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Effect of Poverty on Services Export Concentration in Developing Countries

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Abstract

This paper investigates the effect of poverty on services export concentration in developing countries. The analysis has used an unbalanced panel dataset of 98 developing countries over the period 1995-2014. Findings suggest that a higher poverty rate is positively associated services export concentration, and this effect translates through three channels, namely the education level (a proxy for human capital), the degree of trade policy liberalization (and trade openness), and the level of export product concentration. Thus, if they were to diversify services export items, policymakers should implement policies that directly promote services export diversification (such as liberalizing trade, including reducing services trade barriers, and improving the business environment), but also measures and policies that directly target poor segments of the population.

Keywords: Poverty; Services export concentration; Education; Trade policy liberalization; Trade Openness; Export product concentration.
JEL Classification: F14; O11; I32.

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1. Introduction

Trade in services have witnessed a strong rise in recent years, compared to merchandise trade, and would significantly contribute to shaping the future of global trade (e.g., Roy, 2019; WTO, 2019a; 2019b). This is exemplified by the increasing importance of services in global and regional value chains (e.g., Hoekman and Shepherd, 2017; Lanz and Maurer, 2015), and the increasing role of services for poverty reduction, and promotion of economic growth and development, particularly in developing countries (e.g., Adlung, 2007; Balchin et al., 2016; Fiorini, and Hoekman, 2018; François and Hoekman, 2010; Hoekman and Mattoo, 2008; Roy, 2019).

While a voluminous literature has considered the determinants of export product diversification[2], it is only recently that very few studies have been devoted to the macroeconomic determinants of services export diversification (or sophistication). These include for example, Sahoo and Dash (2017) and Eichengreen and Gupta (2013a) who have examined the macroeconomic factors underlying the structure of services exports, by distinguishing between traditional services and modern services[3]. Anand et al. (2012) have also explored the determinants and impact of services exports sophistication, and goods exports sophistication, and have emphasized the essential role of modern services in spurring economic growth, notably in developing countries and low-income countries. More recently, Gnangnon (2020a) has explored respectively the effect of manufactured export performance on services export diversification, and reported that manufactured exports induce greater services export diversification, including when countries further liberalize their trade regimes, enhance their financial development, improve their education level, attract higher foreign direct investment inflows, and improve the quality of institutions and governance. To explain the relationship between manufactured exports and services export diversification, the author has put forth the "network hypothesis", i.e., network (positive) effect of higher volumes of goods exports (in particular of manufacturing exports) on the demand for services exports developed by Eichengreen and Gupta (2013b) (see also Sahoo and Dash, 2014). On the other side, Gnangnon (2020b) has obtained that AfT flows, including both AfT for services sectors and AfT for non-services sectors influence positively services export diversification. Finally, Gnangnon (2020c) has demonstrated empirically that greater access to the Internet enhances services export diversification, notably through the channels of innovation, merchandise exports (including export product concentration) and foreign direct investment inflows.

The present study aims to add to the nascent literature on the macroeconomic determinants of services export diversification by investigating the effect of poverty on services export diversification. In so doing, it builds on and complements the three aforementioned papers (Gnangnon, 2020a, b, c) on the macroeconomic determinants of services export diversification. It explores the effect of poverty on services export diversification through three channels, including the education level, the level of trade policy liberalization/trade openness, and the degree of export

[2] These studies include for example Agosin et al. (2012); Amighini and Sanfilipo (2014); Bahar and Santos (2018); Gnangnon and Roberts (2017); Gnangnon (2019c, 2019d); Harding and Javorcik (2012); Hausmann et al. (2007); Kim, 2019; Munemo (2011); Osakwe et al. (2018); and Zhu and Fu (2013).

[3] In the literature, the distinction between 'traditional services' and 'modern services' is blurred. Eichengreen and Gupta (2013a) have considered that traditional services include trade and transport, tourism, financial services and insurance, while modern services encompass communications, computer, information and other related services. For Sahoo and Dash (2017), traditional services include transport and travel services, while modern services encompass transportability and tradability, financial services, insurance, business processing and software services.

product concentration. Exploring the services export diversification effect of poverty (to complement the study by Gnangnon, 2019a on the export product diversification effect poverty) is relevant for three major reasons. **First**, poverty can have devastating effects on people's life, in particular if it becomes persistent (as it is the case in many developing countries) (Galbraith 1958; Mirza et al., 2019; Mood and Jonsson, 2016). This was why the international community has put 'poverty reduction' (in particular the 'elimination of poverty in all its forms everywhere') as the first of the seventeen Sustainable Development Goals (SDGs). These goals purport to promote sustainable development in all countries (see page 14 of the United Nations document A/RES/70/1, titled "Transforming our world: the 2030 Agenda for Sustainable Development"). **Second**, services export diversification and services export sophistication can be associated with higher economic growth (e.g., Anand et al., 2012; Gnangnon, 2020d; Mishra et al., 2011; Stojkoski et al., 2016). Anand et al. (2012), Mishra et al. (2011) and Stojkoski et al. (2016) have suggested that services export sophistication represents an additional means for developing countries to spur economic growth. **Third**, while the determinants of poverty has been largely explored in the literature, little attention has been paid to the effects, in particular macroeconomic effects of poverty. The extant literature on the matter is very limited: studies on the macroeconomic effects of poverty include for example, the effect of poverty on human capital (e.g., Azariadis and Stachurski, 2005; Bain et al. 2013; Bowles et al., 2006; Haushofer and Fehr, 2014; Perkins et al., 2012), economic growth (e.g., Bagchi and Svejnar, 2015; Breunig and Majeed, 2020; López and Servén, 2015; Ravallion, 2002, 2012), economic development (e.g., Mehanna, 2004; Nakabashi, 2018), export product diversification (Gnangnon, 2019a), and trade openness (Gnangnon, 2019b).

The present analysis uses an unbalanced panel dataset of 98 developing countries, with data spanning the period 1995-2014, along with the two-step system Generalized Methods of Moments (GMM). It shows that while poverty tends to exert a positive effect on services export concentration in developing countries, such an effect translates through three channels that are the education level (a proxy for human capital), the degree of trade policy liberalization (and trade openness), and the level of export product concentration.

The rest of the paper is organized around six sections. Section 2 presents a theoretical discussion on how poverty can affect services export diversification, notably through education and trade openness channels. Section 3 sketches the baseline model that would help conduct the empirical analysis. Section 4 provides a discussion on the appropriate econometric approach to perform the empirical analysis, and Section 5 interprets empirical outcomes. Section 6 deepens the analysis by investigating whether the effect of poverty on services export product diversification is conditional upon countries' degree of export product concentration. Section 7 concludes.

2. Effect of poverty on services export diversification: theoretical discussion

Poverty prevents people from enjoying a life in "decency" (Galbraith, 1958). It is generally seen as a lack of economic resources, and if it is persistent, has many adverse economic and social consequences. Low incomes can lead people to fall in a poverty trap[4] (e,g., Carter and Barrett,

[4] In fact, according to authors such as Bowles et al. (2006); Naschold (2013); Barrett et al. (2006), and Dutta and Kumar (2016), poverty acts as an attractor where individual wealth dynamics can be trapped

2006; Sachs, 2005), negatively affect their standard of life, consumption patterns and leisure time activities, and deteriorate their social relations and participation (e.g., Attree, 2006; Böhnke, 2008; Callan et al. 1993; Levitas 2006; Mirza et al., 2019; Mood and Jonsson, 2016; Ridge and Millar, 2011; Sen, 1983; Townsend, 1979; United Nations, 1995). Authors such as Azariadis and Stachurski (2005) and Barrett and Carter (2013) have argued that poverty is a self-reinforcing phenomenon, which constrains the growth of an individual's wealth. This phenomenon stems from multiple factors, such as financial factors (for example, access to low return assets), the costs of setting-up high-tech equipment, political economy aspects such as imperfect markets, credit constraints to better technology adoption, and differentiated opportunities (see also Banerjee and Newman, 1993; Barrett and Carter, 2013; Barrett et al., 2016; Mirza et al., 2019).

Lack of financial means prevents poor people from investing in human capital, including physical capital and health (e.g., Azariadis and Stachurski, 2005; Bain et al. 2013; Bowles et al., 2006; Haushofer and Fehr, 2014; López, 2006; Perkins et al., 2012; Sachs, 2005). Higher poverty compromises children's physical growth, their cognitive development and socio-emotional functioning. It limits children's achievement, and increases the risk that they are dropped out early of school (e.g., Hill and Sandfort, 1995). In the same vein, Hanson et al. (2013) have noted that children in families with poor and near-poor socioeconomic status experience lower brain total gray matter volumes than those in families with high socioeconomic status. As brain gray matter is critical for processing information and executing actions, children in poor families are more prone to difficulties at school and, therefore accumulate less human capital. Additionally, there is a psychology effect of poverty on children' parents when it comes to take decision related to investment in human capital accumulation. These parents tend to focus on short-term financial outcomes (e.g., Mullainathan and Shafir, 2013) at the expense of goal-directed ones, and are additionally averse to undertake risky investments (such as in the education and health enhancement of their children) that generate long term returns (e.g., Haushofer and Fehr, 2014). Such behaviour makes poor families be caught in a poverty trap. Compared to those in developed countries, poor individuals in developing countries are more averse to risk, and more likely to discount future payoffs than wealthier individuals (e.g., Haushofer and Fehr, 2014; Pender, 1996; Yesuf and Bluffstone, 2008)[5].

