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The effects of globalization on child labor in developing countries

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This paper inquires the effects of globalization on child labor in developing countries via cross-country analysis by decomposing globalization to its components; foreign direct investment (FDI) and trade. The findings reveal that the relationship between the child labor supply and gross domestic product per capita (PCGDP) can be expressed as a U shape. The study indicates that the child labor increases in the developing countries whose PCGDP levels are above 7 500 USD since the net effect of globalization is positive for the positive substitution effect is bigger than the negative income effect. Data have been collected from UNICEF and World Bank.

JEL Classifications: C31, F14, F15, F16, J49

Keywords: Child labor, globalization, trade, FDI, developing countries.

Introduction

The child labor participation rates decrease in the world in general and this tendency is explained with economic growth by some economists. Basu (1999) indicates that the decreasing trends in the participation rates for the children, 10-14 years between 1950 and 2010. A much more important thing for us to notice in Basu (1999) is that after the 1990's the declining trend of child labor in the world in general seems to slow down remarkably. In these years, the effect of economic growth on child labor was started to be felt distinctly in developing countries by increasing *FDI* penetration and becoming more open to trade.

Although child labor shows a decreasing trend according to world statistics, the detailed regional studies get some evidence about increases in child labor participation rates with economic growth in those regions. According to Swaminathan (1998) economic growth increases the demand for the child labor; especially during the lack of government intervention, labor market becomes open to child labor. Edmonds (2002b), considering expenditures per capita, indicates that the child labor in the most impoverished households doesn't change or increases depending on the expenditures per capita. In some studies such as Tesfay (2003), Kak (2004), Kambhampati and Ranjan (2005), it is emphasized that child labor participation rates decrease with the progressive stage of economic development. Tesfay (2003) finds significant results about child labor participation rates which initially increase with economic growth but decrease in the following stages in the developing countries that have 1000 USD or more *PCGDP*. Kak (2004) determines that the level of economic development is the only factor explaining the magnitude of child labor participation rates and there is a non linear relationship between each other. Kambhampati and Ranjan (2005) indicates a balance between the effect of economic growth that increase child labor demand and the effect of economic growth that decrease the child labor supply.

The studies that research the effect of economic growth on child labor participation rates take part in literature along with globalization. Those studies mainly focus on two things. One of them is that they are looking at the effect of growth on child labor. The other is that they are looking at the effect of openness to trade and *FDI* on child labor participation rates in developing countries. It is seen that the number of researches investigating the effects of economic growth on child labor participation rates by

considering factors brought by globalization is not enough. However, the studies that interrogate the effects of being more open to trade and *FDI* penetration on child labor have an important place in literature.

In their cross-country study, Cigno et al (2002) indicate a negative relationship between child labor and trade. Kucera (2002) measures the effect of *FDI* inflows on child labor participation rates and states that the level of child labor is not an important local criterion for foreign investors. Shelburne (2002) finds that if an economy opens to international trade it becomes larger and accordingly the per capita increases and these factors reduce the prevalence of child labor. Using a panel of Vietnamese households, Edmonds and Pavcnik (2002)'s findings show greater market integration associated with less child labor. Busse and Braun (2004) have found a negative relationship between *FDI* and the child labor. Neumayer and Soysa (2005) present some evidence about that the countries which have a higher stock of *FDI* or which are open towards trade also have a lower incidence of child labor. Edmonds and Pavcnik (2006) explore a relationship between the trade, measured by openness, and the child labor in a cross-country setting. According to their findings, the more the countries trade the less they have child labor. Kis-Katos (2007) finds an empirical support on the relationship between the trade and the child labor. According to her, increases in openness to trade are associated with reductions in the child labor. Bonnal (2007) makes a panel data approach for the link between openness to trade and child labor and he finds that the countries which trade more and have a higher stock of *FDI* have less child labor. Iram and Fatima (2008) use multivariable vector autoregression (VAR) model for investigating the causal links between *FDI*, openness to trade and the child labor. They find that openness to trade raises the exportable sector and increases the demand for child labor. On the other hand, *FDI* is found to lower the incidence of the child labor. Davies and Voy (2009) measure the effect of *FDI* on child labor by using instrumental variable techniques. They find that *FDI* has a negative effect on child labor; however they show this is biased by the endogeneity of *FDI*, and the effect of *FDI* is channeled through its impact on per capita income.

