Pakistan Journal of Applied Economics, Vol.30 No.1, (27-42), Summer 2020

A DYNAMIC STUDY OF CHILD LABOR MARKET AND ITS DETERMINANTS IN PAKISTAN: A Time Series Analysis

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Abstract

This paper aims to investigate the long-run and short-run dynamics of important determinants of child labor at macroeconomic level in the case of Pakistan. The import distinction of this paper is that it is the first attempt to investigate the long-run and short-impacts of determinants of child labor by using time series estimation technique of Autoregressive Distributive Lags Model (ARDL). The long-run findings suggest that an increase in GDP per capita and gross primary school enrollment leads toward the reduction of incidence of child labor. Despite the fact that engagement of children in any kind of economic activities is legally banned but due to lack of enforcement of laws and poor institutional support child labor is common in Pakistan. Similarly, an improvement in the quality of existing institutions can potentially contribute in the reduction of child labor. However, the positive and significant sign of the coefficient of young dependency (YD) suggests that higher dependency of young children is increasing the incidence of child labor in Pakistan. The overall findings suggest that in short-run the determinants, such as GDP, School enrolment, dependency, and institutional quality have similar impact on child labor, the impact of growth in per capita income is apparent in the reduction of child labor. The findings of this paper is suggesting that merely economic growth is not sufficient enough to reduce the extent of child labor in Pakistan, we have to align such efforts with policies aiming to achieve demographic and gender empowerment.

Key words: Child Labor, Institutional Quality, Per Capita Income, Young Dependency, ARDL.
JEL Classification: J47, J70, E24, E27.

I. Introduction

The phenomenon of child labor is generally associated with developing countries and is casting dark shadow on the future of millions of children trapped in it. Almost 168 million children of less than 15 years actively participate in labor market and this account for 11 per cent of children of the world [ILO (2016)]. Out of these chil-

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dren, 85 million work either in hazardous jobs or poor conditions and unsafe environments. Attributed to their active participation in labor market, it becomes almost impossible to seek educational undertakings for majority of the children; and their poor health further worsen the situation. Most of these children are of the age group 5-11, which accounts 44 per cent (73 million) of the total population of child laborers [ILO, (2016)]. These laboring children are extremely vulnerable to various kinds of exploitative and cruel treatment and working conditions; for instance, more working hours, very low wage, hazardous working conditions, etc.

In economics literature child labor is treated and investigated as a microeconomic or household level issue. However, various factors simultaneously justify to investige this issue to be considered and investigated at macro level. There are various macroeconomic variables which are closely associated with child labor in an economy. For instance per capita income, fiscal allocation for human capital formation, state of institutions, and quality of governance, trends of national fertility and population growth, and the dependency burden of young population.

This study aims to investigate the role of important macroeconomic variables on the participation rate of child labor in the economy of Pakistan. The literature, exploring macroeconomic dynamics of child labor is relatively limited, not only in case of Pakistan but also at the international level. Generally, the issue of child labor has been investigated as a household level based microeconomic phenomenon. To the best of the knowledge of authors of this study, so far no such efforts have been initiated to investigate the macroeconomic determinants of child labor in the case of Pakistan.

As far as the organization of this paper is concerned, after the introduction (Section I) trends of child labor in Pakistan are presented in Section II. Literature review is presented in Section III, while Section IV is dedicated to the empirical model and estimation methodology adopted to active research objectives. In Section V the important empirical results are given, and finally, the paper is concluded in Section VI.

II. Trends of Child Labor in Pakistan

Like many other developing nations, Pakistan is also facing the issue of child labor where a considerable number of children are economically active in the labor market. The official statistics of 2013 suggest that in Pakistan, 3.1 million children are in the age group of 10-14 and are reported to be active in the labor market. However, many researchers and experts believe that actual number of working children is far higher than the official figures. The important reason behind such perception is that children below 10 years are excluded from the survey of national labor force. Table 1 presents the trend of child labor in Pakistan where it is observed that an increasing trend in both male and female (children) participation in labor force, however, a relatively increasing trend is obvious in the case of female employment.

