

COVID-19, Child Labour Incidence and Policy Responses: A Dynamic Trade Theoretic Analysis.

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Abstract

The present paper attempts to offer an analytical structure towards an understanding of the effects of COVID-19 pandemic on schooling, education and the incidence of child labour. The paper explores the social cost of the global outbreak and its consequences on various sectors. In doing so, we extend the Three-sector General Equilibrium model to incorporate the dynamics of a trade theoretic economy and derive a child's optimal time allocation in schooling and unskilled wage earning in the labour market from household's optimization of an intertemporal utility function. Three different cases pertaining to time allocation are obtained which crucially hinges on the level of education subsidy provided by the government. Our study considering the impact of the global outbreak has found that a fall in training cum recruitment cost in the skilled sector or an increase in education subsidy can lower the incidence of child labour.

JEL classification: I24, D5, C15, J78, J43, J46

Keywords: Child Labour, COVID-19 Pandemic, Public policy, Education.

Introduction and Motivation

The multifarious impact of COVID-19 has been observed in every sector around the world. We have witnessed a lot of shifts in different trends and the pandemic has also made us realize that changes are inevitable in nature.

The education and schooling sector has been hugely wedged by the pandemic, its insinuations and the reverberations. The outbreak of the virus has affected approximately 120 crore students across the world and around 32 crore students in India. Due to various restrictions like travelling and measures limiting community spread, the educational intuitions had been compelled to cancel normal classes and conduct classes through the online mode of communication.

Apart from education, the labour force has also been affected in innumerable ways. The detrimental effects of the pandemic were not distributed equally. They have mostly damaged the poor nations which were already in vulnerable conditions. Although in the last two decade there has been a noteworthy stride in the fight against child labour, the COVID-19 pandemic poses a real risk of backpedalling.

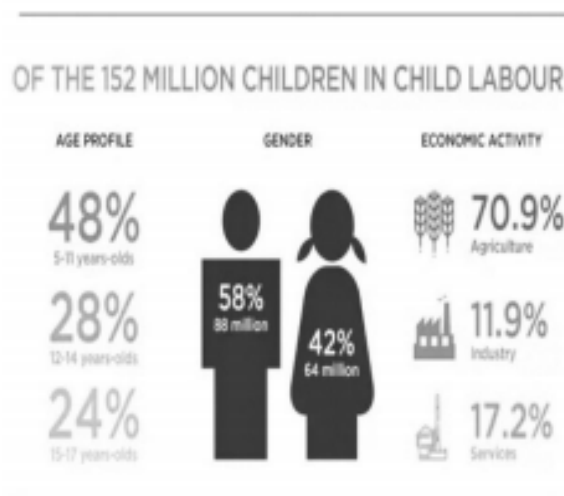


Figure 1, gives us a brief idea about the involvement of children in the labour force with respect to their age, gender and the sector in which they are involved. The COVID-19 pandemic has resulted in an economic downturn as a result of which positive trend may weaken and child

labour may worsen especially in developing countries. The pandemic has increased economic insecurity and many people lost their job due to disruption in the supply chain as a result of which the manufacturing

sector got halted. In India alone, COVID-19 is said to have left 120 million without employment as of May 2020.

The economic contraction due to COVID-19 has reduced opportunities in the labour market mainly for the people in the marginalized sector like migrant labourers. As a result of this parents from these marginalized societies are forced to push children into hazardous and exploitive work so they can contribute to household incomes.

Table 1: Children engaged in child labour across the world

Region	Number of Child Labourers (million)	Regional Prevalence of Child Labour (%)
Africa	72.1	19.6
Asia and the Pacific	62.1	7.4
Americas	10.7	5.3
Arab States	1.2	2.9
Europe and Central Asia	5.5	4.1

Source - ILO

From the table, we can see there are around 152 million children engaged in child labour, where the highest value of child labour engagement can be seen in the African regions and least value of child labour is evident in European and Central Asian regions. Most of the child labour engagement can be found in the agricultural sector or in a hazardous sector such as mining and construction.

