔ of assets. It has only a small footprint by African banks, with most of the rest of the banking system owned by Portuguese banks. Interestingly, Angolan banks have expanded to other countries such as Cabo Verde, Namibia, and even to Portugal (Shambaugh, 2012).

One of the key immediate challenges facing the Angolan banking system is the withdrawal of direct correspondent banking relationships in US dollars (although euro-related transactions remain). This has manifested itself by way of difficulties in accessing dollar bank notes. Some correspondent banks have preferred to withdraw from this line of business—which often has low margins—in the facing of tightening anti-money laundering and combating the financing of terrorism (AML/CFT) regulations and high-profile enforcement actions resulting in high penalties (Ottonello and Perez, 2019; Engel and Park, 2018). This is an issue that is of concern for several other countries in the region and beyond.
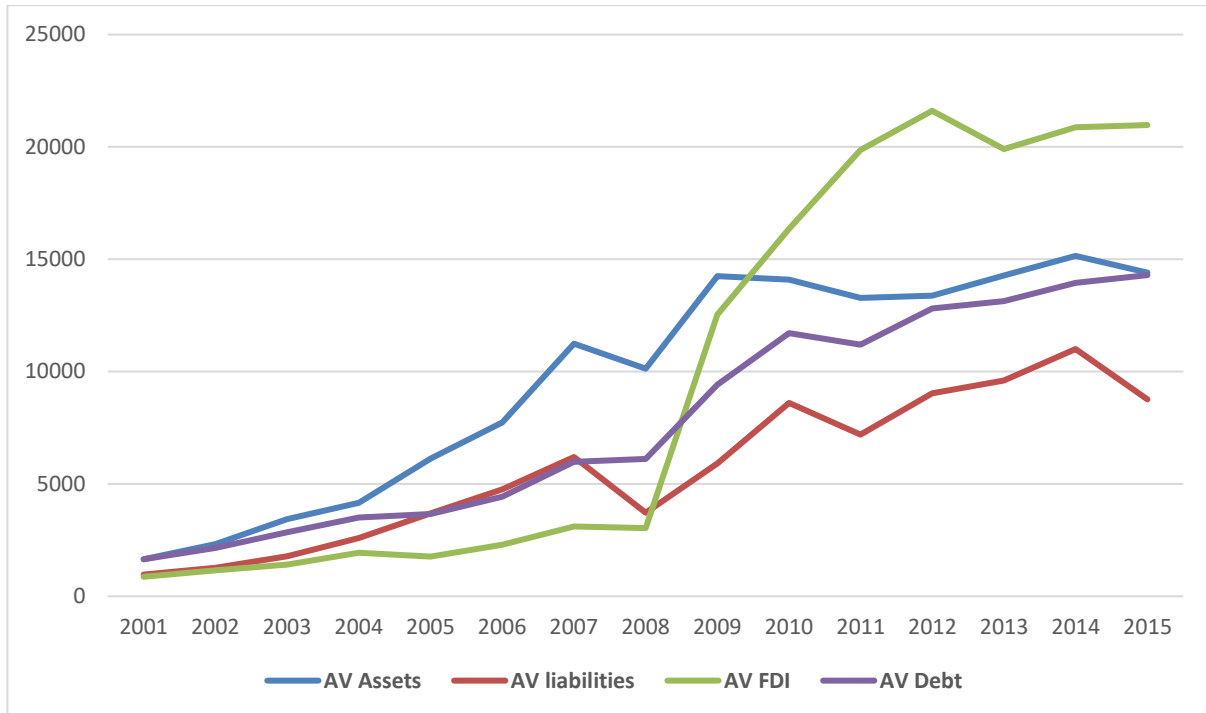
2.1.1 Financial Integration in Africa

Beyond these important trends, which are generally documented, there are on-going changes below the surface (Akerlof, 2019; Gros, 2017). These may well change financial landscape and the face of financial integration in Sub-Sahara Africa in upcoming decade (Araujo et al, 2013).

Apart from the success of PABs, there are several interesting success stories we will like to discuss (Farhi et al, 2014). We all know that Africa has been a world pioneer in mobile banking, but one of our favourite stories is of a company that goes a step further. It uses innovative approaches to technology and finance. M-Kopa Solar in Kenya sells small solar panels to low-income households by allowing customers to acquire a kit by making micro-payments via their mobile phones after an initial down payment of about $35 (Sergeyev, 2016).

This allows low-income households to acquire an asset of about $200 through their micro-savings, something that they could never do under normal circumstances (Aguiar et al, 2015). At the same time, the payment record provides the company a way of assessing their creditworthiness for future credit. Thus, the company has showed that even so-called "unbankable" segments of the population can provide profitable opportunities for financial services, thereby integrating them into the financial system (Grohe and Urihe, 2016). Over 500,000 homes now have solar power in Kenya, and the company is expanding beyond its home base to other East African countries.