All these adverse poverty effects are particularly enhanced by the limited access of poor people to credit markets (e.g., Banerjee and Duflo, 2008; 2014; Carvalho et al., 2016). Overall, higher poverty rates contribute to constraining investments in the economy, and reducing poor people's productivity (e.g., Breunig and Majeed, 2020; Hill and Sandfort, 1995 Perry et al. 2006). On another note, Nakabashi (2018) has reported that poverty incidence has undermined the economic development of the Brazilian States, including through several channels, such as the malnourishment that retards child development, the lower gray matter volume that results in lower human capital accumulation, higher inefficiency due to resource misallocation, and the fall in the fertility rate.

This brief literature review shows that higher poverty rates can be devastating for human capital accumulation, and hence for the productivity of the workforce. In the meantime, human

in poverty's "basin of attraction", and of which individuals cannot get out on their own accord, in particular when poverty is persistent (e.g., Mirza et al., 2019).

[5] The negative externalities associated with higher poverty incidence have been highlighted by Galster et al. (2008).

capital development, including improvement of the education level is essential for the development of services exports (e.g., Goswami et al. 2012; Nyahoho, 2010; Sahoo and Dash, 2014), for services export structure, and for services export sophistication (e.g., Anand et al, 2012; Eichengreen and Gupta, 2013a; Sahoo and Dash, 2017) and in particular, services export diversification (e.g., Gnangnon, 2020a, b, c). For example, Gnangnon (2020a) has reported evidence of a positive effect of the education level on services export diversification. In fact, lower human capital development would reduce the productivity of firms that are engaged in services export activities, and prevent these firms for diversifying their services export items. Moreover, low education levels would constrain the emergence of new firms in services export markets, even though the costs of entry into some of these sectors are, in general, lower than the costs of entry into goods markets. Building on this finding, and drawing from the positive association between poverty reduction and human capital accumulation, we argue that poverty could influence services export diversification through its effect on human capital accumulation, including the education level: we expect that lower poverty rates would be associated with a greater services export diversification in the context of higher education levels (***hypothesis 1***).

We postulate the second hypothesis that poverty could affect countries' services export diversification path through trade openness. On the one hand, Gnangnon (2019b) has shown that while poverty tends to reduce trade openness in developing countries, it appears to be positively associated with advanced countries (among developing countries), while in relatively poor countries, it leads to lower trade openness. The author has argued that the negative trade openness effect of poverty can take place through lower human and financial resources for both households and the government[6]. The positive effect of poverty on trade openness can be attributed to the possibility for governments in relatively advanced developing countries to secure financial resources for implementing redistributive policies in favour of poor people, and to provide subsidies to firms. These would encourage consumption and imports by poor households and firms, and investments by firms (that could spur exports). On the other hand, Gnangnon (2020a) has found a positive effect of trade openness on services export diversification. The author has postulated that the theoretical effect of trade openness on services export diversification can occur through market extension, spillovers associated with knowledge and technology embodied in the imported goods and services, expansion of research and development (R&D) activities, and access to investment and intermediate goods (e.g., Agosin et al., 2012; Costas et al., 2008; Dennis and Shepherd, 2011). Nevertheless, Gnangnon (2020a) has also pointed out that, from a theoretical perspective, and in line with the argument of Agosin et al. (2012) concerning the effect of trade openness on export product diversification, greater trade openness could also induce higher services export concentration (i.e., services export specialization), if it leads countries to develop activities in the services sectors in which they have comparative advantage. Against this background, we postulate that if higher poverty levels induce lower trade openness, and the latter is associated with higher services export concentration, then higher poverty would result in greater services export concentration, with the magnitude of this effect increasing as the level of trade openness rises (***Hypothesis 2***). In contrast, if poverty is (on average across countries) associated

[6] The rise in poverty levels would reduce public revenue for governments and constrain their supply of public infrastructure and strengthen productive capacity in both the public and private sectors, as well as public services such as education and health, all of these are necessary to reduce trade costs, enhance firms' competitiveness, and promote trade openness (Gnangnon, 2019b).

with greater trade openness (for the reasons outlined above), and if in turn, trade openness generates greater services export diversification, then, higher poverty levels would ultimately be associated with greater services export diversification (***Hypothesis 3***). Overall, the effect of poverty on services export diversification through the trade openness channel is an empirical matter.

3. Empirical model

To investigate empirically the effect of poverty on services export concentration, we rely on the literature on the determinants of export product diversification[7], and particularly draw from the work by Anand et al. (2012) and from recent studies related to the macroeconomic determinants of services export diversification (Gnangnon, 2020a,b,c). We consider a baseline model that contains, in addition to the variable measuring poverty rates, a set of control variables, including the real per capita income ("GDPC"), the level of access to the Internet ("INTERNET"), the size of net foreign direct investment inflows per capita ("FDI"), the financial development depth (denoted "FINDEV"), the regulatory policy quality ("REGQUAL"), and the population size ("POP"). Note that the channel-variables capturing respectively the education level, and trade liberalization/trade openness have not been included in the baseline model, and will be included in the analysis later. All variables are described in Appendix 1.

We consider the following baseline specification:

$$SEC_{it} = \alpha_0 + \alpha_1 SEC_{it-1} + \alpha_2 POV_{it} + \alpha_3 GDPC_{it} + \alpha_4 INTERNET_{it} + \alpha_5 FDI_{it} + \alpha_6 FINDEV_{it} + \alpha_7 REGQUAL_{it} + \alpha_8 POP_{it} + \mu_i + \lambda_t + \omega_{it} \qquad (1)$$

i and t represent respectively a given country, and the time-period. The sample is unbalanced, and covers 98 developing countries over the period 1995-2014. Following the practice in the empirical literature, in particular the work by Gnangnon (2020b, c), we use sub-periods of 3-year averages, which include 1995-1997, 1998-2000, 2001-2003, 2004-2006, 2007-2010, and 2011-2014 (the last two sub-periods cover 4 years) so as to remove noise and mute cyclical elements in the data.

The dependent variable "SEC" stands for the degree of services export concentration, which is primarily measured by the THEIL index of services export concentration (denoted "THEIL") using the definitions and methods in Cadot et al., 2011) (see also Agosin et al., 2012; and Gnangnon, 2020a,b,c). For robustness check, we have used the Hirschman-Herfindahl index of services export. concentration (denoted "HHI"). These two indices have been computed using commercial services exports data contained in the database constructed by the International Monetary Fund (see Loungani et al., 2017). This database provides data on 11 major services exports sectors at the 2-digit level (for details on these indices, see Appendix 1).

Following Gnangnon (2020a,b,c), we have introduced the one-period lag of the variable "SEC" as a regressor in model (1) so as to both account for the strong persistence of the level of services export concentration over time, and concurrently to control for possible omitted variables in the model specification.

[7] These studies include for example Agosin et al. (2012); Amighini and Sanfilipo (2014); Bahar and Santos (2018); Gnangnon and Roberts (2017); Gnangnon (2019c, 2019d); Harding and Javorcik (2012); Hausmann et al. (2007); Kim, 2019; Munemo (2011); Osakwe et al. (2018); and Zhu and Fu (2013).

The variable "POV" is the indicator of poverty. It is primarily measured by the poverty headcount ratio at $1.90 a day (denoted "POVHC"), which is the percentage of the population living on less than $1.90 a day at 2011 international prices. For robustness check, the poverty level is measured by the poverty gap at $1.90 a day (2011 PPP), denoted "POVGAP". It reflects the depth of poverty as well as its incidence, and is calculated as the mean shortfall in income or consumption from the poverty line $1.90 a day (counting the nonpoor as having zero shortfall). This variable is also expressed as a percentage of the poverty line. It is important to note that in all regressions whose results are displayed later, we have consistently used the two indicators of poverty, even though "POVHC" remains our main measure of poverty.

All control variables (i.e., control variables) are described in Appendix 1. To address the concerns related to the units of measurement of variables contained in model (1), we have standardized all variables (see also Gnangnon, 2020a). The procedure for standardization involves calculating for each variable, the ratio of the difference between this variable and its mean (average) to the standard deviation of this variable. By proceeding in this way, the time dummies included in model (1) take the values of zero, which leads us to exclude them from the regressions based on standardized variables. The standardization procedure allows comparing regressions' estimates, and hence identifying which ones contribute the most to the dynamics of services export product concentration (or diversification). It additionally helps address eventual outlier problems in the dataset. We report in Appendix 2a the standard descriptive statistics on unstandardized (i.e., non-transformed) variables used in model (1). Appendix 2b contains the descriptive statistics on standardized variables used in the model, and Appendix 3 lists countries in the full sample.

