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This paper is from the
GTAP Annual Conference on Global Economic Analysis
<https://www.gtap.agecon.purdue.edu/events/conferences/default.asp>

An empirical assessment of the role of trade in services in export diversification in Sub-Saharan Africa

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ABSTRACT

This paper identifies the dimensions of international trade in services that promote export diversification in an unbalanced panel of 48 countries in Sub-Saharan Africa over the period 1996 - 2020. Using the System-Generalized Method of Moments (GMM), the results show that tourism, services total export, export in transport services, travel services, insurances services, financial services, use of licenses services and other business services promote export diversification in SSA. Governments should improve their business environment and strengthen services sector liberalization to attract more foreign direct investments in services. They should also adopt policies and strategies to develop and orient the services sector towards more efficient and high-value-added services.

KEYWORDS: Trade in services, tourism, export diversification, GMM.

JEL CLASSIFICATION: F13, F14, Z32

1. INTRODUCTION

The search for sound knowledge on the drivers of economic diversification is important for the developing world as it is associated with economic growth (Dadush et al., 2020; Van den Berg and Lewer, 2007) and mitigates the risks associated with commodity price volatility and macroeconomic shocks (Berthélemy, 2005a). Diversification of the productive structure of a country's export basket is considered as an important source of resilience to external macroeconomic shocks and development for low-income countries (Berthélemy, 2005; Caselli et al., 2015a). Diversification has been shown to be relevant for developing countries as an engine of economic growth through technological spillovers to other sectors and as a source of jobs creation, structural transformation, and sustainable development (Freire, 2019).

Economic diversification is equated with the exports structure of a country. For Barthelemy (2005), an economy is said to be diversified if its productive structure is dispersed into a large number of activities that differ from one another like goods and services produced. It is determined by a multitude of factors that influence the long-term behaviour of the export structure of a country or region. Empirical and analytical studies on diversification have long focused on the structure and dynamics of trade of tangible goods. Services, despite their increasingly dominant place in international trade, according to recent statistics (UNCTAD¹, 2020; WTO², 2020), are almost invisible in the exploration of the determinants of economic diversification. Yet today, both the developed and developing worlds are undergoing structural changes that bring services to the forefront. The WTO's 2019 report estimates that global trade in services is growing faster than the trade in goods, with the value of trade in services reaching US\$13.3 trillion in 2017. The share of developing economies in world trade in commercial services was 34% in 2017 (WTO, 2018).

The premises of the theoretical foundations on the contribution of services to real activity can be found in classical economic thought which, centred on the role of the manufacturing industry, has contributed to forging an image of deficient services from the performance view (Faiz, 2007). Smith (1776) contrasts the productive work of manufacturing with the unproductive work of services, which vanish the moment they are produced. For Smith (1776), services are immaterial and do not create value identified with material production. The debate on services resurfaced in the 1960s with (Baumol, 1967a) and Fuchs (1968) attributing to services the status of Cost Disease. In the 1980s, much of the research was devoted to trade in

¹ United Nations Conference on Trade and Development

² World Trade Organisation

services, drawing on WTO's publications and regional trade agreements. However, as (Francois and Hoekman, 2010) finger out, the majority of research on services focuses more on liberalisation in the services sector as well as the literature gives credit to trade and FDI in services. Meanwhile studies on the contributions of international services flows to world output and export patterns are even less visible.

Therefore, we are in a phase of questioning the effect of the international diffusion of trade in services on export diversification. What are the dimensions of trade in services that are conducive to export diversification in Sub-Saharan Africa (SSA)? This paper identifies the dimensions of trade in services that promote exports diversification.

The relationship between services trade dynamism and exports diversification still needs empirical studies to strengthen the so far insufficient debate. The search for directions in the relationship between trade openness policies and economic diversification has guided the research prism for a long time. In view of the importance of diversification in transforming economies and achieving the goals set out in recent national, regional³ and global development initiatives⁴, an assessment of the determinants, with particular attention to the role of services, of export diversification in developing countries, especially in Sub-Saharan Africa, is needed.

Exploring services as trade policy strategy remains an alternative in Africa, since natural resources account for the bulk of African exports. Moreover, given the growing role of services in Africa, the implementation of the African Continental Free Trade Area (AfCFTA) will be difficult if services are relegated to a secondary position in favour of trade in goods.

A better understanding of the relationship between the development of international trade in services and diversification could better guide African policy makers in terms of policy adoption and implementation. In this sense, this paper contributes to better inform decision makers. The existence of a fairly extensive literature on economic diversification demonstrates the importance of and interest in diversification in the analysis of the vectors of economic transformation, however, the existing studies do not simultaneously take into account the role of services and trade in services in the process of diversification of economies. Therefore, this study would be, according to our understanding, one of first paper in the empirical literature.

The rest of the paper is structured as follows. The second section presents the literature review. The third section presents the stylized facts on trade in services and export diversification in SSA. The fourth section presents the data and the methodology. The fifth section presents and

³ Agenda 2063 of the Africa Union

⁴ The Sustainable Development Goals (SDGs)

discusses the empirical results on the effects of trade in services on export diversification in SSA. The sixth and last section concludes.

2. LITTERATURE REVIEW

The premises of export diversification debate according to some authors (Berthélemy, 2005b; Cadot et al., 2011; Cadot and De Melo, 2016; Hausmann et al., 2007a; Imbs & Wacziarg, 2003) can be traced back to the classical, neoclassical and the debate is non-exhaustive in the literature. While Ricardo supports specialisation, Heckscher-Ohlin models argue instead that export dynamics are largely determined by endowments, so that, if anything, we should be concerned with factor accumulation, not diversification (Cadot et al., 2011). Yet export diversification remains a constant concern for policy makers in developing countries. Even more naive is the idea of explaining export dynamics primarily by endowments. Indeed, according to Cadot et al. (2011), the relationship between endowments, trade and growth is complex and imperfectly understood. Models of intra-industry trade have long shown that many factors other than endowments, including market failures and policies, can affect trade patterns. This idea is supported by the work of Hausmann et al. (2007) who find that export patterns can exhibit path dependence in the presence of externalities.

Export diversification allows countries to manage volatility risks (Berthélemy, 2005; Hammouda and Ben, 2006), to go beyond broadening the export basket by diversifying destinations (Romer, 1990). As such, Chan et Manova (2015) argue that by diversifying into several consumer markets, exporters may be able to hedge country-specific demand fluctuations and insure against downturns at home.

The scepticism of the pioneers (Baumol, 1967; Bladen, 1960; Smith, 1776) about the role of services in economic development has for a long time dominated economic literature, so that services have remained in a non-tradable and unproductive sector consideration. However, in recent years, services have become increasingly important in international trade and investment. This is accompanied by a growing interest in services trade in the diversification literature (Caselli et al., 2015; Feng et al., 2021; Gngangnon, 2020a; Nieminen, 2020).

Although the increase in tourism revenues according to Lejárraga and Walkenhorst (2013) does not automatically translate into structural transformation and large-scale economic development, the fact is that this sector is once again at the heart of the major development and economic diversification strategies of several developing countries. Tourism demand has induced effects on other economic sectors through indirect and direct effects generated by

tourism spending on non-tourism sectors in host economies (Lejárraga and Walkenhorst, 2013; Romão, 2020; Sharpley, 2002).

Empirically, the relationship between the tourism sector and export diversification is controversial in the empirical literature. On the demand side, Lin et Sung (1984) find that tourism export growth is more stable than that of major commodity exports, partly because tourism is less subject to import protectionism. They believe that tourism is therefore considered a prime choice in Hong Kong's economic diversification. Lejárraga et Walkenhorst (2013) in their study of a large sample of developing countries with cross-sectional data, find that the area most amenable to short-term policy interventions, such as the business environment or trade regulations, are the most important in fostering productive linkages between tourism and the general economy. In contrast, fixed factors, such as land availability, or longer-term objectives, such as progress in development levels, have less influence on the productive and export structure. Using a panel data model for 2006-2017, Romão (2020) finds that specialisation patterns combining tourism and agriculture have positive effects in both cases. Diversification strategies that include unrelated sectors contribute to increasing the resilience of European regions, while a focus on construction reduces regional resilience.