The SADC Integrated Regional Settlement System (SIRESS) is another uplifting story of financial integration (Coulibaly, 2018). The aim of SIRESS is to reduce overreliance on international networks such as SWIFT and correspondent banks for regional cross-border transfers (Ottonello, 2021).
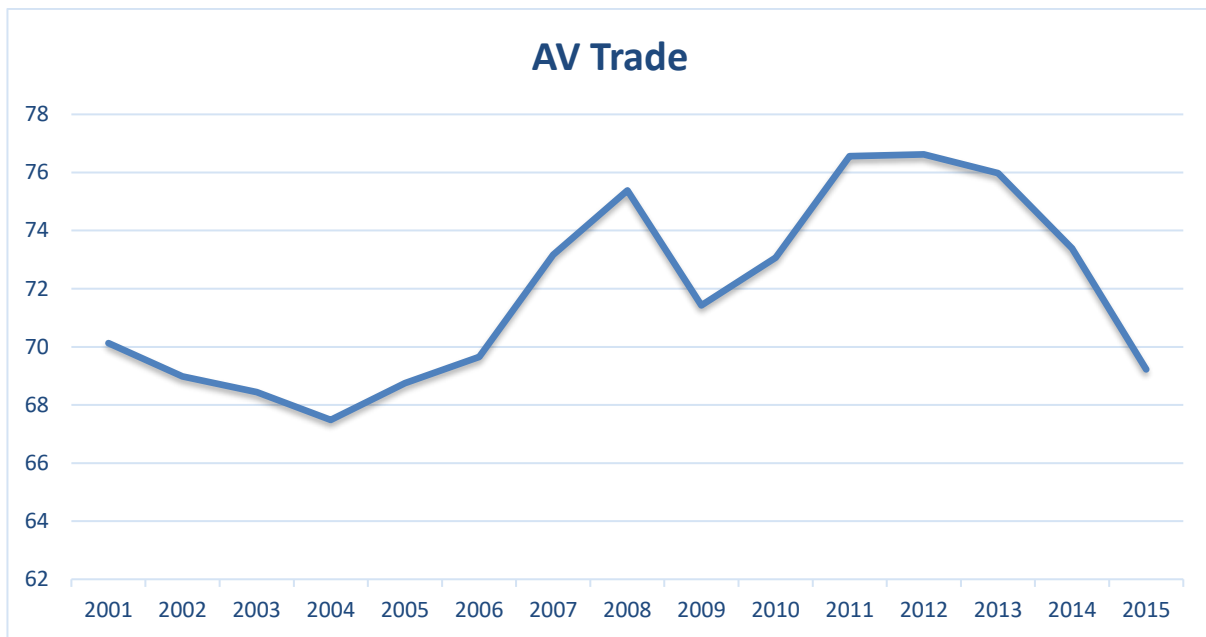
Source: Owned compilation from data

Figure 1: Average Evolution of Financial Integration in Sub-Saharan Africa.

The figure above shows the evolution on averages of the different indicators used to measure financial integration in this study. In 2001, FDI is having the lowest average of 869; liabilities follow by 967; assets 1648 and debts having the highest average of 1649. The averages increases up to 2005 were the average of debts are dominated by that of liabilities, from the figure, assets is having the highest average from 2002 to 2010 were it was dominated by the average of foreign direct investment. From 2008 to 2015, liabilities had the lowest average, meanwhile the average of FDI were higher from 2010 to 2015.

2.1.2: International Trade Flows in SSA countries

The International trade of goods and services in Sub-Saharan Africa has remain unstable due to agricultural output and fluctuations of prices of products in the world market, also because many SSA countries export are mostly primary products at the same import ready finished products. The general trend is that export has been fluctuating in Sub-Saharan Africa over the years until after the 2008 global economic crisis that led to a fall in general economic activities and subsequently a fall in Sub-Saharan Africa exports in 2009 and began rising even though not at a steady state. Unlike export, import has equally witnessed the fluctuation trend over almost the same years of economic crisis when

all economic activities where grounded in the subsequent years. From 2007, the continuous increase of import of finished products in the countries is because of low rate of industrialization, which is justified by lack of investment capital. The graphs below show the evolution of average trade flows and the average of export and imports.

Source: Owned compilation from data

Figure 2: The Evolution of average trade of goods and services in Sub-Saharan Africa
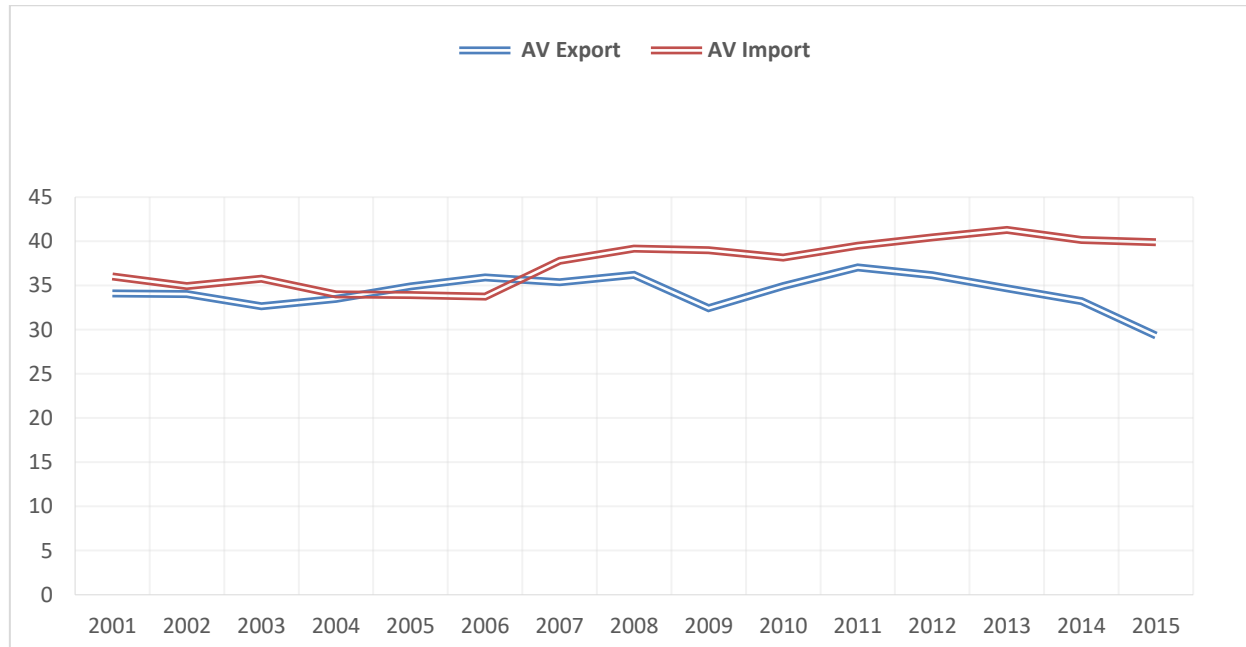
Source: Owned compilation from data

