A Survey of Recent Economics Literature on Child Labor

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Introduction

In this note, we will overview the child labor issues discussed in recent economics literature. To start with, let us lay down with what we mean by child labor. The conventional working definition of child labor is the following:

- **child:** under 15 (set by ILO's Convention No. 138) is the most used standard. ILO [1996] let ages depend on work contents, under 13 for "light" works and under 18 for "hazardous" works.
- **labor:** "economically active," when a person works on a regular basis for which he/she is remunerated or that results in output destined for market.

Age dependency of "child" on work contents gives an impression of being *ad hoc*. This can be considered as reflecting a view that a child should not work to the extent it harms the development of broadly defined human capital. A"light work" is defined in the Convention 138 as a work which is:

- not likely to be harmful to their health or development;
- not such as to prejudice their attendance at school, their participation in vocational orientation or training programmes approved by the competent

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authority or their capacity to benefit from the instruction received.

A “hazardous work” is a work which is likely to harm the health, safety or morals of children (ILO [2002b: 20]). Recommendation No. 190 specifies that a particular consideration should be given to:

- a work that exposes children to physical, psychological, or sexual abuse;
- a work underground, under water, at dangerous heights, and in confined spaces;
- a work with dangerous machinery, equipment, and tools, or which involves the manual handling or transport of heavy loads;
- a work in an unhealthy environment which may, for example, expose children to hazardous substances, agents or processes, or to temperatures, noise levels, or vibrations damaging to their health; and,
- a work under particularly difficult conditions such as work for long hours or during the night, or work where the child is unreasonably confined to the premises of the employer.

In addition to two work categories of “light” and “hazardous”, the “worst form” is added in Convention 182 (passed in 1999), and it says they should be prohibited. These include slavery (sales of human, trafficking, debt bondage, serfdom, forced or compulsory labor), and “hazardous” to health and unsafe tasks. The “worst form” exists in Andhra Pradesh in the form of debt-bonded laborers, pes-

ticide sprayers in cotton seed industry, and workers in mining industry. Another important thing to note in the definition is that "labor" does not include domestic works. This will give an underreporting bias in most widely used child labor data following ILO standards.

The perception on child labor in economics varies, but not in a way that one cannot reconcile each other. Rather, the different views look at the different aspects of costs and benefits of child labor. One strand argues against it, by saying that children should go to school or poor work condition is hazardous to health. Basu [1999], [2003] is one of few economists who formalizes the idea that child labor may have a negative externality on who do not hire children. It shows that the presence of employers who do not feel bad about having child laborers in their workplaces depresses wage rates, under a fairly general conditions.

It is based on his sexual harassment argument (pecuniary externality): allowing sexual harassment (violence on child labor) penalizes workers (households) that do not allow sexual harassment (sending kids to work with violence) through a decrease in wage. Assume that violence on child worker is compensated by money at rate $\theta > 0$ per a child. Denote production as $x(n_a + n_c)$ and labor supply as $n_a = f_a(w_a), n_c = f_c(w_c)$ where we denote n_i for number of workers for $i = a.c$ with a being adults and c being children. Then, FOCs give $x'[f_a'(w_a^*) +$

$f_c'(w_a^* + \theta)] = w_a^*$. Since the LHS is smaller than the LHS of non-violence case $x'[f_a'(w^*) + f_c'(w^*)] = w^*$ because $f_i' > 0$ and $x'' < 0$, existence of violence reduces the equilibrium market wage rate[*1].

Baland and Robinson [2000], on the other hand, uses their, now classic, model to pin down the time inconsistency problem faced by parents: parents may overuse child labor to secure old age savings.

[*1] We can come up with another situation where a lack of distaste for child labor decreases total employment. Consider two types of employers, type 1 has a distaste for child laborers in own workplace, and type 2 does not. Assume for simplicity that such a distaste can be expressed in monetary value of $\theta > 0$ for each child being hired. Let n_a and n_c denote number of adult and child workers, respectively, and production be $x(n_a + n_c)$ with usual $x' > 0$, $x'' < 0$ assumptions. Suppose that equilibrium labor supply responds to wage offer w_I, thus $n_i = f_i(w_i)$ for $i = a, c$. Then, the profit maximization problem for employers who do not have a distaste for child workers is:

$$\begin{aligned} \max_{\{n_a, n_c\}} \quad & x(n_a + n_c) - w_a n_a - w_c n_c \\ \text{s.t.} \quad & n_a = f_a(w_a) \\ & n_c = f_c(w_c) \end{aligned}$$