The real per capita income, which is a proxy for the economic development level, captures here economies of scale (e.g., Krugman, 1981; Li et al., 2005; Nyahoho, 2010) that help facilitate the emergence of the demand for new services and hence induce services production and export diversification. For example, Gnangnon (2020b) has found a positive effect of the real per capita income on services export diversification.

Greater access to the Internet can promote services export diversification through its impact on innovation (e.g., Paunov, 2013), export product diversification (e.g., Chen, 2013; Lapatinas, 2019), international trade (e.g., Freund and Weinhold, 2002, 2004; Choi, 2010; Gnangnon and Iyer, 2018) and foreign direct investment inflows (e.g., Choi, 2003). Gnangnon (2020c) has obtained empirically that greater access to the Internet is positively associated with services export diversification.

We also hypothesize that an increase in the population size can be associated with an expansion of the services sector because such an increase can induce a rise in the number of services demanded by final consumers (e.g., Goswami et al., 2012). As a result, a rise in the population size can be associated either with a greater services export diversification (if the demand of services includes new services), or it can generate a greater services export concentration if consumers demand a higher number of already existing services. Gnangnon (2020a,b,c) have reported a positive effect of the population site on services export diversification.

The effect of financial development on services export diversification depends on the use of the financial resources obtained by firms that are dependent on finance for their international trade activities (in particular services trade activities) (see Agosin et al., 2012). If these funds were used to develop new services export items, then financial development would be associated with greater services export diversification. However, if these financial resources are used to expand the

services trade activities in which the country has comparative advantages, then financial development would be associated with greater services export concentration. Gnangnon (2020a) and Gnangnon (2020c) have observed that financial development influences positively services export concentration, while Gnangnon (2020b) has found that financial development promotes services export diversification. The difference in these outcomes may be attributed to the sample (including both the countries and the time-series dimension) used in these different studies. However, the financial development indicator remains a control variable in these three studies, as well as in the present analysis, thereby suggesting that a separate research paper might be needed to investigate the services export diversification effect of financial development.

FDI inflows exert a significant effect on the volume of services exports (e.g., Ansari and Ojemakinde, 2003; Grünfeld and Moxnes, 2003; Srivastava, 2006) and could therefore potentially influence countries' path of services export diversification, depending on whether activities of multinationals engaged in FDI involved the development of new services export items (in which case, FDI inflows would be positively associated with services export diversification) or whether such activities entail the expansion of services export 'products' in which the country already enjoys a comparative advantage. In the latter case, FDI inflows would generate greater services export concentration.

The essential role of the institutional quality in promoting services has been highlighted in studies of the determinants of export product diversification, notably those by Gnangnon (2020a,b,c). In fact, a good regulatory policy quality can facilitate the diversification of services export items by firms involved in international trade activities, or induce these firms to expand the range of existing services export items (in which countries enjoy comparative advantage). Thus, an improvement in regulatory policy quality can be associated either with services export diversification, or with services export concentration.

We sketch a first view on the relationship between each of the two poverty indicators and the main indicator of services export concentration (i.e, "THEIL"). In particular, Figure 1 relies on unstandardized variables to provide the development of poverty rates and the indicator of services export concentration over the full sample, using the dataset of non-overlapping sub-periods of 3-year average. Figure 2 uses the same sample and both standardized and unstandardized variables to present the correlation pattern between poverty and services export concentration.

Figure 1 shows that the two indicators of poverty have moved in the same direction over the entire period, and at the same time, the indicator of services export concentration has moved in an opposite direction to the poverty indicators. This suggests that, on average, countries tend to enjoy a higher level of services export diversification when their levels of poverty rise. This might seem contradictory with our theoretical hypothesis, but this graph simply provides an idea about the correlation between poverty and services export concentration, but not the effect of poverty on services export concentration, as the latter could only be obtained by estimating model (1) that controls for other potential factors possibly influencing countries' services export product concentration path. The average of poverty rates over the full sample has particularly increase during the last sub-periods, notably from 2004-2006 to 2011-2014, after an important rise from 1995-1997 to 2001-2003, and a subsequent decline from 2001-2003 to 2006. This rise in the poverty rates over the last sub-period of the analysis can be attributed to the 2008 financial crisis, although other factors may also have been at play. On the other hand, the indicator of services

export concentration has decreased from 1995-1997 to 2001-2003 (reflecting the fact that on average, developing countries tended to diversify their services export basket), and exhibited a rising trend from 2001-2003 to 2011-2014, which indicates a tendency for greater services export concentration.

Figure 2 shows the existence of a negative correlation pattern between poverty indicators and services export concentration, regardless of whether variables are unstandardized or standardized.

4. Econometric technique

Following Gnangnon (2020a,b,c), our main estimator to estimate model (1) as well as its different variants is the two-step system Generalized Methods of Moments (GMM) estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). This estimator helps address the endogeneity concerns related not only to measurement errors, but also to the bi-directional causality between a number of regressors in model (1) and the services export concentration indicator. These regressors include the poverty indicators, the level of Internet access, the depth of financial development, the education level, the degree of trade liberalization/or trade openness, the size of per capita FDI inflows, and the indicator of regulatory policy quality. Specifically, as an illustration of the bi-directional causality between poverty and services export concentration, one could argue that while we poverty is, theoretically, expected to influence the path of services export concentration (as discussed in Section 2), it is also possible that countries with a high degree of services export concentration (for example on traditional services items) and that concurrently experience a rise in the poverty rate, would be incentivized to implement policies and measures aiming at encouraging the expansion of the range of services export items, with the ultimate objective of reducing poverty.

The two-step system GMM estimator performs better (is more efficient - see Bond et al., 2001) than the difference GMM estimator (developed by Arellano and Bond, 1991), as it generates weak instruments if the regressors are highly persistent. This is likely to be the case for the majority of our regressors, of which the poverty indicators. Moreover, the difference GMM approach magnifies the problems of unbalanced panels in dynamic panel dataset (Roodman, 2009). The two-step system GMM estimator estimates a system of equations (i.e., level and first difference equations), and uses appropriately lagged first differences as instruments for the level equation, and appropriate lagged levels as instruments for the first-difference equation. The consistency of the two-step system GMM estimator is evaluated by means of the Arellano-Bond test of the presence of first-order serial correlation in the error term (denoted AR(1)), the Arellano-Bond test of the absence of second-order autocorrelation in the error term (denoted AR(2)). Another important test is the Sargan/Hansen test of over-identifying restrictions (OID) that helps to assess the exogeneity of instruments, as well as the eventual presence of a problem of too many instruments (or instrument proliferation), the null hypothesis being that the instruments used in the regressions are exogenous. While not explicitly required by Arellano and Bover (1995), we have also presented the results of the Arellano-Bond test of the absence of third-order autocorrelation in the error term (denoted AR(3)). In fact, the non-rejection of the null hypothesis of the absence of third-order autocorrelation in the error term might indicate that there is no problem of omitted variables in the model estimated. Finally, following for example Roodman (2009), we present the

number of instruments used in the regressions, given that a higher number of countries than the number of instruments may render the above-mentioned tests less powerful. All regressions described below have utilized 3 lags of the dependent variable as instruments, and 2 lags of endogenous variables as instruments. It is worth recalling that all these regressions used both indicators of poverty.

The empirical exercise is conducted as follows. We start by presenting the estimation of model (1) - without the one-period lag of the dependent variable as a regressor - using the fixed effects estimator ("FEDK") where the Driscoll and Kraay (1998) technique has been used to correct standard errors. The estimates arising from the regressions (that use the two poverty indicators) are likely biased due to the endogeneity concerns discussed above. However, these regressions have been performed so as to compare the estimates with those of the two-step system GMM estimator. The outcomes of the FEDK-based regression are reported in columns [1] and [2] of Table 1.

Columns [3] and [4] of Table 1 present the outcomes stemming from the estimation of the dynamic model (1), using the two-step system GMM estimator. Estimates contained in Tables 2 to 5 are based on the two-step system GMM estimator. Columns [1] and [2] of Table 2 contain the outcomes of the estimation of specifications of model (1) in which we introduce the channel-variables, including the education level, and the indicator of trade policy liberalization. The objective of doing so is to check whether the magnitude and significance of the coefficients of the poverty indicators are sensitive to the inclusion of these two-channels variables in the regressions. If after including these two variables in the regressions, the coefficients of poverty indicators remain statistically significant, this would signify that there are other possible additional variables through which poverty could influence services export concentration. However, this does not mean that the effect of poverty on services export concentration does not translate through the education level and the trade openness/trade liberalization. In contrast, if after including the two channel-variables in the regressions, the coefficients of poverty indicators become statistically non-significant (whereas they were statistically significant in the absence of these two-channel variables), then we can deduce that these two-channel variables remain the only channels through which poverty can affect services export concentration. Columns [3] and [4] of Table 2 report, for robustness check analysis, the outcomes arising from the estimation of specifications of model (1) where the variable "SEC" is measured by the indicator "HHI". Note that these model specifications also include the two-channel variables.

