TRADE LIBERALIZATION AND CHILD LABOR: A CASE STUDY OF PAKISTAN

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Dedicated to

MY BELOVED PARENTS

Certificate

This is to certify that this research essay by Muhammad Nawaz is accepted in its present form by the Department of Economics, Quaid-i-Azam University, Islamabad as satisfying the thesis requirements for the degree of Masters.

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ABSTRACT

The boom in industrial sector has lead to many problems and child labor is one of them. This study focuses its attention to investigate the linkages between trade liberalization and child labor. The results of our study suggest that trade openness and GDP per capita increase the child labor. While, urbanization and international policies or trade sanctions (imposed by the developed countries) decreases the child labor in Pakistan. The study also finds that poverty and income inequality have no significant impact on child labor. Our findings also provide the support for the idea that trade openness is associated with the increment in child labor in Pakistan.

Chapter 1

INTRODUCTION

"The child is father of the man." Wordsworth.

1.1 INTRODUCTION

Child labor has been an important issue for researchers in the later part of twentieth century and its significance is escalating day by day in the new millennium. Although its hazardous form is present for many centuries, it was first recognized as a social problem with the introduction of factory system in the late eighteenth century in Great Britain. Since then, it has become the focal point of the researchers, scholars and different organizations. International labor organization (ILO), and UN General Assembly not only tried to remove its curious form but also suggested different policies to discourage it.

There is no universally accepted definition of "child labor". Different definitions are used by international organizations, non-governmental organizations, trade unions, researchers and other interested groups. Writers and speakers often lead to the confusion about the definition. International conventions define "child labor" as activities such as soldering and prostitution (New International Magazine, 1997). But not everyone agrees with this definition. Whereas, UNICEF (1997) define tentative definition of child labor as "the regular, full-time employment of children under a legally define age in factories, stores, offices, etc".

Estimated values of child labor does not provide unified picture and the labor force participation rate of children aged 10-14 years suffer from both statistical and conceptual

problem (Neumayer, 2005). In many countries, the rate is based on estimations and projections rather than reliable survey, which are "particularly problematic at the tale of the age distribution" (Mehran, 2001). Statistical results of international labor organization (ILO, 2002) states that there are 211 million children, or 18 percent of children aged 5-14 are economically active world wide, while it's estimated results of 1996 states that there are 250 million children aged 5-14 who are engaged in a work, approximately 120 million of these work full time. Asia has the largest number of child worker; the percentage of child labor is highest in Africa. UNICEF "State of the world's children report" says that although the exact number is not known, it is surely in the hundreds of million. It estimates that almost 158 million children are globally involved in labor, which is shown as region wise in table 1.1.

Table 1.1: Number of children aged 5-14 engaged in labor, by region (2006)

Region	Number (in millions) of children who labor.	Percentage of children who labor.
Sub-Sahara Africa	69	35
Eastern/ Southern Africa	35	36
West/ Central Africa	34	34
South Asia	44	13
Latin America/ Caribbean	12	11
East Asia/ Pacific	22	7
Middle East/ North Africa	8	9
CEE/ CIS	3	5
Developing countries	157	15
World	158	14

SOURCE: UNICEF global database, 2007

According to Human Rights Watch (HRW, 1996) there are 115 million working children in India alone. Pakistan is also the victim of child labor and estimated figures are approximately 13 million. This huge difference in the estimated values of child labor in UNICEF, ILO and HRW may be because of different definitions of child labor.

Statistical figures prove that child labor is the problem of both developed and developing countries. But its curious form is present in South Asian countries. India and Bangladesh is already a victim of child labor. However, Pakistan continues to be epidemic by this difficulty and the rate of child labor is increasing day by day. Widespread acceptance of child labor depicts the fact that many of its forms are exploitative. Most of the children work in the subsistence agriculture sector and informal sector like small work shops, household work, and causal mining.

The contribution of world organizations, economists and researchers is worthwhile in order to eradicate child labor. World organizations have passed different constitutions over the period of time pertaining to this problem. The constitution of UN General Assembly (1989)[1], the minimum age convention 138 of international labor organization (ILO)[2] and the constitution of Islamic republic of Pakistan which states that "no child below the age of 14 shall be engaged in any factory or mine or in any other hazardous employment" (Labor unity- Documents, 2006), can play a vital role in controlling child labor, if implemented.

Great economist Milton Friedman, the author of the phrase "Miracle of Chile" proposes "Industrial Revolution"[3] in order to discourage child labor (Wikipedia, Encyclopedia,

[1] The UN General Assembly adopted the convention on the Rights of the Child (CRC) within which Article 32 asserts the right that children should not be engaged in work deemed to be "hazardous or to interfere with the child's education, or to be harmful to the child's health".

[2] This convention state that minimum age for employment may not be set lower than the age of completion of compulsory schooling and, in any event not less that 15 years (initially 14 years in the case of developing countries).

[3] According to the Friedman's theory, before the Industrial Revolution virtually all children worked in agriculture. During the Industrial Revolution many of these children moved from farm work to factory work. Over time, as real wages rose, parents became able to afford to send their children to school instead of work and as a result child labor declined, both before and after legislation.

2008).Some economist suggest to boycott the products manufactured in industries involving child labor, while at the same time some of the researchers believe that boycotting product manufactured through child labor may force these children to turn to more dangerous or exhausting professions, such as prostitution or agriculture (Ranjan,1999, 2001) .

However, child labor can not effectively be controlled as long as its fundamental causes are not identified. Several researchers have made their contribution in this regard. Nonetheless, they vary in their results in identifying the basic cause of child labor. Poor families often rely on child labor for survival, and sometimes it is their only source of income. That is why; the primary cause of child labor is parental poverty (Basu & Van, 1998). There is also some controversy among the researchers about the basic reason for the prevalence of child labor. Some of them believe that credit constraint force the parents to send their children to work (Ranjan, 2001), while others consider that high school cost and poor quality of education may force the parents to send their children to work rather than to school (Tanaka, 2003).

International policies are also helpful tools to remove the curious form of child labor. Some researchers believe that trade sanctions is the best tool to eradicate child labor (Grossman & Michaelis, 2007) while other scholars believe that child labor can be removed by promoting the trade. However, any type of policy that enhances adult labor and increases their real wages is helpful utensil to eradicate child labor. In fact, it is this controversial link between trade liberalization and child labor that provide motivation for this study.

Different empirical studies are conducted for different regions. Since regions differ in their characteristics, the results may also be region specific. This leads to the need of conducting separate study for a region or a country. Since, Pakistan is also blamed for child labor and remained a victim of trade sanctions. That is why; it also deserves a separate investigation to find out the determinants of child labor.

1.2 OBJECTIVE OF THE STUDY

The objective of this study is to trace out empirically the relationship between child labor and globalization along with some other important aspects. The study particularly focuses its attention to find out the impact of trade liberalization on child labor in Pakistan. Different variables in two equations have been taken on the basis of theoretical model and past literature. These variables have been under special consideration of the most of the researchers.

1.3 PLAN OF THE STUDY

The study consists of six chapters. The second chapter reviews the theoretical and empirical work on trade and child labor. The third chapter consists of theoretical model which provide the linkages of different variables with child labor. The fourth chapter deals with the data description by showing the nature of data, their sources, and data format. In addition to that, it also describes the econometric technique used for estimation. In the fifth chapter we discuss our estimated results. Finally, the last chapter concludes the study and gives some policy implications.

Chapter 2

REVIEW OF LITERATURE

2.1 INTRODUCTION

In the light of the existing literature, we have classified the mechanism into three categories through which trade may affect child labor. The first category highlights the studies that evaluate the impact of globalization on child labor, while second considers that trade sanctions is a policy tool to eradicate child labor, and the last section unveils some general studies of child labor.