Trade in financial and banking services in the multilateral system affects not only the volume of exports (Baldwin and Krugman, 1989; Chan and Manova, 2015; Dixit, 1989; Kletzer and Bardhan, 1987; Memanova and Mylonidis, 2020) but also the dynamics of a country's export basket structure (Bose et al., 2020; Foley and Manova, 2015; Nieminen, 2020). Foley and Manova (2015) argue that the ability to access financial capital to pay for fixed and variable costs affects firms' choices about entry and export operations and, therefore, influences the overall structure of trade. Financial frictions and the use of internal capital markets influence the decisions made by multinationals regarding production locations, integration and corporate governance.

Empirically, Nieminen (2020) using data from the Exporter Dynamics Database (EDD) finds that access to domestic financial services contributes positively to export diversification by increasing the number of small exporters, as financial services alleviate the credit constraints faced by these exporters. Nguyen et al. (2020) mobilise nine financial development indices and three patent variables to identify the main determinants of the captured economic complexity index. Nguyen et al. (2020) find that an overly large financial sector does not contribute to the diversification and sophistication of a national economy, but the efficiency of financial markets seems to have a positive influence on these processes, probably because financial markets provide alternative ways of financing patents and knowledge.

Unger (2016) conducts an empirical analysis on the role of financial intermediation in international trade. Combining Melitz's (2003) firm heterogeneity with Holmstrom and Tirole's (1997) credit frictions, Unger (2016) observes a selection of larger firms towards exporting and unsupervised financing, such as government debt or corporate bonds. Smaller producers only serve the domestic market and have to resort to more costly financial intermediation. He also finds that producers respond to financial shocks by switching to other types of financing. Furthermore, his model highlights a new source of gains from trade: average productivity increases when lower trade costs allow some exporters to select cheaper unguarded financing.

Chan and Manova (2015) show empirically that financial market imperfections affect the number and identity of exporters' destinations. Their results reveal that large economies with lower trade costs are more attractive markets because they offer higher export profits. They show that financially advanced nations therefore have more trading partners and move down the hierarchy, particularly in sectors that are highly dependent on the financial system. Gani and Clemes (2016) find a statistically significant positive correlation between the rule of law and regulatory quality and exports and imports of insurance and financial services in OECD countries and in some developing countries. In contrast, their empirical results reveal a negative and statistically significant relationship of contract enforcement with exports and imports of insurance and financial services.

The fast development of Information and Communication Technologies (ICTs) has a significant impact on the performance of companies (Chari et al., 2007; León et al., 2016; Ravichandran et al., 2009), in the production of new goods (Chari et al., 2007), as well as on their access to new markets (León et al., 2016). León et al. (2016), in their study, analyse the impact of ICT use on the degree and type of diversification of small and medium-sized enterprises (SMEs). From a sample of 95 companies in the Autonomous Community of the Basque Country, they realize that diversified companies show a higher level of ICT use and this resource positively affects the degree of international diversification and the intensity of the company's activities.

Chari et al. (2007) develop and empirically test the hypothesis that investment in information technology helps to leverage the firm's specific assets across national borders and thus contributes to improving international diversification performance. Chari et al. (2007) show that the impact of international diversification on performance is a positive function of the level of ICT investment. For the latter, the impact on performance can be significantly positive (for firms with high ICT investment), significantly negative (for firms with low ICT

investment), or neutral (for the average internationally diversified firm, i.e. firms with an average level of ICT investment). Ravichandran et al. (2009) find in their study of US firms that while ICT spending interacts with tied diversification to have a positive effect on firm performance, similar interactions with untied diversification have no effect on firm performance. Moreover, the interaction between ICT spending and geographic diversification is only positively associated with performance when the level of geographic diversification is low.

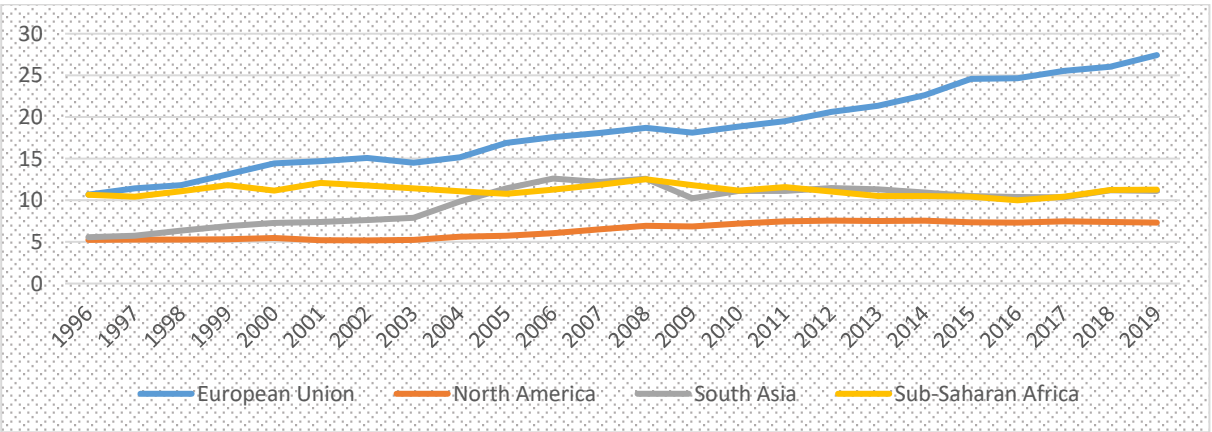
3. TRADE IN SERVICES AND EXPORT DIVERSIFICATION: STYLIZED FACTS

This section presents the stylized facts of the relation between trade in services and export diversification in SSA.

3.1. Dynamics of trade in services in Sub Saharan Africa

Figure 1 shows the evolution of trade in services in percentage to GDP in some regions of the world, namely Sub-Saharan Africa, the European Union, South Asia and North America. The European Union is the area that has seen a strong increase in trade in services, especially since 1996, following the entry into force of the General Agreement on Trade in Services (GATS). SSA, with an average of 11.16 percent of GDP between 1996 and 2019, is the second region where trade in services accounts for a significant share of GDP. In North America and South Asia, trade in services represents an average of 6.41% and 9.71% of GDP, respectively.

Figure 1: Trade in services (% of GDP) dynamics in some regions over 1996 - 2019



Source: Authors, UNCTAD data (2021)

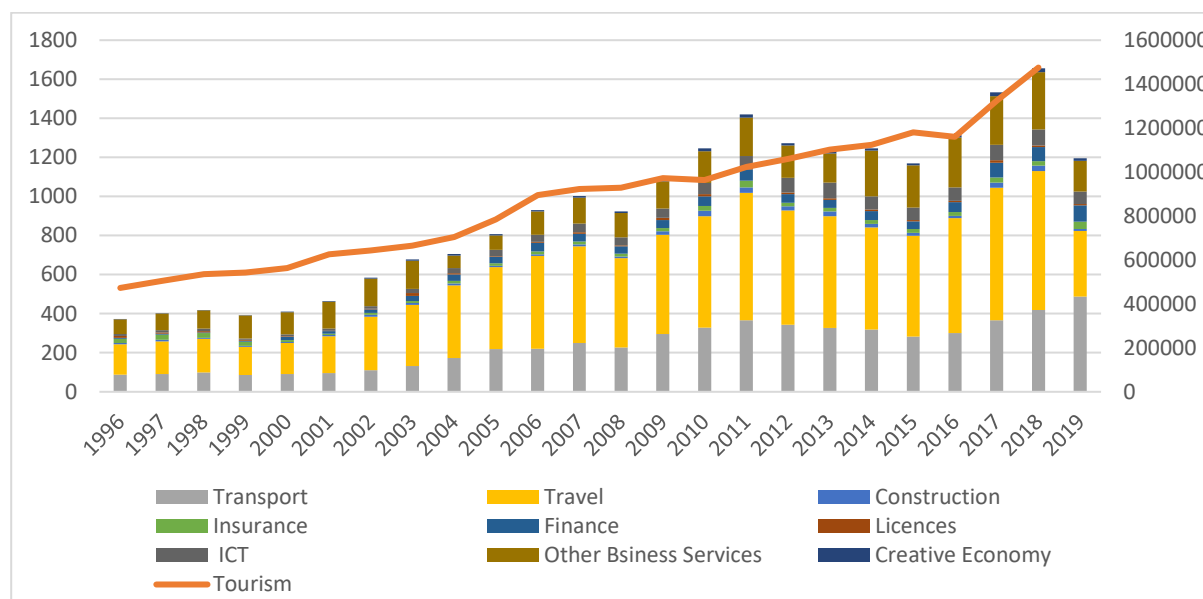
Trade in services in SSA is experiencing significant dynamism in view of its remarkable performance. SSA countries are net importers of services as imports of services are more important than exports of services. Over the period 1996 – 2019, total services imports

accounted for 68% of total services trade against 32% for services exports. However, due to the COVID-19 pandemic, exports and imports of services fell significantly in 2020, equally a 15.55% drop in total trade in services in 2020 compared to 2019.

