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An Econometric Analysis Of Child Labor In India

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Abstract

This study investigates the factors compelling parents to involve their children in economic activities. The research utilizes cross-sectional data from the Indian Household Development Survey (IHDS) 2011–12, employing a binary choice model to analyse the determinants of child labor. The econometric results reveal that the household head's education level, average income, and wage rates negatively correlate with child labor. In contrast, family size and the child's age exhibit a positive correlation. The findings underscore the importance of parental education for children's future. Policy recommendations include enhancing educational facilities for lower-income families and establishing skill development centres in rural and urban areas to equip economically disadvantaged individuals with employable skills.

Keywords: Child labour, education, poverty, binary choice model, household characteristics, India

JEL Classification: J13, J22, I25, D13

1. Introduction

1.1 Definition and Scope

Child labour, as defined by the International Labour Organization (ILO), refers to work that deprives children of their childhood, potential, and dignity, adversely affecting their physical and mental development. While some light work is considered acceptable, child labor typically encompasses exploitative practices.

1.2 Determinants of Child Labor

a. **Poverty and Income Constraints** Basu and Van (1998) introduced the "Luxury Axiom," which posits that child labor arises from household poverty. Empirical studies highlight a strong link between low household income, lack of credit access, and higher child labour rates.

b. **Education Access and Costs** The high costs and poor quality of education reduce the opportunity cost compared to child labor. In rural areas, inadequate infrastructure exacerbates this issue.

c. **Cultural and Social Norms** Societal acceptance of child labor, particularly in agrarian and informal sectors, perpetuates the practice. Gender disparities are prevalent, with boys engaging in manual labor and girls in domestic tasks.

d. **Economic Structure** Economies reliant on agriculture and informal sectors tend to have higher child labor rates. For instance, Edmonds and Pavcnik (2005) found that trade liberalization's impact on child labor varies depending on household dynamics.

1.3 Economic Impacts of Child Labor

a. **On Households** Although child labor contributes to household income, it perpetuates cycles of poverty by limiting children's educational attainment and future earning potential.

b. **On National Economies** A workforce dominated by low-skilled labor hinders long-term economic growth. Regions with high child labor rates face reputational risks in global trade.

c. **On Global Supply Chains** Child labor is prevalent in textiles, agriculture, and mining, posing ethical and economic challenges for multinational corporations.

1.4 Conceptualizing Child and Child Labour The term "child" is context-dependent. According to UNICEF (1994), a child is an individual under 18. Child labour, defined by UNICEF and ILO, encompasses work depriving children of education, health, and overall well-being. In India, a child is legally defined as anyone aged 0–14 years, with multiple legislations outlining varying age thresholds for labor.

1.5 Demand and Supply Factors of Child Labor

India hosts the most significant number of child labourers globally, driven by complex socio-economic and cultural factors, including poverty, caste-based discrimination, illiteracy, and inadequate law enforcement. These causes intertwine with broader issues such as globalization and regional inequalities.

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2. Literature Review

Parental education significantly influences child labor. Sakamoto (2006) and Khan (2003) found that educated parents are less likely to send their children to work. Similarly, family income and size are critical determinants. Larger households are associated with higher child labor rates due to economic pressures (Akarro & Mtweve, 2011). Empirical studies also underscore the role of public spending on education in reducing child labour (Gunnarsson et al., 2006).

Ray (2000) used data from Peru and Pakistan to show that poverty and income inequality are significant drivers of child labor. Economic shocks further exacerbate this issue by compelling households to prioritize income over education. Edmonds and Turk (2004) demonstrated that rising household incomes in Vietnam led to decreased child labor due to improved school enrolment rates.

Krueger (1996) highlighted that indirect schooling costs, such as transportation and uniforms, discourage enrolment, increasing child labour rates. Additional studies, such as those by Abrar and Ghouri (2010), emphasize the socioeconomic dimensions of child labor, including how larger family sizes often lead to higher incidences of child labor as families struggle to meet basic needs.

Ponczek and Souza (2007) revealed that larger family sizes and economic pressures often force children into labor. They observed gendered trends in child labor, where boys tend to work in manual labor sectors and girls in domestic tasks, reinforcing existing societal norms. Gunnarsson et al. (2006) further elaborated on the negative impact of inadequate public education funding on reducing child labor.

Skyt (2002) examined the microeconomic factors influencing rural child labor in India, identifying a strong correlation between agricultural dependence and child work prevalence. Similarly, Ahmed (1999) focused on eliminating child labor through legislative reforms and public awareness campaigns, emphasizing the role of grassroots-level education initiatives.

