

Children's Work Activities in a Peasant Household: Epitome of Neo-Classical Rationality or Else?

Arup Maharatna

Gokhale Institute of Politics and Economics
Pune 411 004
Maharashtra, India

Abstract

A simple micro-economic model of a small peasant household economy has been formulated to derive the conditions for optimum labour time allocation among different gainful activities of the child and adult members. An empirical example with Indian data is also presented as an aid to a judgement on the relevance of such neo-classical optimising framework in the context of poor peasants of LDCs.

I Introduction

In the Chicago-school tradition of economics, much of the household behaviour/decisions is typically seen, and increasingly sought to be shown, as outcomes, in large part, of rational economic choice in terms of an optimising mind-set and its pecuniary calculations within some specific household economic circumstances/constraints¹. In the same vein, the parents of developing countries are thought to be governed by their own household economic specificities. For instance, relatively large family size is often viewed as being consistent with 'rational' economic choice in a poor household in which children not only contribute to family's lot, but their upbringing entails relatively low cost both in terms of absolute expenditure per child as well as net loss of opportunities of adult earnings because of child-rearing.² There is indeed fairly large literature - both theoretical and empirical - on *net* economic value of children's work activities in developing countries. Notwithstanding inconclusive and even conflicting results on the *net* economic value of children's work activities in the context of peasant households,³ the phenomenon of children's participation in productive/useful activities both within household and outside - commonly (and sometimes loosely) dubbed as 'child labour' - is overwhelmingly real and manifest in most of the less developed countries.⁴ With this phenomenon as a broad backdrop, the modest objective of the present paper is two-fold: namely, first, to envisage theoretically (i.e. by building a simple model) the conditions, implications and ramifications of 'economic rationality' in the neoclassical microeconomics sense for the pattern of labour allocation between children and adults in the context of a typical peasant household of a poor country; and second, to evaluate them (hence the model itself) in the light of India's empirical data.

Despite relatively fast growing and increasingly sophisticated literature and research on whether/how the use of child labour could be got rid of,⁵ children in majority developing countries do participate in family farm activities; they share a considerable portion of domestic chores, for example, by caring the younger children, by collecting

firewood, fetching water etc. Indeed children are also often found working as child wage-labourers or attached labourers outside the household. Thus, children, much like adult members, can perform in their own capacity certain tasks in both domestic front and the farming process. Examining the labour allocation/distribution of adult and child members among distinct categories of activities could be one way of testing - albeit somewhat indirectly - the validity and/or applicability of the basic neo classical premise that poor peasants in LDCS behave rationally on the lines of neo-classical microeconomic principles. In the following section, a simple model for a typical peasant household is formulated to derive conditions for optimum pattern of labour hour allocations of different members (children and adults) among diverse activities – of course in view of plausible constraints. This in turn offers the reduced forms relationships between relevant variables, which could be put to empirical test. In the third section an attempt is made to see whether these theoretically derived relationships are borne out by some Indian data. Concluding remarks are presented in the fourth section.

II The Model

Let us consider a poor peasant household with a given plot of land in a labour-surplus rural society. The family consists of α adult members and β number of children who all take part in farm activities. Both children and adult members have employment opportunities outside the family farm, but wage rate for the former, W_c , is lower than that for the latter, W_a .⁶ Furthermore, both children and adult members take part in the household chores. However, there are some, not all, domestic works and farm activities, which evidently fall in the purview of children's capabilities. For example, a child of ten years cannot plough land, but can participate somehow in sowing and/or harvesting processes; she/he may not be able to cook but can collect firewood or bring his parents the meal in the field⁷. Thus, we distinguish, qualitatively, between child labour and adult labour as if they are two different inputs employed in producing both crops and domestic services.⁸ Technically speaking, corresponding to family farm output P and household services D , we assume two well-behaved production functions, each involving two inputs, child labour and adult labour:

$$P = f(\alpha l_a^h, \beta l_c^h); f_1 > 0, f_2 > 0, f_{11} < 0, f_{22} < 0 \quad (1)$$

$$D = g(\alpha l_a^d, \beta l_c^d); g_1 > 0, g_2 > 0, g_{11} < 0, g_{22} < 0 \quad (2)$$

where,

l_a^h = farm-labour hours supplied per adult member

l_c^h = farm-labour hours supplied per child member

l_a^d = household-labour hours supplied per adult

l_c^d = household-labour hours supplied per child.