Figure 2 and 3 provide a set of information on the evolution of trade in services in the most important dimensions of this sector in SSA during the period 1996 - 2019. The figures show a strong expansion of the tourism sector in SSA since 1996. With an average annual growth rate of 5.57% over the period 1996 - 20019, SSA is becoming an important destination for world tourism. The number of arriving visitors has increased from 16 million in 1996 to over 50 million annual visitors in 2019. This surge in tourism demand is accompanied by a significant increase in local consumer products, with important knock-on effects on other sectors.

The figures show that travel services occupy the largest share of commercial services exports in SSA from 1996 to 2019. Indeed, this sector accounts for an average of 42.70 percent of total services exports in SSA (with 3.44 percent average growth) while travel services imports are down with an average of 0.51% over the same period representing 22.36 percent of total commercial services imports. Imports of transports services lead total services imports with an average growth of 0.19% over the period 1996 - 2019 and averaging about 41%. Exports of transportation services represent 25.29% on average over the period and an average growth of 1.78%. While exports of ICT services declined by an average of 1.88%, their imports grew by an average of 0.84% over the period 1996-2019. Average imports of financial and insurance services represent 5.42% of total commercial services imports compared to average exports of 5.16% over the period 1996-2019.

Figure 2 : Commercial services exports share dynamics in SSA over 1996 -2020

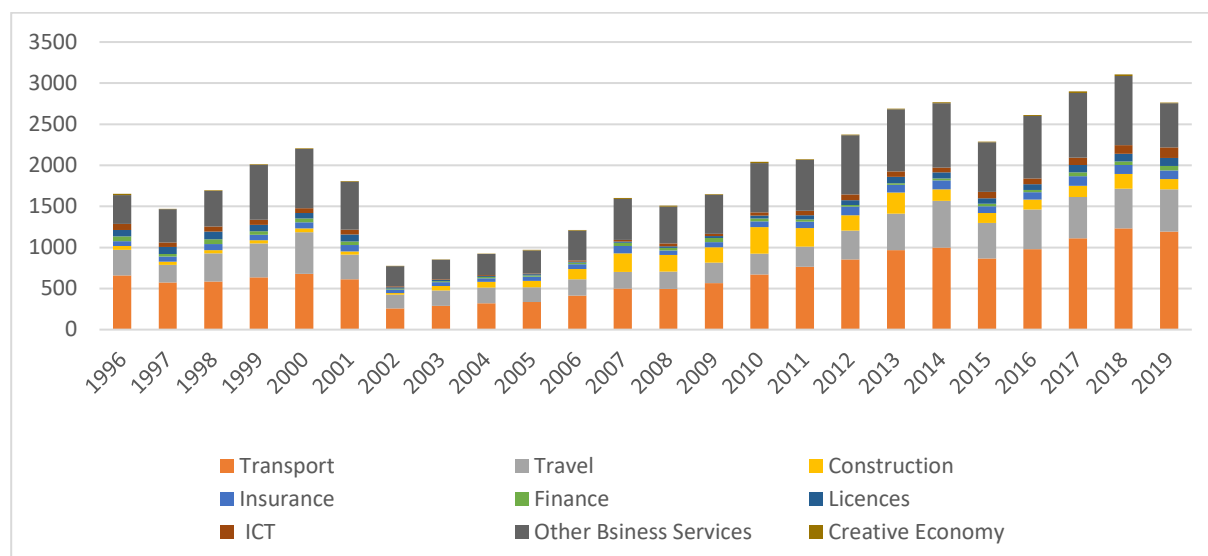


Source: Authors, data from UNCTAD (2021)

Figure 3 traces the evolution of the export concentration index in five (5) regions of the world, namely SSA, North America, Western Europe, East and Southeast Asia, and North Africa over the period 1996 to 2019. The figure reveals a shift in HHI into two groups. The first group includes regions with low exports concentration (North America, Western Europe, and East and Southeast Asia) and the second group includes regions (Sub-Saharan Africa and North Africa) with high exports concentration index. The export concentration of East and South Asian countries evolves on average around 0.1 while North American and Western European countries show an evolution of their export concentration below 0.1 over the period 1996 - 2019. The trend in the export concentration index for Sub-Saharan Africa and North Africa shows growth over the period 1996-2007. Over this period, North Africa shows higher levels of concentration than the other parts of the world, with a peak of 0.5 in 2008. The figure also reveals that over this period, Sub-Saharan Africa also shows an increasing trend in the HHI index.

However, starting in 2008, there was a sharp decline in the export concentration index in both regions of Africa (Sub-Saharan Africa and North Africa). The financial crisis of 2007-2009 explains this situation. Indeed, the financial crisis during these years led to a contraction in global demand for raw materials, of which African countries are the largest suppliers. Faced with low demand for non-value-added exports from developed countries, African countries are forced to increase their local processing capacity for their raw materials.

Figure 3 : Commercial services imports share dynamics in SSA over 1996 -2020



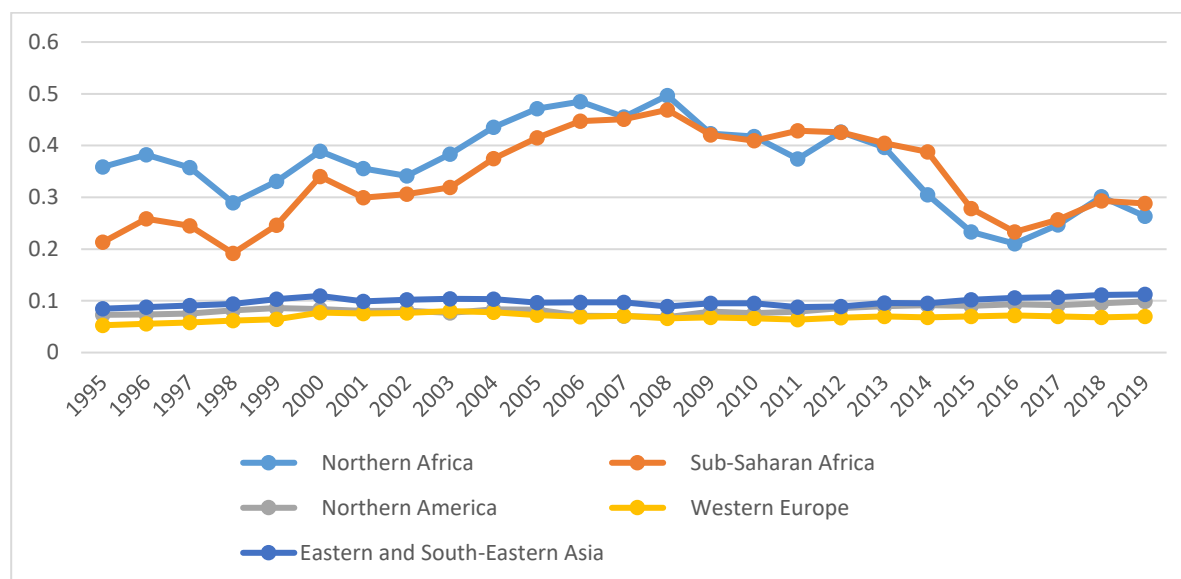
Source: Authors, data from UNCTAD (2021)

3.2. Dynamics of export diversification in Sub Saharan Africa

Figure 4 traces the evolution of the export concentration index in five (5) regions of the world, namely SSA, North America, Western Europe, East and Southeast Asia, and North Africa over the period 1996-2019. The figure reveals a shift in Herfindahl-Hirschman index (HHI) into two groups. The first group includes regions with low exports concentration (North America, Western Europe, and East and Southeast Asia) and the second group includes regions (SSA and North Africa) with high exports concentration index. The export concentration of East and South Asian countries evolves on average around 0.1 while North American and Western European countries show an evolution of their export concentration below 0.1 over the period 1996 - 2019. The trend in the export concentration index for SSA and North Africa shows growth over the period 1996-2007. Over this period, North Africa shows higher levels of concentration than the other parts of the world, with a peak of 0.5 in 2008. The figure also reveals that over this period, SSA also shows an increasing trend in the HHI index.