In India, we can observe from the census data of 2011, that 10.1 million children are engaged in child labour. Uttar Pradesh, Bihar, Rajasthan, Maharashtra, and Madhya Pradesh witness relatively higher number of cases regarding child labour.

The root cause of child labour is poverty and lack of access to decent working prospects. On top of these factors, social marginalization and lack of formal as well as vocational education often force underaged minors to work in unwanted conditions where they are mostly exploited. According to the World Bank,

there is a chance of 12 million people slipping below the poverty line due to pandemic related job loss. Now, various researches have shown that poverty is co related to child labour, it has indicated that a certain point percentage change in poverty can cause an increase in child labour around 0.7%. The return of migrant labourer in their respective village communities has also led to deterioration in the labour force supply in the cities, mainly the sectors such as agriculture, construction which heavily rely on migrant labourers are the worst affected. The parents from marginalized sections are forced to send their children to be employed in the workforce which can result in exploitation, In such cases the employer can hire them at a less cost as children's have less bargaining powers and are unable to press for their rights.

A study by the International Labour Organization shows that the children who are not a part of the education system have been more vulnerable to this threat. The International Labour Organization has also formulated a special policy framework as a responsive measure for the pandemic. The policy comes with an objective to primarily stimulate economy and employment, support enterprises, jobs and income. Protection of workers in workplace is the key measure and it also aims to rely on social dialogues for solutions.

UNICEF's agenda to tackle the pandemic and is also praiseworthy. Some of its aims are to keep children well nourished, reach out to vulnerable children with basic amenities, stimulate the learning process of children, providing provisions to families in order fulfil their needs and take care of minors, protect them from violence and most importantly, protect refugee as well as migrant children and the ones affected by the consequences of the global outbreak.

We investigate the data collected from World Bank, ILO and various other sources to identify the relation between Poverty rate and Child Labour across various countries. It helps us to establish the background for our research by incorporating the idea of "Poverty Hypothesis" in our research paper.

The method involves, representation of the latest data for Poverty rate and Child Labour for 18 different countries in form of a X, Y Scatter Graph.

Table 1 describes the percentage of child labour and poverty for different low and middle income countries obtained from the World Bank data, ILO and few other sources. Using the data in table 1 we obtain the average rate of child labour and poverty to be 19.9 per cent and 34.2 per cent respectively.

The following matrix is intended to show the cross-sectional variation of child labour and poverty for the countries listed in table 1.