However, each member has some maximum number of hours at his disposal for work in a single day. This sets a limit to the work hours for all the members. If l_a^m and l_c^m stand respectively for the labour hours supplied per adult and per child in wage-employment outside family, we could write the following constraints:

$$L_a \geq l_a^h + l_a^m + l_a^d \quad (3)$$

$$L_c \geq l_c^h + l_c^m + l_c^d \quad (4)$$

where L_a = the maximum number of work hours at disposal of each adult member,
and L_c = the maximum number of work hours at the disposal of child worker.

It is assumed that no open or visible idleness among the members exists. The surplus labour, if any, would take only disguised form either in family farm or domestic activities or both.⁹ Thus, if surplus labour owing to the limited wage employment opportunities takes the form of low work intensity within the household, then (3) & (4) may be taken as equalities.

However, a considerable scarcity of jobs outside the family farm, especially among adult hands, is fairly common within much of the developing world. The extent of unemployment faced by adult workers could be captured in terms of probability of finding an adult job, z , being less than unity, and hence the expected wage earning of an adult member would be $z.W_a$.¹⁰ Now it is the expected wage, rather than actual wage, that would count in the optimisation exercise. The peasant household income, C , being the sum of family-farm output and wage earnings of all the members, can then be expressed as follows:¹¹

$$c = f(\alpha_a^h, \beta l_c^h) + z.w_a l_a^m .\alpha + w_c l_c^m .\beta \quad (5)$$

Now, since our basic query relates to the optimum allocation of certain quantities of labour inputs among different productive uses, it seems logical to view such household decisions from a producer's standpoint. However, unlike a wage-labour-based capitalist farm, this peasant household would aim at maximizing total family income rather than profit. Since the number of children is no more a matter of choice, the income per member would be the maximum when total family income is maximized. In case of a poor household, the children and adults alike can hardly afford the voluntary leisure as a substitute for income because such substitutability (between income and leisure) presumably emerges only beyond a certain minimum levels of per capita consumption or living standard. Since we are considering a specific class of poor peasant households in which children's survival is seen to depend crucially on their own productive role, and all members appear busy in making both ends meet, the household utility function could be thought to include only household income. Hence, the household utility maximization hardly differs from household income maximization, given the family size. Therefore, the household objective function to be optimised in the present case can be one given by (5).

While maximizing household income, C , the peasant family, however, faces another constraint, namely that a minimum level of domestic services, G , must be produced, given the family size. A minimum amount of labour inputs, for example, has to be devoted to cooking for the whole family. Similarly, a corresponding minimum labour time is required for fetching firewood or bringing water or washing utensils. Although G should, understandably enough, vary with the family size or age-composition of the family members, it should be somewhat fixed for the day-to-day functioning of a given household:

$$g(al_a^d, \beta l_c^d) \geq G \quad (6)$$

The labour time spent on domestic chores eats into the labour time available for income-earning activities. Therefore, the domestic services, which are not included in the bundle defined as G – such as home decoration or gardening etc. – can realistically be ruled out in the present case of a poor peasant. Hence, the constraint (6) should better take the equality form. However, our treatment of domestic activities and labour hours at home deviates somewhat from a typical household production approach in which members' domestic labour time, combined with some market goods, produce commodities which, in turn, are the '*true objects of utility*' (Becker, 1965). This departure is made in view of our focus here, only on the labour allocation problem confronting a typical poor peasant household in which both children and adult members are productive agents. The very limited purpose of the present paper does not require us to start with a household utility function involving substitutable commodities like quantity and quality of children, leisure etc.¹² Thus, we model the peasant household not typically in a broader mould of the consumer behaviour, but we rather frame the problem of allocation of the given labour inputs from a producer's standpoint. Now, let us form the following Lagrangian expression:

$$w = f(\alpha l_a^h, \beta l_c^h) + \alpha \cdot z \cdot w_a l_a^m + \beta \cdot w_c l_c^m + \lambda \{g(\alpha l_a^d, \beta l_c^d) - G\} \quad (7)$$

The optimum allocation of both adult and child labour inputs among the household farm and off-farm employment automatically determines their optimum labour allocation in the domestic front given (3) and (4). Therefore, using (3) and (4), the optimisation of (7) with respect to $l_a^h, l_c^h, l_a^m, l_c^m$ and λ yields the following first-order conditions¹³:

$$f_1 - \lambda g_1 = 0 \quad (8)$$

$$f_2 - \lambda g_2 = 0 \quad (9)$$

$$z W_a - \lambda g_1 = 0 \quad (10)$$

$$W_c - \lambda g_2 = 0 \quad (11)$$

$$g(\alpha l_a^d, \beta l_c^d) - G = 0 \quad (12)$$

Combining (8) and (9) leads to

$$\frac{f_1}{f_2} = \frac{g_1}{g_2} \quad (13)$$

Similarly, by combining (10) and (11), we have

$$\frac{z \cdot W_a}{W_c} = \frac{g_1}{g_2} \quad (14)$$

Combining (13) and (14) reduces to a familiar equilibrium condition:

