

On Selfish Parents and Child Labour

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Abstract

This paper investigates a prediction of the altruistic model, which is that adult consumption is decreasing in child labour. Parents typically decide whether children work and this immediately raises the question of whether they might act in their self-interest. If they do, then arguments for legislative action such as a ban on child labour or compulsory schooling gain strength. Using a large household survey for Pakistan, *m*-demands for adult consumption are estimated, distinguishing tobacco, tea and coffee and adult clothing and footwear. We cannot reject altruism based on the demands for adult clothing and footwear and tea and coffee, but altruism is decisively rejected in the case of tobacco consumption. The rejection of altruism is stronger for girls than for boys in the household. Given that, in these data, tobacco is disproportionately consumed by males, the results indicate that fathers are more “selfish” than mothers and that the brunt of this selfishness may fall more heavily upon daughters than on sons.

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1. Introduction

This paper investigates parent altruism in the context of the decision to send a child to work. Since this decision is, more often than not, made by parents, it is subject to agency problems. If parents derive a direct disutility from child labour then, controlling for prices, we should observe that child labour is associated with a cutting back of adult consumption. This follows from the simple intuition that parents will equate the marginal utility of consumption to the marginal utility of child leisure, which is higher if children work. This prediction is investigated by studying the manner in which the consumption of adult goods in a household varies with the quantity of child labour in the household. The model is estimated as an m-demand since this gives an unambiguous sign on the coefficient of interest. Distinct from Marshallian and conditional demands, m-demands are a function of all prices and the quantity of a reference good. In the current context, the m-demand for adult consumption is a function of real wages and the quantity of child leisure (labour), and child labour is potentially endogenous. This problem can be addressed using information on the presence of primary, middle and secondary schools in the village in which the child lives as it seems reasonable to assume that this does not directly influence adult consumption. The theory suggests household income as a further appropriate instrument for child labour. Overidentifying restrictions afforded by household income, parent's education and the regional unemployment rate are discussed and tested.

Section 2 motivates this analysis with reference to research and policy pertaining to child labour, altruism and gender differentials in well-being. A theoretical structure is set out in Section 3. The construction of an empirical model to investigate the relevant prediction of the model is discussed in Section 4. Section 5 describes the relevant features of the data. The results are presented in Section 6, together with several variants that establish their robustness. A discussion of the results and their relation to cognate areas of research and policy follows in Section 7, and Section 8 concludes.

2. Motivation

2.1. Addressing Child Labour

Economists have exhibited considerable interest in modelling child labour in recent years, led by the seminal paper of Basu and Van (1998). A somewhat extreme form of altruism, appealing in the context, is an essential axiom of this paper: parents send children to work if and only if their earnings are a necessary contribution to meeting the subsistence expenditures of the household. So, parents care very much about the

leisure (or education) of their children. The authors show that this assumption, (together with the assumption that adults and children are substitutable in production), is sufficient to generate multiple equilibria in the labour market. Recognition of this has interesting implications for the likely impact of bans, trade sanctions and changes in fertility on child labour. In a development of this framework, Basu (2000) shows that the effects on child labour of an adult minimum wage are ambiguous. These are theoretically appealing papers which have had a substantial impact on research and policy debate. However they rely upon a fairly strong form of parent altruism. More recent research on the economics of child labour has tended to continue to assume parent altruism (e.g., Baland and Robinson, 2000). This paper investigates whether the data are consistent with this.

Research motivated to investigate parent altruism towards children is scarce. Yet it is clearly of enormous significance to a range of issues. If parents do not care sufficiently about the future welfare of their children or, in particular, if an agency problem arises in private human capital investment decisions made within the household, then there is a clear case for governments to intervene. This may take the form of subsidising education and thereby relaxing the trade-off between the current consumption of parents and the future consumption or wellbeing of their children. Alternatively, evidence of non-altruism amongst parents offers a rationale for legislative measures such as bans on child labour or compulsory schooling. In the alternative scenario in which parents are altruistic and children work only when compelled by poverty, legislation would be difficult to enforce and it would tend to reduce the welfare of poor children. More generally, the degree of altruism amongst parents will influence the design and effectiveness of government transfer programmes. Amongst current interventions motivated to reduce child labour, some of the more successful have the feature that income transfers to parents are conditional on the child attending school². While there has been no explicit discussion of parent altruism in this context, this aspect of design is consistent with some skepticism regarding altruism. The range of programmes instituted by international organisations in the last five odd years with the express purpose of reducing child labour reflect alternative approaches. While the ILO favours legislative measures, UNICEF has focused on investments in the education sector and the World Bank perceives the problem as being primarily a symptom of poverty. Which of these approaches is most effective in any regional context depends, amongst other things, on the relative significance of non-altruism in determining child labour.

2.2. Investigating Altruism

The analysis in this paper also ties into a broader literature concerned with altruism within families. In the most commonly used definition, Person A's preferences are described as altruistic towards Person B if B's consumption, leisure or utility appear in the utility function of A³. What is the evidence? Using household survey data from

² For example, Progreso in Mexico and Bolsa Escola in Brazil (see World Bank, 2000) and Becker (2000).

³ If A's utility depends upon the utility of B (rather than on the arguments of B's utility function) then A's preferences are described as "caring". (*comment on my working with consumption and leisure rather than with sub-utilities and which is stronger etc*).

nineteenth century America, Parsons and Goldin (1989) reject parent altruism in the context of child labour. They find that the propensity to save from child income is similar to that from adult income and, they argue, this is inconsistent with borrowing constraints⁴. They further argue that the negative correlation in their data between adult and child earnings is indicative of non-altruism⁵.

This isolated case apart, there does not appear to be any data-analytic research on altruism towards young children or child labour. Research on altruism has mostly considered sharing between spouses and resource transfers between adult children and their elderly parents using data from high-income countries. These papers test income pooling amongst household members by investigating whether individual outcomes are independent of individual incomes once total income is held constant. Altonji, Hayashi and Kotlikoff (1992) use US data on parents and their adult children to estimate food demand equations and Hayashi (1995) conducts a similar analysis for two-generation households in Japan. For two-generation households in the US, Pezzin and Schone (1997) investigate the effects of resource control on the extent of informal care that adult child provide to elderly parents, and on the parent's use of market-provided care. All of these studies reject income pooling and hence the unitary model of decision making. Income pooling has also been investigated for households consisting of husbands and wives (see Schultz (1990), Thomas (1990), Browning *et al* (1994), Fortrin and Lacroix (1998), Bourguignon *et al* (1993), Phipps and Burton (1994)) and, again, the consensual result is that income pooling is rejected: the share of household resources accruing to an individual tends to depend significantly upon the weight of her income in the total. This evidence of preference heterogeneity has interesting predictions for public policy concerning, for instance, the possibility that the effects of a subsidy offered to a household may depend upon whether it is paid to the man or the woman⁶.

While preference heterogeneity between adults has thus been fairly well studied in recent years, similar evidence involving young children is thin, not least because, in most countries, children do not work and thus do not have bargaining power that can be denoted by their relative incomes, nor fallback options that would make sense of a bargaining framework. Yet, the question of whether parents are altruistic towards children is interesting even when they do not bargain: the alternative to altruism is then simply non-altruism. The existing literature has been primarily concerned with the question of preference heterogeneity within the household and therefore on whether the often-used unitary or consensus model of household decision-making is restrictive or not. In contrast, this paper is primarily concerned with the question of altruism which is of

⁴ They also argue that this is inconsistent with the hypothesis that parents accumulate child income to transfer to them later (e.g. dowry) but why is unclear.

⁵ There appear to be potential problems of endogeneity in the empirical specifications used in this paper. The authors also present informal evidence that the retained earnings of children were quite small and suggest that it further describes non-altruism. However, if children worked in order to contribute to subsistence needs, this would be consistent with altruism.

