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FDI, child labor and gender issues in Sub – Saharan Africa: an empirical approach

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Abstract

Trade openness, market size and economic conditions are traditional factors that influence the operation of multinational enterprises (MNEs) and the international capital flows. Over the past years, multinational companies consider additional factors when investing their capitals abroad, among which the political, social and financial conditions of the recipient country. In particular, low labor cost is listed among the factors that attract more foreign investors, which in certain cases could be attributed to the fact that MNEs employ unskilled workers, such as minor employees. Therefore, the association of Foreign Direct Investment (FDI) and child labor in developed and developing economies is an important social issue, which attracted limited research interest though. An extended literature review of empirical studies is conducted in order to investigate and discuss findings on the association between FDI inflows and child labor. Additionally, factors that could potentially determine the exploitation of minor employees by MNEs are presented. Therefore, the purpose of the paper is to empirically investigate the interaction between FDI and child labor in developing countries, taking into consideration gender issues. The paper concludes that previous empirical studies reached contrasting results, considering that different empirical models and methodologies were used. It is observed that a positive association between FDI inflows and child labor is observed by certain researchers, while, on the contrary, others conclude that FDI inflows reduce child labor. Moreover, FDI and child labor determinants, such as the sectoral distribution of inflows or the UN Convention on the Rights of the Child respectively, have also been considered by previous researches. The present research contributed to the existing literature since it

is the first effort to empirically investigate the association between FDI and child labor in Sub – Saharan countries by gender. Additionally, the study extends to the investigation of the agriculture as a determinant variable of child labor between male and female minor employees. The paper concludes with a number of policies and proposals that will reduce or prevent child labor in the subsidiaries of multinational companies.

Keywords: FDI, child labor, MNEs, Sub-Saharan Africa

JEL: F23, J46, E24, O15

1. Introduction

A successful strategy against child labor could be considered one of the top priorities in several regions. However, despite the decrease in the incidence of child labor worldwide, the problem remains unsolved and a feature mostly of the developing economies (Banerjee & Nag, 2013). It is estimated that more than 246 million minors are involved in child labor, while 170 million of them work under hazardous conditions (Chaudhuri, 2011). Child exploitation remains a universal problem, which becomes more severe mostly after the migration crisis of 2015 (Southall and MacDonald, 2013).

International organizations made significant efforts over the past decades in order to protect children's rights and to prevent child labor. Specifically, the protection of children and the elimination of child labor are listed among the top priorities of 190 countries, which signed the United Nations (UN) Conventions of the Rights of the Child. Similarly, the International Labor Organization (ILO) included two Conventions that aimed at the protection of minor employees.

Worldwide, as suggested by Edmonds and Pavcnik (2005), working child are employed in several factors, either by their parents or by industries and MNEs. However, the majority of the minors work mostly in agriculture, mining, fishing, manufacturing and construction and they are exposed to various safety and health risks. Therefore, the phenomenon attracted research interest since it has a significant negative effect on the minors' personal and social development, as well as on the equilibrium of the market.

The present research focuses on FDI inflows, which could lead to increased income, while at the same time to higher demand for cheap labor force and to cause child labor via a substitution effect. Nevertheless, despite the fact that FDI remains a subject of study for several decades, the relation of FDI inflows and child labor in developing countries attracted research interest over the past few years (Kechagia & Metaxas, 2018). Therefore, the purpose of the study is to conduct an extended literature review and to empirically investigate and discuss the impact of FDI inflows on child labor in developing economies of Sub – Saharan Africa. The study contributes to the existing knowledge by undertaking an econometric analysis on the association between FDI inflows and child labor in 22 countries for the period 1980 – 2019, focusing on the differences between genders. The role of agriculture as a determinant variable of child labor in both genders is also considered.

Section 1 briefly defines the theoretical framework of the research and presents the findings of the related literature review. Section 2 presents the empirical methodology and the data used in the analysis and Section 3 includes the empirical results. The paper concludes with a section for suggestions and future work.

2. Theoretical framework

2.1. The phenomenon of child labor

Child labor could be attributed to myriad financial, cultural, social and political factors. In several developing countries, it constitutes a severe public health issue attributed to the violation of the children's basic human rights. It is argued that it is a broad sense and it includes several harmful to children activities (Edmonds & Pavcnik, 2005).

Despite the fact that child labor occurs in both developed and developing economies, the present research focuses on the less developed ones, in which the problem is even more intense (Scanlon et al, 2002). It is observed that child labor is higher in specific regions, mostly the African countries (Canagarajah & Nielsen, 2001; Hope, 2005; Machonachie & Hilson, 2016).

Child labor has also attracted the research of international organizations. The contribution of the ILO Convention 138 (Articles 1 – 3) and Convention 182 (Articles 2 – 3 and 7) focused on the protection of the minor employees' rights. In particular, they aimed at setting a minimum age for child labor and at preventing severe forms of child labor (ILO, 2020a; ILO, 2020b). In a similar manner, the UN Convention on the Rights of the Child highlighted the importance of non – discrimination, rights and personal development of the children (United Nations, 2020).