$$\frac{f_1}{f_2} = \frac{g_1}{g_2} = \frac{z \cdot W_a}{W_c} \quad (15)$$

The above result, which is pretty text-book-type condition, tells us what sounds fairly obvious, namely, that the ratios of marginal returns from unit rise in child labour and adult labour in three sectors – family farm, off-farm and domestic chores – must be same at the equilibrium. So long as this condition is not satisfied, the scope for reallocation of labour inputs among these sectors remains for the better. Alternatively, the expected adult wage and child wage rates can also be interpreted as the respective prices of the adult and child labour inputs employed in family farm and domestic services production. This is because the use of one unit labour time in latter activities must pay a price in terms of wage income loss or the opportunity cost price, which

depends on wage rate per unit of time in off-farm employment. Hence (15) provides the optimum input ratios between adult and child labour in these three sectors, and entails no operational significance of α and β . From (15), it is also possible to hypothesize about the impact on sectoral adult-child labour input ratios of parametric variations in the values of W_a/W_c and z . For example, it is easy to see that an exogenous rise in W_a/W_c would lead to a fall in adult-child labour ratios in both family farm and domestic services production, given (1) and (2) and hence, it would be associated with a rise in adult-child labour ratio in off-farm sector, given (3) and (4) and the value of z being unchanged. Given the value of W_a/W_c any exogenous rise in z should have exactly similar effects on the sectoral input ratios and *vice versa*. That is, we may write:

$$Y_j = \psi(W_a/W_c, z) \quad (16)$$

where $Y_j = l_a^j / l_c^j, j = h, m, d$

Now, the five equations (8) – (12) can be solved for the optimum values of $l_a^h, l_c^h, l_a^d, l_c^d$ and λ . By putting these values into (3) and (4), the optimum values of l_a^m and l_c^m get rather easily determined. It is also pretty easy to see that all these solutions would be expressed in terms of W_a, W_c and z .

Undertaking a comparative static exercise, we examine the directions of change in each of these six optimum values in response to an exogenous change in W_a or W_c or z . That is, we may thus derive the separate labour supply functions for both adults and children in each of the three sectors:

$$l_i^j = F_i^j(W_a, W_c, z) \quad \begin{array}{l} i = a, c \\ j = h, m, d \end{array} \quad (17)$$

The following results can easily be established (*see Appendix*):

$$\frac{dl_a^h}{dw_a} < 0, \frac{dl_a^d}{dw_a} < 0, \frac{dl_a^m}{dw_a} > 0$$

$$\frac{dl_c^h}{dw_a} < 0, \frac{dl_c^d}{dw_a} > 0, \frac{dl_c^m}{dw_a} \geq 0$$

It becomes clear that the effects of a change in z would be exactly similar to those of a change in W_a as above.

$$\frac{dl_c^h}{dw_c} < 0, \frac{dl_c^d}{dw_c} > 0, \frac{dl_c^m}{dw_c} > 0$$

$$\frac{dl_a^h}{dw_c} < 0, \frac{dl_a^d}{dw_c} > 0, \frac{dl_a^m}{dw_c} \geq 0$$

Therefore, while children do relieve the adult members of a part of the domestic workload as part of a strategy for internalising the benefits of the higher adult wage rate or of increased adult job opportunities, the latter, in terms of above rational model of labour allocation, should also play the same role whenever children's wage rate gets higher or rises. However, the impact of a change in adult wage rate (child wage rate) on the children's (adults') wage labour hours is not clear, as it would depend on the output-elasticity of the relevant labour inputs.

It should be noted that the labour supply functions given by (17) are all homogeneous of degree zero in wage rates both for adults and children. The equilibrium condition

(15) clearly suggests that if W_a and W_c change in the same proportion, the labour time supplied by adults and children in each sector should remain unchanged. Therefore, the labour time supplied in each sector separately by adults and children can be expressed as a function of relative wage rate i.e., W_a/W_c and z . Estimating such labour supply functions separately for each sector may amount to a test of poor peasants' rationality in allocating optimally the work-capacities of children and adults among different fronts.¹⁴ Finally, it should be stressed that since this model is far from comprehensive, and since it does not take account of many possible factors other than wage rate in shaping labour allocation, it needs to be used with caution in inferring about its validity in the light of some real empirical data. We present below a simple empirical exercise in an attempt to throw some light on the question as to whether or not adult-child rural labour allocation pattern across Indian states conforms to the observed variations in adult-child wage ratio.