Abrar et al. (2010) demonstrated that urban markets often attract child labourers due to inadequate enforcement of labor laws. Bar and Basu (2009) analyzed long-term strategies to alleviate child labor, focusing on land redistribution and improved access to microcredit facilities for impoverished households.

3. Objectives of the Study

The study aims to:

1. Examine the relationship between family income and child labor.
2. Assess the impact of parental education on child labor.
3. Analyse how family size influences child labor.
4. Investigate the role of a child's age in determining child labor.
5. Evaluate the effects of government-provided incentives such as free books, uniforms, and scholarships on child labor.
6. Explore the influence of caste and religion on child labor.

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4. Data and Methodology

4.1 Data Description

The analysis utilizes IHDS (2011–12) data, defining child labor as children aged 5–14 years not attending school. The dependent variable is child literacy, while independent variables include household income, parental education, family size, caste, religion, and government incentives.

4.2 Analytical Technique

A logistic regression model is employed due to the binary nature of the dependent variable. The model assesses how household characteristics influence the likelihood of children attending school versus engaging in labor.

Methodology

Analytical Technique

Parents decide about their children's future by allocating it to two activities.
Child going to school: This is a self-explanatory work performed by a child, and he/she is found not working for any form of wage. Besides school, the child is also said to perform some domestic work (work related to his own home), and this type of work is not considered child labor. So, children who do full-time study and some domestic work are called students.
A child going to work: Children who go to work and get some wage in response or work at some family business are included in the definition of child labor
Logistic Regression- I used logistic repression for the analysis because the dependent variable is a binary outcome.

Empirical technique: Certain variables are taken into account to determine the determinants of child labor. These variables include child age, head of the household education (father, mother, uncle, brother, and grandfather), household income (all income sources and employment status of the parents), and family size.
The logit model equation in this will become:

Based on these considerations, we define a binary variable y that takes values

Y = 1, if a child is going to school
= 0, a child is working

This binary variable is then regressed on a set of explanatory variables that include various individual and household characteristics. Since the dependent variable is binary, we cannot estimate the coefficients using the least squares method. Instead, the maximum likelihood

estimation technique has been used to calculate the coefficients. The issues involved in the specification and estimation of these models are discussed at length in Johnston (1984), Amemia (1985), Kmenta (1985)

Logistic regression					Number of obs	=	29811
LR chi2(24)						=	3720.62
			Prob >		chi2	=	0.0000
Log likelihood	=	-6685.1633	Pseudo		R2	=	0.2177

Child literacy	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
eduadlt	.2018972	.0178449	11.31	0.000	.1669219	.2368726
COPC	.000011	2.60e-06	4.25	0.000	5.94e-06	.0000161
PERSONS	-.0174546	.0176405	-0.99	0.322	-.0520293	.0171201
INCOMEPC	9.21e-07	2.76e-06	0.33	0.739	-4.50e-06	6.34e-06
FHEADAGE	-.0297065	.0075272	-3.95	0.000	-.0444595	-.0149536
MHEADAGE	.024078	.0071184	3.38	0.001	.0101261	.0380298
NCHILDF	-.0599836	.0289276	-2.07	0.038	-.1166805	-.0032866
NCHILDM	-.1083832	.0320125	-3.39	0.001	-.1711265	-.0456398
Facebook	-.0501726	.0684657	-0.73	0.464	-.1843628	.0840177
freeuniform	.1899881	.0595679	3.19	0.001	.0732373	.306739
freeschoolfee	-.1364649	.0581955	-2.34	0.019	-.250526	-.0224038
Scholarship	.000467	.0001455	3.21	0.001	.0001817	.0007523
pvtschoolfee	.000042	.0000115	3.66	0.000	.0000196	.0000645
Householdpercap	0	(omitted)				
duch	-.1146627	.1354773	-0.85	0.397	-.3801933	.150868
dobc	-.0182792	.0660201	-0.28	0.782	-.1476762	.1111179
dsc	-.0846844	.0788	-1.07	0.283	-.2391295	.0697607
dst	-.3116686	.0969919	-3.21	0.001	-.5017693	-.1215679
dosgr	0	(omitted)				
dhindu	-.7275911	.3012799	-2.42	0.016	-1.318089	-.1370934
dmuslim	-.8634585	.3084998	-2.80	0.005	-1.468107	-.25881
dchrstn	-.529718	.3502711	-1.51	0.130	-1.216237	.1568007
dsikh	.5236704	.3947478	1.33	0.185	-.2500211	1.297362
djain	-1.11687	.7022263	-1.59	0.112	-2.493208	.2594684
during	0	(omitted)				
wage	1.19e-07	3.61e-07	0.33	0.742	-5.89e-07	8.26e-07
age	.5115883	.0116875	43.77	0.000	.4886812	.5344955
_cons	-1.568749	.3443595	-4.56	0.000	-2.243681	-.893817

