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Remittances and Productivity in Sub-Saharan Africa

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Abstract

This research investigates how enhancing remittances affects total factor productivity (TFP) dynamics in 25 countries in SSA using data from 1980 to 2014. The Generalised Method of Moments (GMM) empirical strategy is adopted for the purpose of the study and the engaged TFP dynamics are: TFP, real TFP, welfare TFP and real welfare TFP. Significant net effects are not apparent from enhancing remittances for TFP, real TFP growth and welfare TFP while positive net effects are apparent on real welfare TFP. The unexpected findings are elucidated, and policy implications are discussed.

JEL Classification : E23; F24; F30; O16; O55

***Keywords*:** Economic Output; Remitances; Sub-Saharan Africa

1. Introduction

The research question this study explores is the following: does enhancing remittances affect productivity in Sub-Saharan Africa (SSA)? The motivation for the research is substantially premised on three tendencies in the scholarly and policy literature, notably: (i) contensions surrounding the role of aggregate productivity in economic output; (ii) increasing levels of remittances to SSA and (iii) gaps in the extant contemporary literature. These critical elements are substantiated in the following passages.

First, the literature is not yet settled on the role of aggregate productivity and output on economic development. The debate is particularly intense with regard to the absence of a consensus on the mechanisms by which aggregate productivity can be buttressed to exert positive economic development externalities (Baliamoune, 2009; Elu & Price, 2010; Baliamoune-Lutz, 2011; Ssozi & Asongu, 2016a; Tchamyou, 2017; Cheruiyot, 2017). A part of the debate that keeps resurfacing is the importance of factor accumulation versus total factor productivity (TFP) in the prosperity of developing countries. Young (1995) for instance in the debate has built on the successful experiences of countries in East Asia to posit that relative to TFP, positive economic development externalities are more related to factor accumulation. Another strand of literature supports the position on the relevance of cross-country variations in TFP to elucidating cross-country differences in levels of economic development (Romer, 1986, 1993; Abramovitz, 1986; Nelson & Pack, 1999; Klenow & Rodriguez-Clare, 1997; Temple, 1999; Easterly & Levine, 2001; Durlauf, Johnson & Temple, 2005).

When the debate is narrowed to the specific framework of Africa, Devarajan, Easterly and Pack (2001) argue that meagre levels of investment elucidate the economic development prospects of Africa when compared with low levels of productivity. According to the authors, policy makers should put more considerations in articulating determinants of productivity than in consolidating investments that are not productive. A premise on which the

underlying recommendation builds is that compared to investment levels that are low, policy makers should focus more on the productivity of investment. It follows that the productivity of investments should be more of a concern compared to the level of investments. This current research contributes to the attendant literature by assessing how enhancing remittances affect productivity in SSA. The importance of this channel builds on the fact that remittances have been increasing in the sub-region over the past decades.
Second, as illustrated in section 2, remittances inflows into SSA have been rising more than in other regions of the world (Williams, 2016; Ajide & Raheem, 2016; Efobi, Asongu, Okafor, Tchamyou & Tanankem, 2019). According to the attendant literature, a plethora of positive economic development externalities are linked to growing remittances, *inter alia*: more output per worker, enhanced TFP, doing business and industrialization. Moreover, according to the narrative, compared to other external flows (such as foreign aid and foreign investment), remittances are characterized by higher reliability and low volatility. In essence, as supported by Asongu, Biekpe and Tchamyou (2019), Okey (2019) and Ratha and Moghaddam (2020), scholars are growingly interested in the relevance of remittances to doing business, entrepreneurship and industrial development. This research complements this stream of studies by focusing on how remittances affect dynamics of TFP in SSA. The positioning of the study is also motivated by an apparent gap in the literature.

Third, the extant contemporary studies related to productivity have largedly been oriented towards, *inter alia*: externalities of productivity that are boosted by investment from foreign countries (Dunne & Masiyandima, 2017; Fanta & Makina, 2017); changes in labour distribution and gender-related issues (Elu & Price, 2017); the nexus between manufacturing and exports (Cisse, 2017); features of education and the level of children's involvement in the market of labour (Ahouakan & Diene, 2017); assessment of economic outputs with respect to potential economic output (Fedderke & Mengisteab, 2017); the involvement of the female gender in the improvement of agricultural

productivity (Uduji, Okolo-Obasi, 2018a, 2018b); the moderating role of value chains in the incidence of foreign investment on productivity and economic prosperity (Meniago & Asongu, 2019); assessment of relationships between manufacturing sectors and TFP with emphasis on cross-sector variations in productivity growth (Kreuser & Newman, 2018); the importance of information technology in TFP catch-up (Maryan & Jehan, 2018) and the role of financial access in TFP (Bokpin, Ackah & Kunawotor, 2018). How this research is positioned in relation to the extant literature on the relevance of remittances on macroeconomic outcomes is provided in section 2.

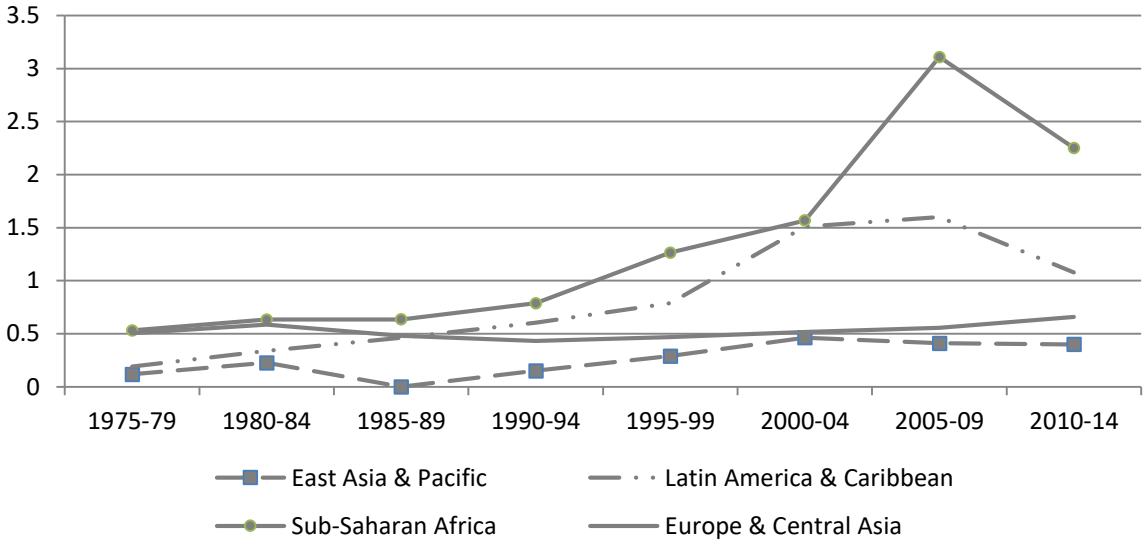
The positioning of this research not only departs from the engaged literature in the perspective that it focuses on the nexus between remittances and TFP. Accordingly, it also takes on board concerns related to sustainable development goals (SDGs) by not exclusively focusing on mainstream TFP. Accordingly, SDGs are strongly centred on the need for output and economic productivity to benefit majority of the population (Asongu, Biekpe & le Roux, 2017). This is essentially because most countries in SSA did not achieve the Millennium Development Goals (MDGs) targets of improving welfare because the over two decades of output and growing economic prosperity did not trickle down to the poorer fractions of the population (Tchamyou, 2019, 2020; Asongu & Odhiambo, 2019a). These concerns about welfare are taken on board by adding welfare productivity dynamics to the mainstream TFP indicator.

The remainder of the research is structured as follows. Section 2 presents stylized facts, the intuition and the relevant literature on the importance of remittances in development outcomes in developing countries. The data and methodology are covered in section 3 while section 4 providess the empirical findings and corresponding discussion. The research concludes in section 5 with future research directions.

