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Uchenna Efobi
College of Business and Social Sciences,
Covenant University, Ota, Ogun State, Nigeria
E-mail: Uche.efobi@covenantuniversity.edu.ng

Simplice Asongu
Department of Economics, University of South Africa.
P. O. Box 392, UNISA 0003, Pretoria South Africa.
E-mails: asongusimplice@yahoo.com /
asongus@afridev.org

Chinelo Okafor
Covenant University, Ota, Ogun State, Nigeria
E-mail: chilepvictor@yahoo.com

Vanessa Tchamyou
Faculty of Applied Economics, University of Antwerp,
Antwerp, Belgium
E-mail: simenvanessa@yahoo.com

Belmondo Tanankem
Ministry of Economy, Planning and Regional Development – Cameroon,
Department of Analysis and Economic Policies
E-mail: tanankemvoufo@yahoo.fr

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Remittances, Finance and Industrialisation in Africa

Uchenna Efobi, Simplice Asongu, Chinelo Okafor, Vanessa Tchamyou & Belmond Tanankem

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Abstract

The paper assesses how remittances directly and indirectly affect industrialisation using a panel of 49 African countries for the period 1980-2014. The indirect impact is assessed through financial development channels. The empirical evidence is based on three interactive and non-interactive simultaneity-robust estimation techniques, namely: (i) Instrumental Fixed Effects (FE) to control for the unobserved heterogeneity; (ii) Generalised Method of Moments (GMM) to control for persistence in industrialisation and (iii) Instrumental Quantile Regressions (QR) to account for initial levels of industrialisation. The non-interactive specification elucidates direct effects of remittances on industrialisation whereas interactive specifications explain indirect impacts. The findings broadly show that for certain initial levels of industrialisation, remittances can drive industrialisation through the financial development mechanism. Policy implications are discussed.

JEL Classification: F24; F43; G20; O55
Keywords: Africa; Diaspora; Financial development; Industrialisation; Remittances

1. Introduction

This study on linkages between financial development, remittances and industrialisation is motivated by three main factors in policy and scholarly circles, notably: (i) increasing remittances to Africa; (ii) growing policy interest on the importance of fast-tracking and fostering industrialisation in Africa and (iii) gaps in the literature. The points are substantiated in chronological order.

First, as illustrated in Section 2.1, remittances inflow into Africa has been growing over the last two decades and there is a policy interest of understanding how this external resource can be leveraged for economic development. Within this context, a study on the connection between remittances and industrialisation is worthwhile. Such a connection is even more relevant because some success stories have been recorded in African countries as a result of Diaspora investment. Examples include: the *Dahabshiil* story of Somalia Diaspora, which throve rapidly despite state collapse as in Somalia in 1988. In Nigeria, some organizations such as Nigeria in Diaspora Support Programme, the Annual Diaspora Direct Investment Summit and the Nigerian Diaspora Trade and Investment Association, are success stories on how the Diaspora can contribute to industrial growth and development. Nonetheless, though Diaspora financial inflow may not be expected to have a huge industrial push in Africa, it can help provide a stable economic foundation on which sustainable industrial development can be fostered.

Second, on the policy interest of industrialisation in Africa, investors should be interested in establishing manufacturing industries in Africa for at least two reasons. (i) The continent is experiencing a period a growth resurgence that began in the mid 1990s (Fosu, 2015) and was recently host to six of the ten fastest growing economies in the world (Asongu & Gupta, 2016). (ii) According to a United Nations (UN) estimates, the population of African is expected to double by 2036 (UN, 2009). Asongu (2013a) has concluded that the incremental population can exclusively be accommodated by private investment, contrary to public investment. Moreover, compared to other regions of the world, there is a burgeoning middle class in the continent (Shimeles & Ncube, 2015). The above factors translate investment opportunities for investors to establish manufacturing industries in Africa. Investments for industrial purposes in a formal setting usually require the services of a formal financial institution (or bank) for credit purposes because partial debt-financing is a better optimal financing structure than exclusively equity financing (see Scott, 1977; Bradley et al., 1984), because the former is associated with a tax-shield. Hence, remittances may complement debt-financing for investment purposes. Furthermore, remittances can be used as deposits (or liquid liabilities) with which to leverage on capital for investment purposes. In this scenario where the credit obtained from the bank is higher than the corresponding deposits. Having discussed the growing importance of remittances, the relevance of remittances in Africa's economic development, reasons for which investors should be interested in African industrialisation and the importance of financial development as a channel of industrialisation in the preceding two paragraphs, in what follows the study is

situated within the context of extant literature on the relevance of remittances in development outcomes.

Third, as critically engaged in Section 2.2, the extant literature on channels for the economic consequences of remittances can be discussed in five main strands, notably: (i) remittances as a source of liquidity for entrepreneurship (Woodruff & Zentano, 2001; Massey & Parrado, 1998; Woodruff & Zenteno, 2007; Asongu et al., 2019); (ii) remittances as a boost to industrialisation through skill enhancement, technology transfer and improved market-oriented production (Tsegai, 2004; Brinkerhoff, 2006; Dzansi, 2013; Syed & Miyazako, 2013; Ssozi & Asongu, 2016a, 2016b); (iii) the exchange channel which affects the manufacturing sector's performance (Rajan & Subramanian, 2005; Selaya &Thiele, 2010; Barajas et al., 2009; Dzansi, 2013); (iv) the mechanism on the demand for non-tradable goods (Lartey et al., 2008; Lartey & Mandelman, 2009; Amuedo-Dorantes, 2014) and (v) the financial development channel which has either considered the effect of financial development on industrialisation (Shahbaz & Lean, 2012; Udoh & Ogbuagu, 2012; Ewetan & Ike, 2014) or the importance of remittances in financial development (Aggarwal, Demirguc-Kunt &Peria, 2011; Kaberuka &Namubiru; 2014; Karikari, Mensah & Harvey, 2016).

In the light of the above literature, this study contributes to the first-four strands by articulating the unexplored financial channel and to the last-strand, by connecting the two main branches of attendant literature. It is important to articulate the latter contribution within the context of African-centric contemporary literature. Accordingly, the paper's novel approach in examining the complementary role of remittances and financial development in spurring industrialization distinguishes it from two studies that are closely related to the fifth strand of the extant literature summarized in the preceding paragraph, namely: (i) Gui-Diby and Renard (2015), a study which has investigated the importance of foreign direct investment in Africa's industrialisation and (ii) Karikari, Mensah and Harvey (2016) who have focused on the nexus between remittances and financial development. In summary, the positioning of this study contributes both to the broad literature on channels through which remittances can boost industrialisation and to African-centric literature on the relevance of financial development in greasing the impact of remittances on industrialisation.