In this paper, we empirically examine an important linkage between the child labor participation rates and the globalization in 92 developing countries specified in Appendix. In particular we focus on three questions: 1 - Whether income is a significant determinant of the child labor participation rate in the duration of globalization period in developing countries? 2 - Whether this interaction shows different characteristics at different stages of economic development? 3 - Whether the globalization lead to more child labor employment or not?

The theoretical frame and literature review are presented after the introduction section followed by the research methodology and the data source. Finally, findings and conclusions are argued at the end of the paper.

The theoretical frame and the literature

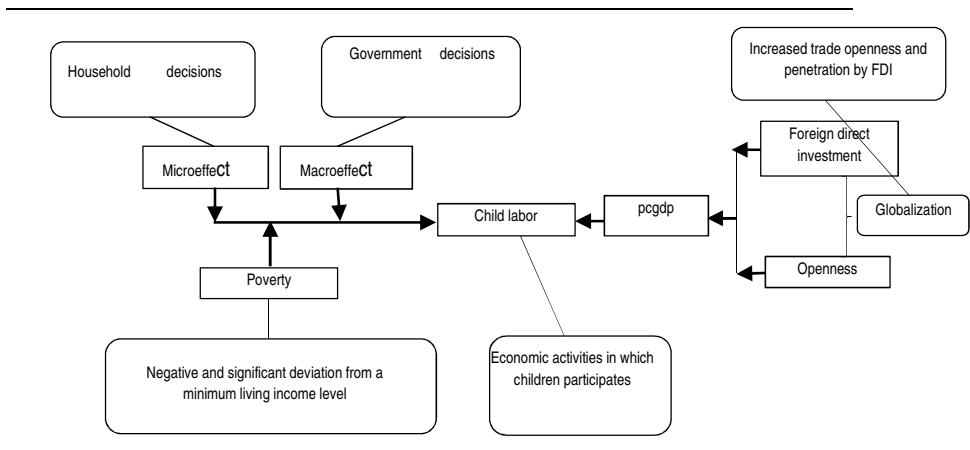
In the theoretical frame, we attempt to show the possible causes of the child labor with its economic reasons. Moreover, we inquire "How child labor continues to be affected by economic growth", once it exists in developing countries at the globalization circumstance. As seen in Figure 1, there are two dimensions which create child labor mechanism as both demand and supply side. First of them is made up of the factors that determine child labor supply and defined as in the triangle of household decisions, government decisions and poverty. The second one is made up of the factors affecting the demand for the child labor and developing according to the growth dynamics of economies that integrate with the global economy. The effects of economic growth on child labor supply are developing according to variation in duration of conditions that affect those factors.

The developing countries' supply side problem of child labor mainly results from phenomenon such as poverty, household, and government decisions. The income levels of countries play a very critical role between this triangle. There is a strong negative

relationship between the incidence of child labor and household income (Fallon and Tzannatos, 1998; Udry, 2003). Most studies that are related with child labor notice the poverty of the household as one of the important factors in determining child labor (ILO, 1992; Grootaert and Kanbur, 1995). Basu and Van (1998) argues that poverty forces parents send their children to work since they do not see any alternative choice. It can be mentioned that when society is characterized by poverty and inequality, the incidence of child labor tend to increase (UNICEF, 1986; Grootaert and Kanbur, 1995). Krueger (1996) has found that the prevalence of child labor declines sharply with national income. According to him, the use of child labor is negatively related with the economic development. In addition, the governments of wealthier countries seem to have more strictly controlled labor standards and better working conditions. Governments of developing countries often lack of resources to enforce child labor bans.