III An Empirical Exercise with Indian Data: A State-level Analysis

Finding a suitable set of data to test well-defined hypotheses is often not very easy in much of the social science discourse. This is particularly so in empirical explorations into patterns of labour-time disposition of household members by sex and age. Indeed our own search for appropriate data in the Indian context did not bear much fruits in finding reliable, consistent, and disaggregated (e.g. at least district-level) information pertaining to adult-child labour composition in the rural economy. Consequently, for the sake of gleaning some useful empirical insights *vis-à-vis* the simple neoclassical model above, we attempt at utilizing National Sample Survey Organisation's state-level aggregative (average) information. The state-level information on average daily earnings of men and women and children in rural labour households is available from NSSO Rounds of Rural Labour Enquiry, while the information on respective rates of work participation/incidence in the rural economy is obtainable from Employment and Unemployment Surveys. Although information on average earnings are not available for children by sex and age groups, information on work participation rates of children is available for two age groups, namely 5-9 years and 10-14 years and for both males and females separately. Utilizing these two sources of state-level data for 1993-94 and 1999-2000, we estimate correlation coefficient matrixes involving several relevant state-level averages, namely, adult and child earnings per day (i.e. the respective wage rates, roughly speaking) and their ratios, proportions of adult and child workers (classified by principal and subsidiary categories) to total populations and their ratios, and the proportion of children attending schools (Table 1).

As can be seen from Table 1, the state-level correlation in 1999-2000 between adult-child ratio of average daily earnings and the adult-child ratio of work participation (usual-status) is found insignificant, and indeed even negative – a finding which seemingly belies, and is clearly contrary to, a positive relationship hypothesised above in terms of a simple optimising exercise in the context of a poor farm household. However, strikingly enough, the work participation ratio between adult (30-39 years) and children (10-14 years) in 1999-2000 turns to be highly significantly and positively correlated with the adult-child wage ratio of 1993-1994. Notwithstanding usual/general caveats involved in interpreting correlation coefficients, especially between state-level aggregative data, the above finding invites serious attention. For example, this could be an indication that it takes quite some time (e.g. 6/7 years) for the adult-child labour composition across states to conform to the optimum pattern

called for by the corresponding variation in adult-child wage-ratio (earnings), and in the process (meanwhile) the latter might change again to call for further change in labour composition, which in turn can adjust itself only in another several years, and so on. This apparent lack of evidence of instantaneous adjustment on the lines presumed by microeconomic model of rational household economic behaviour is particularly unsurprising in the context of state level data/analysis. The state-level aggregative data, on the one hand, iron out micro-level/disaggregated (e.g. district and household levels) variations in circumstances and constraints. On the other hand, they entail the effects of broader regional diversities in culture, geography, productive and social forces, which are all beyond the capture of a simple partial equilibrium model described above. Indeed, state-level data used here might well reflect several region-specific social (e.g. taboos relating to wage employment, migration) and other constraints (e.g. irrigation facilities, employment opportunities), which could come on the way to a quick responsiveness of adult-child labour-ratio to given changes in the wage-ratio. Furthermore, and somewhat relatedly, the hypothesised positive relationship between adult-child wage-ratio and adult-child labour-ratio could well get muddled in the state-level average data that almost certainly embody diverse influences of many such variations as ecology and geophysical features, levels of development and incomes, poverty, and educational facilities.

Table 1 Product Moment Correlation Coefficients across Indian States, 1999-2000

	1999-2000	1993-1994/1999-2000#
<i>Adult-Child Wage Ratio AND Adult-Child Ratio of Work Participation (both sexes combined, principal workers)</i>	-0.31 [-0.22] N = 18	0.87 ** [0.15] N = 19
<i>Adult-Child Wage Ratio AND Adult-Child Ratio of Work Participation (Male) (principal workers)</i>	-0.37 [-0.36] N = 18	0.86 ** [-0.08] N = 19
<i>Adult-Child Wage Ratio AND Adult-Child Ratio of Work Participation (Both Sexes combined, usual workers)</i>	-0.24 [-0.18] N = 18	0.81 ** [-0.59] N = 19
<i>Adult-Child Wage Ratio AND Adult-Child Ratio of Work Participation (Male) (usual workers)</i>	-0.34 [-0.22] N=18	0.80 ** [-0.06] N= 19
<i>Child Daily Average Earnings AND % Children Attending school</i>	0.55 * [0.16] N=18	0.36 N=19
<i>% of children attending school AND % of child workers (usual workers)</i>	-0.63 ** [-0.21] N=33	

These are respective correlation coefficients between X and Y where X refers to 1993-1994 and Y refers to 1999-2000.