⁶ See Strauss and Beegle (1997) for a detailed account of the empirical evidence, as well as an overview of models of intra-household allocation. Some of the early evidence for developing countries is surveyed in Strauss and Thomas (1995).

independent theoretical interest. Moreover, it has direct implications for public policy. As mentioned earlier, if parents are not altruistic in respect of the time allocation decisions they take for their children then there is a case for interventions such as compulsory schooling.

2.3. Contributions

The rest of this section delineates the contributions of this paper. To summarise, this paper would appear to be the first to examine altruism of parents towards young children and it suggests a method distinct from investigating income pooling in Engel specifications of demand. It is set in a village economy where the question is sharpened and its implications more profound, given the limited role of the state in determining the welfare of children. It directly allows for differences in altruism towards sons and daughters and, indirectly, between fathers and mothers. It contributes to a relatively small literature in both areas, altruism and child labour.

Previous studies have tended to investigate resource transfers from young adults towards their elderly parents, and they typically reject income pooling (Section 2.2). As biological models of altruism predict “downward” flows more readily than reverse flows (see Bergstrom, 1997), it remains to investigate altruism towards young children. Biology apart, young children are more likely than adult children to inspire altruism in their parents for reasons such as that they are not fully equipped to look after themselves, they almost certainly live with the parents, and they are charming! Overall, if this is the context in which altruism is most likely to be found, then rejection of altruism here would be a fairly strong statement. A further motivation for investigating non-altruism of parents towards young children is that it is likely to have the most profound consequences. It is when children are young that health and educational capital is most rapidly formed and future economic and reproductive success is likely to be conditional on this⁷. This is especially true in poor societies in which the role of the state in

⁷ There is plenty of evidence on both counts. On the role of child health in determining cognitive ability and achievement, see Glewwe and Jacoby (1995), for example. On the role of education in determining future economic success, see Bowles (1972) for a stimulating early discussion although there have since been scores of studies showing pecuniary returns to a year of education in the region of 10%. Investments in the health and education of children are expected to contribute to reproductive success for the following reasons. Other things being equal, educated individuals are more likely to find partners and marry, this effect tending to be stronger amongst men than amongst women (e.g. Qian, 1998). At given levels of income, parental education is a significant determinant of child education (e.g. Behrman et al (1999), Bhalotra and Heady (2000), Lam (2000)), creating a perpetuation effect in terms of the quality of offspring and their consequent reproductive success. There are similar intergenerational perpetuation tendencies in health. Adult nutritional status is, to a large extent, determined in childhood: it is difficult to catch up from a lagging position in the growth curve (e.g. Micklewright and Ismail, 2001). Also, well-nourished mothers tend to produce children of higher birthweight, who are more likely to be healthy and survive (e.g. Mahler (1996), Breslin (1998), Reich (1989), Rogers (1989)).

determining investments in children and in the creation of individual welfare is limited, resulting in family background assuming larger importance.

It is therefore interesting to investigate altruism in a rural economy. This paper therefore uses data from rural Pakistan. Here, the average household is poor, discount rates are high, life expectancy is low, and there is a high probability of running into binding economic constraints, which might be argued to inculcate attitudes that conflict with altruism. A contrary view is that altruism is encouraged by traditional family structures, the importance of reciprocity in informal insurance mechanisms that bind family and community, and social norms that develop around these institutions⁸.

In view of the compelling evidence of gender differences in well-being, this paper allows for differences in parent altruism towards sons and daughters⁹. If girl's leisure (or schooling) is less valued than that of boys then we would expect smaller cutbacks in adult consumption when girls work. Differentiation of boys and girls in the analysis increases the power of the test. By virtue of using a range of adult goods, some of which are thought to be disproportionately consumed by men, the analysis is also able to indicate differences in altruism between fathers and mothers.

A further difference between this paper and existing research is in the formulation of the problem and in the methods used to investigate it. Previous research has focused on testing for income pooling. The method is to estimate Engel curves for consumption goods, with total income and individual earnings appearing as regressors and to test for the significance of individual earnings. Statistical inference in these models faces the problem that individual earnings depend upon endogenous labour supplies. This is often addressed by restricting the estimation to a sample of full-time workers. While this avoids substitution effects between commodity demands and labour supply (see Browning and Meghir (1991), for instance), it introduces a potential sample selection bias. For example, it seems plausible that households in which the share of resources accruing to an individual depends upon her relative income are households in which individuals have an incentive to work. Thus selecting a sub-sample in which husbands and wives work is

⁸ The reciprocity that is institutionalised in the vertically integrated family in many developing countries, whereby young adults in poor countries tend to care for their elderly parents, is expected to contribute to altruistic behaviour of parents towards young children. Indeed, Cigno (1993) suggests a rationale for reverse flows in terms of a "self-enforcing family constitution". To the extent that boys are more likely than girls to offer old-age security to their parents, a reciprocity argument would suggest greater altruism of parents towards boys than towards girls. In Pakistan, parents are more likely to live with and rely upon sons in their old age but this is by no means universal- the converse is more common in Indonesia, for example.

⁹ Evidence of the dramatically lower school enrollment rate for Pakistani girls and their higher rates of work participation is presented in Table 2. Evidence that adult women consume less food and other items than adult men is in Bhalotra and Attfield (1998) and indicators of the low status of women in Pakistan can be found in UNDP (1997).

likely to bias the results towards rejection of altruism. Since altruism is typically rejected in this literature, this is a concern¹⁰.

Clearly this approach to testing income pooling is difficult to apply to an investigation of the intra-household allocation of leisure or labour supply. We can hardly expect to explain individual labour supply in terms of individual earnings! It is therefore not surprising that this literature has focused on the allocation of consumption to the relative neglect of labour supply. This paper suggests that m-demand estimates can be used to determine parental preferences over child leisure (or schooling). By virtue of assuming away bargaining and the possibility of kids being “rotten”, we can safely think of child leisure or education as commodities that generate utility for parents rather than as variables that are inverse indicators of the relative income (and hence bargaining power) of children. However, see Section 6.6 below.

Altruism is distinct from income pooling in the sense that neither implies the other. Non-altruistic models can generate income pooling, and altruism can hold in cooperative or in non-cooperative models in which incomes are not pooled (e.g., Bergstrom, 1997). As discussed, while evidence on income pooling has been growing, there is little direct evidence on altruism. Investigating altruism also offers an alternative test of the unitary model as compared with the usual income pooling test¹¹. In this paper, a direct test of altruism is formulated based on the first order conditions which imply an inverse relation of adult consumption and child labour at constant prices and wages. The estimates in this paper represent one of the early and unconventional uses of m-demand functions.

3. Theoretical Framework

Demands that are modelled as a function of prices and the quantity of a reference good rather than total expenditure are termed m-demands. Browning (1998) proposes the m-demand formulation as a way of maximising the preference information that can be recovered from the data when information on total expenditure is not available, making Marshallian demands difficult to estimate. In the current context, total expenditure *is* available. However, it turns out that an m-demand is the most natural way to investigate the hypothesis at hand, as the alternative conditional demand model does not yield an unambiguous sign on the coefficient of interest. M-demand formulations also have some other useful features. First, as in the case of Marshallian demands, within-period m-demands are correctly specified even if some households are liquidity constrained. This robustness is of particular importance in the setting of a poor village economy that is considered in this paper. Second, they do not require us to make separability assumptions. Given the quantity of the reference good, the m-demand for any particular commodity

¹⁰ For example, Browning *et al* (1994) estimate male and female clothing demand equations on Canadian data using a sample in which both partners work and, while they highlight the sample selection problem, they are unable to address it.