In spite of the absence of a formal theoretical model on linkages between remittances, financial development and industrialisation, we argue that 'applied econometrics' should not be exclusively restricted to acceptance or rejection of empirical results that are based on established theoretical underpinnings. Hence, consistent with empirical literature (see

Costantini & Lupi, 2005; Narayan et al., 2011), building on sound intuition (even in the absence of a formal theoretical model) is also a useful scientific exercise.

The study builds on two questions: first, to what extent will Diaspora remittance inflow affect Africa's industrialization drive? Second, will this effect be dependent on the quality of the financial institutions in the respective countries? In order to provide answers to these questions, the research uses a panel of 49 African countries for the period 1980-2014. The empirical evidence is based on three interactive and non-interactive simultaneity-robust estimation techniques, namely: (i) Instrumental Fixed Effects (FE) to control for the unobserved heterogeneity; (ii) Generalised Method of Moments (GMM) to control for persistence in industrialisation and (iii) Instrumental Quantile Regressions (QR) to account for initial levels of industrialisation. The non-interactive specification elucidates direct effects of remittances on industrialisation whereas interactive specifications explain indirect impacts. The results broadly show that for certain initial levels of industrialisation, remittances can drive industrialisation through the financial development mechanism.

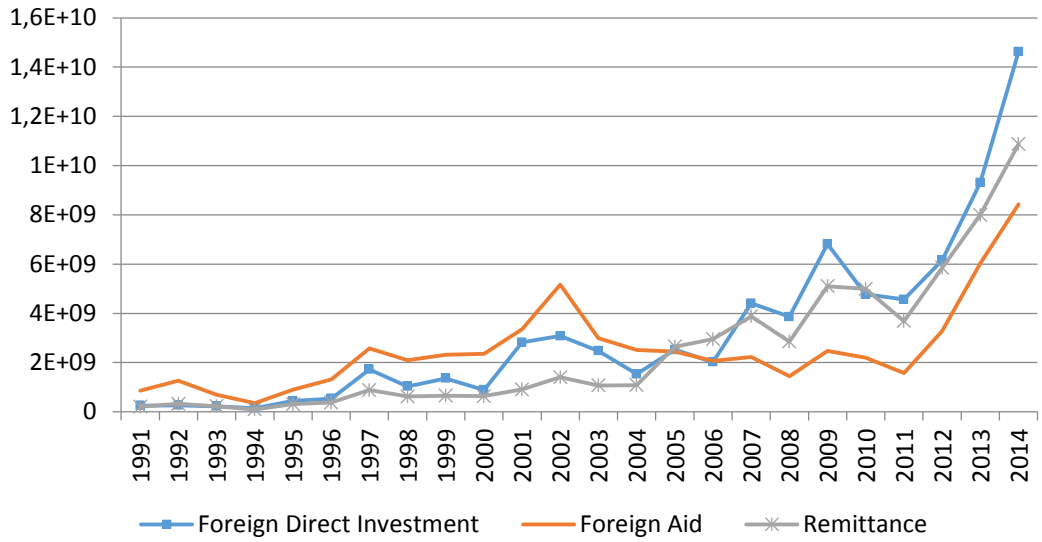
The rest of the paper is structured as follows. Section 2 discusses stylized facts and related literature. The data and methodology are covered in section 3 while section 4 presents the empirical results. Section 5 concludes with implications and future research directions.

2. Stylized facts and literature review

2.1 Stylized facts

Remittances represent an important source of foreign capital flow to Sub-Sahara African (SSA) countries. Since the early 2000s, the flow of remittances to these countries has increased many folds above foreign aid, and very close to the volume of foreign direct investment (See Figure 1). Among the benefits of remittances over other forms of foreign capital flow is that it is less cyclical and volatile. Hence it has become the focus of African Development practitioners, especially considering public policies to harness this all-important capital flow. For example, the Joint African Union-Economic Commission for Africa (ECA) in 2013 emphasised on the need for African countries to refocus attention to leveraging on remittance flow.

Figure 1: Foreign Investment Flow to Africa



Source: Authors' Computation from World Development Indicators

Despite the trend of remittance inflow to SSA countries, and the public policies directed at improving the volume of flow, there is still a huge resource deficit experienced by SSA countries, especially in driving their industrialisation. For instance, Africa's current infrastructure needs stand at a value of 93 billion US$ annually, from which 45 billion US$ is mobilised from different domestic sources, leaving an annual deficit of about 50 billion US$ (Elhiraika, 2015). Also, the growth experienced in some SSA countries has not been able to generate enough savings for investment, and the estimated finance gap for investment is estimated at more than 5 percent (Hamdok, 2015). Yet, reducing this resource gap will require additional sources of finance. Apart from Foreign Direct Investment (FDI), remittances are seen as an alternative. However, remittances sent to SSA countries are mostly used for consumption and anti-cyclical purposes. Therefore to leverage on the increasing inflow and channel its usage for industrial growth and development, a developed financial system will be required to play two important roles: (i) reduce the cost of remittance inflow to the respective SSA countries; and (ii) provide financial instruments that can aid in channelling such inflows to industrial development activities. This proposition has currently not received any empirical attention, which therefore motivates this study.

2.2 Literature review

Industrialisation is the socio-economic process of rapid transformation in significant manufacturing activity in relation to other forms of production and work undertaken within a respective economy (Naude, Szirmai & Lavopa, 2013). It entails the increase in value addition of the manufacturing sector in relation to the overall size of the economy. Thus a significant development of the manufacturing sector, compared with other sectors, will lead to a faster attainment of any country's industrialisation (Gui-Diby & Renard, 2015). From these definitions, two components are required for thriving industrialisation. They include:(i) the encouragement of the manufacturing sector for production;(ii) such production must be sustained in order to meet local and international demands.

Remittances on the other hand, are the financial flow from migration. It is largely seen as household transfer with altruism motives and have a social insurance role (Agarwal & Horowitz, 2002; Kapur, 2004). However, there are more benefits from remittances than just the household outcomes. There is a rich literature that documents a more active utilisation of capital flow from remittances rather than final demand expenditure. For instance, considering industrialisation of nations, remittance inflow can be of immense benefit through different channels.

Focusing on the first channel, remittance can be a source of liquidity for boosting domestic entrepreneurship. Furthermore, remittances act as a substitute for inefficient or non-existent credit markets in order to enable local entrepreneurs bypass the barriers to business development that results from lack of start-up capital or high interest rates. For instance, Woodruff and Zentano (2001) found that 27% of firms in Mexico were reliant on remittances from abroad to finance their liquidity and that remittances represent 20% of the capital invested for business development. Some other studies that show the positive relationship between remittances and industrial growth include: Massey and Parrado (1998) and Woodruff and Zenteno (2007) showed improved Mexican businesses asa result of remittance; Yang (2008) confirmed that Filipino households engaged more in investments and entrepreneurship as a result of remittance; while Hossain and Hasanuzzaman (2015) showed that investment in Bangladesh's economy increased as a result of remittances.