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Figure 4 : Evolution of exports concentration (HHI) in some regions



Source: Authors, data from UNCTAD (2021)

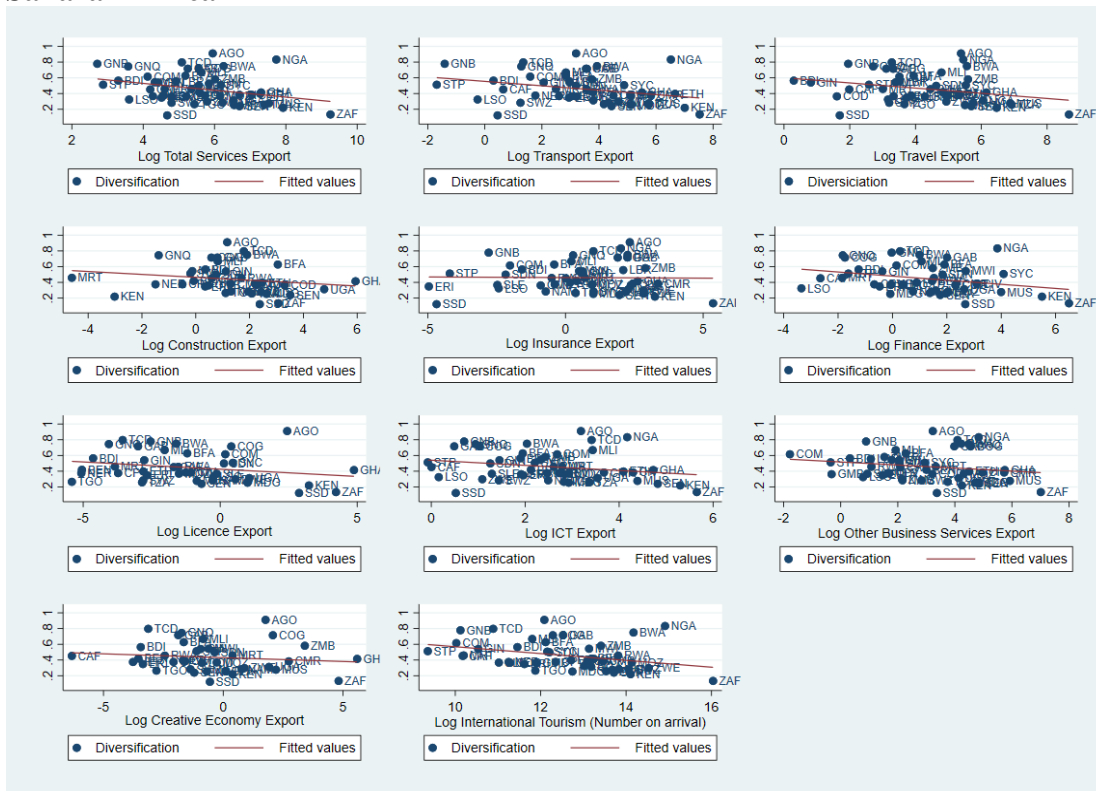
3.3. Correlation between interest variables

Figure 5 provides an overview of the correlation between export concentration (HHI) and the explanatory variables of interest (tourism, export of transport, travel, financial, insurance, ICT, licence, creative services and others services). It shows a negative relationship between export of tourism, transport, travel, financial, ICT, licence, creative services and others services and export concentration index (HHI). This means that an increase (decrease) in exports volume of these services leads to a decrease (increase) in export concentration in SSA between 1996 and 2020.

The figure 6 shows a positive relationship between import of transport, travel, financial, ICT, licence, creative services and others services and export concentration index (HHI) in Sub Saharan Africa. That is, an increase (decrease) in import of those services dimensions imply an increase (decrease) in export concentration index (HHI) or a decrease in export diversification in Sub Saharan Africa over the period 1996 to 2020. Moreover, Table 2 in the Appendix shows that all dimensions of services imports in SSA are not only positively correlated with the export concentration index, but also have fairly low correlation coefficients.

Given that export in services have more negative relationship with export concentration more than import in services, that mean the focus should be put on the relationship between export in services and export diversification. However, it's important to notice that correlation does not automatically imply a causal relationship between the variables, so econometric regression will allow us to verify the true nature of the relationship between the variables.

Figure 5: Correlation between export concentration and exports in services in Sub-Saharan Africa



Source: Authors, data from UNCTAD (2021)

Figure 6: Correlation between export concentration and imports in services in Sub-Saharan Africa



Source: Authors, data from UNCTAD (2021)

4. DATA AND METHODOLOGY

This section presents the data and the methodology

4.1.Data

In the literature, we find several rates expressing the degree of diversification of exports, such as the warhead index (Attaran et Zwick, 1987; Hammouda et Ben, 2006), the entropy index (Attaran et Zwick, 1987; Berthélemy, 2005), the Herfindahl-Hirschman index (Agosin et al., 2012; Berthélemy, 2005; Hammouda and Ben, 2006), the aggregated specialization index (Berthélemy, 2005; Dadush et al., 2020; Hammouda et Ben, 2006) and the export ubiquity index developed by Hausmann et Hidalgo (2012). In this study, we use the Herfindahl-Hirschman index (HHI) as a relative measure of trade diversification by expressing its value between 0 and 1. HHI is preferred because it is both the simplest to program and the most frequently used in the literature on export diversification⁵.

The normalized HHI index reflects the degree of concentration of a country's exports, expressed as a value between 0 and 1. When the value of the index is close to 0, it reflects a lower concentration of exports and a high degree of economic diversification; however, a value close to 1 reflects a high concentration of exports and therefore a low degree of economic diversification. Data on HHI are collected from the UNCTAD database.

Data on trade services (all services dimensions) are also collected from the UNCTAD database. These data are of two types : (i) those corresponding to the concepts and definitions of the fifth edition of the IMF Balance of Payments Manual (BPM5) edited in 1993 with data from 1980 to 2013 and (ii) the sixth edition of the IMF Balance of Payments and International Investment Position Manual (BPM6) edition in 2009 which provides a new definition of services with a classification of eighteen (18) categories and sub-categories of services by breaking the first six categories according to the BPM5. The BPM5 categories services as follow: (1) all services, (2) transport, (3) travel, (4) other services, (5) all commercial services, and (6) other commercial services. Then, in order to have a large database with a wide range of categorised services, we reprocessed the data from the two tables. Indeed, given that the classification from BPM6 gives a wider range of services than the one made on the basis of BPM5, we proceeded to regroup by summing some sub-categories of services. This allowed us not only to obtain a combination of the two databases but also to extend the data period from 1980 to 2020.

⁵ For more details on the construction of the index, see Cottet et al. (2012) and Hammouda and Ben (2006)

Data on human capital (number of years spent in secondary school) are from the World Pen Table (WPT). Data on macroeconomic, physical and institutional variables are from the World Bank (WDI and WGI). The study covers an unbalanced panel of 48 countries in SSA (Table A2, Appendix) over the period 1996-2020 (25 years). While Table A3 (Appendix) presents the variables, their definitions and their sources, Table A4 (Appendix), presents the descriptive statistics of those variables.

4.2. Model specification

According to the literature on export dynamics and structure, the theoretical foundation formulation (Agosin et al., 2012; Benbouziane, 2018; Cadot et al., 2011; Dadush et al., 2020; Elhiraika and Mbate, 2014; Hammouda and Ben, 2006; Imbs and Wacziarg, 2003; Nieminen, 2020) of export diversification can be summarized as follow.

$$\text{Export diversification} = f(\text{macroeconomic variables, policy variables, physical variables, institutional variables}) \quad (1)$$

While some authors use simple linear models (Berthélemy, 2005; Hammouda and Ben, 2006; Klinger and Lederman, 2006), others use non-parametric models (Imbs and Wacziarg, 2003), general equilibrium models (Hausmann and Rodrik, 2003). In this empirical exercise, we estimate the following equation:

$$EXCON_{it} = \lambda_0 + \lambda_1 EXCON_{it-1} + \lambda_2 TS_{it} + \lambda_j X_{it} + \eta_t + u_i + \varepsilon_{it}, \quad i=1 \dots N, \quad t=1 \dots T \quad (2)$$

Where $EXCON_{it}$ represents the dependent variable reflecting export concentration, $EXCON_{it-1}$ represents the lagged variable of the dependent variable, the use of this autoregressive lagged variable (AR1) is motivated by the fact that diversification is a slow and dynamic process. TS_{it} represents the set of our variables of interest (the dimensions of services trade). $\sum X_{it}$ gathers our control variables, η_t represents the period fixed effects, u_i a vector represents the country fixed effects, ε_{it} represents the error terms capturing all unobserved variables and likely to influence the dependent variable, with $E(\varepsilon_{it}) = 0$, i represents the individual (country) and t time period.