It is observed that the sub-Saharan countries present the highest prevalence of child labor (Fig. 1). According to Rena and Herani (2009) the sub – Saharan African countries present low school enrollment rates and high prevalence of child labor. According to Admassie (2002), high incidence of child labor in the Sub – Saharan African countries is attributed, among other factors, to high rates of poverty and to high population growth. Among them, Ethiopia presented the higher rate of children engaged in economic activity in 2019 (48,6%). On the contrary, among the African countries Algeria and Egypt presented 4,3% and 4,8% of child labor respectively. As for the Latin American countries, it is observed that Haiti and Paraguay had the

highest rates of child labor in 2019 (35,5% and 17,9% respectively), contrary to Colombia that presented 3,6% rate of children engaged in economic activity in 2019.

-----Insert Figure 1-----

2.2. Causes and consequences of child labor

Child labor is a crucial social issue that attracts increased research interest, which mostly in developing countries, is attributed to several factors. Poverty is considered the most important factor that lead to child labor (Admassie, 2002; Basu, 2002; Jafarey & Lahiri, 2002; Scanlon et al, 2002; Shafiq, 2007; Kim, 2009; Rena & Herani, 2009). Therefore, in several developing economies, child labor is associated to low socioeconomic status and poor family well – being (Fetuga et al, 2005; Chaudhuri, 2011), as well as to the number of children in a family (Fetuga et al, 2005; El – Gilany et al, 2007) and high fertility rates (Katav – Herz, 2003; Burhan et al, 2016).

According to Basu (1999) child labor is related to insufficient labor standards, while Jafarey and Lahiri (2002) and Edmonds and Pavcnik (2005) observed that the problem is also attributed to market imperfections. In a later study, the researchers suggested that child labor is associated to limited trading activity, arguing that child labor is lower in countries that trade more (Edmonds & Pavcnik, 2006). Similarly, in several developing countries children are treated as potential employees, while their legal framework is either inadequate or inappropriate (Basu, 2002). Furthermore, it is observed that the incidence of child labor is higher in dualistic economies (Banerjee & Nag, 2013; Dwibedi & Chaudhuri, 2014).

Gender is also listed among the factors associated to child labor. Edmonds and Pavcnik (2005) argued that boys are less likely to participate in labor, while girls usually work long hours compared to boys. On the contrary, Putnick and Bornstein (2016) suggested that boys are more likely to engage in child labor; however, it is highlighted that this difference could be attributed to different kinds of labor. Additionally, Bonke (2010) observed that girls often work inside the home rather than outside the home activities, including the MNEs. On the contrary, Kea (2007) focused on the case of Gambia and observed that girls work in agricultural activities, as well

as in the household. Nevertheless, when regarding to FDI and child labor, Voy (2012) observed that gender does not affect the association between the two variables.

Moreover, there is vast empirical and theoretical literature devoted to the consequences of child labor, arguing that the phenomenon has severe and various socioeconomic effects. In particular, child labor could lead to sexual exploitation, slavery and corporal punishment (Basu, 1999; Scanlon et al, 2002). Additionally, in several developing countries child labor is related to high rates of mortality (Roggero et al, 2007; Shendell et al, 2016), occupational injuries (Schlick et al, 2014) as well as to the victimization or economic exploitation of the children (Greenbaum and Bodrick, 2017). Mental illnesses are also listed among the health issues of working children, as observed by several studies (Fekadu et al, 2006; Khan, et al 2007; Thabet et al, 2010).

In several cases, minor employees are exposed to poor ergonomics and chemicals, which cause them illnesses, disabilities or evens deaths (Shendell et al, 2016). Moreover, the phenomenon is associated to low rates of school enrollment and early dropout (Shafiq, 2007; Kim, 2009; Hou, 2010; Huisman & Smits, 2015), poor academic performance (Holgado et al, 2014). Finally, minor employees are often malnourished, in certain cases they are unpaid and they drop – out of school in order to contribute to the family survival (Roggero et al, 2007).

Finally, Chaudhuri and Dwibedi (2016) observed that child labor is exploitative and dangerous and focused on domestic help. Their study concluded that in order to eliminate child labor as domestic held it is important to improve welfare of poor families through direct financial assistance and redistribution of taxes. Similarly, Edmonds and Pavcnik (2005) observed that child labor is related to child trafficking, or even forced labor.

2.3. Literature review

The association between FDI inflows and child labor in developing countries attracted research interest, leading, however, to contrasting results. In particular, certain researchers concluded that FDI inflows increase child labor (e.g. Dagdemir & Acaroglu, 2010; Doytch et al, 2014), while others reached to the conclusion that the absorption of FDI inflows reduces child labor in developing countries (e.g. Neumayer & de Soyza, 2005; Davies & Voy, 2009; Iram & Fatima, 2008), as presented in Table1 and 2 respectively.

-----Insert Table 1-----

-----Insert Table 2-----

The above presented studies reached to contrasting results despite the fact that they include large samples of developing countries, except for Iram and Fatima (2008), who studied the case of Pakistan. Nevertheless, the researchers used different explanatory variables, time periods and methodologies in order to investigate the impact of FDI on child labor. Additionally, Doytch et al (2014) and argued that different production sectors lead to contrasting effects on child labor.

The literature review concludes that solely Sundjo et al (2018), as presented in Table 3, observed that FDI inflows do not influence child labor in a sample of 25 Sub – Saharan African economies. It is noted that Busse and Braun (2004) used FDI inflows and not child labor as the dependent variable and thus their study is excluded from the above described tables. Moreover, Shelburne (2001) studied child labor but FDI inflows were not included in the empirical model.