Globalization might be changing the decision duration of the factors that determine the child labor supply. Social and cultural norms are more traditional in developing countries leading to a higher social acceptability of child labor (Lopez-Calva, 2001). But because the consciousness level of parents inevitably converges to global norms, social acceptability of child labor incidence decreases due to the globalization. As a result, they may prefer sending their children to a school instead of sending them to work. Globalization has an effect on the labor market regulations and standards in developing countries.

FIGURE 1. THE MECHANISM OF CHILD LABOR IN A GLOBAL WORLD



Source: Based on literature review.

This situation is observed when the governments are coerced by the developed world about child labor policies. At this uncertainty, the wealthy countries can be effective in reducing child labor by using threat of trade sanctions when developing countries enter into the world economy (Edmonds, 2002). Governments might ban child labor or encourage children to go to school instead of work by giving subsidies to their high schooling expenses. In addition to this, compulsory schooling should be considered as an instrument for governments to prevent children from working (Lopez-Calva, 2001).

Globalization might be affecting the sources of the economic growth which create child labor demand. The effect of growth duration on the demand for the child labor that is started by the developing countries along with global dynamics are hidden in those countries' comparative advantage. According to Heckser-Ohlin framework, developing countries abundant in unskilled labor have a comparative advantage and at the same time they are exporters of the goods that are produced intensively by the unskilled labor. Krueger (1996) has indicated that the trade between the nations is based on comparative advantage. Globalization may not only create comparative advantages in unskilled labor intensive sectors, especially in the rural sector, for the developing countries but also lead

to competitive erosion of labor standards at the end. This is called as race to the bottom hypothesis in literature (Singh and Zammit, 2004). But as far as the long-term capital movements from developed countries to developing countries are concerned, the labor standard of developing countries plays an important role in comparative advantage. It is known that the developing countries with lax labor standards, low wages and abundant supply of unskilled labor, especially with child workers, are regarded as a heaven for foreign investors. A country can gain competitive advantage over others with a higher extent of child labor by cutting costs. Growth with trade liberalization and FDI penetration increases the demand of child labor and their wages (Edmonds and Pavcnik, 2006). This increases the cost of opportunity for children to go to the school. This situation supports the decision of the parents about sending their child to the school or to work and parents are more likely to send their children to work (Ranjan, 2001). This is called as the “substitution effect” (Davies and Voy, 2009). It’s known that the substitution effects of globalization are most likely expected to increase the supply of the child labor.

The developing countries having the comparative advantage on the unskilled labor intensive sectors have limitations on their growth. These limitations are caused by the rising wages and the improving labor standards. Real wages depend on increasing relative rate of return of unskilled labor during the growth by openness to trade. Unskilled labor supply develops according to the long term capital movements at the time that the labor standards converge to universal norms (Singh and Zammit, 2004). This development triggers higher earnings, and higher earnings lead to make a preference on either schooling or leisure. It can be thought as an existence of an alternative choice for household decisions and as a result, child labor will decrease. In other words, Edmonds (2002) suggests that when globalization improves the income of impoverished households, this additional income helps parents reduce the workload of their children and provide an opportunity to send more of them to school. These are often called as the “income effect” and it’s known that income effects of trade are most likely expected to reduce the need for child labor incidence (Kis-Katos, 2007).

In developing countries, the child labor is under the pressure of increasing with substitution effect and of decreasing with income effect during the period of economic growth. The net effect depends on either case which dominates. We will use this substitution and income effects to explain our findings about our economic model in the findings and arguments section.

The economic model and the data

This part of the paper argues the variables explaining the child labor participation rates and proposes a reduced form of econometric equation to interrogate the validity of this relation. Table-1 indicates the child labor participation rates of developing countries and some factors affecting the child labor. The data of child labor participation rate is from Unicef (2009). According to the literature, the most common measure of the child labor is the labor force participation of children aged a specific period of years. In our study, we use the time intervals of 5-14 years.