2. Stylize facts, intuition and related literature

It is difficult to provide an accurate historical perspective of African remittances because the phenomenon is as old as the phenomenon of migration itself. However, from recent history, data on remittances and corresponding African migration have been of interest to multilateral development institutions since the World Bank was established in 1944 and began collecting data on the phenomenon in subsequent years (World Bank, 2006). This section is stratified into three main categories, focusing on stylized facts, theoretical underpinnings and extant literature on the importance of remittances in development outcomes. First, consistent with the corresponding literature (Efobi et al., 2019; Asongu et al., 2019; Ajide & Raheem, 2016; Mabrouk & Mekni, 2018), as illustrated in Figure 1 from World Development Indicators, during the past twenty years, remittances have been increasing more in SSA compared to other regions in the world such as East Asia and the Pacific, Latin America and the Caribbean and Europe and Central Asia. From the graph, it can be observed that over the past thirty years, the inflow of remittances into SSA has been steadily growing; a tendency that reached about 1.5% of GDP at the start of the third millennium.

Figure 1: Remittance Inflow as a Percentage of GDP (1975-2014)



Source: Authors' mapping with data from World Development Indicators (2016).

In the second strand, the research discusses the intuition for the study. The literature maintains that since countries in SSA are characterised by issues of surplus liquidity and limited financial access, remittances could represent an alternative source of funding entrepreneurial and industrial development (Saxegaard, 2006; Beck, Demirgüç-Kunt & Levine, 2007; Fouda, 2009; Asongu, 2014; Tchamyou, 2020; Efobi *et al*., 2019; Asongu & Odhiambo, 2019b, 2020a). This concern of limited funding opportunities in countries in SSA is consistent with the financial development literature which maintains that enterprises in the region have constraints of financial access (Kusi, Agbloyor, Ansah-Adu & Gyeke-Dako, 2017; Asongu, Batuo, Nwachukwu & Tchamyou, 2018; Kusi, & Opoku-Mensah, 2018). It follows that remittances could be used to fund activities that engender productivity given the limited access to finance in countries of SSA. In the following strand, the extant literature substantiates the importance of remittances in driving entepreneurship, doing business, productivity and economic development.

As highlighted in the introduction, a third strand of this section provides insights into attendant literature that has documented evidence on the beneficial incidences of remittances in promoting private investment, entrepreneurship and economic development. Whereas remittances are fundamentally acknowledged as a form of altriusm that are associated with social insurance externalities (Agarwal & Horowitz, 2002; Kapur, 2004), it is also imperative to maintain that the benefits of remittances are not limited to household rewards exclusively. In line with Efobi et al. (2019), there is a substantial bulk of the literature which acknowledges the crucial role that is played by remittances in satisfying both production and consumption demands of a society. Furthermore, in countries that are charactrised by considerable concerns of surplus liquidity in banking institutions on the one hand, and financial markets are not sufficiently developed to provide opportunities of long-term finance on the other, remittances could represent a viable alternative to funding projects. The intuition is consistent with the attendant literature on the subject. We have examples from Mexico where approximately 30% of businesses in the country

depend on remittances originating from the Diaspora for liquidities matters (Woodruff & Zentano, 2001). Moreover, thesame study maintains that about 20% of capital used for the bulding of corporations in the country is accounted for by the inflow of remittances.

The positions in the preceding paragraph are in tandem with the other scholarly perspectives supporting the importance of remittances in promoting entrepeneurship, conditions for doing business and economic development in developing countries. Examples of such studies on the paramount role played by remittances include: the funding of investment projects in Mexico (Massey & Parrado, 1998; Woodruff & Zenteno, 2001); contribution to significant entrepreneurial operations in the Philippines (Yang, 2008); conducive long run investment externalities in Bangladesh (Hossain & Hasanuzzaman, 2015); evolving market-focused investments in agriculture (Syed & Miyazako, 2013); buttressing of both farm and non-farm operations in Ghana (Tsegai, 2004); consolidation of the manufacuting sector (Dzansi, 2013) and enhancing of TFP (Barajas, Chami, Fullenkamp, Gapen & Montiel, 2013).

It is also important to note that the scholarly positions engaged so far have largely been oriented towards the direct linkages between remittances and entrepreneurial outcomes. However, it is also relevant to note that indirect impacts are also apparent in the attendant literature. For instance, there is a growing complementary body of literature on the indirect mechanisms through which remittances influence macroeconomic outcomes, *inter alia*: financial development (Aggarwal, Demirguc-Kunt & Peria, 2011; Bettin, Lucchetti & Zazzaro, 2012; Osabuohien & Efobi, 2013; Efobi et al, 2015; Kaberuka & Namubiru, 2014; Karikari, Mensah, Harvey, 2016; Efobi, Osabuohien & Oluwatobi, 2019); exchange rate (Rajan & Subramanian, 2005; Lartey, Mandelman & Acosta, 2008; Acosta, Lartey & Mandelman, 2009; Barajas Chami, Fullenkamp, Gapen & Montiel, 2009; Selaya & Thiele, 2010; Dzansi, 2013; Amuedo-Dorantes, 2014) and information technology (Asongu *et al*., 2019).

3. Data and Methodology

3.1 Data

This study is focused on twenty-five nations in SSA and is premised on data from 1980 to 2014[1]. Data availability constraints at the time of the study motivate the adopted temporal and geographical scopes of the research. In order to align the dataset with the Generalised Method of Moments (GMM) which is adopted by the study, the dataset is restructured to produce two sub-datasets, notably: five seven-year and seven five-year data averages in terms of non-overlapping intervals. After a preliminary assessment, it is apparent from the findings that only the former sub-dataset can produce estimated coefficients that are void of concerns related to instrument proliferation, even when the option of collapsing instruments is considered in the empirical exercise. In essence, the considered estimation strategy requires that the number of countries should exceed the number of periods in each country (Tchamyou, Asongu & Nwachukwu, 2018; Agyei, Marfo-Yiadom, Ansong & Idun, 2019; Wilson & Vencatachellum, 2019). Hence, restructuring the dataset is critical in ensuring that such a preliminary requirement is met. Ultimately, the adopted non-overlapping intervals are: 1980-1986; 1987-1993; 1994-2000; 2001-2007 and 2008-2014.

The variables are obtained from several sources, notably: (i) World Development Indicators (WDI) of the World Bank from which three control variables are adopted (i.e. population growth, education and government expenditure); (ii) the Financial Development and Structure Database (FDSD) of the World Bank from which the remittances variable is sourced, in line with Efobi et al. (2019); (iii) the United Nations Conference on Trade and Development (UNCTAD) database from which the foreign direct investment (FDI) variable is obtained and (iv) the Penn World Table database from which the TFP dynamics are obtained, namely: TFP, real TFP growth, welfare TFP and welfare real TFP.

[1]The countries that are selected contingent on data availability constraints are: Benin; Botswana; Burkina Faso; Burundi; Cameroon; Central African Republic; Cote d'Ivoire; Gabon; Kenya; Lesotho; Mauritania; Mauritius; Mozambique; Namibia; Niger; Nigeria; Rwanda; Senegal; Sierra Leone; South Africa; Sudan; Swaziland; Tanzania; Togo and Zimbabwe.

The choice of the TFP dynamics is consistent with recent TFP literature on Africa (Kreuser & Newman, 2018; Maryan & Jehan, 2018; Asongu, 2020) while the adoption of the control variables is in accordance with the attendant economic output and productivity literature, *inter alia*: Barro (2003), Becker, Laeser and Murphy (1999), Sahoo, Dash and Nataraj (2010), Heady and Hodge (2009), Ssozi and Asongu (2016a, 2016b), Elu and Price (2010, 2017), Tchamyou (2017), Dunne and Masiyandima (2017), Bokpin, Ackah and Kunawotor (2018), Efobi, Tanankem and Asongu (2018)[2]. The adopted control variables for the most part is anticipated to positively influence the outcome variables. Appendix 1 provides the definitions and sources of variables while Appendix 2 discloses the summary statistics. The correlation matrix is covered in Appendix 3.