2.2 GLOBALIZATION AND CHILD LABOR

In this section, we highlight the studies that explain how trade affects child labor? Firstly, we mention the framework through which trade affects aggregate income. Trade is the more valuable tool, which increases the income of a country {Frankle (1999) and Irwin (2001)}.

The effect of the increase in income on child labor depends on the parental preferences, a theoretical study Baland (2000) illustrates that when child labor is good in parental preferences, increase in income can lower the child labor by overcoming liquidity constraints. The study also argues that when parents are fully altruistic toward their children, child labor can be Pareto inefficient and if parents have interior bequest and savings, then child labor may be inefficient due to the imperfection of the capital markets. But contrary to that, Basu (1998) concludes that if child labor is a bad in parental

preferences, increase in income stimulates child labor. The study also argues that ban on child labor would worsen the economic conditions and it would lead to reduction in utility of household, if the market is in equilibrium. But ban on child labor would be favorable only if there are multiple equilibria in labor market.

In another theoretical study, Edmonds (2005_a) concludes that child labor can be reduced by improving the living standard of the individual through trade liberalization, while imperfect availability of credit, ineffective or expensive school system is associated with the increment in child labor. However, programs such as improvement in school infrastructure and reduction in the cost of schooling guide to lessen the child labor, because international donors also promote such policies due to the interconnection of poverty and child labor.

The empirical evidences on trade openness and child labor do not provide a unified picture. Shelburne (2001) finds negative correlation between trade openness and the prevalence of child labor. The study concludes that 1% reduction in child labor due to 10% increase in trade openness and GDP.

To scrutinize the effect of foreign direct investment (FDI) on child labor, Davies (2008) shows that its impact on child labor depends on the magnitudes of substitution and income effects. If income effect dominates, then 10% increase in FDI cause to 0.24% decrease in child labor. Whereas, critics of globalization believe that FDI increases the relative wages of unskilled worker including children, substitution effect works and child labor increases. Neumayer (2004) finds negative correlation between FDI, trade openness and child labor.

But one more dependent variable primary school non-attendance rate has no effect of globalization, which confirms the Cigno et al. (2002) analysis.

In a remarkable works, Cigno et al. (2002) develops the relationship between globalization and child labor. The empirical results regarding that the net impact of globalization on child labor is ambiguous. While, theoretical work built up corner solution, as children work full time and children never work due to the difference between marginal cost of education and the parent's willingness to pay. So, change in wages has no substitution effect. Whenever, interior solution happens between both and change in wage rate cause to dominate substitution effect. Overall, the policy effects are uncertain.

Another empirical study, Edmonds (2006) examines the interaction between trade and child labor. The study develops and estimates a linear and non-linear regression models and also imply negative correlation between trade and child labor, as 10% increase in trade openness is associated with 7% decline in child labor. Whereas, 10% increase in openness of Non-OECD (poor) countries with OECD (rich) countries reduce 9% child labor. But when we account for cross country income differences or unskilled labor intensive product, then the study concludes that trade have no effect on child labor.

Cross sectional empirical data is also important but no one can refute the importance of micro empirical data, which are general and better suited to investigate the response of child labor and the relative strengths of income and substitution effects. Edmonds et al. (2005 b) contributes in such a study by using the house-hold level data on over 3000 rural house-hold during in 1993 and 1998 within a poor country. The country is an exporter of

agriculture commodity "rice". The reaction of child labor due to increase in price of exported good "rice" depends on house-hold capacity as "producer" and 'consumer" and also on the magnitude of income effect and substitution effect. Positive income effect on household that are net producer of rice cause to decrease in child labor as price of exported good "rice" increases. Whenever, unfavorable or negative income effect of increase in relative price of exported goods cause to increase in child labor if the household are net consumer or child labor is bad (Basu & Van,1998).The regression results show that the probability of 30% increase in prices of rice cause to 9% decrease in child labor.

Similarly, Edmonds et al. (2005 c) explore the effect of tariff reduction policy on both child labor and schooling rate by using the micro level data of 130,000 children from 1987 to 1999. The empirical results estimate that the effect of tariff reduction policy on decline in child labor and increase in schooling rate is smaller in rural areas than in the urban areas, as in rural areas, tariff elasticity of schooling is 0.87 and tariff elasticity of child labor is -1.53.

Another micro empirical study which is contrary to the common results and shows that during coffee sector boom in Nicaragua's 1993 and 1998, there is significantly 67.8% increase in child labor in urban areas and 28% increase in child labor in rural areas (Kruger, 2004). The study also investigates the prediction of substitution effect and income effect due to increase in wage rate, whenever another finding proves that increment in the permanent income of household reduces the child labor and raises the school enrolment rate.

2.3 TRADE SANCTIONS AND CHILD LABOR

In this section, we report the mechanism through which trade sanctions may affect child labor. Whenever, trade sanctions change the relative return to child labor (through shift in product demand). Several studies consider such effects, such as Chaudhuri and Gupta (2004) extend a slightly different study with the construction of theoretical model in two-sector general equilibrium framework. The study glance at the impact of reduction in tariff rate of imported goods on the supply of child labor, which depends critically on the relatively factor intensive of the two sectors, if the import-commodity sector is more capital intensive than the export sector then reduction in tariff rate of imported goods reduce the child labor through the price effect (which lowers the price of importable goods) and income effect (which change the factor prices) where, they move in a same direction. If the import commodity sector is labor intensive then policy effect increases the child labor through the inverse relation between price effect and income effect.

Gupta (2002) execute the same study by analyzing the theoretical general equilibrium model of a small open less developed economy which suffer from child labor problem and adult unemployment problem. Whenever, developed countries impose trade sanctions or tariff on the import of those goods that are produced by the child labor, tariff immediately reduces the prices and wages of child labor's product. Two effects immediately work in opposite direction, one is wage effect and other is unemployment effect. If wage effect dominates the unemployment effect then the supply of child labor and unemployment in adult labor market decreases. If unemployment effect dominates then inverse process happens and trade sanctions increase the child labor, which worse-off the economic situation.

Jafarey and Lahiri (2002) develop the study of trade sanctions and child labor by incorporating the role of credit markets. Whereas, the impact of trade sanctions on child labor depend on the availability of credit markets. If there is a perfect availability of credit, then trade sanctions reduce the prices and wages of unskilled child labor (product) and child labor decrease in the economy. But, if there is a limitation for the poor in the availability of credit then trade sanctions increases the child labor due to the substitution effect. Ranjan (2001) carry out the same study in the presence of credit constraint. The study indicate that greater equality is coupled with the reduction in child labor and income redistribution policy reduces the skilled wages and increases the unskilled wages, where the net impact of policy change on child labor is unambiguous. If the trade sanctions decrease the unskilled wages of labor intensive goods, then child labor increases in the economy. Whenever, increase in wages of skilled workers reduces the child labor in credit constraint market. While, other polices such as food support program is batter tool to eradicate child labor than trade sanctions.

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Grossmann (2007) build up a model of trade sanctions and child labor in a small open economy that import homogenous consumption goods at world price and export a differentiated product. Exported goods are produced with the help of adult labor and child labor, where both of them are perfect substitute and trade sanctions make the difference between uniform tariff and firm-specific tariff that are imposed by rest of the world on the goods of exported countries. Uniform tariff is increasing in the amount of child labor, while the net impact of uniform tariff policy is ineffective. Higher uniform tariff rate does not discourage the child labor and there is no substitution between adult labor and child labor. Whenever, firm-specific tariff is effective and decreases the child labor due to

lower export demand for each firm and marginal revenue of child labor now fall short of the marginal revenue of an adult labor. Overall, the utility levels of household decline.

2.4 GENERAL ANALYSIS OF CHILD LABOR

This section employs some general studies. It also incorporates those studies which identify some other reasons for child labor.

