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Impact of Social Labeling on Child Labor in the Indian Carpet Industry

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Abstract

Does the labeling of tradable products like carpets which have been produced without child labor contribute to decreased vulnerability of poor households and their children? This paper analyzes which factors determine the probability of a child to work in the carpet industry, and examines the influence of non governmental organizations (NGOs) like Rugmark which are engaged in the social labeling process. Data was obtained from interviews with 417 households in North India. Based on their calorie intake, the households were dissected into two groups, one very poor group below and another one above the subsistence level. The econometric analysis shows that a child living in a very poor household is more likely to work when his/her calorie intake increases (nutritional efficiency wage argument), while the opposite is true for a child from the above-subsistence household group. In addition, it has been found that social labeling has no significant influence on the very poor households. In contrast, at the above-subsistence level, social labeling has a significant positive welfare influence on the households. Furthermore, the occurrence of child labor is more likely for NGOs without monitoring.

Kurzfassung

Trägt die Zertifizierung von Produkten, wie z.B. von Teppichen, die ohne Kinderarbeit produziert wurden, zu sinkender Verwundbarkeit armer Haushalte und ihrer Kinder bei? Der Diskussionsbeitrag untersucht die Faktoren, die die Wahrscheinlichkeit bestimmen, dass ein Kind in der Teppichindustrie arbeitet, sowie den Einfluss von Nicht Regierungsorganisationen (NROs) wie Rugmark, die im Bereich der Sozialzertifizierung aktiv sind. Die Daten basieren auf Interviews mit 417 Haushalten in Nordindien. Auf der Basis der Kalorienzufuhr werden die Haushalte in zwei Gruppen aufgeteilt, eine sehr arme Gruppe unterhalb und eine andere oberhalb der Subsistenzgrenze. Die ökonomische Analyse zeigt, dass die Wahrscheinlichkeit zu arbeiten für ein Kind aus einem sehr armen Haushalt größer ist, wenn seine/ihre Kalorienzufuhr steigt (ernährungsbezogene Effizienzlohntheorie), während das Gegenteil für ein Kind aus einem oberhalb der Subsistenzgrenze lebenden Haushalt zutrifft. Darüber hinaus ist kein signifikanter Einfluss von Sozialzertifizierung auf die sehr armen Haushalte zu finden. Im Gegensatz dazu hat Sozialzertifizierung einen signifikanten Wohlfahrtseffekt auf Haushalte, die sich oberhalb der Subsistenzgrenze befinden. Weiterhin ist die Präsenz von Kinderarbeit wahrscheinlicher, wenn die NROs keine Kontrollen durchführen.

1 Introduction

The link between global trade and international labor standards was recognized as early as in the nineteenth century (Brown *et al.*, 1996). It has, however, recently gained prominence in the international trade policy debate. Especially in forums, such as the International Labour Organization (ILO) and the World Trade Organization (WTO), the subject of labor standards or social clauses has been a lively and mostly debated issue (Basu, K., 1998; Bhagwati, 1995). One of the major areas for setting international labor standards concerns child labor (Maskus, 1997; Brown, 1998).

A number of problems are involved in the definition and measurement of child labor. Any child labor estimate depends on how the terms 'child' and 'labor' are defined. As a legal framework, ILO Convention No.138, adopted in 1973, which came into force in 1976 along with the accompanying recommendation No.146, set 15 as the minimum age for work. The Worst Forms of Child Labor Convention from 1999 (No.182) aims to ensure that children in all countries, irrespective of their level of development, are protected from extreme forms of labor. Based on the ILO Conventions No. 138 and 182, child labor is defined as the following:

At age 5-11: all children working in any economic activity

At age 12-14: all children working in any economic activity excluding those in light work

At age 15-17: all children in hazardous and other worst forms of work

South Asia is home to the largest number of working children in the world. The ILO estimates that some 21.6 million economically-active children live in the five large South Asian countries Bangladesh, India, Nepal, Pakistan, and Sri Lanka. However, statistics on their number in the age group 5-14 years vary on average between 5-26% (Bangladesh: 19%, India: 5%, Nepal: 26%, Pakistan: 8%, Sri Lanka: 15%) (IPEC, 2005). Estimates of the incidence of child labor in the Indian carpet industry vary significantly. Vijaygopalan (1993) estimated that child laborers were only 8% of the workforce, while Sharma (2002) estimated that child laborers were about 19% of all workers. According to the population census of India (1991), around 11 million child laborers below 14 years work in India (IPEC, 2005). Anker *et al.* (1998) estimate that around 130,000 children are engaged in the carpet industry in India, whereas others assume that there are some 300,000 child laborers (Srivastava, 2005).