Another channel through which remittance inflow promotes industrialisation is skill and technology transfer, and improved market-oriented production. Brinkerhoff (2006) presents an explicit analysis of how migrants promote skill transfer within the homelands of Peoples

Republic of China (PRC), Philippines, and Afghanistan. Dzansi (2013) also used manufacturing data on a sample of 40 remittance-dependent economies over the period 1991 to 2004 to conclude that remittance inflow accelerates manufacturing growth through improved skill and technology transfers that migrants bring to their home countries. Syed and Miyazako (2013) found remittances to be an important source of investment in agriculture, particularly for a shift from subsistence agriculture to market-oriented production. Likewise in Ghana, remittance is seen to improve both farm and non-farm production (Tsegai, 2004). This important role of remittance is vital for African countries as there is a policy debate on how to improve the agricultural sector from subsistence and primary production to value addition. Traditionally, lack of access to fundamental assets and productive inputs like credit, has prevented the capitalisation of agricultural enterprises and productivity in developing countries. Moreover, remittances have also been recently documented to contribute to output per worker (Ssozi & Asongu, 2016a) and TFP (Ssozi & Asongu, 2016b) in SSA.

A third channel through which remittances inflow affects industrialisation is the exchange rate, which will definitely affect the manufacturing sector's performance. Remittance inflow can affect the relative growth of traded and non-traded manufacturing sectors. Its impact on the traded manufacturing sector is principally affected by its role on the country's real exchange rate (Rajan &Subramanian, 2005; Selaya &Thiele, 2010). Since remittances affect the exchange rate of countries as a result of the demand for and supply of foreign exchange, the value of tradable manufacturing goods will most likely be affected, which will in turn influences the performance of the manufacturing sector. This effect is largely dependent on the extent to which the nature of traded-goods production is likely to generate dynamic production externalities (Barajas et al., 2009). Dzansi (2013) supports this argument.

Another channel of remittances on industrialisation is that it spurs up the demand for non-tradable goods. For instance, Acosta, Lartey and Mandelman (2009) found that remittances could lead to a decline in the production of manufactured and other tradable goods as a result of real exchange rate appreciation. Since remittance inflow raises consumption of household (Amuedo-Dorantes, 2014), the demand for non-tradable will also be on the increase and will affect the productive performance of other sectors. Lartey et al. (2008) showed this relationship by using a sample of 109 developing and transition countries for the

period 1990-2003. Their study found a relative positive impact of remittance inflow on the prices of non-tradable compared to tradable goods.

Focusing on financial development (which is the efficiency of the financial sector), studies have shown that remittance has an indirect impact on the growth of the manufacturing sector and industrialisation through its impact on financial development. The development of the financial sector imply that financial institutions are becoming more efficient in performing their responsibility of transforming mobilised deposits into credit for economic operators within an economy. Thus, for a financial system to be efficient there must be credit flowing more or less from the financial system to the real economy through the pooling of savings and allocation of capital to productive investments, among others (Levine, 2005; Estrada et al., 2010; Svirydzenka, 2016). In this study, however, our main interest is to observe the effect of interacting remittances and financial development on industrialisation. Our main argument is that in the long-run, the efficiency of the financial system,mixed with inflow of financial resources (through remittance), will result in the growth of the manufacturing sector and industrial development.This proposition has not received much empirical attention.

Much of the literature on remittance and financial development have considered either the impact of financial development on industrialisation (see Shahbaz & Lean, 2012; Udoh & Ogbuagu, 2012; Ewetan & Ike, 2014) or how remittances can be an important source of financial sector development (see Aggarwal, Demirguc-Kunt &Peria, 2011; Kaberuka &Namubiru; 2014; Karikari, Mensah & Harvey, 2016). In this study we considered the interactive effect between remittance inflow and financial development on industrialisation. We propose that this relationship can be complementary depending on the recipient country's government intervention. Taking a cue from Chinese industrial growth and the relevance of migrant input, it is evident that the active participation of the government and its dynamic policies targeted at encouraging migrant input to the economy had a great impact on Chinese industrial development (Xiang, 2006). For instance, the government creates policies that define the "rule of the game" and creates incentives to encourage economic interactions. Some of these policies can be directed at improving the quality of the financial institutions in the respective countries through *targeted regulations*. This is such that financial institutions play supportive role to aid thriving remittance recipients to better utilise the fund for investment and business development.

3. Data and methodology

3.1 Data

This study assesses a panel of 49 African countries with data for the period 1980-2014 from World Development Indicators (WDI) and the Financial Development and Structure Database (FDSD) of the World Bank and the United Nations Conference for Trade and Development (UNCTAD) and Dreher et al. (2010) databases[2]. Whereas the periodicity for Fixed Effects and Quantile regressions is annual for a 35 years span.The adopted periodicity for the Generalized Method of Moments (GMM) is based on 5 year data averages or non-overlapping intervals in order to mitigate potential concerns of instrument proliferation or over-identification. Hence, there are seven data points used in the GMM specification, notably: 1980-1984; 1985-1989; 1990-1994; 1995-1999; 2000-2004; 2005-2009 and 2010-2014.

Our explained variable is industrialization in Africa, which is measured as the manufacturing value added as a percentage of GDP (constant prices). We prefer the manufacturing value added based on International Standard Industrial Classification (section D). This measure captures the productive manufacturing units that are classified according to the kind of principal economic activity, which include works that are performed by power-driven machinery or manually, factory based work or in a household (United Nations, 1990). Also, this measure of industrialisation is favoured by Kang and Lee (2011), UNIDO (2013) and Gui-Diby and Renard (2015).

Two main independent variables are employed: (i) personal remittances received annually (as % of GDP) and (ii) financial sector development in terms of bank sector intermediation efficiency and domestic credit to the private sector. Whereas remittance is the main focus of the paper, financial development is used as a channel through which remittances can influence industrialization. This is consistent with the objective of the study which is to assess the direct and indirect incidences of remittances on industrialization.

[2]Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Republic; Chad; Congo; the Democratic Republic of Congo; Comoros; Cote d'Ivoire; Djibouti; Egypt; Equatorial Guinea; Ethiopia; Gabon; Gambia; Ghana; Guinea-Bissau; Guinea; Kenya; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique ; Namibia ; Niger ; Nigeria; Rwanda; Sao Tome and Principe; Seychelles; Senegal ; Sierra Leone; Sudan; Swaziland; Tanzania; Togo; Tunisia; Uganda; Zambia and Zimbabwe.