Most of the people believe that unequal distribution of income (inequality) is the main determination of child labor. Tanaka (2003) contributes in such type of literature with the construction of theoretical model that analyzes the relation between child labor and public education under majority voting. The study also considers that different countries have same per capita income but child labor varies with the distribution of income. Unequal distribution of income leads to higher child labor and less school attendance rate. Whereas, the equal distribution of income put the median income above some threshold which increases the school attendance rate and decreases the child labor.

Blunch & Verner (2000) empirically scrutinize the relation between poverty and child labor. The findings on the base of household data as well as theoretical model suggest that poverty is positively related with the child labor.

It is argued that some parents send their children to work instead of sending them to school despite the high return on education. Ranjan (1999) evaluates such study by developing a formal model which analyze that in the presence of adequate borrowing opportunities, poor parents prefer to send their children to school while the return to

education is high, which satisfy the Jafery (2002) analysis. Whenever, in the absence of borrowing opportunities, poor parents like to send their children to work and higher income parents prefer to school while the returns to education is high. The study future evaluates that ban on child labor would reduce the welfare of parents and intend them to send their children to work. However, favorable policy intervention such as consumption support to the poor family's children, improvement in the credit imperfection and redistribution of parental income with proportional tax and uniform lump-sum subsidies cause to decrease in child labor.

Other similar study, Cigno (2003) determines the impact of globalization on child labor, where parental decision of child labor depends on education return and public expenditure on health or sanitation. The findings suggest that the countries that have comparative advantage in educated worker, decrease in trade barriers raises the skill premium and create the incentive for parents to send their children to school. But the countries that have large endowments of uneducated worker, reduction in trade barriers decrease the skill premium and increase the child labor. However, reduction in private cost of education or health and sanitation improve the life expectancy and raises the school attendance rate.

Chapter 3

ANALYTICAL FRAMEWORK

3.1 INTRODUCTION

This chapter provides the theoretical framework and analytical model for empirical investigation. We extend the work of Kis-Katos (2007) that is based on the phenomena of "Globalization and child labor" and also empirically estimate the model.

3.2 THE MODEL

3.2.1 Production and Prices

Suppose that two types of goods food X_1 and manufacturing good X_2 that is numeraire with relative price P are produced in a small open economy like Heckscher-Ohlin type. Where, production is based on two mobile factors, labor L and composite capital K. Zero profit and full employment condition in perfectly competitive market is given as:

$$\begin{aligned} a_{L1}W + a_{K1}r &= p & a_{L2}w + a_{K2}r &= 1 \\ a_{L1}X_1 + a_{L2}X_2 &= L & a_{K1}X_1 + a_{K2}X_2 &= K \end{aligned} \qquad (1)$$

Where w and r stand for wages per efficiency unit of labor and return to capital respectively, and $a_{Li}(w,r)$, $a_{Ki}(w,r)$ $[i=1,2]$ are the optimal per unit input coefficient, that depend on factor prices.

Our small economy is involved into a world economy and there is a difference between world prices p^W and domestic relative price p due to the barriers to trade:

$$p = \beta p^w \qquad (2)$$

According to our assumption, good X_1 (food) is the export of the country (Heckscher-Ohlin, 1933) because; it is produced with the abundant of labor. Thus, $\beta < 1$. When both goods are produced, factor prices w (p) and r (p) are determined only by the given output prices.

3.2.2 Factor Ownership and Household Income

Consider that there are "N" households in the economy belongs to the same family size as one children and one parent. Household i employ 1 unit of adult labor and with $k^i \varepsilon \left(o, k^{\max}\right)$ units of composite capital, both are inelastic in supply. Density function $g(k)$ shows the distribution of capital in the economy. Adult income y_a^i is specified by the sum of adult wages and capital income,

$$y_a^i = w + rk^i \qquad (3_a)$$

Children can also contribute in household income, because they are assumed to be a perfect substitute of adult labor in production ('Substitution axiom' by Basu & Van, 1998). The portion of time in which children of family i spends working by l^i, Where $0 \leq l^i \leq 1$. It is argued that children are less productive than adults with the efficiency parameter γ, they earn income y_c^i by working.

$$y_c^i = w\gamma l^i \qquad (3_b)$$

3.2.3 Household Preferences over Consumption and Child Labor

Suppose that, identical preferences over consumption of food c_1^i and manufacturing good c_2^i are faced by the household with subsistence parameter "s" (necessary food). If they

don't achieve "s" then they consume only food. Utility function of consumption is thus defined in two steps.

$$U^i = \begin{cases} \ell(c_1^i) & \text{if } c_1^i \leq s \text{ with } \ell(s) = u_0, \ell' > 0 \\ u_0 + u(c_1^i - s, c_2^i) & \text{if } c_1^i > s \end{cases} \quad (4)$$

The first line of the utility function U^i evaluates that if the people live below the poverty line, then they spend all its resources on food. The second line describes the condition in which household living above the subsistence threshold, which is increasing, strictly concave and homothetic function with two arguments, consumption of additional food $c_1^i - s$ and of the other good c_2^i. Child labor is assumed to survive only as long as it desired to achieve subsistence consumption ('Luxury axiom' by Basu & Van, 1998). Thus, Children work only in those families where adult cannot finance the minimum amount of food on their own.

3.2.4 Household Decisions and Child Labor Outcomes

Consumption decision of the household depends on the household maximizing utility subject to the family budget constraint. In some families, where adult income is higher than the cost of subsistence as $y_a^i > ps$, then the utility is maximized under the adult budget constraint $y_a^i = pc_1^i + c_2^i$. They favor to the homothetic case for the consumption of both additional food $c_1^i - s$ and manufacturing good c_2^i. If the adult income is less than the cost of subsistence, an income gap $ps - y_a^i$ arises then the children work only to fulfill this income gap.

$$0 \leq y_c^i \leq ps - y_a^i \quad (5_a)$$

Child labor in family i is determined by the income gap and child wages.

$$l_c^i = \begin{cases} 1 & \text{if } y_a^i \le ps - w\gamma, \\ \dfrac{ps - y_a^i}{w\gamma} & \text{if } ps - w\gamma < y_a^i < ps, \\ 0 & \text{if } ps \le y_a^i. \end{cases} \qquad (5_b)$$

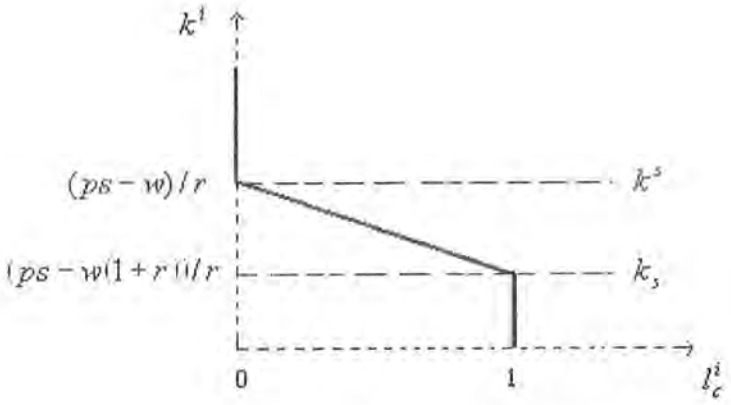
Function of family capital k^i is revealed by child labor supply for given goods and factor prices.