¹¹ To summarise these relations, let the hypothesis of unitary or consensus preferences be U, let altruism be A and income pooling be P. Then $U \Rightarrow P$ and $U \Rightarrow A$, though neither of the reverse implications holds. Neither A nor P imply the other.

does not depend upon the quantities of other commodities. This is useful in estimation as it avoids dealing with additional endogenous regressors which is especially desirable when some (like adult labour) are censored.

3.1. The General Case

It is assumed that parents decide the allocation of child time and that the issue of parent-child bargaining does not arise. This is plausible in our context and backed by evidence from anthropological studies that children hand over their earnings to their parents¹². Altruism is captured by a utility function for parents that includes child leisure or schooling:

$$(1) U = U(C_p, C_c, L_p, L_c)$$

where C denotes consumption, L is leisure and subscripts p and c denote parent and child respectively. We do not model bargaining between parents over the allocation of time of their children as this would distract from the current purpose. It would also be complicated because the average household in our data contains four resident adults, each of whom might have a varying degree of influence on outcomes for children. In the empirical model, we distinguish male and female heads of household and include comprehensive controls for the age-gender composition of the household. The categories of adult consumption that we consider include some that are disproportionately consumed by males if not strictly male goods. In these ways, heterogeneity in male and female preferences is allowed.

The budget constraint is

$$(2) w_p L_p + w_c L_c + p(C_p + C_c) = m$$

where m is full income, $w = (w_p, w_c)$ is a vector of wage rates, and p is the price of parent and child consumption. We select child leisure, L_c , as the reference good. The only condition on the choice of a reference good is that it be normal and purchased by most households. The first order conditions for the maximisation of (1) subject to the budget constraint are:

¹² This is a fairly *explicit* mechanism of income pooling! On this, see Khan, (2001) for Pakistan and Gupta (1998) and Burra (1995) for India.

$$(3) \frac{U_i}{U_{L_c}} = \frac{p_i}{w_c}$$

where $i=1,2,3$, ranges over C_p , C_c and L_p , so that $p_1=p_2=p$ and $p_3=w_p$. The three equations in (3) can be solved simultaneously for the quantity of the reference good, L_c , to get **m-demands** (so called because they can be derived from marginal rates of substitution) of the form:

$$(4) Q_i = f(p_i, w_c, L_c)$$

where $Q_i=(C_p, C_c, L_p)$ and the demands are homogeneous of degree zero in prices and wages. It is straightforward to see from (3) that, at constant prices and wages, the quantities of parent consumption and child leisure move in the same direction or that parent consumption is inversely related to child labour. If parents are altruistic (as described in (1)) then estimates of (4) for $Q_i=C_p$ should give $\partial C_p/\partial L_c > 0$ or $\partial C_p/\partial H_c < 0$ where H_c denotes child labour. As the sign on $\partial C_p/\partial L_c$ is sufficient for our current purposes, we do not concern ourselves with the L_p equation. Estimates of the child consumption (C_c) equation are obtained for reasons discussed in Section 6.

Now consider an alternative way of deriving (4) which involves starting with the commonly used **Marshallian demands** for each commodity and eliminating total expenditure using the demand equation for the reference good, L_c :

$$(5) Q_i = f^i(p_i, w_c, m)$$

$$(6) L_c = f^c(p_i, w_c, m)$$

where, as before, $p_i=(p, w_p)$. Given that child leisure, L_c , is normal, we can invert (6) to get $m=g(p_i, w_c, L_c)$ and substitute this in (5) to get

$$(7) Q_i = f^i(p_i, w_c, g(p_i, w_c, L_c)) = \theta(p_i, w_c, L_c)$$

which, for $Q_i=C_p$, is (4). Again, $(\partial C_p/\partial L_c)|_{dw=0, dp=0} = (\partial f^i/\partial g)(\partial g/\partial L_c) > 0$ as long as both C_p and L_c are normal. Comparison of (5) and (7) establishes the difference between Marshallian and m-demands. It is useful to make explicit a third formulation, the **conditional demand** function:

$$(8) Q_i = \lambda^i(p_i, m, L_c)$$

Early discussion of conditional demands is due to Pollak (1969). Derivation of these from a conditional cost function is detailed in Browning and Meghir (1991). As we are

interested in how adult consumption varies with child labour, (8) may appear to be a candidate for estimation. However, we cannot, in general, infer anything about preferences over the conditioning good (L_c) from observing demands alone. This is because the demand functions, (8), are invariant to arbitrary normalisations of the utility function. For instance, if U denotes utility as before, ψ is increasing in U and c is cost, the conditional cost functions $c(p_i, L_c, U)$ and $c(p_i, L_c, \psi(L_c, U))$ give the same conditional demand functions (see Browning and Meghir, 1991).

To summarise, the proposition investigated in this paper, that has been shown to hold in a very general case is as follows. *If parents are altruistic then $\partial C_p / \partial L_c > 0$. Altruism is defined as the appearance of L_c , child leisure (or schooling), in the utility function of parents. If L_c does not appear in (1), or if parents are not altruistic, then we would expect estimates of (4) to give $\partial C_p / \partial L_c = 0$.* We have argued that this hypothesis is best couched in terms of m-demands rather than conditional or Marshallian demands. The following Section derives demands for a specified form of the utility function. This offers a useful illustration of the expected sign on the key derivative, $\partial C_p / \partial L_c$, when different exogenous variables are held constant.

3.2. Additively Separable Utility

This Section takes the special case of additively separable utility which encompasses popularly used specifications such as the Linear Expenditure System (LES). An additively separable form of (1) is $U = u(C_p) + v(L_c) + f(C_c) + g(L_p)$ and, as before, we shall define child leisure, L_c , as the reference good. The comparative statics for this function, which involve a 4x4 matrix, are presented in the Appendix. Since, under additive separability, the m-demand for good i is independent of other non-reference prices, the prices of child consumption and adult leisure will not appear in the m-demand for adult consumption (see Section 4.1). Anticipating this and for expositional ease, we work with the simplified utility function¹³:

$$(9) U = u(C_p) + v(L_c)$$

To avoid clutter, subscripts p and c are now dropped. Henceforth, C should be understood to refer to adult consumption, L to child leisure and w to the child wage rate. The first order conditions imply

$$(10) v' - w u' = 0$$

and the budget constraint is, as before,

¹³ We may like to think of this as implying that children are always adequately fed, even by non-altruistic parents, and that parents are always employed. The unrestricted case is presented in the Appendix.

$$(11) wL + C = m$$

Differentiating totally in (10) and (11) and solving establishes the comparative statics:

$$(12) \begin{pmatrix} -wu'' & v'' \\ 1 & w \end{pmatrix} \begin{pmatrix} dC \\ dL \end{pmatrix} - \begin{pmatrix} u' & 0 \\ -L & 1 \end{pmatrix} \begin{pmatrix} dw \\ dm \end{pmatrix} = 0$$

$$\Rightarrow (13) \begin{pmatrix} dC \\ dL \end{pmatrix} = \frac{-1}{w^2 u'' + v''} \begin{pmatrix} wu' + v''L & -v'' \\ wu''L - u' & -wu'' \end{pmatrix} \begin{pmatrix} dw \\ dm \end{pmatrix}$$

It follows that

$$(14) \frac{dC}{dL} = \frac{(wu' + v''L)dw - v''dm}{(wu''L - u')dw - wu''dm}$$

Thus if the wage is held constant or $dw = 0$, then $\frac{\partial C}{\partial L} = \frac{v''}{wu''} > 0$.

If parents are not altruistic, then $v(L_c) = 0$ and $\frac{\partial C}{\partial L} = 0$.