3.2 Methodology

3.2.1 Specification

The selection of the estimation technique is informed by the literature on the importance of aligning the empirical strategy with the data behaviour and objectives of the stdudy (Kou, Lu, Peng & Shi, 2012; Kou, Peng & Wang, 2014; Kou, Ergu, Chen, Lin, 2016; Kou, Chao, Peng & Alsaadi, 2019a; Kou, Yang, Xiao, Chen & Alsaadi, 2019b). The estmation strategy adopted by this research is consistent with the narrative in the data section on the need to adjust the dataset so that it should be consistent with the GMM technique to be adopted. Hence, the study follows contemporary GMM-centric literature in the adoption of a *two-step* GMM approach that accounts for heteroscedasticity because the *one-step* option is consistent with homoscedasticity (Assefa & Mollick, 2017; Fosu & Abass, 2019; Tchamyou, 2020; Akinyemi, Efobi, Asongu & Osabuohien, 2019). Moreover, in addition to the motivation for the empirical strategy outlined in the preceding section, two more considerations should be taken on board, notably: (i) the dependent variables are largely persistent given that

[2] Other economic output and productivity studies that support the relevance of adopted control variables are: Nyasha and Odhiambo (2015a, 2015b); Okafor, Piesse and Webster (2017); Kumi, Muazu and Yeboah (2017); Maryam and Jehan (2018); Kreuser and Newman (2018); Muazu and Alagidede (2017); and Yaya and Cabral (2017).

their correlations between first lag and level series' exceed 0.800 which represents an established benchmark for confirming evidence of persistence in a variable (Asongu & Odhiambo, 2018a, 2018b; Tchamyou, 2019; Agyei et al., 2019) and (ii) the concern of endogeneity is adddressed by on the one hand, accounting for reverse causality or simultaneity by means of internal instruments and on the other hand, taking on board the concern of the unobserved heterogeneity by controlling for time-invariant variables.

The levels and first difference equations below in (1) and (2) respectively, show the standard GMM equations used to assess the relevance of increasing remittances for TFP dynamics.

$$TFP_{i,t} = \sigma_0 + \sigma_1 TFP_{i,t-\tau} + \sigma_2 R_{i,t} + \sigma_3 RR_{i,t} + \sum_{h=1}^{4} \delta_h W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \quad (1)$$

$$TFP_{i,t} - TFP_{i,t-\tau} = \sigma_1 (TFP_{i,t-\tau} - TFP_{i,t-2\tau}) + \sigma_2 (R_{i,t} - R_{i,t-\tau}) + \sigma_3 (RR_{i,t} - RR_{i,t-\tau}) + \sum_{h=1}^{4} \delta_h (W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} + \varepsilon_{i,t-\tau}) \quad , \quad (2)$$

where $TFP_{i,t}$ denotes an indicator of TFP (i.e. TFP, real TFP growth, welfare TFP and welfare real TFP) of country i in period t; R reflects remittances; RR denotes a quadratic interaction of remittances ("remittances" × "remittances"); σ_0 is a constant; τ is the degree of auto-regression that is one and reflects a lag of seven years because such a lag appropriately captures past information; W denotes the set of control variables adopted for the research (*FDI, Population, Education and Government Expenditure)*, η_i is the country-specific effect, ξ_t is the time-specific constant and $\varepsilon_{i,t}$ the error term.

The GMM alternative employed in this research is the option by Roodman (2009) based on "forward orthogonal deviations" which has been documented in contemporary GMM-centric literature to provide more robust estimations (Boateng, Asongu, Akamavi & Tchamyou, 2018; Tchamyou *et al*., 2019a, 2019b; Asongu & Odhiambo, 2019c). Hence, the approach adopted which departs from the standard *difference* and *system* GMM options is an amelioration of the Arellano and Bover (1995) approach.

3.2.2 Identification, simultaneity and exclusion restrictions

Three important elements need to be articulated in order for a GMM specification to be robust, notably: identification, simultaneity and exclusion restrictions. This section is devoted to clarifying these elements. First, the identification procedure consists of eliciting three sets of variables involved in the empirical exercise, namely: the dependent variable, the endogenous explaining or predetermined variable and the strictly exogenous variable. In accordance with the narrative in the data section, the outcome variables are obviously TFP productivity dynamics. The predetermined variables on the contrary are the acknowledged channels through which the identified strictly exogenous variables influence the outcome variables. In the context of this study, borrowing from the extant literature, these predetermined variables are remittances and elements in the conditioning information set (Tchamyou & Asongu, 2017), while the strictly variables are years. According to Roodman (2009), years are feasible strictly exogenous indicators because they cannot be endogenous upon a first difference. In the light of this strategy of identification, the exclusion restriction assumption is examined by means of assessing if the acknowledged strictly exogenous variables affect the outcome variable exclusively via the predetermined variables.

Second, as concerns the dimension of simultaneity or reverse causality, instrumental variables that are forward differenced are employed and the examination process consists of using Helmet transformations to remove fixed effects that are probable of biasing the models being estimated. Accordingly, this approach therefore controls for potential correlations between the lagged outcome variables and fixed impacts that cause endogeneity. This process of addressing the obstacle of endogeneity is in line with the attendant literature which has supported the relevance of obtaining orthogonal or parallel conditions between lagged and forward-differenced observations (Arellano & Bover, 1995; Love & Zicchino, 2006; Roodman, 2009).

Third, the considered assumption of exclusion restrictions clarified in the first strand of this section is assessed by means of the Difference in Hansen Test (DHT) which is also used to investigate if the adopted instruments exhibit strict exogeneity. In essence, the null hypothesis of this test is the view that remittances and adopted control variables are mechanisms by which the strictly exogenous variables affect the adopted TFP dynamics. It follows that in the findings that are reported in the following section, the alternative hypothesis of the DHT should be rejected in order for the exclusion restriction assumption to be valid. The disclosed criterion used to confirm the validity of exclusion restrictions is broadly consistent with the approach used in standard instrumental variable (IV) estimations which require that the alternative hypothesis of the Sargan/Hansen test should be rejected in order for the identification strategy to be valid (Lalountas, Manolas & Vavouras, 2011; Agbloyor, Abor, Adjasi & Yawson, 2013; Beck, Demirgüç-Kunt & Levine, 2003; Amavilah, Asongu & Andrés, 2017).

4. Empirical results

The empirical findings are provided in this section in Tables 1-2. Each of the tables is divided into two main fractions. For instance, Table 1 reports results on TFP and real TFP growth in the left-hand and right-hand side respectively while Table 2 shows findings on welfare TFP and real welfare TFP in the left-hand and right-hand side, respectively. For either table, each side entails five specifications: the first without a conditioning information set and the remaining four with one variable of the conditioning information set respectively in each specification. The motivation for exclusively adopting one variable in the conditioning information set for every specification is to avoid concerns of instrument proliferation in post-estimation diagnostic tests. Accordingly, even when the option of collapsing instruments is activated in the estimation exercise, the prevailing issue of instrument proliferation that is susceptible of biasing estimated coefficients is apparent when many independent variables are engaged in the specification exercise. Along the same lines of arguments,

some examples of studies that have adopted no control variable in order to avoid concerns of instrument proliferation in the GMM-centric literature are: Osabuohien and Efobi (2013) and Asongu and Nwachukwu (2017).

In order to assess if the estimated models are valid or not, four criteria of information are considered in accordance with contemporary GMM-oriented studies[3]. Building on these criteria, some models are not valid because the second order Areallano and Bond autocorrelation and Hansen tests are rejected. Some examples of invalid models are apparent in the second, third and last columns of Table 1 and in the second, third and seventh columns of Table 2.

To examine the relevance of consolidating remittances on TFP dynamics, in accordance with contempory literature on interactive regressions, net effects are computed (Asongu & Odhiambo, 2020b, 2020c; Agoba, Abor, Osei & Sa-Aadu, 2020). Accordingly, these net effects entail both the unconditional effect of remittances as well as the conditional or quadractic effect of remittances. For some specifications: (i) "not specifically applicable" or "nsa" is used to denote cases where net effects could not be estimated because the criteria of information used to assess the validity of models do not hold and (ii) "not applicable" or "na" is used to show scenarios where net effects could equally not be calculated because at least one estimated coefficient relevant for their computations is not significant.