The above equation evaluates two type of corner solution. One is the rich family that does not rely on child labor and other is the poor family whose adult does not finance the subsistence cost themselves and their children work full time. However, there is a third group of families that lives just at the subsistence level and relies on some child labor. Fractions of the families that live below the poverty line are denoted by η and the families that achieve the subsistence level themselves and not rely on child labor are denoted by 0. Aggregate capital holding in these two families is denoted by $K_\eta = \int_0^{k_\lambda} kg(k)dk$ and $K_0 = \int_{k_\lambda}^{k^\lambda} kg(k)dk$. The relevant threshold of capital endowment k_s and k^s *(cf. fig)* depend on factor and goods prices in the economy:

$$k_s = \max\left((ps - w(1+\gamma))/r, 0\right) \qquad \eta = \int_0^{k_\lambda} g(k)dk \qquad (6_a)$$

$$k^s = \max\left((ps - w)/r, 0\right) \qquad 0 = \int_{k_\lambda}^{k^\lambda} g(k)dk \qquad (6_b)$$

At capital endowment k^s, Children will never work because adult finance the subsistence consumption themselves. Children would like to work, if capital endowment is k_s and adults themselves never finance the subsistence cost.



The hours of child labor supply

3.2.5 Aggregate Child Labor Supply and Goods and Factor Market Equilibria

Aggregate hour of child labor supply L_C are given by the sum of the individual households' child labor supplies:

$$L_C = L_{C\eta} + L_{C0} = \eta N + \frac{pS_0 - Y_{A0}}{w\gamma} \qquad (7)$$

$L_{C\eta}$, evaluates the situation where children work full time. L_{C0}, is the aggregate internal outcomes where children income $Y_{C0} = w\gamma L_{C0}$ is just casing the aggregate income gap "$pS_0 - Y_{A0}$". If the factor employments is equal to aggregate factor supply, then the market will be clear perfectly i.e. $L = N + \gamma L_C$. However, the consequential domestic income is given by $Y = wL + rK = pX_1 + X_2$.The balance trade equilibrium is evaluated, if the value of export is equal to value of import at world market prices. If the trade is in equilibrium, then the domestic prices will be determined by the market frictions and given world market prices. Where, both the production technologies and factor endowment will determine factor rewards w, r and family income, consumption and production patterns as well as L_C, the level of child labor in the market.

3.3 Trade Liberalization and Child Labor

Openness in trade is recognized both as one of the child labor dilemma and also solution for them. Globalization critics confirm that international trade is unique intensive to employ more child labor. But many economists are against this episode and demonstrate that international trade is a source to reduce child labor. However, the average income effect also causes to lessen the child labor; reduction in inequality in the south can also raise child labor (Rogers, 2001).

3.3.1 Impact of Trade on Goods and Factor Prices

The boost in trade cause to bring the domestic prices p closer to world market prices p^w, β rises (hats denote percentage change).

$$\hat{p} = \hat{\beta} > 0 \qquad (8_a)$$

Owing to increase in prices, Food X_1 become relatively luxurious and raises the cost of subsistence, but at the same time factor prices as wages w increases and capital return r falls in terms of absolute values (Stolper & Samuelson, 1941).

$$\hat{r} < 0 < \hat{p} < \hat{w} \qquad (8_b)$$

For any given level of child labor, the impact of these prices changes are seen as poorest advantage more from trade because their wages rises and rich benefit the less because their capital return falls. Overall the inequality in the economy is reduced; the change in the 'income gap' triggers a child labor response, economy–wide child labor change.

3.3.2 The Reaction of Individual Child Labor Supply

The impact of trade liberalization on child labor depends on the change in adult and child income relative to rise in relative prices of food. If we consider the families where children work for some time not all, the reaction can be divided into three parts.

$$\hat{l}_c^i = \frac{ps}{y_c^i}\hat{p} - \left(\frac{w}{y_c^i}\hat{w} + \frac{rk^i}{y_c^i}\hat{r}\right) - \hat{w}. \qquad (9)$$

The above equation can be explained as, in first part; there is an adverse price effect because increase in prices cause to decrease in child labor. In second part (within bracket) there is an adult income effect that can take both the sign depending on the factor endowments and relative magnitude of factors price change. The higher the shares of wage income in total adult income, the more favorable the adult income effect. In third part, there is a child income effect that reduces child labor. The families that more rely on labor, they experience a favorable income effect for the increase in wages and remain unaffected due to the decreasing return on capital. Hence, they decrease child labor. The families that are more abundant in capital, the reaction of child labor depend on the overall sign of the real income effect.

3.3.3 Changes in the economy wide child labor supply

Economy-wide change in child labor depends on the distribution of the income effects to individual families living at or near to subsistence threshold. Whenever prices change, aggregate hour of child work (equation 7) also changes for two reasons: as a result of the accumulated change in individual child labor supply in those families where child labor is interior and change in the number of children working full time. In the present model, marginal changes of the number of child labor have no first order effect on aggregate

child labor (i.e. $dL_C = dL_{CO}$, see Appendix). However, the relative change in aggregate hour of work is determined as:

$$\hat{L}_C = \frac{pS_0}{Y_C}\hat{p} - \left(\frac{w0N}{Y_C}\hat{w} + \frac{rK_0}{Y_C}\hat{r}\right) - \hat{w} \qquad (10_a)$$

It is economy–wide equivalent to expression (9). Our assumption of perfect competition shows that factor price movements depend on the change in goods prices $\hat{p}$. Change in child labor supply is shown in terms of the relative price change (using the magnification effects of Jones, 1965, see Appendix).

$$\hat{L}_C = -\frac{1}{\delta}\frac{1}{Y_C} w\left(0N + \gamma L_{C0} - a_{L1}S_0\right)\hat{p} \qquad (10_b)$$

The reaction of child labor supply depends on two main factors (1) on the production structure, that is captured by the unit cost shares between industries, δ (>0) and on unit input coefficient a_{L1}, and (2) on the importance of subsistence consumption relative to the family endowments. However, child labor decreases in the economy if the number of the people (labor supply) living at the poverty line $oN + \gamma L_{CO}$ is greater than the labor embodied in the subsistence consumption $a_{L1}S_0$. If no people in the economy is living below the poverty line as $\eta = 0$, and $L_{CO} = L_C$, then the overall income of the people increases and gains from income cause to decreases in child labor. If some of the people living below the poverty line, $\eta > 0$ then the favorable income effect increases the child labor. Because, poor cannot achieve the subsistence level and they have to send their children on work full time. On the other side, richer also increases the child labor due to the income loss.

Aggregate hours of child labor increase if (1) the distribution of income raises the incidence of child labor due to globalization. (2) And the income gains from trade are not larger enough to overweight these effects, due to following conditions (i) if large the number of people living below the poverty line and (ii) the comparative advantage in labor intensive goods is relatively small.

3.3.4 Model Specification

In extending the model presented in Kis-Katos (2007), our contribution is to incorporate and rationalize different variables in it. As, some child labor not only prevails in the poor but also in the rich countries. That is why; we investigate the effect of change in wage rates in both the rich and the poor countries. We also examine the income effect and substitution effect due to increase in wage rate.

Suppose that there is an increment in the income of both adult labor and child labor due to increase in wage rate. The growth in income would immediately lead to increase in consumption. This will result in the increase in utility of household. Since, utility is positively related with consumption and income. Increment in utility or income gain may or may not compel the individual to increase the supply of labor in order to achieve the consumption on extra food $(c_1^i - s)$ and manufacturing goods (c_2^i) but it depends on individual's status. As, if the individual is rich or living in the rich country, income effect dominates and increase in income may induce the individual to reduce the supply of child labor. If the individual is poor or living in the poor country, substitution effect may lead the individual to increase the child labor in order to achieve the higher consumption and income level.

International policies as direct ban on child labor, trade sanctions or ban on the import of those goods that are produced by the child labor are inappropriate. Such policies not only discourage the economic growth of the poor countries but also it increases the inefficiency in the economy (Baland & Robinson 2000). Because, more probably, children work in those families where subsistence cost is higher than that of adult income and "income gap" $\left(ps - y_a^i\right)$ exists. If the children would never work in those families, it would excite poverty and inequality that discourage economic growth in those countries.