-----Insert Table 3-----

Therefore, previous studies reached to vague and contrasting results. The present research aims at clarifying the impact of FDI inflows in developing countries, studying a sample of 22 Sub – Saharan African countries from 1980 to 2013. Contrary to previous researches, the present study sheds light to gender issues. As a result, the association between FDI inflows and child labor by gender is investigated. The literature review reveals that it is the first effort to empirically investigate FDI and child labor in Sub – Saharan Africa by gender, considering the case of FDI inflows in agriculture as well. It should be highlighted that that Voy (2012) investigated the role of gender in child labor; nevertheless, the study did not focus on a specific geographic region and aimed at exploring the impact of globalization on child labor.

3. Methodology

3.1. Data and sample

The research included secondary data collected from international and reliable databases. The sources and the definition of the used variables are presented in Table 4.

-----Insert Table 4-----

In particular, considering the available data, the sample consisted of 22 developing economies in Sub – Saharan Africa, as presented in Table 5, and the time period ranged from 1980 to 2019, based on the available data.

-----Insert Table 5-----

3.2. Methodological approach

3.2.1. The dependent variable

It is argued that most low – income countries present unreliable data on labor market, let alone child labor (Edmonds & Pavcnik, 2005). According to Scanlon et al (2002) there is limited reliable data on working children. Following previous researches (Kucera, 2002; Busse & Braun, 2004; Neumayer & de Soyza, 2005; Braun, 2006) the secondary school non – enrolment rates is used as a proxy for child labor, arguing that children who work do not attend school. This is based on the argument that school enrollment and child labor are incompatible activities; therefore, it is assumed that minors either work or go to school (ILO, 2000). Similarly, Beegle et al (2009) also observed that child labor is associated to drop – out of school. The use of the specific proxy overcomes the issue of missing data.

Therefore, based on the literature review and on the economic factors related to the operation of MNEs in developing countries, child labor the dependent variable and it is modeled as a function of FDI inflows and explanatory variables. It is noted that child labor is estimated as following:

- (1) Child labor = 100 – total school enrolment secondary
- (2) Child labor male = 100 – total school enrolment secondary male
- (3) Child labor female = 100 – total school enrolment secondary female

Among the studied countries in Sub – Saharan Africa, as presented in Fig. 2, Namibia has the highest mean secondary enrolment rates during the studied period, contrary to Mozambique that ranks last among the countries of the sample.

-----Insert Figure 2-----

3.2.2. The explanatory variables

The main independent variable of the model is the amount of net FDI inflows in the studied countries during 1980 – 2019. The literature review leads to constating findings on the role of FDI inflows, arguing that supporters of globalization consider that FDI inflows contribute to the reduction of child labor considering that capital inflows are related to an income effect, because of which minors are nor required to leave school and work since they have higher family income (Basu & Van, 1998; Cigno et al, 2002; Neumayer & de Soyza, 2005; Kis – Katos, 2007; Davies & Voy, 2009; Mendola, 2016). On the contrary, other researchers suggest that FDI inflows in developing countries could increase the demand for unskilled employees, among which minors, because of a substitution effect (Cigno et al, 2002; Neumayer & de Soyza, 2005; Kis – Katos, 2007; Davies & Voy, 2009). Therefore, as presented in Table 1, Table 2 and Table 3, the findings on the impact of FDI on child labor are vague. Figure 3 presents total net FDI inflows (% GDP) during the studied period for each country of the sample. Among the studied economies, Liberia attracted more FDI compared to the rest countries of the sample, contrary to Somalia that absorbed less FDI than any other country.

-----Insert Figure 3-----

Gross Domestic Product (GDP) per capita is used as a proxy for income. The literature review findings reveal a negative association between child labor and GDP per capita, as observed by Burhan et al (2016) in 44 African economies, Fatima (2017) in 129 developing economies, Voy (2012) in 82 countries and Neumayer and de Souza (2005) among 177 countries. Similarly, Sundjo et al (2018) in a sample of 25 Sub - Saharan African countries observed a negative relation between child labor and GDP per. On the contrary, Iram and Fatima (2008) concluded to a positive but statistically insignificant relation between the two variables. It is interesting that Dagdemir and Acaroglou (2010) concluded to contrasting results on the relation

between child labor and GDP per capita, represented by a U shape curve. According to the researchers, child labor increases in countries that present GDP per capita higher than \$ 7.500.

Trade openness is another explanatory variable of child labor, based on the literature review. According to Edmonds and Pavcnik (2006), it is observed that the higher the country's trade openness, the lower the incidence of child labor, considering that trade affects the household incomes and thus the supply of child labor. Shelburne (2001) argued that trade openness provides incentives so as to use fewer minor employees. Similarly, Cigno et al (2002) suggested that trade openness could either reduce or, at least, not effect child labor. Additionally, Jafarey and Lahiri (2002) trade sanctions and constraints could increase child labor, mostly in the developing countries and among poor households. On the contrary, other studied concluded to a negative effect of trade openness on child labor (Busse and Braun, 2004; Iram & Fatima, 2008).

The basic model (equation 1), which is presented in the following section, is extended though the inclusion of additional explanatory variables, namely population, value added of agriculture and a dummy variable for UN Convention. In particular, population is used since it is considered an important factor of child labor in developing countries based on the literature review and it is used as a proxy for country size. Sundjo et al (2018) reached to the conclusion that there is a positive relation between child labor and rural population in 25 Sub – Saharan African countries, but a negative association between child labor and population growth. Admassie (2002) observed that high population growth leads to higher rates of child labor in developing economies, focusing on Sub – Saharan Africa.