FOCs give:

$$x'[f_a'(w^*) + f_c'(w^*)] = w^*.$$

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FOCs give:

$$x'[f_a'(w_c^* + \theta) + f_c'(w_c^*)] = w_c^* + \theta.$$

Comparing two conditions, we see that, given $f' > 0$ and $x'' < 0$, $w_c^* < w^* < w_c^* + \theta$ and $x'[f_a'(w^*) + f_c'(w^*)] < x'[f_a'(w_c^* + \theta) + f_c'(w_c^*)]$. Thus the presence of employers who do not mind child laborers reduces the total employment.

Other strand of articles defends child labor, by saying that there are some learning as they work, or working children can support their family and, most importantly, themselves. The most important work along this line is Beegle et al. [2003b]. They argue that child labor has its own reward through learning at the workplace. Their estimation results based on Bangladeshi data show that working has a greater return than schooling after 5 years. In theoretical works, the most models assume altruistic parents, however, there may be some cases of apathetic parents. This is more likely for girls who are working away from home or as a bonded laborer. If this is the case, earning on one's own may be the only way to protect themselves.

I Data Issues

Data is the major obstacle in carrying out child labor research. The most studies suffer from difficulty in obtaining reliable child labor data. Reasons for this are, first, a likely underreporting bias, due to difficulty in reaching households with child labor, and, even if they are questioned, stigma and illegality of child labor prompts them to deny its existence. Second, as it is parents who are asked about children's work hours, not children themselves, there should be substantial recall errors. Another difficulty when collecting information in rainfed regions is

migration. In dry or *rabi* seasons, especially in villages on red soil with no functional irrigation facilities, many households migrate to more water rich regions as agricultural laborers, or to cities for other jobs such as construction works. Depending on duration, migrant families sometimes take their children with them. This makes data collection practically impossible.

Our sampling scheme luckily can avoid all of these difficulties. Underreporting bias is reduced by using MVF staffs to whom respondents feel easier, with a referral from local MVF sympathizers in the same village, than other unknown enumerators from big cities. We also asked for a cooperation to local MVF sympathizers to double check on children's attendance records by going to schools everyday[*2]. We have asked work hours are asked to both children and adults to reduce recall errors. We have a panel over a year with raingage data at village level. We have selected villages with small migrant family proportions. In addition to these, we control for other NGO activities on education. This is done by choosing an NGO-nonactive area in AP. This does not create a selection problem at the village level because the most NGOs have just begun their operations,

[*2] In Andhra Pradesh, the official enrollment record does not justify its name. In the extreme cases, all school age children in the village are recorded as being enrolled regardless of their attendance records. Even in the less extreme cases, enrollment record does not give an accurate attendance status of each child, thus is almost useless other than knowing a subset of out-of-school children.

TABLE 1: CHILD LABOR PARTICIPATION RATES AND PER CAPITA GDP GROWTH RATES (%)

		1950	1960	1970	1980	1990	1995	2000
World	participation	27.57	24.81	22.3	19.91	14.65	13.02	11.32
Africa	participation	38.42	35.88	33.05	30.97	27.87	26.23	24.92
	growth rates			2.45	4.78	7.89	2.71	3.00
Latin America	participation	19.36	16.53	14.60	12.64	11.23	9.77	8.21
	growth rates			3.14	5.28	9.29	3.00	3.1.0
Asia	participation	36.06	32.26	28.35	23.42	15.19	12.77	10.18
	growth rates			4.28	6.41	10.66	6.56	4.67
Europe	participation	6.49	3.52	1.62	0.42	0.1	0.06	0.04
	growth rates			5.48	7.00	9.14	6.21	4.16
Ethiopia	participation	52.95	50.75	48.51	46.32	43.47	42.30	41.10
	growth rates			2.09	4.39	6.81	1.96	4.51
Brazil	participation	23.53	22.19	20.33	19.02	17.78	16.09	14.39
	growth rates			5.75	6.25	11.74	4.73	3.51
China	participation	47.85	43.17	39.03	30.48	15.24	11.55	7.86
	growth rates			NA	5.76	9.36	8.47	7.98
India	participation	35.43	30.07	25.46	21.44	16.68	14.37	12.07
	growth rates			3.66	4.78	7.94	7.26	6.43
Italy	participation	29.11	10.91	4.12	1.55	0.43	0.38	0.33
	growth rates			7.10	7.15	9.46	6.70	2.97