* significant at 0.05 level

** significant at 0.01 level

N number of States.

Note: (1) Figures in [] brackets are respective coefficients when children aged 6-10 years are considered in place of children aged 10-14 year; (2) The proportions of 'adult workers' refer only to those aged 30-39 years; (3) Wage rates for adults refer to only males, but children's wages refer to both sexes combined; (4) All data refer to rural areas.

Sources: Wages: Rural Labour Enquiry, Report on Wages and Earnings of Rural Labour Households, (NSS 55th Round), 1999-2000; School attendance: UNICEF, Multiple Indicator Survey, 2000; Proportion of Workers (usual and principal status) by Age and Sex: NSS Report 458, *Employment and Unemployment Situation in India, 1999-2000*.

For example, a highly significant and positive correlation between children's average earnings/wages and their proportion attending school across the states could appear counter-intuitive at the first sight from the standpoint of above-modelled household

economic rationality [e.g. higher the level of children's wage, the larger should be the proportion working and keeping away school, other things remaining the same]. But of course 'other things' are not the same across Indian states. Diverse levels of social and economic development, per capita income, and poverty ratio across Indian states might well eclipse the relationships derived from a simple model for individual household between children's school attendance, wage rates, and work participation. Some such possible influences of state-level differentials are illustrated in Table 2. For example, there have been significant and positive correlations between state domestic income per capita on the one hand and wages for adults and children and the proportion of school-attending children on the other. However, per capita state domestic income, while having no association with adult-child wage ratio, shows a positive correlation - albeit not very highly significant in terms of statistical tests - with adult-child ratio of work participation. Although the proportion of child workers (usual status) in a state has no distinct association with the level of rural poverty, the latter's correlation is negative both with the proportion of children currently attending school (and highly significant) and their average earning/wages (see Table 2). The proportion of male child workers aged 10-14 years does show a substantial negative correlation with total unemployment per 1000 rural male population in 1999-2000. This could well be a reflection that children's work participation depends crucially on the work opportunities, rather than household poverty *per se*. In any case, all this above is suggestive that children's schooling gets an increasing (relative) priority in households along with rising incomes - a sense of priority which could make for a situation of increasing number of children who keep away from work and attend school, despite higher and/or rising average earnings/wages of children's work.

In any case, Table 3 presents state-level average adult-child ratio of earnings/wages during the 1990s, and the corresponding ratio between adult-child gaps (in proportionate terms) in earnings/wages and labour-allocation. While adult average daily earning is, of course, larger than that of children in almost all states, the former is generally not twice as much for the latter especially in 1999-2000. Indeed, in some states in 1999-2000, say West Bengal and Punjab, the average earnings of children has been pretty close to adults' average earnings. Although in some states in 1993-1994 (e.g. Tamil Nadu, Kerala, Orissa) adults' average earning had been more than twice that of the children, the ratio has declined somewhat by 1999-2000.

While the optimum (partial) equilibrium in a rather simplistic model above typically warrants a unity of the ratio of the adult-child gaps (proportionate) in earnings/wages and labour allocation, for none of the states the ratio is close to unity and for many states it is far below unity. This is clearly suggestive that adults' overall labour allocation to work activities relative to that of children has been disproportionately greater than what could be warranted by adults' wage relative to that for children. This ratio is somewhat close to 0.5 in a few states such as Andhra Pradesh, Rajasthan, and Karnataka which are marked for relatively large incidence of rural child labour. The simple state-level correlation coefficients show that this ratio is higher (towards unity), the lower is the rural poverty ratio (-0.62* with children aged 10-14, -0.57* with children aged 5-9 years). It is true that one should not read or rely too much in the exact magnitudes of the correlation coefficients, as they are based on relatively small number of observations, of which some could be rather 'extremes' or 'outliers'. But they may well provide some broad indications, vindications, or doubt about *a priori* hypotheses derivable from simple deductive modelling.