Additionally, the rural area is investigated as an explanatory variable of child labor. According to Neumayer and de Soya (2005) child labor is less likely to be prevalent in urban areas. On the contrary, agriculture is listed among the main industries of child employment, as suggested by Srivastava (2011), who argued that the specific sector is the oldest and most common in child labor worldwide. In a similar manner, Doytch et al (2014) observed there is a positive association between child labor and FDI inflows in agriculture, focusing on the Central Asian developing countries. These findings are in line with the results of Dagdemir and Acaroglu (2010), who concluded that child labor is mostly observed in urban areas.

The empirical model also includes a dummy variable of UN Convention. According to the UN Convention, every child should attend primary school for free and should be encouraged to attend higher education; nevertheless, in the Sub – Saharan African countries these objectives are not fulfilled yet. It is important to consider the effect of the UN Convention since it refers to the protection of the children from economic exploitation or any economic activity related to the consequences above presents, such as health or mental issues. A negative association between the dummy and the dependent variable is expected, as observed by previous researches (Davies & Voy, 2009; Machonachie & Hilson, 2016). It is noted that a dummy variable equal to 1 for the countries of the sample that signed the UN Convention on the Rights of the Child is used.

Finally, gender dimensions of child labor are also considered. It is, thus, investigated whether the gender of the minor employees is related to FDI inflows. As mentioned above, there are limited findings on child labor by gender and FDI inflows, while previous researchers concluded to vague findings. In particular, Voy (2012) did not find evidence that the effect of FDI on child labor is influenced by gender. Additionally, Fors (2014) focused on child labor and social globalization in several groups of developing countries and concluded that child labor is highly correlated to agriculture, mostly for boys.

3.2.3. The empirical model

Based on the framework presented by Davies and Voy (2009) and taking into consideration the model used by Dagdemir and Acaroglu (2010), the present research extended their empirical models, taking into consideration the literature review findings. In particular, based on the initial model of Davies and Voy (2009) and adding a set of control variables, the model is developed as following:

$$\text{Eq. (1).} \quad \text{Child labor} = C + \beta_1 \text{FDI}_{i,t} + X_{it} + \varepsilon_{i,t}$$

Where, X includes a variety of explanatory variables.

In the present research the additional variables used were per capita GDP, trade openness and the value added of agriculture, as suggested by Dagdemir and

Acaroglu (2010). The dummy variable for the UN Convention is also included. Therefore, the extended model is expressed as:

$$\text{Eq. (2)} \quad \text{Child labor} = C + \beta_1 \text{FDI}_{i,t} + \beta_2 \text{GDP}_{i,t} + \beta_3 \text{Population}_{i,t} + \beta_4 \text{Trade_openness}_{i,t} + \text{Agriculture}_{i,t} + \text{UN_Convention}_{i,t} + \varepsilon_{i,t}$$

As mentioned above the present study focused on the differences between male and female minor employees. Therefore, Equation 3 is used for the investigation of child labor among boys and Equation 4 among girls respectively.

$$\text{Eq. (3)} \quad \text{Child labor} = C + \beta_1 \text{FDI}_{i,t} + \beta_2 \text{GDP}_{i,t} + \beta_3 \text{Population}_{i,t} + \beta_4 \text{Trade_openness}_{i,t} + \text{Agriculture}_{i,t} + \text{UN_Convention}_{i,t} + \varepsilon_{i,t}$$

$$\text{Eq. (4)} \quad \text{Child labor} = C + \beta_1 \text{FDI}_{i,t} + \beta_2 \text{GDP}_{i,t} + \beta_3 \text{Population}_{i,t} + \beta_4 \text{Trade_openness}_{i,t} + \text{Agriculture}_{i,t} + \text{UN_Convention}_{i,t} + \varepsilon_{i,t}$$

The error term is not serially correlated. In order to control for heteroscedasticity and to avoid outliers, the model was transformed in logarithmic form. Additionally, the study focuses on endogeneity and in order to deal with this issue independent demographic and instrumental variables that affect FDI without influencing child labor are used, including population size, trade openness and GDP. The independent variables are gradually included in Equation 2, Equation 3 and Equation 4 respectively.

Based on the above presented models, the first step was to test for multicollinearity. It is crucial to control for multicollinearity because the presence of this problem it would lead to statistically insignificant or redundant variables (Alin, 2010). Additionally, a correlation matrix was used and a stepwise regression was also applied so as to verify the included variables. However, these procedures led to same results regarding the included variables.

The next step included the selection among the estimation techniques, taking into consideration the sample size and the time period. The sample included 22 countries and the time period extended from 1980 to 2019. Based on the above, Hausman test and Breusch – Pagan Lagrange Multiplier test were applied so as to

choose between Fixed and Random Effects and Ordinary Least Squares and Random Effects respectively. The results are also available upon request.

Finally, it was tested whether the results are robust for cross – section dependence, heteroscedasticity and autocorrelation. As for the robustness of the models, the Breusch – Pagan LM test was used for cross – section dependence, the Wald test for heteroscedasticity and the Durbin Watson (DW) for autocorrelation. Therefore, the Feasible Generalized Least Square (FGLS) was chosen so as to solve these issues. It is noted that the statistical program Eviews 11 was used.

4. Results

The descriptive statistics of the dependent and the independents variables are presented in Table 6.