On the other hand, if income is held constant or $dm = 0$, then $\frac{\partial C}{\partial L} = \frac{wu' + v''L}{wu''L - u'}$

This has an ambiguous sign. It is worth emphasising that ambiguity in a special case implies ambiguity in the general case, although the converse is not true¹⁴. This sub-Section has shown that if we were to estimate Engel curves or conditional demand type functions in which the demand for adult consumption is expressed as a function of child labour with household income and prices (other than the child wage) held constant, the

¹⁴ Denote the general case G (the utility function in (1)), and the special case S (the additively separable utility function (9)). Then the basis for this remark is simply that if $G \Rightarrow S$ then (not S) \Rightarrow (not G) and so demonstrating that the sign of interest is not unambiguous in the special case implies that it is not unambiguous in general.

sign on the child labour variable could go either way. On the other hand, $\partial C/\partial L$ has a unique sign for $dw=0$, which is the m-demand specification displayed in (4).

3.3. Stone-Geary Utility

As discussed in Section 2, the model in Basu and Van (1998) and Basu (2000) is particularly interesting in the context of child labour. The utility function specified in Basu (2000) is :

$$(15) U = (C-S)(L)$$

where, as in the preceding example, C and L denote parent consumption and child leisure respectively, and S is the subsistence level of consumption. Suppose L is a discrete variable denoting work participation (as in Basu and Van). The utility function for this case is drawn in Figure 1, from which it is clear that parents derive no utility from above-subsistence consumption if achieving this requires their children to work. Parent altruism is of a strong form in that children are set to work if and only if their income is essential to subsistence. If, more generally, L is (continuous) hours of leisure, then parent utility is decreasing in hours of child work. The first order conditions for the continuous case can be expressed as:

$$(16) C-S = wL$$

Thus, at given levels of w and S , $\partial C/\partial L > 0$ or $\partial C/\partial H < 0$, as before.

4. An Empirical Model

4.1. Specification Issues

In this section, we discuss issues that arise in translating the theoretical model into a valid empirical model. This includes choice of functional form, incorporation of taste heterogeneity, dealing with endogenous regressors, and testing for weak separability.

Functional Form

The estimated equation, based on the (within-period) m-demand in equation (4) is

$$(17) \ln(E_p) = \alpha(a) + \beta_p \ln(w_p) + \beta_c \ln(w_c) + \gamma f(L_c) + e$$

The functional form displayed in (17) is both flexible and easy to estimate¹⁵. E_p is expenditure on adult consumption, a is a vector of demographics that represent

¹⁵ Browning (1994) shows that quasi-homothetic preferences such as the Linear Expenditure System (LES) yield m-demands that are an affine function of the level of the reference good

observable heterogeneity across households in the sample and e is a random error term that captures unobserved heterogeneity, functional form mis-specification and other specification errors including measurement error. The content of the vector a is described in Section 4.2 after the data have been introduced. The form in which L_c appears is also left unspecified until Section 4.2, where it is discussed in the context of our particular data set. We shall replace child leisure, L_c , with work, H_c , and expect that, under altruism, $\partial E_p / \partial H_c < 0$. In an alternative specification, we will replace L_c with schooling, S_c , in which an altruistic model would predict $\partial E_p / \partial S_c > 0$.

Weak Separability

Equation (17) represents a general model consistent with that in Section 3.1. We do not invoke separability assumptions. Estimates of (17) will, however, naturally offer tests of weak separability of adult consumption from both adult labour and child labour in terms of the significance of the adult and child wage rates respectively. To see this, suppose that preferences for goods $(q_0, q_1, \dots, q_n, z)$ are separable from one of the goods, n , so that $U(q_0, q_1, \dots, q_n, z) = V(q_n, \phi(q_1, \dots, q_{n-1}, z))$. Then the m -demands for good $i \neq n$ are independent of the level and price of good n :

$$(18) \quad q_i = f^i(p_1, \dots, p_{n-1}, r, z)$$

where (q_i, p_i) are the quantity and price of good i and (z, r) are the quantity and price of the reference good. Similarly, if preferences over the n goods (q_1, \dots, q_n) are separable from the level of the reference good, z , then the m -demands are independent of the price of the reference good, r (see Browning, 1998).

Endogeneity

In general, the reference good in an m -demand function is endogenous just as, in a Marshallian demand function, total expenditure (denoted m) is endogenous (e.g., Deaton (1985), Blundell (1986)). To see why, ignore price variation and write down the simple Marshallian demands for adult consumption and child leisure, the two goods that figure in (4) and its empirical counterpart, (17):

$$(19) \quad C_p = \chi_p m + v_p$$

$$(20) \quad L_c = \chi_c m + v_c$$

As already indicated, $E(v_p | m) \neq 0$, for example, on account of infrequency of purchase (which makes for lumpy expenditures) and measurement errors common to individual commodity expenditures and total expenditure. Similarly, $E(v_c | m) \neq 0$ because total household expenditure is a function of the labour supplies of all family members and, additionally, the determinants of labour supply and income may include common

and that the m -demands associated with homothetic preferences are linear in the reference good.

unobservables. Inverting on the reference good in (20) and substituting in (19) gives the m-demand :

$$(21)C_p = \frac{\chi_p}{\chi_c}L_c - \frac{\chi_p}{\chi_c}v_c + v_p$$

It is now easy to see that L_c is correlated with the error term in (21) (or with e in (17)). There is a measurement error bias arising from the fact that L_c is a choice variable described by $L_c = (\chi_c m + v_c)$ rather than by $\chi_c m$. Also, any correlation of v_c and v_p on account of heterogeneity will cause v_p to be correlated with L_c .

Instruments

If income is a valid instrument for total expenditure in the often-estimated (Marshallian) Engel curves, then it is a valid instrument for the reference good in an m-demand for the same reason. As for efficiency, income is certainly correlated with the level of the reference good. In his illustration of the use of m-demands on Canadian Family Expenditure data, Browning (1998) uses just income as an instrument for the reference good, “food at home” in estimating m-demands for seven composite consumption categories including “food outside the home”, “transport”, etc. In this paper, further appropriate instruments for the reference good, child labour (or child schooling) are available. Indicator variables for whether the community in which the household lives has a primary, middle and secondary school are assumed to influence child labour but to have no direct effect on adult consumption. This allows us to investigate the validity of income as an overidentifying restriction. Further overidentifying restrictions investigated are associated with parent’s education and the community unemployment rate. Previous research on the same data has shown that all of these variables are significant determinants of child labour (e.g. Bhalotra and Heady (2000) and Bhalotra (2000)) but we nevertheless present tests of the power of the instruments. The identifying restrictions are somewhat more plausible in our context where labour supply refers to children and consumption to adults than in the more commonly encountered context in which both consumption and labour supply refer to the same adult. The covariance matrix is adjusted for generated regressors.

4.2. Data and Measurement

This section describes the data and defines the variables, addressing any issues of measurement. The data are the 2400 *rural* observations from the Pakistan Integrated Household Survey (PIHS) of 1991. This is a stratified sample survey and the lowest stratum is a cluster of households. Since households living in close geographic proximity will tend to have some unobservables (like climate, soil or culture) in common, the standard errors of all estimates obtained on these data are adjusted to allow for intra-cluster correlations (see Deaton (1997), Chapter 2). The data are available from the

Living Standards Measurement Survey unit of the World Bank. Pakistan has very low levels of school enrollment, even in comparison with other low income countries, and its child workforce participation rates are among the highest in the world (ILO, 1996b). Children are commonly defined as persons under 15 years of age (e.g., ILO, 1996b). Since employment questions in our survey are only addressed to individuals ten years or older, child labour in this paper refers to *10-14 year olds*, and *boys and girls* are distinguished. Henceforth unqualified reference to “children” is to this age category. For the analysis, we drop households that do not have a child in the 10-14 age range. This results in a loss of 44% of rural households.