Table 2 Product Moment Correlation Coefficients across Indian States, 1993-2000

	1999-2000	1993-1994	1993-1994/1999-2000#
<i>Per Capita Net State Domestic Product AND % of children (10-14 years) attending school</i>	0.62** [0.59**] N=29		0.56** [0.52**] N=29
<i>Per Capita Net State Domestic Product AND average daily earnings per adult man</i>	0.49** N= 32	0.24 N= 29	0.53** N= 32
<i>Per Capita Net State Domestic Product AND average daily earnings of per child</i>	0.48** N= 19	0.424 N= 18	0.43 N= 19
<i>Per Capita Net State Domestic Product AND Adult-Child Wage Ratio</i>	0.07 N= 19	0.01 N= 18	-0.01 N= 19
<i>Per Capita Net State Domestic Product AND Adult-Child Ratio of Work Participation</i>	0.34 [-0.15] N = 28 [19]	-	0.43* [-0.12] N = 28 [19]
<i>Rural Poverty AND % of child usual workers</i>	0.03 [0.01] N = 32	-	0.13 [-0.05] N = 32
<i>rural poverty AND Adult-Child Ratio of work participation</i>	- 0.20 [0.13] N = 31 [19]	-	-0.2 [0.24] N= 31 [19]
<i>Net state domestic income per capita AND % of child usual workers</i>	- 0.37 [-0.24] N = 29	-	- 0.29 [-0.20] N = 29
<i>Total unemployment per 1000 persons AND % of child workers aged 10-14 years (usual status, male)</i>	-0.59* [-0.43] N=16		-0.77**[-0.62*] N=16
<i>rural poverty AND % of children 10-14 years attending school</i>	- 0.37* [-0.54*] n = 32	-	-0.41* [-0.54**] N = 32
<i>rural poverty AND adults' (children's) average daily earnings/wages</i>	-0.36* (-0.32) N = 17	- 0.31 (- 0.32) N = 32	-0.36* (-0.31) N = 32

Note: (1) Data on the number of child workers refer to male children aged 10-14 years; (2) Figures in [] brackets are respective correlation coefficients for male children aged 6-10 years; (3) All data except state domestic income per capita refer to rural areas.

These are respective correlation coefficients between X and Y where X refers to 1993-1994 and Y refers to 1999-2000.

* significant at 0.05 level; ** significant at 0.01 level

Sources: Information on Net State Domestic Product Per Capita and Rural Poverty for the States is downloaded from www.indiabudget.nic.in. For sources on other variables see Table 1.

Table 3: Ratios of Adult-child Wage Differentials to Corresponding Labour Input Differentials

States	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (<i>Principal + Subsidiary</i>)	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (<i>Principal</i>)	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (Male) (<i>Principal + Subsidiary</i>)	Adult-Child Wage Ratio To Adult-Child Ratio of Work Participation (Male) (<i>Principal</i>)	Adult Wage To Child Wage, 1993-94 [1999-2000]
AP	0.46	0.44	0.37	0.35	1.63 [1.66]
AS	0.09	0.07	0.09	0.07	1.45 [1.31]
BH	0.11	0.08	0.10	0.09	1.23 [1.46]
GJ	0.16	0.14	0.14	0.13	1.24 [1.20]
HR	0.06	0.06	0.06	0.05	0.85 [1.50]
KA	0.36	0.35	0.31	0.30	1.77 [2.02]
KE	-	-	-	-	5.04 [-]
MP	0.18	0.16	0.17	0.16	1.54 [1.46]
MH	0.17	0.16	0.15	0.14	1.97 [1.78]
OR	0.18	0.16	0.12	0.11	2.03 [1.51]
PJ	0.08	0.08	0.07	0.07	1.36 [1.06]
RJ	0.44	0.43	0.26	0.25	1.56 [2.23]
TN	0.19	0.17	0.17	0.15	2.07 [1.82]
UP	0.14	0.10	0.11	0.08	1.68 [1.54]
WB	0.16	0.14	0.09	0.08	1.87 [1.12]
HP	-	-	-	-	1.55
MN	0.04	0.05	0.05	0.05	- [1.57]
MG	0.12	0.12	0.15	0.15	- [1.61]
MZ	-	-	-	-	1.98 [-]
TR	0.05	0.05	0.04	0.04	1.22 [1.27]
IND	0.20	0.19	0.15	0.14	1.75 [1.67]

