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Does Poverty deter Foreign Direct Investment flows to Developing Countries?

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Abstract

The present paper investigates the effect of poverty on foreign direct investment (FDI) inflows in developing countries. It complements the important extant literature on the effect of FDI inflows on poverty by examining the issue the other way around. The analysis is conducted using a sample of 117 countries over the period 1980-2017, and the two-step system Generalized Methods of Moments (GMM) technique. It has relied on two indicators of poverty, namely poverty headcount ratio and poverty gap. Findings indicate that over the full sample, poverty influences negatively FDI inflows, including through its adverse effect on human capital (that is, both education and health). Unsurprisingly, low-income countries (considered as poorest countries in the full sample) experience a higher negative effect of poverty on FDI inflows than other countries. On another note, participation in international trade matters for the effect of poverty on FDI inflows. In fact, an increase in poverty levels results in lower FDI inflows in countries that experience low workers' productivity, a less developed financial sector, and a low level of infrastructure development. Furthermore, the effect of poverty on FDI inflows does not depend on the prevailing economic growth rate. Finally, the analysis has revealed the existence of a non-linear effect of poverty on FDI inflows for the poverty headcount indicator, but not for the poverty gap indicator. The non-linear effect of poverty headcount on FDI inflows is such that a rise in poverty headcount ratio results in lower FDI inflows, but an additional increase to poverty more than further discourages FDI inflows. The conclusion discusses the implications of these findings.

Keywords: Poverty; Foreign direct investment inflows; Human capital; Trade openness; Export product diversification; Economic growth; Labour productivity; Financial development; Infrastructure development.
JEL Classification: I30; F20.

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1. Introduction

Reducing or eliminating poverty is a shared objective of national policymakers and the international community. Foreign direct investment[2] (FDI) inflows appear as one of the key factors that could contribute to achieving this objective. For example, FDI inflows can help reduce poverty through its positive effect[3] on capital accumulation, employment, technology transfer, and competitiveness, among others (e.g., Dhrifi et al. 2020; Gohou & Soumare, 2012; Javorcik, 2015; Fauzel et al., 2015; Fowowe & Shuaibu, 2014). In the meantime, the issue the other way around, i.e., whether higher poverty deters FDI inflows, has received scarce attention in the literature. One of the scarce studies that have investigated this issue is that of Dhrifi et al. (2020). The authors have used a sample of 98 developing countries over the period 1995-2017, as well as the three stage least squares approach (in a framework of simultaneous equations) to explore the causal links between foreign direct investment, environmental degradation and poverty. They have found, *inter alia*, that there exist a bi-directional causal relationship between FDI and poverty, notably that lower poverty (i.e., a higher household final consumption expenditure per capita) induces higher FDI inflows. However, in our view, this study suffers from not taking into account countries' time invariant specific effects. Additionally, it can be useful to deepen the analysis by investigating in depth whether some macroeconomic factors matter for the effect of poverty on FDI inflows.

The present article purports to fill this void in the literature by investigating the effect of poverty on FDI inflows in developing countries. In so doing, it intends to complement the existing few studies on the macroeconomic effects of poverty. These studies include for example, the effect of poverty on human capital (e.g., Azariadis and Stachurski, 2005; Bain et al. 2013; 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, 2012), economic development (e.g., Mehanna, 2004; Nakabashi, 2018), trade openness (Gnangnon, 2019a), export product diversification (Gnangnon, 2019b), real exchange rate (Gnangnon, 2020a), tax revenue (Gnangnon, 2020b), and services export diversification (Gnangnon, 2020c).

We postulate that the effect poverty on FDI inflows translates through the human capital channel. The analysis has also investigated whether some macroeconomic factors (in the host-countries) that underpin movements of FDI inflows could matter for the effect of poverty on FDI inflows. These include participation in international trade (here through trade openness and export product diversification), workers' productivity, economic growth, financial development and infrastructure development. The analysis has been conducted on an unbalanced panel dataset containing 117 developing countries over the period 1980-2017. It uses the two-step system Generalized Methods of Moments (GMM) approach, and shows for the full sample that poverty deters FDI inflows, with this effect translating through the level of human capital accumulated. Specially, higher poverty rates influence negatively FDI inflows in countries that accumulate less human capital. Building on this negative effect of poverty on FDI inflows, the analysis has also shown that poverty reduces FDI inflows in countries that restrict trade policies or experience lower

[2] Paul and Singh (2017) and Paul et al., (2020) have provided a stock-taking of the work relating to FDI over the previous five decades.

[3] Nevertheless, some studies have reported that FDI inflows may not always contribute to reducing poverty. For example, Huang et al. (2010) have obtained for 12 middle-income countries in East Asia as well as Latin America that both outward and inward FDI exert a negative effect on the mean income of the poorest quintile of the population, although the magnitude of this negative effect is higher in Latin American countries than in East Asian ones. Quiñonez et al. (2018) have observed that FDI is not significantly associated with the reduction of poverty in Latin America.

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level of trade openness, as well as in countries that experience a high degree of export product concentration. Finally, higher poverty rates deter FDI inflows in countries where workers' productivity decline, financial development is undermined, and those where the supply of infrastructure is constrained. Finally, economic growth does not influence the effect of poverty on FDI inflows.

The remaining part of the paper is constructed around five sections. Section 2 provides a theoretical discussion on the effect of poverty on FDI inflows. Section 3 presents the baseline model specification to perform the empirical analysis, presents some data analysis and discusses the econometric method for the analysis. Section 4 interprets empirical outcomes, and Section 5 deepens the analysis. Section 6 concludes.

2. Theoretical discussion on the effect of poverty on FDI inflows

Poverty is the deprivation in well-being (World Bank, 2015), and has many aspects, of which low incomes and the inability to acquire the essential goods and services necessary for survival with dignity. Other dimensions of poverty include low levels of health and education (i.e., human capital), poor access to clean water and sanitation, inadequate physical security, lack of voice, insufficient capacity and opportunity to improve one's life. The present study considers essentially the monetary dimension of poverty, which can surely impact all of its other dimensions. We postulate that the effect of poverty on FDI inflows translates through the human capital channel. The economic theory has postulated that human capital in the form of education is a key determinant of FDI inflows (e.g., Dunning, 1988, 2009; Lucas, 1990; Zhang and Markusen, 1999). This is reflected in many empirical studies on the effect of human capital on FDI inflows (or more generally on the determinants of FDI inflows) that have used the education level as a measure of human capital (e.g., Asiedu, 2002; Checchi et al., 2007; Cleeve et al., 2015; Kim and Park, 2007; Noorbaksh and Paloni, 2001; Nunnenkamp and Spatz, 2002). However, in his formulation of human capital theory, Becker (1962) has considered human capital as the skills, education, health, and training of individuals, and emphasized the important role of health for the enhancement of workers' productivity. Along the same lines, Kooreman and Wunderlink (1997) have defined human capital as all qualities of a person, such as knowledge, health, skills and experience that affect his or her possibilities of earning current and future money income, psychological income, and income in kind. The role of human capital (through education and health) in enhancing the overall factor productivity and creating equal opportunity for all citizens in the country, has been emphasized by World Bank (2015) and the Commission on Growth and Development (CGD, 2008). Alsan et al. (2006) have noted, in light of the complementarity between physical capital and skills, that a healthy and more highly educated workforce can raise the productivity of capital. In that regard, authors such as Asiedu et al. (2015), Azémar and Desbordes (2009), and Ghosh and Francesco (2015) have demonstrated empirically that health, as a human capital component, also affects significantly FDI inflows.

Low incomes can push people into a poverty trap, and negatively affect their standard of life (e,g., Azariadis and Stachurski, 2005; Barrett and Carter, 2013; Barrett et al. 2016; Carter and Barrett, 2006; Mirza et al., 2019; Naschold, 2013; Sachs, 2005). This feature of poor people can be exacerbated by their inability to have access to credit markets (e.g., Banerjee and Duflo, 2008; 2014; Carvalho et al., 2016). Specially, low incomes limit the capacity of poor people to increase

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investment in human capital, including both education and health (e.g., Azariadis and Stachurski, 2005; Bain et al. 2013; Haushofer and Fehr, 2014; López, 2006; Perkins et al., 2012; Sachs, 2005). According to Hill and Sandfort (1995), a rise in poverty limits children's achievement, and increases the risk that they are dropped out early of school. Hanson et al. (2013) have shown that children from families with poor and near-poor socioeconomic status experience lower brain gray matter volumes than children from families with high socioeconomic status. In light of the importance of brain gray matter for processing information and executing actions, children in poor families are likely to accumulate less human capital than those in families with high socio-economic status. Mullainathan and Shafir (2013) have also noted the existence of a psychology effect of poverty on children' parents when they are to take decisions related to investment in human capital. These parents tend to favour short-term financial outcomes at the expense of goal-directed ones. They are therefore averse to undertake risky investments (such as in their children's education and health) that generate long term returns (e.g., Haushofer and Fehr, 2014). A number of studies (e.g., Haushofer and Fehr, 2014; Pender, 1996; Yesuf and Bluffstone, 2008) have found that compared to developed countries, poor individuals in developing countries are more averse to risk, and more likely to discount future payoffs than wealthier individuals. Attanasio et al. (2017) have reported evidence for Ethiopia and Peru that more able and higher income parents invest more, particularly at younger ages when investments have the greatest impacts. Nakabashi (2018) has noted that poverty can also induce a resource misallocation, which inequality of opportunities[4] and increases inefficiency. Summing-up, higher poverty rates is expected to reduce the accumulation of human capital in the economy (in terms of both education and health), reduce productivity of workers' (including that of poor people), and constrain investments in the economy (e.g., Breunig and Majeed, 2020; Hill and Sandfort, 1995 Perry et al. 2006).

As the effect of poverty on FDI inflows is expected to translate through the human capital channel, the direction of this effect ultimately depends on how human capital itself affects FDI inflows (given that higher poverty is likely to adversely affect human capital). The effect of human capital on FDI inflows has been the subject of a voluminous literature[5]. As noted above, the existing theoretical studies demonstrate that a high level of human capital (education and health) drives in FDI flows through, *inter alia*, its positive effect on labour productivity. In a recent work, another theoretical perspective has been adopted by Morita and Sugawara (2015). The latter have developed a theoretical model where they have assumed that the effect of human capital on FDI would translate through manufactured goods, which is considered as having the human capital-intensive technology. They have shown theoretically that manufactured goods firms (in foreign countries) do not engage in FDI in a developing country featured by a low level of human capital. This pushes the developing country into a poverty trap. In contrast, if the government of the developing country implements a tariff on imports of manufactured goods, then it becomes costly to export these goods to that developing country. this would push manufacturing firms to engage in FDI in the developing country, allowing it to escape from the poverty trap.

The empirical literature on the effect of human capital on FDI inflows remains inconclusive, even though many existing works (including recent ones) have reported that multinational

[4] Nakabashi (2018) has provided the example that some people with high learning potential that reside in regions with a high rate of poverty, are not likely to take advantage of their high learning potential.

[5] We do not intend to provide an extensive literature review on the subject matter here, as a recent literature review is provided by Cleeve et al. (2015).