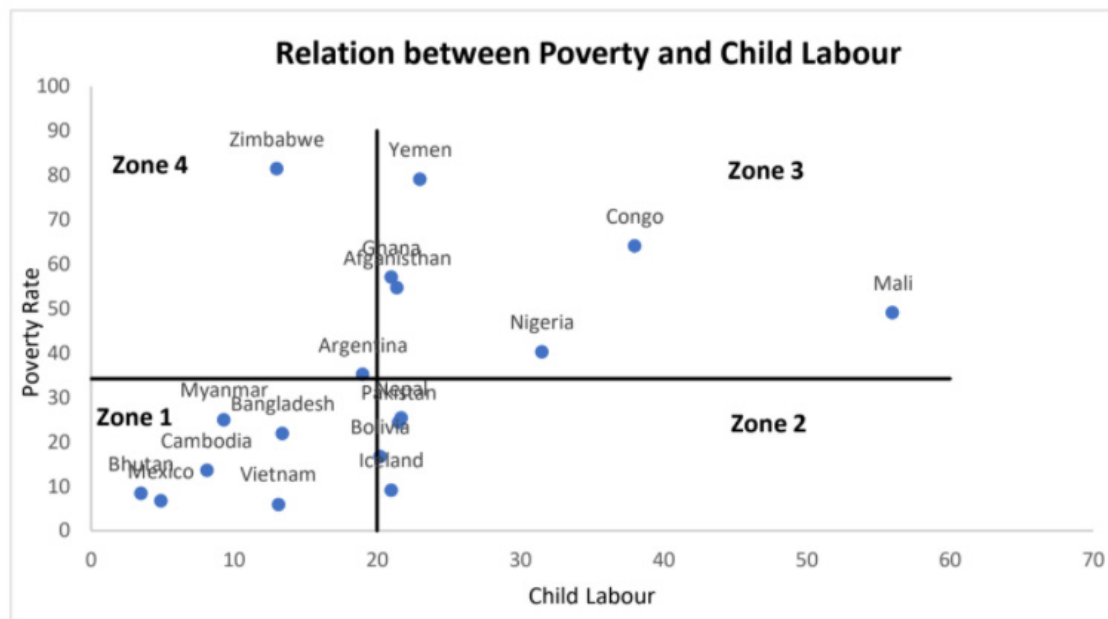


Figure 3 - Source: Self computation using data from World Bank, ILO and various other sources

In Fig. (3), along the horizontal axis percentage share of child labour is measured while along the vertical axis poverty rate is measured. The solid vertical line originating from the horizontal axis shows the average share of percentage of child labour and the solid horizontal line originating from the vertical axis shows the average rate of poverty. These average level divides the box into four different zones. The four different zones, zone 1-zone 4 represents the zone with (lower child labour, lower poverty), (higher child labour, lower poverty), (higher child labour, higher poverty) and (lower child labour, higher poverty), respectively. Zone 1 and Zone 3 follows Poverty hypothesis i.e. child labour varies positively with poverty rate while Zone 2 and Zone 4 violates the poverty hypothesis. From Fig. (1) we observe that most countries are concentrated either in Zone 1 or Zone 3 with an exception of Zimbabwe in Zone 4 and Iceland and Bolivia in Zone 2. The concentration of most countries in zone 1 and zone 3 clearly validates the poverty hypothesis for cross-sectional variation among middle- and low income countries.

Review of Literature

Poverty as the primary cause behind the emergence of the problem of working children from poor and unskilled households was explored in the seminal work by Basu and Van (1998). Basu, Das and Dutta (2009) had shown labour market imperfection as an additional source behind the emergence of the incidence of child labour. Other relevant literature which found poverty hypothesis or wealth effect as cause behind child labour includes Basu (1999), Ray (2000), Basu and Tzannatos (2003), Emerson & Souza (2003), Krueger (1996), Edmonds and Pavenik (2005) etc. among many others. Dwibedi and Marjit (2017) explained the wealth paradox and provided a theoretical exposure based on two axioms of "inequality lowers welfare" and "inequality improves relative-status" which affects child labour supply decision. Dwibedi and Chaudhuri (2014) had analysed the failure of price subsidy policy to the backward agriculture that fails to lower the incidence of child labour. Jafarey and Lahiri (2002) obtained that credit (borrowing) constraint hinders the way of trade sanction to curb the incidence of child labour. If borrowing constraint is relaxed then trade sanctions may produce favourable outcomes.

Derivation of Child Labour Supply Function

In this model we attempt to provide a multi-sectoral dynamic trade-theoretical model to analyse the effect of COVID-19 policy responses on the incidence of child labour, school dropout rate and skill acquisition. Further, we also propose some alternative policy measure which could reduce the incidence of child labour and increase the rate of schooling. In so doing, we first derive endogenously the optimal time allocation of child's time in schooling and in labour market activities. This is an intertemporal decision-making problem where a poor unskilled family faces a trade-off in terms of present gain from engaging the child in unskilled labour intensive work which increases family's present level of consumption, and present discounted value of future skilled earning from schooling which increases future period consumption level. The family while optimally choosing the time allocation for the child takes market unskilled adult wage rate, child wage rate and skilled wage rate as datum which are determined from the competitive general equilibrium system.