Outcomes contained in Table 3 help to explore how the effect of poverty on services export concentration varies across countries in the full sample. In particular, columns [1] and [2] of this Table report the estimates stemming from the estimation of specifications of the baseline model (1) in which we include the interaction between the real per capita income and each of the poverty indicators. Columns [3] and [4] of the same Table contain the results of the estimation of specifications of the baseline model (1) in which we include not only the two channel-variables, but also the interaction between the real per capita income and each of the poverty indicators.

From now onwards, the channel-variables, namely the education level and trade policy liberalization variables are included in all specifications of model (1). In Table 4, we display the estimation's outcomes that allow testing ***hypothesis 1*** set out in section 2, that is, whether the effect of poverty on services export concentration is conditional upon the level of education. To that effect, we estimate two other specifications of model (1) that include the interaction between

each poverty variable and the variable capturing the education level. Results presented in Table 5 help test ***hypothesis 2*** **/hypothesis 3** set out in section 2, i.e., whether the effect of poverty on services export concentration translates through the trade liberalization/trade openness channel. Therefore, we estimate different variants of model (1) in which we interact the variable "TRJURE" with each of the two poverty indicators. For robustness check, we have replaced in these two specifications the variable "TRJURE[8]" with two different indicators of trade openness. The first of these indicators denoted ("OPEN") is the standard measure of trade openness used in the empirical literature: this is the share of the sum of exports and imports in percentage of GDP. The second indicator is the trade openness indicator proposed by Squalli and Wilson (2011) (denoted "OPENSW"), which is computed as the standard measure of trade openness (i.e., "OPEN") adjusted by the proportion of a country's trade level relative to the average world trade (see Squalli and Wilson, 2011: p1758).

5. Interpretation of empirical results

The FEDK-based results in column [1] of Table 1 show a positive and significant effect (at the 5% level) of poverty headcount ratio on services export concentration, while the FEDK-based results in column [2] of the same Table indicate the absence of a significant effect (at the conventional levels) of poverty gap on services export concentration. Among control variables, we find that at the 5% level, services export concentration is positively affected by higher real per capita income (the coefficient of "GDPC" is significant at the 1% in column [1], but only at the 10% level in column [2] of Table 1), higher FDI inflows, a greater depth of financial development, and a rise in the population size. The Internet access and the regulatory policy quality do not exert a significant effect on services export concentration at the conventional levels. The likely biased nature of these outcomes prompts us to turn to the estimations' outcomes based on the two-step system GMM technique that are presented in columns [3] and [4] of Table 1, as well as across Tables 2 to 5. The outcomes of the diagnostic tests that help evaluate the consistency of this estimator are satisfactory. In fact, the statistical significance at the 1% of the coefficient of the one-period lag of the dependent variable across columns [3] and [4] of Table 1, and across all columns of Tables 2 to 5, confirms the persistence of services export concentration over time, and thus, highlights the need for considering a dynamic specification of model (1). Incidentally, it can be observed from columns [3] and [4] of Table 1, and all columns of Tables 2 to 5 that the p-values of the AR(1) test are lower than 0.1 (i.e., the 10% level), while the p-values of the AR(2) and AR(3) tests are all higher than 0.1. Furthermore, the instruments can be considered as exogenous given that the OID test always generates a p-value higher than 0.1, and the number of instruments is, as expected, always lower than the number of countries used in the analysis.

Estimates in columns [3] and [4] of Table 1 suggest positive and significant coefficients (at the 1% level) of the poverty indicators, namely poverty headcount ratio and poverty gap. We conclude that, as expected, a rise in poverty is associated with greater services export concentration. Nevertheless, the coefficient of "POVGAP" is higher than that of "POVHC".

[8] As noted in Appendix 1, the indicator "TRJURE" is the de jure indicator of trade globalization, and represents one of the components of KOF Globalization index developed by Dreher (2006). It is calculated as the average of two subcomponents, namely the prevalence of non-tariff barriers, and compliance costs of importing and exporting. "TRJURE" measures the degree of trade policy liberalization and not the level of trade openness, the latter being dependent on trade policy liberalization as well as other economic policies and geographic factors.

These outcomes are different from those in columns [1] and [2] of Table 1: these two coefficients are far higher than the one obtained in column [1] of Table 1. We obtain that a rise in the poverty headcount ratio indicator by a one standard deviation is associated with an increase in the index of services export concentration by a 0.28 standard deviation. Similarly, a rise in the poverty gap indicator by a one standard deviation induces an increase in the index of services export concentration by a 0.36 standard deviation. Results of control variables are similar across columns [3] and [4], although sometimes, they are different in terms of magnitude and statistical significance. It appears that at the 5% level, real per capita income exerts a positive effect on services export concentration, which signifies that as countries experience a higher real per capita income, they tend to increase their services export specialization. A greater access to the Internet and an improvement in the regulatory policy quality are positively associated with services export diversification. Higher FDI inflows and a rise in the population size influence positively services export concentration. Finally, financial development does not affect significantly (at the conventional levels) services export diversification. As noted above, one of the advantages of the standardization procedure of variables used in the analysis is the possibility of ranking the contribution of regressors to the dynamics of services export concentration. In this regard, we note from columns [3] and [4] of Table 1 that at the 5% level, the poverty indicators contribute the most to the dynamics of services export concentration. This variable is followed (when considered coefficients in absolute value) by the population size, FDI inflows, the real per capita income, the share of individuals using the Internet, and the indicator of regulatory policy quality. An important message from columns [3] and [4] of Table 1 is that not only does poverty induces a greater services export concentration, but it is also ranked first among the macroeconomic factors (considered in the baseline model (1)) that affect services export concentration.

Results in column [1] of Table 2 show that the coefficient of "POVHC" is significant only at the 10% level. This signifies that at the 5% level, there is no significant effect of poverty headcount ratio on services export concentration. As the channel-variables capturing the education level and trade policy have been included in the specification of model (1) whose estimation has yielded those outcomes, we could be tempted to conclude that the effect of poverty on services export concentration passes through these two channels. It is important to note here that the coefficient of the education level variable is not significant at the conventional levels, while that of trade policy is positive and significant at the 1% level. At the same time, we note from column [2] of Table 1 that the coefficient of "POVGAP" is positive and significant at the 1% level, even in the presence of the education level and trade policy variables (the coefficient of education variable is not significant at the 10% level, whereas that of trade policy is positive and significant at the 1% level). As underlined above, these outcomes do not signify that the effect of poverty on services export concentration does not translate either through the education level, or through trade policy, as hypothesized in section 2. Instead, they suggest that there might be additional macroeconomic factors through which poverty could influence services export concentration. It is also worth highlighting that the present paper does not intend to explore all possible determinants (including macroeconomic, but possibly microeconomic factors) of services export concentration, as this might be a daunting task if such an analysis were to be carried out in one single research paper. Additionally, these do not mean that our results suffer from omitted variables bias, because the inclusion of the one-period lag of the dependent variable as a regressor in the model contribute to addressing this concern. Furthermore, as we also observed above, the AR(3) test (even not

recommended) has shown that the model does not appear to suffer from omitted variables bias. Results in columns [3] and [4] of Table 1 rely, for robustness check, on "HHI" as the indicator of services export concentration. They show that poverty headcount ratio and poverty gap influence positively and significantly (at the 1% level) services export concentration, in spite of the inclusion of the two channel-variables in the specifications of model (1) (once again, here the coefficient of education variable is not significant at the 10% level, whereas that of trade policy is positive and significant at the 1% level). These outcomes tend to confirm that there are likely other factors through which poverty can affect services export concentration. As we see later, one of these factors is countries' level of services export product concentration.

To recall, estimates in columns [1] and [2] of Table 3 are based on specifications of model (1) that include the interaction variable between each poverty indicator and the real per capita income, but exclude the two channel-variables. Likewise, estimates in columns [3] and [4] of Table 3 are based on specifications of model (1) that include both the interaction variable between each poverty indicator and the real per capita income, and the two channel-variables. We obtain from columns [1] and [2] of this Table that the coefficients of the interaction variables are not statistically significant at the conventional levels, while in columns [3] and [4], they are significant at the 1% level. These results, therefore, confirm our suggestion above that poverty might influence services export concentration through other channels than the education and trade policy avenues. Based on results concerning the two interaction variables in columns [3] and [4], and noting that in these two columns, the coefficients of "POVHC" and "POVGAP" are all significant at the 1% level, we conclude that poverty always exerts a positive effect on services export concentration, and the magnitude of this positive effect increases as countries experience a higher real per capita income. In other words, advanced (developing) countries experience a higher positive effect of poverty on services export concentration compared to relatively less advanced economies (among developing countries).

Outcomes displayed in column [1] of Table 4 indicate that the coefficient of the interaction variable "POVHC*EDU" is significant at the 5% level, while that of "POVHC" is not statistically significant at the conventional levels. Taken together, these two results suggest that lower poverty headcount rates induce services export diversification in the context of a rise in the education level. These findings confirm the **theoretical hypothesis 1.** Furthermore, these findings are more than confirmed by estimates provided in column [2] of Table 4, as we obtain positive coefficients for both the interaction variable "POVGAP*EDU", and the variable "POVGAP", with the coefficient of the former being significant at the 1% level, while that the coefficient of the latter is significant at the 5% level.