In the model, equation (5_b or 7) subsistence consumption $\left(ps\right)$ plays an important role. If the adult labor does not attain subsistence consumption $\left(ps\right)$ himself, he (she) would like to spend his (her) income only on food (c_1^i), where consumption of food may or may not equal to subsistence cost ($c_1^i \leq s$) and children may work only to accomplish the subsistence need. They may earn by working ($w\gamma l^i$) where $0 \leq l^i \leq 1$. If the adult labor is able to finance the subsistence consumption $\left(ps\right)$ himself then there is no need for child labor and individual spend his additional income $\left(y_a^i - ps\right)$ on extra food ($c_1^i - s$) and on manufacturing goods (c_2^i).

The above discussion is helpful in relating different variables to the model for the purpose of empirical analysis. GDP per capita is a good indicator of income. Its increment certainly indicates higher economic activity and potential increase in the exogenous income of both adult labor and child labor. Hence, the adult labor is assumed to be more efficient than child labor, increment in income may result in the increase in adult labor

and decrease in the child labor. Because, we are incorporating it with reference to the second step of equation (5_b), which shows that children work relatively more in those families that live just at the subsistence level by the "luxury axiom" (Basu & Van, 1998). In this way, per capita GDP is expected to be negatively connected with child labor (Kruger, 2004).

However, the families that live below the poverty line and also more rely on child labor; increase in GDP per capita may stimulate the income of both adult labor and child labor with reference to the first step (5_b). In such a case, the individual increase the supply of adult labor in order to achieve subsistence cost as well as the consumption of both extra food and manufacturing goods. But growth in adult labor income is not enough, because subsistence cost (ps) is still higher than adult income (y_a^i) as $(y_a^i < ps)$. So, substitution effect may dominate that induces the increase in child labor. In this way, per capita GDP is positively correlated with child labor in poor countries or families. However, in case of rich countries or families, income effect may dominate and incremental income may reduce the child labor.

Urbanization provides possible expansion in wage rates of labor. It is closely associated with economic expansion. In rural areas, adults may not finance the subsistence consumption (ps) themselves and they have to rely on child labor. Hence, child labor still prevails in rural areas (Edmonds & Pavenik, 2005a). If there exists surplus labor in rural agricultural sector and the marginal productivity of labor is close to zero then wages in informal urban sector remains higher than formal rural sector (Lewis, 1954). Higher

wages may force the adult labor to migrate from rural agriculture sector to urban manufacturing sector. The higher wages in urban sector may increase the supply of adult labor. It may lead to the increase in the income of adult labor and they may finance the subsistence consumption (ps) themselves according to the second step (5_b).

In addition, some awareness also prevails among people in urban areas and there are a large numbers of NGO's working in urban areas that may compel the parents to send their children to schools. They also finance the people for education purpose. On the whole, it is expected that child labor may decrease even if not eliminated. In this way, urbanization may be a potential reason for the reduction in child labor.

Higher wages in urban sector would lead to higher incomes of the adult labor. But, if the increment in adult income fails to finance the subsistence consumption (ps) then their migrated children have to work in order to fulfill the subsistence cost (step1, 5_b). Hence, they remove the income gap $(ps - y_a^i)$ by working. In addition to that, some time migrated parents become greedy and they force their children to work in order to attain the consumption on extra food $(c_1^i - s)$ and manufacturing goods (c_2^i). In this way, urbanization may be positively related to the child labor.

Openness to trade oscillates the economic growth of the countries. It increases the price of domestic goods that will result in rise in wages and fall in returns to capital, if the country is abundant in labor (Stolper & Samuelson, 1941). Rise of wages may force both the adult and children to provide more labor. However, adult labor is assumed to be more

competent than child labor. Enhance in wages may increase the adult labor and decrease the child labor. If we focus on families whose children work some time but not all time with reference to (step2, 5_b). Increment in adult income may lead to domination of wage return over capital return (10_a) and adults may able to finance subsistence cost themselves, the above process may lead to reduction in child labor. However, the case for rich families may be reverse and if their returns on capital deplete then substitution effect may play a role and result in more child labor.

Openness to trade has an important effect on the countries where some of the people live below the poverty line $(\eta > 0)$. Since, prices $(\hat{P})$ increase more than increase in wages and both the rich and poor are worse-off. The poor have to meet higher consumption level and richer have to bear the income loss. Hence, substitution effect works and child labor may increase (Kruger, 2004). But the economy in which no one live below the poverty line ($\eta = 0$), Higher wages increase the income of both adult and child labor. But adult become able to finances the subsistence cost themselves. Income effect dominates and child labor may decrease (Cigno et al, 2002). Overall, the openness to trade may assume both signs (positive, negative) with child labor depending upon countries or family's position.

Inequality and poverty are the main determinant of child labor. Higher inequality is associated with higher child labor. International trade polices may stimulate the process of eradication of poverty or inequality as consequence of increased wages or decrease the return to capital of labor intensive country (Stolper and Samuelson, 1941). Increment in wages of the poor and reduction in return to capital of the rich may decrease the

difference between returns to factors of both the families in equation (10_a) and lessen the inequality as well as poverty in the economy. Reduction in inequality or poverty may compel the adult labor to work more and send their children to school, because the return on education is high in future than the current wages of children. This procedure may lead to the increment in adult labor and reduction in child labor. In this way, inequality and poverty are positively related with child labor (Tanaka 2003, Blunch 2000).

Thus our main equations for regression are as follows:

$$\ln(Chlab) = \beta_0 + \beta_1 \ln(GDP_{PC}) + \beta_2 \ln(Open) + \beta_3 \ln(UBZ) + \beta_4 \ln(Inequality)$$

$$\ln(Chlab) = \gamma_0 + \gamma_1 \ln(GDP_{PC}) + \gamma_2 \ln(Open) + \gamma_3 \ln(UBZ) + \gamma_4 \ln(Poverty) + \gamma_5 \ln(D_{TS})$$

Where $Chlab$, GDP_{PC}, UBZ, $Open$, and D_{TS} stand for Child labor, Gross domestic product per capita, Urbanization, Trade openness, and Dummy variable for trade sanctions[4] respectively. However, inequality and poverty have usual meanings.

[4] The dummy variable takes value equal to one from the start of restrictions (trade sanctions) on Pakistan due to child labor.

Chapter 4

DATA, VARIABLES AND METHODOLOGY

4.1 INTRODUCTION

In this chapter, we elaborate the variables along with the nature and sources of data used in our study. This chapter is divided into three main sections. The first section considers the nature, type, sources and format of data. It also highlights the region and time period of analysis. The second section employs the definition and concise description of different variables used in the underlying study while last section is about the explanation of econometric technique that is used to find empirical results.

4.2 DATA

We want to analyze the impact of globalization on child labor. For this purpose, we have chosen the country "Pakistan" for our empirical analysis. It is selected for the reason that it has been the victim of trade sanctions for child labor. The sample period for our analysis is from 1974 to 2006. Since, we want to analyze the impact of trade liberalization on child labor only for Pakistan, the nature of our study requires times series analysis. The total number of observation for our analysis is 32.

4.2.1 Data Source

The data source used for the dependent variables is labor force survey (LFS), whereas the data sources used for explanatory variables are World Development Indicator (WDI), Economic survey of Pakistan (ESP) and World Institute for Development Economic Research (WIDER).

The source of data, Labor Force Survey (LFS) is published by Federal Bureau of Statistics (FBS) "Pakistan". It includes statistics on labor hours, employment and unemployment. The labor force surveys have been published since 1963. But these surveys are not conducted on annual basis. Since, the nature of our study requires the annual data for all the years. That is why; we use compound growth rate formula in interpolation to fill up data gaps.

Our main source of data for explanatory variable "Income inequality" is World Institute for Development Economic Research (WIDER). It works and collects data of income inequality from the whole world. The data source for "Poverty" is Economic Survey of Pakistan (ESP). However, we obtain data for other explanatory variables from World Development Indicator (WDI). It provides national and international statistics annually in print and CD-ROM.