The survey contains extensive information on income, expenditure and the demographic characteristics of households. The dependent variable, E_p , is *expenditure on adult consumption*. The selected elements of E_p include *adult clothing* and *adult footwear*, which are explicitly assigned as adult-only consumption in the survey. We also investigate demands for *tobacco*, *tea* and *coffee* as these are predominantly consumed by adults. They are available separately but we aggregate clothing with footwear and also tea with coffee since expenditures on each are very small relative to total expenditure. Estimates are then obtained for each of the three composite goods separately and also for their sum. The sum is, henceforth, referred to as “adult goods”. While tobacco might be thought the most superfluous of our set of adult goods, it might nevertheless be the least amenable to cutting back if there is any addiction. The same applies, if to a lesser degree, to tea and coffee¹⁶. For these reasons, it is interesting to estimate separate equations for these items in addition to having estimates for the composite, and to observe any differences that obtain in regard to altruism.

The average household size in the sample is 8, the average number of adults (age greater than 14) being 4. Thus, while the theoretical discussion is cast in terms of *parents* and *children*, in an empirical context where integrated families are common we are in fact investigating altruism of *adults* (that may include uncles, aunts, sisters-in-law and grandparents) towards children¹⁷. As described below, age and gender differences in household structure are controlled for in the estimated model and this allows intercept effects of different family types on the level of adult consumption.

The variable of interest in (17) is the “reference good”, *child leisure*. This is replaced by child labour or, alternatively, schooling. We now describe the alternative forms of and definitions of child labour (H_c) in our data and then discuss how a household-level measure is obtained from individual-level data. A profile of child activities is presented in Table 2; further discussion is in Section 5. Regular work that

¹⁶ Estimates of the Becker-Murphy model of rational addiction on US data indicate that smoking is addictive (e.g. Chaloupka, 1991). Evidence that caffeine (which is in tea and coffee) is habit-forming is contained in Oleskals and Bardsley (1998).

¹⁷ This does not make our results much less interesting from a biological perspective since household members in Asian households are typically closely related to one another. This is less true in sub-Saharan Africa where the practice of fostering is much more widespread and the blood-chain can grow quite dilute (Ainsworth (1998) provides an early quantitative assessment of child fostering in Tanzania).

produces marketable goods includes employment on the household-run farm or enterprise (henceforth, “*household employment*”) and employment for wages outside the home (henceforth, “*wage employment*”). Participation in work is defined as participation in either activity and hours of work as the sum of hours in the two activities. Since school attendance is not exactly the inverse of child labour, further estimates are obtained for the case where L_c , is replaced with school attendance, S_c .

As a *household-level* measure of *participation* in child labour or child school attendance, we use the proportion of children in the household engaged in work (or school). Using available information on hours of work of individual children, we also construct the average *hours* of work per child in the household and investigate this in an alternative specification. Non-linearity is investigated by including the square of the participation and average hours variables in addition to the respective linear terms- these are retained only if significant. The robustness of the estimates to disaggregation by *gender* and by *type of work* (wage vs household employment) is investigated.

Wage rates for adults and children are obtained from community (or cluster) level questionnaires in which village leaders are asked what the going wage for agricultural activity is for men, women and children. The wage data were examined in order to confirm that they behave plausibly, and they do. For example there is a lower incidence of child labour in villages in which the male wage is higher¹⁸. However the child wage is missing for 22 of 151 clusters and the male wage for 3. Since a missing value for a community translates to missing values for every household in it (resulting in 1.6% of adult and 14.4% of child wage rates missing at the household level), missing values are imputed using other community level information such as whether there is a market, a shop, a post office, electricity, gas, and a bus running through the village. The imputation involves generating a predicted value from the best available subset of these data (see Goldstein, 1996).

The survey also provides individual-level information on earnings and hours, permitting calculation of individual wage rates. However, only 36% of men and 10% of children are in wage employment (recall that self or household employment dominates wage employment in this rural economy). Wage rates were predicted for the rest of the sample using a selection-corrected (Heckman, 1974) unemployment-adjusted (see Ham (1986) and Card (1988)) Mincerian model. However, the prediction errors are large. A further potential problem is “division bias”: the fact that the wage, when observed, is computed as earnings divided by hours. The key variable of interest in the estimated model, (17), is hours and, if measured with error, this will be negatively correlated with the wage. A natural option might be to instrument the individual wage with the village wage. This was done but the village wage turns out to be a weak instrument. This is not as surprising as it may first appear, given that the village wage is not the average of the observed wages. Overall, the use of market wage rates at the village level is preferred.

Demographic variables that allow for taste heterogeneity appear additively in the specification suggested in (17). The logarithm of household size (and its square when significant) are included together with the proportions of household members in an

¹⁸ This is plausible and it is a prediction of the model in Basu and Van (1998) and Basu (2000) referred to earlier.

exhaustive set of age-gender categories. The age groups chosen are under-10, 10-14, 15-24, 25-59 and 60-plus. The omitted group is arbitrarily chosen to be children under 10. Studies for high-income countries often include the age of the household head as a demographic variable but they typically select samples consisting of married couples with no children. In the current context, it is important to control for the vast degree of heterogeneity in family types and compositions. Older adults may smoke more than young ones on account of addiction or habit-dependence, or men may smoke more than women. The age-gender variables control for these sorts of variations. Price data are unavailable and, as this is a cross-section, province dummies are included to allow for regional variation in prices. Other exogenous variables included on the grounds that they are expected to influence preferences over consumption are the gender and religion of the head of household, an indicator for whether the household owns land and a measure of the size of the plot, indicators for land tenancy arrangements (whether renting or sharecropping land), and an indicator for whether it owns an enterprise.

The land and enterprise variables are included because these make an important distinction between the self-employed and others in the rural areas of developing countries. They may be correlated with lifestyle and tastes¹⁹. Ownership of productive assets may, at given levels of income, determine attitudes to education when children are expected to inherit the assets and follow the same occupation as their parents. This increases the value of work experience gained as a child, raising the returns to work relative to the returns to school. We investigated the restriction of excluding the land and enterprise variables from the adult consumption equations, while allowing them to influence child labour (and therefore serve as additional instruments). This restriction was rejected. We further investigated whether estimates of the key parameter are altered when these variables are dropped from the system altogether. As there was no significant difference in these estimates, the variables appear as regressors in both the consumption and labour supply equations.

5. Descriptive Analysis

This Section presents a brief description of adult consumption and child labour, the variables of interest. It also presents evidence of the relation of each to household income. It then reports simple tests of the mean differences in adult consumption between households with and without working children. What is revealed by the descriptive data is quite remarkable, motivating the analysis to follow.

5.1. Expenditure Shares & Engel Curves

Some expenditure shares are reported in Table 1. Together, expenditures on all of the adult goods we consider comprise 8.2% of the budget of the average rural household.

¹⁹ For instance, the self-employed may drink more tea or smoke more tobacco as they spend a lot of time not far from their kitchens! On the other hand, they may spend less on clothing and footwear because they do not go out to work (see Browning and Meghir (1991) for evidence that, in British households, the demand for adult clothing is correlated with their labour supply, income-constant).

A striking observation is that the expenditure share of tobacco, tea and coffee, at 3.8%, slightly exceeds the expenditure share of education (ignoring the opportunity cost of education, of course). Observe that these households spend, on average, 54% of their budget on food, an indication of their level of poverty.