Coefficient Interpretation of Logistic Model-

Suppose the e-education of adults in households increases from primary to secondary. In that case, there will be a higher likelihood of children going to school than children who go to work. If the number of people in the household increases by one person, then there will be less likelihood that the child will go to school than the child who will go to work or is more likely to go to work. There will be fewer chances that OBC, ST, and SC will go to school compared to the General caste. In the case of adult education, Income per capita, household expenditure per capita, male head age, free uniform, scholarship, Sikh, wage, and age, the child will be more

likely to go to school in comparison to a child who is going to work. If the age of the Female head, no of persons, no of children increases, then there will be fewer chances that a child will go to school compared to the child going to work.

Logistic Regression: Marginal Effect

y = Pr(Childliteracy) (predict)

= .9645301

Marginal effects after logit

y = Pr(Childliteracy) (predict)
= .96453013

variable	dy/dx	Std. Err.	z	P>|z|	[95 %	C.I.]	X
adult	.0069073	.00063	10.90	0.000	.005666	.008149	3.52403
CO	3.77e-07	.00000	4.26	0.000	2.0e-07	5.5e-07	20447.2
PC	.0005972	.0006	-0.99	0.323	-.001782	.000587	6.41193
NPERS	3.15e-08	.00000	0.33	0.739	-1.5e-07	2.2e-07	20507.2
ONS	-.0010163	.00026	-3.94	0.000	-.001522	-.00051	40.0957
INCOM	.0008237	.00024	3.37	0.001	.000345	.001302	45.2498
EPC	-.0020521	.00099	-2.07	0.038	-.003991	-.000113	1.37
FHEAD	-.003708	.0011	-3.39	0.001	-.005855	-.001561	1.44876
AGE	-.0017116	.00233	-0.73	0.462	-.006276	.002853	.563316
MHEA	.0063265	.00194	3.25	0.001	.002516	.010137	.340277
DAGE	-.0047387	.00206	-2.30	0.021	.008771	-.000706	.387374
NCHIL	.000016	.00000	3.21	0.001	6.2e-06	.000026	90.403
DF	1.44e-06	.00000	3.67	0.000	6.7e-07	2.2e-06	1819.21
NCHIL	-.0041192	.00511	-0.81	0.420	-.014129	.00589	.044681
DM	-.0006262	.00226	-0.28	0.782	-.005064	.003812	.425648
Freebook	-.0029623	.00282	-1.05	0.293	-.008488	.002563	.220254
*	-.012046	.00422	-2.85	0.004	-.020327	-.003765	.087451
freeun~m	-.0208028	.00724	-2.87	0.004	-.034985	-.006621	.790312
*	-.0396965	.0186	-2.13	0.033	-.076161	-.003232	.155412
freesc~e*	-.0230748	.01903	-1.21	0.225	-.060368	.014218	.021804
Schola~p	.0142993	.00843	1.70	0.090	-.002228	.030827	.021066
pvtsch~e	.0654247	.06358	-1.03	0.303	-.19004	.05919	.001778
duch*	4.06e-09	.00000	0.33	0.742	-2.0e-08	2.8e-08	126576
dobc*	.0175023	.00044	39.78	0.000	.01664	.018365	9.81611
dsc* dst*							
dhindu*							
dmuslim							
*							
dchrstn*							
dsikh*							
djain*							
vage age							

Interpretation of Marginal Effect of Logistic regression results- if an adult's education in the household increases from primary to secondary, then it will be 0.60% more likely that the child will go to school compared to the child who will go to work. If the number of people in households increases by one person, then there will be 0.05% less likely that the child will go to school compared to the child who will go to work or is more likely to go to work. There is a 0.06% lower chance that OBC will attend school than the general caste. If wage increases by 1 rupee, then 0.05% will be more likely to attend school than working children. If per capita income increases by 1 rupee, then 0.10% of the population will be more likely to attend school than working children. If the number of female children increases by one, then 0.20% will be less likely to go to school than those who will work. If the number of male children increases by 1, then 0.37% will be less likely to go to school than those who work. If the male head household increases by 1 year, then there will be 0.08% more chances a child will go to school in comparison to the child who will go to work. If the female head of household increases by 1 year, then there will be a 0.01% lower chance that a child will go to school than if the child goes to work. There will be 1.14% more chances that Sikh children will go to school compared to Hindu children.