Note: Top rows indicate child labor participation rates. Definition of child labor follows ILO's convention. Bottom rows are annual average GDP growth rates of a decade. For example, 1970 figures are for years 1961 to 1970. Growth rates are obtained by regressing log of per capita GDP on time trend. Regional growth rates are arithmetic means of countries in each regions, to be consistent with regional child labor participation rates computed without country weights.

Source: Child participation rates are from Basu [1999: Table 2], who cites from ILO [1996]. PPP-adjusted per capita GDP data is from Heston, Summers and Aten [2002].

for five years at maximum, and their locational choices are close to their original locations. In addition, in some Districts, there is no visible NGO activity even around the major towns or mandal headquarters. Given NGOs are not wide spread in the rural part of AP, one can easily find a set of geographically contiguous villages that are unaffected by NGO activities. Halaharvi and Holagunda mandals of Kurnur district satisfy all the conditions, and are suitable for conducting our research.

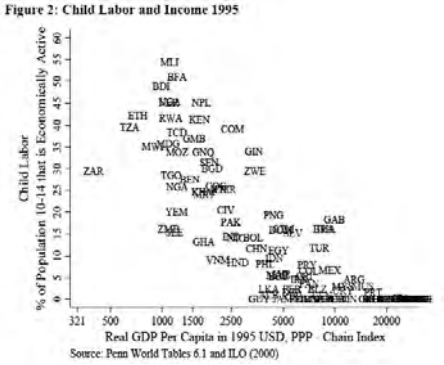
II Macroeconomic Trends in Child Labor

In the long-run, a cross-country evidence indicates growth seems to lessen the incidence (**Table 1**). On the other hand, not much is known for the short- and medium-run. With regard to land holding and child labor, it has long been pointed out that children of landed households are more likely to work as returns on household labor in own farms increased, by returns-on-land-enhancing technological progress such as the Green Revolution. This happens if land and/or labor markets are imperfect that there is an imperfect substitutability between family and hired labor, that land cannot be sold or rented out (Bhalotra and Heady [2003]). However, also see the contrary case of India where expected technical progress increases returns on schooling more for the landed, inducing more school constructions, while withdrawal of child labor of landed increases child wage rates thus inducing more works of the landless children (Foster and Rosenzweig [2000]).

We often hear an argument that globalization (trade liberalization) increases demand for child labor and thus its incidence. This can be interpreted as an increase in child wage induces children to supply more labor. However, one needs some conditions for a wage increase to result in more labor supply. Firstly, one needs substitution effect to overwhelm wealth effect in wage increase. Secondly,

FIGURE1: TRADE AND CHILD LABOR PARTICIPATION RATES (%)

FIGURE2: PER CAPITA INCOME AND CHILD LABOR PARTICIPATION RATES (%)



Source: Edmonds and Pavcnik [2004], Figures 1, 2.

substitutability between adult and child labor should be limited, because, if not, an increase in child labor industry should also increase demand for adult labor, and if a household earns a higher adult wage, they may be able to afford child's education if they want to.

Relationship between trade and child labor is studied by Edmonds and Pavcnik [2004]. Prior to their study, most studies look at one or few country evidence in a descriptive fashion. The authors use most comprehensive cross-section data and look for a positive correlation between trade and child labor incidence. They could not.

Unfortunately, although correlations between child labor and growth, child labor and trade are somewhat inspiring, they do not tell much about what to do to reduce child labor, or whether we should aim at eliminating child labor at all.

This follows from unclear causality in these relationships, and from high level of aggregation that ignores many other relevant factors. Thus we must study determinants of child labor in detail, from a microeconomic viewpoint.