TABLE 1

Averages of Active Population
10-14 years age group (in 1,000)

Years	Children in Labor Force	Male	Female
1981-1985	2494.00	2118.40	375.60
1986-1990	2271.48	1906.60	364.88
1991-1995	1902.60	1443.20	459.40
1996-2000	2144.00	1610.60	533.40
2001-2005	2317.60	1443.33	585.60
2006-2010	2979.60	2006.00	773.60
2011-2013	3140.00	2184.00	956.00

Source: Authors' estimation from the Economic Survey of Pakistan and the International Labor Organization.

The five-years average age and gender specific participation rates are presented in Table 2. Though the activity rate in labor market is relatively high but the direction of change is desirable as it fell from 20.7 per cent in 1981-85 to 11.4 per cent in 2011-13. In case of boys, a declining trend in activity rate in labor market can be observed, i.e., it fell from 33.28 per cent in 1981-85 to 13.78 per cent in 2011-13. However, opposite phenomenon can be observed in case of female participation rate, which was 6.52 per cent in 1981-85 and increased to 9.36 per cent in 2006-10; it further adjusted to 8.22 per cent in 2011-13.

TABLE 2

Participation Rate of Child Labor (10-14 years)
in National Labor Force (5 years average %)

Years	Total Activity Rate	Male Activity Rate	Female Activity Rate
1981-1985	20.70	33.28	6.52
1986-1990	17.63	27.78	6.08
1991-1995	12.94	17.94	6.86
1996-2000	12.74	17.98	6.80
2001-2005	12.35	18.00	6.90
2006-2010	13.48	17.51	9.36
2011-2013	11.14	13.78	8.22

Source: Authors' estimation from Economic Survey of Pakistan and International Labor Organization.

III. Literature Review

Survey of the literature and the significant research contributions is presented in this section. Gerry and Guy (1981) reported that in most cases children are active in labor markets and are engaged in family enterprises; and generally they combine education with work. This study also suggest that engagement of children in non-domestic economic activities is mostly observed in subsistence nature of economic activities where lower level of skills is required. An important feature highlighted by this study is that acquisition of debt or advance payments by the owner of business to the household may also result in prolonged working hours by the children or bonded child labor.

An important investigation on the issue of child labor and its determinants was contributed by Jafri and Rashid (1997) who used labor force statistics of Pakistan and explored various characteristics of participation group of 10-14 years and reported an increasing trend related to child labor, i.e., the increase from 1.80 million in 1990-91 to 2 million in 1992-93. The highest demand of child labor is observed in service sector where the most common type is unpaid family workers. Most of the economically active children, 75 per cent of the total, are reported to work for 35 hours per week. Similarly, Hamid (1994) investigated the supply side factors of child labor and the working environment faced by these children in urban areas of Pakistan. This study also explored the trends of school dropout children and reported that there are only 9 per cent chances to resume their education in such cases. Educational attainment of parents, employment status and income of the head of household, gender of the child, size and composition of household are important determents of the supply of child labor.

The hallmark contribution in the field of child labor is contributed by Basu and Van (1998) who composed a theoretical model of labor market and pointed out the possible existence of multiple equilibriums. They also suggested that entrepreneurs will demand only for adult labor when his/her wages are less than the effective child wage and, if the wage is higher they will employ only the children, and will remain indifferent at equal wages. Any ban on employment of children would raise the wage of adult workers, but at the same time will have a negative impact on welfare level of families who have more (working) children. The important theoretical contribution of their model is the presentation of luxury and substitution axioms related to the households' preference of engaging children in the labor force. Theoretical model composed by Basu and Van (1998), was further augmented by Swinnerton and Rogers (1999) who point out another axiom termed as distribution axiom. This axiom explains the equitable incidence of the distribution of non-labor income and its impact on child labor.

Ranjan (2001) reported about the positive impact of income inequality on the prevalence of child labor and pointed out the significant impact of credit constraint faced by parents in extreme poverty, on the supply of child labor. Another interesting finding of his research contribution is that trade sanctions can potentially reduce wages of unskilled labor and in such a situation the incidence of child labor may increase.

Rogers and Swinnerton (2001) estimated a Tobit model which included additional variables like real GDP per worker, incidence of income inequality, child to adult ratio in population, and some other instrumental variables. Their findings suggested that nations with higher labor productivity and lesser inequality in income distribution have lower participation of children in their labor force. Dehejia and Gatti (2005) applied various sophisticated econometric techniques and reported that social credit markets significantly affects the child labor and so does the primary to secondary schooling ratio. Larger share of exports in GDP led towards the lower incidence of child labor and similarly, higher fertility rate and dependency burden were among the other important determinants of child labor in developing nations.