The developing countries and data regarding *PCGDP*, *FDI* and trade variables have been selected from World Development Indicators (2009). The gross domestic product per capita data which is represented by *PCGDP* belongs to the year of 2005. The data is constantly in U.S. dollars. *FDI* are the net inflows of investment. The *FDI* variable is determined by $FDI / \text{Gross Domestic Product (GDP)}$ and it is the average value of *FDI* that enters into the selected developing countries averaging over the period of the years between 2000 and 2005. The openness (trade) is calculated by $(X+M) / PCGDP$. Here *X* is the export and *M* is the import amount for the year 2005. The rural area ratios data is from Socioeconomic Data and Application Center (SEDAC, 2007) and it is the ratio of the countries’ rural population to total population.

The hypothesis of the study can be constructed from theoretical frame. Theoretically, there are some uncertainties on the subject of the direction of the relationship between

economic growth and child labor participation rates. But the direction of general tendency is towards a decrease on child labor participation rates with an increase on *PCGDP*. Hypothetically, it is considered there might be a quadratic relationship between economic growth and child labor at the time of the basic econometric equation is set up.

In our empirical test, we want to see the whole effect of all variables that we think they have an influence on child labor from globalization side. The literature related with the subject shows that child labor participation rate is decreasing with openness to trade and along with an increase in *FDI* penetration. The question of “how globalization affects the child labor in developing countries” is explained depending on the degree of in what level the economic growth is affected by openness to trade and *FDI* penetration. This effect is the sum of positive substitution effect which is created according to the increase in child labor demand and wages and negative income effect which is created according to *PCGDP* level. This situation can show a difference according to the *PCGDP* level of developing countries. The general tendency in developing countries that grow along with the global economy is descending from lower income economies to higher income economies. In this study, the stated hypothesis is accepted and additionally while the basic econometric equation is set up, the possibility of the non linear relationship between economic growth and child labor is also interrogated.

With this purpose, the econometric equations below are defined.

$$child\ labor_i = a + \beta_1 pcgdp_i + \beta_3 fdi_i + \beta_4 trade_i + \varepsilon_i \quad (1)$$

$$child\ labor_i = a + \beta_1 pcgdp_i + \beta_2 pcgdp_i^2 + \beta_3 fdi_i + \beta_4 trade_i + \varepsilon_i \quad (2)$$

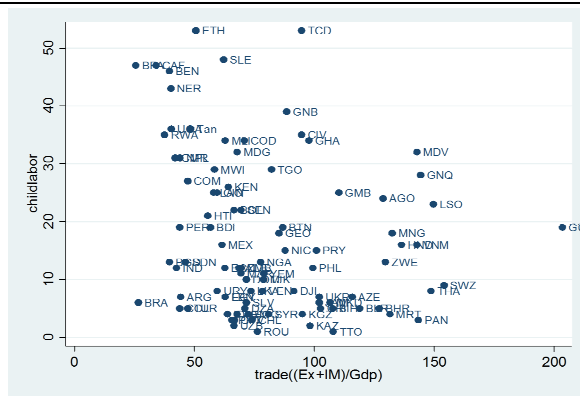
We attempt to explain the effects of economic growth on child labor participation rate by using cross-country model. Firstly, we test monotonic relationship (equation 1). The sign of the income parameter is expected to be negative. Secondly, we test for a non-linear quadratic relationship (Equation 2). Edmonds and Pavcnik (2006) allow for the income to enter into the model nonlinearly since the effect of income on child labor differs across poor and rich countries. A similar approach is followed by including square of income as a non-linear term into our model. For the U shape hypothesis to realize, $\beta_1 < 0$ and $\beta_2 > 0$ must be true. The condition for both the validity of the literature findings in developing countries according to the hypothesis explaining the possible effects of globalization on child labor is expected as $\beta_1 < 0$ and $\beta_2 > 0$. In developing countries according to the hypothesis that explains the relationship between openness to trade and *FDI* penetration via child labor and according to the literature that interrogates this hypothesis $\beta_3 < 0$ and $\beta_4 < 0$ is expected.