India's profits from exporting hand-woven carpets (in which many child laborers are involved) increased from US\$ 65 million to US\$ 229 million between 1979 and 1983. But the growth of the Indian carpet industry also remained impressive in the nineties, with a constantly increasing export value from US\$ 302 million (1991-92) up to US\$ 580 million (1996-97). The main importers of Indian carpets are Germany (34%) and the United States (32%). Thus, it is not surprising that suggestions like the introduction of a social clause in the WTO or labeling initiatives also originate from developed countries where an increased awareness about the use of child labor in a number of the products they purchased developed (Sharma *et al.*, 2000).

However, several groups of people have argued that a social clause in the WTO which allows the use of trade sanctions is not the right response to child labor and other problems of labor standards (Bhagwati, 1995; Srinivasan, 1996). Instead, Bhagwati (1995) suggests the ILO to be the main international agency to strive towards better standards. Hemmer *et al.* (1996) pose arguments against trade sanctions by emphasizing the supply side of child labor. They argue that child labor is strongly related to poverty, and that trade restrictions would harm especially the less developed countries most. Furthermore, it is argued that the use of multilateral threats is to practice protectionism, which is likely to hurt not just workers in the Third World but consumers in the developed nations as well (Basu, K, 1998).

As a result, several measures and initiatives like 'Social Labeling' or 'Codes of Conduct' are directed towards ending the use of child labor. Social labeling for example acts as a signal in the market, informing consumers about the social conditions of production, and assuring them that the item or service they purchase is produced under equitable working conditions (Hilowitz, 1999). Social labeling is praised as a market-based and voluntary, and therefore more attractive instrument to raise labor standards (Basu *et al.*, 2006). Thus, non governmental organizations (NGOs) like the Rugmark Foundation, Care & Fair, or STEP were established in the mid-nineties to encourage manufacturers of hand-knotted carpets to produce them without child labor. The Rugmark Foundation, established by "Brot für die Welt", "Misereor", "terre des hommes" and UNICEF in 1995, aims at eliminating the employment of children in the carpet industry by assigning the Rugmark-label to carpets made without child labor. Care & Fair is an association established by the German federation of carpet importers. While the NGOs differ in their approach and objectives, they operate within a broader common goal - the removal of child labor. The common basic goals of the NGOs are to eliminate child labor from the production of hand-knotted carpets and also to rehabilitate former child carpet workers.

The major differences between social labeling NGOs are described in Table 1. While Rugmark and Kaleen label individual products, STEP and Care & Fair label the company as a whole. Some initiatives like Rugmark monitor production sites themselves to ensure that the label's requirements are fulfilled. In contrast, Kaleen and STEP hire external agencies to monitor, thus contributing to an increased trustworthiness of the label. Care & Fair is abstaining from monitoring. In accordance with its philosophy, Care & Fair India runs hospitals to provide health care to the carpet weavers and workers. The Rugmark initiative has no clinical facilities to provide health care to the households, however, they provide some health benefits in their rehabilitation centers. There are some special schools constructed and managed by Rugmark for a better opportunity of child schooling throughout the carpet weaving areas. These supply side actions in the child labor market, as provided by social labeling NGOs, are very important to address the child labor problem.

Table 1: Overview of labeling initiatives in India

	Rugmark	Kaleen	STEP	Care & Fair
Number of Exporters	215	256	22	138
Monitoring	Self	By external agency	By external agency	None
Rehabilitation and Welfare Measures	Schools & Adult Education Centers Rehabilitation Center Medical Facilities	Schools - Medical Facilities	School & Carpet Weaving Training Centers - Mobile Health Facility	Schools - Hospitals, Dispensary Schools, Clinics
Certification	Individual Carpets	Individual Carpets	Company	Company
Source of Financing	0.25% of FOB contribution by exporters & external funding	0.25% of FOB contribution by exporters & from the Govt. of India	External funding only	0.25% of FOB contribution by exporters & external funding

Source: Sharma, 2003

Although the issue of child labor ranks high in international trade policy debates, there has been relatively little empirical work on this. This empirical study analyzes how social labeling affects the labor force status and schooling of children. It focuses on the labeling programs which have been in operation now for 10 years in India. Understanding the effects of social labeling on child labor and schooling is crucial, as it is expected to increase human capital accumulation which again is one of the main prerequisites for long-term growth. The results of this research also contribute to a better understanding of whether the marketing signals carried by the logos of labeling NGOs are able to reduce child labor or not.

The structure of this paper is as follows: Chapter 2 gives an overview of the theoretical and empirical literature related to child labor and social labeling, and explains the hypotheses to be tested. Chapter 3 describes survey sampling, stratification techniques and the econometric model used in the study for India. The econometric results are presented in Chapter 4, and the final Chapter 5 concludes.

2 Review of Literature

In the following, some major empirical and theoretical studies will be presented reflecting some of the main arguments raised in the child labor literature.