A district level investigation on socio-economic determinants of child labor was contributed by Chaudhry and Khan (2002) who probed in the determinants of child labor in the city of Dera Ismail Khan, Pakistan. Income and size of households, fertility rate, trends of adult literacy, working hours of children and their monetary contribution were the important variables used in their study. Poverty and size of households were reported the most important factors linked to the supply of child labor. Similar trend is reported in the case of fertility, while adults' literacy has negative impact on the supply of child labor. Lower rate of participation is observed in case of female child labor. Lower awareness of potential hazards make these children more vulnerable in extreme working conditions. Suffering from the chronic lung diseases, deformation of bones, burns and work injuries were among the frequently faced health problems by the working children. A similar research contribution at district level was contributed by Kulsoom (2009) who investigated the prevalence of child labor in Rawalpindi, Pakistan; and the employment trends in the age group of 11-17 years. Important variables of the study included the wage of child, work experience, average household income, parents' age and their income. The study reported that household poverty is the major factor behind the supply of child labor. Assets ownership by the household is negatively correlated to the supply of child labor. This study also suggested the statistically significant relationship between the child income and weekly working hours.

Beegle (2005) investigated the effect of credit on child labor in Kagera region of Tanzania. The study focused more on socio-economic determinants of child labor with special focus on agricultural activities. The households with higher accumulation of assets can easily be coup with the income shocks as chances of child labor are significantly lower for such households. Educational attainment can potentially smooth the income stream of households; therefore, it has negative relationship with the child labor.

Higher fertility and lower economic productivity in earlier stages of economic development can potentially contribute in extending the participation of child labor (Hazan and Binyamin, 2002). The rising productivity and resulting economic productivity can potentially reduce the extent of child labor due to rapidly increasing wage differentials the falling demand for child labor can potentially reduce fertility.

The association between rising per capita income and resulting per capita household expenditures has a significant effect on child labor in Vietnam (Edmonds, 2005). From 1993 to 1997, there was a visible decline of around 30 percent in the child labor and almost 80 percent of this variation is explained by the increased household expenditures. This findings establishes a strong association between economic growth and child labor in developing economies.

Improvement in the quality and access of schooling can significantly reduce the extent of child labor, however this depends on the nature of economic activity in which child is engaged (Hazarika and Bedi, 2003). This research probed the child's time allocation decision by using the Pakistani household data and reported that in case of contrary to the urban areas the rural Pakistan is relatively lesser responsive to alter the time allocation children in labor market even at lower cost of education.

Adult wages, the adult unemployment rate, and the size of informal economy are the important factor which determines the dynamics of child labor market in Pakistan (Fatima, 2017). By using the pseudo-panel approach, this paper has probed and highlighted numerous factors which are significantly contributing in child labor in Pakistan and suggested that any policy aiming to address the issue of child labor must also consider the dynamics of labor market.

IV. Empirical Model and Estimation Methodology

Basic model of the present study is composed by considering an economy of identical households with different wealth endowments; and their combined production is expressed as a single product, the GDP. Each household is comprised of one parent and one child and have two time periods: the first period is when parents decide the allocation of child's time and his/her future which represents the second period in the model of this study; parents have no role to play in the second period. The labor supply (by parents) is considered as inelastic and yields an exogenous income *Y*. Considering that parents, as head of the household, have preference over the family's existing living standard *X*, and future welfare of child *Wk*; following will be the utility function of parents:

$$U = u\,(X,\ Wk) \tag{1}$$

The time of child is allocated by parents between education acquisition *ET*, leisure and play *LP*, work outside the household *N*, and domestic work *D*; therefore the child will face the following constraint:

$$ET + LP + N + D = 1 \tag{2}$$

The standard of living is produced by homogenous production function and is derived from the purchased input *G* and the input of child's time *D*:

$$S = F(G, D) \tag{3}$$

whereas, the child's future welfare *Wk* depends on the positive, diminishing marginal product function:

$$W\text{k} = R\ (ET, LP) \tag{4}$$

here the time allocated is considered for education *ET*, and leisure and play *LP* which contribute positively in future welfare of the child. Parents incurring direct cost c for schooling is assumed to increase along-with the time spent in education. Therefore, we can consider that *cET*, is the direct schooling cost which represents the forgone consumption by the households. If child work outside the household, then he can contributes ω^*N earnings, in addition to the non-child income *Y*. This increase in income can positively influence the utility level of a household.