-----Insert Table 6-----

Firstly, child labor was studied as the dependent variable, as presented in Table 7. It is observed that there is a positive sign of FDI, trade openness, population and value added of agriculture. On the contrary, there is a negative association between GDP per capita and child labor in each model and between child labor and the dummy variable. Additionally, GDP is statistically insignificant solely in Model 2. When regarding to the explanatory variables that take a positive sign, it is observed that FDI is statistically highly significant in model 2 ($p=0.000$), trade openness is statistically highly significant in model 1 and in model 2 ($p=0.000$), but insignificant in model 3 and model 4, while population is highly significant in model 2, model 3 and model 4. Moreover, value added of agriculture is highly significant in model 3 and model 4 and the dummy variable UN Convention was also highly significant in model 4. It is noted that p-values are presented in the parentheses. It is observed that there is no cross – section dependence, heteroscedasticity and autocorrelation. Among the models 1-4, it is observed that Model 3 presented the highest R^2 , which represents its overall significance.

-----Insert Table 7-----

Secondly, child labor among boys was investigated as the dependent variable. All estimated models led to positive sign for FDI inflows, population and value added of agriculture. In particular, GDP per capita has a negative sign and it is statistically highly significant ($p=0.000$) in all models (model 5 to 8). Trade openness has a negative sign solely in Model 7, but it is statistically insignificant. Finally, the dummy variable also has a negative sign. It is noted that Model 5 presented the highest R^2 .

-----Insert Table 8-----

The investigation of child labor among female minors led, however, to contrasting results. It is observed that FDI has a negative sign in model 9 and model 10, but the variable is statistically significant solely in model 9 (at $\alpha=5\%$). GDP per capita has a negative sign and it is statistically highly significant ($p=0.000$) in each model. Trade openness has a positive sign and it is statistically highly significant in model 9 and model 10. Contrary to the previous presented results, population has a negative sign and it is statistically highly significant in model 10 and model 11. Moreover, the value added of agriculture has a positive sign, while the dummy variable a negative one. It is noted that Model 9 has the highest R^2 .

-----Insert Table 9-----

5. Discussion

Child labor in developing economies is attributed to several socioeconomic factors, among which low level of development, poverty and poor institutional quality. The present research led to the conclusion that there is a positive relation between FDI and child labor, as well as between child labor among boys and FDI in the studied countries from 1980 to 2019. The findings are in line with the results of Dagdemir and Acaroglu (2010) and in accordance with Doytch et al (2014), who also observed a positive association between FDI and child labor, mostly in the agricultural sector, as in the present research. On the contrary, a negative association was observed between FDI inflows in the Sub – Saharan African countries and child labor among girls. Despite the fact that the majority of the researchers concluded to a negative impact of FDI inflows in child labor (e.g. Neumayer & de Soya, 2005, Davies and Voy, 2009; Voy, 2012; Fatima, 2017), none of them studied child labor

among girls as the dependent variable. It is therefore the first study to present the negative influence of FDI inflows on child labor of female minors in Sub – Saharan Africa from 1980 to 2019.

Additionally, a negative association between GDP per capita and child labor is observed, regardless the gender of the minor employees. Doytch et al (2014) also observed a negative association between GDP per capita and child labor; however, the researchers focused on different regions and they did not consider child labor in different genders. Similarly, Neumayer and de Soyza (2005) also concluded to a negative impact of GDP per capita on child labor. The negative relation between the specific variables could be attributed to the fact children from families with higher GDP per capita, used as a proxy for income, are less likely to leave school for economic reasons. It is, thus, concluded that raising GDP per capita in the studied countries contributes to the reduction in the rate of child labor.

Trade openness is positively related to child labor, as well as to child labor in boys and girls, which is in line with the Iram and Fatima (2008). On the contrary, Neumayer and de Soyza (2005) concluded to a negative relation between child labor and trade openness; nevertheless, their study included 117 developing economies and they did not focus on Sub – Saharan Africa. Fatima (2017) also observed a negative association between trade openness and child labor; however, the study included 129 developing economies from different geographic regions and argued that trade could have a negligible influence on child labor when regarding to export – oriented companies. Therefore, it is concluded that increasing trade openness could increase the demand for minor employees in the Sub – Saharan African economies. It is interesting that Cigno et al (2002) argued that there is no significant impact of trade openness on child labor.

Finally, among the most suitable models, population has a positive sign, as observed by Voy (2012). It is noted that Doytch et al (2014) argued that there is a negative association between population density and child labor. The value added of agriculture is also positively related to child labor in the studied countries. This is in line with the literature review findings, arguing that Neumayer and de Soyza (2005) and Doytch et al (2014) highlighted the role of the specific sector in promoting child labor. Nevertheless, Iram and Fatima (2008) concluded to a negative association between value added of agriculture and child labor; however, the researchers did not study a group of developing countries but focused on the case of Pakistan.

In conclusion, gender plays a crucial role in the association between child labor and FDI. It is observed that FDI inflows in the studied countries have a negative impact on child labor among female employees, while, on the contrary, they are positively associated to child labor among boys. Nevertheless, agriculture does not affect child labor between male and female employees in the studied countries.