2.1 Globalization and the Incidence of Child Labor

In recent years, discussion about the impact of globalization and trade liberalization on the incidence of child labor has started to be evoked in the literature. The opponents of globalization argue that market integration, by increasing labor demand, expands the earning opportunities of children and thereby inevitably leads to more child labor. Maskus (1997) e.g. considers globalization as an expanded opportunity to engage in international trade so that a larger export sector will raise the demand for child labor inputs. As long as children work formally or informally in a sector, which supplies inputs to the export sector, increased trade can lead to a greater child labor incidence (Maskus, 1997). According to Brown (2002), the rise in the demand for child labor will be accompanied by a rise in the child's wage. This change lowers the return to education and raises the opportunity cost of education, thereby stimulating child labor.

Edmonds (2002) postulates that increased earning opportunities for parents may change the types of work, children are involved in. As a result, children may be forced to take over some of the activities usually performed by adults within their households. On the other hand, a study for Vietnam (Edmonds et al., 2005) shows that the increased earning opportunities, associated with globalization, for children working in export-oriented sectors do not necessarily lead to more child labor. Neumayer and de Soysa (2005) argue that countries being more open towards trade and/or having a higher stock of foreign direct investment also have a lower incidence of child labor. They conclude that globalization is associated with less, not more, child labor. Basu and Van (1998) argue that any positive income effects that accompany trade openness, will help families meeting or even exceeding the critical adult-wage level at which child labor begins to decline.

2.2 Social Labeling and Child Labor

Basu et al. (2006) provide a model of North-South trade and explore the promise of social labeling in the context of its four often-noted objectives: child labor employment, consumer information, welfare, and trade linkages. They highlight the market responses to social labeling when product market competition between the North and South is based on both comparative cost advantage and the use of child labor as a hidden product attribute.

Brown (1999) analyzes the economic mechanics and consequences of product labeling. When product labeling is applied to child labor, he finds that even in the optimistic case in which consumers pay a labeling premium that exceeds the additional cost of adult-only technology, there is no net reduction in the labor force participation of children. Children are better off only when the price premium (that is, a transfer from the consumers in the

North to the children in the South) is used for their benefit. Lopez (2002) discusses the legality of government-sponsored social labeling initiatives under WTO agreements. He first presents the basic characteristics, potentials and shortcomings of labeling initiatives and then suggests a drive towards government sponsorship as a way to correct the shortcomings. He then moves on to analyze these initiatives under the relevant General Agreement on Tariffs and Trade (GATT) and the Technical Barriers to Trade (TBT) agreement provisions. Hilowitz et al. (1999) discuss various issues related to voluntary social labeling with reference to child labor. Six initiatives are described and some examples are given for specific instances of labeling. Sharma et al. (2000) examine the impacts of the labeling initiatives vis-à-vis child labor. They look at working mechanisms of labeling NGOs and highlight the major strengths and weaknesses of social labeling.

2.3 Selected Hypotheses on Child Labor

There are two major child labor hypotheses from the theoretical literature which will be analyzed in the empirical part of this paper.

Brown's model (1998) suggests that labeling will either reduce children's wages or, at best, leave them unchanged. If the child wage is unchanged and adult wage increases, then according to Basu and Van (1998) altruistic parents would withdraw their children from the labor force. Basu and Van (1998) introduce multiple equilibria in the labor market when the children are considered as "potential workers". One essential hypothesis which is drawn from their model is called the "luxury hypothesis". It implies that a household would not send its children to work if its income from non-child labor sources were sufficiently high. Therefore, if adult wage/income increases, then the probability of the incidence of child labor decreases and vice versa. Assuming parental altruism, child labor is due to parents' low income. Based on the luxury hypothesis, it might be well argued that children do not work once a household reaches the subsistence level in terms of calorie intake.

On the other hand, a larger calorie intake reduces the number of required breaks or leisure time and thereby increases the number of potential working hours (Hemmer, 1979). This 'nutritional efficiency wage theory' explains a situation where income elasticity of leisure or schooling is negative (inferior good) assuming that income equals consumption. "A certain minimum calorie intake is indispensable for 100% efficiency, and if this requirement is not met, the worker is incapable of persistent activity - there will be major interruptions" (Hemmer, 1979).

According to the nutrition-based efficiency wage model (Liebenstein, 1957), employers do not lower the wage because the workers would then consume less, thereby lowering their productivity; paying a lower wage may raise the cost per efficiency unit of labor (Swamy, 1997). In other words, when calorie intake goes up, children are healthier, they work more hours and contribute more to the income of their family. This linkage between higher wages and greater efforts is related to the hypothesis that in poor economies, wages determine workers' consumption levels.

Thus, at very low levels of income and hence nutrition (below-subsistence), the effort that household members are able to exert may be positively influenced by an increase in calorie intake as long as the household reaches the subsistence level. Therefore, the below-subsistence households might send their children for more hours to work to increase their household income in order to be able to reach the subsistence level. The result is obviously an obstacle for social labeling NGOs.

To test the nutrition-based efficiency wage model, the whole sample in this study was subdivided into two groups based on a certain poverty threshold. The results will be presented in Chapter 4.3.