$$C = Y + \omega^*N - cET \tag{5}$$

In such an arrangement, the parent's problem is:

$$Max\ u\ (F\ (Y + \omega^*N\text{-}cET), R\ (ET, LP) \tag{6}$$

subject to:

$$ET + LP + N + D = 1; \tag{7}$$

where, theoretically the signs of slope coefficients are:

$$ET \geq 0, LP \geq 0, N \geq 0, D \geq 0.$$

To be more specific, parents optimize a separable utility function comprising of present and the future utility's discounted value by choice of his/her own earning *Y*, and contribution by the child ω^*N:

$$max\ U = Ut + \mu Ut + 1 \tag{8}$$

where, μ represents the discount factor.

If a child does not attend school, there may be the following possible explanation of the scenario:

$$\frac{\partial u}{\partial Wk}\ \frac{\partial R}{\partial ET} \leq \mu + \frac{\partial u}{\partial X}\ \frac{\partial F}{\partial G}\ c \tag{9}$$

It can be seen that parent's marginal utility from the foregone consumption due to child's cost of education and the discount factor μ is at least as large as the parent's marginal utility that come through improving child welfare by additional education. A second possible scenario is that, child is engaged in wage work and does not attend school if:

$$\frac{\partial u}{\partial Wk}\ \frac{\partial R}{\partial ET} \leq \mu + \frac{\partial u}{\partial X}\ \frac{\partial F}{\partial G}\ (\omega * + c) \tag{10}$$

and in such a situation, it can be said that due to child's contribution the standard of living of a household is at least, as large as the marginal utility from the return to education.

In order to derive expression for aggregate labor supply (comprised of adult and children), Basu and Van (1998) extends the following scenario for an employer:

$$\min\left[\omega, \frac{\omega*}{\gamma}\right]$$

where, $\gamma < 1$ and ω^* is the wage earned by child; ω represents the wage of adult worker, i.e., parents in this case. The employer will engage the adult worker only if $\omega > (\omega^*)/\gamma$ and child labor will be employed only if $\omega > (\omega^*)/\gamma$. If a employer engage an adult and a child worker, then the aggregate labor supply can be expressed as:

$$\text{Aggregate labor supply} = A + \gamma C \tag{11}$$

Being a signatory of the United Nations Convention on the rights of child, each Member State is committed to introduce the associated legislation to eliminate the child labor. The quality of institution plays imperative role in this regard, therefore modified equation of labor supply will be:

$$\text{Aggregate labor supply} = A + \gamma\,(C)\,(1/GV) \tag{12}$$

where, *GV* is a variable related to bureaucratic quality and the rule of law; higher the value of this variable lower will be the extent of child labor. As interest of this study is to investigate the important determinants of child labor and their impact on child labor in Pakistan, therefore the functional form will be as:

$$CHL = f\,(GPC, EDU, YD, GV) \tag{13}$$

where, *CHL* represents the measure of child labor participation rate (10-14 years old), *GPC* indicate GDP per capita (constant US$ 2005), *EDU* is an important variable which captures the impact of gross secondary enrolment (both male and female) in the model, *YD* is young dependency (population age 0-14 as a percentage of total), and variable *GV* is a composite variable of bureaucratic quality and the rule of law.

In order to estimate this functional form there is a need to estimate the following model:

$$CHL_t = \alpha_1 + \alpha_2\, GPC_t + \alpha_3\, EDU_t + \alpha_4\, YD_t + \alpha_5\, GV_t + \mu_t \tag{14}$$

Now, by using this model it can be estimated that the impact of various factors can influence the participation rate of child labor in case of Pakistan.