In order to gain insight into consumption behaviour in this sample, Engel curves of the following form were estimated:

$$(22) \omega_{\text{adult}} = F(\ln Y) + \beta \ln N + \sum_k \gamma_k (N_k/N) + \theta L_c + v$$

where ω_{adult} is the budget-share of the adult consumption category, F is an unrestricted function, Y is household expenditure per capita, instrumented by household income, N is household size, N_k/N is a vector describing the age-gender composition of the household and, as before, L_c is a measure of child labour. Semiparametric estimates were obtained using the procedure suggested by Robinson (1988). The estimated curves are plotted in Figure 2. They are non-linear and a reasonable fit is provided by the quadratic logarithmic function (for further details of estimation and tests, see Bhalotra and Attfield, 1998). We confirmed that the shape of the Engel curves is unaltered when L_c is omitted from equation (22), giving a conventional Engel curve. The interesting feature of the estimated curves for the current analysis is that all of the elements of adult consumption that we consider behave like necessities for most of the range of incomes in these data. This sharpens the question of whether child education, leisure or consumption is sufficiently valued in relation to adult consumption.

5.2. Extent and Nature of Child Labour

Child labour in rural Pakistan displays two striking features relative to child labour in other developing countries. First, there is a remarkable gender gap in education and this is partly reflected in a higher work participation rate for girls. The rest of the enrolment differential is explained by there being more girls than boys that report being neither in income-generating work nor in school. We suspect that this corresponds to domestic work. Second, Pakistan exhibits a relatively high rate of employment of children in wage labour. The vast majority of working children in developing countries are engaged in work on household farms and enterprises and, in many parts of sub-Saharan Africa, there is no wage employment of children (see Bhalotra and Heady, 2000, for example). Activity rates for children in our sample are in Table 2. Wage employment engages 12% of girls and 6% of boys. Average hours in wage labour in the reference week are 31 for girls and 45 for boys. Employment on household farms and enterprises engages about 22% of boys and 28% of girls, and average hours in this case are considerably lower, at 23 and 13 a week respectively.

Figure 3 presents participation rates for girls and boys in our sample by quartile of household expenditure. Wage work and school attendance display a gentle gradient, steeper for girls than for boys. Child work on household farms and enterprises shows no clear relation with living standards - and this is by far the most prevalent form of child labour across developing countries. Overall, Figure 3 shows unexpectedly high work participation rates for children amongst households in the top 25% of the income

distribution. Figure 4 presents non-parametric estimates of the relation of living standards and hours of child wage labour conditional on participation. Once again, there is no clear tendency for child labour to decline with living standards! While these data do not directly suggest non-altruism, they seem inconsistent with the view that parents are fundamentally altruistic and send their children to work only when constrained to choose between this and starvation. Further discussion of this issue is left till Section 7.

5.3. Tests of Differences in Means: Adult Consumption and Child Labour

For each of the three adult goods and for their sum, Table 3 reports t-tests for the null that mean budget-share is the same in households that have no working children as it is in households with at least one working child. The comparisons are also presented for boys and girls separately and for wage work as distinct from household farm/enterprise work (Table 3A)²⁰. The results are striking. Across the board, the data appear inconsistent with altruism. For adult wear, tea and coffee, expenditure shares are invariant to child labour: adult consumption is no lower in households where children work. The strongest suggestion of parental selfishness emerges in the case of tobacco as a significantly higher fraction of the budget is spent on tobacco in households where children work! **Disaggregating by gender** is very revealing. Households in which at least one girl works are seen, on average, to consume significantly more not only of tobacco but also of tea & coffee and adult clothing! In contrast, in the sub-sample of households containing at least one working boy, tobacco and tea consumption are on average no different than in other households but the share of income spent on adult clothing and footwear is significantly lower. The suggestion of non-altruism in these data is therefore much more evident for girls than for boys. **Disaggregation by the two types of child work** confirms the broad pattern observed with the aggregative definition. The only change worthy of remark is that, in the case of household farm/enterprise work, the evidence of selfish behaviour that was earlier only significant for tobacco is found to be significant for tea & coffee as well. Overall, the fact that the broad pattern of results is fairly similar for market wage labour and household labour strengthens the interpretation of these results.

These are, of course, only unconditional correlations. We now proceed to investigate whether these results persist in an m-demand formulation that involves conditioning on all relevant prices and demographics.

6. Results

Estimates of m-demands are presented for three sub-groups of adult consumption, tobacco, tea & coffee, adult clothing & footwear, and for their sum (Section 6.1). The preferred definition of the child labour variable is the proportion of children in the household that participate in any kind of work. Comparable estimates of all equations using this definition are presented in Table 4. For each item of adult consumption, we investigate replacing all work with wage work, work with school attendance, and

²⁰ Although, as discussed, we estimate m-demands rather than Engel curves, it is more informative to look at budget *shares* in this descriptive exercise as these are normalised measures of spending.

participation with hours. In each case, the results of disaggregating by child gender are also presented. The main results from investigating these variant specifications are displayed in Table 5. The estimates that appear in Tables 4 and 5 are instrumental variables estimates of a model of the form in (17), in which a range of observable taste shifters is held constant. For comparison, OLS estimates of every equation were also obtained. We also investigated change in the key parameter that result upon suppressing the taste shifters in an IV model. This indicates how much work the conditioning variables other than the wage rates do. Table 6 presents these three estimates for two of the adult consumption categories.

In Section 6.2, we present m-demands for adult consumption in which child consumption replaces child leisure as the reference good. If the results pertaining to altruism are robust, they should be confirmed in these equations. For reasons discussed below, we also obtain estimates of the demand for ceremonies and for child clothing & footwear (see Sections 6.3, 6.4). Tests on the instrumental variables are discussed in Section 6.5 and results pertaining to separability and to other variables in the model are presented in Section 6.6.

The dependent variable is the logarithm of expenditure. For adult consumption, this is normalised upon the number of adults in the household. Similarly, child consumption is expressed per child. Expenditures on ceremonies are not deflated.

6.1. Demands for Adult Consumption

Refer to Tables 4-6.

Participation in Work

Consider first the case where child labour is defined as the proportion of children (boys and girls aged 10-14) in the household that participate in work, whether for wages or on the household-run farm or enterprise. Although the coefficients alter with IV and with the inclusion of control variables, the main results are robust to these variations. The data decisively reject altruism in the case of tobacco but are consistent with altruism in consumption of adult clothing and footwear, tea and coffee. The composite of these items of adult consumption shows evidence consistent with altruism²¹. How large are these effects? If the proportion of children in work were to rise by 10 percentage points (from 0.32 to 0.42), expenditures on tobacco *per adult* would rise by 18.5% (an increase of Rs. 3.6 on an average of Rs. 19.4)!²². The same rise in child labour is associated with declines

²¹ The results obtained for the composite adult good are of course just weighted averages of the results for its components (the weights are implicit in Table 2). Since the components display different responses, these average results are not interesting in themselves. They are presented mainly to suggest what we would conclude if we were not to disaggregate by component.

²² If child labour were to disappear (a decrease of 0.32 percentage points) then tobacco expenditures would decline by 45%. To avoid assuming infinitesimal changes, the percentage

in per-adult expenditures of 8.8% and 19.1% for tea & coffee and adult clothing & footwear respectively, and with a decline in total per-adult spending on the three categories of goods of 11.5%. These result for tobacco is consistent with the cross-tabulations presented in Section 5.3 but, in the case of the other goods, the first appearance of non-altruism is reversed now that we are conditioning on other covariates of consumption.

Disaggregation by gender shows that the elasticity of adult consumption with respect to child labour is larger for girls than for boys in each equation (Table 5). Gender-specific estimates of price and income elasticities in models of child nutrition and child labour have similarly revealed higher elasticities of parental investment in girls as compared with boys (for example, on nutrition, see Behrman and Deolalikar (1992) and Alderman *et al* (1995) and, on child labour, see Bhalotra (2000) and Ilahi (2000))²³.