To put the discussed computational insights into more perspective, in the last column of Table 2, the net effect from enhancing remittances on welfare real TFP is 0.005 (2×[-0.0002 × 4.768] + [0.007]). In the attendant calculation, the

[3] "*First, the null hypothesis of the second-order Arellano and Bond autocorrelation test (AR (2)) in difference for the absence of autocorrelation in the residuals should not be rejected. Second the Sargan and Hansen over-identification restrictions (OIR) tests should not be significant because their null hypotheses are the positions that instruments are valid or not correlated with the error terms. In essence, while the Sargan OIR test is not robust but not weakened by instruments, the Hansen OIR is robust but weakened by instruments. In order to restrict identification or limit the proliferation of instruments, we have ensured that instruments are lower than the number of cross-sections in most specifications. Third, the Difference in Hansen Test (DHT) for exogeneity of instruments is also employed to assess the validity of results from the Hansen OIR test. Fourth, a Fisher test for the joint validity of estimated coefficients is also provided*" (Asongu & De Moor, 2017, p.200).

average value of remittances is 4.768, the unconditional effect of remittance is 0.007, the conditional impact of remittances is -0.0002 while the leading 2 is traceable to the quadratic derivation.

The following findings can be established from Tables 1-2. Significant net effects are not apparent from enhancing remittances for TFP, real TFP growth and welfare TFP while positive net effects are apparent on real welfare TFP. Most of the significant control variables have the expected signs.

Table 1: Remittances and TFP dynamics (1)

	Dependent variable: Total Factor Productivty Dynamics									
	Total Factor Productivity (TFP)					**Real Total Factor Productivity Growth (Real TFP growth)**				
TFP (-1)	**0.934*** (0.000)**	**0.867** (0.023)**	**0.793*** (0.000)**	**0.685*** (0.000)**	**0.881*** (0.000)**	---	---	---	---	---
Real TFP growth (-1)	---	---	---	---	---	**0.588*** (0.000)**	**0.697*** (0.000)**	**0.482*** (0.000)**	**0.475*** (0.000)**	**0.687*** (0.000)**
Remittances (Remit)	0.001 (0.139)	**0.001** (0.023)**	0.0001 (0.862)	**-0.002*** (0.001)**	-0.0005 (0.871)	0.0007 (0.542)	0.001 (0.283)	-0.0005 (0.655)	-0.00003 (0.961)	0.004 (0.140)
Remit × Remit	-9.78e-08 (0.993)	-6.68e-06 (0.456)	0.00001 (0.283)	-4.08e-06 (0.711)	6.04e-06 (0.941)	-0.00002 (0.124)	-0.00001 (0.092)	-0.00001 (0.155)	-0.00001 (0.366)	**-0.0001** (0.013)**
FDI	---	**-0.002* (0.065)**	---	---	---	---	0.0002 (0.819)	---	---	---
Population	---	---	0.001 (0.883)	---	---	---	---	**-0.012* (0.073)**	---	---
Education	---	---	---	**0.465*** (0.000)**	---	---	---	---	-0.098 (0.286)	---
Gov't Expenditure	---	---	---	---	0.00007 (0.971)	---	---	---	---	**0.003** (0.040)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	nsa	nsa	na	na	na	na	na	na	na	nsa
AR(1)	**(0.487)**	**(0.451)**	**(0.475)**	**(0.483)**	**(0.521)**	**(0.223)**	**(0.207)**	**(0.285)**	**(0.737)**	**(0.149)**
AR(2)	**(0.950)**	**(0.970)**	**(0.832)**	**(0.782)**	**(0.908)**	**(0.103)**	**(0.127)**	**(0.122)**	**(0.789)**	(0.082)
Sargan OIR	(0.039)	(0.075)	(0.023)	**(0.374)**	(0.004)	**(0.270)**	**(0.139)**	(0.065)	(0.060)	(0.056)
Hansen OIR	(0.083)	(0.026)	**(0.115)**	(0.087)	**(0.272)**	**(0.388)**	**(0.578)**	**(0.160)**	**(0.225)**	(0.034)
DHT for instruments (a)Instruments in levels										
H excluding group	---	(0.025)	(0.008)	(0.082)	(0.005)	---	**(0.146)**	(0.007)	(0.054)	(0.014)
Dif(null, H=exogenous)	**(0.429)**	(0.084)	**(0.555)**	**(0.148)**	**(0.960)**	**(0.795)**	**(0.720)**	**(0.710)**	**(0.439)**	**(0.160)**
(b) IV (years, eq(diff))										
H excluding group	(0.048)	(0.013)	(0.037)	(0.073)	**(0.106)**	**(0.543)**	**(0.579)**	(0.077)	**(0.273)**	(0.029)
Dif(null, H=exogenous)	**(0.302)**	**(0.398)**	**(0.791)**	**(0.295)**	**(0.846)**	**(0.260)**	**(0.419)**	**(0.599)**	**(0.236)**	**(0.244)**
Fisher	**1576.26***	**2169.74***	**1748.70***	**2.58e+06***	**809.43***	**76694***	**241432***	**91722***	**1.54e+07***	**164836***
Instruments	14	18	18	18	18	18	18	18	18	18
Countries	24	24	24	24	24	24	24	24	24	24

Observations	86	86	86	74	84	86	86	86	74	84

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Fisher statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen OIR tests. Gov't: Government. nsa: not specifically applicable because the estimated model is not valid. na: not applicable because at least one estimated coefficient required for the computation of net effects is not significant. The mean value of remittances is 4.768. Constants are included in all regressions.

Table 2: Remittances and TFP dynamics (2)

	Dependent variable: Total Factor Productivty Dynamics									
	Welfare Total Factor Productivity (Welfare TFP)					**Welfare real Total Factor Productivity (Welfare real TFP)**				
Welfare TFP (-1)	**0.941*** (0.000)**	**0.927*** (0.000)**	**0.781*** (0.000)**	**0.716*** (0.000)**	**0.878*** (0.000)**	---	---	---	---	---
Welfare real TFP (-1)	---	---	---	---	---	**0.478*** (0.000)**	**0.497*** (0.000)**	**0.438*** (0.000)**	**0.383*** (0.000)**	**0.535*** (0.000)**
Remittances (Remit)	**0.002*** (0.003)**	**0.003*** (0.000)**	0.001 (0.113)	-0.0002 (0.826)	-0.0002 (0.962)	**0.001*** (0.003)**	**0.001*** (0.001)**	0.0008 (0.348)	0.0008 (0.192)	**0.007* (0.055)**
Remit × Remit	**-0.00002** (0.019)**	**-0.00003*** (0.000)**	-7.97e-06 (0.411)	**-0.00003** (0.015)**	-0.00001 (0.919)	**-0.00002*** (0.029)**	**-0.00002** (0.025)**	-0.00001 (0.292)	-0.00001 (0.199)	**-0.0002*** (0.007)**
FDI	---	-0.0006 (0.568)	---	---	---	---	0.0008 (0.704)	---	---	---
Population	---	---	-0.004 (0.476)	---	---	---	---	-0.011 (0.241)	---	---
Education	---	---	---	**0.411*** (0.000)**	---	---	---	---	0.092 (0.357)	---
Gov't Expenditure	---	---	---	---	0.0007 (0.667)	---	---	---	---	**0.003* (0.088)**
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Net Effects	nsa	nsa	na	na	na	nsa	0.0008	na	na	0.0050
AR(1)	**(0.966)**	**(0.913)**	**(0.968)**	**(0.395)**	**(0.858)**	(0.049)	(0.048)	(0.053)	**(0.207)**	**(0.100)**
AR(2)	**(0.349)**	**(0.321)**	**(0.581)**	**(0.345)**	**(0.387)**	**(0.122)**	**(0.151)**	**(0.175)**	**(0.350)**	(0.095)
Sargan OIR	(0.036)	(0.076)	(0.003)	**(0.366)**	(0.018)	(0.031)	(0.056)	(0.002)	**(0.122)**	**(0.134)**
Hansen OIR	(0.075)	(0.037)	**(0.143)**	**(0.270)**	**(0.240)**	(0.063)	**(0.187)**	**(0.100)**	**(0.260)**	**(0.176)**
DHT for instruments (a)Instruments in levels										
H excluding group	---	(0.093)	(0.008)	(0.078)	(0.006)	---	**(0.229)**	(0.008)	**(0.217)**	(0.008)
Dif(null, H=exogenous)	**(0.601)**	(0.059)	**(0.635)**	**(0.448)**	**(0.900)**	**(0.121)**	**(0.199)**	**(0.496)**	**(0.287)**	**(0.716)**
(b) IV (years, eq(diff))										
H excluding group	(0.034)	(0.052)	**(0.197)**	**(0.268)**	**(0.109)**	**(0.430)**	**(0.595)**	**(0.101)**	**(0.127)**	**(0.308)**
Dif(null, H=exogenous)	**(0.352)**	**(0.142)**	**(0.182)**	**(0.318)**	**(0.714)**	**(0.032)**	**(0.056)**	**(0.246)**	**(0.687)**	**(0.139)**
Fisher	**398.44***	**389.27***	**1010.48***	**1.70e+06***	**489.59***	**28751.78***	**30251.04***	**31193.51***	**36328.86***	**527646***
Instruments	14	18	18	18	18	14	18	18	18	18
Countries	24	24	24	24	24	24	24	24	24	24
Observations	86	86	86	74	84	86	86	86	74	84

***,**,*: significance levels at 1%, 5% and 10% respectively. DHT: Difference in Hansen Test for Exogeneity of Instruments Subsets. Dif: Difference. OIR: Over-identifying Restrictions Test. The significance of bold values is twofold. 1) The significance of estimated coefficients and the Fisher statistics. 2) The failure to reject the null hypotheses of: a) no autocorrelation in the AR(1) & AR(2) tests and; b) the validity of the instruments in the Sargan and Hansen OIR tests.