Along with the empirical findings of the present paper, we acknowledge that the research presents certain limitations. Future studies could perhaps focus on the equilibrium of the labor market in case minor employees are suddenly withdrawn from multinational subsidiaries. Additionally, it would be interesting to investigate the impact of the refugee crisis on the association between child labor and FDI, arguing that unaccompanied minors are often at risk for labor trafficking. In particular, minor migrants and refugees lack of adult supervision, they are often exposed to harmful condition and they are vulnerable to economic manipulation (Linton et al, 2017).

Finally, another limitation refers to the diversity related to child labor, considering that the phenomenon includes several types of activities. Nevertheless, the literature review findings revealed the definitions and sources of previous researches on child labor, arguing that the phenomenon refers to activities that deter the children's well – being. The role of additional sectors could also be studied, such as domestic work, manufacturing and construction (Srivastava, 2011; Chaudhuri & Dwibedi, 2016). Moreover, future studies could even extent to the role of additional factors that could influence child labor, such as infrastructure (Kucera, 2002; Beegle et al, 2009) or political stability (Neumayer & de Soyza, 2005; Roberts, 2016).

It is argued that policymakers should pay attention on the domestic help of children, which in several cases is not mentioned despite the fact that it could also be exploitative for minor employees. Domestic is a different dimension of child labor, which could also be a subject of future research. Additionally, policies should also consider the impact of the recent migration flows on child labor (de Paoli & Mendola, 2015; Mendola, 2016).

Therefore, strengthening laws against child labor and improving working conditions could affect ensure children's rights. In each case, it is difficult to investigate informal child labor. Thus, it is suggested that the legal framework should be re-considered and MNEs should collaborate with host governments in order to prevent the exploitation of children. It is also crucial to recognize victims and to interment appropriately though applying a public health strategy, aiming at the

prevention of child exploitation or trafficking. Furthermore, the legal framework on compulsory education in the studied countries should be re – considered and motives should be provided to children and their families in order to reduce drop – out rates.

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Appendix

Table 1: Summary of empirical findings of studies that concluded to a positive effect of FDI on child labor

Author(s)	Purpose	Sample	Time period	Methodology	Dependent variable	Independent variable	Findings
Doytch et al (2014)	To investigate the impact of disaggregated FDI inflows in different economic sectors on child labor.	100 countries	1990 - 2009	Cross-country analysis Blundell–Bond System GMM.	Child labor	Income level FDI Quality of institutions Population density	The impact of FDI on child labor depends on the sector of production. A positive relation between FDI in agricultural sector and child labor is observed in Europe and Central Asia, while a negative one is presented in FDI in manufacturing in East and South Asia, as well as in FDI in mining in Latin American countries.
Dagdemir & Acaroglu (2010).	To investigate the impact of globalization on child labor, focusing on the components of the process, meaning FDI and trade.	92 developing countries	2000 - 2005	OLS	Child labor	Per capita GDP FDI Trade openness Rural area	FDI and child labor are positively related. Child labor decreased to a certain level of FDI but increases with FDI penetration.

Table 2: Summary of empirical findings of studies that concluded to a negative association between FDI and child labor

Author(s)	Purpose	Sample	Time period	Methodology	Dependent variable	Independent variable	Findings
Neumayer & de Soysa (2005)	To empirically investigate the link between FDI and child labor.	117 countries	1995	OLS	Child labor	GDP per capita GDP Urbanization Agriculture Trade openness Stock of FDI Public health expenditures Public education expenditures Pupil to teacher ratio	Both trade and FDI inflows are negatively associated to child labor.
Davies & Voy (2009)	To investigate the extent to which child labor is affected by FDI inflows.	145 countries	1995	Pooled regressions	Child labor	FDI GDP	There is a statistically negative association between FDI and child labor. Nevertheless, it is observed that the inclusion of the income level affects the impact of FDI on child labor.
Iram & Fatima (2008).	To investigate the association among FDI, trade openness, poverty, value added of agriculture, urban	Pakistan	1970-2003	Multivariate vector autoregression (VAR)	Child labor	FDI, trade openness, GDP per capita, value added by agriculture, urban population	FDI reduces child labor

	population and child labor.						
Voy (2012)	To evaluate the impact of globalization on child labor	82 countries	Survey years per country	Multiple regression	Child labor	FDI, population, trade openness, economic activity per gender, GDP per capita	FDI inflows are related to lower incidence of child labor
Burhan et al (2016)	To study the effect of income, school enrollment, fertility and FDI on child labor in Africa	44 African countries	1980-2003	Panel Estimated Generalized Least Squares (EGLS)	Child labor	GDP per capita, primary school enrollment, total fertility rate, FDI stock	Increasing FDI leads to the reduction of child labor in Africa.
Fatima (2017)	To analyze the impact of credit market imperfections and globalization on child labor.	129 developing countries	1970-2010	OLS	Child labor	Trade openness, FDI inflows, real GDP per capita, domestic credit	Higher inflows of FDI lead to lower rates of child labor

Table 3: Summary of empirical findings of studies that did not observe an association between FDI and child labor

Author(s)	Purpose	Sample	Time period	Methodology	Dependent variable	Independent variable	Findings
Sundjo et al (2018)	To investigate the effect of trade and FDI on child labor in Sub-Saharan Africa	25 Sub-Saharan African countries	1999-2013	OLS	Child labor	Trade openness, FDI inflows, rural population, primary school enrolment, GDP per capita, population growth	The impact of FDI inflows on child labor is insignificant.