III Empirical Studies

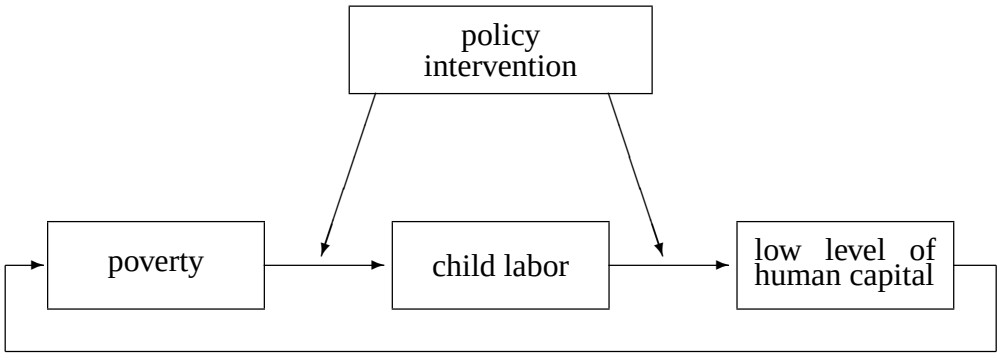
III.1 Types of Studies

Development economics is full of empirical studies on child education/labor choices. In this note, we will skim only the most recent. One can identify three types of inquiries in empirical studies: *causes* of child labor, *effects* of child labor on human capital development, and *policy effects* on child labor.

These three are all interrelated. To simplify, we can view the child labor as an intergenerational problem of **Figure 3**. Each of three types of studies deal with one of the arrows: "causes" analyses poverty-child labor nexus, "effects" deals with child labor-human capital nexus, and "policy" considers interventions to stop this cycle from reproducing itself.

One should note that the word "poverty" does not only refer to income poverty but has many other dimensions. One example is social segregation. If a group of people (e.g., scheduled tribes, scheduled castes, out-castes in the case of India) is not welcomed for participation in certain segments of labor market or political

FIGURE 3: INTERGENERATIONAL REPRODUCTION OF POVERTY THROUGH CHILD LABOR



processes, or not guaranteed to gain benefits from public services such as an access to justice system or clean water, this is also an indication of being "poor". In short, it is a lack of entitlement to *any* existing social institutions that causes poverty. An intimidation by local officials to ST people thus is also considered as a component of poverty in **Figure 3**. Hence, it is not especially inspiring to label a certain NGO as having an "anti-deterministic" view (meaning, having a view that income poverty is not necessarily the most important cause of child labor). Instead, one should not narrow one's attention only to income poverty. One should look into a lack of *every* entitlement. In other words, the variables representing social dimensions should also be included when we estimate the individual choices regarding child labor.

III.2 Causes of Child Labor

The most studies dealing with causes of child labor try to identify the *exogenous* shocks that affect (shadow) wages of child labor. They usually try to find exogenous wealth shocks from the data. To come up with the exogenous wealth shocks, economists use a variety of indicators and equally various justifications. Examples of what are argued as the exogenous wealth shocks include: pension reform, health shocks (can either be transitory or permanent shocks), gender of newborns, self-reported crop shocks, estimated residuals of profit or production function.

There are some caveats. First, it is hard to be sure that an income/profit decomposition into anticipated and unanticipated components by an econometrician coincides with the actual perceptions of households. This is always assumed to coincide, loosely following the tradition of rational expectations. Second, failing to use the exogenous shocks causes overemphasis of wealth shocks: income is simultaneously determined with child labor whose negative correlation with the disturbance term through attitude towards education (lower the respects for education parents have, lower the income, more the child labor hours) creates underestimation of effects of wealth shocks, which in turn overemphasizes the negative effect of wealth on child labor hours. These considerations led us to

favor the studies using the anticipated but (most likely to be) exogenous shocks, e.g., the South African pension plan.

Beegle et al. [2003] investigates impacts of liquidity constraints on child labor in rural Tanzania using a four-round panel of 800 households between 1991-94. Child labor is measured as hours worked both in and out of home. Using self-reported crop loss shocks for identification, which they found to be correlated only with female headship and uncorrelated across time, they found child labor is increasing with crop losses, but such an increase is smaller if households have more collateralizable durable goods (which they interpret it as a proxy of accesses to credits).

Bhalotra and Heady [2003] observes, using Pakistani and Ghanaian cross sectional data, female child labor hours to increase with land holdings, after controlling for household wealth with food consumption. Coefficient on land is positive if both land and labor markets are imperfect, negative if credit market is imperfect (use land as collateral) and imperfections in land or labor markets (require more child labor) are ignorable, zero if credit market is perfect and either land (can sell/rent out) or labor (can hire) or both markets are perfect, or imperfection of all three markets cancel out.