Gov't: Government. nsa: not specifically applicable because the estimated model is not valid. na: not applicable because at least one estimated coefficient required for the computation of net effects is not significant. The mean value of remittances is 4.768.

The findings of this study are not broadly consistent with the strand of literature in Section 2 supporting the importance of remittances in the accumulation of capital for economic prosperity (Aggarwal et al., 2011; Bettin et al., 2012; Kaberuka & Namubiru, 2014; Karikari et al., 2016). Moreover, it is important to note that in this study, we have focused on productivity to assess if the potential benefits of remittances documented in the attendant literature withstand empirical scrutiny within the framework of productivity. It follows that remittances are not yet adequate to favourably stimulate the engaged dynamics of TFP. This inadequateness can be explained from two main perspectives, namely: the main driving forces motivating the decision to remit and the Dutch disease. These perspectives are expanded below in the same chronology as they are highlighted.

On the front of the decision to remit, the insignificant net effects may be because the driving forces behind remittances are strategic and altruistic motives and not investment motives such that, non-monetary returns are not expected from the family and friends receiving such remittances. It is also worthwhile to note that investment motives for remittances are more associated with permanent emigration compared to strategic and insurance motivates which are more linked with temporary labour migration (Rapoport & Docquier, 2005).

With regard to the Dutch disease scenario, the insignificant net effects can also be traceable to the fact that substantial inflows in foreign currency can lead to an appreciation of domestic currency. The Dutch disease is linked to export-substitution and less productivity of domestic companies owing to such appreciation of domestic currency.

5. Concluding implications and future research directions

This research has investigated how enhancing remittances affects TFP dynamics in 25 countries in SSA using data from 1980 to 2014. The Generalised Method of Moments (GMM) empirical strategy is adopted for the purpose of the study and the engaged TFP dynamics are: TFP, real TFP, welfare TFP and real welfare TFP. From the findings, significant net effects are not apparent from enhancing remittances for TFP, real TFP growth and welfare TFP while positive net effects are apparent on real welfare TFP.

While from the findings most net effects have not been established owing of insignificant estimated coefficients, it is worthwhile to note that the insignificant effects may also have economic significance in reflecting the position that remittances cannot affect TFP dynamics in isolation and therefore need to be complemented with other mechanisms that influence TFP. Moreover, by reporting the findings that are based on insignificant results, this study departs from the "file drawer" problem or publication bias in mainstream literature which consists of preferring the reporting of strong and significant results and discarding weak and insignificant findings (Rosenberg, 2005; Franco, Malhotra & Simonovits, 2014; Ejemeyovwi & Osabuohien, 2020).

We have discussed in the previous section that the absence of significant positive net effects can be traceable to the Dutch diseases and motives of remittances which can be more skewed for consumption than for investment purposes. Hence, in the light of the findings, bold policies should be designed to tailor remittances for investment and productivity purposes. Some of suh coordinated policies that already exist and should be consolidated are, the African Diapora Investment Fund (ADIF) and African Finance Initiative (ADF). Accordingly, the ADIF aims to provide investment for African diaspora-oriented business that is relevant for the achievement of global agenda such as the sustaintable development goals. The three-core start-up financial services and products of the ADIF recently initiated by the African Union should be tailored

to enhance productivity and investment in sectors that promote import-substitution in order to promote employment, economic output, exports and by extension avoid the Dutch disease. These three-core start-up commodities are: (i) the management of the diaspora endownment trust; (ii) management of diaspora mutual funds and (iii) management and issuance of diapora bonds (African Union, 2019).

Another example that can be consolidated to improve the relevance of diaspora remittances in productivity dynamics is the ADF which aims to stimulate investments from the diasposa, create jobs, improve the social economy, as well as boost long run economic growth by supporting entrepreneurs in the diaspora in terms of addressing investment-related concerns such as, *inter alia*: (i) high borrowing cost and limited access to capital; (ii) information on the scarcity apparent in local markets; (iii) restricted support for transnational business investment and (iv) absence of diversed and structured products (Afford Diaspora Finance, 2020). Hence, the ADF project which is currently limited to four targeted countries (i.e. Nigeria, Rwanda, Sierra Leone and Zimbabwe) can be extended to other African countries in order to have the expected effects on productivity dynamics.

In the light of the above, the findings naturally leave room for future research in the understanding of channels that can complement remittances in order to engender positive outcomes on TFP dynamics. *Inter alia*, mechanisms related to information and communication technololgy are some recommendable channels to start with because they facilitate production processes as well as the smooth transfer of remittances. Moreover, understanding differences among countries in Sub-Saharan Africa is crucial. For example, Southern Africa may be different relative to, *inter alia*, East Africa, Central Africa and West Africa. These concerns should be taken on board in future studies because the narratives in the paper are tailored to be consistent with the estimation technique which eliminates country and regional fixed effects in order to avoid the correlation between the lagged dependent variable and corresponding

fixed effects that is a source of endogeneity. Hence, the adopted GMM estimation technique is not consistent with accounting for regional and country fixed effects.

Appendices

Appendix 1: Definitions and sources of variables

Variables	Signs	Variable Definitions (Measurements)	Sources
TFP1	TFP	Total Factor Productivity (TFP)	Penn World Table database
TFP2	RTFP	Real Total Factor Productivity Growth (RTFPg)	Penn World Table database
TFP3	WTFP	Welfare Total Factor Productivity (WTFP)	Penn World Table database
TFP4	WRTFP	Welfare Real Total Factor Productivity (WRTFP)	Penn World Table database
Remittances	Remittances	Personal remittances, received (% of GDP)	FDSD
Foreign Direct Investment	FDI	Foreign Direct Investment Inflows(% of GDP)	UNCTAD
Education	Education	SEPSGPI: School enrollment, primary and secondary (gross), gender parity index (GPI)	WDI
Population	Population	Logarithm of Population (in millions)	WDI
Government Expenditure	Gov't Expenditure	Governments final consumption expenditure (% of GDP)	WDI

WDI: World Development Indicators. GDP: Gross Domestic Product.UNCTAD: United Nations Conference on Trade and Development. FDSD: Financial Development and Structure Database.

Appendix 2: Summary statistics

	Mean	SD	Minimum	Maximum	Observations
Total Factor Productivity	0.539	0.310	0.121	1.884	125
Real Total Factor Productivity Growth	0.539	0.276	0.123	1.381	125
Welfare Total Factor Productivity	0.984	0.189	0.605	1.664	125
Welfare Real Total Factor Productivity	0.927	0.190	0.456	1.785	125
Remittances	4.768	12.917	0.003	89.354	107
Foreign Direct Investment	1.903	2.795	-3.440	22.118	124
Education	0.854	0.177	0.465	1.341	107
Population	2.515	0.818	-0.242	4.165	125
Government Expenditure	16.066	5.358	6.085	36.155	122

S.D: Standard Deviation.