The choice of the financial development channels is motivated by the fact that while investment is needed for industrialization, such investment for the most part has to be financed by the banking sector, since financial markets are not developed in most African countries (see Asongu, 2012, 2013b; Tchamyou & Asougu, 2017a; Nyasha & Odhiambo, 2017; Domeher et al., 2017 ; Ozili, 2017 ; Assefa & Mollick, 2017). Accordingly, we argue that even when remittances are used for consumption purposes, they may still be deposited in financial institutions for other investment and/or future consumption purposes. Such corresponding mobilized deposits or liquidity liabilities in financial institutions are then borrowed to economic operators for investment purposes. In the light of these clarifications: (i) banking intermediation efficiency is defined as the ability of financial institutions to transformed mobilized deposits into credit for economic operators and measured as "bank credit on bank deposits" while (ii) domestic credit to the private sector is defined as the ability of financial institutions to grant credit to economic operators and measured as Domestic credit to private sector (% of GDP)[3].

In order to account for omitted variable bias in the regressions, five control variables are employed, namely: trade openness, domestic investment, internet penetration, population growth and economic globalization. Trade openness is the total of exports and imports of goods and services (% of GDP), domestic investment is gross fixed capital formation, including acquisitions less disposals of valuables (% of GDP), internet penetration is internet users (per 100 people), population growth is the logarithm of the population (in millions) and economic globalization considers both the flow of and the restrictions to trade and capital in a given country. While from intuition positive effects can be expected from all the control variables on industrialization, market dynamics and expansion could reveal different effects. For instance, domestic investment that is skewed toward social, education and health investment may not directly lead to industrialization or may even slow-down the process. On the other hand, domestic investment to the productive sector directly affects industrialization. With regard to population growth, if commodities demanded by an increasing population are

[3] Whereas the mean and maximum values of the banking intermediation efficiency are high (see Appendix 1), it is important to note that, the mean is driven the upper-median of a distribution. Hence a few countries may drive-up the mean, while overall; there are substantial surplus liquidity issues for the majority of countries. It is also important to note that loaning out a high fraction of deposits doesn't necessarily imply efficiency. In some circumstances it might be recklessness due to the maturity mismatch between deposits and loans. While there are other definitions of bank efficiency, the focus of this study is on financial intermediation efficiency as defined by the Financial Structure and Development Database of the World Bank. For instance, from the point of the bank, the efficiency may be gauged in terms of return on assets, while from the perspective of shareholders it may be measured in terms of return on equity.

imported for the most part, this may not engender negative effects on domestic industrialization. The definitions of the variables (with the corresponding sources) are provided in Appendix 1.

3.2 Methodology

3.2.1 Instrumentation and instrumental Fixed effects estimations

Three simultaneity-robust estimation techniques are employed, namely: (i) Instrumental Variable (IV)[4] Fixed Effects to control for the unobserved heterogeneity; (ii) Generalised Method of Moments to control for persistence in industrialisation and (ii) IV Variable Quantile regressions to account for initial levels of industrialisation. The employment of multiple estimation techniques is in accordance with data behaviour (Asongu & Nwachukwu, 2016a).

The issue of simultaneity (or an aspect of endogeneity) in the independent variables is tackled by instrumenting them with their first lags. For instance, the procedure for instrumenting remittances is as follows in Eq. (1) below.

$$\mathrm{Re}_{i,t} = \alpha + \delta_j\left(\mathrm{Re}_{i,t-1}\right) + \eta_i + \varepsilon_{i,t} \ , \qquad (1)$$

where $\mathrm{Re}_{i,t}$, denotesremittances of country i at period t, α is a constant, η_i are country-specific effects, $\mathrm{Re}_{i,t-1}$, represents remittances in country i at period $t-1$, and $\varepsilon_{i,t}$ the error term.

The instrumentation procedure in Eq. (1) consists of regressing remittances on their first lags, then saving the fitted values that are later used as the independent variable of interest in the Fixed Effects and Quantile Regression specifications. The instrumentation process which is replicated for all independent variables is Heteroscedasticity and Autocorrelation Consistent (HAC) in standard errors.

The panel Fixed Effects (FE) models are presented in Eq. (2) as follows:

$$I_{i,t} = \partial_0 + \partial_1 \mathrm{Re}_{i,t} + \partial_2 Fin_{i,t} + \partial_3 \mathrm{Re}\ Fin_{i,t} + \sum_{h=1}^{5} \omega_h W_{h,i,t-\tau} + \eta_i + \varepsilon_{i,t} \ , \qquad (2)$$

[4] Instrumental Variable and Instrumental are used interchangeably throughout the study.

where, $I_{i,t}$ is the industrialization indicator of country i at period t, ∂ is a constant, Re is remittances, Fin represents financial development (financial efficiency or financial activity), Re Fin is the interaction between remittances and financial development, W is the vector of control variables(trade openness, domestic investment, internet penetration, population growth and economic globalization), η_i is the country-specific effect and $\varepsilon_{i,t}$ the error term.

3.2.2 Generalised method of moments: specification, identification and exclusion restrictions

There are five main reasons for adopting a GMM technique. First, the N>T (49>7) criterion that is essential for the application of the estimation approach is met given that the number of countries (or cross sections) is substantially higher than the number of data points used for the GMM specification (Tchamyou, 2018a, 2018b; Amuakwa-Mensah et al., 2017). It is important to note that we are using 5 year non-overlapping intervals for the GMM specification. Second, industrialisation is persistent because its correlation with its first lag is 0.968 which is higher than the 0.800 rule of thumb threshold. Third, given that the GMM specification is consistent with panel data analysis; cross-country differences are considered in the regressions. Fourth, the *system* estimator corrects for biases in the *difference* estimator. Fifth, the estimation approach has some bite on endogeneity because it accounts for simultaneity. Moreover, the use of time-invariant omitted variables also increases the control for endogeneity.

Consistent with Bond et al. (2001), the *system* GMM estimator proposed by Arellano and Bond (1995) and Blundell and Bond (1998) has better estimation properties when compared with the difference estimator proposed by Arellano and Bond (1991). In this study, we prefer the Roodman (2009a, 2009b) extension of Arellano and Bover (1995) because it has been documented to: (i) restrict over-identification or instrument proliferation and (ii) account for cross-sectional dependence (see Love & Zicchino, 2006; Baltagi, 2008; Boateng et al., 2018). Accordingly, the technique adopts forward orthogonal deviations instead of first differences. The adopted specification approach is *two-step* because it controls for heteroscedasticity. It is important to note that the *one-step* approach is homoscedasticity-consistent.