The stylized economy consists of three sectors. In the first hand we have the agriculture sector which uses unskilled informal adult labour and child labour who are employed at wage rate W and W_c . Secondly, we have the high skilled export sector uses skilled labour who are employed at wage rate W_s and capital k . Finally, we have the manufacturing sector which is an import competing sector employs unskilled formal labour at wage rate $\bar{W}$ which is institutionally fixed and also uses capital k . Capital earns homogenous return ' r ' across sectors. Unemployment of skilled labour exists in formal manufacturing sector; however, no open unemployment exists.

We have divided one day's time into two equal halves each half consisting of twelve hours. Thus, time dynamic in our model is not only limited to two discrete period analysis but also two-time period in each day. Skilled sector exploits this time zone difference to function and produce output for entire hours in each day by outsourcing its services during night hours. This outsourcing encounters a fixed technological cost.

In this two-period optimization framework the representative households are altruistic decision makers. Let there are 'n' number of homogenous households. Each household maximizes their utility which is a function of consumption in two periods and is represented by

$$U = \log C_t + \beta \log C_{t+1} \quad (1)$$

In period 1 the household consumption is denoted by C_t . Let if l_c be the time allocation of the child in school or work. If b is the amount which the child is losing for engagement in schooling by not going to work and s is the subsidy on the education. Given that income is entirely exhausted in consumption, thus, in period 1 consumption is given by

$$C_t = (W + l_c W_c) - b l_c + s l_c \quad (2)$$

The first period income consists of income from unskilled work ($W + l_c W_c$), income from subsidy provided for education ($s l_c$) net of cost of education ($b l_c$). 2 The direct cost of education is b and the rate of subsidy is s .

In period 2, the consumption is given by

$$C_{t+1} = [l_c W + (1 - l_c) W_s] \quad (3)$$

In the second period, the child acquires skill for the time spent in schooling in period 1 and earns higher skilled wage in period 2 $(1 - l_c) W_s$. However, for the time which was spent in doing unskilled work in period 1 earns the same unskilled wage rate in period 2. Finally, we normalize the total time of the child to unity. Thus, the time distribution is given by

$$l_c^u + l_c^s = 1 \quad (4)$$

Households maximize their utility (eq. 1) subject to the constraints in (eq. 2, eq. 3 and eq. 4).
The household's problem can be stated as

$$\begin{aligned} \text{Max } U &= \log C_t + \log C_{t+1} \\ \text{Subject to, } C_t &= (W + l_c W_c) - b l_c + s l_c \\ C_{t+1} &= [l_c W + (1 - l_c) W_s] \\ l_c^u + l_c^s &= 1 \end{aligned}$$

The optimization yields child labour supply function,

$$\begin{aligned} L_c &= \bar{L} l_c(W, W_s, s, b) \quad (5) \\ l_c^u &= 1 - l_c^s \end{aligned}$$

The optimization yields an interior solution, however, there are three different cases where the household can allocate the child completely in education, or completely doing unskilled work, and/or both which crucially hinges on fulfilment of certain sufficient condition corresponding to specific rate of education subsidies.

There arise three different situations that are represented by the following lemmas.

Due to COVID-19 the economic contraction in various sectors has pushed many families into severe poverty because of which they were forced to push their children into labour works. Now even if the situation improves and the government provides a certain level of subsidy there is less chance the family will send their children to education.

No education and only work:

Lemma 1: $l_c^* = 1$ when $W + b - s_1 \geq \beta(W_s - W)$

Households would not at all be interested in education of child provided if the net opportunity cost of education is higher than the discounted gain from schooling. Lemma 1 holds under the above sufficient condition even without strict inequality. Thus $s_1 = W + b - \beta(W_s - W)$ is the critical subsidy level below which there will be no incentive for child's education.

This is the situation in which the child attends for schools and does not participate in any wage-earning activities.

Only education and no child labour:

Lemma 2: $l_c^* = 0$, when $\frac{\beta(W_s - W)}{W} = s_2 - b - W$

Lemma 2 can be interpreted as household would prefer the child to spend complete time in schooling if there is parity between the future discounted relative gain from schooling and present value of subsidy net of opportunity cost. In other words, the subsidy must be in excess to opportunity cost of education by the magnitude equivalent to future discounted gain from schooling.