This equation explains the relationship between child labor force participation rates and development level in developing countries. The development level here is explained with *PCGDP* by considering global economic integration degrees of developing countries. In this econometric equation, the effect of globalization on child labor is explained by setting up a relationship between *PCGDP*, *PCGDP*², trade and *FDI* ratios through income. If the openness varies simultaneously with the income, exclusion of square of income term may bias our coefficient on openness because of its endogeneity.

While Edmonds and Pavcnik (2006) analyze the relationship between international trade and child labor by considering cross-country approach, they emphasize the endogeneity of openness. Firstly, they look at the relationship between child labor and the trade of developing countries. The Figure 2 shows this relation for the chosen 92 developing countries for this study.

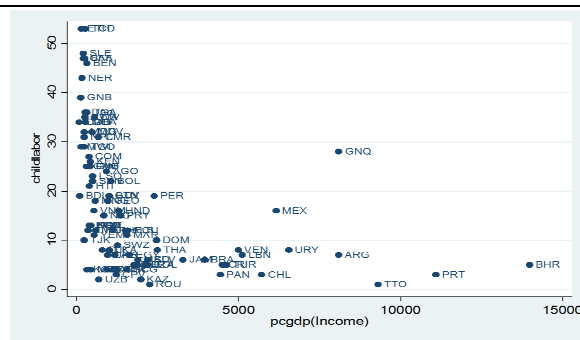
It is known that there is a strong association between trade and income (Frankel and Romer, 1999). And also many sources indicate the importance of the relation between income and child labor Krueger (1996), Shelburne (2002), Edmonds and Pavcnik (2006). Therefore, this also could lead to an association between trade and child labor. Figure 3 shows the relationship between the child labor and the income. Since there is a strong relationship between those variables, it can be possible that an existence of an endogeneity between child labor and income occurs.

FIGURE 2. RELATION BETWEEN CHILD LABOR AND TRADE



Source: Unicef (2009) and World Development Indicators (2007).

FIGURE 3. RELATION BETWEEN CHILD LABOR AND INCOME



Source: Unicef (2009) and World Development Indicators (2009).

For controlling the endogeneity of openness and *FDI*, Davies and Voy (2009) use an instrumental variable (IV) based on trade instrument created by Frankel and Romer (1999) related with geographical features of countries. In our economic model, we compare our findings IV rural area ratio that is a geographical determinant of openness and *FDI*. However, it is not necessarily correlated with income because the income is highly correlated with the child labor. We added rural area variable as IV and expect to increase our model’s explanatory power. We get Equation (3) as;

$$child\ labor_i = a + \beta_1 pcgdp_i + \beta_2 pcgdp_i^2 + \beta_3 fdi_i + \beta_4 trade_i + \beta_5 rural_i + \varepsilon_i \quad (3)$$

Findings and arguments

In Table 1 below, we see the descriptive statistics for the variables of the model. While the dependent variable child labor participation rates change between 1% and 53%, explanatory variable PCGDP change between 89 USD and 13 989 USD (*FDI* between 0.05% and 29.15%, trade between 25% and 204% and rural area between 7% and 93%) among the developing countries.

For all steps of our calculations we use OLS estimation. In the first step, we considered the linear model. While the sign of the income parameter suggests a negative, linear

relationship between child labor participation rate and *PCGDP*, the t-statistics are significant at 0.01 levels. The results of other basic explanatory variables (*FDI* and trade) show that although trade is negatively related, *FDI* is positively related to child labor. While trade is significant at 0.01 levels, the *FDI* is significant at 0.05 levels and the R^2 of the model is 0.26.