Figure 3: The Evolution on average of export and import of goods and services

Sub-Saharan Africa countries have a fairly long history of repeated attempts to link themselves together, both in various sub groups and even continent wide, through several broad types of trade. International trade is hailed as an engine of long-term growth (Lewis 2019). Financial integration, according to Jong-A-Pin and De HaAn, (2011); Hausmann et al, (2005), has impact on export and import trade in developing countries through a series of channels. Greater financial integration fosters the efficient allocation of resources through comparative advantage and enables the Sub-Sahara Africa countries to realise economies of scale and scope.

Also, Calderón, Cantú, and G. Zeufack, (2020), opined that financial integration also facilitates the diffusion of technological and managerial know-how, become a tool share risks that emerge from international macroeconomic shocks, reduces anti-competitive practices among domestic firms and encourages competition in both domestic and international markets. Financial integration is commonly considered as a strategic choice trade and firm cooperation within geographical area (Boubakri and Guillaumin, 2015).

Policies that foster financial integration create opportunities, but also entail risks. From the works of World Bank group, (2020); Haddad, Lim, Pancaro and Saborowski, (2013); and Lederman and Maloney, (2007), inappropriate management of financial integration could expose the country to lower

growth, and increase instability and inequality in the economy. Market and institutional imperfections, concentration in extractive activities and specializing away from technologically advanced sectors can curtail the gains from trade (Chang et al. 2009). For instance, commodity exporters and countries with uninsured production risk are unstable in the event of adverse terms of trade shocks (Malik and Temple 2009).

The relevance of financial integration is a very persistent issue in Sub-Sahara Africa, especially in view of political and economic backwardness. Sub-Sahara Africa is confronted with a deep-rooted level of poverty, a minimal share of world trade, and a low pace of development in human capital and infrastructure as well as being faced with an access challenge from external pressures (Romalis, 2005; Glick and Rose, 2001; Wall, 200). Ensuring that financial integration succeeds in SSA is vital not only because of the perspectives and challenges mentioned above, but also the policies that are required to ensure its fruitfulness are the same as those needed if SSA is to benefit from the process of globalisation and integration into the world economy. Furthermore, according to Clausing, (2000), the effectiveness of financial integration in SSA is an important issue specifically related to trade flows among members of any trading bloc on the continent.

With regards to financial integration, perspectives differ many international institutions agree on SSA's relatively low level of regional trade. United Nations Economic Commission for Africa and African Development Bank (UNECA and AfDB 2010) conclude that on average, over the past decades, only about 10 to 12 percent of SSA trade has taken place with other African nations. Approximately 40 percent of North American trade occurs among North American countries. Similarly, about 63 percent of Western European trade takes place among Western European nations. In 2012, the World Bank (Brenton and Isik 2012) cited Africa's low level of intra-regional trade as well as the continent's fragmentation.

According to De Grauwe, (2007), African countries have decided to embark on a road that will, in the long-run, lead them to a full-fledged economic and political union. This objective is endorsed through the African Union's Constitutive Act, which envisages the creation of ten organs including, among others, the establishment of financial Institutions—the African Central Bank, the African Monetary Fund and the African Investment Bank- and a body of elected representatives which will play the role of a parliament- the Pan-African Parliament. Considering the pronounced political fragmentation of Africa, it is more likely that the main engine for this bold integration project ought to be the economy (Hausman et al, 2007).

Africa, especially SSA countries is adopting policies that will create sustained economic growth to alleviate its problems of malnutrition, unemployment, poor health, and insufficient education system.

Increase in financial integration will greatly decrease the potential risk for outbreak of war and political tension among counties, Hernandez, (2004); Anderson and Moazzami, (2003); Cubadda, (2001) show that trade brings peace. In order to achieve a continent–wide financial integration, careful and rigorous studies about macroeconomic interdependence must be conducted to appraise the benefits and costs of the integration.

2.2. Empirical Review

The empirical literature in this paper has been classified into two sections: arguments in support of the links between financial integration and international trade flows and arguments against.

A) An investigation into the strong link between financial integration and international trade flows Routledge (2015) examined whether financially integrated countries export relatively more in industries that depend heavily on external finance considers three different components of financial integration: international portfolio equity investments, foreign direct investments, and external debt. The results of the study show that, of these three components, international portfolio equity investments have the strongest and most robust effect on the sectorial composition of export flows. International portfolio equity investments increase exports relatively more in industries that depend heavily on external sources of finance. He also concluded that this positive effect on exports disappears when the quality of institutions is low.

Standard international trade theories assume that financial markets are perfect. However, financial markets are not frictionless in the real world. The presence of financial friction implies that financial constraints might affect export performance. Exporting is a costly activity, and therefore more external finance is needed to cover additional sunk, fixed, and variable costs of exporting (Manova 2010).

In accordance with this argument, theoretical and empirical papers show that external finance opportunities affect comparative advantage and export performance (AbuAl-Foul and Soliman 2008; Manova 2008; Hur et al. 2006; Beck 2003, 2002; Kletzer and Bardhan 1987). While a large body of empirical evidence has established the importance of domestic financial development on the sectorial composition of export, evidence on the effect of financial integration on exports has been limited.

Furthermore, Kim and Lee, (2012) examines the real and financial integration of East Asian economies, by comparing the degree of real vs financial and global vs regional integration, before and after the Asian crisis. First, price and quantity measures such as the size of intra- and inter-regional trade, cross-border financial assets, stock return correlation, and interest rate differentials are investigated.