Humphries [2003] points possible causes in 19^{th} century as poverty, non altru-

istic parents, technologies in early periods, and (for decrease of child labor) trade unions of adult males protesting against them.

III.3 Effects of Child Labor

Noting children can both work and go to school during the same day or period, one may want to know how work affects educational attainment. Heady [2003] surveyed Ghanaian households and conduct Raven tests on children. He then compared school test scores of child laborers and child school goers using Raven test scores as control variables for inherent ability. He found that being at work reduces elementary reading and elementary maths scores, while among those who work, longer working hours reduces advanced reading and advanced maths scores[*3].

Beegle et al. [2003b] considers effects of work experience and schooling on future wages. They use the same Vietnamese household panel data as Edmonds [2004a], and estimated how being a worker affects probability of being a student five years later and wage rates five years later. Results show that being a worker reduces the probability of being a student at five years later, and even if one is a student, school scores are lower than those who were students five years ago.

[*3] Cavalieri [2002] also shows working impairs school scores. However, she uses a matching estimator based on "selection on the observable", thus self-selection bias may exists. See Wooldridge [2001] for details.

What is interesting about their work is that they compare the effects of work experience and schooling on wage increase. They showed that a year of additional schooling increases daily wage rate by 9%, and four years of 12 hour-per-week work increase wage rates by 25% to 50% more than four years of schooling. As authors admit, returns on education and working could not control for heterogeneity in individual talents, and four years may be too short measure returns on school. However, comparison of returns on various activities has been nonexistent prior to their work, and it has an intuitive appeal as it gives a single number to evaluate.

III.4 Policies to Stop Child Labor

A great number of policies aim at eliminating a causal relationship between poverty and child labor. It is not so common to find policies to ameliorate effects of child labor on human capital development. Such policies can be considered as a compromise between full schooling and working, and should aim at accommodating school drop outs in rejoining classes, even while they work. This is done by opening schools in lean seasons, promoting vocational trainings, or imposing employers to attend their child workers to continuation schools. In a more intensive scheme, funding residential bridge camps will help resume learning of drop outs.

The most common policy on child labor is a legislative ban. As streets of today's India show, it is not effective at all. Partly reflecting that there is hardly an effective ban in developing countries today, most of studies on bans are those on developed countries in pre-20^{th} century era.

Goldin and Katz [2003] shows a significant but quantitatively small (5% of recorded increase) effect of state compulsory education and (anti-) child labor laws on secondary school enrollment in the US between 1910 to 1940. Improvements in economic conditions (proxied by proportion of car ownership) explain 19% of enrollment increase. They used the state wise enrollment rates and variations in state laws affecting child labor. The continuation school laws (which require employers to send the youths below working age to attend to schools during workdays up to certain hours in a week) had the most consistently positive effect on enrollment compared to the compulsory schooling laws (minimum years of education) or the child labor laws (ban). This is possibly because they imposed costs on employers who hire the youths. The enrollment rates increased with increased per capita wealth, greater school access, lower inequality of income, greater homogeneity of community, decreased with greater opportunity for youth employment, as authors previously suggested. Laws did not affect much because schools were already available and their fees were free.

Edmonds [2004] uses South African cross sectional data to estimate differences in child labor between households with and without pension eligibility. It was shown that child labor decreases with pension eligibility. The school attendance also increases with the presence of pension-eligible males in a household. The pension noneligibility is interpreted as an exogenous (to households) proxy of liquidity constraint, or a lack of additional income. To control for elderly's influence through coresidence other than pension eligibility, the restricted samples of households with elderly coresidence are also used to compare between eligible and noneligible households [*4] [*5].

Bourguignon et al. [2003] simulates the transition probabilities between full time worker, part time worker, full time student status after conditional (on school attendance) transfers are made to households[*6]. Parameters are obtained from a multinomial logit and a Mincerian wage equation using OLS (to which authors acknowledge selection-bias, but argue there is no way to correct). About 40% of all children would change from full-work status to schooling/part-time schooling

[*4] Eligibility by an elderly may increase his/her power in a household, if we follow the line along collective household models. Evidence from the restricted sample comparison that an eligibility reduces child labor can be interpreted as an evidence supporting,*not* denying, the bargaining in a household, provided elderly is against the child labor. If so, an increase in schooling may be explained by both an increase in wealth and an increase in elderly's bargaining power.