Overall, by validating **hypothesis 1,** Table 4 conveys the message that a decline in poverty rates is associated with greater services export concentration in countries that experience a higher education level.

Results in Table 5 allow exploring whether the effect of poverty on services export concentration depends the level of trade policy liberalization (or trade openness). Column [1] of this Table shows that the coefficients of both "POVHC*TRJURE" and "POVHC" are positive and significant at the 1% level. Hence, we conclude that poverty headcount ratio induces greater services export concentration in countries that further liberalize their trade regimes, and the higher the level of trade policy liberalization, the greater is the magnitude of the positive effect of poverty headcount ratio on services export concentration. Put differently, trade policy liberalization is

associated with greater services export diversification in countries that endeavour to reduce their poverty rates. Thus, even if countries liberalize their trade regimes, they do not necessarily develop new services export items if they experience a high level of poverty. Another possible interpretation of these outcomes is that higher poverty rates tend to constrain countries to rely on export of few services items. We note from column [2] of Table 5 that the coefficient of "POVGAP*TRJURE" is statistically significant only at the 10% level, while the coefficient of "POVGAP" is positive and significant at the 1% level. On the basis of these outcomes, we conclude that it is only at the 10% level that the positive effect of poverty gap on services export concentration rises with the degree of trade policy liberalization. Incidentally, columns [3] and [4] of Table 5 suggest no statistical significance of the poverty indicators, while the interaction variables between each of the poverty indicators and the trade openness ("OPEN") variable hold positive and significant coefficients at the 1% level. Similarly, we find in columns [5] and [6] of Table 5 that the interaction terms of the variables "POVHC*OPENSW" and "POVGAP*OPENSW", and the estimates related to "POVHC" and "POVGAP" are all significant at the 1% level. Overall, results in columns [3] to [6] of Table 5 indicate that the effect of poverty (be it poverty headcount or poverty gap) on services export concentration is always positive, and rises as countries further open-up their economies to international trade. These findings confirm the ones obtained from column [1] of Table 5.

Summing-up, Table 5 conveys the message that lower poverty levels induce a higher degree of services export diversification in countries that further liberalize their trade regimes, or improve their overall level of trade openness. For these countries, the lower the poverty rate, the higher is the magnitude of the positive effect of poverty on services export diversification in the context of greater trade policy liberalization (or greater trade openness). Therefore, these findings confirm **hypothesis 2** at the expense of **hypothesis 3.**

Estimates of control variables in Tables 2 to 5 are similar, and additionally align well with those observed in columns [3] and [4] of Table 1.

6. Further analysis: effect of poverty on services export diversification through export product concentration

Thus far, the analysis has examined the effect of poverty on services export concentration through the education and trade openness channels, and has noticed that there might be other macroeconomic factors through which poverty could influence services export concentration. In the present section, we explore one of these possible additional channels, that is, the level of export product concentration. Thus, we examine here whether poverty influences services export diversification through the export product diversification channel.

From the theoretical perspectives, on the one hand, Gnangnon (2019a) has provided empirical evidence that higher poverty induces greater export product concentration, with this effect taking place through lower financial means for both households and governments, and the lack of adequate human capital resources in the economy. On the other hand, it has been hypothesized that the demand for services exports can increase further to a rise in the volumes of goods exports, in particular the volumes of manufacturing exports. This hypothesis has been developed and empirically supported by Eichengreen and Gupta (2013a), and Sahoo and Dash (2014). These authors have argued that this 'network' argument relies on the idea that countries

that enhance their integration into the global trade markets for goods (including for manufacturing goods) would develop a network that could be used to promote services exports. Building on this argument, Gnangnon (2020b) has demonstrated empirically that higher manufactured exports are associated with greater services export diversification, and Gnangnon (2020c) has obtained that greater export product concentration induces greater services export concentration, i.e., higher export product diversification is associated with services export diversification. On another note, Gnangnon and Priyadarshi (2016) have found empirical evidence that export product diversification induce greater exports of commercial services in least developed countries. In light of the foregoing, our hypothesis (***hypothesis 4***) is that the effect of poverty on services export diversification would translate through export product diversification: higher poverty would be associated with greater services export concentration through its positive effect on export product concentration; additionally, the greater the degree of export product concentration (usually on primary commodities or commodities with low-value addition), the higher is the magnitude of the positive effect of poverty on services export concentration. Incidentally, as human capital is an important determinant of export product diversification (e.g., Agosin et al. 2012; Gnangnon and Roberts, 2017; Gnangnon, 2019c, 2019d; Harding and Javorcik, 2012; Hausmann et al. 2007; Osakwe et al. 2018; and Zhu and Fu, 2013), and in light of the discussion above concerning the human capital effect of poverty, we postulate that poverty can also affect services export diversification through the effect of human capital (which is itself dependent on the level of poverty) on export product diversification.

To test "***hypothesis 4***", we estimate (by means of the two-step system GMM estimator) other variants of model (1) - where the dependent variable is "THEIL". These model specifications contain the channel-variables tested above (i.e., the education level and the trade openness variables) as well as the variable capturing the export product concentration (denoted "ECI") and its interaction with each of the two poverty variables. The overall export product concentration index has been computed by the International Monetary Fund (IMF) using the definitions and methods of Cadot et al. (2011) (see Appendix 1 for details on this index). The estimations' results based on the "ECI" index are reported in Table 6. We first note that all requirements of the two-step system GMM are satisfied in Table 6. Additionally, the one-period lag of the dependent variable is always statistically significant (at the 1% level), thereby confirming the need for considering the dynamic nature of these variants of model (1).

We find from the two columns of Table 6 that the interaction variables, and the poverty variables hold positive and significant coefficients (at the 1% level). Taken together, these two results indicate that the effect of poverty on services export concentration genuinely depends on the level of export product concentration. Regardless of the level of export product concentration, poverty always induces a greater services export concentration, and the magnitude of this positive effect increases with the degree of export product concentration. These findings indicate that poor countries (or low-income countries) are likely to experience a higher degree of concentration on few services export items than less poor countries because they have higher poverty levels and a higher degree of export product concentration on primary products (than less poor countries). In a nutshell, these outcomes validate the **theoretical hypothesis 4.**

7. Conclusion

This paper has examined the effect of poverty on services export concentration in developing countries. In so doing, it aims to complement the very few studies on the determinants of services export diversification, as well as the recent work on the effect of poverty on export product concentration. The analysis has shown that poverty influences positively services export concentration, with the magnitude of this effect being higher in advanced (developing) countries than in relatively less advanced economies. Additionally, and interestingly, the effect of poverty on export product concentration is conditional on the education level, the degree of trade policy liberalization (and trade openness), and the level of export product concentration. Specifically, lower poverty rates are associated with greater services export diversification in countries with a higher education level, as well as in countries that further liberalize their trade regimes, or experience greater trade openness. Likewise, poverty is associated with a higher level of services export concentration in countries that have a high degree of export product concentration (probably those with low value-added products, as in many developing countries, notably poorest ones). The latter finding complements the ones in the literature, whereby poverty induces a higher level of export product concentration.

From a policy perspective, the present analysis shows that to diversify their services export items basket, including towards sophisticated export items (given the pro-economic growth effect of services export sophistication), policymakers in developing countries should not only implement policies in favour of diversification of services export items (such as improving the business environment, liberalize trade and in particular removing services trade barriers, improving access to the Internet…etc), but they should also aim at directly reducing poverty. It is worth pointing out that some of those measures/policies aiming at diversifying services export items are likely to indirectly help reduce poverty (through a variety of channels of which export product diversification). However, additional direct measures in favour of the poor segments of the populations should be implemented so as to directly reduce poverty, and ultimately facilitate services export diversification. Such policies include for example, the development of social safety nets in favour of poor people, well-targeted transfers/subsidies to those that need them the most to develop small businesses, and the enhancement of human capital. An avenue for future research could be to explore other possible factors (than the ones examined in the present analysis) through which poverty can affect services export concentration in developing countries.