Another strand of literature (Tembo and Makina, 2017) on the impact of financial integration on export with specific focus on the impact of the SADC protocols on trade and finance and investment (Tembo and Makina, 2017) using a sample of 14 countries made and applying the panel cointegration fully modified ordinary least squares model alongside the GMM showed that regional integration through the protocol on trade had a positive and significant impact on size and efficiency of the trade sector using the FMOLS estimator. GMM estimations for the same variables were largely insignificant. Study findings also pointed to an improvement in global financial integration indicators as a result of the trade protocol, which in turn also contributed to an increase in the level of monetization of regional financial markets. The finance and investment protocol had a positive and significant impact on private sector credit for both estimators and largely insignificant relationship with broad money. The impact of the finance protocol was not significant enough to be detected in global integration measures, implying their implementation may not have significantly improved global integration for SADC countries. The study also uncovered the complimentary relationship between institutional quality and social capital in the financial development process.

Beck (2002) and Kletzer and Bardhan (1987) propose that financial development is a source of comparative advantage in the presence of financial frictions. On the empirical side, Beck (2003) shows that economies with higher levels of financial development tend to specialize in industries that are more dependent on external finance. Hur et al. (2006) found that countries with well-developed financial markets have higher trade shares and trade balances in industries with more intangible assets. Several studies suggest a strong impact of trade on international financial integration. Gilmore et al. (2008) assert that international financial integration is strongly motivated by increasing international trade, increasing capital mobility, and removal of controls on cross-border capital movements. The international financial integration also results from the various forms of policy alignment associated with the creation of economic unions.

In addition, Lane & Milesi-Ferretti (2003) argue that there is a close connection between trade in goods and services and international financial integration. Frankel & Rose (1998) demonstrate that stronger trade linkage results in a surge in the correlation of business cycles. Imbs (2004) considers the effect of international trade by estimating the respective contributions of different types of trade impacts (Brooks, 2016). Forbes and Chinn (2004) assert that direct trade relation plays an influential role as the determinant of the effect of large equity markets on other financial market (Passari and Rey, 2015). Further, Inklaar et al. (2008) confirm the crucial role of trade on promoting international financial linkage

Walti, (2011) uses a panel data specification approach to explain bilateral equity return correlations between advanced economies over the period 1975-2006. The study concludes that trade integration

has a positive effect on bilateral stock market return correlation.

B) Some restrictions on the link between financial integration and international trade flows
Some authors suggest that the increased level of international financial integration does not essentially lead to a higher degree of international trade. Particularly, Vithessonthi and Kumarasinghe (2016) report that international trade integration is not significantly linked with its equity market integration with the global equity market. Some authors even assert that increased international financial integration leads to a decline in the number of imports and hence, international trade integration.

From the empirical literature (Egbetunde and Akinlo, 2019), who studied the impact of financial integration on economic growth in Africa using a dynamic panel Generalised Method of Moment (GMM), covering the period of 1980 to 2010, the study finds that financial integration had a negative and significant impact on economic growth in SSA.

The results also reveal that institutional quality had a negative and significant impact on economic growth in SSA. The results of the study further show that financial development had negative impact on economic growth in the region. The paper concludes that the economies did not reap the benefits of financial integration. The government in the region needs to put in place appropriate macroeconomic policies and institutions that will drive the benefits of financial integration in order to sustain economic development.

A number of studies argue that international trade integration and international financial integration have to be considered simultaneously since there seems to be bidirectional causality among these variables. For example, Rana (2007) suggests that both trade integration and international financial integration are increasing in Asia. More recently, Vithessonthi and Kumarasinghe (2016) reported that there is no empirical support for the relation between international trade and international financial integration.

The effects of regional trade agreements on integration have been a subject to many scholars from the field of economics, international businesses, to trade from different corners of the globe. Tinbergen (1962) was the first to empirically examine the effects of economic integration on bilateral trade flow while investigating the impact of Preferential Trade Agreement (PTA) on bilateral trade flow, using the membership of the British Commonwealth and the European Economic Community (EEC) as regional blocs. He found out that there was insignificant effect of PTA on trade flow.

It is alleged that the elimination of the restrictions on cross-border capital flows increases international trade, which strongly motivates financial integration. This integration highly depends on the various

forms of financial policies alignment amongst countries and whether there are associated with the creation of economic unions, custom unions. Schiavo et al, (2010) used a network approach to analyse the patterns of international trade and financial integration and found that trade network is more densely connected than financial integration network.

Some studies have reported that an increase in financial integration instead leads to a fall in the amount of import and hence a decline in international trade transactions. According to Vithessonthi and Kumarasinghe (2016), it is because international trade is not significantly linked to the integration of equity markets in to one. Also, Baltagi et al (2009) in a GMM model indicated that the marginal effects of financial openness are negatively related to the trade openness, this gives a clear impression of the bidirectional causality between international financial integration and trade.

Serrano et al. (2006) build a weighted directed network of integration and trade imbalances with links directed from net importers to net exporters. The probability distribution of imbalances is heavy-tailed and suggests the presence of large heterogeneity: only a small part of relations carry most of trade imbalances.

From the forgone discussions on the pros and cons of the nexus of financial integration and international trade flows in Sub-Saharan Africa, there is an urgent need to throw more light on this debate in the literature.

3. METHODOLOGY AND DATA SOURCES
3.1 Data Type and Sources
The analysis makes use of secondary data from different sources depending on the type of variables. The period of data and the sample of countries are based on data availability. The study uses panel data on SSA countries and over a period 15 years from 2001 to 2015. The use of panel data helps to capture the relevant relationships among variables over time, reduces the collinearity among the explanatory variables, improves efficiency of econometric estimates, and controls for unobservable individual heterogeneity and dynamics (Baltagi, 2005). The dependent variable use in analysis is trade of goods and services in trade % and the data on trade were collected from the World Development Indicator (WDI) database. Data on financial integration were collected from Lane and Maria Milesi-Ferreti 2017 database. Data of other variables such as inflation, population, governance, and corruption come from the World Bank's World Development Indicators (WDI) 2019 statistics.