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enterprises tend to locate in countries that accumulate human capital, as the latter is associated with increased labour productivity. For example, many studies have obtained empirical evidence that human capital, measured by the education level, is positively associated with FDI inflows (e.g., Asiedu, 2002; Checchi et al., 2007; Cleeve et al., 2015; Kar, 2013; Kim and Park, 2007; Miyamoto, 2003; Noorbaksh and Paloni, 2001; Nunnenkamp and Spatz, 2002). Other studies have emphasized the strong relevance of the population health for attracting FDI flows (e.g., Alsan et al. 2006; Asiedu et al. 2015; Azémar and Desbordes, 2009; Ghosh and Francesco, 2015). The theoretical argument here is on the one hand that a healthy workforce can raise workers' productivity and attract FDI inflows (e.g., Alsan et al., 2006). On the other hand, a good population health, including that of potential workers reduces firms' production costs[6], their profitability, and consequently influence positively their decision to invest. Alsan et al. (2006) have shown that a rise in the life expectancy (a proxy for the population health) exerts a strong positive effect on FDI inflows in developing countries and developed countries alike. Azémar and Desbordes (2009) have found for sub-Saharan African countries that HIV and malaria strongly reduce FDI inflows. In the same vein, Asiedu et al. (2015) have uncovered a negative effect of HIV/AIDS on FDI flows to sub-Saharan African countries. Ghosh and Francesco (2015) have shown that a rise in the level of communicable diseases (here, HIV, malaria and tuberculosis) in a country influences negatively FDI inflows to that country. Nevertheless, some other earlier studies have not reported a statistically significant effect of human capital on FDI inflows. For example, Root and Ahmed (1979) have observed for 58 developing countries that human capital (measured by literacy, school enrolment and the availability of technical and professional workers) exerts no significant effect on FDI inflows. Using a set of 54 developing countries for the years 1976, 1979 and 1980 (in a cross-sectional framework), Schneider and Frey (1985) have obtained that compared with other economic and political determinants of FDI inflows, human capital (proxied by the secondary education level) influences less FDI inflows. Hanson (1996) has also reported for a sample of 105 developing countries that the adult literacy rate is a less important driver of inward FDI, compared to other socio-political factors. Other authors such as Blanton and Blanton (2007) have emphasized the importance of capturing human capital through both education level and health. They have obtained empirically that both education level and life expectancy affect positively FDI inflows.

In light of the discussion in the present section, the bulk of studies (including recent ones) on the effect of human capital on FDI inflows tends to report that multinational firms are strongly willing to locate in countries with a high level of human capital. Therefore, we postulate that poverty would deter FDI inflows, notably in countries that experience lower levels of human capital. We test this hypothesis in the empirical part of the analysis.

3. Empirical analysis

This section first presents the model specification that allows addressing empirically the question concerning whether or not poverty deters or attracts FDI inflows (see sub-section 1). Second, it presents some analysis on data concerning the key variables of interest, including the

[6] Such costs can arise from higher workers' turnover, and hence, higher costs of recruiting and training new workers, higher life insurance benefits and pension fund commitments due to earlier deaths, or higher medical coverage, especially in countries where there are limited public health provisions (Ghosh and Francesco, 2015) and higher absenteeism (Alsan et al., 2006).

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foreign direct investment variable, and the poverty variables (see sub-section 2). Third, it discusses the econometric approach to carry out the empirical analysis (see sub-section 3).

3.1. Model specification

Following many recent studies on the determinants of FDI inflows (e.g., Asiedu and Lien, 2011; Asiedu et al., 2015; Busse and Hefeker, 2007; Canh et al., 2020; Sadeghi et al., 2020), we consider a linear dynamic panel-data baseline model that includes the poverty variable (denoted "POV") as the main regressor, and a number of control variables drawn from existing empirical literature, and which reflect the location advantages for undertaking FDI. The controls introduced in this baseline model include the real per capita income ("GDPC"), the population size ("POP"), trade openness ("OPEN"), the inflation rate ("INFL"), the share of total natural resource rents in the Gross Domestic Product ("RENT"), and the level of democratization ("POLITY2").

The real per capita income can reflect the return on the foreign investment, real wages and market size in the host country (e.g., Asiedu, 2002; 2011; Cleeve et al, 2015; Chakrabarti, 2001). On the one hand, a rise in real wages in the host country can discourage FDI inflows, for a given level of labour productivity. On the other hand, a rise in the real per capita income can reflect an increase in the market size. This can help firms to use efficiently their resources and exploit economies of scale, and hence encourage FDI inflows. Similarly, the higher the real per capita income (i.e., a higher return on foreign investment), the greater are FDI inflows. Overall, the net effect of the real per capita income on FDI inflows is a priori unknown, and therefore, is an empirical issue. The population size also acts as an indicator of the market size (e.g., Billington, 1999; Chakrabarti, 2001), with its rise being expected to positively affect FDI inflows. On another note, a lower inflation rate (that represents greater macroeconomic stability) is expected to result in higher FDI inflows (e.g., Asiedu and Lien, 2011; Canh et al., 2020; Cleeve et al., 2015; Drhifi et al., 2020). Many studies have also found that natural resources represent an important driver of FDI inflows (e.g., Asiedu, 2006; Asiedu and Lien, 2011), with countries endowed in natural resources attracting greater FDI inflows. Concerning democracy (which also acts here as a proxy[7] for institutional and governance quality), the direction of its theoretical impact on FDI inflows is a priori uncertain. According for example to Asiedu and Lien (2011: page 1), on the one hand, greater democratization can positively affect FDI inflows because "democracy provides checks and balances on elected officials, which in turn reduces arbitrary government intervention, lowers the risk of policy reversal and strengthens property right protection". On the other hand, multinational firms may opt for undertaking FDI in autocratic countries, as autocratic governments, which are usually not accountable to their electorate, may offer them greater incentive packages and protection from labour union, compared to democratic governments. Thus, the net effect of democracy on FDI inflows becomes an empirical issue. In the empirical literature, Asiedu and Lien (2011) have obtained for developing countries that the effect of democracy on FDI inflows is conditional upon the share of natural resources (minerals and oil) in total exports. Democracy drives in FDI flows if this share is lower than a certain threshold. Democracy may attract FDI inflows in 90 countries, and reduce FDI inflows in the 22 remaining countries of their sample. A positive effect of democracy on FDI inflows have also been reported

[7] The positive relationship between democracy and the institutional quality has been emphasized for example by Charron and Lapuente (2010); Rodrik (1996); and Sung (2004).

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by authors such as Busse and Hefeker (2007), Guerin and Manzocchi (2009) and Jensen (2003). In contrast, Lacroix et al. (2020) have found for developing countries that while on average, democratic transitions do not affect FDI inflows, consolidated democratic transitions (i.e. transitions that do not reverse for at least five years) appear to induce greater FDI inflows only 10 years after the transition. Cui and Moon (2020) have obtained, among others, that the time horizon of autocratic regimes influences positively FDI inflows through the development of domestic commitment-institutions.

The relationship between trade and FDI has been analysed through the prism of complementarity and substitutability, and remains inconclusive. On the one hand, trade protection can increase FDI inflows. This is the case when multinational firms establish affiliates in the host country's market with a view to avoiding high trade barriers (including tariffs) that would hit their exports to this country from their home country (this is the so-called tariff-jumping hypothesis). However, trade protection can also reduce the attractiveness of FDI inflows. This is because trade protection increases trade costs (i.e., the costs of import and export of intermediate and final goods) for affiliates of multinational firms that are parts of global production chains, and signals uncertainty about trade openness or the general institutional environment to potential investors (Görg and Labonte, 2012). Along the same lines, greater trade openness contributes to the improvement of the investment climate (Grossman and Helpman, 1991). Furthermore, authors such as Norbäck and Persson (2004) have argued that trade protection can deter FDI inflows by making domestic firms less attractive for foreign investors that aim to engage in merger and acquisitions activities in the host-country. In a nutshell, the complementarity or substitutability relationship between trade and FDI depends on the form[8] of FDI, i.e., whether the latter is a horizontal FDI, vertical FDI, export-platform FDI, or complex-vertical FDI (e.g., Fugazza and Trentini, 2014). Trade and horizontal FDI are substitutable, while other types of FDI such as vertical FDI are complementary with trade (e.g., Albulescu and Goyeau, 2019; Carr et al. 2001; Egger and Pfaffermayr, 2004; Markusen 1984; Markusen and Venables 1999; Helpman 1984, Park and Park, 2015). Many recent studies on the macroeconomic determinants of FDI inflows have reported a positive effect of trade openness (or trade policy liberalization) on FDI inflows (e.g., Aizenman and Ilan, 2006; Asiedu, 2006; Büthe and Milner, 2008; Cleeve et al., 2015; Greenaway et al. 2007).

In light of the foregoing, we consider the following baseline specification:

$$FDI_{it} = \alpha_1 FDI_{it-1} + \alpha_2 POV_{it} + \alpha_3 GDPC_{it} + \alpha_4 OPEN_{it} + \alpha_5 INFL_{it} + \alpha_6 POLITY2_{it} + \alpha_7 RENT_{it} + \alpha_8 POP_{it} + \vartheta_i + \gamma_t + \tau_{it} \quad (1)$$

A given country and the time-period are denoted respectively by the subscripts i and t. The panel dataset is unbalanced, and contains 117 countries over the period 1980-2017. It has been

[8] Horizontal FDI is motivated by market access and avoidance of trade frictions such as transport costs and trade barriers. Vertical FDI is motivated by international factor price differentials. Export-platform FDI occurs when multinationals engage in FDI with a view to serving not only the local market but also serve surrounding countries. Thus, market access conditions in the neighbouring countries of the host-country are crucial for encouraging export platform FDI in the host-country. Finally, complex vertical FDI is undertaken with a view to minimizing production costs. Both third countries' access to the host-country's market, and the host-country's openness to the rest of the world are relevant for encouraging this type of FDI (Fugazza and Trentini, 2014).

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constructed based on data availability. α_1 to α_8 are coefficients that would be estimated. ϑ_i represent countries' time invariant specific effects; γ_t are time dummies that reflect global factors influencing simultaneously all countries' FDI inflows. τ_{it} is an idiosyncratic error-term. We use five-year averaged non-overlapping observations not only to address the problem of missing data, but also to mitigate the effect of business cycles on variables, as well as measurement errors associated with variables in model (1). There are indeed 8 non-overlapping sub-periods, which are 1980-1984; 1985-1989; 1990-1994; 1995-1999; 2000-2004; 2005-2009; 2010-2014, and 2015-2017 (the last sub-periods covers 3 years).

The dependent variable "FDI" represents the ratio of net FDI inflows to GDP. Following previous studies highlighted above, the one-period lag of this variable has been introduced as a regressor in model (1) so as to account for the persistence of FDI inflows over time.

The variable "POV" stands for the poverty rate, and represents the key regressor of interest in the analysis. We use two measures of poverty (also widely used in the empirical literature). These include the poverty headcount ratio at $1.90 a day (denoted "POVHC"), which is our primary indicator of poverty, and the poverty gap at $1.90 a day (denoted "POVGAP"), which is used for robustness check in the analysis. The poverty headcount at $1.90 a day represents the percentage of the population living with less than $1.90 a day, at 2011 international prices. The poverty gap at $1.90 a day (at 2011 international prices) indicates the depth and incidence of poverty. It represents 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. Even though the poverty headcount ratio is our primary measure of poverty rate, and the poverty gap is used for robustness check analysis, we have consistently used these two indicators of poverty in all regressions performed below. All variables, including the dependent variable, the main regressor of interest and control variables are described in Appendix 1.

Variables used in model (1) have different units of measurement. One way to circumvent this problem is to standardize all variables (e.g., Gnangnon, 2020d). The standardization procedure consists here of calculating for each variable, the ratio of the difference between this variable and its mean (average) to the standard deviation of the variable. This procedure has several other advantages apart from helping to address the unit of measurement problem of variables. For example, it helps rank regressors in terms of the ones and the least that contribute to explaining the dynamics of FDI inflows. Thus, this procedure helps identify the rank of the main regressor of interest, i.e., "POV" compared to all regressors in explaining the evolution of FDI inflows. Additionally, this procedure helps to deal with potential outliers problems in the panel dataset at hand. Appendices 2a and 2b contain respectively the standard descriptive statistics on unstandardized (i.e., non-transformed) variables, and on standardized variables. The list of countries used in the full sample is provided in Appendix 3.