1. Data Sources and the Description of Variables

The variable of *CHL* represents the participation rate of children belonging to 10-14 year age group. The data is compiled from various issues of Labor Force Survey of Pakistan and the Economic Survey of Pakistan. Variable *GPC* represents the Gross per Capita income of Pakistan and the series is extracted from various issues of Economic Survey of Pakistan. The Annual enrolment rate in secondary education is expressed through the variable *EDU* and data of this variable is compiled from the World Development Indicators (WDI) and similar source is used to extract the data of young dependency on working population, expressed as *YD* in the model of this study. Variable *GV* represents the institutional quality in case of Pakistan which is generated from the six components (Investment Profile, Corruption, Law and Order, Government Stability, Democratic Accountability and the Bureaucratic Quality). The range of institutional quality index value is 1 to 12, where the value of one shows the lowest level of institutional quality and the maximum value of 12.

2. Methodology

In order to explore the robust empirical findings, the present study investigates the long-run and short-run dynamic relationships between the child labor and its determinants by using the Autoregressive Distributive Lag (ARDL) approach of cointegration for Pakistan economy.

For the sake of investigating long-run relationships among variables (*CHL*, *GPC*, *EDU*, *YD* and *GV*), the bounds testing procedure proposed by Pesaran and Shin (1999), and Pesaran, et al. (2001)] have been used. This practice is essentially required to test for existence of a linear long-run relationship. The method can be applied irrespective of whether the underling variables are stationary at level I(0), first difference I(1) or a combination of both. Additionally, error correction term can be easily derived from the simple linear transformation Banerjee, et al. (1993). Moreover, the other major advantage of the ARDL approach is that it can also be applied in those studies which have a small sample size, as in the case of this research study. This approach is superior to Johansen and Juselius' cointegration technique (in small sample) and provides the short-run adjustment without losing the long- run information [Pesaran and Shin (1999)].

The present research explores whether the above mentioned determinants has significant impact in case of Pakistan. To assess the impact of per capital income (*GPC*), education (*EDU*) and governance (*GV*); and the young dependency (*YD*) on child labor, the ARDL approach to cointegration of Equation (14) involves estimation of the following model:

$$\Delta CHL_t = \delta + \sum_{i=1}^{p} \psi_i \Delta CHL_{t-1} + \sum_{i=1}^{p} \phi_i \Delta GPC_{t-1} + \sum_{i=1}^{p} \varphi_i \Delta EDU_{t-1} + \sum_{i=1}^{p} \omega_i \Delta YD_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta GV_{t-1} + \lambda_1 CHL_{t-1} + \lambda_2 GPC_{t-1} + \lambda_3 EDU_{t-1} + \lambda_4 YD_{t-1} + \lambda_5 GV_{t-1} + \mu_t \quad (15)$$

while δ is drift component ut is the white noise residual and, Δ denotes the first difference operator; λ's is the long-run multiplier, whereas ψ, γ, ϕ, ω and φ are short-run dynamic coefficients. To find the long-run relationship among variables, the statistic underlying the ARDL procedure is the Wald or F-test, which can be used to test the significance of lagged levels of variables in a conditional unrestricted equilibrium correction model.

The ARDL approach is based on the Wald-test (F-statistic). Two critical values (lower and upper) are given by Pesaran, et al. (2001) for the cointegration test. When the calculated F-statistic is higher than the upper bound critical value the *H0* is rejected and variables are cointegrated. If estimated F-statistic is below the lower bound critical value, the *H0* cannot be rejected (there is no cointegration among variables). When the computed F-statistics falls between the lower and upper bounds, the results are inconclusive. The null hypothesis of non-existence of a stable long-run relation is rejected, if F-statistic for null hypothesis, *H0*: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0$, , is higher than the upper bound critical value. On the other hand, the alternative hypothesis *Ha*: $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 \neq 0$, is accepted if F-statistic is smaller than the lower bound critical values. When the long-run relationship exists among variables, then there is an error correction representation. Therefore, the following error correction model is estimated:

$$\Delta CHL_t = \delta + \sum_{i=1}^{p} \psi_i \Delta CHL_{t-1} + \sum_{i=1}^{p} \phi_i \Delta GPC_{t-1} + \sum_{i=1}^{p} \varphi_i \Delta EDU_{t-1} + \sum_{i=1}^{p} \omega_i \Delta YD_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta GV_{t-1} + \theta ETC_{t-1} + \mu_t \quad (16)$$