4.3 VARIABLES

In our research study, we used different variables for our regression analysis and also for the linkages of the model. This section defines the constructions and the brief description of both dependent and explanatory variables.

a. Child Labor

Our dependent variable is child labor $(Chlab)$ which is based on the estimates of the international labor organization (ILO, 2000). It gives the percentage point in labor force

participation rate of children aged between 10 and 14 years[5] (Edmonds, Pavenik 2006). However, there is no single, clear cut definition of child labor under international law. According to the ILO (2002) "A child labor is defined as economically active if he or she works for wages (cash or in kind), works in the family form in the production and processing of primary products, works in family enterprises that are making primary products for the market, barter or own consumption, or in unemployed and looking for these types of work." Most of the empirical surveys explain "Child Labor" as pertaining to those children under 14 years of age who works on regular bases for which they are paid, or whose work result in output destined for the market (Basu & Van 1998).

b. Trade openness

Trade openness $(Open)$ is our main explanatory variables. It takes actual trade flows and captures trade policy indirectly. It is defined as a percentage point in the openness indicator where openness is measured by the ratio of import plus export to GDP. Whenever, Gross domestic product (GDP) accounts the sales and purchase of domestically produced goods. Data are in constant U.S. dollars.

c. GDP Per Capita

Another important economic variable is Gross Domestic Product per capita (GDPPC) which is used as explanatory variables for empirical research in our analysis. The World Development Indicator describes GDP per capita as gross domestic product divided by mid year population in constant U.S dollars. GDP is measured by the value of output

[5] ILO does not provide such information for children younger than 10.

domestically produced. GDP per capita is found to be the most powerful explanatory factors for the prevalence of child labor in cross section of countries (Kruger 1996, Edmondes & Pavanik 2006).

d. Urbanization

Urbanization (UBZ) is a demographic variable which increases the income of the individual. It is used in our empirical research as explanatory variables and is measured as the share of urban population within a country. That is why, we account for urbanization in our research analysis as urban population divided by total population.

e. Income inequality

Income inequality is socio-economic variable which is considered as a key determinant of child labor (Tanak 2003). There are many measures that are available for income inequality but an appropriate and valid measure is Gini Index. According to the world development indicator (WDI), "Gini Index measures the extent to which the distribution of the income among individuals or households within an economy deviates from a perfectly equal distribution. The values of Gini index Varies from 0 to 1. A Gini index of 0 means perfect equality, while an index of 1 means perfect inequality". Due to the unavailability of the complete data for Gini Index, we use the compound growth rate formula in interpolation to fill up data gaps.

f. Poverty

Poverty is an important economic socio-economic variable. There are many measures that can be used to measure the poverty but most commonly used measure is Head Count Index (HCI). According to World Development Indicator (WDI), "Head count index measures the percentage of the population living below the poverty line. National estimates are based on population-weighted subgroups estimates from household surveys." The annual data for poverty is not available. In order to fulfill the data gaps for all years, we use interpolation to fill up the data gaps.

g. Policy Variable

We use dummy variable (D_{TS}) in our regression analysis. It appears as policy variable and captures the impact of trade sanctions that are imposed by the developed countries on Pakistan. It takes the value equal to "ONE" for the years where sanctions prevailed and "ZERO" otherwise. Policy implication of the variable can be explained as the ban from developed countries on the import of those goods which are produced with the help of child labor in Pakistan. Developed countries have been imposing such policies since 1992.

4.4 ESTIMATION TECHNIQUE

In order to regress the econometric model for empirical analysis, we apply ordinary least square (OLS) method. We estimated two separate equations one by one by taking logs of both dependent and independent variables. The dependant variable in both the equation is child labor and we try to determine its responsiveness to different variables in case of

Pakistan. In our research study, we also deal with the qualitative dummy variables in one of the two equations.

We estimate each equation with alternative specification in order to check robustness, significance and reliability of the results. We also apply moving average of order one in order to tackle the problem of autocorrelation, where it was needed.

Chapter 5

RESULTS AND INTERPRETATIONS

5.1 INTRODUCTION

In this chapter, the empirical results are reported along with the interpretations. This chapter is divided into two main sections. The first section analyzes the results of our estimated equation in which we have used the explanatory variables as GDP per capita, Trade openness, Income inequality, and Urbanization.

The second section deals with the empirical results and interpretations of second regression equation. In this framework, we exclude the variable income inequality and introduce two newly variables, one is poverty and other important variable is dummy variable, that is used as policy variable and capture the impact of trade sanctions imposed by the developed countries. It takes the value equal to one at the beginning of the time when they impose a ban on the import of those goods that are produced with the help of child labor in Pakistan and zero otherwise.

Our econometric model consists of two equations with alternative specification. We estimated each equation with different possible combinations in order to ensure the robustness, significance, consistency of sign and the reliability of our result.

5.2 INTERPRETATIONS OF THE FIRST MODEL

In order to avoid the problem of multicollinearity and to check the robustness, reliability, and significance of results, we estimated the equation with alternative specification. Different possible combinations of variables are estimated, which are shown in Table 5.1.

Table (5.1): Result of Regression Analysis

EXPLANATORY VARIABLES

Intercept	GDP_{PC}	OPEN	UBZ	Inequality	MA(1)	R^2	F-Stat	D.W
-5.731 (-2.95)	1.539 (4.47)*	0.951 (2.50)*			0.989 (617.59)	0.825	45.67 (0.00)	1.43
-5.538 (-3.16)	1.586 (5.30)*			1.483 (2.64)*	0.837 (10.68)	0.835	48.96 (0.000	1.34
9.040 (2.14)	5.402 (4.94)*		-11.482 (-3.78)*		0.741 (7.92)	0.859	59.23 (0.00)	1.56
-5.870 (-3.21)	1.721 (5.18)*	0.616 (1.66)***		1.273 (2.21)**	0.989 (602.02)	0.851	40.02 (0.00)	1.66
8.926 (2.12)	5.543 (5.08)*	0.767 (1.68)***	-11.456 (-3.80)*		0.791 (9.69)	0.871	47.48 (0.00)	1.83
6.791 (1.26)	4.833 (3.52)*		-9.681 (-2.41)**	0.447 (0.68)	0.754 (7.93)	0.861	43.70 (0.00)	1.51
6.867 (1.29)	5.018 (3.69)*	0.757 (1.64)***	-9.801 (-2.48)*	0.415 (0.64)	0.808 (9.92)	0.873	37.24 (0.00)	1.78

Note: MA (1) = moving average of order one. D.W = Durbin-Watson stats. The values of t-statistics are given in parenthesis and p-values are given in the parenthesis of F-Stat values. *, **, *** indicate that t-values are significant at 1%, 5%, and and10% level of significance respectively.

The regression results of our estimated equations are shown in Table 5.1. The final equation which incorporates all explanatory variables concludes that except for income inequality all variables are statistically significant and have expected signs. To tackle the problem of autocorrelation, we apply the Moving Average of order one [MA (1)] that brings the values of Durbin Watson (D-W) stats closer to the desired level. The results show that the overall performance of estimation is good and the value of (R^2) remains close to 0.85.

The results show that GDP per capita is highly significant at 1% level and bears sign according to theoretical expectations. It is showing as robustness in all estimated equations, and its relation to the child labor is positive. Higher per capita income means higher purchasing power and possible higher utility. The increments in income may force the individuals (adult labor) to increase the labor supply in order to gain the benefit of higher utility. But the gain in income is not enough that they can finance the subsistence consumption themselves. That is why, they rely on child labor. In addition to that, individuals live in a country like Pakistan where too many of the people live below the poverty line and children are more likely to work in those families. Hence, substitution effect works and child labor increases in the country. The result also supports to the theoretical model.