3.2. Data analysis

We present in Figure 1 the development of the net FDI inflows (% GDP) and of the two poverty indicators (using unstandardized, i.e., non-transformed variables), over both the sub-sample of low-income countries ("LICs") and the sub-sample of other countries in the full sample (denoted "OTHER"). The focus on sub-samples LICs and OTHER is dictated by the fact that the group of LICs (as designated by the World Bank) represents poorest countries in the full sample.

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It is likely that the relationship between poverty and FDI over this sub-sample would not be the same as for the sub-sample "OTHER", in particular as LICs likely exhibit higher poverty rates than the sub-sample "OTHER". Figures 2 to 4 show the correlation patterns between poverty indicators and the FDI-to-GDP ratio, over the full sample as well the sub-samples "LICs" and "OTHER".

[Insert Figure 1, here]

It can be observed from Figure 1 that poverty rates (poverty headcount ratio and poverty gap) have been declining over time in both the sub-samples "LICs" and "OTHER", although unsurprisingly, poverty has been higher (on average) in LICs than in other countries in the full sample. Concurrently, from the sub-period 1985-1989 to 2000-2004, the share of net FDI inflows in GDP has exhibited an upward trend in both LICs and OTHER, but remains consistently higher in OTHER than in LICs. This share has moved from 0.42% in 1985-1989 to 3.33% in 2000-2004 in LICs, and from 0.53% in 1985-1989 to 3.39% in 2000-2004 in OTHER. However, from 2000-2004 to 2005-2009, while the share of net FDI inflows (% GDP) has increased in the two sub-samples, this share has become higher in LICs than in OTHER. This share has subsequently declined in LICs from 5.65% in 2005-2009 to 4% in 2015-2017, whereas for OTHER, it has firstly moved up from 3.35% in 2005-2009 to 6.74% in 2010-2014, but then declined to reach 3.8% in 2015-2017. It is worth noting that between 1980-1984 and 1985-1989, the net FDI inflows to GDP ratio has increased in LICs (from 0.39% to 0.42%), but declined in "OTHER" from 1% to 0.53%.

[Insert Figure 2, here]
[Insert Figure 3, here]
[Insert Figure 4, here]

Figures 2 to 4 suggest an unclear correlation patterns between the unstandardized poverty indicators and the unstandardized variable "FDI" (i.e., the share of net FDI inflows in GDP). Additionally, the graphs that show these correlation patterns indicate the presence of outliers. However, these outliers' problems disappear when looking at the graphs based on standardized "FDI" and poverty indicators. Interestingly, the graphs that rely on standardized variables show a negative correlation between poverty indicators and FDI for the full sample, and the two sub-samples.

3.3. Econometric method

The estimation of model (1) by means of standard econometric approaches such as the ordinary least squares (OLS) would yield biased estimates not only because of the potential correlation between the lagged dependent variable and specific time invariant effect[9], but also because of the potential endogeneity of the majority of regressors in the baseline model. This endogeneity issue can stem from the bi-directional causality between those regressors and the dependent variable, i.e, the FDI inflows (% GDP). Specially, we consider here as potentially endogenous, all variables, except for the population size. For example, while we have conjectured above that poverty could affect FDI inflows, many studies highlighted above have also demonstrated that FDI inflows can influence poverty. Likewise, trade openness can affect FDI, as

[9] This bias, also termed Nickell bias (Nickell, 1981) decreases as the time dimension of the panel dataset increases. It is particularly severe in panel with large cross-section and relatively limited time-period.

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FDI can also influence the level of trade openness. While real per capita income can affect FDI inflows, the latter can also influence the former. The same reasoning can apply to the other potential endogenous regressors. To handle these endogeneity concerns, one can employ the first-difference Generalized Methods of Moments (GMM) estimator proposed by Arellano and Bond (1991). This estimator utilizes as instruments, the lagged values of the first difference of the endogenous variables. However, Arellano and Bover (1995) have pointed out that the main limitation of this estimator is that lagged levels of endogenous variables are often weak instruments for first differences variables, in particular if the variables follow a random walk (i.e., they show a strong persistence over time - which is the case for variables in model (1)). Blundell and Bond (1998) have proposed a more efficient estimator, which is the two-step system GMM. This estimator estimates a system of equations comprising the first difference equation and the original equation in levels. As a result, the two-step system GMM estimator generates additional instruments that help increase efficiency. Moreover, this estimator is particularly suitable for dynamic unbalanced panel datasets, as the first-difference estimator magnifies gaps (Roodman, 2009). To ensure the consistency of the two-step system GMM estimator, we report the outcomes from a number of standard tests. These tests include the Arellano-Bond test of first-order serial correlation in the error term (AR(1)) as well as the Arellano-Bond test of 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), which helps assess the validity of the instruments used in the regressions. We have also presented the outcome of the Arellano-Bond test of no third-order autocorrelation in the error term (denoted AR(3)), as the absence of serial correlation at the third order in the residuals can be an indication of the absence of omitted variable problem. Finally, we have ensured that there is no proliferation of instruments in the regressions[10], as otherwise, the diagnostic tests may lose power (e.g., Roodman, 2009). Overall, the empirical analysis relies on the two-step system GMM estimator. To meet these conditions for the consistency of the two-step system GMM estimator, we use in the regressions a maximum of 3 lags of the dependent variable as instruments, and 2 lags of endogenous variables as instruments.

Columns [1] and [2] of Table 1 contain the estimates arising from the estimation of model (1). To recall all estimations are performed using the two indicators of poverty. Columns [3] and [4] of Table 1 contains outcomes that allow examining the effect of poverty on FDI inflows in low-income countries (LICs) (considered as poorest countries in the full sample) versus other countries in the full sample. Given that poverty would affect FDI inflows through the human capital channel, and that countries that accumulate human capital are likely to attract more foreign firms willing to engage in FDI activities, we can expect that poverty would exert a higher negative effect on FDI inflows to LICs than to other countries in the full sample. To obtain the outcomes reported in columns [3] and [4] of Table 1, we estimate two variants of model (1) (i.e., with each poverty indicator) in which we include the dummy "LIC" along with its interaction with the poverty variable. This dummy takes the value "1" for countries classified as low-income countries by the World Bank, and "0", otherwise.

Table 2 reports the results that allow examining whether the effect of poverty on FDI inflows translates through the human capital channel. These results are obtained by using an

[10] We avoid the excess instruments problem by ensuring that the number of instruments used in the regressions is lower than the cross-section dimension of the panel dataset.

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indicator of human capital that encompasses both education and health (see for example also Blanton and Blanton, 2007). Thus, columns [1] and [2] of Table 2 present the results of the estimation of two variants of model (1) that contain the human capital variable denoted "HUM" as well as its interaction with each of the poverty indicators. The human capital index is calculated as the geometric mean of life expectancy and educational attainment indicators (e.g., Ali and Cantner, 2020): $HUMI_{it} = \sqrt{LEI_{it} * EDUI_{it}}$, where LEI_{it} and $EDUI_{it}$ are respectively the computed index of life expectancy and the computed index of educational attainment, for a given country i, in a given year t (see Appendix 1 for details on the computation of the human capital indicator). Columns [3] to [6] of Table 2 present the outcomes of the estimations of different other variants of model (1) where each component of the human capital index (i.e., the educational attainment index and the life expectancy index) is interacted with each of the two poverty indicators.

4. Results' Interpretation

At the outset, we would like to note that for the sake of simplicity, we use in this section as well as in the rest of the analysis, the expression "FDI inflows" to signify "the ratio of net FDI inflows to GDP". The interpretation of outcomes displayed in Tables 1 and 2 rests primarily on the consistency on the estimator used to obtain these results, i.e., on the consistency of the two-step system GMM estimator. At the outset, it is noteworthy that like many previous studies, we obtain that the FDI inflows variable exhibits a state dependence path, as all coefficients of the variable "FDI" across columns of the two Tables are positive and significant at the 1% level. We display at the bottom of Tables 1 and 2, the results of the tests that help evaluate the consistency of the two-step system GMM estimator. It appears from these results that the requirements of the two-step system GMM are met, that is, the p-values of the AR(1) test are lower than 0.1 (i.e., the 10% level); the p-values of the AR(2) and AR(3) tests are all higher than 0.1; and the OID test shows p-values higher than 0.1. We can now interpret the estimates reported in Tables 1 and 2.

[Insert Table 1, here]

The first two columns of Table 1 show negative and significant (at least at the 5% level) coefficients of the poverty indicators. These results suggest, as expected, that an increase in poverty rates in host-countries deters FDI inflows, i.e., discourages multinational firms from undertaking foreign direct investment in the host-countries. These outcomes are in line with those of Dhrifi et al. (2020) who have also found that lower poverty rates, measured by a rise in household final consumption expenditure per capita, result in higher FDI inflows. However, as noted above, the study by Dhrifi et al. (2020) suffer from not controlling for time invariant countries' specific effects. Additionally, the authors have not deeply investigated the possible channels through which poverty can affect FDI inflows to host-countries. An increase in poverty headcount rate by a 1 standard deviation is associated with a decline in FDI inflows by 0.166 standard deviation (see column [1] of Table 1). In other words, an increase in poverty headcount ratio by 25.653 points (see Appendix 2a) induces a fall in FDI inflows by 0.77 percentage points (= 0.166*4.639). Likewise, a rise in poverty gap rate by a 1 standard deviation is associated with a fall in FDI inflows by 0.118 standard deviation. This means that a rise in poverty gap rate by 13.03 points (see Appendix 2a) is associated with a decline in FDI inflows by 0.55 percentage points (= 0.118*4.639). Apart from the real per capita income variable whose coefficient is not significant in columns [1] and [2] of Table 1 (the

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coefficient is significant in column [1] but not in column [2] at the conventional levels), all other control variables show the same sign and statistical significance across these two columns, although with different magnitudes. In column [1] of Table 1, real per capita income (whose theoretical sign was unknown) appears to influence negatively and significantly FDI inflows, thereby indicating that less advanced developing countries tend to attract more FDI inflows than advanced developing countries. In line with this finding, Asiedu (2002) has obtained a positive effect of the investment return (measured by the inverse of the real per capita income) on FDI inflows. A similar finding has been reported, for example, by François et al. (2020). Results concerning many other control variables are consistent with our theoretical expectations. We find that FDI locate in countries with a greater trade openness, low inflation rates, a greater level of democratization, and endowed with natural resources (all these outcomes are significant at the 1% level). The population size does not influence significantly FDI inflows at the conventional levels. Focusing specifically on results provided in column [1] of Table 1 (as the poverty headcount ratio is our main measure of poverty) and considering coefficients in absolute values, we note that the poverty headcount ratio indicator ranks third among all variables in terms of their contribution to the dynamics of FDI inflows. The regressor that contributes the most to explaining FDI flows to countries is the level of trade openness, followed in the descending order by the level of democracy, the poverty headcount ratio, the inflation rate, the real per capita income, and the endowment in natural resources. The same ranking applies to outcomes in column [2] of Table 1, although without the real per capita income whose coefficient is not statistically significant at the conventional levels.