The following equations in level (3) and first difference (4) summarize the standard *system* GMM estimation procedure.

$$I_{i,t} = \sigma_0 + \sigma_1 I_{i,t-\tau} + \sigma_2 \mathrm{Re}_{i,t} + \sigma_3 Fin_{i,t} + \sigma_4 \mathrm{Re}\, Fin_{i,t} + \sum_{h=1}^{5} \delta_h W_{h,i,t-\tau} + \eta_i + \xi_t + \varepsilon_{i,t} \qquad (3)$$

$$I_{i,t} - I_{i,t-\tau} = \sigma_1(I_{i,t-\tau} - I_{i,t-2\tau}) + \sigma_2(\mathrm{Re}_{i,t} - \mathrm{Re}_{i,t-\tau}) + \sigma_3(Fin_{i,t} - Fin_{i,t-\tau}) + \sigma_4(\mathrm{Re}\,Fin_{i,t} - \mathrm{Re}\,Fin_{i,t-\tau}) + \sum_{h=1}^{5}\delta_h(W_{h,i,t-\tau} - W_{h,i,t-2\tau}) + (\xi_t - \xi_{t-\tau}) + (\varepsilon_{i,t} - \varepsilon_{i,t-\tau}) \quad (4)$$

where, τ represents the coefficient of auto-regression and ξ_t is the time-specific constant.

We briefly discuss exclusion and identification restrictions. As documented in recent literature, all explanatory variables are considered as predetermined or suspected endogenous while only time-invariant omitted variables are acknowledged as strictly exogenous (see Asongu & Nwachukwu, 2016a; Boateng et al., 2018). This is because it is unlikely for time-invariant omitted variables (or years) to become endogenous in first-difference estimations (see Roodman, 2009b). Hence, the process for treating *ivstyle* (years) is 'iv(years, eq(diff))' while the *gmmstyle* is used for predetermined variables.

In the light of above insights, years or time invariant omitted variables influence industrialisation exclusively through the suspected endogenous variables. Furthermore, the statistical validity of the exclusion restriction is examined with the Difference in Hansen Test (DHT) for instrument exogeneity. Accordingly, the alternative hypothesis of this test should be rejected for the time-invariant omitted variables to elucidate industrialisation exclusively via the endogenous explaining variables. Therefore, whereas in the standard instrumental variable (IV) approach, failure to reject the null hypothesis of the Sargan Overidentifying Restrictions (OIR) test shows that the instruments do not elucidate the outcome variable beyond the predetermined variables (see Beck et al., 2003; Asongu & Nwachukwu, 2016b), with the GMM technique, the information criterion needed to examine if time-invariant omitted variables are strictly exogenous is the DHT. Hence, in the findings that are revealed in Section 5, this assumption of exclusion restriction is confirmed if the null hypothesis of the DHT corresponding to IV (year, eq(diff)) is not rejected.

It is important to note that the instrumentation process used for the Fixed Effects and Quantile regressions is different from the process adopted in the GMM approach. Assumptions on "identification and exclusion restrictions" surrounding the adopted GMM approach have been discussed in the two preceding paragraphs. As for the assumptions underlying the IV strategy used for the Fixed Effects and Quantile Regressions, it assumed that a time lag is needed for remittances to be channeled to the country and invested to affect the industrialisation process. A one year time lag is adopted because one year adequately captures past information.

3.2.3 Instrumental Quantile regressions

The preceding modelling approaches are based on mean values of the industrialisation. Unfortunately, mean values reflect blanket policies. Furthermore, such blanket policies may not be effective unless they are contingent on existing levels of industrialisation and specified differently across countries with high, intermediate and low industrialisation. The concern about modelling exclusively at the conditional mean of the dependent variable is addressed with *Quantile* Regressions (QR) which enables the study to assess the relationships throughout the conditional distributions of industrialisation (see Keonker & Hallock, 2001; Billger & Goel, 2009; Okada & Samreth, 2012; Asongu, 2013c; Tchamyou & Asongu, 2017b).

Knowledgeable of above facts, studies that assess mean impacts with Ordinary Least Squares are founded on the hypothesis of normally distributed error terms. Such an assumption of normally distributed errors terms is not valid in the QR technique. Moreover, the estimation approach is robust in the presence of outliers because it enables the examination of parameter estimates at various points of the conditional distribution of the outcome variable (or industrialisation) (see Koenker & Bassett, 1978).

The θ^{th}quantile estimator of industrialisation is obtained by solving the following optimization problem, which is presented without subscripts for simplicity in Eq. (5)

$$\min_{\beta \in R^k}\left[\sum_{i\in\{i:y_i\geq x_{i'}\beta\}}\theta\left|y_i-x_{i'}\beta\right|+\sum_{i\in\{i:y_i<x_{i'}\beta\}}(1-\theta)\left|y_i-x_{i'}\beta\right|\right], \quad (5)$$

where $\theta\in(0,1)$. As opposed to OLS that is fundamentally based on minimizing the sum of squared residuals, with QR, the weighted sum of absolute deviations are minimised. For instance, the 10th or 90th quantiles (with θ=0.10 or 0.90 respectively) are investigated by approximately weighing the residuals. The conditional quantile of industrialisation or y_i given x_i is:

$$Q_y(\theta / x_i) = x_{i'}\beta_\theta, \quad (6)$$

where unique slope parameters are modelled for each θ^{th} specific quantile. This formulation is analogous to $E(y/x)=x_{i'}\beta$ in the OLS slope where parameters are assessed only at the mean of the conditional distribution of the industrialisation. In Eq. (6), the dependent variable y_i is industrialisation whereas x_i contains a constant term, remittances, financial

development, interaction between remittances and financial development, trade openness, domestic investment, internet penetration, population growth and economic globalization. Given that all independent variables are instrumented, the OLS in the QR approach become a Two Stage Least Squares exercise.

4. Presentation of results

While Table 1 presents findings on FE and GMM regressions, Table 2 discloses results on QR. Both models entail 3 specifications: the non-interactive specification and two interactive specifications. One of the interactive specifications corresponds to banking efficiency, while the other is related to financial activity. The non-interactive specification elucidates direct effects of remittances on industrialisation, whereas interactive specifications explain indirect impacts. In the same vein, Table2 presents three specifications, one corresponding to non-interactive regressions for direct effects (see Panel A) and the other two related to interactive regressions for indirect impacts (Panels B and C).

From the FE regressions in Table 1, there is a negative marginal effect from the interaction between domestic credit and remittances. In the same table, four principal information criteria are employed to assess the validity of the GMM model with forward orthogonal deviations[5].In addition to the information criteria, two points are important to note. (i) The second-order Arellano and Bond autocorrelation test (AR(2)) is more relevant as an information criterion than the corresponding first-order test because some studies have exclusively reported a higher order with no disclosure of the first order (e.g. see Narayan et al., 2011; Asongu & Nwachukwu, 2016c). (ii) The Sargan test is not robust but not weakened by instruments whereas the Hansen test is robust but weakened by instruments. A logical way of addressing the conflict is to adopt the Hansen test and avoid the proliferation of instruments. Instrument proliferation is subsequently avoided by ensuring that the number of instruments in each specification is lower than the corresponding number of cross sections.Not all control variables are included in the GMM specification in order to avoid instrument proliferation that could substantially bias estimated coefficients. Based on the

[5]"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 Fischer test for the joint validity of estimated coefficients is also provided" (Asongu & De Moor, 2017, p.200).

information criteria, a positive marginal effect is apparent from the interaction between remittances and banking system efficiency.