The subsidy level s_2 that is required to achieve $l_c^* = 0$ is given by

$$s_2 = (b + W) + \frac{\beta(W_s - W)}{W}$$

This subsidy (s_2) includes the cost of education that includes both direct cost of schooling (b) and opportunity cost (W), and the relative discounted gain from schooling. Subsidies provided by either Government or various organization covers only the direct cost of schooling, however, our analysis brings out that it must include the other parameters as well.

In this circumstance, child allocates the time in skilling by attending school and also engaged in wage earning activities to supplement family consumption. This is the most observed scenario for most unskilled families in developing nations.

Both education and child labour (intermediate case):

Lemma 3: $0 < l_c < 1$ when $\beta(W_s - W) > (W_s + b - s^*)$

It explains that the discounted gain from schooling is higher than the opportunity cost net of subsidy, thus acting as participatory constraint.

The subsidy level that corresponds to the interior solution for l_c^* is given by s^* ,

$$w + b - \beta(W_s - W) < s^* < (b + W) + \frac{\beta(W_s - W)}{W}$$

Thus, the child education that corresponds to different subsidy levels is given by,

$$l_c^* = \begin{cases} 0 & \text{if } s^* < s_1 = W + b - \beta(W_s - W) \\ (0,1) & \text{if } s_1 < s^* < s_2 = (b + W) + \frac{\beta(W_s - W)}{W} \\ 1 & \text{if } s^* > s_2 \end{cases}$$

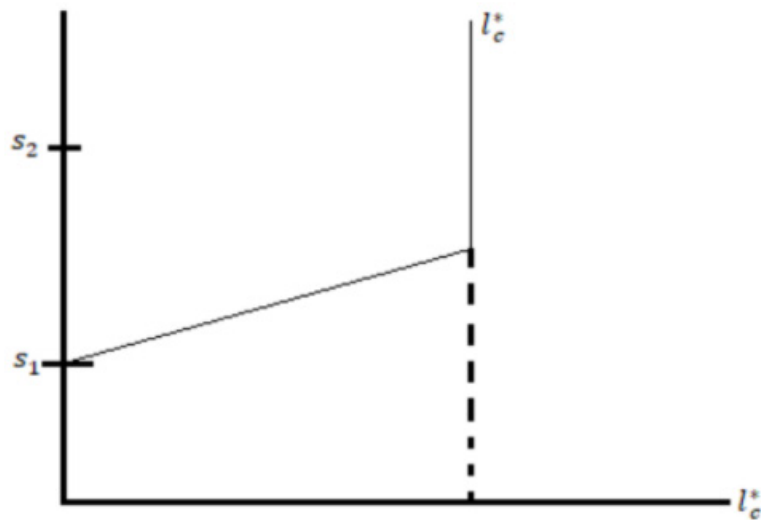


Figure 4. – Source: Self estimated

Figure 4 summarizes all the three lemmas. It plots the relationship between subsidies and child labour supply. If subsidy is below s_1 , this will be insufficient to generate any incentive for child schooling, thus l_c^* is vertical up to s_1 at the origin. Subsidies higher than s_1 but lower than s_2 is sufficient for child participation in education although not complete level of education is attained. A subsidy s_2 leads to a corner solution where household of the child prefers to have complete education. Under these conditions and increase in education subsidy targeted towards child schooling may be completely ineffective or partially effective accordingly $s < s_1$ or $s \in (s_1, s_2)$. .

The General Equilibrium analogue

We construct a three sector- four factor competitive model, motivated by the work of Jones (1965) and Jones (1971). This is a small, open and a developing economy with a non-traded informal sector. Sector X is an informal export competing agriculture sector which consists of unskilled adult labour and child who are employed at wage rate W and W_c . Sector Y is the high skilled export competing sector which consists of skilled labour who are employed at wage rate W_s and uses capital k . Sector Z is an import competing manufacturing sector which use adult labour and capital 'k' and the wage rate is $\bar{W}$ which is institutionally determined.