Taking-up results in columns [3] and [4], we obtain that the poverty indicators and the interaction variable between each poverty indicator and the dummy "LIC" hold all negative and significant (at the 1% level) coefficients. These suggest that an increase in poverty exerts a higher negative effect on FDI inflows to LICs than to other countries in the full sample (this is consistent with our theoretical expectation). Hence, the net effects of poverty headcount ratio and poverty gap on FDI inflows to LICs are given by -0.374 (= -0.141 - 0.233) and -0.306 (= -0.133 - 0.173). Similarly, the net effects of poverty headcount ratio and poverty gap on FDI inflows for the sub-sample "OTHER" are given by -0.141 and -0.133. These outcomes suggest that for LICs, an increase in poverty headcount ratio by 1 standard deviation induces a decline in FDI inflows by 0.374 standard deviation. That is, a rise in poverty headcount ratio by 25.653 points is associated with a decline in FDI inflows by 1.734 percentage point (= 0.374*4.639) in LICs. For other countries than LICs in the full sample, an increase in poverty headcount ratio by 1 standard deviation is associated with a decline in FDI inflows by 0.141 standard deviation. That is, a rise in poverty headcount ratio by 25.653 points is associated with a decline in FDI inflows by 0.654 percentage point (= 0.141*4.639) in this group of countries. The same interpretation applies for the effect of poverty gap on FDI inflows in sub-samples "LICs" and "OTHER".

It is interesting to note that the estimates relating to control variables in columns [3] and [4] of Table 1 are consistent with those in columns [1] and [2] of the same Table (at least in terms of the sign and statistical significance of the coefficients of these variables).

[Insert Table 2, here]

In Table 2, our coefficients of main interest are the ones of the human capital index (and its components) as well as the interaction terms related to the interaction variable between the human capital (or each of its components) and the relevant poverty indicator. We note from the six

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columns of the Table that the coefficients of the poverty indicators are all negative and significant at the 1% level, and the interaction terms (of the interaction variables) are all positive and significant at the 1% level. These outcomes suggest that lower poverty rates induce higher FDI inflows in countries that experience a greater accumulation of human capital, including those that enjoy an improvement in the educational attainment and a rise in the expectancy life. In other words, a rise in poverty rates deter FDI inflows through its negative effect on human capital index (including its two components). This is particularly the case when the poverty rate (for both poverty headcount and poverty gap) exceeds a certain threshold. Standardized and unstandardized values of this threshold of poverty are reported at the bottom of Table 3. Standardized values of the poverty threshold are computed using the estimates reported in Table 1. Unstandardized values of the threshold are computed by adding the average (mean) (over the full sample) of the relevant poverty indicator to the outcome arising from the standardized values previously calculated, times the standard deviation of the relevant poverty indicator. It is worth emphasizing that the unstandardized threshold values of poverty indicators that are reported in Table 2 fall within the range of values of the relevant poverty indicator. Values of the (unstandardized) poverty headcount ratio range between 0 and 94.4, and values of the (unstandardized) poverty gap range between 0 and 64.52 (see Appendix 2a). All in all, results in Table 2 confirm our hypothesis in Section 2 that higher poverty rates deter FDI inflows through its negative effect on human capital. Control variables show similar estimates as those in Table 1. Additionally, we observe in Table 3 that, as expected, the population size (one proxy for the host-country's market size) influences positively FDI inflows.

5. Further analysis

This section examines whether international trade (sub-section 5.1) as well as other factors (sub-section 5.2) that influence the location of FDI flows, matter for the effect of poverty on FDI inflows. In the sub-section 5.3, we consider whether there exists a non-linear effect of poverty on FDI inflows.

5.1. Does international trade matter for the effect of poverty on FDI inflows?

In this sub-section, we examine whether international trade matters for the effect of poverty (which connotes lower accumulation of human capital) on FDI inflows. The rationale for undertaking this empirical exercise is that poverty would affect FDI inflows through the international trade channel due to its human capital effect. We approach participation in international trade from two perspectives, i.e., (de facto and de jure) trade openness, and export product diversification. As for the trade openness channel, Gnangnon (2019a) has provided empirical evidence that poverty increases trade openness in advanced developing countries, but induces lower trade openness level in relatively less advanced developing countries (such as poor countries). The theoretical adverse effect of poverty on trade openness passes through lower human capital accumulation (for people) and lower public revenue (see Gnangnon, 2020b). In contrast, according to the author, poverty influences positively trade openness in relatively advanced developing countries because the latter are more capable of securing financial resources (than less advanced countries) so as to implement redistributive policies in favour of poor people, and provide subsidies to firms. In turn, these encourage domestic consumption and imports by

poor households and domestic firms, as well as higher investments by firms (that could increase exports). On the other hand, even though international trade can be complementary or substitutable with FDI inflows, recent studies tend to report a positive effect of trade openness on aggregate FDI inflows (e.g., Aizenman and Ilan, 2006; Asiedu, 2006; Büthe and Milner, 2008; Greenaway et al. 2007). Summing-up, while the effect of trade openness on FDI inflows can be expected to be positive, it remains that the effect of poverty on FDI inflows can be positive or negative depending on countries' real per capita income level. Against this background, it is difficult to anticipate the direction of the effect of poverty on FDI inflows for varying degrees of trade openness.

[Insert Table 3, here]

Columns [1] to [6] of Table 3 present the results that help to analyse whether the effect of poverty on FDI inflows depends on the degree of trade openness. These outcomes arise from the estimation of several specifications of model (1) where three different indicators of trade openness have been interacted with each poverty indicator. The indicators of trade openness include the one already contained in model (1), i.e., the variable "OPEN", the trade openness indicator suggested by Squalli and Wilson (2011) (denoted "OPENSW"), and the 'de jure' measure of trade openness, i.e., the de jure trade globalisation index denoted "TRJURE" (see Dreher, 2006 and Gygli et al. 2019). Both the variables "OPEN" and "OPENSW" are 'de facto' indicators of trade openness. The Squalli and Wilson (2011)'s indicator of trade openness is the share of the sum of exports and imports in percentage of GDP, adjusted by the proportion of a country's trade level relative to the average world trade (see Squalli and Wilson, 2011: p1758). The 'de jure' indicator of trade openness is a composite index of trade regulations, trade taxes, tariffs, and trade agreements.

We now turn to the issue as to whether the effect of poverty on FDI inflows is conditional upon host-countries' level of export product concentration. It is worth recalling that many developing countries (notably low-income countries) rely mainly on export of low value-added products, including for example primary commodities. Gnangnon (2019b) has demonstrated empirically that due to its adverse effect on human capital and public revenue[11], an increase in poverty rates is associated with greater export product concentration. On another note, Sadeghi et al. (2020) have obtained empirically that economic complexity, which embodies inter alia, economic sophistication, is an important determinant of FDI inflow to host countries. This explains why countries with a similar level of human capital endowment experience different performances in FDI attraction. Similarly, Gnangnon (2019c) has provided empirical evidence that export product diversification influences positively FDI inflows, including when host-countries enjoy a higher economic growth rate or a greater trade openness. Against this backdrop, we postulate that poverty is likely to induce lower (higher) FDI inflows in countries with a high degree of export product concentration (diversification).

To test this hypothesis, we estimate two specifications of model (1) (i.e., with each of the two poverty indicators) in which we introduce an indicator of export product concentration (denoted "ECI") and its interaction with the relevant poverty indicator. We use the index of export product concentration computed by the International Monetary Fund (IMF), based on definitions and methods employed by Cadot et al. (2011) (see Appendix 1 for more details on the index). This

[11] Gnangnon (2020b) has shown that poverty exerts a negative effect on public revenue, including the share of non-resource tax revenue in GDP.

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is the Theil index of overall export product concentration that encompasses both export product diversification at the intensive margins and export product concentration at the extensive margins. Higher values of this index indicate greater export product concentration. Results of the estimation of these two specifications of model (1) are provided in columns [7] and [8] of Table 3.

We note from all columns of Table 3 that the coefficient of "FDI" is positive and significant at the 1% level. This confirms the state-dependence nature of FDI inflows. Additionally, the results of the tests that help check the consistency of the two-step system GMM estimator are fully satisfactory (see the bottom of Table 3). It is interesting to note from columns [1] to [6] of Table 3 that the interaction terms of the variables capturing the interaction between each of the three trade openness indicators and each of the two poverty indicators are all positive and significant at the 1% level. These outcomes suggest that countries tend to experience lower FDI inflows when they face an increase in poverty rates (either poverty headcount ratio or poverty gap) in the context of lower trade openness or restrictive trade policies. However, except for the case where the coefficient of the poverty gap indicator is not significant at the conventional levels (see column [2] of the Table), the coefficients of the poverty indicators are all negative and significant at least at the 5% level. We, therefore, conclude from column [1] and columns [3] to [6] of Table 3 that there is a threshold of poverty rate above which FDI inflows decline in the context of lower trade openness or restrictive trade policies. Values of this threshold are provided for the indicator "POVHC" and "POVGAP" at the bottom of Table 3. With regard to results in column [2], we find that "POVGAP" holds a coefficient that is not significant at the 10% level. As the coefficient of the interaction variable ["POVGAP*OPEN"] is positive and significant at the 1% level in the same column, we deduce that higher poverty gap rates in host-countries consistently generate a fall in FDI inflows to these countries when the latter reduce trade openness. The lower the level of trade openness, the greater is the magnitude of the negative effect of a rise in poverty gap rate on FDI inflows.

The outcomes in columns [7] and [8] of Table 3 indicate that the interaction variables ["POVHC*ECI"] and ["POVGAP*ECI"] hold negative and significant (at the 1% level) coefficients. In the meantime, the coefficients of the variables "POVHC" and "POVGAP" are all negative, but respectively significant (only at the 10% level), and not significant at the conventional levels. Based on these outcomes, we conclude that at the 5% level, a rise in poverty levels (for both headcount poverty ratio and poverty gap) always induce lower FDI inflows in countries that experience a high level of export product concentration. This result holds for every level of poverty. Put differently, countries that face a rise in poverty levels, experience lower FDI inflows when their level of export product concentration is high. Additionally, the higher the degree of export product concentration in these countries, the greater is the magnitude of the negative effect of poverty on FDI inflows. These findings confirm our expectation elaborated above.

The estimates associated with control variables align with those of Table 1.

5.2. Does the effect of poverty on FDI inflows depend on other factors that can influence the location of FDI?

This section further deepens the analysis undertaken thus far, by investigating whether some other macroeconomic factors (that are relevant for FDI location) matter for the effect of poverty on FDI inflows. These factors include workers' productivity, economic growth, financial development, and infrastructure development.

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As noted in section 2, higher poverty levels adversely affects human capital, and reduce workers' productivity. In the meantime, a decline workers' productivity is likely to deter FDI inflows, as in general, multinational firms tend to locate in countries featured by high labour productivity. Therefore, we can expect higher poverty to lead to lower FDI inflows in countries with low workers' productivity. We test empirically this hypothesis by estimating two variants of model (1) that contain a measure of workers' productivity, denoted "PROD", and its interaction with each poverty indicator (in each of the model specification). The variable "PROD" is measured by the ratio of the annual real GDP to the number of workers (see Appendix 1). Noe that in these two specifications of model (1), we have removed the real per capita income variable ("GDPC"), given the way the variable "PROD" has been computed. The outcomes of the estimation of these specifications of model (1) are provided in columns [1] and [2] of Table 4. Note that in the two regressions, the variable "PROD" and the interaction variables are treated as endogenous, given the possible feedback loop between "FDI" and "PROD" variables.