The value of regression coefficient in our different variants of estimated equations lies within the range of 1.53 to 5.54, suggesting that the elasticity of child labor with respect to GDP per capita is almost 3.5 on average. It suggests that if GDP per capita increases 100%, child labor will be increased by 3.5%. This result is consistent with Ranjan (2001).

Trade openness is statistically significant and it has anticipated sign. In our regression results, it is robust and positively related with the child labor. Increase in trade leads to the higher prices and lower the utility. In addition, if increment in prices is greater than the increase in wages, hence it makes the individuals worse-off. The poor are worse-off because they are unable to attain the subsistence consumption for them and the rich are worse-off because they suffer from the income loss due to higher prices. In such a situation, the substitution effect may dominate and child labor increases in the economy.

The value of regression coefficients of our one of the main explanatory variable (Trade openness) varies between the narrow ranges of 0.61 to 0.95. It suggests that the elasticity of child labor with respect to trade openness is almost 0.78 on average. It indicates that 100 percent increase in trade openness; increase the child labor 0.78 percent. There are some studies, which are consistent with this result such as Kruger (2004), Kis-Katos (2007).

Urbanization is an important demographic variable that can take possibly either sign as far as child labor is concerned. The empirical results demonstrate that urbanization is negatively related with the child labor and it statistically significant at 1% level. It is as robust as other variables. The negative association between child labor and urbanization can be justified as the wages in urban sector is higher than that of rural agriculture sector. Higher wages attract the individuals to migrate from the rural areas to urban areas. It increases the income and the utility of the individuals and they finance the subsistence consumption themselves. In addition to that, they also know that the future return of education is higher than the current wages of child labor. The above process discourages

the child labor. So, income effect dominates and child labor may decrease in the economy. The result of negative association of urbanization with child labor is consistent with the Kis-Katos (2007).

Income inequality is a socio-economic variable which has expected sign but it is insignificant in most of the cases. As it is positively related with the supply of child labor, higher income inequality means that poor people have lower income and lower utility. In order to attain the higher income and higher utility, the individual like to send their children to work. Hence, inequality is theoretically very important socio-economic stimulant of child labor {Tanaka (2003)} but empirically largely insignificant in case of Pakistan.

To sum up, we find that trade openness and GDP per capita are the major economic variables that raise the child labor in Pakistan. While urbanization is the only variable, that reduces the child labor. All are robust and statistically significant. Another variable income inequality is positively related with child labor but insignificant in most of the cases.

5.3 INTERPRETATIONS OF THE SECOND MODEL

The regression results of the second estimated equation are reported in Table 5.2. Here we include two explanatory variables, one of them is poverty and the other is dummy variable by excluding income inequality. If we simply incorporate poverty then its impact on child labor may be misleading as due to international trade sanctions on Pakistan's exports of such items that were being produced by using child labor. It is expected that poverty may cause child labor positively but from the start of sanctions child labor reduced sharply while poverty was having rising trend due to unemployment of otherwise employed children. It appears as policy variable and captures the impact of trade sanctions imposed by developed countries. It takes the value ONE for sanctions and ZERO otherwise.

In order to investigate the robustness, consistency of sign, significance and to avoid the problem of multicollinearity, we estimated the model by using the alternative specification. The results of equation that incorporates all explanatory variables are shown in Table 5.2 below.

Table (5.2): Result of Regression Analysis

EXPLANATORY VARIABLES

Intercept	GDP_{PC}	OPEN	UBZ	Poverty	D_{TS}	MA(1)	R^2	F-Stat	D.W
-10.135 (-4.12)	2.215 (5.40)*	0.501 (1.32)			-0.396 (-2.60)*	0.989 (435.51)	0.859	42.92 (0.00)	1.690
-4.798 (-1.18)	1.708 (3.38)*			-0.887 (-1.98)**	-0.315 (-1.53)	0.742 (6.44)	0.858	42.57 (0.00)	1.534
2.751 (0.61)	5.561 (5.61)*		-9.869 (-3.51)*		-0.417 (-2.71)*	0.777 (9.32)	0.888	55.912 (0.00)	1.703
3.093 (0.73)	5.828 (5.97)*	0.801 (2.06)**	-10.18 (-3.78)*		-0.416 (-2.96)*	0.849 (13.0)	0.903	50.321 (0.00)	2.205
2.848 (0.62)	5.419 (3.75)*		-9.579 (-2.70)*	-0.070 (-0.14)	-0.403 (-2.17)**	0.772 (8.60)	0.888	43.166 (0.00)	1.699
3.126 (0.72)	5.705 (4.13)*	0.799 (2.00)**	-9.923 (-2.94)*	-0.062 (-0.13)	-0.406 (-2.41)**	0.836 (11.73)	0.903	40.406 (0.00)	2.168

Note: MA (1) = moving average of order one. D.W = Durbin-Watson stats. The values of t-statistics are given in parenthesis and p-values are given in the parenthesis of F-Stat values. *, **, *** indicate that t-values are significant at 1%, 5%, and and10% level of significance respectively.

The results of the above table reveal that except for poverty all variables have expected sign and are statistically significant at standard level. It has unexpected sign and remains insignificant in most of the cases. The dummy variable which appears as policy variable bears expected signs and turns out to be significant in most of the times. It reflects that trade sanctions play crucial role in reducing child labor in Pakistan after being imposed.

The overall performance of the estimated equation is very well as in our all alternative specifications the value of R^2 remains closer to 0.88. To control autocorrelation problem in our estimated equations, we apply the Moving Average of order one [MA (1)]. It helps to improve the value of Durbin-Watson (D-W) stats where it was not at the standard level. The high value of F-statistics shows that the overall fit of the model is good.

The result shows that GDP per capita has expected sign and statistically significant at standard level. In our regression results, it has consistency in sign and also positively associated with the child labor. Higher per capita income means that higher purchasing power and possible higher utility. Higher income encourages the individual to increase the supply of both adult labor and child labor in order to attain the consumption on extra food and manufacturing goods. In addition to that, child labor work only in those families where adult labor can not finance the subsistence cost themselves. Hence, child labor increases in the country (Pakistan). The results also support to our theoretical model.

The value of regression coefficient (GDP per capita) varies within the range of 1.70 to 5.82. It suggests that the elasticity of child labor with respect to GDP per capita is almost

3.75 on average and shows that if GDP per capita increases 100%; child labor will be decreased by 3.75%. This result is consistent to the related studies.

Our theoretical results predict that trade openness can be positively or negatively linked with the child labor. The empirical results in regression analysis shows that trade openness is statistically significant in most of the times and has also expected sign. It is positively related with the child labor in Pakistan and state that trade openness increases the prices of domestic goods, higher prices of domestic goods discourage both the rich and the poor. The rich face the income loss and the poor don't attain the subsistence cost. In such cases, substitution effect may dominate and child labor increase in the economy.

The values of its regression coefficient vary within the range of 0.35 to 0.80. The result evaluates that the elasticity of child labor with respect to trade openness is almost 0.57 on average. It reflects to the situation that if trade openness increases by 100%, child labor will be increased by 0.57%. This result is also consistent with our theoretical model as well as the empirical findings.

Urbanization is an important demographic variable. It has anticipated sign and statistically significant at 1% level. It is negatively connected with the child labor. Higher wages in urban areas leads to the reduction in child labor. Hence, income effect works and child labor may decrease. In addition to that, there are a large number of NGO's which work in urban areas and motivate the individuals to send their children to school rather than to work. The value of its regression coefficient varies within the range of -0.95 to -10.1. It

suggests that the elasticity of child labor with respect to urbanization is almost -9.8 on average. The above result is also consistent with the related studies.