3 The Case of the Indian Carpet Industry: Data and Methodology

3.1 Survey Sampling

In 2005, primary and secondary information and data was collected from 417 households in Uttar Pradesh, India. In order to decrease the variances and therefore to increase the efficiency of the tests and the precision of the estimators, it was necessary to control for the influence of confounding variables which might lead to the heterogeneity problem, thus disturbing the main analysis. This was done by partitioning the population with respect to the following four main factors:

1. Administrative and social difference of regions.
2. Important time points (e.g. before and after NGO came into operation (before and after 1995))
3. Different situations/ problems and stories of focused population
4. Status of the households with children (labeling or not; going to school or not)

3.2 Stratification Technique

In the first step, stratification was conducted by spatial partitioning: a sample was taken from Uttar Pradesh. Then, within Uttar Pradesh, an independent random sample from each of the three sub regions of Uttar Pradesh was taken (Table 2).

Table 2: Survey location in different districts of Uttar Pradesh (India)

Name of Districts	Varanasi	Mirzapur	Bhadohi
Name of Location	Chandapur	Purjagir	Sawalepur
	Mahgaon	Dengurpatti	Pargaaspur
	Tilthi	Chaksari	Samahi Rampur
	Katchariya	Gazia	Ghamapur
	Kanakpur	Gobraha	Hariyanv
	Jayapur	Pakhwaia	
		Barbatta	
		Bhatewra	

Source: Own compilation.

Stratification is important if various strata in the population differ considerably from one another in their average values or variability. The crucial question, then, is "how can a sample be designed so as to be representative of the population?" The answer is: first, every individual in the population must have a chance of being drawn in the sample; and second, the choice of the individuals in the sample must be random. Unless these requirements are met, there is no way to know whether the sample is representative. If the design of the investigation is such that some individuals cannot be drawn, then unknown biases may affect the sample. The advocates of non-random sampling often admit the possibility of bias but point at the high cost of random sampling.

Finally, the sample size was stratified into 10 categories of households as depicted in Table 3. Based on lists from Rugmark and Care & Fair, some households from the labeled carpet industries were selected next to households from the non-labeled carpet industries from the same area.

Table 3: Categories of the surveyed households in India

Category	Description	Age Limit
Cat 1	Who worked in carpet industries in 1995 as a child laborer and is still working in carpet industries.	15 to 23
Cat 2	Child laborers and former child laborers who are continuing education / finished education / rehabilitation center at Rugmark/ Care & Fare/ Step.	5 to 23
Cat 3	Who was removed from carpet industry after 1995 for working as a 'child laborer' but did not enroll to labeling NGO school or any school, and working in carpet industry.	5 to 23
Cat 4	Child laborers and ex child laborers of carpet industries who dropped out from public and NGO schools provided by Rugmark /Care & Fair/ Step.	5 to 23
Cat 5	Child laborer in the intermediate sector of carpet production (cleaning/ mixing/ spinning/ carding/ dying/ packing)	5 to 14
Cat 6	Child laborers and ex child laborers who got vocational training like tailoring, textile making, screen printing after they had retrenched from their job in carpet production by the labeling initiatives.	5 to 23
Cat 7	Children who are not working but accompany their parents while working in carpet industry / part time child worker.	5 to 14
Cat 8	Children who are not working but accompany their parents while working.	5 to 14
Cat 9	No child is working in a carpet weaving family from the same locality where children are working (control group).	5 to 14
Cat 10	Family of the child laborers and ex child laborers who are getting benefits from the health care service of labeling NGO.	5 to 14

Source: Own compilation

As a rule of thumb the target was to select 30 persons from different households of each of the 10 categories randomly. Since there was no base line survey after 1993 to list the children who lost their job from the carpet industries by the social labeling initiatives, a list of the children who were educated by the labeling NGOs schools in different parts of Uttar Pradesh was taken as a basis instead.

The major challenge of the field research for this study was to locate the stratified households and getting a large enough random sample for each of the ten categories (Table 3), so that a reasonable degree of confidence could be reached with statistically significant results. To account for regional differences, the survey site was chosen on the basis of concentrated carpet industries in three districts of Eastern India namely Mirzapur, Bhadohi and Varanasi.

Stratifying the sample also included (i) identifying the carpet enterprises which are registered at the labeling NGOs, and (ii) differentiating between labeling and non-labeling households. The labeling household was defined by those households where the head of the household knows about the main objective of labeling NGOs³. To compare the situation of labeling and non-labeling households, approximately 50 percent of the surveyed households were targeted from the labeling industry and 50 percent from the non-labeled industry. The quantitative study covers a total of 2,438 persons in 417 households in India.