Few studies have looked at the effect of poverty on economic growth. For example, Ravallion (2012) has obtained that countries with a higher initial incidence of poverty tend to experiment lower subsequent rate of economic growth. The study by Bagchi and Svejnar (2015) have taken into account the effects of politically connected wealth inequality and politically unconnected wealth inequality, and uncovered no significant effect of initial poverty on economic growth. Breunig and Majeed (2020) have reported that inequality reduces economic growth when poverty increases. Overall, it is not clear whether an increase in poverty always affects economic growth. Concurrently, the literature has found that economic growth - that indicates the pace of economic activity (and reflects market growth in the host-country) - tends to influence positively[12] FDI inflows (e.g., Busse and Hefeker, 2007; Canh et al., 2020; Cleeve et al., 2015; Cui and Moon, 2020; Gastanaga at al. 1998; Noorbakhsh et al., 2001; Root and Ahmed, 1979; Schneider and Frey, 1985). Therefore, the direction of the effect of poverty on FDI inflows for varying levels of economic growth, remains unclear, and would be determined empirically. We analyse whether the effect of poverty on FDI inflows is conditional upon the economic growth rate in the host-country by estimating two different specifications of model (1) (i.e., with each poverty indicator) that include the economic growth rate variable denoted "GROWTH" (see Appendix 1) and its interaction with the relevant poverty variable. Both the variable "GROWTH" and the related interaction variable are considered as endogenous in the regressions. The estimations' results are displayed in columns [3] and [4] of Table 4.

The effect of poverty on FDI inflows may also depend on the extent of financial development in the host-country. Gnangnon (2020d) has obtained that an increase in poverty undermines the development of the financial sector in the context of lower levels of education, lower degrees of trade openness and lower levels of export product diversification. On the other side, Desbordes, and Wei (2017) have found evidence that financial development strongly promotes FDI inflows. This finding has been confirmed by Liu et al. (2020) who have observed that financial development induces greater FDI inflows only when financial development depth exceeds a certain threshold. Akisik (2020) has tempered these outcomes by demonstrating empirically that while financial development, International Financial Reporting Standards (IFRS)

[12] Nonetheless, some authors such as Asiedu (2002) have not found a significant effect of economic growth on FDI inflows.

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and rule of law, taken individually, exerts a positive effect on FDI inflows, their interactions appear to mitigate these positive effects. In the view of the author, these results suggest a preference by international investors for portfolio investments over direct investments in financially developed countries that have adopted IFRS and an effective rule of law. Based on the findings concerning both the effect of poverty on financial development, and the effect of financial development on FDI inflows, we can expect that higher poverty rates would deter FDI inflows in countries featured by a less developed financial sector. Two other variants of model (1) are estimated to explore the extent to which the effect of poverty on FDI inflows varies for different levels of financial development in the host-countries. These models include the variable "FINDEV" - that measures the extent of financial development - and its interaction with each poverty indicator. The depth of financial development is measured here by the share of the domestic credit provided by banks to the private sector in GDP (see Appendix 1 for the details on this variable). Both "FINDEV" and the related interaction variables are treated as endogenous in the regressions, given the feedback effect from FDI inflows to financial development (e.g., Boateng, 2017; Yavas and Malladi, 2020). The estimates arising from these regressions are presented in columns [5] and [6] of Table 4.

Finally, as it connotes lower accumulation of human capital, poverty can also influence FDI inflows through the infrastructure channel. Many studies (e.g., Asiedu, 2002, 2006; Asiedu et al., 2009; Asiedu and Lien, 2011; Asiedu et al., 2015; Cheng and Kwan, 1999; Noy and Vu, 2007; Wheeler and Mody, 1992) have reported a positive effect of infrastructure development on FDI inflows. The theoretical ground is that good infrastructure increases investments' productivity, which in turn, helps to enhance foreign firms' willingness to engage in FDI activities. On the other hand, we argue that as higher poverty reduces public revenue, it can reduce public expenditure in favour of building domestic infrastructure. In this scenario, increase in poverty can generate lower FDI inflows through a lower supply of infrastructure. Following studies such as Noy and Vu (2007) and Asiedu et al. (2015), we use the gross fixed capital formation expressed as a share of GDP (denoted "GFCF") as our measure of infrastructural development (see Appendix 1 for details on this variable). This variable is interacted with each poverty indicator in two different specifications of model (1) whose estimations' results are presented in columns [7] and [8] of Table 4. Note that both the variable "GFCF" and the related interaction variables are considered as endogenous in the regressions.

[Insert Table 4, here]

The outcomes of the diagnostic tests for assessing the consistency of the two-step system GMM estimator (see the bottom of all columns of Table 4) are fully satisfactory. Moreover, across all columns of this Table, the coefficients of the one-period lag of "FDI" are positive and significant at the 1% level. These validate once again the hypothesis that the share of net FDI inflows in GDP is state-dependent. We note from columns [1] and [2] of Table that the interaction terms of the variables ["POVHC*PROD"] and ["POVGAP*PROD"] are positive and significant at the 1% level, while the coefficients of "POVHC" and "POVGAP" are negative and significant at least at the 5% level. By combining these outcomes, we conclude that a rise in poverty rates (either poverty headcount ratio or poverty gap) deters FDI inflows to countries whose workers' productivity has declined, notably when the poverty rate exceeds a certain threshold. The latter is provided at the bottom of Table 4 for each poverty indicator. These findings confirm our expectations above that poverty would discourage FDI inflows in countries where the labour productivity would decline (as a side effect of poverty rises). Estimates in columns [3] and [4] show

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that neither the poverty variables, nor their interaction with the economic growth variable exhibit statistically significant coefficients at the conventional levels. We, therefore, deduce that the effect of poverty on FDI inflows does not depend on the level of economic growth (a proxy for the pace of economic activity) in the host countries. In contrast, estimates in columns [5] and [6] indicate negative and significant (at the 1% level) coefficients of the two poverty variables, whereas the interaction variables ["POVHC*FINDEV"] and ["POVGAP*FINDEV"] hold positive and significant (at the 1% level) coefficients. As a consequence, higher poverty levels are associated with lower FDI inflows to countries whose financial sector is less developed, notably when the poverty rate exceeds a turning point (see the threshold associated with each poverty indicator at the bottom of columns of [5] and [6] of Table 4). These outcomes also validate our expectation laid out above. Finally, the outcomes in columns [7] and [8] of Table 4 reveal that the coefficients of the two poverty indicators are not significant at the conventional levels, while the coefficients of the interaction variables ["POVHC*GFCF"] and ["POVGAP*GFCF"] are positive and significant at the 1% level. The combination of these outcomes indicates that higher poverty rates consistently reduce FDI inflows when infrastructure is under-developed. The lower the level of infrastructure development, the higher is the size of the negative effect of poverty on FDI inflows, regardless of the indicator of poverty considered.

Outcomes concerning control variables in all columns of Table 4 are to a large extent, consistent with those presented in Table 1.

5.3. Is there a non-linear effect of poverty on FDI inflows?

This sub-section explores whether there exists a non-linear effect of poverty on FDI inflows. This question arises from the suspicion that the graph based on standardized variables in Figure 2 may suggest the existence of a non-linear relationship between poverty and FDI inflows. To test this hypothesis, we estimate two specifications of model (1) in which we introduce respectively the squared term of each poverty indicators. Both the poverty indicator and its squared term are considered as endogenous in each regression. The results of these estimations are presented in Table 5. The outcomes of the diagnostics tests related to the two-step system GMM (see the bottom of the Table) confirm the appropriateness of this estimator for carrying out the empirical analysis in this sub-section. The strong persistence (over time) nature of the variable "FDI" is also confirmed through the positive and significant coefficients of this variable in the two columns of Table 5.

[Insert Table 5, here]

We note from column [1] of this Table that both the poverty headcount indicator and its squared term exhibit coefficients that are negative and significant at the 1% level. These results suggest that there is a non-linear effect of poverty headcount ratio on FDI inflows, as not only does a rise in poverty headcount ratio results in lower FDI inflows, but an additional increase to poverty would more than further discourage FDI inflows. Meanwhile, we observe in column [2] of the same Table that the coefficient of "POVGAP" is negative and significant at the 1% level, while its squared term has a coefficient that is not significant at the 10% level. Thus, the effect of poverty gap on FDI inflows is not non-linear, but is rather linear. Based on these outcomes in columns [1] and [2] of Table 5, we might not conclude for the existence of a non-linear relationship between poverty and FDI inflows. However, as poverty headcount is our preferred measure of poverty, we may be tempted to draw the conclusion that poverty is non-linearly associated with

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FDI inflows, with the non-linear effect taking essentially the form of a negative FDI inflows effect of poverty. As for previous Tables, estimates related to control variables line up with those reported in Table 1.

6. Conclusion

Several studies have been conducted on the effect of FDI inflows on poverty in developing countries. The present study investigates the issue the other way around, that is, whether poverty influences FDI inflows in developing countries. The analysis uses two poverty indicators, namely poverty headcount ratio, and poverty gap, and has been performed using an unbalanced panel dataset of 117 countries over the period 1980-2017. Findings are quite interesting. First, over the full sample, poverty exerts a negative effect on FDI inflows, including through the human capital (including education and health) channel: the lower the human capital level (which likely stems from rising poverty rates), the higher is the magnitude of the negative effect of poverty on FDI inflows. Second, low-income countries suffer more from the adverse effect of poverty on FDI inflows than other countries in the full sample. Third, participation in international trade also matters for the effect of poverty on FDI inflows. In fact, rises in poverty rates induce lower FDI flows to countries that adopt restrictive trade policies or measures that reduce its trade openness level, as well as countries that experience a high degree of export product concentration. Fourth, while the effect of poverty on FDI inflows is not conditional upon the prevailing level of economic growth, it also appears that poverty influences negatively FDI inflows in countries with a lower labour productivity, a less developed financial sector, and a low level of infrastructure development. Finally, there may be a non-linear effect of poverty on FDI inflows.

Overall, these findings indicate that while FDI inflows can play an essential role in reducing poverty in developing countries (for example, through jobs creation, technology transfer, enhancement of human skills), rising poverty levels also act as a deterrent to FDI inflows. This is because multinational firms are likely willing to set up plants in countries that accumulate human capital, which higher poverty rates can significantly erode. From a policy perspective, the study reveals that by implementing pro-poor domestic policies (including through the assistance of the international community) and hence allowing greater investment in human capital, developing countries can attract significant volumes of FDI. On the other hand, pro-poor policies are likely to encourage trade policy liberalization (as well as trade openness) and greater export product diversification that could, in turn, act as attractors of FDI flows. By helping reduce poverty (which connotes greater human capital accumulation), such policies can enhance workers' productivity, promote financial development, allow national policymakers to collect higher public revenue and thus to supply good quality of infrastructure, all of these being important drivers of FDI flows.