TABLE 1. DESCRIPTIVE STATISTICS FOR DEPENDENT AND INDEPENDENT VARIABLES

Variable	Mean	Std. Dev.	Min.	Max.
childlabor	17.40217	13.65192	1	53
pcgdp	1805.326	2526.333	89	13988
pcgdp ²	1.00e+07	2.78e+07	7921	1.96e+08
fdi	4.055978	4.337307	.05	29.15
trade	81.32804	34.51587	25.6	203.5
rural	58.02363	22.08462	7.070909	93.23992

TABLE 2. FACTORS EXPLAINING THE CROSS-COUNTRY EFFECTS OF CHILD LABOR BY GLOBALIZATION WITH OLS

Variables	First Step, Sample Size=92, $R^2=0.26$		Second Step, Sample Size=92, $R^2=0.36$		Third Step, Sample Size=92, $R^2=0.43$		Fourth Step, Sample Size=92, $R^2=0.47$	
	Coef.	t-statistics	Coef.	t-statistics	Coef.	t-statistics	Coef.	t-statistics
childlabor								
pcgdp	-.002427	-4.79***	-.0065792	-5.40***	-.0005258	-0.89	-.0036117	-2.71***
pcgdp ²			4.05e-07	3.70***			2.72e-07	2.57**
fdi	.8218332	2.52**	.9154032	3.00***	.6199897	2.13**	.7149546	2.51**
trade	-.1187104	-2.96***	-.1180608	-3.15***	-.1167604	-3.29***	-.116637	-3.39***
rural					.3277953	5.01***	.2753795	4.13***
cons.	28.10479	8.67***	31.09618	9.91***	6.312839	1.21	11.80161	2.15**

Note: *** significant at 0.01 level, ** significant at 0.05 level, * significant at 0.1 level.

In Table 2 below, we see the explanation of the economic model.

In the second step, we add *PCGDP*² variable to the basic explanatory variables. We have asked whether there is an evidence of a non-linear relationship between child labor and the level of development. For each sample, a nonlinear relationship with *PCGDP* is tested. The previous signs are all preserved and *PCGDP*²'s sign is positive. All significance levels are at 0.01. The additional variable *PCGDP*² has increased R^2 from 0.26 to 0.36.

In the third step, we add both *PCGDP*² and rural area variables to the basic explanatory variables. While the significance of basic variables are preserved, *PCGDP*²'s significance is at 0.05 level and rural area's significance is at 0.01 level. The R^2 of the model has increased from around 0.26 to 0.47.

The *PCGDP* is one of the most powerful explanatory variables of child labor in a cross-country setting of developing countries. As seen from the Table 2, higher per capita income levels are associated with lower incidence of child labor. On the other hand the square of income level is associated with higher incidence of child labor. It is seen in Figure 4 that after certain income threshold level, child labor participation rates start to increase in some developing countries. Here the threshold level is around 7 500 USD *PCGDP*. The literature has not addressed this variable yet.

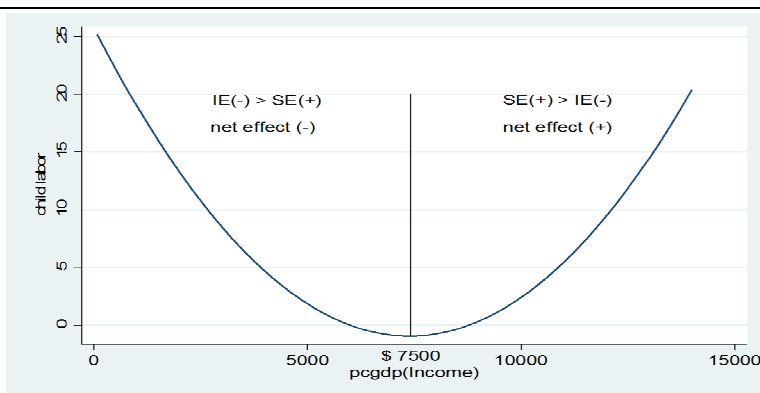
According to our model's findings, the relationship between *PCGDP* and *PCGDP*² variables and demand for child labor indicate that growth has two different effects on child labor in developing countries growing with the influence of openness to trade. As stated in the theoretical frame, child labor participation rates exhibit declining trend in the countries becoming more open to trade and attracting more *FDI* penetration by economic growth. In this period, positive substitution effect is accompanied by the negative income effect. For the first stage (Figure 4, before 7 500 USD), the findings of the model result in negative net effect since the income effect is bigger than the substitution effect. Along