The following findings are apparent from the QR in Table 2. Consistent differences in estimated coefficients between Two Stage Least Squares and quantiles (in terms of sign, significance and magnitude of significance) justify the relevance of adopted empirical strategy. While standard Quantile Regressions produce OLS, Instrumental Variable Quantile Regressions produce the equivalent of 2SLS in place of OLS. This is essentially because the OLS approach is improved by controlling for simultaneity. In Panel A,banking efficiency decreases industrialisation whereas domestic credit increases it. In Panel B, the interaction between remittances and banking efficiency is positive in the median and 75th quintile while it is negative in the 90th quintile. In Panel C, the interaction between remittances and domestic credit is positive from the 10th quintile to the median and the 90th quintile while it is negative in the 75th quintile. Most of the significant control variables have the expected signs.

The findings broadly show that for certain initial levels of industrialisation, remittances can drive industrialisation through financial development mechanisms. The direct negative effect of bank efficiency may be traceable to the substantially documented issues of surplus liquidity in African financial institutions (see Saxegaard, 2006; Asongu, 2014). This scenario will certainly need to be addressed to expect a positive and significant complementary impact from remittance inflow on industrialisation. This also explains why the interaction of remittances with private domestic credit has more positive effects throughout the conditional distributions of industrialisation. Moreover, the positive marginal effects with private domestic credit are also of higher magnitude. To put this point into greater perspective, when remittances are deposited in financial institutions as liquid liabilities, such deposits have to be transformed into credit for economic operators in order to affect the industrialisation process. Unfortunately, the substantially documented issue of surplus liquidity is partly confirmed in this inquiry because the banking system efficiency variable does not consistently interact with remittances to affect industrialisation. It is important to note that banking system efficiency or financial intermediation efficiency is appreciated as the ability of banks to transform mobilised deposits into credit for economic operators.

In the light of the above, remittances should be accompanied with complementary financial development policies that have an overall aim of fighting concerns of surplus liquidity. The introduction of information sharing offices that are destined to mitigate information asymmetry between lenders and borrowers is an important step towards this direction. These recommendations are consistent with the perspective that remittances are more effective when a policy environment is good for investment with sound institutions and well developed financial systems (see IMF, 2005). This is also in accordance with recent research which shows that remittances could promote financial development which in turn promotes economic prosperity (Aggarwal et al., 2011). Even in scenarios where financial systems are undeveloped, remittances could directly affect economic development (Giuliano & Ruiz-Arranz, 2009).

INSERT TABLE 1 and 2 HERE

We devote some space to engage issues surrounding adopted estimation techniques and robustness of results that may potentially arise. First, in the reporting of the findings, we have no preferred estimator. This is essentially because, it difficult to establish a preferred estimator because each estimation technique has its own shortcomings and advantages. For instance, the country fixed effects that are considered in Fixed Effects (FE) regressions are eliminated in GMM estimations. Moreover, whereas both FE and GMM regressions are based on the mean value of the dependent variable, in Quantile regressions, the relationships are assessed throughout the conditional distribution of the dependent variable. Moreover, the employment of alternative estimation techniques that are robust to simultaneity and the unobserved heterogeneity is to some degree evidence of robust empirical assessments. Hence, we expect different results from the different estimation techniques because of their empirical specificities. For instance, we expect different results from Quantile regression vis-à-vis 2SLS because the investigated relationships may be contingent on initial levels of industrialisation, such that the use of remittances to finance industrialisation through financial channels depends on the existing levels of industrialisation.

Second, we have not considered using Principal Component Analysis (PCA) to derive one composite indicator that better reflects financial development. It is important to note that the use of PCA in the literature is generally based on the absence of universally accepted measures of financial development (see Gries et al., 2009). Gries et al. (2009) state: "*In the*

related literature several proxies for financial deepening have been suggested, for example, monetary aggregates such as Money Supply (M2) on GDP. To date there is no consensus on the on the superiority of any indicator" (p. 1851).In this study, we have clearly distinguished the financial intermediation efficiency channel from the credit access channel. Mixing both through PCA does not add value to us because we are knowledgeable of the conceptual underpinnings motivating the financial indicators. For instance, former (credit channel) is already contained in the latter (financial intermediation channel) as the numerator. Whereas the PCA has been employed in some studies, what we wish to articulate in this study is the credit and intermediation efficiency channels of financial development. Two points motivate the choice of these channels. On the one hand, the depth channel (financial deposits or liquid liabilities) does not reflect financial activity in African countries because of the substantially document surplus liquidity issues (Saxegaard, 2006; Fouda, 2009). In other words, in order for liquid liabilities to be used by economic operators, these have to be transformed into credit for economic activity. This process is known as financial intermediation efficiency: the intermediation efficiency channel. On the other hand, the use of PCA juxtaposes concepts of financial development because concepts of financial depth and activity are often mixed (Asongu, 2015) and it is difficult to derive practicable policy implications because respective weights of indicators constituting the PCA are difficult to obtain from the estimated coefficients corresponding to PCA. Moreover, there are issues of inferential validity associated with PC-augmented regressors. These issues that were raised by Pagan (1984, p.242) have been substantiated in recent literature, notably: Oxley and McAleer (1993), Ba and Ng (2006), McKenzie and McAleer (1997), and Westerlund and Urbain (2012, 2013a, 2013b).

5. Concluding implications and future research directions

The paper assesses how remittances directly and indirectly affect industrialisation in a panel of 49 African countries for the period 1980-2014. The indirect impact is assessed through financial development channels. The empirical evidence is based on three interactive and non-interactive simultaneity-robust estimation techniques, namely: (i) Instrumental Fixed Effects (FE) to control for the unobserved heterogeneity; (ii) Generalised Method of Moments (GMM) to control for persistence in industrialisation and (iii) Instrumental Quantile Regressions (QR) to account for initial levels of industrialisation.

The non-interactive specification elucidates direct effects of remittances on industrialisation whereas interactive specifications explain indirect impacts. From the FE, there is a negative

marginal effect from the interaction between domestic credit and remittances. In the GMM results, a positive marginal effect is apparent from the interaction between remittances and banking system efficiency. In QR: (i) banking efficiency decreases industrialisation whereas domestic credit increases it; (ii) the interaction between remittances and banking efficiency is positive in the median and 75th quantiles while it is negative in the 90th quintile; (iii) the interaction between remittances and domestic credit is positive from the 10th quintile to the medians and in the 90thquintile while it is negative in the 75th quintile.