Participation in Wage Work

In comparison with child labour on household farms and enterprises, child wage labour involves longer hours, it involves working outside the home, and it involves a monetary wage for the child. Overall, it comes closer to the conventional definition of employment, and it is likely to be more harmful to the child. Given these features, we might expect a stronger or more well-defined reaction of adult consumption to child wage labour. For this reason, the equations are re-estimated with child labour defined as child wage labour. The broad pattern of results persists and all of the response coefficients are larger. Separating the proportion of working children into boys and girls again gives exactly the pattern of results obtained for the earlier definition of work, which included home farm/enterprise work (see Table 5).

School Attendance

These equations were estimated again with work replaced by school attendance. Altruism predicts a positive association of adult consumption and the proportion of children in the household that attend school. Consistent with the results for work, altruism is rejected on tobacco expenditures but cannot be rejected for the other categories of adult consumption that we consider. Gender disaggregation again produces results broadly similar to those got for work. There is one important difference in that the estimates for tea & coffee become insignificant and hence consistent with non-altruism.

change in spending is defined as $(e^{\beta(dH)}-1)$ where H is the proportion of children in work, dH is the hypothesised change in this, and β is the coefficient on H in a model of log spending.

²³ The null of altruism predicts $\partial C/\partial H < 0$. In the absence of altruism, we expect $\partial C/\partial H = 0$ (see Section 3). The significantly positive coefficient on H (child labour) in the tobacco equation in Table 4 does not have a clean interpretation although it clearly rejects altruism. However, disaggregation of child labour by gender appears to reconcile this with theory as the coefficients become insignificantly different from zero (Table 5).

Hours of Work

The proportion of children in the household that work is replaced by the average hours of work per child in the household. The pattern of results for hours is identical to that for participation when no distinction is made between the sexes. An increase in work per child of 1 hour is associated with an increase in tobacco expenditure per adult of 5.1% and significant reductions of 3.3% and 5.9% in tea & coffee and adult clothing & footwear spending per adult, respectively. The corresponding decline in spending on the composite adult good is 3.7%. As with participation, these are substantial responses²⁴.

When hours per child are entered as two gender-specific terms, the results diverge from those obtained for participation. This may be related to the fact that the participation rate of girls is higher while their average hours of work conditional on participation are lower (see Section 5.2). Now all spending behaviour is consistent with non-altruism towards girls. Additionally, spending patterns for tobacco as well as for tea & coffee are consistent with non-altruism towards boys. Indeed the only case consistent with altruism- and only towards boys- is of spending on adult clothing & footwear. Our earlier observation that elasticities are larger for girls is also reversed: While the participation data revealed larger responses to the work of girls as compared with boys, the hours data reveal larger responses (positive and negative) to boys than to girls.

6.2. Demand for Adult Consumption: Child Consumption as the Reference Good

We have so far defined child leisure (or labour/education) as the reference good. In order to further investigate the robustness of the main results referring to the altruism coefficient, we now replace child leisure with child consumption. The first order conditions of the general model imply that, at constant wages and prices, child consumption and adult consumption move in the same direction under altruism. If parents do not care about child consumption then adult consumption should be invariant to child consumption (see Section 3). Results are presented in Table 7 for tobacco and for adult clothing & footwear, adult consumption categories that exhibited very different behaviour when child labour was used. The results are consistent with those in Table 4. We find a significant positive association of adult and child consumption of footwear and clothing (with an elasticity just smaller than one), which is consistent with altruism. In

²⁴ At the 95th percentile, hours are 40 a week! For boys, the mean is 4.2 and the 95th percentile is 30. For girls, the corresponding figures are 2.7 and 19. The distribution of hours of wage work of children conditional on participation shows considerable variation. The average hours per child are 6.9 a week, including zeroes for a high proportion of children who are not in work. Continuity may not be a strong assumption since it seems unlikely that there are large fixed costs of work for children. The majority work on the household farm or enterprise making transport trivial and consistent with flexibility. A discontinuity between participation and hours of work was nevertheless explored by introducing along with hours, an indicator variable defined as unity if at least one child is in work (or average hours per child are non-zero). This dominates the hours variable: in all cases, introducing the dummy makes the hours coefficient insignificant. This is a reason that we concentrate on the results based on participation.

line with the non-negative relation observed between tobacco spending and child labour, we now observe a non-positive relation of tobacco spending with spending on child clothing and footwear. The important result is that our inferences about parent altruism are not restricted to the case of child labour but appear in the same form in the case of child consumption.

6.3. Demand for Ceremonies

Estimates of a similar equation for ceremonial expenditures are also presented (Table 4). Households in developing countries are known to spend quite a lot on birth, marriage and death ceremonies. Although our hypothesis pertains to adult consumption, it is of some interest to investigate whether households with working children spend less on ceremonies. We find that they do. The coefficient on the proportion of children in the household in work is significantly negative. It is interesting to observe that estimates of a quadratic logarithmic Engel curve (as described in Section 5.1) for ceremonies shows that, in contrast to the adult and child consumption categories considered in this paper, ceremonial expenditures are completely unrelated to household income: the rich and the poor have similar expenditures on average!

6.4. Demand for Child Consumption

We have assumed that children do not bargain with their parents; that their parents unilaterally decide whether they work and how much. As discussed in Section 2, in models of bargaining between household members (almost always two adults), it is conventional to assume that bargaining power is a function of relative incomes or of fallback incomes (or utilities). It is implausible, at least in our context, that the average child under 15 has a fallback position to speak of. However, working children do have incomes, these being explicit in the case of wage labour. At given wage rates, the variable indicating participation or hours of child labour is a measure of children's contribution to household income. A bargaining model would predict that the higher the proportion of working children (or hours per child) in a household, the higher the level of spending on child-specific goods. Our model has the opposite prediction. It is evident from (4) that $\partial C_c / \partial H_c < 0$, where C is consumption, H is labour and c denotes children. In order to investigate this, the m-demand for child clothing and footwear is estimated (see Table 4). Child labour has a significantly negative effect on expenditures on child consumption, consistent with altruism (as reflected, for example, in the model of spending on adult clothing and footwear), and inconsistent with bargaining.

6.5. Instruments

The child labour and schooling variables are instrumented as discussed in Section 4.1. We assume that the presence of primary, middle and secondary schools in the village in which the child lives influences the level of child labour or schooling but that it has no direct effect on consumption. Tests of the five overidentifying restrictions available are presented in Table 8, where we also report tests of the strength of the instruments in the auxiliary model for child labour. Restricting the instrument set to a polynomial in income

(as in Browning, 1998) produced estimates with similar coefficients but considerably higher standard errors, indicating the efficiency gains from using the expanded instrument set that we have. All estimates reported so far are 2SLS with the covariance matrix adjusted for generated regressors and robust to heteroskedasticity and intra-cluster correlation. We confirmed that 3SLS estimates produce almost identical coefficients and lower standard errors, though the efficiency gains in moving from 2SLS to 3SLS are modest. Appendix Table 1 contains comparable 2SLS and 3SLS estimates for the (illustrative) cases of tobacco and adult clothing & footwear.

6.6. Separability and Other Variables

Refer to Table 4. The adult wage has a positive effect on spending in every equation and it is significant in all but the adult wear and ceremonies equations. The evidence thus points to rejection of separability of adult labour supply from adult consumption of stimulants (tobacco, tea and coffee) as also from child consumption and ceremonial expenditures. The child wage is significant in the equation for adult clothing and footwear (and, via this, in the equation in column 4 for the composite adult good). However, for all the other categories of spending, we are unable to reject separability of consumption from child labour supply (see Section 4.1).