States	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (<i>Principal + Subsidiary</i>)	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (<i>Principal</i>)	Adult-Child Wage Ratio/ Adult-Child Ratio of Work Participation (Male) (<i>Principal + Subsidiary</i>)	Adult-Child Wage Ratio To Adult-Child Ratio of Work Participation (Male) (<i>Principal</i>)
AP	0.37	0.35	0.43	0.46
AS	0.10	0.08	0.08	0.10
BH	0.08	0.07	0.06	0.09
GJ	0.14	0.13	0.14	0.17
HR	0.04	0.03	0.03	0.03
KA	0.27	0.26	0.31	0.32
KE	0.06	0.02	0.03	0.05
MP	0.18	0.17	0.17	0.19
MH	0.17	0.16	0.18	0.19
OR	0.16	0.15	0.21	0.24
PJ	0.09	0.09	0.11	0.10
RJ	0.18	0.17	0.30	0.31
TN	0.19	0.17	0.19	0.21
UP	0.12	0.09	0.11	0.15
WB	0.14	0.13	0.24	0.27
HP	0.10	0.02	0.03	0.14
MN	-	-	-	-
MG	-	-	-	-
MZ	0.18	0.07	0.09	0.29
TR	0.04	0.04	0.05	0.05
IND	0.16	0.15	0.19	0.21

'-' data not available.

Note: Same as table 1

Sources: Same as Table 1.

IV Concluding Remarks

The chief objective of the paper has been to construct a simple static partial equilibrium model for a peasant household to identify the optimum behaviour of labour allocation between children and adult members, given the adult-child differential in wage/earnings and the movements therein, and given of course some simplifying assumptions. If, as the received literature on children's productive and useful activities often poses, children can be seen broadly as an economic 'instrument'/ strategy in the material sphere of a poor household, the derived condition for optimum pattern of adult-child labour allocation across several fronts, say household chores and hired paid employment, calls for its distinct sensitivity to adult-child earning differential. In view of several difficulties of testing such hypotheses derived at the household level, a rather simple empirical investigation has been made with the state-level average data available from NSSO. There is, not surprisingly, no evidence of instantaneous adjustment/equality between adult-child labour ratio and adult-child wage ratio at the state-level, though there is some evidence suggesting a lagged (by about 6/7 years) adjustment process of the former (i.e. labour allocation pattern) to the latter (i.e. adult-child wage ratio) on macroeconomic plane. Strikingly enough, the children's relative work participation *vis-à-vis* adult counterparts in rural India turns to be far too less than what a sample microeconomic calculus would have warranted in terms of children's average earnings relative to adults'.

The lack of consonance in the state-level variations between child earnings and child labour incidence, while being apparently counterintuitive from typical neo-classical perspective, appears pretty consistent with the view that parents have an inherent priority for children's schooling, which however they, while very poor, can hardly afford, but not exactly because children in these rural circumstances have to work, earn, and make the household survive (e.g. Maharatna 1997; Probe 1999). For example, the proportion of children attending school is lower in a state, the higher is the incidence/level of poverty; but the proportion of rural children who participate in work activities in a state, has no discernible association with the level of rural poverty. Indeed the adult-child labour allocation is comparatively *better* (albeit still far from perfect) attuned to the pattern of adult-child wage differential in a number of states, namely, Andhra Pradesh, Karnataka, Rajasthan, Gujarat – the states which have experienced remarkable (or even perhaps dramatic in some cases) reductions in rural poverty, but are still marked by high incidence of child labour. On the other hand, the reported rural incidence of child labour is amongst the least, together with very poor (almost nil) correspondence between adult-child ratios in earnings and labour allocation, in such states as Orissa, Uttar Pradesh, Assam, Bihar, which in turn are amongst the most afflicted in terms of rural poverty. Thus, the reality relating to children's work activities in rural areas is in a sense much too complex a phenomenon for straitjacketing exercises; but at the same time, and especially from the standpoint of familial emotions, parental priorities, and household poverty, this phenomenon seems simple and stark enough so as to make superfluous and/or even distracting the elegant attempts at its modelling founded squarely on some key self-contained (and seemingly self-contained too) neoclassical perceptions and premises of economic rationality.¹⁵