3.3 Econometric Methodology

To determine the factors which lead to child labor and to test empirically whether the luxury hypothesis as well as the nutritional efficiency wage theory are valid, binary multiple logistic regression is used to estimate the probability that a child is being employed, in the following way:

$$\log \text{it}(P) = \ln \frac{P}{1-P} = \alpha + \beta'X \quad (1)$$

where

P = Probability (Child is employed | X),

α = Intercept parameter,

β = Vector of slope parameters,

X = Vector of explanatory variables

The null hypothesis is $\beta_i = 0$ for all i. The explanatory variables are divided into two sets: variables describing household characteristics and variables describing each individual child of a household. The following sub-model (2) concentrates on household characteristics as explanatory variables X_H (see Table 4) and determines the probability that at least one child in a household is employed.

³ In India, the carpet production is scattered among different looms of households. Sometimes, the members of the households have no idea whether they belong to a labeling program. Therefore, a question was designed whether the head of the household had any idea about the main objective of Rugmark.

$$\log it(P_H) = \ln \frac{P_H}{1 - P_H} = \alpha + \beta' X_H \quad (2)$$

where P_H = Probability (HH_IsAnyChildLab | X_H)

Table 4: Variables used for econometric analysis

Variable name SAS	Variable Description	Type of the Variable
HH_Id	Household Id	Key
HH_HoH_Age	Age of the Head of Household	Continuous
HH_HoH_Sex	Gender of the Head of Household	Binary
HH_HoH_Edu	Education of the Head of Household	Categorical
HH_Size	Actual total permanent members of the household	Continuous
HH_IncGT14	Last month total income of family members older than 14	Continuous
HH_Debts	Actual total outstanding debts incl. interest and costs	Continuous
HH_No_Children	Total actual number of children (≥ 14)	Continuous
HH_LabelInd	Is anybody of the family working in a labeled industry?	Binary
HH_absolutePov	Households with less than US\$ 1 per day (Absolute poverty)	Binary
HH_IsAnyChildLab	At least one child has been working in the last two months either full time or part time	Categorical
HH_KalPC	Per capita calorie intake	Continuous
HH_No_ChildrenSchool	Total number of school going children	Continuous

Source: Own Compilation.

To be able to test the efficiency wage theory, the households were divided into two groups based on their nutritional status: one group is below subsistence and the other group is above subsistence in terms of calorie consumption. Consequently, a dummy variable of below-subsistence and above-subsistence households was included in the logistic regression model.

There is a threshold level of energy intake X^* below which the households send their children to work. This is because their adult per capita productivity is so low that they depend on their children's salary to secure their basic energy requirements. A person is counted as "food poor" if the nutritional content of the food(s) he or she consumes is less than the prescribed threshold (X^*). As a simplifying assumption, most countries use dietary energy as a proxy for the overall nutritional status, i.e., if a person gets enough energy, then he or she also gets adequate protein and the other essential nutrients (David, 2005). The Food and Agriculture Organization (FAO) and World Health Organization (WHO) give recommendations of daily allowance for energy as the amount needed to

maintain health, growth, and an appropriate level of physical activity. WHO, as shown in Table 5, uses different thresholds for different population groups, in urban and rural areas respectively, in Least Developed Countries (LDCs).

Table 5: Minimum calorie requirements of the household members

Age (years)	Urban		Rural	
	male	female	male	female
(: 1]	820	820	820	820
(1:2]	1150	1150	1150	1150
(2:3]	1350	1350	1350	1350
(3:5]	1550	1550	1550	1550
(5:7]	1850	1750	1850	1750
(7:10]	2100	1800	2100	1800
(10:12]	2200	1950	2200	1950
(12:14]	2400	2100	2400	2100
(14:16]	2600	2150	2600	2150
(16:18]	2850	2150	2850	2150
(18:30]	3150	2500	3500	2750
(30:60]	3050	2450	3400	2750
(60 :)	2600	2200	2850	2450

Source: http://www.ifpri.org/training/material/poverty/training_tuftspma.ppt

When households are unable to maintain minimum consumption because of income variability, these shocks generate a welfare loss. Cultural factors can also deprive members of the household (i.e., women and children) from getting an equitable share. However, it is assumed that household members' strong family ties would ensure that food is shared equally.

The household food consumption in this study is obtained via a 24-hours recall from all the members of the household. The total energy consumption $\sum kcal$ of each sample household is derived from the net amounts of food commodities consumed, converted into energy and different micronutrients. Per capita values are generated by dividing $\sum kcal$ by the number of consuming members in the households in the last 24 hours.