exceeding some threshold income levels while the demand for unskilled labor decreases inevitably, the demand for skilled labor increases among the developing countries growing by openness to trade. The decreasing income wages cause families become impoverished with the decrease of unskilled labor demand. In order to preserve the same income level, more household members need to work in these impoverished families. The strategy developed against poverty causes parents send their children to work instead of the school. For this second stage (Figure 4, after 7500 USD), while the negative income effect is decreasing, the net effect is positive along with the positive substitution effect. The relationship between child labor and *PCGDP* is like the U shape, as seen in Figure 4.¹

The *FDI* variable which is mentioned in very few studies is seen positively related with child labor. However, we look at this relation from the side of income and substitution effects. Our motivation for this approach increases income with *FDI* penetration. Figure 5b indicates the graphical representation of this relation. Initially child labor decreases until some *FDI* level around 10%. After that child labor increases with *FDI* penetration.

The trade variable, referring to the openness in reality, is negatively related with child labor. However depending on increasing income with trade, income and substitution effects indicate their influence again for the relationship between the child labor and trade. According to the Figure 5c child labor decreases and starts increasing after some trade level around 20%. We also face with a U shape like in the relationship between the child labor and income.

FIGURE 4. THE RELATIONSHIP BETWEEN GDP PER CAPITA AND CHILD LABOR BY SUBSTITUTION AND INCOME EFFECTS FOR DEVELOPING COUNTRIES



We have concluded that this control variable is not a significant determinant of child labor. When we have found a significant relationship between rural area variable and child labor, the rural area variable is positively related to child labor as seen in Figure 5d. It is an expected result because the child labor is mostly seen in rural areas. In addition, the rural area variable increased the model's R^2 from 0.26 to 0.47. This is an important finding because it is an evidence for the effect of agricultural employment on child labor.

Conclusion

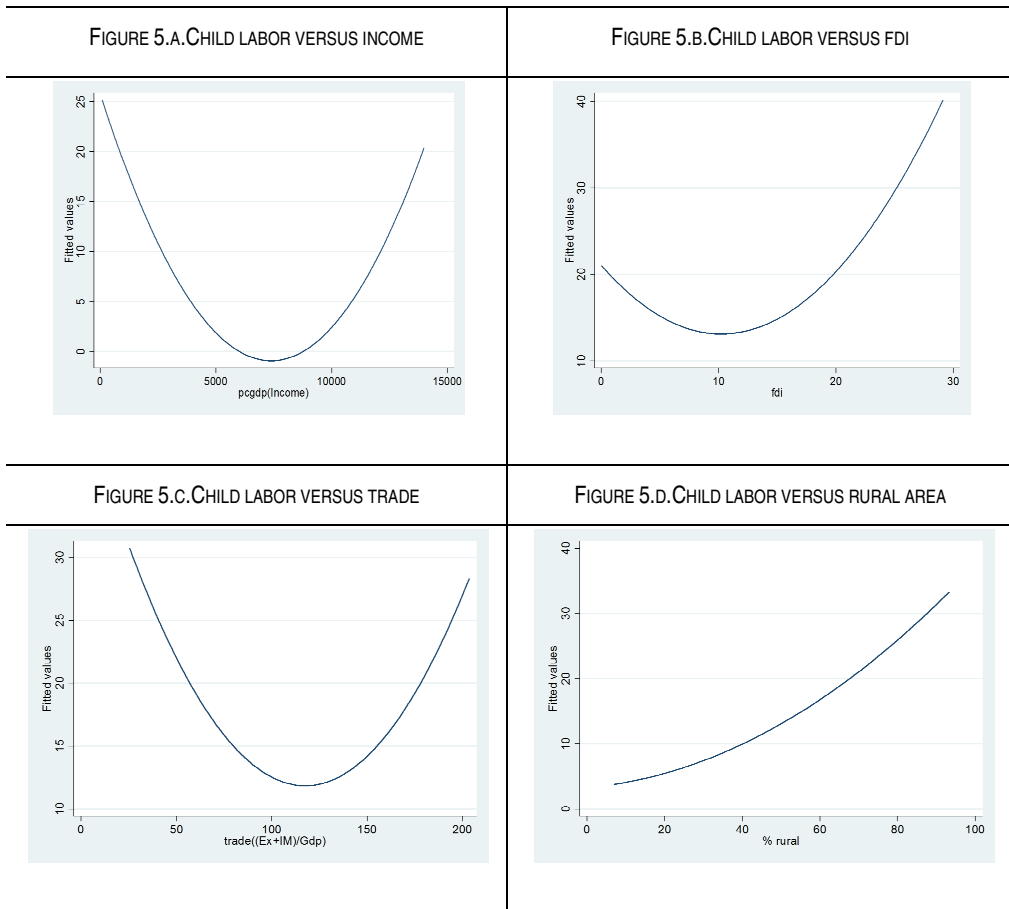
This paper attempts to explain the effects of globalization on child labor with specific emphasis on an unaddressed issue in the literature; the positive impact of globalization on child labor after a threshold level. While addressing this problem, we've focused on income levels of countries by considering their openness to trade and *FDI* penetration ratios. Additionally, the paper stresses the importance of some variables such as *PCGDP*²