3.2 The theoretical model
Following the ground-breaking work of Tinbergen (1962), the gravity model equation has been the primary empirical model used to make bilateral trade estimates. The theoretical framework of the

gravity model was first provided by the work of Anderson (1979), Krugman (1979, 1980), Helpman (1981), Bergstrand (1985), Bergstrand (1989) and Deardorff (1998); Egger, (2000). These early applications were partial-equilibrium, reduced-form specifications of the gravity model. Anderson and van Wincoop (2003) incorporated general equilibrium features for trade and developed a structural gravity model that included multilateral resistance effects. The Gravity model predicts that the flow of people, ideas or commodities between two places is positively related to their size and negatively related to the distance.

$$trade_{ij} = \alpha \frac{(GDP_i GDP_j)\delta_1}{Distance_{ij}\delta^2}$$

Where; $trade_{ij}$ is the value of bilateral trade between country i and j, GDP_i and GDP_j national incomes of country i and j, distance ij is a measure of the bilateral distance between the two countries and $\boldsymbol{\alpha}$ is a constant of proportionality.

The paper also makes use of the descriptive approach in the literature to examine the contribution of financial integration on trade patterns; for example, the studies of Milner and Sledziewska 2005; Dell'Aquila et al., 1999; Yeats, 1998 used different indicators to measure the trade of goods and services. A descriptive approach implicitly assumes that the share of trade happens with the partner nation that would not have changed in the absence of the agreement. This method depends on a static framework, and the results are also dependent on the level of aggregation (Jayasinghe & Sarker, 2004).

Empirical implementation

In addition, the analysis makes use a two-dimensional panel data model approach to model; where we include a time dimension t as the additional second dimension. Bun and Klaassen 2007 and Egger (2000) show that FE is preferred over random effects; just as Klaassen and Teulings (2015a) we are going to consider a multiple regression model. Drawing from Melitz (2003), as used by Arkolakis et al, (2012) and refined and modified by Bergstrand et al (2014), the baseline study for this research is specified following Kabir et al (2017), Anderson and Yotov (2016). Using a multiple regression model, which is different from the gravity model widely used in existing literature (Vo, 2018), our econometric equation is as follow;

$$Trade_{it} = \beta_0 + \beta_1 FI_{it} + \beta_2 INF_{it} + \beta_3 POP_{it} + \beta_4 ER_{it} + \beta_5 GOV_{it} + \beta_6 COR + \varepsilon_{it}$$

Where; Trade is trade of goods and services proxy by imports and exports of goods and services, and FI represents financial integration, INF represents inflation, POP is total population which is taking lag value in our regression, ER is exchange rate, GOV represents governance, COR represents control of corruption, and ε is error term.

Motivation and Choice of Variables

The dependent variable is trade of goods and services denoted as $\boldsymbol{Trade_{it}}$, since we are making the empirical analysis with the multiple regression model; $Trade_{it}$ is representing the sum of export and import of country i in year t. The measure of trade use here is inspired from Nkoa and Che, (2020); Sun and Li, (2018); Braha et al, (2017).

Independent Variables: The independent variables are those that influence trade of goods and services. They are divided into the main variable of the study, macroeconomic variables, and institutional variables.

The Main Variable (FI): The main independent variable here is financial integration. We use four different variables that describe financial integration as used in other literature. Portfolio equity investment measures ownership of shares of companies and mutual funds. FDI includes controlling stakes in acquired foreign firms. External debt includes portfolio debt securities, bank loans and deposits, and other debt instruments. Our financial integration variables are from Lane and Milesi-Ferretti (2017) and include total assets and liabilities.

Even if the stock of assets and liabilities does not have sharp fluctuations across the short period, we use averages over the period 2001 to 2015 to smooth the effects of any potential fluctuations. PORT is the stock of portfolio equity assets and liabilities as a share of the gross domestic product (GDP). FDI is the foreign direct investment assets and liabilities as a share of GDP. DEBT is the stock of foreign debt assets and liabilities as a share of GDP.

Following Maskus et al (2012) and Edison et al (2002), we include both assets and liabilities since theoretical concepts of financial integration include both the ability of foreigners to invest in a country and the ability of residents to invest abroad.

- Macroeconomic Variables

Inflation: Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Previous literature has explored the relationship trade and inflation, some studies found a positive relation between exchange rate and inflation (Muco et al, 2004) and some other researchers found a negative relationship (Arslaner et al, 2014).

Population: The justification for the inclusion of population growth in our model is based on the derived motivation from the growth theory (Tumwebaze and Ijjo, 2015; Kastner et al. 2014). The new

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growth theory points out the importance of growth of labour supply (population growth) and growth of labour productivity as factors of economic growth. Thus, the quest for export and financial integration shall lead to food productivity and greater economic of scale.

According to the dynamic trade theory, the static gains from trade—due to specialization and reallocation of existing resources—are small compared to the dynamic gains due to an increase in the growth rate and the volume of additional resources made available to, or employed by, the trading country (Tumwebaze and Ijjo 2015).

Exchange Rate: Real effective exchange rate or nominal effective exchange rate is a well-known proxy for distance in literature of trade (Eregha 2019; Baier et al, 2019; Hadjiyiannis et al, 2016; Campi and Duenas, 2016; Bergstrand et al, 2014, 2013; Bond et al, 2012; Arribas et al, 2009). The nominal effective exchange rate measure as an unadjusted weighted average rate at which one country currency's exchange for a basket of multiple currencies (World Bank, and World Development Indicators WDI; Shobande 2018; Oke et al, 2017).