4 Econometric Results

4.1 Social Labeling and Other Determinants of Child Labor Supply

The results of testing the influence of variables on the probability of a child to work (Equation 2) are shown in Table 6:

Table 6: Logit regression (Equation 2) results for the probability of child labor

Analysis of Maximum Likelihood Estimates		Odds Ratio Estimates			
Parameters	Estimates	Points Estimate	90% Confidence Limits		
Intercept	0.55				
HH_LabelInd	NGO Knowledge vs. no NGO Knowledge	-0.27 ***	0.58	0.37	0.90
HH_HoH_Sex	Female vs. Male	0.02	1.03	0.46	2.29
HH_HoH_Edu	Primary education vs. no education	-0.12	0.79	0.49	1.29
HH_IncGT14		-0.03	0.97	0.84	1.12
HH_No_Children		0.85 ***	2.35	1.74	3.18
HH_Debts		0.01	1.01	0.99	1.03
HH_HoH_Age		0.05	1.05	0.90	1.23
HH_No_ChildrenSchool		-1.26 ***	0.28	0.21	0.37
HH_Size		-0.23 *	0.79	0.63	0.99

Note: dependent variable: 'HH_IsAnyChildLab' (Yes/No), N = 417

***, **, *: Significant at 1%, 5% and 10%.

Source: Own regression results.

The knowledge about labeling NGOs of a household has been found to be an important factor in determining whether a child works or not. The knowledge about labeling NGOs is "yes" if the head of the household is well informed about the objective of Rugmark or Care & Fair. Table 6 shows that for each family, the magnitude of the estimated child labor decreases with labeling NGO's intervention.

The estimated odds ratio of the labeling status is 0.58⁴ for the household-wise regression. This means, that the odds of having a child laborer in the family who has no knowledge about labeling NGOs are more than 72 percent⁵ of the odds of having a child laborer in a family who has knowledge about NGOs in India. Therefore, the probability of child labor

⁴ In Table 6 the point estimator of the odds ratio of HH_LabelInd of registered vs. unregistered is 0.58 which is defined as:

$$0.58 = \frac{\text{odds}(\text{any child in the family working / household head has knowledge about labeling NGOs objective})}{\text{odds}(\text{any child in the family working / household head has no knowledge about labeling NGOs objective})}$$

⁵ $1.72 = \frac{1}{0.58}$

increases in the carpet industry when the household has no knowledge about labeling NGOs.

Following the luxury axiom⁶ of Basu and Van (1998), it was tested whether there is a relationship between child labor and adult income ('HH_IncGt14' - scaled adult's income in 5,000 Rupies). It can be concluded that the sign of the estimated adult income coefficient supports the Basu and Van model, though adult income has no statistically significant influence on child labor in the carpet belt of India.

Improvement of the head of the household's education ('HH_HoH_Edu') decreases the probability of a child's employment in the labor market. This is confirmed by the negative sign of the estimates in the odds ratio of 'at least primary education' and 'no education' in the regression. However, it is not significant.

The age of the head of the household ('HH_HoH_Age' Scaled head of the household's age in 5 years of age) shows a positive effect on child labor supply in the regression. The use of children as a form of insurance (Portner, 2001) also provides some insights into the role of the 'age of the head of the household' in determining child labor. The idea behind this might be that the older the head of the household is, the more aware he or she will be about his or her dependency for livelihood in the future. Child laborers could be seen as an 'economic insurance' in old age for the head of the household. However, the estimated odds ratio for 'age of the head of the household' is not significant.

The sign of the coefficient of the size of a household 'HH_Size' shows that with an increase in household size, the probability of child labor decreases in India. This is contrary to what would have been expected, however, it might be explained by an increased number of adults - and not children - in the household. In fact, the more adults there are in the household, the less likely it is that a child works. The variable 'total number of children' ('HH_No_Children') shows a statistically significant and positive relation with the occurrence of child labor in India. This indicates that the higher the number of children in a household, the more likely it is that some children of this family will go to work.

The estimated odds ratio for 'total number of children' is 2.3 in the regression which means that the likelihood (odds) of a child to work increases by the factor 2.3 for each additional child in the household. This shows a strong and positive association between 'total number of children' in a family and child labor, which is described frequently in the literature (Patrinós et al., 1995). In other words: the higher the probability that a child works, the higher is also the probability of an additional birth in the household (Cigno et al., 2001).

⁶ The family will send the children to the labor market only if the family's income from non child labor sources drops significantly.

4.2 Social Labeling and the Nutritional Efficiency Wage Argument

Tables 7 and 8 present the coefficient estimates of the logit regressions of child labor participation for two different groups, i.e. households above the subsistence level and those below it. First of all, important differences derive from the calorie intake (HH_KalPC) of the two household groups. For the very poor households in India, the estimated odds ratio for the per capita calorie intake is 1.53 (Table 8). This means, that for each additional increase of 500 Kcal in the family consumption, the odds for child labor increase by 53 percent. Thus, the statistical significance of the 'calorie intake' coefficient in the below-subsistence households suggests a significant growth in child employment with the increased calorie intake. This result supports the 'efficiency wage argument', showing that when calorie intake goes up, children are healthier, work more hours and get better paid and contribute more income to their family (Liebenstein, 1957). Therefore, the statistically significant poverty trap under the subsistence level stimulates child labor.