4.3. Estimation strategy

Our model is a simple linear model and several estimation methods are available for the estimation of this type of model. There is the Ordinary Least Squares (OLS) method with fixed effects or random effects estimation, we also have the double least squares method. However, panel estimation by the OLS method can give biased estimates due to the violation of certain

assumptions such as the autocorrelation of errors, the heteroscedasticity of errors, and the endogeneity of certain variables. Also, when the explanatory variables are correlated, the OLS and within estimators are inconsistent. Thus, to have consistent estimators, the Generalized Moment Method (GMM) is more recommended.

The Generalized Moment Method (GMM) is based on the conditions of orthogonality between the lagged endogenous variables and the error terms, i.e., absence of correlation between the lagged endogenous variable and the error terms. There are two types of GMM methods, the first difference GMM method developed by Arellano et Bond (1991) which can face the problem of over-identification. The second type is the GMM in system proposed by Arellano et Bover (1995). This method combines first difference equations and level equations. In the system GMM method, the instruments in the first difference equation are expressed in level and the instruments in the level equation are expressed in first difference.

As highlighted by Roodman (2009), GMM is appropriate in panels with small T and large N, meaning few periods and many individuals, a linear functional relationship, a dynamic left-hand side variable (dependent variable), dependent on its own past realizations, and independent variables that are not strictly exogenous, meaning that they are correlated with past and possibly current realizations of the error.

The adoption of this technique is subject to certain rules. Indeed, the existence of endogeneity between the diversification of exports and trade in services justifies our choice of the GMM method as estimator. It is theoretically established (Caselli et al., 2015; Gngangnon, 2020a, 2020b; Lin and Sung, 1984) that a high level of participation in international trade in services promotes greater economic diversification. Conversely, the more diversified an economy is, the more likely it is to export more services. Economic diversification stimulates the country's capacity to produce market services. In this respect, Gordon and Gupta (2005) et Grünfeld and Moxnes (2003) show that countries with a wide range of export products are the biggest suppliers of market services.

5. RESULTS AND DISCUSSION

This section presents and discusses the empirical results on the effects of trade in services on export diversification in Sub-Saharan Africa.

5.1. Heterogeneous effects of trade in services on export diversification in SSA

Using the system generalized method of moments (GMM) and performed several calibrations, the empirical results are presented in Table 1. The results of the diagnostic tests show that all models are well specified. The Hansen test does not reject the validity of

instruments (Hansen test p-values ≥ 10), and the absence of second-order serial correlation is also not rejected (AR (2) p-values ≥ 10). Too many instruments can severely weaken and bias the Hansen over-identifying restrictions test and, therefore, the rule of thumb is that the number of instruments should be less than the number of countries (Roodman, 2009b). In all tables, the number of countries is more than the number of instruments, indicating that there is no problem of instruments proliferation.

Realizing the presence of outliers that can bias the results since they have extreme values for some variables, we performed regressions by excluding the outliers to check the sensibility of trade in services on export diversification. The results found from regressions without outliers are the same to the first results with outliers. We first ran the regressions with services export (dimensions) as explanatory variables and then with services import. From the different regressions, only the services exports present convincing results. All the dimensions as well as total services imports show positive and insignificant coefficients, which confirms figure 6 on the correlation between services imports and export diversification. Thus, our main focus has been made on the effect of services exports on export diversification.

In the analysis of the results, an independent variable with a negative sign implies that this variable leads to a decrease in the concentration of exports and an increase in exports diversification. An explanatory variable with a positive coefficient leads to an increase in exports concentration and to a decrease in exports diversification.

Table 1 shows that export concentration index (HHI) initial variable is positive and significant at the 1% and 5 % level in all specified models. This is not only supporting the findings of Agosin et al. (2012), Elhiraika and Mbate (2014), Fosu and Abass (2019) , but also the economic theory arguing that export dynamics is a long-run implication than in the short-run. These results support the idea of the dependence of African countries on their diversification trajectories developed by Elhiraika and Mbate (2014) and supported then by Fosu and Abass (2019).

All our variables of interest show the expected signs according to economic theory. Indeed, total services exports, transport services, travel services, insurance services, financial services, other business services, creative economy services have coefficients with negative sign and are all significant at 5% or 10%. The exceptions are exports in construction services and exports of uses of licence services that have coefficients with negative sign but are not significant.

The results show a negative relationship between total services export and export concentration in SSA. Indeed, given that we have a level-log model, a 100% growth in total services exports leads to a 0.0548-unit decrease in SSA export concentration. In addition, the results show that an increase in transport and travel services exports leads to a decrease in SSA export concentration. The coefficients of transport and travel services are negative and significant at the 5% and 10% levels respectively. A 100% growth in transport and travel services exports leads to a decrease in export concentration of 0.0312 and 0.0118 units respectively. This positive relationship between transport services and export diversification confirms the thesis that the efficiency of transport services largely determines the ability of firms to compete in foreign markets (Casas, 1983; Francois and Wooton, 2001; Strandenes, 2021). Faced with high transport costs, exporting firms, in order to remain competitive, must pay lower wages to workers, accept lower returns to capital or must be more productive. For a country whose exports are made possible by imported transport services, facing exorbitant transport costs not only reduces the competitiveness of its firms but also affects the productive capacity and the number of products destined for export.

The negative relationship between exports of insurance services, financial services and export concentration reinforces Foley and Manova (2015) idea that financial frictions and the use of domestic capital markets influence multinationals decisions about where and how to produce. These results further support Nieminen (2020) findings that argue that access to banking and financial services through the development of the financial sector and banking structure positively affects the microstructures of the export sector as well as the behaviour of exporters which will have effects on export diversification at the macro level, through the number of active export lines and the concentration among active export lines. Indeed, any 100% increase in exports of financial services and insurance services leads to a decrease of 0.0139 and 0.00971 units of export concentration in SSA respectively. The negative relationship between other business services (services to enterprises) exports and export concentration highlights the important role that services provide to enterprises play as intermediaries in the production process and productivity of firms (Arnold et al., 2008, 2011; Jones and Kierzkowski, 1990; Malchow-Møller et al., 2015; Su et al., 2020).

There is a negative relationship between the logarithm of tourism and export concentration due to the negative sign of the coefficient of the variable which is also significant at the 10% level. The increase in the number of tourists on arrival by 100% leads to a decrease of 0.0391 units in the concentration of exports in SSA. This implies that the development of tourism sector implies a greater diversification of export in SSA. These findings are in line with

economic theory (Lejárraga and Walkenhorst, 2013; Lin and Sung, 1984; Romão, 2020) which shows that tourism demand is always accompanied by significant spillover effects on other activity sectors due to the growing demand for consumption goods complementary to tourism. These results also confirm Lejárraga and Walkenhorst (2013) who argues that since tourism services are consumed locally, tourists will demand a variety of products and services to satisfy their needs, which encourages the visited country to increase the supply of consumer goods.

However, despite the substantial literature (Biryukova and Matiukhina, 2019; Hausmann et al., 2007b; Luong and Nguyen, 2021; Xing, 2018) on the catalytic role of ICT in the growth of firms' productive performance, the non-significance of the coefficients of exports of ICT services, construction services and creative economy services can be explained in part by the fact that the exports of these services in SSA, even if they are evolving over time, are still small in comparison to other services. For instance, Fink et al. (2005) in their estimates using disaggregated data reveal that communication costs are more important for trade in differentiated products than for trade in homogeneous products.