[*5] Age can be endogenous, because one needs to be relatively wealthy to live up to eligible ages.

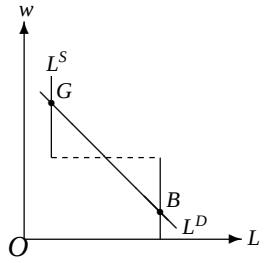
[*6] This is an *ex ante* simulation study of a proposed plan.

status with conditional cash transfers, using Brazilian data. As for households below 90 Reais per month, 15 Reais per month would prompt 60% their children to withdraw from full-time work.

IV Theoretical Studies

Basu and Van [1998] shows the possibility of multiple equilibria, a good equilibrium G with high wage, no child labor, and a bad equilibrium B with low wage, child labor, in a general equilibrium framework (hence both are PO).

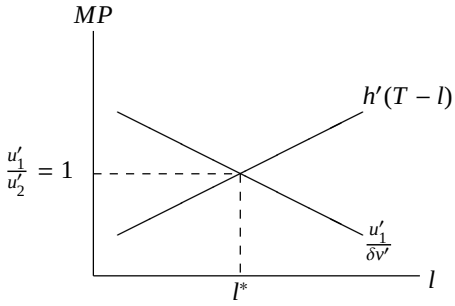
FIGURE 4: MULTIPLE EQUILIBRIA IN BASU AND VAN MODEL

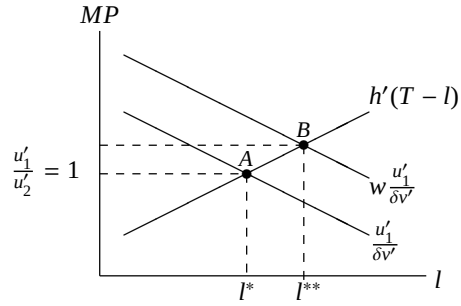


It assumes the "luxury" axiom that, below a certain wage level, households do not let their kids work. It also assumes a mass of children can significantly affect adult wage rates ("substitutability" axiom *plus* many working kids). Labor supply curve in this economy is thus S-shaped, and may have two equilibria. A required policy is a one-time shock to promote coordination.

Welfare effects of a ban when there is only one equilibrium, a bad one, which is likely in poor countries, is ambiguous. It increases the adult wage rates unambiguously, but it may reduce the total income of poor households. They also show

FIGURE 5: OPTIMAL CHILD LABOR **FIGURE 6: INEFFICIENTLY EXCESSIVE CHILD LABOR**





a possibility that a partial ban can make households worse off, as it reduces child wages while increase adult wages thus the net effect can be negative. Basu [2000] shows that if adult wage is increased by a minimum wage law, it could end up the unemployed adults to send children to work to depress market clearing wage further, thus creating more adult unemployment and more child labor.

Baland and Robinson [2000] shows in a two-period model that if bequest b or savings s is at the corner $b = 0$, $s = 0$, or both, child labor l_c is inefficiently high. This follows since negative bequest $b < 0$ is child's future compensation for not letting him/her work in childhood, but such must be a mere promise, as children do not have money in the childhood, which is considered to be not credible. This is likely to happen when parental time endowment A is small (when parents are 'poor') or altruism is low, thus inducing the use of child labor. $s = 0$ happens when there is a liquidity constraint, where parental marginal utility in the first

period gets greater than the second, thereby using child labor in the first period more than in the absence of liquidity constraint. Although the child is compensated with bequest for an increased childhood labor, utility is lower. A marginal ban, expressed by an exogenous infinitesimal decrease in child labor supply, will increase current wage for both adults and children (implicitly assuming a total ban would be impossible, cost of violation to be levied on producers which shifts back labor demand does not overwhelm the decrease in child labor supply, or simply cost of violation is zero, thereby results in a child wage increase), while future wage for adults (current children) to decrease as they try to supply more labor. Thus a marginal ban can improve dynasty welfare if effects of current wage hike dominates future wage decline. However, implementation of a ban should take the form of charging fines on producers employing children. Thus their model should be modified to take into account an increase in marginal cost of production which uses child labor. They also showed that under two-way altruism where child makes transfers τ in second period, perfect capital market ensures child labor l_c to be at efficient level, even bequest is at the corner $b = 0$, and l_c to be inefficiently high when capital market is imperfect $s = 0$ even transfer is at interior $\tau > 0$, because such a transfer does not solve the liquidity problem in the first period.