¹ Note: Figure 4 is derived from Figure 5-a.

to distinguish rich and poor countries and rural area ratios in order to indicate the geographical characteristics of countries. We've set up a cross-country model including the variables and analyzed all combinations of effects separately in four steps.

The findings can be summarized in threefold. Firstly, the child labor decreases among the selected sample of developing countries whose *PCGDP*'s are high, and after a certain threshold income level, 7500 USD, child labor participation rates start to increase. Secondly, the countries with high *FDI* penetration is associated with high levels of child labor participation rates. And thirdly, there is a negative association between openness to trade and the child labor.

FIGURE 5. DEPICTS THE RELATIONSHIP BETWEEN CHILD LABOR AND INCOME, FDI, TRADE AND RURAL AREA RATIOS BY FITTING CURVE.



In explaining the findings as a net effect of globalization, we inquire child labor and its relationship with *PCGDP* graphically. Results indicate that the relationship between child labor and *PCGDP* can be expressed as a U shape (parabola). The participation rate of child labor first declines and then rises as countries develop. The minimum of this parabola at the same time is the threshold *PCGDP* level for developing countries.

For economic interpretation of this U shape we attempt to use decomposition approach of income and substitution effects. The reasons for the downward portion of the U shape are probably found in a combination of an initially strong income effect and a weak substitution effect. The initial decline in the child labor participation rate is due to the movement of production from intensive unskilled labor sectors to the market by openness

to trade. According to the findings, before the income level of 7 500 USD, the net effect of globalization is negative since the negative income effect is bigger than the positive substitution effect. In this case, families with increased income levels are encouraged to send their children to the school instead of work. But the income effect weakens and the substitution effect strengthens at some point of development. After the income level of 7500 USD, the net effect of globalization is positive because the positive substitution effect is bigger than the negative income effect. Why does the relationship change its direction and child labor enter the labor force at higher stages of economic development? Because while the demand for skilled labor increases along with high level of income, the demand for unskilled labor decreases controversially. This situation makes impoverished families poorer because of their inability to preserve their previous income levels. At this point, the families struggling with poverty are encouraged to send their children to work. The findings of the research indicate that the positive effect of globalization along with increasing income on child labor phenomenon does not display continuity. The factors increasing child labor supply in developing countries have become more effective as a result of integration with global economy. The findings of the study also show that economic growth is not sufficient to struggle with the child labor problem in developing countries and should be supported with policies such as decreasing inequality in income distribution and poverty. Additionally, more importance should be given to regulate labor market conditions in the case of increasing child labor participation rates.

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