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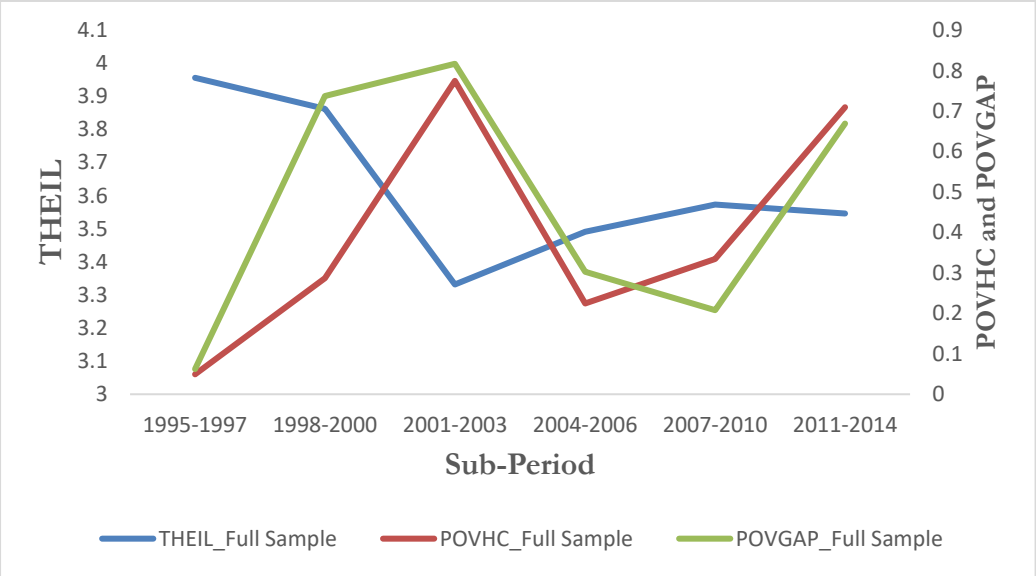
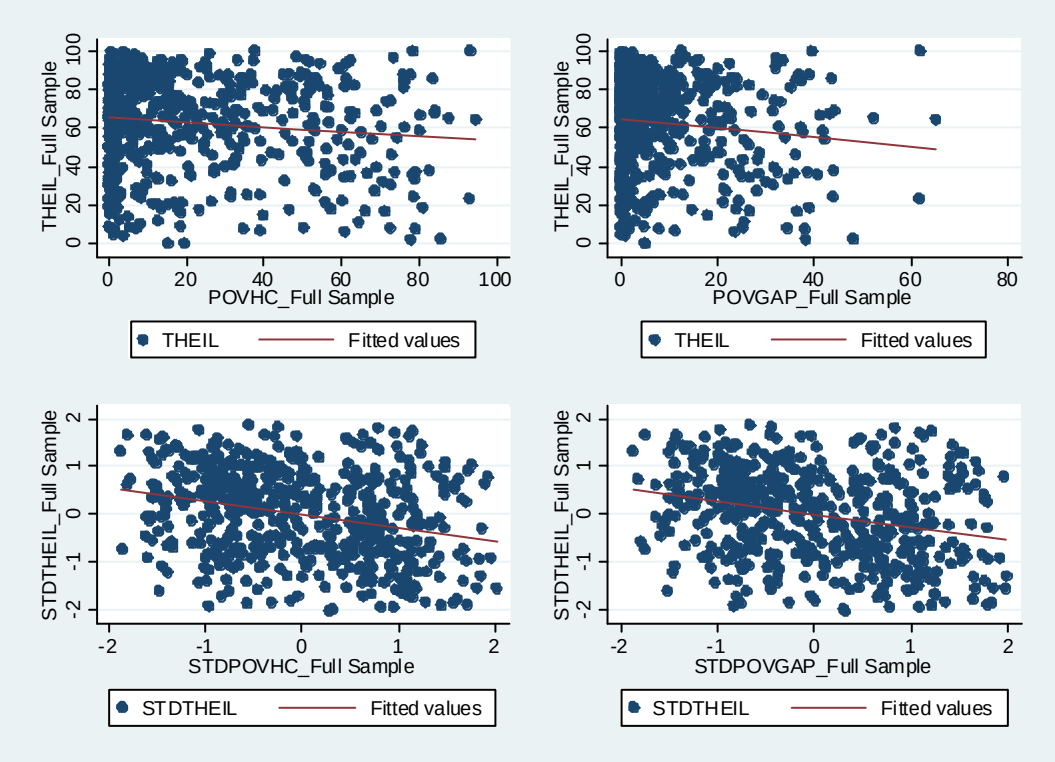
FIGURES

Figure 1: Developments of poverty indicators and THEIL_over the full sample



Source: Author

Figure 2: Correlation pattern between Poverty indicators and THEIL_ Over the full sample



Source: Author

Note: The variables used in the graphs are unstandardized variables. "POVHC", "POVGAP" and "STDTHEIL" are respectively the standardized variables poverty headcount, poverty gap, and THEIL.

TABLES and APPENDICES

Table 1: Effect of the poverty on services export concentration ("THEIL")
Estimators: FEDK and Two-Step System GMM

	FEDK		**Two-Step System GMM**	
Variables	**THEIL**	**THEIL**	**THEIL**	**THEIL**
	(1)	**(2)**	**(3)**	**(4)**
$THEIL_{t-1}$			0.435***	0.458***
			(0.0344)	(0.0364)
POVHC	0.0720**		0.278***	
	(0.0355)		(0.0796)	
POVGAP		0.0374		0.361***
		(0.0368)		(0.0757)
GDPC	0.392**	0.364*	0.233***	0.158*
	(0.187)	(0.188)	(0.0835)	(0.0869)
INTERNET	-0.219	-0.200	-0.162**	-0.174*
	(0.152)	(0.157)	(0.0813)	(0.0891)
FDI	0.118***	0.115***	0.149***	0.219***
	(0.0401)	(0.0417)	(0.0564)	(0.0585)
FINDEV	0.143***	0.143***	-0.00577	0.000658
	(0.0285)	(0.0290)	(0.0542)	(0.0562)
REGQUAL	-0.0311	-0.0360	-0.131**	-0.154**
	(0.0410)	(0.0400)	(0.0606)	(0.0663)
POP	0.150***	0.132***	0.237***	0.296***
	(0.0308)	(0.0373)	(0.0672)	(0.0785)
Constant	-0.0109	-0.00702	0.195***	0.205***
	(0.0702)	(0.0710)	(0.0188)	(0.0188)
Observations - Countries	529 - 98	524 - 98	439 - 98	434 - 98
Within R-squared	0.1964	0.1953		
Number of Instruments			56	56
AR1 (P-Value)			0.0000	0.0000
AR2 (P-Value)			0.8904	0.6286
AR3 (P-Value)			0.6602	0.7821
OID (P-Value)			0.4421	0.4718

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "INTERNET", "FINDEV", "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Table 2: Effect of the poverty on services export concentration ("THEIL" and "HHI")
Estimator: Two-Step System GMM

Variables	**THEIL**	**THEIL**	**HHI**	**HHI**
	(1)	**(2)**	**(3)**	**(4)**
One-Period Lag of the Dependent Variable	0.428***	0.442***	0.492***	0.506***
	(0.0306)	(0.0307)	(0.0309)	(0.0309)
POVHC	0.121*		0.315***	
	(0.0676)		(0.0506)	
POVGAP		0.245***		0.288***
		(0.0539)		(0.0542)
EDU	-0.0536	-0.0300	-0.0653	-0.105
	(0.0710)	(0.0655)	(0.106)	(0.0977)
TRJURE	0.161***	0.183***	-0.136***	-0.146**
	(0.0463)	(0.0458)	(0.0512)	(0.0583)
GDPC	0.268***	0.301***	0.338***	0.316**
	(0.0841)	(0.0850)	(0.125)	(0.126)
INTERNET	-0.195**	-0.229***	-0.192*	-0.202*
	(0.0836)	(0.0874)	(0.101)	(0.112)
FDI	0.0337	0.0976*	0.000329	0.00793
	(0.0545)	(0.0528)	(0.0629)	(0.0679)
FINDEV	-0.0221	-0.0517	0.0164	0.0160
	(0.0312)	(0.0345)	(0.0449)	(0.0473)
REGQUAL	0.0752*	0.0444	0.0900**	0.0913*
	(0.0435)	(0.0446)	(0.0457)	(0.0532)
POP	0.321***	0.334***	0.341***	0.365***
	(0.0669)	(0.0609)	(0.0651)	(0.0770)
Constant	0.103***	0.117***	-0.0238	0.000971
	(0.0173)	(0.0152)	(0.0278)	(0.0292)
Observations – Countries	353 - 98	348 - 98	353 - 98	348 - 98
Within R-squared				
Number of Instruments	72	72	72	72
AR1 (P-Value)	0.0041	0.0038	0.0062	0.0075
AR2 (P-Value)	0.3183	0.2081	0.9060	0.8135
AR3 (P-Value)	0.9031	0.9646	0.3019	0.3070
OID (P-Value)	0.6491	0.6752	0.1752	0.1570

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "INTERNET", "FINDEV", "EDU", "TRJURE" "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Table 3: Effect of the poverty on services export concentration ("THEIL") for varying values of the real per capita income
Estimator: Two-Step System GMM