Table 4: Databases and definitions of the variables

Variable	Database	Definition
School enrolment secondary	World Bank	Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially

		corresponds to the level of education shown.
School enrolment secondary male	World Bank	Gross enrollment ratio is the ratio of total enrollment (male), regardless of age, to the population of the age group that officially corresponds to the level of education shown.
School enrolment secondary female	World Bank	Gross enrollment ratio is the ratio of total enrollment (female), regardless of age, to the population of the age group that officially corresponds to the level of education shown.
FDI	World Bank	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor (%GDP)
GDP	World Bank	GDP per capita is gross domestic product divided by midyear population. Data are in current U.S. dollars.
Trade openness	World Bank	Ratio of total exports and imports divided by GDP
Population	World Bank	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.
Agriculture value added of agriculture	World Bank	Agriculture corresponds to ISIC divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs.
Dummy variable	ILO	Ratifications of C138 on Minimum Age Convention, 1973

Table 5: Sub – Saharan African Countries of the sample (excluding high income)

1	Angola	12	Kenya
2	Cameroon	13	Liberia (Not ratified the UN Convention)
3	Central African Republic	14	Mozambique
4	Congo Dem. Rep.	15	Namibia
5	Congo Rep.	16	Nigeria
6	Cote d' Ivoire	17	Rwanda
7	Ethiopia	18	Senegal
8	Gabon	19	Somalia (Not ratified the UN Convention)
9	Gambia	20	Uganda
10	Ghana	21	Zambia
11	Guinea	22	Zimbabwe

Table 6: Descriptive statistics for the variables used in the research

Variable	Mean	Median	Maximum	Minimum	St. Dev.	Jarque Bera	N
School enrolment	32.287	32.834	74.679	4.217	16.155	14.838	358

secondary							
School enrolment secondary male	28.458	27.191	74.629	2.213	16.719	20.442	358
School enrolment secondary female	36.086	36.109	83.356	6.165	16.218	9.461	358
FDI	2.616	1.268	86.989	-5.007	6.354	12880.8	358
GDP	1052.382	692.282	5.892.156	96.096	1057.196	542.404	358
Trade openness	63.683	58.626	156.861	6.32	28.469	28.844	358
Population	2240133	11355868	1,86E+08	637246	3406826	1672.39	358
	2	0			5	3	
Agriculture	23.547	21.525	76.074	3.925	12.8	125.29	358

Table 7: Empirical results of child labor as the dependent variable

	Dependent variable: lnChild_labor Panel FGSL			
	Model 1	Model 2	Model 3	Model 4
C	4.436*** (0.000)	4.158*** (0.000)	3.799*** (0.000)	3.679*** (0.000)
LnFDI	0.019* (0.053)	0.017*** (0.000)	0.02* (0.058)	0.032** (0.012)
LnGDP	-0.046*** (0.000)	-0.05 (0.104)	-0.059*** (0.000)	-0.056** (0.003)
LnTrade	0.02*** (0.000)	0.018*** (0.000)	0.005 (0.185)	0.004 (0.163)
LnPop		0.019** (0.003)	0.038*** (0.000)	0.045*** (0.000)
LnAgriculture			0.043*** (0.000)	0.176*** (0.000)
UN Convention				-0.169*** (0.000)
R ²	0.779	0.782	0.79	0.776
Adj. R ²	0.77	0.773	0.78	0.78
S.E. of regression	1.011	1.011	1.01	1.012
F-statistic	75.646	73.515	73.07	73.129
Prob(F-statistic)	0.000	0.000	0.000	0.000
N	880	880	880	880
DW	1.703	1.703	1.703	1.704
Breusch – Pagan LM	2.52	2.48	2.34	2.56
Wald test	5.22	5.78	5.83	5.87

(*** < 0.01, significant at 1%, ** < 0.05, significant at 5%, * < 0.1, significant at 10%).

Table 8: Empirical results of child labor among boys as the dependent variable

	Dependent variable: lnChild_labor_male Panel FGSL			
	Model 5	Model 6	Model 7	Model 8
C	4.453*** (0.000)	3.882*** (0.000)	3.411** * (0.000)	3.228** (0.001)
LnFDI	0.022**	0.016**	0.019*	0.023*

	(0.009)	(0.028)	(0.086)	(0.082)
LnGDP	-0.052*** (0.000)	-0.058*** (0.000)	-0.07*** (0.000)	-0.079*** (0.000)
LnTrade	0.017** (0.006)	0.014** (0.018)	-0.001 (0.824)	0.021** (0.045)
LnPop		0.04*** (0.000)	0.065** * (0.000)	0.089** (0.001)
LnAgriculture			0.055** (0.000)	0.067*** (0.000)
UN Convention				-0.028** (0.002)
R ²	0.777	0.779	0.737	0.734
Adj. R ²	0.778	0.77	0.724	0.733
S.E. of regression	1.012	1.012	1.013	1.013
F-statistic	74.842	72.403	57.702	56.891
Prob(F- statistic)	0.000	0.000	0.000	0.000
N	880	880	880	880
DW	1.703	1.703	1.703	1.704
Breusch – Pagan LM	2.34	2.29	2.51	2.48
Wald test	7.01	8.52	8.67	8.92

(*** < 0.01, significant at 1%, **p < 0.05, significant at 5%, * < 0.1, significant at 10%).