Endnotes

1. A prominent sphere of application of this approach has been the micro-economic theory of fertility behaviour (e.g. Becker 1960 and Willis 1973).
2. See e.g. Birdsall (1980), Mamdani 1972.
3. See, among others, White (1975), Cain 1977, De Tray 1983, Macfarlane 1976, Mueller 1976; Choudhury 1982; Maharatna (1997).
4. For Indian evidence see e.g. Jenkins 2004, among others. See Edmonds (2007) for a comprehensive update in global context.
5. Basu (1998, 2000), Baland and Robinson (2000) among others.
6. For relevant evidence on the plausibility of this assumption, see, for example, National Sample Survey, Govt. of India (1976) (relative numbers).
7. e.g. White 1975, Macfarlane 1976, and Deere & De Janvry 1979.
8. This of course, in effect, implies an absence of perfect substitutability of child labour by adult labour – an assumption, which, though not plausible and realistic under all circumstances, is made largely for convenience of exposition of the implications for labour allocation.
9. The phenomenon of disguised unemployment is well-known. It takes the form of lower than ‘standard’ work hours and/or work intensity (e.g. Sen 1962:13-15, and Sen 1966).
10. Thus for simplicity, we have ignored open unemployment among children, which is also not very significant in the rural labour market. See Govt. of India (1976). However, its incorporation into our model would not alter the basic results.
11. We keep the expiration single by not expressing it in wrong terms.
12. Rosenzweig (1980), for example, has attempted to derive the market (paid) labour supply function for the husband and wife of a landed cultivator household optimising the utility function which includes leisure.
13. Assuming that the second-order conditions are satisfied.
14. Assuming that the second-order conditions are satisfied.
15. All this happens to lend support to Amartya Sen’s electrifying exposition of neoclassical notions of rationality as being on occasions close to ‘foolishness’ from a broader perspective/angle (Sen 1977).

Appendix

Taking total differentiation of the five equations (8) – (12) and putting $\alpha = \beta=1$, we have

$$\begin{aligned}
 f_{11}dl_a^h + f_{12}dl_c^h - \lambda g_{11}dl_a^d - \lambda g_{12}dl_c^d - g_1d\lambda &= 0 \\
 f_{21}dl_a^h + f_{22}dl_c^h - \lambda g_{21}dl_a^d - \lambda g_{22}dl_c^d - g_2d\lambda &= 0 \\
 0 \quad 0 \quad +\lambda g_{11}dl_a^d + \lambda g_{12}dl_c^d + g_1d\lambda &= W_a dz + zdw_a \\
 0 \quad 0 \quad +\lambda g_{21}dl_a^d + \lambda g_{22}dl_c^d + g_2d\lambda &= dw_c \\
 0 \quad 0 \quad +g_1dl_a^d + g_2dl_c^d + 0 &= 0
 \end{aligned} \quad \left. \vphantom{\begin{aligned} f_{11}dl_a^h + f_{12}dl_c^h - \lambda g_{11}dl_a^d - \lambda g_{12}dl_c^d - g_1d\lambda = 0 \\ f_{21}dl_a^h + f_{22}dl_c^h - \lambda g_{21}dl_a^d - \lambda g_{22}dl_c^d - g_2d\lambda = 0 \\ 0 \quad 0 \quad +\lambda g_{11}dl_a^d + \lambda g_{12}dl_c^d + g_1d\lambda = W_a dz + zdw_a \\ 0 \quad 0 \quad +\lambda g_{21}dl_a^d + \lambda g_{22}dl_c^d + g_2d\lambda = dw_c \\ 0 \quad 0 \quad +g_1dl_a^d + g_2dl_c^d + 0 = 0 \end{aligned}} \right\} \quad (18)$$

While examining the impact of an exogenous rise in W_a , we put $dz = dw_c = 0$ and using the standard results, namely, $f_{12} = f_{21} > 0$, $g_{12} = g_{21} > 0$,

$(f_{11}f_{22} - f_{12}^2) > 0$, and by Cramer's rule, find that

$$dl_a^h = \frac{-dw_a z f_{22} (\lambda g_{11} g_2^2 - \lambda g_{12} g_2 g_{21} - \lambda g_{12} g_2 g_{12} + \lambda g_1^2 g_{22})}{(f_{11}f_{22} - f_{12}^2) \{2\lambda g_{12} g_2 g_{12} - \lambda (g_{11} g_2^2 + g_{22} g_1^2)\}}$$

or

$$\frac{dl_a^h}{dw_a} < 0$$

Similarly, $\frac{dl_a^d}{dw_a} < 0$ and hence by (3)

$$\frac{dl_a^m}{dw_a} > 0$$

Similarly, it can be shown that

$$\frac{dl_c^h}{dw_a} < 0, \frac{dl_c^d}{dw_a} > 0 \text{ and hence } \frac{dl_c^m}{dw_a} \geq 0$$

Putting $dw_a = dw_c = 0$ in (18), it is easy to check that the effects of an exogenous change in z would be exactly similar to those of a change in w_a .

Now, putting $dw_a = dz = 0$ in (18), we find the following effects of a change in w_c :

$$\frac{dl_c^h}{dw_c} < 0, \frac{dl_c^d}{dw_c} < 0, \frac{dl_c^m}{dw_c} > 0,$$

$$\frac{dl_a^h}{dw_c} < 0, \frac{dl_a^d}{dw_c} < 0, \frac{dl_a^m}{dw_c} > 0$$

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