3.Conclusion:

The objective of this study was to find out the determinants of child labor in India. This study showed that the greater the family income and parental education, the lesser the child labor, and the larger the family size, the greater the child labor. It was seen that when parents work, the age difference between them is more significant (showing the late marriage). In the case of good education and the ability to earn the basic needs for a family in such cases, there will be no child labor. On the other side, lack of education, large family size, elderly children, poor households, and early marriages will encourage child labor as basic needs will not be obtained easily. For this purpose, children will be found working and participating in economic activities. The result further indicates that family size is the primary determinant in encouraging child labor. The important conclusions that can be drawn from this study are (1) to improve parental education, (2) parents should be encouraged to send their children to school as it will help in the future, and (3) there should be equal distribution of resources as well as income which will also discourage the child labor.

4. Results and Discussion

The logistic regression results reveal the following key findings:

1. Parental education significantly increases the likelihood of children attending school.
2. Larger family sizes correlate with higher child labor rates.
3. Government-provided incentives, such as free uniforms and scholarships, positively impact school attendance.
4. Socio-cultural factors, including caste and religion, also play a role in child labor prevalence.

5. Policy Recommendations

The study highlights the importance of parental education and household income in mitigating child labor. Policy measures should focus on:

1. Expanding access to quality education.
2. Offering financial incentives to low-income families to keep children in school.
3. Strengthening family planning initiatives to manage household sizes.
4. Establishing vocational training centers in underserved areas.

5. Enforcing stricter regulations against child labor and supporting vulnerable households.

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Description of Variable

Variable	Description
Child literacy	Going to School
adult	Adult Education
Age	Age of Person
COPC	Per capita household Expenditure
Persons	Number of people in the household
INCOMEPC	Income per capita
FHEADAGE	Age of Female head of household
MHEADAGE	Age of Male head of household
NCHILDF	No Female Child in the household
NCHILDM	No Male Child in Household

Free book	Free book provided by Government
Free uniform	Free uniforms provided by the Government
Free school fee	Government School
Scholarship	Scholarship provided by Government

Summary Table

Variable	Obs	Mean	Std. Dev.	Min	Max
Childliter~y	40323	.8543511	.3527582	0	1
eduadlt	204569	3.811472	1.643192	1	6
COPC	204478	24323.12	26187.57	180	1461484
PERSONS	204568	5.963953	2.803975	1	33
INCOMEPC	204568	26325.38	45875.83	-289008.3	4161000
FHEADAGE	195261	44.90239	12.73936	7	99
MHEADAGE	181927	49.80323	13.30435	15	99
NCHILDF	204568	.8926469	1.090989	0	10
NCHILDM	204568	.9461988	1.030353	0	10
Freebook	54256	.4358596	.4958735	0	1
freeuniform	54251	.2484931	.4321432	0	1
freeschool~e	54250	.3083871	.4618316	0	1
Scholarship	53484	171.9983	940.2423	0	60000
pvtschoolfee	53705	3299.602	12070.68	0	860000
Householdp~p	204478	24323.12	26187.57	180	1461484
duch	204569	.05012	.2181931	0	1
dobc	204569	.4102723	.4918843	0	1
dsc	204569	.2108677	.4079257	0	1
dst	204569	.0849591	.2788215	0	1
dosgr	204569	.2437808	.4293631	0	1
dhindu	204569	.8010793	.3991892	0	1
dmuslim	204569	.1358564	.3426368	0	1
dchrstn	204569	.0257713	.1584526	0	1
dsikh	204569	.0233955	.1511565	0	1
djain	204569	.0023757	.0486836	0	1
dorelg	204569	.0115218	.1067197	0	1
wage	204568	143970.9	243230	-1037040	1.14e+07
age	204565	29.82206	20.36268	0	99

Source	SS	df	MS
Model	250.824423	24	10.4510176
Residual	2024.52957	29786	.067969166
Total	2275.35400	29810	.076328547

Number of obs = 29811
F(24, 29786) = 153.76
Prob > F = 0.0000
R-squared = 0.1102
Adj R-squared = 0.1095
Root MSE = .26071