The prices of the traded sectors are internationally determined and the price of non-traded sector is determined in the domestic market, the demand for which comes from the expenditure of the skilled male and skilled female labour. All factors earn competitive return, however, the returns to capital are determined in the international capital market which this small open economy takes as datum.

The representative economy is given by the following set of equations:

$$W a_{LX} + W_c a_{cX} = P_X \quad (7)$$

$$W_s(1 + \rho)a_{sY} + r a_{kY} = P_Y \quad (8)$$

$$\bar{W} a_{LZ} + r a_{kZ} = P_Z \quad (9)$$

$$a_{LX}X + a_{LZ}Z = \bar{L} \quad (10)$$

$$a_{cX}X = \bar{L}_c(W, W_s, W_c) \quad (11)$$

$$a_{kY}Y + a_{kZ}Z = \bar{K} \quad (12)$$

$$a_{sY}Y = \bar{S} \quad (13)$$

This is a non-decomposable structure. Constant Returns to Scale and zero profit condition hold across all sectors in both commodity and factor market. From equation 9 the value of r is determined. Once r is determined, from equation 8 the value of W_s is determined. Solving simultaneously equation (7) and equations (10)–(13) we solve for W , W_c , X , Y and Z . This completes the determination of general equilibrium values of variables in the model.

Investment uncertainty due to COVID-19

Investment uncertainty leads to contraction in domestic capital formation which causes stock of capital in the economy to plummet, the outputs of High-skilled export sector (Sector Y) and Import competing manufacturing sector (Sector Z) contracts, respectively owing to fall in capital. This leads to an outflow of labour force from Sector Y which gets absorbed in the Informal Sector (Sector X). Labour supply in sector X increases which causes unskilled adult wage rate to plummet. Sector X expands owing to inflow of labour from sector Y , thus, the expanding sector X demand more child labour which causes child wage rate to accentuate. The fall in unskilled adult labour wage causes child labour supply to increase owing to the poverty-hypothesis, and an increase in child wage rate further escalates child labour supply owing to positive income effect. The following proposition is immediate.

Proposition 1:

Effect of pandemic in terms of fall in domestic investment accentuates aggregate child labour supply due to fall in family income of unskilled poor families. As the government reduces the formal unskilled formal labour wage in sector Z , it follows from equation 8 that to maintain price-average cost parity condition the return-on-investment rises. An increase in cost of capital in the high-skilled sector Y causes it to contract in terms of output. The contracting sector Y lowers the demand for skilled workers, thus causing skilled wage rate to fall (eq.7). The fall in skilled wage rate lowers the discounted present value of education for the child labour supplying family, thus supply of child labour increases while child schooling falls. The above discussion leads to the following two propositions.

Proposition 2:

Consider the effect of fall in training cost which enters into the high skilled import competing sector Y and import competing sector Z which causes expansion in both the sector. Since W is determined in eq. 7, thus adult unskilled wage rate remains unchanged. However, demand for skilled labour increases in sector 2 which accentuates the skilled wage rate. Now an increase in subsidy for children education can also be a corrective alternate policy for promoting child education and lowering the incidence of child labour.

Proposition 3:

A fall in training cum recruitment cost in the skilled sector or an increase in education subsidy could be alternative corrective policy which can lower the incidence of child labour.