- **Institutional Variables**

Governance: Voice and Accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution (Yarbrough and Robert, 2014).

Corruption: Control of corruption is an institutional indicator which captures the perception of the extent to which public power is being exercised for private gain, including all petty and grand forms of corruption. It also captures the state of elites and private interests, irregular payments in public utilities, tax collection in public contracts, corruption between administrations and businesses. The control corruption index is widely used in literature to determine its effect on international trade seen in the works of Athari and Banreini, (2021); Malim and Azizan, (2020).

The stochastic term ε is the term made up of i and t which captures the unobserved specific country effects and considers the specific time effects common to all countries, i represents the sample of each country under study, and t stands for years. Our parameters (β = 1, 2, 3, 4, 5, 6) are to be estimated and economically stands for the proportionate change in trade of goods and services as a result of a proportionate change in the measures of financial integration and other variables respectively and β_0.

It should be noted that the empirical model for the present study differs in some respects from the previous models found in the literature. The major difference stems from the variables used in the

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model. Besides the core variables of the model, this study adopted institutional variables that are believed to influence trade in the Sub-Saharan Africa region. For example, GOV and COR, other explanatory variable that have been introduced in the model includes inflation, population, and exchange rate.

Table 2: Variables description

Variables	*Acronyms*	*Measures*	*Source*
Dependent Variables			
Export trade	EX	Export trade	
Independent Variables			
Financial Integration			Lane and
Assets	ASS	Portfolio assets	Milesi-
Liabilities	LIA	Portfolio liabilities	Ferretti
Foreign Direct Investment	FDI	Foreign assets and liabilities	(2017)
Debts	DEBT	Debt assets	
Other Variables			
Inflation	INF	Inflation rate	WDI (2021)
Population	POP	In Total Pop	WDI (2021)
Exchange rate	ER	REER	CEPII (2021)
Governance	GOV	Voice and accountability	WDI (2021)
Corruption	COR	Control of corruption	WDI (2021)

Table 3: Expected Signs of Variables

Variables	Expected signs
Trade	No sign
FI	+
INF	+/-
POP	+
ER	+/-
GOV	+
COR	+/-

RESULTS AND DISCUSSIONS

The descriptive statistics (table 4) presents the summary statistics of the variables used in the study. From the table, mean value of Trade is 71.884, its value ranges between 21.333 and 156.862, having the standard deviation 27.79. The average value of Import is 37.588, its minimum value is 10.666 and the maximum value is 80.181. The mean value of Export is 34.295, its value ranges between 8.865 and 81.516. The standard deviation of import and export are 14.091 and 16.878 respectively. For the measures of financial integration, the average value of liabilities is 5673.06, its maximum value is 158269 and its minimum value is 1. The assets average value is 9709.123, its maximum value is 165921 and its minimum value is 1. Foreign direct investment is having an average value of 9846.96, its minimum value is -5 and its maximum value is 292780. Debts average value is 7792.317, having a minimum value 133 and its maximum value is 87322.

Still from table 4, exchange rate has an average value of 103.492, a maximum value of 225.468 and a minimum value of 52.656. Inflation has an average value of 6.254, a maximum value of 152.561 and a minimum value of -3.1. The average value of Governance is -0.299, its maximum value is 0.941 and its minimum value is -1.384. The average value of population is 16.1, its maximum value is 19.015 and its minimum value is 12.985. The average value of Corruption is -0.548, its maximum value is 1.217 and its minimum value is -1.444.

Table 4: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Trade	300	71.884	27.79	21.333	156.862
Import	300	37.588	14.091	10.666	80.181
Export	300	34.295	16.878	8.865	81.516
Liabilities	300	5673.06	22012.58	1	158269
Assets	300	9709.123	29942.404	1	165921
FDI	300	9846.96	39949.816	-5	292780
DEBT	300	7792.317	14457.012	133	87322
REER	300	103.492	23.6	52.656	225.468
Inflation	300	6.254	12.65	-3.1	152.561
Governance	300	-.299	.626	-1.384	.941
Population	300	16.1	1.364	12.985	19.015
Corruption	300	-.548	.607	-1.444	1.217

Source: Author from the collected data.

The correlation test

The correlation matrix gives a picture of the relationship between the variables used in the study. It also shows if there is a problem of multi-co-linearity shown by the correlation between trade and liabilities (-0.082) between import and assets (0.152) and between export and foreign direct investment (0.113). The correlation table is presented in the appendix.

The Wooldridge test of autocorrelation

After constructing the Wooldridge test of autocorrelation, it shows that there is the presence of autocorrelation between independent variables. The Wooldridge test has shown the presence of autocorrelation in all the four equations. The result of the Wooldridge test is presented in the table of the two stage least square and in the appendix.

2.4.1: Baseline Estimation

In order to assess the importance of the measures of financial integration to trade of goods and services in SSA, the FGLS methodology is at first placed used. The first motivation behind this methodology is to solve the problem of autocorrelation and heteroscedasticity that could eventually result. The results of this estimation are presented in Table 2.

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According to Table 2, all the measures of financial integration, which are liabilities, assets, foreign direct investment and debts, two are negative and insignificant while the other two are significant to trade of goods and services in this study. While other variables such as exchange rate, inflation, corruption and population have influence on trade of goods and services. The dynamic nature of this model cannot be captured through the FGLS estimator or other standard econometric estimators like the OLS, fixed or random effects. This is because the lagged variable in our model is likely to correlate with specific effects, thereby, generating an endogeneity bias (Gnangnon, 2019; Nickell, 1981). Moreover, several regressors in the model could develop a bidirectional problem. In order to address this endogeneity, we use the two stage least square estimator.