Appendix 3: Correlation matrix (uniform sample size: 123)

TFP	RTFP	WTFP	WRTFP	Remit	FDI	Education	Pop	Gov. Ex	
1.000	0.266	0.953	0.140	-0.151	-0.127	0.256	0.045	0.088	TFP
	1.000	0.275	0.562	-0.265	0.007	-0.058	-0.230	0.039	RTFP
		1.000	0.132	-0.071	-0.091	0.266	-0.032	0.182	WTFP
			1.000	-0.074	0.090	-0.105	-0.084	-0.061	WRTFP
				1.000	0.040	0.351	-0.043	0.287	Remit
					1.000	0.223	0.056	0.124	FDI
						1.000	0.036	0.321	Education
							1.000	-0.349	Pop
								1.000	Gov. Ex

TFP: Total Factor Productivity. RTFP: WTFP: Welfare Total Factor Productivity. WRTFP: Welfare Real Total Factor Productivity. FDI: Foreign Direct Investment. Pop:population growth. Gov. Ex: Government Expenditure.

References

Abramovitz, M. (1986). "Catching up, forging ahead, and falling behind". *The Journal of Economic History*, 46(02), pp. 385-406.

Acosta, P. A., Lartey, E.K.K., & Mandelman, F.S., (2009), "Remittances and the Dutch Disease", *Journal of International Economics*, 79(1), pp. 102-116.

Afford Diaspora Finance (2020). Diaspora Finance Initiative. *AFFORD Diaspora Finance* http://www.afford-diasporafinance.org/about-dfi/ (Accessed: 22/02/2020).

African Union (2019). African Diaspora Investment Fund (ADIF) Framework Validation Workshop. The African Union https://au.int/en/pressreleases/20191118/african-diaspora-investment-fund-adif-framework-validation-workshop (Accessed: 22/02/2020).

Agbloyor, E. K., Abor, J., Adjasi, C. K. D., & Yawson, A., (2013). "Exploring the causality links between financial markets and foreign direct investment in Africa", *Research in International Business and Finance*, 28(May, 2013), pp. 118-134.

Aggarwal, R., Demirguc-Kunt, A., & Peria, M. S. M., (2011). "Do Remittances Promote Financial Development? Evidence from a Panel of Developing Countries." *Journal of Development Economics*, 96(2), pp. 255-264.

Agarwal, R., & Horowitz, A. W., (2002). "Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-Migrant Households", *World Development*, 30(11), pp. 2033-2044.

Agoba, A. M., Abor, J., Osei, K. A., & Sa-Aadu, J. (2020). "Do independent Central Banks Exhibit Varied Bahaviour in Election and Non-Election Years: The Case of Fiscal Policy in Africa". *Journal of African Business*, 21(1), pp. 105-125.

Agyei, S. K., Marfo-Yiadom, E., Ansong, A., & Idun, A. A. A. (2019). "Corporate Tax Avoidance Incentives of Banks in Ghana", *Journal of African Business*, DOI: 10.1080/15228916.2019.1695183.

Ahouakan, E. W. V., & Diene, M., (2017). "Does School Quality Matter? Primary Schools Characteristics and Child Labour Intensity in Senegal," *Journal of African Development*, 19(1), pp. 113-131.

Ajide, K. B., & Raheem, I. D., (2016). "The Institutional Quality Impact on Remittances in the ECOWAS Sub-Region", *African Development Review*, 28(4), pp. 462-481.

Akinyemi, O., Efobi, U., Asongu, S., & Osabuohien, E., (2019). "Renewable Energy, Trade Performance and the Conditional Role of Finance and Institutional Capacity of sub-Sahara African Countries", *Energy Policy*, 132(September), pp. 490-498.

Amavilah, A., Asongu, S. A., & Andrés, A. R., (2017). "Effects of globalization on peace and
stability: Implications for governance and the knowledge economy of African countries",
Technological Forecasting and Social Change, 122(C), pp. 91-103.

Amuedo-Dorantes, C., (2014), "The good and the bad in remittance flows", IZA World of Labour, Retrieved from http://wol.iza.org/articles/good-and-bad-in-remittance-flows.pdf (Accessed: 06/02/2017).

Arellano, M., & Bover, O. (1995). "Another look at the instrumental variable estimation of errorcomponents models". *Journal of Econometrics,* 68(1), pp. 29–52.

Assefa, T. A., & Mollick, V., (2017). "Financial Development and Economic Growth in Africa", *Journal of African Business*, 18(3), pp. 320-339.

Asongu, S. A., (2014). "Correcting Inflation with Financial Dynamic Fundamentals: Which Adjustments Matter in Africa?", *Journal of African Business*, 15(1), pp. 64-73.

Asongu, S. A., (2020). "Financial Access and Productivity Dynamics in Sub-Saharan Africa", *International Journal of Public Administration*, DOI: 10.1080/01900692.2019.1664570.

Asongu, S. A., Batuo, E., Nwachukwu, J. C., & Tchamyou, V. S., (2018). "Is information diffusion a threat to market power for financial access? Insights from the African banking industry", *Journal of Multinational Financial Management*, 45(June), pp. 88-104.

Asongu, S. A., & Biekpe, N., & Tchamyou, V. S., (2019). "Remittances, ICT and doing business in Sub-Saharan Africa", *Journal of Economic Studies*, 46(1), pp. 35-54.

Asongu, S. A, & De Moor, L., (2017). "Financial Globalisation Dynamic Thresholds for
Financial Development: Evidence from Africa", *European Journal of Development Research*,
29(1), pp.192-212.

Asongu, S. A., le Roux, S, & Biekpe, N., (2017). "Environmental Degradation, ICT and Inclusive Development in Sub-Saharan Africa", *Energy Policy*, 111(December), pp.353-361.

Asongu, S. A., & Nwachukwu, J. C., (2017)." Foreign Aid and Inclusive Development: Updated Evidence from Africa, 2005–2012", *Social Science Quarterly*, 98(1), pp. 282-298.

Asongu, S. A., & Odhiambo, N. M., (2018a). "ICT, Financial Access and Gender Inclusion in the Formal Economic Sector: Evidence from Africa", *African Finance Journal*, 20(2), pp. 46-66.

Asongu, S. A., & Odhiambo, N. M. (2018b). "Information asymmetry, financialization, and financial access", *International Finance*, 21(3), pp. 297-315.

Asongu, S. A., & Odhiambo, N. M., (2019a)."Basic formal education quality, information technology, and inclusive human development in sub-Saharan Africa", *Sustainable Development*, 27(3), pp. 419-428.

Asongu, S. A., & Odhiambo, N. M., (2019b)." Challenges of Doing Business in Africa: A Systematic Review", *Journal of African Business*, 20(2), pp. 259-268.

Asongu, S. A., & Odhiambo, N. M., (2019c). "How enhancing information and communication technology has affected inequality in Africa for sustainable development: An empirical investigation", *Sustainable Development*, 27(4), pp. 647-656.

Asongu, S. A., & Odhiambo, N. M., (2020a). "Remittances, the diffusion of information and industrialisation in Africa", *Contemporary Social Science*, DOI: 10.1080/21582041.2019.1618898.

Asongu, S. A., & Odhiambo, N. M., (2020b). "Economic Development Thresholds for a Green Economy in Sub-Saharan Africa", *Energy Exploration & Exploitation*, 38(1), pp. 3-17.

Asongu, S. A., & Odhiambo, N. M., (2020c). "Governance, CO2 emissions and inclusive human development in sub-Saharan Africa", *Energy Exploration & Exploitation*, 38(1), pp. 18-36.

Baliamoune, M. (2009). "Openness, Growth and Convergence in Africa: Evidence from 1980-1999 Data". *Journal of African Development*, 11(1), pp. 109-126.

Baliamoune-Lutz, M. (2011). "Growth by Destination (Where You Export Matters): Trade with China and Growth in African Countries". *African Development Review*, *23*(2), pp. 202-218.

Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P., (2009), "Do Workers' Remittances Promote Economic Growth?" *IMF Working Paper* WP/09/153, Washington.

Barro, J. R., (2003). "Determinants of Economic Growth in a Panel of Countries", *Annals of Economics and Finance*, 4(2), pp. 231-274.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). "Law and Finance: Why Does Legal Origin Matter?"*Journal of Comparative Economics*, 31(4), pp. 653–675.

Becker, G. S., Laeser, E. L., & Murphy, K. M. (1999). "Population and economic growth". *American Economic Review*, 89(2), pp. 145-149.