Conclusion

The multifarious impact of COVID-19 has been observed in every sector around the world. The pandemic has increased economic insecurity, disrupted supply chains and halted manufacturing of essential commodities. Along with various other sectors, the education and schooling sector has been hugely wedged by the pandemic, its insinuations and reverberations. The school dropout rates have increased due to complications of the new-normal method of education and lack of availability of essential resources. This has further resulted in increased engagement of children in informal labour force. Our research shows that the effect of pandemic in terms of fall in domestic investment leads to a rise in aggregate child labour supply due to fall in household income of unskilled and poor families. Our findings provide enough evidence to state that government's policy response to COVID-19 disaster in terms of labour market reforms may aggregate the problem of child labour as the prime focus has been on relaxing labour laws to increase inflow of foreign investment in these unprecedented times. Finally we suggest that, a fall in training cum recruitment cost in the skilled sector or an increase in education subsidy could be alternative corrective policy which can lower the incidence of child labour.

References

- I. Basu, Kaushik. March 2000. "The Intriguing Relation Between Adult Minimum Wage and Child Labour." The Economic Journal Volume 110, Issue 462, Pages C50– C61.
- II. Jayanta Kumar Dwibedi & Sarbajit Chaudhuri. July 14, 2007. "Globalization, Consumerism and Child Labour." SSRN.
- III. Sarbajit Chaudhuri & Jayanta Kumar Dwibedi. 2016. "The economics of child labour in the era of globalization: policy issues." The economics of child labour in the era of globalization: policy issues. Taylor & Francis.
- IV. D. Dasgupta & M. Rajeev, 2020. "Paradox of a Supply Constrained Keynesian Equilibrium." Economic & Political Weekly 55(22), 23.
- V. S. Mahendra Dev & Rajeswari Sengupta. April 2020. "Covid-19: Impact on the Indian Economy." Indira Gandhi Institute of Development Research, Mumbai.
- VI. Kaushik Basu & Pham Hoang Van, June 1998. "The Economics of Child Labor." The American Economic Review pg. 412–427.
- VII. Martin Ravallion & Quentin Wodon, 2000. "Does Child Labour Displace Schooling? Evidence on Behavioural Responses to an Enrollment Subsidy." The economic journal 110(462), 158–175.

Appendix

$$\text{Max } U = C_t + C_{t+1} \quad (1)$$

Subject to,

$$C_t = (W + l_c W_c) - bl_c + sl_c \quad (2)$$

$$C_{t+1} = [l_c W + (1 - l_c)W_s] \quad (3)$$

$$l_c^u + l_c^s = 1 \quad (4)$$

Using eq. (4), (2) & (3) boils down to

$$C_t = (W + l_c W_c) - bl_c + sl_c$$

$$\therefore C_t = W + l_c(W_c - b + s) \quad (2.1)$$

$$C_{t+1} = [l_c W + (1 - l_c)W_s]$$

$$\therefore C_{t+1} = l_c(W - W_s) + W_s \quad (3.1)$$

Substituting eq. (2.1) & eq. (3.1) in U we get

$$U = \log[W + l_c(W_c - b + s)] + \log[l_c(W - W_s) + W_s]$$

To obtain an interior solution the F.O.C. is given by,

$$\frac{dU}{dl_c} = 0$$

$$\Rightarrow \frac{1 \times (W_c - b + s)}{W + l_c(W_c - b + s)} + \frac{(W - W_s) + W_s}{l_c(W - W_s) + W_s} = 0$$

$$l_c^{s*} = \frac{W_s(b + W - W_c - s) - W^2}{2(W - W_s)(W_c - b + s)} \quad (5)$$

$$l_c^{u*} = 1 - l_c^{s*}$$

Table 1: Source – Self computed using data from ILO, World Bank and other sources

Country	Child Labour (%)	Poverty (%)
Afghanistan	21.4	54.5
Argentina	19	35
Bangladesh	13.4	21.8
Bhutan	3.5	8.2
Bolivia	20.2	16.6
Cambodia	8.1	13.5
Congo	38	63.9
Ghana	21	56.9
Iceland	21	9
Mali	56	49
Mexico	4.9	6.6
Myanmar	9.3	24.8
Nepal	21.7	25.2
Nigeria	31.5	40.1
Pakistan	21.5	24.3
Vietnam	13.1	5.8
Yemen	23	79
Zimbabwe	13	81.3
Mean	19.97777778	34.19444444