Table 5: Baseline Estimation

VARIABLES	(1) eq1 Trade	(2) eq2 Trade	(3) eq3 Trade	(4) eq4 Trade
REER	-0.139*** (0.0316)	-0.138*** (0.0320)	-0.136*** (0.0301)	-0.132*** (0.0280)
INF	0.253** (0.0889)	0.252** (0.0883)	0.251** (0.0885)	0.245** (0.0869)
COR	-9.862* (4.710)	-9.725* (4.604)	-9.429* (4.463)	-8.835* (4.168)
GOV	0.249 (5.591)	0.179 (5.720)	0.116 (5.770)	0.273 (5.665)
LPOP	28.92*** (4.903)	29.17*** (5.016)	28.63*** (5.022)	29.82*** (4.663)
LIA	-4.05e-05 (3.56e-05)	------	-----	-----
ASS	------	-4.88e-05** (2.81e-05)	-----	-----
FDI	------	-----	2.10e-05*** (1.51e-05)	-----
DEBT	-------	-----	-----	-7.05e-05 (5.15e-05)
Constant	-386.2*** (77.57)	-389.8*** (79.45)	-381.6*** (79.43)	-400.4*** (73.78)
Observations	300	300	300	300
Number of groups	20	20	20	20
N_g	20	20	20	20
df_m	6	6	6	6
df_r	14	14	14	14

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F	22.82	22.00	26.85	24.76
r2_w	0.158	0.161	0.160	0.160
Lag	2	2	2	2

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

2.4.2: Two stage least squares (2SLS) estimation

Unlike the previous results, we have chosen to employ a two stage least squares (2SLS) estimation technique to regress our equation and consistent result as used in Nkoa and Che (2020). This technique ensures that we receive consistent estimates of our variables and more importantly, it allows us to alleviate the problems of multi-collinearity and endogeneity between financial integration measure variable. The results are presented as follow.

Table 6: Presentation of results using the Two stage least square (2SLS)

VARIABLES	(1) eq1 Trade	(2) eq2 Trade	(3) eq3 Trade	(4) eq4 Trade
LIA	**0.000212*** (6.42e-05)**	----	----	----
ASS	----	**0.000251*** (4.51e-05)**	----	----
FDI	----	----	**0.000138*** (3.26e-05)**	----
DEBT	----	----	----	**0.000518*** (9.36e-05)**
REER	0.00307 (0.0543)	-0.0280 (0.0524)	-0.0397 (0.0540)	-0.0831 (0.0540)
INF	**0.675*** (0.171)**	**0.610*** (0.165)**	**0.648*** (0.169)**	**0.636*** (0.165)**
GOV	**-10.07** (4.404)**	**-15.40*** (4.385)**	**-13.77*** (4.474)**	**-10.04** (4.246)**
LPOP	**-14.45*** (1.365)**	**-13.23*** (1.201)**	**-12.31*** (1.225)**	**-15.20*** (1.288)**
COR	0.377 (5.220)	2.775 (4.943)	4.618 (5.061)	-1.429 (5.030)
Constant	**297.0*** (21.11)**	**279.4*** (18.97)**	**268.2*** (19.37)**	**314.3*** (20.46)**
Observations	260	260	260	260
R-squared	0.431	0.471	0.446	0.470

r2u	0.929	0.934	0.931	0.934
r2c	0.431	0.471	0.446	0.470
r2_a	0.418	0.458	0.432	0.457

Standard errors in parentheses, ***, ** and * denote significance level at 1%, 5% and 10% respectively

From the results obtained after the test on correcting the possible endogeneity problems, the coefficient of determination (R^2) is good for all the equations on both returns to liabilities, assets, foreign direct investment and debt. The P-value associated with the values of fisher is significant at 1% which shows that the model is globally significant and well estimated.

From the two-stage least square (2SLS) estimation, we see that all the measures of financial integration (LIA, ASS, FDI, And DEBT) are all positive and significant at 1% significant level. Also, still looking at the 2SLS estimation for other variables, inflation is having a positive and significant influence on trade of goods and services for all the equations at 1% significant level. Again, the result shows that governance and population have negative and significant influence on trade of goods and services.

2.4.3: Robustness Checks
In order to see how robust the previous results are, the estimation is carried out using the traditional measure of trade of goods and services (sum of imports and exports goods and services) as two dependent variables. This is presented in Table 4 and Table 5 respectively.

Table 7: Trade as import of goods and services

VARIABLES	(1) IM	(2) IM	(3) IM	(4) IM
LIA	4.85e-06 (3.77e-05)	------	------	------
ASS	------	**7.85e-05*** (2.71e-05)**	**------**	**------**
FDI	------	------	**5.60e-05*** (1.91e-05)**	**------**
DEBT	-------	**-------**	**-------**	**0.000114** (5.65e-05)**
REER	-0.0434 (0.0319)	-0.0501 (0.0314)	**-0.0567* (0.0316)**	**-0.0602* (0.0326)**
INF	**0.233**	**0.217**	**0.227**	**0.227**

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	(0.100)	(0.0989)	(0.0988)	(0.0996)
GOV	0.531	-1.390	-1.317	0.364
	(2.588)	(2.629)	(2.620)	(2.565)
LPOP	-5.288***	-5.456***	-5.143***	-5.824***
	(0.802)	(0.720)	(0.717)	(0.778)
COR	0.387	0.170	0.831	-0.663
	(3.068)	(2.963)	(2.963)	(3.039)
Constant	126.8***	128.8***	125.0***	135.7***
	(12.41)	(11.37)	(11.34)	(12.36)
Observations	260	260	260	260
R-squared	0.279	0.301	0.302	0.290
r2u	0.911	0.914	0.914	0.912
r2_a	0.262	0.285	0.285	0.273
r2c	0.279	0.301	0.302	0.290

Standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$, ***, ** and * denote significance level at 1%, 5% and 10% respectively

Table 8: Trade as Export of goods and services

	(5)	(6)	(7)	(8)
VARIABLES	EX	EX	EX	EX
LIA	0.000207***	-----	------	-----
	(3.68e-05)			
ASS	------	0.000173***	-------	------
		(2.63e-05)		
FDI	------	------	8.17e-05***	------
			(1.94e-05)	
DEBT	-------	------	-------	0.000405***
				(5.32e-05)
REER	0.0465	0.0220	0.0170	-0.0229
	(0.0311)	(0.0305)	(0.0321)	(0.0307)
INF	0.442***	0.393***	0.420***	0.409***
	(0.0978)	(0.0961)	(0.100)	(0.0937)
GOV	-10.60***	-14.00***	-12.46***	-10.40***
	(2.522)	(2.553)	(2.659)	(2.412)
LPOP	-9.160***	-7.777***	-7.164***	-9.378***
	(0.782)	(0.699)	(0.728)	(0.732)
COR	-0.0104	2.606	3.787	-0.766
	(2.990)	(2.878)	(3.007)	(2.857)

Constant	**170.2*****	**150.6*****	**143.2*****	**178.7*****
	(12.09)	**(11.04)**	**(11.51)**	**(11.62)**
Observations	260	260	260	260
R-squared	0.484	0.504	0.458	0.527
r2u	0.904	0.908	0.899	0.912
r2c	0.484	0.504	0.458	0.527
r2_a	0.472	0.492	0.446	0.516

Standard errors in parentheses, ***, ** and * denote significance level at 1%, 5% and 10% respectively

2.5: Discussion of Results

From the results of Table 3, Table 4, and Table 5, the interpretations are presented into financial integration indicators and other variables.

Financial integration indicators

Liabilities: This result in table 2, equation 1 reveals that liabilities is positive and significantly explain trade of goods and services in SSA countries at 1% significant level. This implies that a unit increase in liabilities, trade of goods and services increases by 0.000212. Also, looking liabilities in table 4 and 5, it is seen that liabilities is positive but not significant in table 4, meaning that liabilities does not influence import of goods and services. While in table 5, liabilities are having a positive and significant influence on export of goods and services at 1% significant level. This result is in line with Sobeiegraj, (2017); Andrzejeuk, (2012) in securing receivable and liabilities in international trade.

Assets: In table 3, equation 2 assets have a significant positive influence in the model at 1% significant level. The value 0.000251 implies that one unit increase of assets, trade of goods and services will change positively by 0.000251. Also looking at the robustness check in table 4 and 5, there is positive and significant influence of assets on imports and exports of goods and services at 1% significant level. This result is similar to that of Barbier, (2011) who argued on natural assets trade and concluded that assets have effects on trade.

Foreign direct investment (FDI): FDI positive and significantly enhances trade of goods and services at 1% significant level. This is in line with the results of Sorokina, (2012); Hur et al, (2006). These authors argue that the presence of foreign firms in the domestic market promote national competition and improve efficiency through exports. There is thus an expansion of the share of the hosting firms at the benefit of both the investing and host countries. Moreover, FDI inflow increases sectorial competition within the host economy markets; this causes the host country's firms to search ways in

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improving on their product quality. Increase quality increases demand both at national and international markets.

Debts: The results in tables 3, in equation 4 we have positive and significant influence of debts on trade of goods and services at 1% significant level. Also, in the robustness check of the results shows that debts have positive and significant influent on imports and exports of goods and services at 5% and 1% significant levels respectively. This result is in support by Choong et al, (2010); Rose, (2002) who argued that increase in foreign debt level adversely influences trade performance, whereas the decline in the rate of economic growth weakens the ability of the country to service her debt.

Macroeconomic variables

Inflation: Inflation is positive and significant to trade of goods and services at 1% significant level in all equations in table 3. The expected sign is obtained and the result is in line with Acharya, (2010) who discussed that inflation has significantly contributed to the trade process and further said the relationship has grown stronger, in terms of structural break.

Population: Population has a significant negative effect on trade of goods and services at 1% significant level. It has not respected the expected sign; this may be due to the lag of time. Nuroglu, (2010) show that the impact of population on trade flows is positive for the exporter country, and negative for the importer country.

Exchange rate: Exchange rate in our study is both negative and positive but not significant. After the robustness check, Ariccia, (1999), analyses a negative and significant relationship between exchange rate and international trade.

Institutional variables

Governance: Governance has a negative and significant effect on trade of goods and service. It can be seen based on the fact that SSA countries are among the least industrialised and least competitive economies in the world; taxes and custom revenue still remain the main sources of revenue for the states. If the government should implement well trade policies, local infant industries would emerge, government revenue would increase and export trade would increase (Cooney, Andrew, and Lang 2007).

Corruption: Corruption does not influence trade of goods and services in this study; it follows the expected signs that are positive and negative but not significant to trade. This result is contrary to Jong and Bogmans(2011) who said corruption significantly reduces international trade.

CONCLUSION

Financial integration indicators and results show a positive and significant relationship between financial integration and trade of goods and services in the SSA countries. After having anticipated the possible effects of endogeneity and the existence of a dynamic cross-sectional dependency between exogenous variables, the study applies the two-stage least square (2SLS) techniques to verify the contribution of financial integration in SSA countries on trade of goods and services. All the indicators of financial integration (liabilities, assets, foreign direct investment, and debts) are at 1% significant level. The findings of this work confirmed the results obtained by Sobeiegraj, (2017); Barbier, (2011); and Choong et al, (2010) on a positive relationship between financial integration and trade of goods and services. policy implication of this finding is that policy makers in SSAA should put in place appropriate macroeconomic policies that will improve the quality of their financial markets in elaborating their international trade policies.

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