Bettin, G., Lucchetti, R., and Zazzaro, A., (2012), "Endogeneity and sample selection in a model for remittances," *Journal of Development Economics,* 99(2), pp. 370-384.

Boateng, A., Asongu, S. A., Akamavi, R., & Tchamyou, V. S., (2018). "Information Asymmetry and Market Power in the African Banking Industry", *Journal of Multinational Financial Management,* 44(March), pp. 69-83.

Bokpin, G. A., Ackah, C., & Kunawotor, M. E., (2018). "Financial Access and Firm Productivity in Sub-Saharan Africa", *Journal of African Business*, 19(2), pp. 210-226.

Cheruiyot, K. J., (2017). "Determinants of Technical Efficiency in Kenyan Manufacturing Sector", *African Development Review*, 29(1), pp. 44-55.

Cisse, F., (2017). "Do Firms Learn by Exporting or Learn to Export? Evidence from Senegalese Manufacturing Firms,"*Journal of African Development*, 19(1), pp. 133-160.

Devarajan, S, Easterly, W., & Pack, H., (2001). "Is investment in Africa too high or too low?
Macro- and micro-evidence", *Journal of African Economies*, 10 (suppl 2), pp. 81-108.

Dunne, J. P., & Masiyandima, N., (2017). "Bilateral FDI from South Africa and Income Convergence in SADC," *African Development Review*, 29(3), pp. 403-415.

Durlauf, S., Johnson, P. & Temple, J. (2005). "Growth econometrics", in Aghion, P. and
Durlauf, S. (Eds.), Handbook of Economic Growth, Elsevier, North Holland.

Dzansi, J., (2013). "Do Remittance Inflow Promote Manufacturing Growth?" *The Annals of Regional Science*, 51(1), pp. 89-111.

Easterly, W., & Levine, R. (2001). "It's Not Factor Accumulation: Stylized Facts and Growth Models". *World Bank Economic Review*,15(2), pp. 177–220.

Efobi, U. R., Asongu, S., Okafor, C., Tchamyou, V., & Tanankem, B., (2019). "Remittances, finance and industrialisation in Africa", *Journal of Multinational Financial Management*,
49 (March), pp. 54-66.

Efobi, U. R., Osabuohien, E.S., & Oluwatobi, S., (2015), "One Dollar, One Bank Account: Remittance and Bank Breadth in Nigeria", *Journal of International Migration and Integration*, 16(3), pp. 761-781.

Efobi, U. R., Tanaken, B. V., & Asongu, S. A., (2018). "Female Economic Participation with
Information and Communication Technology Advancement: Evidence from Sub- Saharan
Africa", *South African Journal of Economics*, 86(2), pp. 231-246.

Ejemeyovwi, J. O., & Osabuohien, E. S., (2020). "Investigating the relevance of mobile technology adoption on inclusive growth in West Africa", *Contemporary Social Science*, DOI: 10.1080/21582041.2018.1503320.

Elu, J. U. & Price, G. N., (2010). "Does China Transfer Productivity Enhancing Technology to Sub-Saharan Africa? Evidence from Manufacturing Firms", *African Development Review*, 22(S1), pp. 587–598.

Elu, J. U., & Price, G. N., (2017). "Science Labor Supply in Sub-Saharan Africa: Is There a Gender Disparity in Preferences?," *African Development Review*, 29(3), pp. 367-375,

Fanta,, A. B & Makina, D., (2017). "Equity, Bonds, Institutional Debt and Economic Growth: Evidence from South Africa," *South African Journal of Economics*, 85(1), pp. 86-97.

Fedderke, J. W., & Mengisteab, D. K., (2017). "Estimating South Africa's Output Gap and Potential Growth Rate," *South African Journal of Economics*, 85(2), pp.161-177.

Fosu, K. F., & Abass, A. F., (2019). "Domestic Credit and Export Diversification: Africa from a Global Perspective", *Journal of African Business*, 20(2), pp. 160-179.

Fouda, O. J. P., (2009), "The excess liquidity of banks in Franc zone: how to explain the
paradox in the CEMAC", *Revue Africaine de l'Integration*, 3(2), pp. 1-56.

Franco, A., Malhotra, N., & Simonovits, G., (2014). "Publication Bias in the Social Sciences:
Unlocking the File Drawer", *Science*, 345(6203), pp. 1502-1505.

Heady, D. D., & Hodge, A. (2009). "The effect of population growth on economic growth: A meta-regression analysis of the macroeconomic literature". *Population and Development Review*, 35(2), pp. 221-248.

Hossain, A.K.M., & Hasanuzzaman, S., (2015), "Remittances and investment nexus in Bangladesh: an ARDL bounds testing approach", *International Review of Economics*, 60 (4), pp. 387-407.

Kaberuka, W., & Namubiru, R., (2014). "The effect of remittances on gross domestic savings in Uganda (1999-2011)", *International Journal of Business Management and Administration*, 3(2), pp. 29-39.

Kapur, D., (2004), "Remittances: The New Development Mantra? United Nations Conference on Trade and Development, G-24 Discussion Paper Series", Retrieved from http://www.cities-localgovernments.org/committees/fccd/Upload/library/gdsmdpbg2420045_en_en.pdf (Accessed: 12/07/2017).

Karikari, N.K., Mensah, S. and Harvey, S.K., (2016), Do Remittance Promote Financial Development in Africa? Springer Plus, 5. Retrieved from http://link.springer.com/article/10.1186/s40064-016-2658-7 (Accessed: 12/07/2017).

Klenow P.J. & Rodriguez-Clare, A., (1997). "The Neoclassical Revival in Growth Economics: Has It Gone Too Far?". *NBER Macroeconomics Annual,* 73–114.

Kou, G., Chao, X., Peng, Y., & Alsaadi, F. E., (2019a). "Machine learning methods combined with financial systemic risk", *Technological and Economic Development of Economy*, DOI: https://doi.org/10.3846/tede.2019.8740.

Kou, G., Yang, P., Xiao, F., Chen, Y., & Alsaadi, F. E., (2019b). "Evaluation of feature selection methods for text classification with small datasets using multiple criteria decisionmaking methods", *Applied Soft Computing*, DOI: https://doi.org/10.1016/j.asoc.2019.105836.

Kou, G., Ergu, D., Chen, Y., & Lin, C., (2016). "Pairwise comparison matrix in multiple criteria decision making", *Technological and Economic Development of Economy*, 22(5), pp. 738-765.

Kou, G., Lu, Y., Peng, Y., & Shi, Y., (2012). "Evaluation of Classification Algorithms using MCDM and Rank Correlation", *International Journal of Information Technology & Decision Making*, 11(1), pp. 197-225.

Kou, G., Peng, Y., & Wang, G., (2014). "Evaluation of clustering algorithms for financial risk analysis using MCDM methods", *Information Sciences*, 275(August), pp. 1-12.

Kreuser, C. F., & Newman, C., (2018). "Total Factor Productivity in South African Manufacturing Firms," *South African Journal of Economics*, 86(S1), pp. 40-78.

Kumi, E., & Muazu I., & Yeboah, T., (2017). "Aid, Aid Volatility and Sectoral Growth in Sub-Saharan Africa: Does Finance Matter?," *Journal of African Business*, 18(4), pages 435-456.

Kusi, B. A., Agbloyor, E. K., Ansah-Adu, K., & Gyeke-Dako, A. (2017). "Bank credit risk and credit information sharing in Africa: Does credit information sharing institutions and context matter?" *Research in International Business and Finance*, 42(December), pp.1123- 1136.

Kusi, B. A., & Opoku- Mensah, M. (2018). "Does credit information sharing affect funding cost of banks? Evidence from African banks". *International Journal of Finance & Economics*, 23(1), pp. 19- 28.

Lalountas, D.A., Manolas, G.A., & Vavouras, I.S., (2011), " Corruption, globalization and development: How are these three phenomena related?", Journal of Policy Modeling, 33(4), pp.636-648.

Lartey, E. K., Mandelman, F. S., & Acosta, P. A. (2008). Remittances, exchange rate regimes, and the Dutch Disease: a panel data analysis. Technical report, Working Paper, Federal Reserve Bank of Atlanta.