The findings have two major implications in the literature which also double as potential implications. The first addresses the industrialisation of Africa, which is one of the most fundamental concerns of policy makers, especially because most SSA countries are resource-dependent. Almost the entire SSA countries are between 80 – 100 percent dependent on commodity trading as their major source of foreign exchange (UNCTAD, 2014). The danger of this scenario include exposure of African economies to international shocks caused by commodity price changes, hurting governance structure, and rent-seeking behaviour caused by over-reliance on primary product. Also, there are incidences of greater exposure to the risk of state fragility caused by rebellion from opposing factions that want to control the resources (Collier & Hoeffler, 2001). These possible incidences point to the need for increased industrialisation of African countries since it can mitigate the negative impact from primary commodity dependence and could increase household consumption, the demand for intermediate goods and further change the drivers of economic growth (Gui-Diby & Renard, 2015). This paper therefore has provided empirical evidence that remittances are such potential financial flow that can be considered for the industrialisation of recipient SSA countries.

The second body of literature that this paper has contributed to relates to financing Africa's development. In particular, we have focused on complementing financial flow with improved structure of the financial system. Harnessing Diaspora remittance inflow could be an alternative policy option to improve the development of African industrial sector not just because of the monetary volume of the inflow, but also because of other technical reasons. For instance, the heightened human capital and skills that exist in Diaspora can be an added knowledge capital in line with the financial resources from abroad. Since these resources and technical capacities are from the nationals of such countries living abroad, then it is possible to expect better indigenization and less resistance as experienced in some African countries. Other forms of foreign financial flow have been viewed with skepticism because of the claim of self-interest, capital repatriation, global volatility that can affect their volume of inflow and

its crowd-out effect on smaller indigenous businesses (Fortanier, 2007; Moura &Forte, 2009). For example, following the long history of colonialism of African countries, there are sentiments that investments from foreign nationals may result in neo-colonialism, exposing the host countries and their resources to foreign exploitations. Moreover, Diasporas may be more willing to invest in fragile economies like some of those in Africa, unlike foreign investors who may be unwilling to risk losing their investments.

Considering the importance of remittance inflow as a source of stable foreign capital for the improvement of developing countries' productive capacity and business development, it is important to access other possible channels through which remittance affects industrialisation. This area of enquiry is important to improve the extant literature, especially in relation to African countries. Moreover, future studies can also use alternative estimation techniques to establish both short-run and long-term effects. Within the suggested empirical frameworks, clarifying the magnitude of estimated effects is worthwhile because the estimated coefficients corresponding to the independent variables of interest which are quite small in this study could speak to mere correlations over time.

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List of Tables

Table 1: Fixed Effects and GMM Interactive and Non-Interactive Regressions

	Dependent variable: Industrialisation						
	Fixed Effects				GMM (Based on 5 Yr NOI)		
Industrialisation(-1)	---	---	---		0.960***	0.895***	0.887***
					(0.000)	(0.000)	(0.000)
Constant	16.243***	15.946***	15.138***	Constant	2.898**	1.403	0.043
	(0.000)	(0.000)	(0.000)		(0.023)	(0.297)	(0.960)
Remit(IV)	-0.0006	-0.0003	0.0005	Remit	0.073***	-0.031	0.097**
	(0.170)	(0.567)	(0.379)		(0.000)	(0.192)	(0.043)
BcBd(IV)	-0.007**	-0.009**	---	BE	-0.002	-0.017	---
	(0.022)	(0.023)			(0.768)	(0.112)	
Domcred(IV)	-0.015	---	-0.012	DC	-0.009	---	0.003
	(0.206)		(0.380)		(0.414)		(0.905)
Remit(IV)×BcBd(IV)	---	0.001	---	Remi×BcBd	---	0.001**	---
		(0.984)				(0.020)	
Remit(IV)×Domcred(IV)	---	---	-0.005**	Remit×Domcred	---	---	-0.004
			(0.018)				(0.134)
Trade (IV)	0.001	0.001	0.0006	Trade	-0.016**	0.006	
	(0.898)	(0.818)	(0.936)		(0.039)	(0.291)	
GFCF(IV)	-0.098***	-0.098***	-0.102***	GFCF	0.009	-0.024	0.011
	(0.000)	(0.000)	(0.000)		(0.674)	(0.133)	(0.112)
Internet(IV)	-0.001***	-0.001***	-0.001***	Internet	---	---	---
	(0.009)	(0.003)	(0.008)				
Population(IV)	-0.027	-0.024	-0.023	Population	---	---	---
	(0.137)	(0.181)	(0.194)				
Ecoglob(IV)	-0.002	-0.003	0.008	Ecoglob	---	---	---
	(0.902)	(0.857)	(0.659)				
				AR(1)	(0.008)	(0.009)	(0.011)
				AR(2)	(0.188)	(0.148)	(0.254)
				Sargan OIR	(0.219)	(0.029)	(0.068)
				Hansen OIR	(0.732)	(0.281)	(0.811)
				DHT for instruments			
				(a)Instruments in levels			
				H excluding group	(0.513)	(0.472)	(0.531)
				Dif(null, H=exogenous)	(0.710)	(0.222)	(0.812)
				(b) IV (years, eq(diff))			
				H excluding group	(0.546)	(0.354)	(0.563)
				Dif(null, H=exogenous)	(0.801)	(0.250)	(0.931)
R^2(within)	0.056	0.052	0.061				
Fisher	8.78***	8.31***	9.70***	Fisher	135.04***	267.82***	146.46***
				Instruments	28	28	28
Countries	43	43	43	Countries	49	47	47
Observations	1219	1241	1227	Observations	233	212	212

*,**,***: significance levels of 10%, 5% and 1% 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) and AR(2) tests and; b) the validity of the instruments in the Sargan OIR and DHT tests.
IV: Instrumented value. Remit: Remittances. BcBd: Bank Credit to Bank Deposits. Domcred: Domestic credit to the private sector. GFCF: Gross Fixed Capital Formation. Pop: Population. Ecoglob: Economic Globalisation. Industria: Industrialisation. Whereas the paper using a sample of 49 countries, not all countries may appear regression output because of issues in degrees of freedom (i.e. missing observations) and number of control variables involved the specification.