The error correction term (*ETC*) in the model indicates the speed of adjustment back to long-run equilibrium after a short-run shock. The significance of estimated F-statistics [Equation (16)] demonstrate the existence of short-run causal relationship between variables; while the significance of coefficient of ECT_{t-1} is based on t-statistics indicating the existence of a long-run causal relationship between variables. To ensure the goodness of fit of model, the diagnostic and stability tests are also conducted; the diagnostic test examine the serial correlation, functional form, normality and heteroscidasticity associated with the selected model. In order to select the optimal lag length for each variable, the ARDL approach estimates $(p+1)k$ is a number of regressions where p is the maximum number of lags and k is the number of variables in the model. The model is selected on the basis of Akaike's Information Criteria (AIC).

V. The Empirical Results

To examine the potential long-run relationship between child labor and its determinants, the ARDL cointegration approach is used. Prior to test the long-run co-integration relation, it is necessary to establish the order of integration among variables. As pointed by Ouattara (2004), in the presence of I(2) or the above variables, computed F-statistics

are not valid. For this reason, the Augmented Dickey Fuller (ADF) was carried out on time series at levels and difference forms of the variables. The results given in Table-3 shows that all underling variables are unit root at level, but however, all variables become stationary at I(1) variables.

TABLE 3

Test of the Unit Root Hypothesis

	Level		First Difference	
Variables	t-statistics	K	t-statistics	K
CHL	-1.39	0	-6.73*	0
GPC	-0.43	1	-3.43**	0
EDU	-0.34	1	-3.63**	0
AD	-1.08	0	-4.14*	0
GV	-1.98	1	-4.55*	0

Source: Authors' estimation.
Note: The optimal lags (k) for conducting the ADF test were determined by AIC (Akaike information criteria). **and *indicate significance at the 5% and 1% levels, respectively.

The Bound test or Wald test is applied to examine the existence of stable long-run relationship between child labor and its determinants. Table 4 reports the estimated F-statistic based on Wald test which is found to be 13.27 and is greater than the upper bound critical value at one per cent level (see, Pesaran, et al. (2001) and Narayan (2005)].[1] Thus, the null hypothesis of non-existence of a stable long-run relationship is rejected; empirical finding reveals that there is a strong evidence of a long-run relationship among the un-

TABLE 4

Bound Test

Test Statistic	Value	K
F-statistic	13.27	4
Critical Value Bounds		
Significance	I(0)	I(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Authors' estimation.

[1] The critical value bounds (with an unrestricted intercept and no trend; with six regressors k=6) are obtained from Pesaran, et al. (2001). Their values are 2.12-3.23 at 90%, 2.24-3.61 at 95%, and 3.15-4.43 at 99%. Narayan (2005) pointed out that the existing critical values reported in Pesaran, et al. (2001) are useful for large sample. However, that are not appropriate for small sample. Narayan (2005) estimates a set of critical values for sample sizes ranging from 30 to 80 observations. They are 2.353-3.599 at 90%, 2.797-4.211 at 95%, and 3.800-5.643 at 99%.

TABLE 5

ARDL Long Run Estimates

Dependent Variable=CHL		
Regressors	Estimated Coefficients	P-value
Constant	74.75*	0.002
GPC	-0.11**	0.021
EDU	-1.18**	0.025
YD	4.77**	0.019
GV	-3.87*	0.000
Diagnostic Tests		
Serial Correlation	1.02	
Heteroscedasticity	0.75	
Functional Form	0.84	
Normality	0.98	

Source: Authors' estimation.
Note: ** and * indicate significance at 5% and 1% levels, respectively.

derlying variables. The optimum order of ARDL was found to be (4, 4, 4, 4, 3) selected on the basis of Akaike Information Criteria (AIC).

Table-5 depicts the long-run estimates of ARDL procedure and the estimated model passes through the diagnostic tests of serial correlation, functional form specification, normality and heteroscedasticity. It is also visible that all determinants of child labor are inversely and significantly related to child labor.

The long-run coefficient of per capita income (GPC) suggests that one per cent increase in (GPC) yield decrease in child labor by 0.11 per cent. This implies that GPC is one of the important factors in the reduction of child labor. In this regard the findings of this study are aligned with the findings of Lim (2000) in the case of Philippines and Cameron (2002) in the case of Indonesia. This endorses the importance of growth oriented policies for increasing the per capita income and eventually leads to reduction of child labor in developing countries. The nations with higher per capita income have lower extent of child labor; and opposite is the case with nations having low per capita income. Similar findings are extended by Behrman, et al. (1999) for 18 Latin American and Caribbean countries, Skoufias and Parker (2001) for urban areas of Mexico.