In contrast, in the above-subsistence level households, the relationship between the calorie intake and child labor is negative and not significant. This implies that a child living in an above-subsistence household group is less likely to work, when his or her calorie intake increases.

However, what is more important in this study is to investigate whether social labeling NGOs can have an impact through their welfare activities on the very poor households? Are they able to release the poorest households from the poverty trap? In fact, what has been found is that in both groups, the labeling status of the households (HH_LabelInd) leads to a decrease in child labor. However, the statistical significance of the coefficient is different in the two regressions. While in the above-subsistence group, the odds of a child to work in labeling households are 90 percent lower, the labeling status has no significant influence in the very poor households. Thus, while the labeling NGOs could increase household's welfare, they could not neutralize or reduce the effect of the 'food poverty trap' in the below-subsistence households.

It can be concluded, that labeling NGOs are successful to remove child labor in the above-subsistence households, a group for which the nutritional efficiency wage argument does not apply. However, children from below-subsistence households are engaged in economic activities because of the subsistence trap due to the nutritional efficiency wage argument. The labeling status of the household has no significant impact on a child's working status.

The other factors which influence child labor supply are the number of children under 14 years of age, age of the head of the household, as well as the total number of school-going children in the household. The total amount of household debt, education and sex of the head of the household turned out to be insignificant independent variables. More details on these variables and the intuition behind them have been already provided in Chapter 4.1.

Table 7: Logit regression results for the probability of child labor in India (households above the subsistence level)

Analysis of Maximum Likelihood Estimates		Odds Ratio Estimates				
Parameters		Estimate		Points Estimate	90%	Confidence Limits
HH_LabelInd	NGO knowledge vs. no NGO knowledge	-1.15	**	0.10	0.01	0.77
HH_HoH_Sex	Female vs. male	-0.88		0.17	0.01	2.86
HH_HoH_Edu	Primary education vs. no education	1.22		0.08	0.001	274.827
HH_KalPC		-0.84		0.43	0.10	1.74
HH_No_Children		2.68	***	14.60	2.66	80.12
HH_Debts		0.01		1.01	0.96	1.06
HH_HoH_Age		0.97	***	2.65	1.29	5.46
HH_No_ChildrenSchool		-1.9	***	0.15	0.05	0.46
HH_Size		-2.31	***	0.09	0.02	0.46

Note: dependent variable: HH_IsAnyChildLab, N = 135

***, **, *: Significant at 1%, 5% and 10%

Source: Own regression result

Table 8: Logit regression results for the probability of child labor in India (households below the subsistence level)

Analysis of Maximum Likelihood Estimates		Odds Ratio Estimates				
Parameters		Estimate		Points Estimate	90%	Confidence Limits
HH_LabelInd	NGO knowledge vs. no NGO knowledge	-0.23		0.63	0.39	1.02
HH_HoH_Sex	Female vs. male	0.21		1.52	0.59	3.92
HH_HoH_Edu	Primary education vs. no education	-0.11		0.81	0.48	1.33
HH_KalPC		0.43	*	1.53	1.01	2.30
HH_No_Children		0.67	***	1.95	1.42	2.70
HH_Debts		0.01		1.01	0.99	1.03
HH_HoH_Age		-0.04		0.95	0.88	1.13
HH_No_ChildrenSchool		-1.18	***	0.31	0.23	0.41
HH_Size		-0.09		0.91	0.71	1.16

Note: dependent variable: HH_IsAnyChildLab, N = 120

***, **, *: Significant at 1%, 5% and 10%.

Source: Own regression results.

4.3 Monitoring Frequency and Child Labor

One of the main factors, which could influence the success of labeling products, is 'monitoring frequency'. However, the above section does not consider 'monitoring frequency' as an explanatory variable because of the high collinearity with 'HH_LabelInd' (NGO knowledge vs. no NGO knowledge).

Rugmark has its own inspection and random monitoring system of its member's loom. It would be important to answer the question whether there is any association between monitoring by the labeling NGOs and child laborers working in carpet industry? It is hypothesized that the presence of a monitoring strategy by the labeling NGOs decreases the incidence of child labor in carpet industries.

Table 9: Cross tabulation of monitoring status and child labor in India

Monitoring Within Last Two Months By Labeling NGO	Child Labor		
	Yes	No	Total
No	174	409	330
	29.8%	70.1	100.0%
Yes	47	124	79
	27.4%	72.5%	100.0%
Total	221	533	754
	29.3%	70.7%	100.0%

Source: Own Survey, 2004

Table 9 cross classifies 754 respondents (5 to 14 years of age) by their monitoring status and full time working status for more than 20 days within the last two months. Here, child labor is a response variable and monitoring is an explanatory variable. We therefore study the conditional distributions of child labor, given the monitoring status. The proportions (29.8% for child labor, and 70.1% for no child labor) are non-monitoring sample conditional distributions of child labor. For positive monitoring, the sample conditional distribution is 27.4% for child labor and 72.5% (India) for no child labor.