Variables	**THEIL**	**THEIL**	**THEIL**	**THEIL**
	(1)	(2)	(3)	(4)
$THEIL_{t-1}$	0.435***	0.451***	0.434***	0.452***
	(0.0297)	(0.0333)	(0.0254)	(0.0247)
POVHC*GDPC	-0.0480		0.126***	
	(0.0546)		(0.0344)	
POVGAP*GDPC		-0.0547		0.162***
		(0.0488)		(0.0451)
POVHC	0.268***		0.128**	
	(0.0691)		(0.0520)	
POVGAP		0.331***		0.135**
		(0.0661)		(0.0578)
EDU			-0.0652	-0.0227
			(0.0610)	(0.0598)
TRJURE			0.133***	0.127***
			(0.0448)	(0.0384)
GDPC	0.253***	0.220***	0.212***	0.272***
	(0.0725)	(0.0809)	(0.0617)	(0.0565)
INTERNET	-0.166**	-0.209***	-0.0943	-0.183***
	(0.0677)	(0.0792)	(0.0640)	(0.0562)
FDI	0.149***	0.180***	0.00161	0.000214
	(0.0469)	(0.0469)	(0.0468)	(0.0490)
FINDEV	-0.0263	-0.0377	-0.0223	-0.0128
	(0.0467)	(0.0516)	(0.0351)	(0.0406)
REGQUAL	-0.132***	-0.103*	0.0827**	0.0503
	(0.0498)	(0.0534)	(0.0398)	(0.0422)
POP	0.207***	0.288***	0.375***	0.360***
	(0.0676)	(0.0808)	(0.0463)	(0.0501)
Constant	0.170***	0.177***	0.163***	0.183***
	(0.0291)	(0.0274)	(0.0268)	(0.0261)
Observations - Countries	439 - 98	434 - 98	353 - 98	348 - 98
Number of Instruments	64	64	80	80
AR1 (P-Value)	0.0000	0.0000	0.0053	0.0053
AR2 (P-Value)	0.8938	0.5951	0.3235	0.2310
AR3 (P-Value)	0.7282	0.7840	0.9315	0.7417
OID (P-Value)	0.6052	0.5844	0.6472	0.7405

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "INTERNET", "FINDEV", "EDU", "TRJURE" "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Table 4: Effect of the poverty on services export concentration ("THEIL") for varying education levels
Estimator: Two-Step System GMM

Variables	THEIL	THEIL
	(1)	(2)
$THEIL_{t-1}$	0.389***	0.425***
	(0.0271)	(0.0245)
POVHC*EDU	0.0953**	
	(0.0400)	
POVHC	0.0617	
	(0.0626)	
POVGAP*EDU		0.181***
		(0.0406)
POVGAP		0.138**
		(0.0557)
EDU	-0.0345	-0.0457
	(0.0556)	(0.0603)
TRJURE	0.0973***	0.144***
	(0.0371)	(0.0424)
GDPC	0.130*	0.201**
	(0.0759)	(0.0838)
INTERNET	-0.114*	-0.178**
	(0.0674)	(0.0780)
FDI	0.0566	0.0892*
	(0.0532)	(0.0511)
FINDEV	0.0482*	-0.00173
	(0.0273)	(0.0314)
REGQUAL	0.0541	0.0829**
	(0.0344)	(0.0397)
POP	0.316***	0.393***
	(0.0586)	(0.0508)
Constant	0.110***	0.156***
	(0.0222)	(0.0220)
Observations - Countries	353 - 98	348 - 98
Number of Instruments	80	80
AR1 (P-Value)	0.0065	0.0051
AR2 (P-Value)	0.4657	0.2813
AR3 (P-Value)	0.9008	0.8772
OID (P-Value)	0.5621	0.7746

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "INTERNET", "FINDEV", "EDU", "TRJURE" "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Table 5: Effect of the poverty on services export concentration ("THEIL") for varying levels of trade openness
Estimator: Two-Step System GMM

Variables	THEIL	THEIL	THEIL	THEIL	THEIL	THEIL
	(1)	(2)	(3)	(4)	(5)	(6)
$THEIL_{t-1}$	0.407***	0.387***	0.388***	0.372***	0.387***	0.383***
	(0.0293)	(0.0255)	(0.0188)	(0.0184)	(0.0196)	(0.0196)
POVHC*TRJURE	0.131***					
	(0.0452)					
POVGAP*TRJURE		0.0729*				
		(0.0383)				
POVHC*OPEN			0.307***			
			(0.0394)			
POVGAP*OPEN				0.293***		
				(0.0355)		
POVHC*OPENSW					0.114***	
					(0.0393)	
POVGAP*OPENSW						0.134***
						(0.0364)
POVHC	0.134**		-0.0145		0.112***	
	(0.0552)		(0.0511)		(0.0303)	
POVGAP		0.157***		0.000843		0.155***
		(0.0509)		(0.0369)		(0.0294)
TRJURE	0.122***	0.134***				
	(0.0285)	(0.0309)				
OPEN			0.103***	0.0941***		
			(0.0334)	(0.0251)		
OPENSW					0.136***	0.136***
					(0.0417)	(0.0444)
EDU	0.0176	0.0386	-0.0783	-0.0175	-0.0596	-0.153***
	(0.0563)	(0.0540)	(0.0651)	(0.0572)	(0.0616)	(0.0517)
GDPC	0.180***	0.212***	0.134**	0.0404	0.223***	0.193***

	(0.0628)	(0.0640)	(0.0575)	(0.0536)	(0.0600)	(0.0637)
INTERNET	-0.119*	-0.155**	-0.0570	0.0374	-0.119*	0.00601
	(0.0643)	(0.0631)	(0.0772)	(0.0622)	(0.0613)	(0.0625)
FDI	0.127***	0.0940**	0.0156	0.0672	0.0554	0.0787*
	(0.0421)	(0.0403)	(0.0410)	(0.0410)	(0.0421)	(0.0435)
FINDEV	-0.0535**	-0.0559**	0.0429*	0.0220	-0.00662	-0.0187
	(0.0257)	(0.0262)	(0.0235)	(0.0247)	(0.0225)	(0.0281)
REGQUAL	-0.00654	-0.0174	-0.00843	-0.0456*	-0.00875	-0.0469
	(0.0308)	(0.0341)	(0.0317)	(0.0254)	(0.0333)	(0.0289)
POP	0.275***	0.248***	0.220***	0.127***	0.239***	0.208***
	(0.0530)	(0.0517)	(0.0548)	(0.0477)	(0.0486)	(0.0516)
Constant	0.113***	0.110***	0.133***	0.137***	0.164***	0.166***
	(0.0174)	(0.0146)	(0.0139)	(0.0135)	(0.0182)	(0.0165)
Observations - Countries	353 - 98	348 - 98	340 - 94	335 - 94	340 - 94	335 - 94
Number of Instruments	81	81	81	81	81	81
AR1 (P-Value)	0.0075	0.0074	0.0028	0.0031	0.0072	0.0072
AR2 (P-Value)	0.4323	0.3051	0.6896	0.5434	0.4997	0.3932
AR3 (P-Value)	0.7559	0.7478	0.8612	0.6808	0.7184	0.7214
OID (P-Value)	0.6285	0.5284	0.4041	0.3965	0.6139	0.3823

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "ECIINT", "ECIEXT", "INTERNET", "FINDEV", "EDU", "TRJURE", "OPEN", "OPENSW", "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Table 6: Effect of the poverty on services export concentration ("THEIL") for varying levels of export product concentration
Estimator: Two-Step System GMM

Variables	**THEIL**	**THEIL**
	(1)	**(2)**
$THEIL_{t-1}$	0.395***	0.388***
	(0.0251)	(0.0255)
POVHC	0.126***	
	(0.0445)	
POVGAP		0.240***
		(0.0347)
POVHC*ECI	0.108***	
	(0.0413)	
POVGAP*ECI		0.165***
		(0.0412)
ECI	0.0746***	0.0750***
	(0.0242)	(0.0223)
EDU	-0.00112	-0.0269
	(0.0530)	(0.0513)
TRJURE	0.125***	0.128***
	(0.0283)	(0.0312)
GDPC	0.0552	0.0948
	(0.0407)	(0.0620)
INTERNET	-0.0685*	-0.0663
	(0.0404)	(0.0525)
FDI	0.144***	0.175***
	(0.0318)	(0.0368)
FINDEV	0.0215	0.0109
	(0.0241)	(0.0261)
REGQUAL	-0.0113	-0.0327
	(0.0278)	(0.0304)
POP	0.202***	0.214***
	(0.0492)	(0.0520)
Constant	0.113***	0.111***
	(0.0141)	(0.0115)
Observations – Countries	353 - 98	348 - 98
Number of Instruments	88	88
AR1 (P-Value)	0.0095	0.0113
AR2 (P-Value)	0.5171	0.4339
AR3 (P-Value)	0.8221	0.9665
OID (P-Value)	0.6767	0.4474

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust standard errors are in parenthesis. In the two-step system GMM estimations, the variables "POVHC", "POVGAP", "ECI", "ECIINT", "ECIEXT", "INTERNET", "FINDEV", "EDU", "TRJURE" "FDI", "REGQUAL" and the interaction variables have been considered as endogenous. All variables have been standardized. The regressions have used 3 lags of the dependent variable as instruments and 2 lags of the endogenous variables as instruments.*