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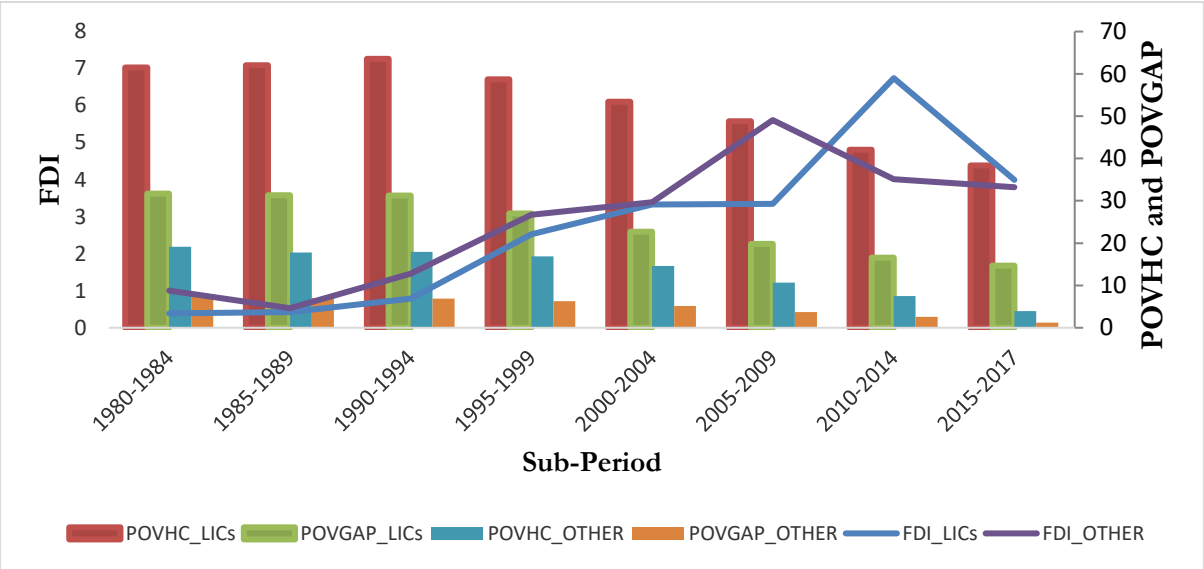
FIGURES

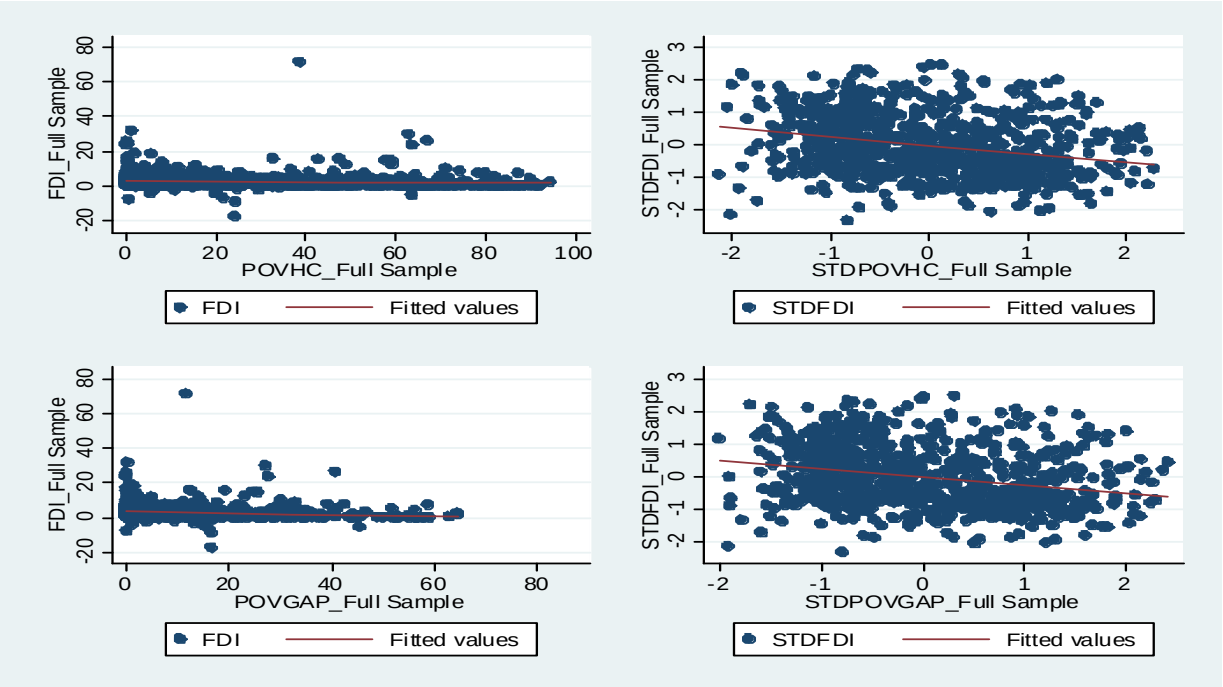
Figure 1: Developments of Poverty and FDI Inflows_over the full sample



Source: Author

Note: "OTHER" refers to other countries than "LICs" in the full sample. The variable "FDI" is the unstandardized FDI in percentage of GDP.

Figure 2: Correlation pattern between Poverty and FDI Inflows_over the full sample



Source: Author

Note: "STDFDI", "STDPOVHC" and "STDPOVGAP" represent respectively the standardized "FDI", "POVHC" and "POVGAP" variables.

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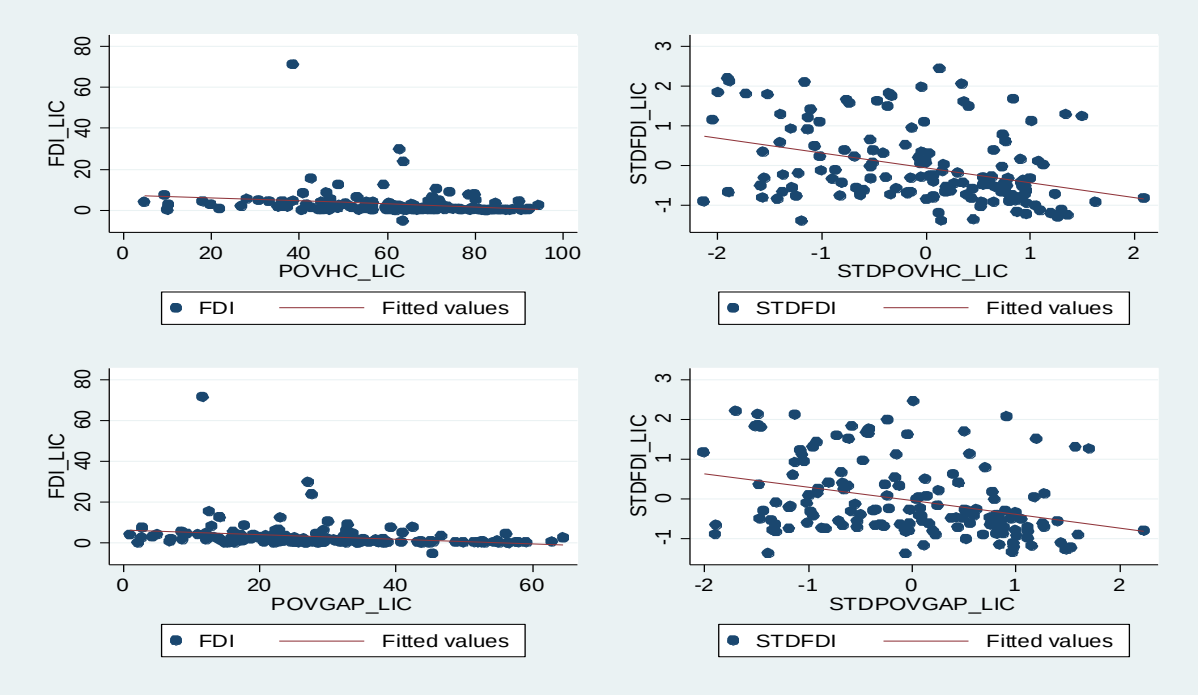
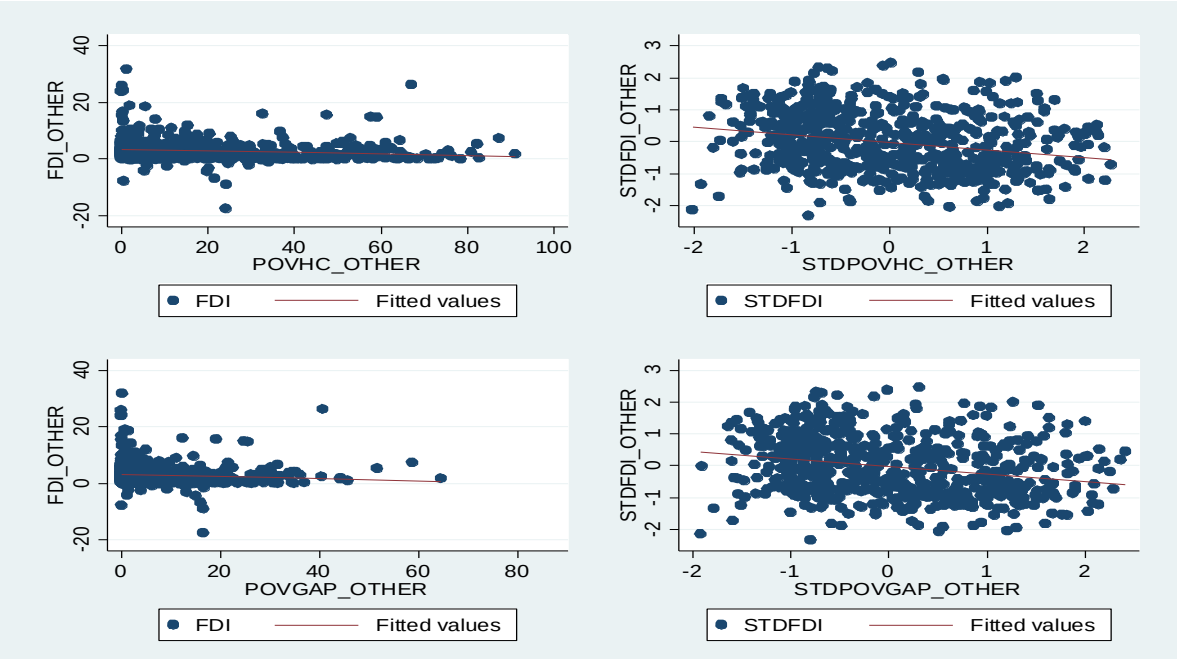
Figure 3: Correlation pattern between Poverty and FDI Inflows_over the sub-sample of LICs



Source: Author
Note: "STDFDI", "STDPOVHC" and "STDPOVGAP" represent respectively the standardized "FDI", "POVHC" and "POVGAP" variables.

Figure 4: Correlation pattern between Poverty and FDI Inflows_over the sub-sample of "OTHER"



Source: Author
Note: "STDFDI", "STDPOVHC" and "STDPOVGAP" represent respectively the standardized "FDI", "POVHC" and "POVGAP" variables.