The control variables show mostly the expected signs, while some give rather mixed signs depending on the specification. The negative and significant relationship between inflation, FDI, credit to the private sector and export concentration is valid in the theoretical field insofar as it confirms some of the results of previous findings. The results on inflation are in line with Balavac et Pugh (2016) who find that permanent instability in the price level is unfavourable for export diversification. The negative relationship between FDI, credit to the private sector and export concentration confirms the findings of Agosin et al. (2012), Balavac and Pugh (2016), Elhiraika and Mbate (2014) and of Fosu and Abass (2019) who in their work find favourable effects of these variables to the diversification of a country's export basket. An environment conducive to FDI and access to credit by the private sector increases the productive structure and competitiveness of firms. Human capital formation is a strong lever for economic diversification because it increases the workforce skills and productivity. In fact, human capital is a strong determinant of export diversification since in countries where population show higher levels of education are more likely to boost export diversification (Elhiraika and Mbate, 2014). However, in this study, despite having negative relation with export concentration, human capital is not significant in all our regressions. That can be explained by the low level of education in most of SSA countries. In addition, most of African manufacturing industries are driven by imported expertise meanwhile local workforce is dedicated to low qualification work.

Natural resources and log of GDP per capita, and political stability encourage export concentration in SSA. A country with a large endowment of natural resources has a high

propensity to export more raw materials than finished goods, which explains the positive relationship between natural resources and export concentration (Agosin et al., 2012a; Ansu et al., 2016; Elhiraika and Mbate, 2014). Political stability is very important for export diversification as argued by Fosu and Abass (2019). Political stability shows rather mixed results as in some specifications it shows positive but insignificant signs and with positive sign and significant at 10% in the other specifications. This is the result of the stabilisation and pacification efforts observed in some countries over the past decades, although in most cases in SSA political stability remains an ongoing quest.

Openness expresses here as the openness in merchandises trade appears to be an important determinant of exports diversification since in all the specifications there is a negative relationship with export concentration. As so far countries are opened to international markets, they are more likely to diversify their exports. This finding is in line with previous works (Agosin et al., 2012a; Elhiraika and Mbate, 2014; Feng et al., 2021; Khalil, 2019; Makhoul et al., 2015).

The time effect incorporated (dummy variables) in the regressions reveals a rather interesting feature. The negative and significant relationship of years 2007 to 2009 shows that the period of the international financial crisis has a favourable effect on exports diversification in SSA. The reason is that during the financial crisis, most of African countries faced difficulties in selling their production due to the contraction in global demand for raw materials. Faced with such a situation, efforts to transform raw materials locally have emerged in several countries in SSA that are heavily dependent on mineral resources, such as Nigeria, South Africa, Kenya, Ethiopia, Ghana and Angola.

5.2. Robustness checks

In order to check the robustness of our results, we perform additional estimations by changing the dependent variable. We use the Theil index of export diversification from the International Monetary Fund (IMF) database instead of the UNCTAD HHI index. Theil index calculated from the seminal work of Cadot et al. (2011) is used in several empirical works (Agosin et al., 2012a; Fosu and Abass, 2019; Gnanon, 2020a) as part of the work on export diversification. The following equation models the relationship between trade in services and export diversification captured by the Theil index. With $THEIL_{it}$ the Theil index, $THEIL_{it-1}$ the lagged variable of the dependent variable, TiS_{it} capturing the dimensions of trade in services, X_{it} a set of control variables, ϑ_t and τ_i the temporal and individual effects respectively and ϵ_{it} the error terms.

$$TI_{it} = \delta_0 + \delta_1 TI_{it-1} + \delta_2 TiS_{it} + \delta_j X_{it} + \vartheta_t + \tau_i + \varepsilon_{it}, i=1, \dots, N, t=1, \dots, T \quad (3)$$

Table 2 shows that using Theil index makes our results robust, in the sense that most of our previous results are confirmed. In contrast to the results in Table 1, with the Theil Index, only export in ICT services is not significant. However, if most of our interest variables become significant and with the expected sign (negative), the other control variables appear in Table 2 with more heterogeneous effect on export diversification compared to the results with HHI in Table 1.

Table 1: Results of system-GMM, dependent variable: Standardized HHI

VARIABLES	Dependent variable: Herfindahl-Hirschman Index (HHI)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
L.HHI	0.528*** (0.0816)	0.649*** (0.0969)	0.519*** (0.0993)	0.581*** (0.0684)	0.745*** (0.0863)	0.595*** (0.0959)	0.640*** (0.0811)	0.628*** (0.128)	0.576*** (0.0769)	0.614*** (0.129)	0.429** (0.192)	0.582*** (0.0883)
POLSTAB	0.0226 (0.0165)	0.0201 (0.0199)	0.0109 (0.0228)	0.0166 (0.0160)	0.0187* (0.0109)	0.0205 (0.0139)	-0.0125 (0.0148)	0.00355 (0.0170)	0.00593 (0.0186)	-0.00378 (0.0164)	0.0398* (0.0235)	0.0222 (0.0186)
HC	-0.0303 (0.0385)	0.0446 (0.0528)	0.00549 (0.0418)	-0.0183 (0.0335)	-0.0180 (0.0353)	-0.00134 (0.0377)	-0.0255 (0.0430)	-0.0122 (0.0501)	-0.0394 (0.0372)	-0.0380 (0.0296)	-0.0766 (0.0842)	0.0190 (0.0468)
INFLATION	-9.48e-05*** (2.62e-05)	-0.000182* (0.000109)	-0.000144* (8.61e-05)	-0.000147*** (4.82e-05)	0.00111 (0.000695)	4.97e-05 (0.000118)	-0.000121*** (2.23e-05)	0.000126 (0.000102)	-9.87e-05*** (3.22e-05)	-5.85e-05 (3.84e-05)	0.000600 (0.000731)	-0.00013** (5.42e-05)
L.MERCHTRADE	-0.0547 (0.0516)	-0.268** (0.108)	-0.123 (0.116)	-0.0628 (0.0682)	-0.0482 (0.0394)	-0.0900* (0.0496)	-0.00562 (0.0305)	0.0537 (0.0396)	0.00807 (0.0526)	0.0565 (0.0628)	-0.247* (0.135)	-0.121* (0.0693)
NATURALRESOUR	0.00713** (0.00299)	0.00359 (0.00277)	0.00449* (0.00238)	0.00413** (0.00182)	0.00226 (0.00150)	0.0072*** (0.00232)	0.000679 (0.00234)	0.00181 (0.00124)	0.00237 (0.00193)	0.00273 (0.00230)	0.00721 (0.00547)	0.00391* (0.00204)
CREDITPRIVATE	-0.00155** (0.000757)	-0.000784 (0.00124)	-0.00143 (0.000883)	-0.00178*** (0.000589)	-0.00126** (0.000577)	-0.00143* (0.000763)	-0.00123* (0.000689)	-0.00161* (0.000863)	-0.00236** (0.00103)	-0.00193** (0.000898)	-0.00111 (0.00122)	-0.00172** (0.000675)
FDI	-0.00158*** (0.000540)	0.000911 (0.00163)	-0.000328 (0.00112)	-0.00168** (0.000692)	-0.000303 (0.00121)	-0.000981 (0.000878)	-0.00178 (0.00118)	-0.000831 (0.00121)	-0.00181* (0.00109)	-0.00225*** (0.000688)	0.00261 (0.00211)	0.00110 (0.00136)
LGDPCA	0.0403*** (0.0135)	0.0989*** (0.0363)	0.0674*** (0.0226)	0.0535*** (0.0173)	0.0338*** (0.00931)	0.0533*** (0.0150)	0.0425** (0.0177)	0.0242 (0.0260)	0.0491*** (0.0149)	0.0344** (0.0152)	0.0787** (0.0307)	0.0683*** (0.0223)
LTOTALEXPORT		-0.0548* (0.0330)										
LTRANS_EXP			-0.0312** (0.0150)									
LTRAVEL_EXP				-0.0118* (0.00712)								
LCONSTRUC_EXP					-0.00339 (0.0128)							
LINSURANCE_EXP						-0.00971* (0.00513)						
LFINANCE_EXP							-0.0139* (0.00835)					
LLICENCE_EXP								-0.0103** (0.00502)				
LICT_EXP									-0.000236 (0.0147)			
LOTHERBUSI_EXP										-0.00682* (0.00390)		
LCREATIVE_EXP											-0.00572 (0.0131)	
LTOURISM												-0.0391* (0.0230)
Constant	0.172 (0.185)	0.744** (0.294)	0.326 (0.366)	0.156 (0.220)	0.102 (0.120)	0.137 (0.164)	-0.0421 (0.146)	-0.187 (0.172)	-0.0904 (0.200)	-0.177 (0.212)	0.729* (0.410)	0.661** (0.316)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	745	721	687	687	330	593	501	356	603	634	352	604
Number of countries, <i>n</i>	37	37	37	37	31	37	33	31	36	37	31	35
No. of instruments, <i>i</i>	25	25	18	35	29	29	31	29	26	32	27	26
Instruments ratio, <i>n/i</i>	1.48	1.48	2.05	1.05	1.06	1.27	1.06	1.06	1.38	1.15	1.37	1.34
AR1 p-value	4.38e-05	0.000313	0.000105	8.69e-05	0.00729	0.000152	0.00560	0.00328	0.00101	0.00301	0.0290	0.000169
AR2 p-value	0.155	0.144	0.147	0.116	0.779	0.331	0.532	0.856	0.826	0.126	0.585	0.364
Hansen p-value	0.670	0.923	0.896	0.507	0.233	0.928	0.627	0.574	0.623	0.748	0.593	0.580