Love, I., &Zicchino, L. (2006). "Financial Development and Dynamic Investment Behaviour: Evidence from Panel VAR".*The Quarterly Review ofEconomics andFinance*, 46(2), pp. 190–210.

Mabrouk, F., & Mekni, M. M., (2018). "Remittances and Food Security in African Countries", *African Development Review*, 30(3), pp. 252-263.

Maryam, K., & Jehan, Z., (2018). "Total Factor Productivity Convergence in Developing Countries: Role of Technology Diffusion," *South African Journal of Economics*, 86(2), pp. 247-262.

Massey, D., & Parrado, E., (1998), "International Migration and Business Formation in Mexico", *Social Science Quarterly*, 79(1), pp. 1-20.

Meniago, C., & Asongu, S. A., (2019). "Harnessing FDI spillovers on TFP and economic growth in Sub-Saharan Africa: the relevance of value chains across economic sectors", *African Governance and Development Institute Working Paper* , Yaoundé.

Meniago, C., & Asongu, S. A., (2018). "Revisiting the Finance-Inequality Nexus in a Panel of African Countries", *Research in International Business and Finance*, 46 (December), pp. 399-419.

Muazu I., & Alagidede, P., (2017). "Financial Development, Growth Volatility and Information Asymmetry in Sub-Saharan Africa: Does Law Matter?," *South African Journal of Economics*, 85(4), pp. 570-588.

Nelson, R.R. & Pack, H. (1999). "The Asian Growth Miracle and Modern Growth Theory". *Economic Journal* 109(457), pp. 416–36.

Nyasha, S., & Odhiambo, N. M. (2015a). "Do banks and stock market spur economic growth? Kenya's experience", *International Journal of Sustainable Economy*, 7(1), pp. 54-65.

Nyasha, S., & Odhiambo, N. M. (2015b). "The Impact of Banks and Stock Market Development on Economic Growth in South Africa: An ARDL-bounds Testing Approach", *Contemporary Economics*, 9(1), pp. 93-108.

Okafor, G., Piesse, J., & Webster, A., (2017). "FDI Determinants in Least Recipient Regions: The Case of Subâ€ Saharan Africa and MENA," *African Development Review*, 29(4), pp. 589-600.

Okey, M. K. N., (2019). "Does International Migration Promote Industrial Development? Evidence from Africa 1980–2010", *International Economic Journal*, 33(2), pp. 310-331.

Osabuohien, E. S., & Efobi, U. R., (2013). "Africa's money in Africa", *South African Journal of Economics*, 81(2), pp. 292-306.

Rajan, R. G. & Subramanian, A., (2005). "What undermines aid's impact on growth?" Technical report, National Bureau of Economic Research, Cambridge.

Ratha, A., & Moghaddam, M., (2020). "Remittances and the Dutch disease phenomenon: evidence from the bounds error correction modelling and a panel space", Journal *of Applied Economics*, DOI: 10.1080/00036846.2019.1710452.

Rapoport, H. & Docquier, F., (2005). "The economics of migrants' remittances", *IZA Discussion Paper*, No. 1531, Bonn.

Romer, P. M., (1986). "Increasing returns and Long-run growth". *Journal of Political Economy*, 94(5), pp. 1002-1037.

Romer, P. M., (1993). "Idea gaps and object gaps in economic development". *Journal of monetary economics*, 32(3), pp. 543-573.

Roodman, D. (2009). "How to Do Xtabond2: An Introduction to Difference and System GMM in Stata".*Stata Journal*, 9(1), pp. 86–136.

Rosenberg, M. S., (2005). "The file-drawer problem revisited: a general weighted method for
calculating fail-safe numbers in meta-analysis", *Evolution*, 59(2), pp. 464-468.

Sahoo, P., Dash, R. K., & Nataraj, G., (2010). "Infrastructure Development and Economic Growth in China", *IDE Discussion Paper* No. 261, Chiba.

Saxegaard, M., (2006), "Excess liquidity and effectiveness of monetary policy: evidence from
sub-Saharan Africa", *IMF Working Paper* No. 06/115, Washington.

Selaya, P., & Thiele, R., (2010). "Aid and sectoral growth: Evidence from panel data". *Journal of Development Studies*, 46(10), pp. 1749–1766.

Ssozi, J., & Asongu, S. A., (2016a). "The Comparative Economics of Catch-up in Output per Worker, Total Factor Productivity and Technological Gain in Sub-Saharan Africa", *African Development Review*, 28(2), pp. 215-228.

Ssozi, J., & Asongu, S. A., (2016b). "The Effects of Remittances on Output per Worker in Sub-Saharan Africa: A Production Function Approach", *South African Journal of Economics*, 84(3), pp. 400-421.

Syed, S., & Miyazako, M., (2013), "Promoting Investment in Agriculture for Increased Production and Productivity", Italy: CAB International and Food and Agriculture Organisation.

Temple, J. (1999). "The New Growth Evidence". *Journal of Economic Literature*, 37(1), pp. 112-156.

Tchamyou, V. S, (2017). "The Role of Knowledge Economy in African Business", *Journal of the Knowledge Economy*, 8(4), pp. 1189–1228.

Tchamyou, V. S., (2020). "Education, Lifelong learning, Inequality and Financial access:
Evidence from African countries". *Contemporary Social Science*.
DOI: 10.1080/21582041.2018.1433314.

Tchamyou, V. S., (2019)."The Role of Information Sharing in Modulating the Effect of Financial Access on Inequality".*Journal of African Business*, 20(3), pp. 317-338.

Tchamyou, V. S., & Asongu, S. A., (2017)."Information Sharing and Financial Sector Development in Africa", *Journal of African Business*, 18(7), pp. 24-49.

Tchamyou, V. S., Asongu, S. A., & Nwachukwu, J. C., (2018). "Effects of asymmetric information on market timing in the mutual fund industry", *International Journal of Managerial Finance*, 14(5), pp. 542-557.

Tchamyou, V.S., Erreygers, G., & Cassimon, D., (2019a). "Inequality, ICT and Financial Access in Africa", *Technological Forecasting and Social Change*,139(February), pp. 169-184.

Tchamyou, V. S., Asongu, S. A., & Odhiambo, N. M., (2019b). "The role of ICT in modulating the effect of education and lifelong learning on income inequality and economic growth in Africa", *African Development Review*, 31(3), pp. 261-274.

Tsegai, D., (2004). "Effects of migration on the source communities in the Volta Basin of Ghana: Potential links of migration, remittances, farm and non-farm self-employment activities". Working paper, Economics and Technological Change. Bonn, Germany: University of Bonn.

Uduji, J.I. & Okolo-Obasi, E. N., (2018a). "Adoption of improved crop varieties by involving farmers in the e-wallet programme in Nigeria". *Journal of Crop Improvement, Journal of Crop Improvement*, 32 (5), pp. 717-737.

Uduji, J.I. & Okolo-Obasi, E. N., (2018b). "Young rural women's participation in the e-wallet programme and usage intensity of modern agricultural inputs in Nigeria", *Gender, Technology and Development*, 22(1), pp. 59-81.

Veeramacheneni, B., Vogel, R., & Ekanayake, E.M., (2008). "Information technology, FDI and economic growth: an india case study". *Southwest Economic Review*, 35 (1), pp. 95-112.

Williams, K., (2016). "Remittances and Financial Development: Evidence from Sub-Saharan Africa", *African Development Review*, 28(3), pp. 357-367.

Wilson, M. K., & Vencatachellum, D. J-M., (2019). "Global Financial Markets, Natural Resources and Cross-Border Mergers and Acquisitions in Africa", *Journal of African Business*, DOI: 10.1080/15228916.2019.1693220.

Woodruff, C., & Zenteno, R.M., (2001), "Remittances and Microenterprises in Mexico," Mimeo, UC San Diego.

World Bank (2006). Global Economic Prospects 2006: Economic Implications of Remittances and Migration. Washington, DC: World Bank.

Yaya K. Y., & Cabral, F. J., (2017). "Innovation and Volatility of the GDP Growth Rate: Case of the Economies of Sub-Saharan Africa," *Journal of African Development*, 19(1), pp. 88-112.

Young, A. (1995). "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience". *Quarterly Journal of Economics*, 110(3), pp. 641–80.