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TABLES and APPENDICES

Table 1: Effect of Poverty on FDI inflows
Estimator: Two-Step System GMM

Variables	FDI	FDI	FDI	FDI
	(1)	(2)	(3)	(4)
FDI_{t-1}	0.284***	0.279***	0.265***	0.274***
	(0.0284)	(0.0284)	(0.0243)	(0.0245)
POVHC	-0.166***		-0.141***	
	(0.0432)		(0.0425)	
POVGAP		-0.118**		-0.133***
		(0.0479)		(0.0448)
POVHC*LIC			-0.233***	
			(0.0495)	
POVGAP*LIC				-0.173***
				(0.0560)
LIC			-0.0330	-0.0788*
			(0.0365)	(0.0409)
GDPC	-0.0965**	-0.0580	-0.100***	-0.0753**
	(0.0415)	(0.0381)	(0.0334)	(0.0349)
OPEN	0.278***	0.280***	0.264***	0.264***
	(0.0375)	(0.0361)	(0.0397)	(0.0376)
INFL	-0.104***	-0.0996***	-0.113***	-0.102***
	(0.0271)	(0.0275)	(0.0225)	(0.0216)
POLITY2	0.252***	0.260***	0.246***	0.256***
	(0.0446)	(0.0446)	(0.0358)	(0.0347)
RENT	0.0893***	0.0966***	0.0881***	0.105***
	(0.0316)	(0.0323)	(0.0280)	(0.0270)
POP	-0.00753	-0.00588	-0.0128	-0.0206
	(0.0383)	(0.0383)	(0.0366)	(0.0343)
Constant	0.0812***	0.0809***	0.0830***	0.0961***
	(0.0131)	(0.0126)	(0.0145)	(0.0145)
Observations - Countries	651 - 117	651 - 117	651 - 117	651 - 117
AR1 (P-Value)	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.3380	0.3189	0.2895	0.2856
AR3 (P-Value)	0.6756	0.6662	0.6131	0.6799
OID (P-Value)	0.2706	0.2741	0.5355	0.4088

*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", "GDPC", "OPEN", "RENT", "POLITY2", "INFL" and the interaction variables have been treated as endogenous. All variables have been standardized.*

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Table 2: Effect of Poverty on FDI inflows for varying levels of human capital accumulated
Estimator: Two-Step System GMM

Variables	FDI	FDI	FDI	FDI	FDI	FDI
	(1)	(2)	(3)	(4)	(5)	(6)
FDI_{t-1}	0.241***	0.251***	0.238***	0.249***	0.244***	0.254***
	(0.0103)	(0.0142)	(0.0134)	(0.0144)	(0.0134)	(0.0163)
POVHC	-0.0884***		-0.0868***		-0.112***	
	(0.0273)		(0.0167)		(0.0206)	
POVGAP		-0.0704***		-0.0748***		-0.105***
		(0.0247)		(0.0151)		(0.0219)
POVHC*HUM	0.164***					
	(0.0143)					
POVGAP*HUMI		0.128***				
		(0.0167)				
POVHC*EDUI			0.127***			
			(0.0141)			
POVGAP*EDUI				0.0801***		
				(0.0143)		
POVHC*LEI					0.122***	
					(0.0249)	
POVGAP*LEI						0.0600**
						(0.0269)
HUMI	0.0170	0.0334				
	(0.0329)	(0.0350)				
EDUI			0.158***	0.114***		
			(0.0356)	(0.0381)		
LEI					0.0496*	0.0633**
					(0.0264)	(0.0257)
GDPC	-0.0689**	-0.0782***	-0.128***	-0.115***	-0.0514**	-0.0565**
	(0.0287)	(0.0276)	(0.0198)	(0.0154)	(0.0247)	(0.0219)
OPEN	0.199***	0.196***	0.198***	0.248***	0.216***	0.222***

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	(0.0298)	(0.0253)	(0.0243)	(0.0279)	(0.0202)	(0.0201)
INFL	-0.109***	-0.0984***	-0.0757***	-0.0718***	-0.0735***	-0.0700***
	(0.0169)	(0.0177)	(0.0194)	(0.0180)	(0.0180)	(0.0174)
POLITY2	0.193***	0.187***	0.153***	0.170***	0.199***	0.242***
	(0.0252)	(0.0298)	(0.0272)	(0.0305)	(0.0272)	(0.0290)
RENT	0.148***	0.141***	0.147***	0.135***	0.119***	0.126***
	(0.0205)	(0.0225)	(0.0218)	(0.0217)	(0.0110)	(0.0143)
POP	0.187***	0.180***	0.128***	0.118***	0.115***	0.0629**
	(0.0265)	(0.0295)	(0.0130)	(0.0131)	(0.0228)	(0.0290)
Constant	0.116***	0.100***	0.0909***	0.0720***	0.117***	0.0884***
	(0.00978)	(0.00970)	(0.00733)	(0.00720)	(0.0139)	(0.0123)
Standardized poverty threshold	0.539 (= 0.0884/0.164)	0.55 (=0.0704/0.128)	0.68 (= 0.0868/0.127)	0.93 (=0.0748/0.0801)	0.92 (=0.112/0.122)	1.75 (=0.105/0.0600)
Unstandardized poverty threshold	39.31 [=(25.653*0.539) + 25.479]	17.56 [=(13.030*0.539) + 10.534]	42.92 [=(25.653*0.68) + 25.479]	22.65 [=(13.030*0.93) + 10.534]	49.08 [=(25.653*0.92) + 25.479]	33.34 [=(13.030*1.75) + 10.534]
Observations - Countries	569 - 98	569 - 98	569 - 98	569 - 98	651 - 117	651 - 117
AR1 (P-Value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.2542	0.2459	0.1816	0.1775	0.3070	0.2915
AR3 (P-Value)	0.9516	0.8879	0.9228	0.8952	0.6922	0.7324
OID (P-Value)	0.6184	0.5760	0.5561	0.6432	0.4049	0.3889

*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", "HUMI ", "EDUI", "LEI", "INFMORT", "GDPC", "OPEN", "RENT", "POLITY2", "INFL" and the interaction variables have been treated as endogenous. All variables have been standardized. Values of the (unstandardized) poverty headcount ratio indicator range between 0 and 94.402, and values of the (unstandardized) poverty gap indicator range between 0 and 64.52 (see Appendix 2a).*

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Table 3: Effect of Poverty on FDI inflows for varying levels of trade openness/export product concentration
Estimator: Two-Step System GMM

Variables	FDI	FDI	FDI	FDI	FDI	FDI	FDI	FDI
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FDI_{t-1}	0.271***	0.256***	0.273***	0.258***	0.280***	0.283***	0.249***	0.228***
	(0.0249)	(0.0245)	(0.0265)	(0.0239)	(0.0218)	(0.0220)	(0.0292)	(0.0296)
POVHC	-0.117***		-0.133***		-0.113***		-0.0774*	
	(0.0304)		(0.0388)		(0.0249)		(0.0443)	
POVGAP		-0.0506		-0.0728**		-0.0825***		-0.0557
		(0.0323)		(0.0352)		(0.0282)		(0.0404)
POVHC*OPEN	0.110***							
	(0.0290)							
POVGAP*OPEN		0.102***						
		(0.0354)						
POVHC*OPENSW			0.298***					
			(0.0405)					
POVGAP*OPENSW				0.317***				
				(0.0462)				
POVHC*TRJURE					0.123***			
					(0.0259)			
POVGAP*TRJURE						0.158***		
						(0.0281)		
POVHC*ECI							-0.216***	
							(0.0457)	
POVGAP*ECI								-0.258***
								(0.0443)
OPEN	0.251***	0.267***					0.202***	0.238***
	(0.0258)	(0.0276)					(0.0398)	(0.0410)
OPENSW			0.199***	0.230***				
			(0.0387)	(0.0412)				
TRJURE					0.213***	0.229***		
					(0.0213)	(0.0275)		

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ECI							-0.287***	-0.340***
							(0.0384)	(0.0384)
GDPC	-0.0743**	-0.0369	-0.200***	-0.161***	-0.0932***	-0.0729***	-0.0409	-0.0170
	(0.0323)	(0.0304)	(0.0365)	(0.0310)	(0.0273)	(0.0230)	(0.0395)	(0.0353)
INFL	-0.0840***	-0.0856***	-0.101***	-0.0985***	-0.0131	-0.00111	-0.0879***	-0.0909***
	(0.0212)	(0.0231)	(0.0246)	(0.0277)	(0.0224)	(0.0223)	(0.0216)	(0.0253)
POLITY2	0.163***	0.189***	0.182***	0.214***	0.164***	0.162***	0.164***	0.155***
	(0.0364)	(0.0359)	(0.0315)	(0.0334)	(0.0342)	(0.0361)	(0.0438)	(0.0404)
RENT	0.114***	0.135***	0.228***	0.252***	0.156***	0.180***	0.147***	0.154***
	(0.0308)	(0.0307)	(0.0316)	(0.0346)	(0.0270)	(0.0259)	(0.0413)	(0.0394)
POP	0.0604**	0.0523*	0.128***	0.113***	0.0869**	0.0930***	0.145***	0.143***
	(0.0285)	(0.0270)	(0.0344)	(0.0346)	(0.0340)	(0.0311)	(0.0418)	(0.0417)
Constant	0.115***	0.103***	0.202***	0.194***	0.115***	0.121***	0.0972***	0.0923***
	(0.0127)	(0.0137)	(0.0187)	(0.0178)	(0.0119)	(0.0121)	(0.0128)	(0.0138)
Standardized poverty threshold	1.06 (=0.117/0.110)	n.a.	0.45 (=0.133/0.298)	0.23 (=0.0728/0.317)	0.92 (=0.113/0.123)	0.52 (=0.0825/0.158)	n.a.	n.a.
Unstandardized poverty threshold	52.67 [=(25.653*1.06) + 25.479]	n.a.	37.02 [=(25.653*0.45) + 25.479]	13.53 [= (13.030*0.23) + 10.534]	49.08 [=(25.653*0.92) + 25.479]	17.31 [= (13.030*0.52) + 10.534]	n.a.	n.a.
Observations - Countries	651 - 117	651 - 117	651 - 117	651 - 117	655 - 114	655 - 114	566 - 113	566 - 113
AR1 (P-Value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.2436	0.1945	0.3821	0.2820	0.4378	0.4207	0.2016	0.1965
AR3 (P-Value)	0.6367	0.5982	0.8882	0.8620	0.4631	0.4740	0.9579	0.8971
OID (P-Value)	0.1644	0.2110	0.2571	0.3553	0.1894	0.2111	0.4842	0.5672

*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", "GDPC", "OPEN", "OPENSW", "TRJURE", "ECI", "RENT", "POLITY2", "INFL" and the interaction variables have been treated as endogenous. All variables have been standardized. Values of the (unstandardized) poverty headcount ratio indicator range between 0 and 94.402, and values of the (unstandardized) poverty gap indicator range between 0 and 64.52 (see Appendix 2a). " n.a." means 'not available'.*

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Table 4: Does the effect of Poverty on FDI inflows is conditional upon other factors?
Estimator: Two-Step System GMM

Variables	FDI	FDI	FDI	FDI	FDI	FDI	FDI	FDI
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FDI_{t-1}	0.264***	0.261***	0.281***	0.283***	0.245***	0.230***	0.274***	0.262***
	(0.0195)	(0.0202)	(0.0178)	(0.0166)	(0.0158)	(0.0179)	(0.0179)	(0.0158)
POVHC	-0.0965***		0.0331		-0.0869***		-0.0125	
	(0.0284)		(0.0278)		(0.0252)		(0.0217)	
POVGAP		-0.0583**		0.0283		-0.0771***		0.0130
		(0.0259)		(0.0286)		(0.0292)		(0.0196)
POVHC*PROD	0.101***							
	(0.0300)							
POVGAP*PROD		0.0938***						
		(0.0338)						
POVHC*GROWTH			-0.00695					
			(0.0273)					
POVGAP*GROWTH				-0.0312				
				(0.0310)				
POVHC*FINDEV					0.161***			
					(0.0196)			
POVGAP*FINDEV						0.130***		
						(0.0243)		
POVHC*GFCF							0.151***	
							(0.0185)	
POVGAP*GFCF								0.0873***
								(0.0193)
PROD	-0.0650***	-0.0400**						
	(0.0223)	(0.0175)						
GROWTH			0.550***	0.562***				
			(0.0366)	(0.0324)				
FINDEV					0.0636***	0.0820***		