The long run estimate of education (EDU) indicates that one per cent increase in EDU will decrease the CHL by 1.11 per cent. Similarly, long-run partial effect of the quality of governance (GV) exerts a negative and significant impact on CHL. Quality of institutions plays an imperative role in execution of short-run and long-run polices determining the impact of these policies. Aruga (1988), Basu (1999), and Shelburne (2001) highlighted the imperative role of institutional quality and the rule of law in effective enforcement of

TABLE 6

Error Correction Model(ECM) Estimates

Dependent Variable=ΔCHL		
Regressors	Estimated Coefficients	p-value
ΔCHL(-1)	1.12**	0.011
ΔCHL(-2)	-0.93*	0.009
ΔCHL(-3)	0.92*	0.003
ΔEDU	0.06	0.651
ΔEDU(-1)	-0.61	0.119
ΔEDU(-2)	-0.44**	0.023
ΔEDU(-3)	1.37**	0.012
ΔGPC	-0.05*	0.001
ΔGPC(-1)	-0.03*	0.031
ΔGPC(-2)	-0.12*	0.012
ΔGPC(-3)	0.06**	0.032
ΔYD	-3.06**	0.017
ΔYD(-1)	2.73	0.079
ΔYD(-2)	-1.33	0.231
ΔYD(-3)	10.13	0.116
ΔGV	-2.93*	0.006
ΔGV(-1)	-1.03*	0.011
ΔGV(-2)	0.61*	0.043
ETC(-1)	-0.37*	0.004

Source: Authors' estimation.
Note: ** and * indicate significance at the 5% and 1% levels, respectively.

regulations aiming to restrict the role of child labor in labor market. The negative and significant signs suggest that a positive change in GDP per capita, gross primary enrollment, and institutional quality will lead towards the reduction of child labor.

The developing nations with higher fertility and rapidly growing population are facing the problem of relatively higher economic dependency and contributing significantlyin increasing child labour. The positive and significant sign of young dependency (YD) suggest that higher dependency of young children contribute positively to increase the incidence of child labor in Pakistan. Similar trend is reported by Rosenzweig and Evanson (1977) in the case of rural India, and Levy (1985) in the case of Egypt. Brezis (2001) highlighted almost the same findings through the analysis of labor force engaged in English Cotton Industry.

Table 6 reports the short-run dynamics of the estimated ARDL model. The coefficient of error-correction term (ER) has correct sign (negative) which is statistically significant at one per cent. This suggests that the error-correction term (ETC) is valid but also that there is significant conservative force tendency to bring the model back into the equilibrium whenever it strays too far. The short-run estimates of ARDL procedure suggest that GPC and GV have significant effect on CHL in the case of Pakistan.

VI. Conclusion

Earlier exposure of children in labor market is an undesirable phenomenon which may result in poor development of human resources and may also result in intergenerational transmission of poverty. There are numerous macroeconomic variables which are having close association with the prevalence of child labor in developing nations like Pakistan. Most of polices aiming to reduce the extent of child participation in labor market are also falling under the jurisdiction of macroeconomics. For instance, there is a consensus among policy makers that public expenditures on health and education have significant impact on human capital development and hence on the reduction of child labor.

The other important findings of present study suggest that the fertility and population growth rates can blamed for higher dependency burden, lower investment in the development of human resources, and lower accumulation of household savings. The higher fertility rate and dependency ratio can potentially increase the probability withdrawal of children from schooling and engaging them into labor force. The dependency rate, particularly of youth, is positively linked with the children participation rate. Any policy aiming to reduce fertility rate and youth dependency will have significant impact on child labor.

Since, most of the developing countries are the signatory of United Nation's Conventions on the right of child and having legislations aiming to protect children from economic exploitations. The variation in children participation in economic activities in different developing countries can be explained through the quality of governance and rule of law. Even the developing nations with better bureaucratic quality and rule of law indicators are having lower extent of child labor as compare to the nations with lax institutional quality.

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