$$\begin{aligned}
\max_{\{s,l_c,b\}} \quad & u(c_{p,1}) + u(c_{p,2}) + \delta v(W) \\
\text{s.t.} \quad & c_{p,1} = A + l_c - s \\
& c_{p,2} = A - b + s \\
& W = h(1 - l_c) + b, \quad h' > 0,\ h'' < 0 \\
& b, s \geqslant 0
\end{aligned}$$

KT-FOCs are:

$$\begin{aligned}
\mathcal{L}_s &= -u_1' + u_2' && \leqslant 0, && s^* \geqslant 0, && s^* \mathcal{L}_s = 0, \\
\mathcal{L}_b &= -u_2' + \delta v' && \leqslant 0, && b^* \geqslant 0, && b^* \mathcal{L}_b = 0, \\
\mathcal{L}_{l_c} &= u_1' - \delta v' h'(1 - l_c) && \leqslant 0, && l_c^* \geqslant 0, && l_c^* \mathcal{L}_{l_c} = 0.
\end{aligned}$$

- If non negativity constraints for b and s are not binding, we have $h'(1-l_c^*) = 1$. This is depicted in **Figure 5**.
- If $b^* = 0$, $\delta v' < u_2'$ and we have $h'(1 - l_c^*) > 1$.
- If $s^* = 0$, $u_1' > u_2'$ and we have $h'(1 - l_c^*) > 1$.
- If $b^* = 0$, $s^* = 0$, we have $h'(1 - l_c^*) > 1$.

All latter three cases of nonoptimal child labor are depicted in **Figure 6**.

Basu and Chau [2003] shows the need of child labor in a harvest season to save for a lean season to come, in a dynamic, partial equilibrium framework. Also shows the case where an offer of debt-bondage labor contract (or an interlinkage labor contract in a less grim terminology) by a monopolistic landlord, whose objective is to maximize his profit from such a contract, is voluntarily taken up by

a tenant-household, when savings from previous harvest season is low and alternative source of credit is costly. A stronger enforcement of ban can reduce the expected marginal product of child labor, hence lowers the child wage, inducing the household to supply more child labor (by assuming subsistence consumption that prohibits substitution between labor and leisure at low consumption levels), because households are assumed not to be penalized when detected. Direct cash transfers from households, if detected, will be fully incorporated in a contract by the monopolistic landlord. A reasonable policy response can be to offer consumption credits at lower rates, or to offer employment opportunities to adults in lean seasons.

Horowitz and Wang [2004] has shown in an extended Baland and Robinson model that when there is a disparity in talents (in human capital accumulation) among children, corner solution for bequest ($b = 0$) gives rise to inefficient, but more egalitarian education among siblings, and can reverse specialization (less education on more talented child) at the extreme. This happens because as parents cannot compensate for differences in human capital accumulation with bequests, they do it in first period to let less talented to be given more time to end up with more egalitarian distribution of human capital. They showed that when bequest can be negative, such inefficiency is eliminated, suggesting a need for formal

old age pension system to be established. Also showed that inefficiency can be enhanced by compulsory schooling when there is a reverse specialization, while reduced when there is not.

Bommier and Dubois [2002] shows that when disutility of child labor is introduced along with transfers τ from child, child labor l_c^{**} is "inefficiently high," meaning $l_c^{**} > l_c^*$ where l_c^* is efficient level, even net transfer from child to parent $\tau - b$ is positive. This holds because, given altruism of child towards parent, the parent can use more child labor in the first period to increase the lifetime child earnings from which parent benefits marginally more than the child (as they feel disutility of child labor only indirectly through child welfare), and ask for mercy ("sorry I gave you a hard time, I wish I can give you more, but I need my savings to live on my own") in the second, to which she knows her child cannot say no. If child can precommit to efficient net transfer level $\tau - b$, then it will discipline the parent in the first period but such a "threat" is time inconsistent. This is one failure of Rotten Kid theorem, lack of precommitment or conditional transferable utility, discussed in Bergstrom [1989]. As child labor is too high in the absence of market failures, a marginal ban on child labor (infinitesimal decrease in l_c) will improve child welfare while deteriorate parent's, thus cannot be an instantaneous Pareto improvement. As everyone is once a child, and as the gain of child is of

first-order whereas the loss of parent is of second, a ban may be preferable in the steady state. But transition to a (marginally) banned state will punish the current adult generation as they were child laborers. Such a loss of parental welfare is offset by a current wage hike due to decrease of child labor supply, and the signs of net loss depends on wage elasticities. Authors argue for subsidization of schooling financed by future taxation on adults.