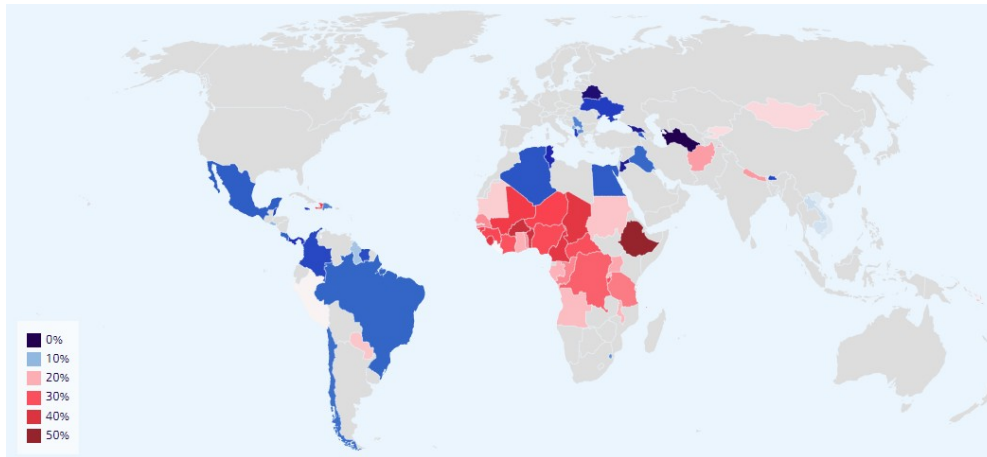
Table 9: Empirical results among girls as the dependent variable

	Dependent variable: lnChild_labor_female Panel FGSL			
	Model 9	Model 10	Model 11	Model 12
C	4.587*** (0.000)	5.527*** (0.000)	5.197*** (0.000)	5.792*** (0.000)
LnFDI	-0.012** (0.034)	-0.001 (0.888)	0.0008 (0.922)	0.089 (0.967)
LnGDP	-0.048*** (0.000)	-0.038*** (0.000)	-0.047*** (0.000)	-0.078*** (0.000)
LnTrade	0.016*** (0.000)	0.017*** (0.000)	0.005 (0.145)	0.021** (0.032)
LnPop		-0.063*** (0.000)	-0.045*** (0.000)	-0.089** (0.002)
LnAgriculture			0.041** (0.000)	0.056*** (0.000)
UN Convention				-0.039* (0.072)
R ²	0.788	0.745	0.776	0.762
Adj. R ²	0.758	0.734	0.767	0.776
S.E. of regression	1.011	1.012	1.013	1.013
F-statistic	71.689	62.145	68.492	65.821
Prob(F- statistic)	0.000	0.000	0.000	0.000

N	880	880	880	880
DW	1.703	1.703	1.703	1.702
Breusch – Pagan LM	2.26	2.39	2.54	2.82
Wald test	7.69	7.89	8.12	8.27

(*** < 0.01, significant at 1%, ** < 0.05, significant at 5%, * < 0.1, significant at 10%).

Figure 1: Prevalence of children engaged in economic activity in 2019



Source: ILOSTAT (2020)

Figure 2: Mean secondary enrolment by country (1980-2019)

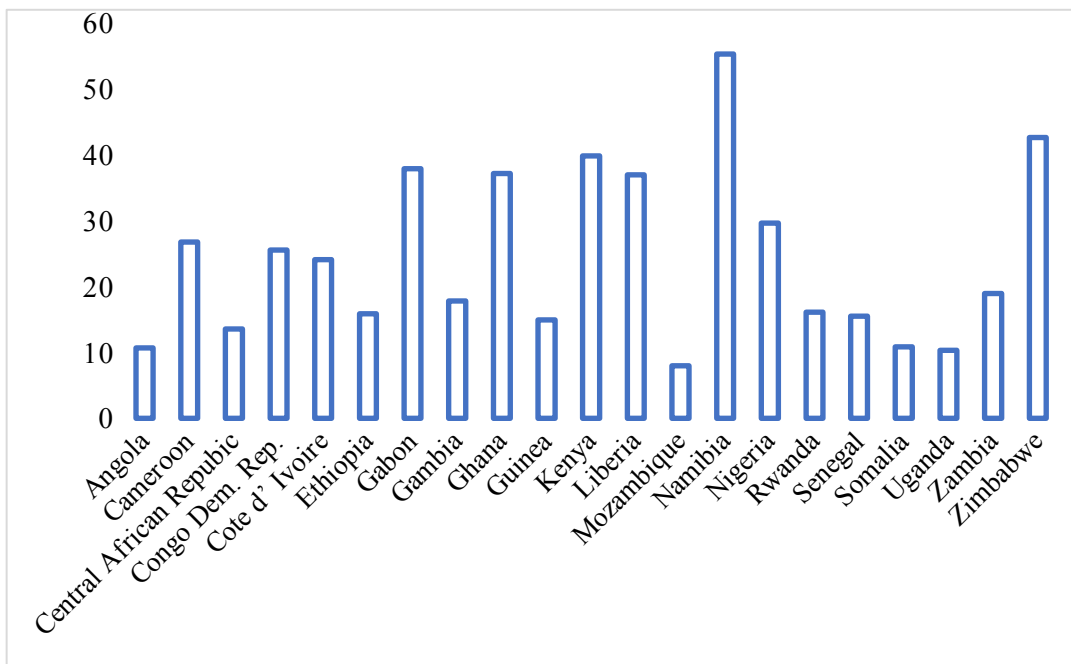


Figure 3: Total inflows of FDI by country (1980-2019)