Appendix 1: Definition and Source of variables

Variables	Definition	Sources
POVHC	Poverty headcount ratio at $1.90 a day is the percentage of the population living on less than $1.90 a day at 2011 international prices.	Data on this indicator is collected from the Word Development Indicators (WDI) of the World Bank and POVCALNET of the World Bank (see http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx). Missing data has been completed using linear interpolation technique over 2 to 4 years (see also Santos-Paulino, 2017 who has adopted the same procedure, although she has not mentioned it explicitly in her article).
POVGAP	Poverty gap at $1.90 a day (2011 PPP) is the mean shortfall in income or consumption from the poverty line $1.90 a day (counting the nonpoor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence.	Data on this indicator is collected from the Word Development Indicators (WDI) of the World Bank and POVCALNET of the World Bank (see http://iresearch.worldbank.org/PovcalNet/povOnDemand.aspx). Missing data has been completed using linear interpolation technique over 2 to 4 years (see also Santos-Paulino, 2017).
THEIL	This variable represents the Theil index of services export concentration. It has been calculated using the following formula (for example, see Agosin et al, 2011; Cadot et al., 2011): $THEIL = \frac{1}{n}\sum_{k=1}^{n}\frac{x_k}{\mu}\ln\left(\frac{x_k}{\mu}\right)$, where $\mu = \frac{1}{n}\sum_{k=1}^{n} x_k$ n represents the total number of the (services) export lines (k) $n = \sum_{k=1}^{n} k$; x_k stands for the amount of services exports associated with the services line "k".	Author's calculation based on data extracted from the database developed by the International Monetary Fund (IMF) on the international trade in services (see online at: https://data.imf.org/?sk=07109577-E65D-4CE1-BB21-0CB3098FC504) – See also Loungani et al. (2017). The data used to compute the HHI indicator are sectoral data on services exports at 2-digit level, which is the maximum digit-level of disaggregated data available on services. In particular, we have relied on 11 major sectors of services (categories of services) – at the 1-digit level - and used the disaggregated data on services exports for sub-sectors at the 2-digit level. These 11 major services sectors are as follows (the sub-sectors are in brackets): **1. Charges for the use of intellectual property n.i.e.;** **2. Construction** (Construction abroad; Construction in reporting economy); **3. Financial services** (Financial Explicitly charged and other financial services; Financial intermediation services indirectly measured -FISIM-); **4. Insurance and pension services** (Auxiliary insurance services; Direct insurance; Pension and standardized guaranteed services; Reinsurance); **5. Maintenance and repair services n.i.e.**;

		6. Manufacturing services on physical inputs owned by others (Goods for processing abroad; Goods for processing in reporting economy); **7. Other Business Services** (Professional and management consulting services; Research and development services; Technical, trade-related, and other business services); **8. Personal, cultural, and recreational services** (Audiovisual and related services; Other personal, cultural, and recreational services); **9. Telecommunications, computer, and information services** (Computer services; Information services; Telecommunications services); **10. Transport** (Air Transport; Other mode of Transport; Postal and courier services; Sea Transport); **11. Travel** (Business; Personal).
HHI	This is the Herfindahl index, which is also referred sometimes to as the Hirschman-Herfindahl index. It has been calculated as the sum of the squared shares of each export line k (with amount exported) in total services exports. Values of this index range from 0 to 1. We have multiplied this indicator by 100 so that its values range between 0 and 100. Higher values of this index reflect greater services export concentration, and lower values indicate greater services export diversification.	Author's calculation based on the same data (extracted from the IMF database on the international trade in services) used to compute the THEIL indicator described above.
INTERNET	Share (%) of individuals using the Internet in the total population.	World Development Indicators (WDI)
GDPC	Per capita Gross Domestic Product (constant 2010 US$)	WDI
TRJURE	This is the de Jure measure of trade openness, i.e., the De jure trade globalisation index developed (see Dreher, 2006 and Gygli et al. 2019). It is a composite index of Trade regulations, trade taxes, tariffs, and trade agreements.	See the database and other information online at: https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html
OPEN	This is the indicator of trade openness, measured by the share (%) of sum of exports and imports of goods and services in GDP.	WDI
OPENSW	Measure of trade openness suggested by Squalli and Wilson (2011). It is calculated as the measure of trade openness (the	Authors' calculation based on data extracted from the WDI

	variable "OPEN" previously described) adjusted by the proportion of a country's trade level relative to the average world trade (see Wilson, 2011: p1758).	
EDU	This is the sum of the gross primary school enrollment (%), gross secondary school enrollment (%), and gross tertiary school enrollment (%).	Author's calculation based on data collected from the WDI.
ECI	This is the variable capturing overall export product concentration. It is calculated using the Theil Index and following the definitions and methods used in Cadot et al. (2011). The overall Theil index of export product concentration is the sum of the intensive and extensive components of the "ECI" variable. Indeed, export product diversification can occur either over product narrowly defined or trading partners. It can be broken down into the extensive and intensive margins of diversification. Extensive export diversification reflects an increase in the number of export products or trading partners, while intensive export diversification considers the shares of export volumes across active products or trading partners. The computation of the index has been based on a classification of products into "Traditional", "New", or "Non-Traded" products categories. A rise in the values of "ECI" index signifies an increase in the degree of overall export product concentration, while a decrease in the values of the index reflects a rise in the degree of overall export product concentration (that is, greater export product diversification).	Details on the calculation of this Index could be found online: International Monetary Fund's Diversification Toolkit – See data online at: https://data.imf.org/?sk=3567E911-4282-4427-98F9-2B8A6F83C3B6
FINDEV	Domestic credit to private sector by banks (% of GDP)	WDI
FDI	The variable "FDI" is the Net Foreign Direct Investment flows (constant US$ 2010 prices). The variable capturing the Net Foreign Direct Investment flows (constant US$ 2010 prices) has been calculated by multiplying the Net Foreign Direct Investment Inflows (% of GDP) by the real per capita	Authors' calculation based on data on Net Foreign Direct Investment flows (% of GDP) and real GDP extracted from the WDI.

	GDP (constant 2010 US$) (e.g., Nagel et al., 2015 and Herzer, 2011).	
POP	This is the measure of the total Population	WDI
REGQUAL	This variable represents the regulatory quality index. It reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Higher values of this index are associated with better regulatory policy quality, while lower values reflect worse regulatory policy quality.	Data on this variable has been collected from World Bank Governance Indicators (WGI) developed by Kaufmann, Kraay and Mastruzzi (2010) and recently updated.

Appendix 2a: Descriptive statistics on unstandardized variables used in the model

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
THEIL	353	65.581	22.985	1.896	100.000
HHI	353	52.685	28.119	0.318	99.231
POVHC	353	20.090	22.749	0.003	87.698
POVGAP	348	7.617	10.235	0.003	52.218
GDPC	353	4487.847	4514.962	192.174	24202.610
INTERNET	353	15.084	18.463	0.012	79.784
TRJURE	353	49.612	20.222	1.540	93.599
OPEN	340	80.304	36.335	22.452	215.823
OPENSW	340	0.00189	0.0037	2.70e-06	0.0262
ECI	353	3.324	1.0639	1.0896	6.175
FINDEV	353	33.064	25.848	2.703	147.552
REGQUAL	353	-0.167	0.647	-1.744	1.496
EDU	353	195.826	51.934	46.927	297.381
POP	353	4.17e+07	1.28e+08	163538	1.27e+09

Appendix 2b: Descriptive statistics on standardized variables used in the model

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
THEIL	353	0.116	0.790	-1.868	1.827
HHI	353	-0.028	0.835	-1.877	1.852
POVHC	353	-0.212	0.828	-1.882	1.837
POVGAP	348	-0.223	0.819	-1.873	1.795
GDPC	353	0.245	0.847	-1.401	1.936
INTERNET	353	0.224	0.898	-1.094	2.003
TRJURE	353	0.225	0.799	-1.901	1.871
OPEN	340	0.103	0.894	-1.834	1.883
OPENSW	340	0.084	0.903	-1.672	1.957
ECI	353	-0.019	0.8776	-1.92626	1.95911
FINDEV	353	0.147	0.894	-1.808	1.960
REGQUAL	353	0.023	0.861	-1.826	1.960
EDU	353	0.195	0.806	-1.504	1.938
POP	353	0.196	0.802	-1.555	1.765

Appendix 3: List of countries contained in the Full Sample

Full sample			
Albania	Estonia	Mauritius	Tanzania
Algeria	Ethiopia	Mexico	Thailand
Angola	Fiji	Moldova	Togo
Argentina	Gabon	Mongolia	Tunisia
Armenia	Gambia, The	Morocco	Turkey
Bangladesh	Georgia	Mozambique	Uganda
Belarus	Ghana	Namibia	Ukraine
Belize	Guatemala	Nepal	Uruguay
Benin	Guinea	Nicaragua	Vanuatu
Bhutan	Guyana	Niger	Venezuela
Botswana	Honduras	Nigeria	Yemen
Brazil	Hungary	Pakistan	
Bulgaria	India	Panama	
Burkina Faso	Indonesia	Paraguay	
Burundi	Iran	Peru	
Cabo Verde	Jamaica	Philippines	
Cambodia	Jordan	Poland	
Cameroon	Kazakhstan	Romania	
Chile	Kenya	Russia	
Colombia	Kyrgyz Republic	Rwanda	
Congo, Democratic Republic of the	Lao P.D.R.	Senegal	
Congo, Republic of	Lesotho	Slovak Republic	
Costa Rica	Liberia	Slovenia	
Croatia	Lithuania	Sri Lanka	
Czech Republic	Macedonia, FYR	St. Lucia	
Dominican Republic	Madagascar	Sudan	
Ecuador	Malawi	Swaziland	
Egypt	Malaysia	Sao Tome and Principe	
El Salvador	Mali	Tajikistan	