*Note: The numbers in parentheses represent the robust standard errors of the estimated coefficients; *, **, *** represent the significances at 10%, 5% and 1%.

Source: Authors

Table 2: Robustness of results (system-GMM, dependant variable: Theil Index)

VARIABLES	Dependent variable: Theil index										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
L.THEIL	0.883*** (0.0781)	0.850*** (0.0782)	0.824*** (0.0968)	0.841*** (0.0810)	0.996*** (0.140)	0.807*** (0.0746)	0.847*** (0.0814)	1.079*** (0.156)	0.937*** (0.0943)	0.770*** (0.0938)	0.775*** (0.192)
POLSTAB	0.164** (0.0788)	0.103* (0.0621)	0.117 (0.0976)	0.205* (0.107)	0.0884 (0.118)	0.0969 (0.0958)	0.138 (0.209)	0.0349 (0.0914)	0.172* (0.104)	0.141 (0.110)	0.260** (0.132)
HC	0.0924 (0.160)	0.199 (0.206)	0.160 (0.186)	0.151 (0.221)	0.142 (0.110)	0.174 (0.120)	-0.149 (0.207)	0.281 (0.215)	0.371 (0.290)	0.128 (0.180)	0.280 (0.219)
INFLATION	-0.000144 (0.000130)	-0.000206 (0.000215)	-0.000230 (0.000181)	-0.000249 (0.000295)	0.00411 (0.00646)	-0.000218 (0.000967)	0.000291 (0.000257)	0.000178 (0.000857)	-0.000654* (0.000378)	4.21e-05 (0.000272)	-0.00273 (0.00433)
LMERCHTRADE	-0.206 (0.195)	-0.332 (0.458)	-0.0367 (0.276)	-0.240 (0.347)	0.0430 (0.585)	-0.168 (0.324)	0.315 (0.427)	-0.756* (0.395)	-1.065* (0.619)	-0.313 (0.473)	-0.0297 (1.014)
NATURALRESOURC	0.0274** (0.0122)	0.0227** (0.0113)	0.0281** (0.0135)	0.0314* (0.0181)	0.00576 (0.0258)	0.0236** (0.0113)	0.0562 (0.0415)	0.0177 (0.0182)	0.0224 (0.0176)	0.0229 (0.0152)	0.0561 (0.0403)
CREDITPRIVATE	0.00125 (0.00393)	0.00260 (0.00445)	0.00376 (0.00552)	0.00185 (0.00381)	-0.00120 (0.00287)	-0.00240 (0.00240)	-0.00210 (0.00390)	0.000904 (0.00458)	0.000748 (0.00789)	-0.00288 (0.00443)	0.00500 (0.00519)
FDI	-0.00400 (0.00343)	-0.00106 (0.00494)	-0.00232 (0.00397)	-0.00404 (0.00409)	-0.0122 (0.0143)	0.000206 (0.00582)	-0.0191* (0.0114)	0.0105 (0.0125)	0.0146 (0.0109)	-0.00195 (0.00516)	-0.00586 (0.0147)
LGDP	-0.0234 (0.0900)	0.147 (0.165)	0.0533 (0.0963)	0.109 (0.139)	0.0333 (0.127)	0.149** (0.0723)	0.219* (0.132)	0.169 (0.156)	0.152 (0.162)	0.155* (0.0852)	-0.0970 (0.276)
LTOTALSERV_EXP		-0.201* (0.110)									
LTRANSPORT_EXP			-0.174** (0.0800)								
LTRAVEL_EXP				-0.136* (0.0774)							
LCONSTRUCT_EXP					-0.0744* (0.0404)						
LINSURANCE_EXP						-0.116** (0.0575)					
LFINANCE_EXP							-0.110** (0.0553)				
LLICENCE_EXP								-0.0572** (0.0229)			
LICT_EXP									-0.0722 (0.112)		
LOTHERBUSINESS_EXP										-0.134* (0.0810)	
LCREATIVE_EXP											-0.0801* (0.0453)
Constant	1.080** (0.430)	1.527 (1.065)	0.633 (0.594)	0.996 (0.678)	-0.516 (1.209)	0.102 (0.976)	-1.949 (1.221)	0.814 (0.926)	2.738* (1.450)	1.237 (1.185)	0.626 (1.946)
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	571	553	526	524	243	448	362	258	446	479	251
Number of countries, <i>n</i>	37	37	37	37	26	36	30	26	34	36	28
No. of instruments, <i>i</i>	33	29	31	35	20	30	29	19	31	35	21
Instruments ratio, <i>n/i</i>	1.12	1.27	1.19	1.05	1.3	1.2	1.03	1.36	1.09	1.02	1.33
AR1 p-value	0.00867	0.0120	0.00925	0.00874	0.0948	0.0239	0.0210	0.0130	0.0429	0.0127	0.0914
AR2 p-value	0.172	0.191	0.159	0.146	0.225	0.633	0.702	0.170	0.600	0.168	0.499
Hansen p-value	0.702	0.324	0.671	0.617	0.383	0.596	0.954	0.485	0.755	0.496	0.655

*Note: The numbers in parentheses represent the robust standard errors of the estimated coefficients; *, **, *** represent the significances at 10%, 5% and 1%.

Source: Authors

6. CONCLUSION

This study has identified the dimensions of trade in services that are conducive to export diversification in SSA. The analysis of the theoretical foundations of the relationship between trade in services through its different components and export diversification led us to resort to empirical method to identify the dimensions of services that promote diversification. The System-Generalized Method of Moments (GMM) is used as an estimation method. The results

show that total export of services, export of transport, travel, insurance, financial, licence and creative economy services and tourism promote export diversification in SSA. .

Given these results, a number of economic policies can be suggested to the SSA policy makers to make services an important lever for economic diversification and development. In this perspective, governments should (1) improve the business environment and strengthen liberalization of the services sector to attract more FDI into the services sector, (2) adopt policies and strategies to develop and orient the services sector towards more efficient and high value-added services (3) strengthen national strategies for the development and modernization of the tourism sector as a lever for growth and economic diversification, (4) invest more in human capital so that the large part of the labour force moving into services sector can be more productive and provide more skilled services as it is the case in South Asia.