The sample relative risk⁷ is 1.08 i.e. the sample proportion of child laborer with no monitoring is 8% the proportion of positive monitoring cases in India. The estimated relative risk means that the probability of child labor is higher for those with no monitoring than for those with monitoring. Thus, the null hypothesis is clearly rejected.

With respect to monitoring, it was also observed, that Rugmark inspectors took initiative to monitor the weaving carpets but not the other intermediate sectors like washing, dyeing, spinning carpets. Thus, a number of children were found to be working in the spinning industry.

⁷ Testing this hypothesis allows an estimation of the relative risk as data were neither sampled nor analyzed retrospectively (Case control).

Furthermore, it should be mentioned, that some organizations believe that credible monitoring is simply an impossible task. For example, the Secretary General of Care & Fair argues that there are 280,000 looms in India spread over 100,000 square kilometers. Thus, credible monitoring of such a large number of geographically dispersed looms is simply not tenable (U.S. Department of Labor, 1997).

5 Conclusions and Policy Implications

The intervention of social labeling NGOs leads to an improvement in the welfare of children and households involved in the Indian carpet industry. Thus, social labeling has been found to be an effective way of combating child labor. However, this is only true for the above-subsistence households, but not for the very poor households living below the subsistence level. Therefore, any policy to curb child labor should be aimed at the below-subsistence group of households who are the most vulnerable in society.

In the above-subsistence group of households, the calorie intake does not determine whether children work or not. Therefore, labeling NGOs are successful to remove child labor by their welfare activities. However, in the below subsistence households, calorie intake increases child labor because of the nutritional efficiency wage. Hence, labeling NGOs have no significant influence on the reduction of child labor supply in this group. The rationale behind this finding is that any welfare enhancing policy by labeling NGOs could directly or indirectly increase the nutrition level of the below-subsistence household members⁸. This implies that children are healthier, work more hours and get better paid and contribute more to their family's income to reach the subsistence level. Since child leisure is a luxury item, the demand for it is higher in the above-subsistence group than in the below-subsistence group.

It can be concluded that any reunion policy of labeling NGOs aiming at sending a child laborer from workplace to his/her family who are below the subsistence level, would cause a bad result for the child laborers unless the adult members have diversified income earning opportunities with fair wages.

Policies might be also formulated by intervening through nutrition programs (food for education, food stamps, food rationing) that allow a family to get over the subsistence trap. Above a certain level of nutrition (subsistence level), the households respond positively to the objective of labeling NGOs i.e. to decrease child labor supply.

Overall, frequent monitoring by labeling NGOs was found to have a positive effect on the reduction of child labor. However, there is always the danger that households who are driven by food poverty either shift their children to less visible sectors (e.g. from carpets to handicrafts), or across the production chain (e.g. from weaving to spinning), or move into the informal sector where conditions are likely more exploitative. In fact, it was found that a number of children moved to the intermediate sector of carpet production,

⁸ According to Engel's law the below subsistence households spend a larger proportion of their income on food (inferior goods) than the above subsistence households.

like the spinning industry which are not monitored by the NGOs. Therefore, it is important to also monitor these sectors which have often more dangerous and hazardous working conditions than the weaving sector. In addition, the monitoring risk or moral hazard problem in monitoring which is caused by the large number of looms in the carpet industry could be avoided by substituting traditional technology with modern technology.

This research estimates a positive correlation between child employment and family debts which is nearly significant⁹ in India. Mostly the uneducated people feel uncomfortable to go to the institutional credit market due to paper works and bureaucracy. Therefore the demand for informal credit is very high among the carpet workers. On the supply side, the poor people sometimes do not have any credit access to the government and private banks. Banks think that poor people are not creditworthy because they do not have any collateral. As a result, the interest rate is very high in the informal credit market. Among the informal sources, the majority of the households receive loans from the industry owners, sometimes as an advance payment. Advance payments make the debtor liable to finish the work in time in order to receive another advance payment and therefore, they use child labor to finish the work as early as possible. One of the instruments to break the credit cycle is 'micro credit'. The Grameen Bank model in Bangladesh might be followed in this regard and child schooling could be treated as the only 'collateral' of the micro credit.

In this context it should be also noted that the findings of the regression analysis support the luxury hypothesis by showing a positive relationship between adult income and child labor in the Indian carpet industry.

The most important factor in the analysis is the number of children under 14 years of age in the household; a household with more children is much more likely to send a child to work than a household with fewer children in India. Education is likely to lead to reduced number of children. Since improvement of the head of the household's education significantly decreases the probability of a child's employment in the labor market, adult education can also in this respect play a positive role in reducing child labor. The age of the head of the household shows a significant and positive effect on child labor supply. Therefore, a micro insurance policy could resolve the problem for old parents who might consider every child's birth as an insurance against their income loss.

⁹ For nearly 14% of the cases, the null hypothesis is true.

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