In contrast to other variables, poverty has unexpected sign but it is statistically insignificant in most of the cases. This result is contradictory to existing empirical literature, i.e. Blunch & Verner (2000) which shows that child labor is positively related with poverty. In case of Pakistan, perhaps pressure of events, such as trade sanctions, has been more influential than the effect of this variable. The other possible reason may be the apprehensive official figures on poverty.

We incorporate dummy variable (D_{TS}) as a policy variable. It has expected sign in all of the alternative regression estimations and remains statistically significant in most of the times. It is negatively associated with the child labor and shows that trade sanctions imposed by the developed nations play an important role in discouraging the child labor. In addition to that, the imposition of such a ban reduces the export of those goods which use the abundant of child labor in Pakistan. Hence, the child labor decreases in those sectors because goods were not exported out of the country.

The values of its regression coefficients vary within the narrow range of -0.24 to -0.41 and suggest that the elasticity of child labor with respect to international policies is -0.32 on average. These results are consistent with those of Jafarey & Lahiri (2002), Grossmann & Michaelis (2007).

To sum up, we find that trade openness and GDP per capita are positively related with the child labor. All are robust and consistent in sign but trade openness is not as significant as GDP per capita. Urbanization reduces the child labor in Pakistan and it is statistically significant at standard level. Our important policy variable plays an important role and decreases the child labor in the region. However, poverty is the only variable that has not only unexpected sign but also insignificant in most of the cases.

Chapter 6

SUMMARY AND CONCLUSION

The objective of our study is to analyze the impact of trade liberalization on child labor in Pakistan. In order to examine this relationship, we have chosen different economic variables. These variables have been selected on the basis of theoretical and empirical literature. We estimated two equations with alternative specification. In first equation, we employ different economic variables as GDP per capita, Urbanization, Income inequality, and Trade openness. While in second equation, we drop one variable income inequality and introduce two new variables one is poverty and the other is dummy variable that capture the effect of trade sanctions imposed by the developed countries. This chapter reports the summary of the results and conclusion of our study as well as policy implication.

6.1 CONCLUSIONS

The results of our study suggest that in first model (Table 5.1), GDP per capita and trade openness are positively connected with the child labor. They are robust as well as significant. However, Urbanization is the only variable that reduces child labor and highly significant. The significance of all these variables does not diminish when we employ them with other possible combinations. Such process suggests that all variables are robust and consistent in terms of sign. However, socio-economic variable income inequality remains robust in terms of sign. Although it has expected sign but it remains insignificant in most of the cases and indicates that it does not contribute to child labor in possible situation as other variables do.

In other estimated equations Table 5.2, we analyze the more practical situation and include the role of international policies that are imposed by developed world. In such a case, our results are consistent with Table 5.1 and suggest that GDP per capita and urbanization have expected sign and they are robust as well as highly significant. Our main variable trade openness is positively linked with the child labor. It is also robust but it is inconsistent and volatile in terms of significance. Poverty is not only insignificant but also has unexpected sign. One more important variable as policies which reflect the imposition of trade sanctions by the developed countries. It is negatively associated with the child labor. In addition to that, it is not only robust but also significant in most of the cases and proves that the international policies have major role in presence of globalization and dependence among countries.

Finally, while concluding our study it can be said that GDP per capita, urbanization, and trade openness have expected sign and are also robust. However, trade openness is not as significant as the other variables. In our research analysis, inequality turns out to be insignificant while poverty has not only unexpected sign but also insignificant in most of the times. Such results show that poverty and income inequality may not qualify as important variables and predictors of child labor in Pakistan. The policy variable shows that trade sanctions play an important role in reducing child labor in case of Pakistan.

6.2 POLICY IMPLICATIONS

As for as GDP per capita is concerned, we obtain same relation in both the models. A rise in GDP per capita stimulates child labor in Pakistan. The results of urbanization are also consistent in both the models and are in accordance with our theoretical expectation.

Migration from rural areas to urban areas leads to increase in real wages of adult labor and reduction in child labor. Rural areas are scattered in villages of very few numbers of persons, where three or four houses are inhabited and it is difficult for the government to provide the health and education services in such remote areas. The policy suggestion is straight forward in such a case that the government should plan optimal size town and facilitate the rural people to live in such areas. So that government may be able to provide them different and basic facilities of life such as health and education for children. In addition to that, the large number of NGO's must educate and facilitate to the migrated and the poor parents. They must aware to the parents about the future benefits of education and to motivate them, so that they may be able to send their children to school rather than to work.

Openness to trade leads to the increment in child labor. However, this result is almost significant in both the models. In such a situation, the policy maker may increase the incentives for the production and export of goods that requires comparatively intensive adult labor. They may increase the prices and wages of goods that are made with the help of adult labor.

Trade sanctions are another tool that may help in the reduction of child labor in Pakistan. This result is also robust in our regression analysis. Trade sanctions are imposed by the developed nations and its enforcement in developing countries is increasing day by day. The policy recommendation in such a case is that developed countries must provide aid to the poor nations, So that, the families in the poor countries who use the abundant of child

labor may receive additional income and avoid sending their children in more hazard forms.

The constitution of UN General Assembly (1989), the minimum age convention 138 or 182 of international labor organization (ILO) and the constitution of Islamic republic of Pakistan are also helpful tool in order to eradicate child labor. The policy recommendation in such a case is that government of Pakistan should take a step for the implementation of such conventions. In addition to that, it may facilitate to the children for education purpose.

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APPENDIX

Proof of $dL_C = dL_{C0}$:

By differentiating equation (7) totally and we get,

$$dL_C = d\eta N + \frac{1}{w\gamma}\left[S_0 dp + p dS_0 - dY_{A0} - \gamma L_{C0} dw\right]$$

Substitute for $d\eta = g(k_s)dk_s$ and $d0 = g(k^s)dk^s - g(k_s)dk_s$ by observing that $dS_0 = Nsd0, dY_{A0} = [N_w + rdK_0]d0 + 0Ndw + K_0 dr, and\ dK_0 = N\left[k^s g(k^s)dk^s - k_s g(k_s)dk_s\right]$ it follows that

$$pdS_0 - dY_{A0} = N\left\{\underbrace{(ps - w - rk^s)}_{-0} g(k^s)dk^s - \underbrace{(ps - w - rk_s)}_{-w\gamma} g(k_s)dk_s\right\} - 0Ndw - K0dr,$$

And hence,

$$dLc = \frac{1}{w\gamma}\left[S_0 dp - K_0 dr - \frac{pS_0 - rK_0}{w}\right] = dL_{C0}$$

$$dL_C = dL_{C0}$$

Relative Change in Aggregate Child Labor (equation 10):

Equation (10a) tracks from totally differentiating equation (7). It can be further modified by using the magnification effects of Jones (1965), which can be resulting by totally differentiating the zero profit equation (1) and noting that unit input coefficients minimize cost.

$$\hat{w} = \frac{ra_{K2}}{\delta}\hat{P}\ and\ \hat{r} = -\frac{wa_{L2}}{\delta}\hat{P},\ Where\ \delta = \delta_{K2} - \delta_{K1} = \delta_{L1} - \delta_{L2},\ While\ \delta_{Li} = \frac{wa_{Li}}{pi},\ and\ \delta_{Ki} = \frac{ra_{Ki}}{pi}$$

(cf. Wong, 1995). Accordingly, equation (10a) becomes:

$$\hat{Lc} = \frac{1}{\delta}\frac{1}{Yc} r\left(K_0 - a_{K1} S_0\right)\hat{p}$$

$$\hat{Lc} = -\frac{1}{\delta}\frac{1}{Yc} w\left(0N + \gamma L_{C0} - a_{L1} S_0\right)\hat{p}$$

However, two expressions are comparable as child income serves to close the 'income gap', $r K_0 = pS_0 - w(0N + \gamma L_{C0})$, and the zero profit conditions apply, $rK_0 = p - wa_{L1}$.