Table 2: Instrumental Quantile Interactive and Non-Interactive Regressions

Dependent variable: Industrialisation

Panel A: Non-Interactive Regressions

	2SLS	Q.10	Q.25	Q.50	Q.75	Q.90
Constant	13.727***	4.921***	7.962***	14.810***	21.484***	21.946***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Remit(IV)	0.0005	0.0003	0.0003	-0.0007*	-0.0005	-0.00007
	(0.358)	(0.359)	(0.302)	(0.078)	(0.352)	(0.942)
BcBd(IV)	-0.018***	-0.001	-0.008***	-0.023***	-0.036***	-0.043***
	(0.000)	(0.754)	(0.007)	(0.000)	(0.000)	(0.000)
Domcred(IV)	0.158***	0.142***	0.162***	0.211***	0.172***	0.135***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trade (IV)	0.038***	0.018***	0.025***	-0.0002	0.037***	0.044***
	(0.000)	(0.006)	(0.000)	(0.975)	(0.001)	(0.005)
GFCF(IV)	-0.210***	-0.057**	-0.107***	-0.120***	-0.269***	-0.303***
	(0.000)	(0.013)	(0.000)	(0.000)	(0.000)	(0.000)
Internet(IV)	-0.00009	0.0008	0.0009*	0.001*	-0.003***	-0.005***
	(0.921)	(0.233)	(0.086)	(0.091)	(0.001)	(0.006)
Population(IV)	-0.044***	-0.007	-0.016***	-0.038***	-0.064***	-0.106***
	(0.000)	(0.375)	(0.007)	(0.000)	(0.000)	(0.000)
Ecoglob(IV)	-0.017	-0.042**	-0.051***	-0.060***	-0.021	0.132***
	(0.426)	(0.010)	(0.001)	(0.002)	(0.349)	(0.000)
R^2/Pseudo R^2	0.175	0.090	0.116	0.140	0.129	0.139
Fisher	47.34***					
Observations	1219	1219	1219	1219	1219	1219

Panel B: Interactive Regressions with Bank Efficiency

	2SLS	Q.10	Q.25	Q.50	Q.75	Q.90
Constant	11.749***	5.010***	6.425***	12.046***	17.908***	18.946***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Remit(IV)	0.0003	0.0001	0.001*	-0.001*	-0.003**	0.002
	(0.785)	(0.893)	(0.076)	(0.050)	(0.026)	(0.222)
BcBd(IV)	-0.003	0.013**	0.011**	-0.002	-0.027***	-0.025**
	(0.466)	(0.015)	(0.022)	(0.671)	(0.002)	(0.023)
Remit(IV)×BcBd(IV)	0.00001	-0.0000005	-0.0000005	0.00004***	0.00004***	-0.00001
	(0.181)	(0.637)	(0.517)	(0.000)	(0.002)	(0.372)
Trade (IV)	0.033***	-0.008	0.004	0.003	0.044***	0.057***
	(0.000)	(0.193)	(0.522)	(0.682)	(0.001)	(0.000)
GFCF(IV)	-0.166***	0.025	-0.028	-0.092***	-0.278***	-0.251***
	(0.000)	(0.255)	(0.112)	(0.000)	(0.000)	(0.000)
Internet(IV)	0.0004	0.0004	0.001**	0.002***	-0.004***	-0.005***
	(0.674)	(0.521)	(0.016)	(0.003)	(0.004)	(0.002)
Population(IV)	-0.041***	-0.007	-0.023***	-0.056***	-0.038***	-0.079***
	(0.000)	(0.356)	(0.001)	(0.000)	(0.001)	(0.000)
Ecoglob(IV)	0.042*	-0.011	-0.009	0.004	0.110***	0.182***
	(0.050)	(0.505)	(0.574)	(0.809)	(0.000)	(0.000)
R^2/Pseudo R^2	0.084	0.023	0.029	0.047	0.058	0.126
Fisher	11.92***					
Observations	1241	1241	1241	1241	1241	1241

Panel C: Interactive Regressions with Domestic Credit to the Private Sector

	2SLS	Q.10	Q.25	Q.50	Q.75	Q.90
Constant	12.429***	7.900***	9.153***	13.592***	15.548***	17.486***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Remit(IV)	-0.0004	-0.003***	-0.002***	-0.001***	0.0008	-0.001
	(0.573)	(0.000)	(0.000)	(0.008)	(0.284)	(0.395)
Domcred(IV)	0.093***	0.034**	0.080***	0.088***	0.188***	0.060**
	(0.000)	(0.027)	(0.000)	(0.000)	(0.000)	(0.019)
Remit(IV)×Domcred(IV)	0.00006***	0.0001***	0.0001***	0.00008***	-0.00006***	0.0001***
	(0.007)	(0.000)	(0.000)	(0.000)	(0.007)	(0.001)
Trade (IV)	0.037***	0.017***	0.013**	0.0007	0.034***	0.041***
	(0.000)	(0.000)	(0.036)	(0.929)	(0.001)	(0.001)
GFCF(IV)	-0.205***	-0.046**	-0.076***	-0.092***	-0.254***	-0.350***
	(0.000)	(0.011)	(0.000)	(0.000)	(0.000)	(0.000)
Internet(IV)	0.0003	0.001***	0.001**	0.002***	-0.002**	-0.006***

	(0.682)	(0.007)	(0.041)	(0.003)	(0.010)	(0.000)
Population(IV)	-0.038***	-0.010	-0.013*	-0.036***	-0.061***	-0.092***
	(0.000)	(0.136)	(0.087)	(0.000)	(0.000)	(0.000)
Ecoglob(IV)	-0.005	-0.075***	-0.058***	-0.064***	0.031	0.211***
	(0.797)	(0.000)	(0.001)	(0.001)	(0.122)	(0.000)
R^2/Pseudo R^2	0.167	0.138	0.139	0.135	0.104	0.124
Fisher	61.38***					
Observations	1227	1227	1227	1227	1227	1227

***,**,*: significance levels of 1%, 5% and 10% respectively. IV: Instrumented value. Remit: Remittances. BcBd: Bank Credit to Bank Deposits. Domcred: Domestic credit to the private sector. GFCF: Gross Fixed Capital Formation. Ecoglob: Economic Globalisation. Lower quantiles (e.g., Q 0.1) signify nations where industrialisation is least. 2SLS: Two Stage Least Squares. Whereas the paper using a sample of 49 countries, not all countries may appear regression output because of issues in degrees of freedom (i.e. missing observations) and number of control variables involved the specification.

Appendices

Appendix 1: Definitions of Variables

Variables	Signs	Definitions of variables (Measurement)	Sources
Industrialisation	Industria	Manufacturing (ISIC D)	UNCTAD
Remittances	Remit	Personal remittances, received (% of GDP)	World Bank (WDI)
Bank Efficiency	BcBd	Bank credit to bank deposits (%)	FDSD (WDI)
Domestic Credit	Domcred	Domestic credit to private sector (% of GDP)	FDSD (WDI)
Trade	Trade	Exports and Imports of goods and services (% of GDP)	World Bank (WDI)
Domestic Investment	GFCF	Gross fixed capital formation (including Acquisitions less disposals of valuables) (% of GDP)	World Bank (WDI)
Internet	Internet	Internet users (per 100 people)	World Bank (WDI)
Population	Pop	Logarithm of Population (in millions)	World Bank (WDI)
Globalisation	Ecoglob	Economic globalization	Dreher et al. (2010)

WDI: World Bank Development Indicators. FDSD: Financial Development and Structure Database.