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8. APPENDICES

Table A1: Pairwise correlation between IHH and export in services dimensions

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) HHI	1.000										
(2) LTOTALEXPORT	-0.294*	1.000									
(3) LTRANSPORT	-0.301*	0.882*	1.000								
(4) LTRAVEL	-0.275*	0.852*	0.726*	1.000							
(5) LCONSTRUCTION	-0.164*	0.470*	0.304*	0.278*	1.000						
(6) LINSURANCE	-0.140*	0.644*	0.557*	0.500*	0.340*	1.000					
(7) LFINANCE	-0.168*	0.649*	0.531*	0.503*	0.389*	0.553*	1.000				
(8) LLICENCE	-0.133*	0.480*	0.401*	0.483*	0.400*	0.361*	0.436*	1.000			
(9) LICT	-0.245*	0.719*	0.603*	0.566*	0.504*	0.507*	0.550*	0.342*	1.000		
(10) LOTHERBUSINESS	-0.215*	0.731*	0.658*	0.514*	0.473*	0.555*	0.542*	0.298*	0.470*	1.000	
(11) LCREATIVE	-0.102*	0.581*	0.451*	0.457*	0.334*	0.531*	0.560*	0.573*	0.405*	0.462*	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A2: Pairwise correlations between IHH and import in services dimensions

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) HHI	1.000										
(2) LTOTALIMPORT	0.111*	1.000									
(3) LTRANSPORT	0.000	0.940*	1.000								
(4) LTRAVEL_IMP	0.020	0.808*	0.742*	1.000							
(5) LCONSTRUCTION	0.136*	0.562*	0.499*	0.296*	1.000						
(6) LINSURANCE	0.149*	0.761*	0.733*	0.622*	0.388*	1.000					
(7) LFINANCE	0.090*	0.665*	0.605*	0.518*	0.374*	0.543*	1.000				
(8) LLICENCE	0.011	0.618*	0.526*	0.566*	0.217*	0.422*	0.484*	1.000			
(9) LICT	0.076*	0.808*	0.781*	0.696*	0.445*	0.629*	0.523*	0.527*	1.000		
(10) LOTHERBUSINESS	0.138*	0.864*	0.723*	0.676*	0.543*	0.694*	0.589*	0.590*	0.684*	1.000	
(11) LCREATIVE	0.176*	0.485*	0.387*	0.429*	0.354*	0.306*	0.498*	0.439*	0.386*	0.488*	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A3: Summary of model variables and their sources

Variables	Description	Sources
Export diversification	The Herfindahl-Hirschman Index (normalized) (HHI) measuring export concentration and varies between 0 (more diverse) and 1 (less diverse)	UNCTAD
Transport	Include all transport services involving the carriage of people and objects from one location to another as well as related supporting and auxiliary services. Also included are postal and courier services.	UNCTAD (MBP5 & MBP6)
Travel	Travel credits cover goods and services for own use or to give away acquired from an economy by non-residents during visits to that economy. Travel debits cover goods and services for own use or to give away acquired from other economies by residents during visits to these other economies.	UNCTAD (MBP5 & MBP6)
Construction	Construction covers the creation, renovation, repair, or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, and so forth. It also includes related installation and assembly work. It includes site preparation and general construction as well as specialized services such as painting, plumbing, and demolition. It also includes management of construction projects.	UNCTAD (MBP5 & MBP6)
Insurance	Expresses Insurance and pension services include services of providing life insurance and annuities, nonlife insurance, reinsurance, freight insurance, pensions, standardized guarantees, and auxiliary services to insurance, pension schemes, and standardized guarantee schemes.	UNCTAD (MBP5 & MBP6)
Financial services	Financial services cover financial intermediary and auxiliary services, except insurance and pension fund services. These services include those usually provided by banks and other financial corporations.	UNCTAD (MBP5 & MBP6)
Licence services	Charges for the use of intellectual property n.i.e. include: (a) charges for the use of proprietary rights (such as patents, trademarks, copyrights, industrial processes and designs including trade secrets, franchises) and (b) charges for licenses to reproduce or distribute (or both) intellectual property embodied in produced originals or prototypes (such as copyrights on books and manuscripts, computer software, cinematographic works, and sound recordings) and related rights (such as for live performances and television, cable, or satellite broadcast).	UNCTAD (MBP5 & MBP6)
ITC services	(1) Telecommunications services encompass the broadcast or transmission of sound, images, data, or other information by telephone, telex, telegram, radio and television cable transmission, radio and television satellite, electronic mail, facsimile, and so forth, including business network services, teleconferencing, and support services. They do not include the value of the information transported. Also included are mobile telecommunications services, Internet backbone services, and online access services, including provision of access to the Internet. Excluded are installation services for telephone network equipment (included in construction) and database services (included in information services). (2) Computer services consist of hardware- and software-related services and data-processing services. They exclude non customized packaged software (systems and applications), and video and audio recordings on physical media; computer-training courses not designed for a specific user; and leasing of computers without an operator. (3) Information	UNCTAD (MBP5 & MBP6)

	services include news agency services, such as the provision of news, photographs, and feature articles to the media. Other information provision services include database services, direct non-bulk subscriptions to newspapers and periodicals, other online content provision services, and library and archive services.	
Others services to enterprises	Other business services cover research and development, professional and management consulting and technical, trade-related and other business services.	UNCTAD (MBP5 & MBP6)
Creative economy	Includes Personal, cultural, and recreational services and consist of (a) audio-visual and related services and (b) other personal, cultural, and recreational services.	UNCTAD (MBP5 & MBP6)
Political Stability	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score between -2.5 and 2.5.	WGI
Human Capital	Estimated on the years of schooling and educational performance	PWT
GDP per capita	Gross Domestic Product per capita (current \$)	WDI
Population	Total population in millions	WDI
Openness in merchandise trade	It expresses of imports and exports of merchandises as a percentage of GDP (X+M)/GDP	WDI
Natural Resources	Expressing the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents and forestry rents.	WDI
Credit	Is the total credit to the private sector which refers to the financial resources provided to the private sector by financial companies as a percentage of GDP	WDI
FDI	Expresses the net inflow of the Foreign Direct Investment measured as a % of GDP.	WDI
Inflation	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole.	WDI

Notes: WDI = World Development Indicators (World Bank), WGI = World Governance Indicators (World Bank), UNCTAD = United Nations Conference on Trade and Development, PWT = Pen World Tables (Gronigen Institute)

Source: Authors,

Table A4: List of studied countries

01	Angola	25	Liberia
02	Benin	26	Madagascar
03	Botswana	27	Malawi
04	Burkina Faso	28	Mali
05	Burundi	29	Mauritania
06	Cap Vert	30	Mauritius
07	Cameroun	31	Namibia
08	Central African Republic	32	Mozambique
09	Chad	33	Niger
10	Comoros	34	Nigeria
11	Congo, Dem Rep	35	Rwanda
12	Congo, Rep	36	Sao Tome and Principe
13	Cote d'Ivoire	37	Senegal
14	Equatorial Guinea	38	Seychelles
15	Eritrea	39	Sierra Leone
16	Eswatini	40	Somalia
17	Ethiopia	41	South Africa
18	Gabon	42	South Sudan
19	Gambia	43	Sudan
20	Ghana	44	Tanzania
21	Guinea	45	Togo
22	Guinea-Bissau	46	Uganda
23	Kenya	47	Zambia
24	Lesotho	48	Zimbabwe

Source: Authors

Table A5: Descriptive statistics

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Herfindahl-Hirschman index (HHI)	1184	.467	.209	.099	.961
Total services export	1097	898.047	2049.35	.668	17639.8
Transport services export	1000	227.282	504.41	0	3549.846
Travel services export	1001	408.345	1134.682	0	9995.91
Construction services export	571	14.476	35.165	0	425.561
Insurance services export	853	18.668	54.647	0	543.898
Finance services export	705	39.176	135.243	0	973.016
Use of license services export	579	7.658	24.048	0	233.413
ICT services export	1102	39.385	90.557	0	755.712
Other business services export	916	152.325	477.262	0	6450.322
Creative economy export	575	9.923	33.626	0	301.323
Total services import	1070	1916.376	3953.172	10.405	38710.166
Transport services import	1006	689.94	1298.85	4.654	9737.58
Travel services import	989	332.078	977.809	0	13508.942
Construction services import	689	128.425	632.716	0	7932.26
Insurance services imports	937	75.603	137.6	-1.512	1498.13
Finance services imports	694	35.792	102.318	0	1241.302
Use of license services imports	732	58.108	262.309	0	2124.316
ICT services imports	995	52.749	146.408	0	1544.648
Other business services imports	951	540.707	1371.359	0	15965.095
Creative economy imports	653	9.872	27.964	0	301.531
Tourism (Number on arrival)	880	860436.25	1802653.4	2900	15121000
Political Stability	1083	-.554	.947	-3.315	1.282
Human Capital	925	1.744	.43	1.053	2.964
Inflation	1144	18.117	166.13	-31.566	4800.532
Openness (Merchandises)	1132	54.459	30.235	7.806	225.412
Natural resources	1089	11.183	11.213	.001	62.697
Credit to private sector	1093	17.452	16.634	0	106.26
Foreign Direct Investment (FDI)	1098	4.515	9.468	-11.625	161.824
GDP per capita	1148	1877.067	2898.967	102.598	22942.61