Parent as a benevolent dictator (note $\tau - b$ can be positive or negative):

$$\begin{aligned} \max_{\{s,l_c,b\}} \quad & u(c_{p,1}) + u(c_{p,2}) + \delta[v_l(1-l_c) + v(c_{c,2})] \\ \text{s.t.} \quad & c_{p,1} = A + l_c - s \\ & c_{p,2} = A + s + \tau - b \\ & c_{c,2} = h(1-l_c) - (\tau - b), \quad h' > 0,\ h'' < 0 \\ & s \geqslant 0 \end{aligned}$$

Consider no market imperfections, hence FOCs are:

$$u_1' = u_2', \qquad h'u_1' = \delta(v_l' + v'), \qquad u_2' = \delta v'.$$

They give:

$$v_l'(1 - l_c^*) - v' \cdot [1 - h'(1 - l_c^*)] = 0,$$

and as $v_l'(1 - l_c^*) < 0$, and $v' > 0$, we have $1 - h'(1 - l_c^*) > 0$ for efficient level of child labor.

When parent maximizes her own altruistic utility and child does the same with her own altruistic utility $v_l(1 - l_c) + v(c_{c,2}) + \lambda[u(c_{p,1}) + u(c_{p,2})]$, given parental choices of l_c, s, while parents consider that child will incorporate parent's decision

when choosing τ, FOCs give:

$$v_l'(1 - l_c^{**}) - v' \cdot [1 - h'(1 - l_c^{**})] = \frac{1}{\delta}(u_2 - \delta v')[1 - h'(1 - l_c^{**})]\left(1 + \frac{d\tau}{ds}\right),$$

and it can be shown that RHS is positive and LHS is negative and increasing in l_c for all $l_c < l_c^*$, thus $l_c^{**} > l_c^*$.

Some Closing Remarks

There is a body of evidence that the child labor may be related to a lack entitlement to credits and insurance. Some papers, on the other hand, show that child labor is not necessarily produced out of poverty but the scarcity of family labor relative to other inputs such as land can also pull children out from schools. There are no studies linking child labor with a lack of social participation or social capital, which can be one of important reasons for SC, ST households in rural India for not sending their children to schools.

Being at work is generally considered detrimental to human capital development. One study, however, shows an evidence (although it may be due to an inconsistent estimation) that a work experience has a greater return than schooling. A challenge to this finding is to provide a consistent explanation with the fact that a child work does not have an entry barrier while a schooling does because of various market imperfections. Regrettably, it is not possible to compare the

returns to work and to school with our data that cover only two years. This can be included in our future research.

There is a wide spread view that a legislative ban imposed on employers for the use of child labor is not effective. India has a federal law that prohibits children from working, and there are other multitude of laws that restrict children from working[*7]. Reflecting their ineffectiveness, current policy interventions are not frequently studies. Instead, they are mostly analyzed in the historical context. One study which utilizes today's rare policy experiment is the South African pension reform. A study found that a positive wealth shock increases schooling in poor households. There are not much of works been done on effects of policies that ameriolate adverse effects of child labor on human capital development. Important policies that support RBCs and various forms of continuation schools deserve more academic attentions.

In the theoretical studies, there are some models that explain various points suggested in the empirical literature. There are some additional insights provided by theories, for example, the time inconsistency problem of parents, and a relationship with adult minimum wage legislation with child labor. These all acknowl-

[*7] Recently, ILO has been propmting to using mobile courts, not the full-fledged court, in AP to prosecute employers who use children at work. Despite their data collection scheme does not allow a rigorous measurement, the uninformal, perceived effectiveness of their program is of interests of many.

edge importance of parental incentives for letting children work to secure current and future consumption. Thus one must not consider child labor in isolation from intrahousehold and intertemporal resource allocation problems.

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