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					(0.0130)	(0.0124)		
GFCF							0.260***	0.254***
							(0.0228)	(0.0245)
GDPC			0.161***	0.162***	-0.112***	-0.105***	-0.0714***	-0.0612***
			(0.0203)	(0.0141)	(0.0196)	(0.0187)	(0.0253)	(0.0228)
OPEN	0.226***	0.199***	0.231***	0.237***	0.203***	0.211***	0.174***	0.198***
	(0.0274)	(0.0233)	(0.0248)	(0.0235)	(0.0207)	(0.0184)	(0.0192)	(0.0200)
RENT	0.135***	0.151***	-0.0783***	-0.0880***	0.0878***	0.111***	0.0794***	0.0870***
	(0.0290)	(0.0263)	(0.0243)	(0.0225)	(0.0180)	(0.0204)	(0.0220)	(0.0230)
POLITY2	0.197***	0.218***	0.159***	0.158***	0.164***	0.176***	0.146***	0.173***
	(0.0351)	(0.0358)	(0.0246)	(0.0231)	(0.0224)	(0.0230)	(0.0272)	(0.0241)
INFL	-0.0814***	-0.0693***	0.0806***	0.0972***	-0.0594***	-0.0633***	-0.104***	-0.108***
	(0.0231)	(0.0241)	(0.0239)	(0.0241)	(0.0162)	(0.0177)	(0.0128)	(0.0138)
POP	0.141***	0.174***	0.0699***	0.0604***	0.111***	0.0838***	0.0765***	0.0588***
	(0.0311)	(0.0312)	(0.0149)	(0.0164)	(0.0174)	(0.0165)	(0.0194)	(0.0188)
Constant	0.123***	0.112***	0.0486***	0.0472***	0.133***	0.115***	0.139***	0.111***
	(0.0188)	(0.0188)	(0.00825)	(0.00849)	(0.00957)	(0.00938)	(0.0101)	(0.00883)
Standardized poverty threshold	0.955 (=0.0965/0.101)	0.62 (=0.0583/0.0938)	n.a.	n.a.	0.54 (=0.0869/0.161)	0.59 (=0.0771/0.130)	n.a.	n.a.
Unstandardized poverty threshold	49.98 [=(25.653*0.955) + 25.479]	18.61 [= (13.030*0.62) + 10.534]	n.a.	n.a.	39.33 [=(25.653*0.54) + 25.479]	18.22 [= (13.030*0.59) + 10.534]	n.a.	n.a.
Observations - Countries	630 - 112	630 - 112	651 - 117	651 - 117	622 - 113	622 - 113	628 - 116	628 - 116
AR1 (P-Value)	96	96	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AR2 (P-Value)	0.0000	0.0000	0.6481	0.6163	0.3441	0.3018	0.3092	0.2484
AR3 (P-Value)	0.2897	0.2849	0.5269	0.4970	0.7711	0.8166	0.7134	0.6234
OID (P-Value)	0.7624	0.7768	0.4350	0.4361	0.2585	0.2151	0.2876	0.3229

*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", "PROD", "*GROWTH", "FINDEV", "GFCF" *"GDPC", "OPEN", "RENT", "POLITY2", "INFL" and the interaction variables have been treated as endogenous. All variables have been standardized. Values of the (unstandardized) poverty headcount ratio indicator range between 0 and 94.402, and values of the (unstandardized) poverty gap indicator range between 0 and 64.52 (see Appendix 2a). " n.a." means 'not available'.*

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Table 5: Non-linear effect of Poverty on FDI inflows
Estimator: Two-Step System GMM

Variables	FDI	FDI
	(1)	(2)
FDI_{t-1}	0.253***	0.263***
	(0.0222)	(0.0242)
POVHC	-0.0615***	
	(0.0223)	
$POVHC^2$	-0.0805***	
	(0.0295)	
POVGAP		-0.0903***
		(0.0280)
$POVGAP^2$		-0.0111
		(0.0306)
GDPC	-0.0126	-0.0353
	(0.0240)	(0.0269)
OPEN	0.242***	0.235***
	(0.0320)	(0.0297)
INFL	-0.100***	-0.0989***
	(0.0249)	(0.0260)
POLITY2	0.283***	0.280***
	(0.0424)	(0.0409)
RENT	0.114***	0.124***
	(0.0276)	(0.0250)
POP	0.0428	0.0154
	(0.0321)	(0.0317)
Constant	0.142***	0.0836***
	(0.0295)	(0.0299)
Observations - Countries	651 - 117	651 - 117
AR1 (P-Value)	0.0000	0.0000
AR2 (P-Value)	0.4193	0.3344
AR3 (P-Value)	0.7199	0.6898
OID (P-Value)	0.4462	0.3713

*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", and their respective squared terms, "GDPC", "OPEN", "RENT", "POLITY2", "INFL" and the interaction variables have been treated as endogenous. All variables have been standardized.*

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Appendix 1: Definition and Source of variables

Variables	Definition	Sources
FDI	Foreign direct investment, net inflows (% of GDP).	World Development Indicators (WDI) of the World Bank.
POVHC	This is the poverty headcount ratio at $1.90 a day. It represents 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).
POVGAP	This is the poverty gap at $1.90 a day (2011 PPP). It represents 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).
HUMI	This is the human capital index, which is computed as the geometric mean of life expectancy and educational attainment indicators. $HUMI_{it} = \sqrt{LEI_{it} * EDUI_{it}}$ where LEI_{it} and $EDUI_{it}$ represent respectively the index of the life expectancy and the index of educational attainment, for a given country i, in a given year t. $LEI_{it} = \frac{LE_{it} - \min(LE_i)}{\max(LE_i) - \min(LE_i)}$, where and "LE" is the indicator of life expectancy in a given country and in year t. $EDUI_{it} = \frac{EDU_{it} - \min(EDU_i)}{\max(EDU_i) - \min(EDU_i)}$, where and "EDU" is the indicator of 'number of years of schooling and returns to education' in a given country and in a given year t developed by Feenstra et al. (2015). This indicator is also referred to as 'human capital' by the authors.	The variable "LE" (i.e., the life expectancy) is extracted from the World Development Indicators (WDI). The variable "EDU" (i.e., the 'number of years of schooling and returns to education') is extracted from the Penn World Tables PWT 9.1 (see Feenstra et al., 2015).
OPEN	This is the indicator of (de facto) trade openness. It is measured by the share of sum of exports and imports of goods and services in GDP.	WDI

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OPENSW	This is another measure of (de facto) trade openness suggested by Squalli and Wilson (2011). It is calculated as the measure of the share of sum of exports and imports of goods and services in GDP, adjusted by the proportion of a country's trade level relative to the average world trade (see Squalli and Wilson, 2011: p1758).	Author's calculation based on data from the World Development Indicators (WDI) of the World Bank.
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
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 is 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
PROD	This is the measure of workers' productivity (i.e., labor productivity). It is proxied by ratio of the annual real GDP to the number of workers.	Author's calculation based on data extracted from the Penn World Table version 9.1 (see Feenstra et al. 2015)
GROWTH	Annual growth rate of the real GDP (constant 2010 US$)	WDI
FINDEV	Domestic credit to private sector by banks (% of GDP)	WDI
GFCF	This is the gross fixed capital formation (% of GDP). Gross fixed capital formation includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of	WDI

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	roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.	
GDPC	GDP per capita (constant 2010 US$)	WDI
INFL	Annual inflation rate (%) based on consumer price index -CPI- (annual %), and where missing values have been replaced with values of the GDP Deflator (annual %).	Author's calculation based on data from the WDI.
RENT	Total natural resources rents (% of GDP)	WDI
POP	Total Population	WDI
POLITY2	This variable is an index extracted from Polity IV Database (Marshall et al., 2018). It represents the degree of democracy based on competitiveness of political participation, the openness and competitiveness of executive recruitment and constraints on the chief executive. Its values range between -10 and +10, with lower values reflecting autocratic regimes, and greater values indicating democratic regimes. Specifically, the value '+10' for this index represents a strong democratic regime, while the value '-10' stands for strong autocratic regime.	Polity IV Database (Marshall et al., 2018)

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

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
FDI	651	3.251	4.639	-7.761	71.270
POVHC	651	25.479	25.653	0	94.402
POVGAP	651	10.534	13.030	0	64.518
HUMI	569	55.030	29.929	0	100
EDUI	569	58.505	29.084	0	100
LEI	651	56.409	30.725	0	100
OPEN	651	74.282	36.958	4.297	229.638
OPENSW	651	0.002	0.004	0.000	0.044
TRJURE	637	43.044	21.139	9.341	93.346
ECI	567	3.599	1.123	1.317	6.411
PROD	630	17984.320	15028.020	1432.176	79732.630
GROWTH	867	3.59	3.915	-34.809	21.570
FINDEV	799	27.744	23.532	0.186	155.930
GFCF	803	22.296	8.223	0.000	77.510
POLITY2	651	2.716	6.110	-10.000	10.000
GDPC	651	3877.272	4263.649	153.903	24600.910
RENT	651	8.026	9.910	0.004	66.355
INFL	651	45.872	333.944	-5.903	6424.987
POP	651	48,600,000	166,000,000	67336.2	1,380,000,000

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

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
FDI	651	0.120	0.895	-2.325	2.447
POVHC	651	-0.061	0.895	-2.134	2.274
POVGAP	651	-0.064	0.891	-2.008	2.410
HUMI	569	0.174	0.787	-1.463	1.827
EDUI	569	0.202	0.757	-1.156	1.740
LEI	651	0.180	0.818	-1.696	1.956
OPEN	651	0.066	0.883	-2.222	2.124
OPENSW	651	-0.053	0.850	-1.735	2.055
TRJURE	637	0.127	0.870	-2.251	2.317
ECI	566	-0.040	0.854	-1.946	2.052
PROD	630	0.057	0.893	-1.811	2.159
GROWTH	867	8.72e-09	0.931	-2.415	2.157
FINDEV	799	-5.35e-09	0.926	-1.825	2.176
GFCF	803	-8.08e-09	0.926	-2.271	2.258
POLITY2	651	0.153	0.743	-2.280	2.209
GDPC	651	0.037	0.874	-2.118	2.089
RENT	651	-0.045	0.868	-1.833	2.246
INFL	651	-0.132	0.807	-1.997	2.472
POP	651	0.102	0.784	-1.654	1.872

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Appendix 3: List of countries used in the analysis

Full sample		
Albania	Gambia, The*	Nicaragua
Algeria	Georgia	Niger*
Angola	Ghana	Nigeria
Argentina	Guatemala	North Macedonia
Armenia	Guinea*	Pakistan
Azerbaijan	Guinea-Bissau*	Panama
Bangladesh	Guyana	Papua New Guinea
Belarus	Haiti*	Paraguay
Benin	Honduras	Peru
Bhutan	Hungary	Philippines
Bolivia	India	Poland
Botswana	Indonesia	Romania
Brazil	Iran, Islamic Rep.	Russian Federation
Bulgaria	Iraq	Rwanda*
Burkina Faso*	Jordan	Senegal
Burundi*	Kazakhstan	Serbia
Cabo Verde	Kenya	Sierra Leone*
Cambodia	Kiribati	Slovak Republic
Cameroon	Kosovo	Slovenia
Central African Republic*	Kyrgyz Republic	South Africa
Chad*	Lao PDR	Sri Lanka
Chile	Latvia	Sudan*
China	Lesotho	Suriname
Colombia	Liberia*	Tajikistan*
Comoros	Lithuania	Tanzania
Congo, Dem. Rep*	Madagascar*	Thailand
Congo, Rep.	Malawi*	Timor-Leste
Costa Rica	Malaysia	Togo*
Cote d'Ivoire	Mali*	Tunisia
Croatia	Mauritania	Turkey
Czech Republic	Mauritius	Turkmenistan
Dominican Republic	Mexico	Uganda*
Ecuador	Moldova	Ukraine
Egypt, Arab Rep.	Mongolia	Uruguay
El Salvador	Montenegro	Uzbekistan
Estonia	Morocco	Venezuela, RB
Eswatini	Mozambique*	Vietnam
Ethiopia*	Namibia	Zambia
Gabon	Nepal	Zimbabwe

Note: **"*"** *denotes a Low-Income Country (LIC).*