Recall that adult consumption expenditure is expressed per adult and, similarly, child consumption, per child. The coefficients on the demographic variables should be interpreted with this in mind. The coefficients on household size indicate scale economies in the consumption of all goods other than tobacco, which exhibits no scale effects, and ceremonies, which exhibit diseconomies of scale. Comparison of the coefficients associated with the proportions of adult males and females in the household is a useful way to denote their relative claims on consumption items. As remarked elsewhere, tobacco appears as disproportionately consumed by males. Given the age-gender composition of the household, female headship has no significant influence on the demands that we analyse. Religion has no effect on adult consumption but non-Muslims in Pakistan are observed to spend more on child clothing and on ceremonies. Land ownership and the form of tenancy have significant influences on consumption but there is no significant effect of owning an enterprise.

7. Discussion of Results

How do our findings relate to the available evidence in the realms of both child labour and altruism within families? As indicated in Section 2, the tendency in previous studies is to reject altruism. However, these studies have primarily investigated altruism amongst spouses or between adults and their elderly parents. Also, as discussed, rejection of altruism may be encouraged by a selectivity bias associated with restricting the sample, in the case of couples, to cases in which both partners are in full-time employment. As altruism is most likely to be seen in parents towards young children, it is unsurprising that our results for adult clothing, footwear, tea and coffee are consistent with altruism. What is surprising is that tobacco consumption behaviour in the same

sample of households is inconsistent with altruism. How does this rejection of parent altruism sit with available evidence on why children work? Is there relevant information about the child workers in this sample from Pakistan that concurs with the results obtained here?

7.1. Altruism and Child Labour

Parental selfishness in the context of child labour is often denied by means of invoking other reasons that children might work. For instance, Basu and Van (1998) defend their assumption of parent altruism by arguing that poverty drives child labour and that the non-poor in developing countries do not send their children to work. However, the data reveal that they do (see Section 5.2). The relation of child labour and household poverty has been investigated for a range of developing countries. A striking result emerging from a review of these studies (see Bhalotra and Tzannatos, 2001) is that the effect of household income on child labour is small and often insignificantly different from zero²⁵. For the sample of households studied in this paper, the income effect for children working on household farms is zero for girls and -0.66 for boys (Bhalotra and Heady, 2000). The income elasticity of hours of wage work conditional on participation is -0.34 for girls and -0.16 for boys. Averaging over children in the household, as was done in this study, to get the hours worked per child produces a considerably larger income elasticity of -0.51 (Bhalotra, 2000). More pertinent to the current discussion, there is a threefold increase in the income effect on child hours of work once we condition on parents' hours of work (Bhalotra, 2001). This is consistent with exogenous increases in income being used to purchase adult leisure at the same time as they are used to purchase child leisure (or child education)²⁶. This violates the pure notion of parental altruism evoked, for example, in Basu and Van (1998), according to which parents will get their children out of work and in to school at any reasonable cost to themselves.

The hypothesis that subsistence constraints compel child labour can be directly investigated by exploiting the fact that subsistence constraints imply a negative wage elasticity of labour supply: if the child is working towards a target income then a decline in the wage rate will induce an increase in child labour (see Bhalotra, 2000). Wage elasticities were estimated using data on child wage workers in the current sample. We find a significantly negative wage elasticity for boys and a wage elasticity of zero for

²⁵ As most available estimates are subject to simultaneity, measurement error and aggregation biases that can be shown to result in an under-estimation of the income effect, this evidence cannot be taken too seriously (see Bhalotra and Tzannatos (2001) for details). The evidence presented in the text for the current sample is obtained from empirical models that attempt to overcome some of the specification problems. It is useful to note that income effects on *schooling* also appear to be smaller than we might expect. These are surveyed for a range of developed and developing countries in Behrman and Knowles (1999). These authors also point out that the available estimates may well carry downward biases on account of the specification errors that afflict most available analyses.

²⁶ In fact, the income effect for the labour supply of adult females estimated from an *unconditional* model is of the same magnitude as that for boys; the elasticity is twice as large for girls and insignificant for men (Bhalotra, 2000).

girls. Boys thus appear to work towards a target income and this target is, plausibly, the shortfall between household subsistence needs and non-child income. However, the target may not be subsistence or subsistence may be defined (by parents) to include tobacco consumption. The evidence for girls is more ambiguous. They appear to work even in circumstances when it is unclear that their earnings contribute to subsistence. A wage elasticity of zero is consistent with alternatives to the poverty hypothesis such as low expected returns to schooling, or selfish parents. In particular, if parents wanted to extract as much as they could from a child, they would get her to work to the maximum level consistent with maintaining her health. The level of the wage would then be irrelevant.

So much for economic analyses of the data. What does other evidence suggest? Amongst anthropologists and economic historians studying child labour, parent altruism is a debated question. In both fields of enquiry, the evidence is only indicative, it being difficult to generalise from small non-random samples and difficult, especially in historical studies, to construct appropriate counterfactuals. However, there are some compelling indications of non-altruism. In an anthropological study conducted in the Sialkot region of Pakistan, Ali (2001) observes that the households supplying child labour are not terribly poor, that they own televisions and other consumer goods and that child income, which is always handed over to parents, is typically spent on above-subsistence consumption²⁷. During industrialisation in Britain, a popular but not unchallenged view amongst the elite was that the parents of working children were avaricious (see Nardinelli (1990) p. 94).

Let us now *summarise* where we have got to. The hypothesis that children work if and only if the household is so poor that it would not survive if they did not is interesting in the current analysis because it is a natural way to reconcile child labour with parent altruism. Indeed, in the model of Basu and Van, they are one and the same thing: parent altruism is defined to mean that children do not work in above-subsistence households. We have seen that this is challenged by simple descriptive data, and the preceding discussion of income and wage effects on child labour further establishes that it is unclear that subsistence constraints are either a necessary or a sufficient explanation of child labour and that, based upon studies previous to this one, the evidence on parent altruism is ambiguous. Overall, the evidence in this paper of (a) some degree of non-altruism, revealed through consumption patterns in tobacco and, to a lesser extent, tea and coffee, and (b) a stronger rejection of altruism towards girls than towards boys, is consistent with previous evidence based on these same data.

7.2. The Distinctiveness of Tobacco

At first glance, tobacco may seem to be the most superfluous commodity of the adult consumption items that we investigate the demand for. Yet, it may be the most

²⁷ Sialkot is a region that, prior to the introduction of a major ILO-UNICEF programme in 1997, produced 90% of the world's footballs. A large part of the stitching was done informally, in homes, the eventual product being sold through multinational firms such as Adidas and Nike. It was the involvement of these children in stitching the footballs that featured in the American media and stimulated some of the recent demands for labelling of products made with child labour, and trade sanctions against goods produced with child labour.

difficult to sacrifice because of its stimulant and addictive properties. As discussed earlier, tea and coffee consumption was investigated partly to find out whether the non-altruistic behaviour associated with tobacco consumption carries over to other goods with these properties. In the main results for participation of children in work (Table 4), tea & coffee consumption was consistent with altruism. However, when we replace work participation with school attendance or with gender-specific hours of work, the tea & coffee equations reject altruism (Table 5). In any case, we cannot discard the relevance of stimulant or addiction properties to the extent that these properties are stronger in tobacco than in tea and coffee. However, the consistent differentiation of tobacco from the other goods across all variations of the model does invite the speculation that what sets tobacco apart from the other goods is that it is predominantly an adult *male* good. This is confirmed in our data. The equations estimated in this paper indicate that an adult male (aged 25-59) consumes four times as much tobacco as an adult female does. In contrast, men consume only 70% of the tea and coffee that women consume, on average.

It was observed in Section 5.1 that all of the adult consumption items we consider behave like necessities (Figure 2). This is especially true of tobacco: the poor tend to spend a higher fraction of their budget on it than the rich²⁸. The poor are also more likely to have working children than are the non-poor. This alone can generate the positive correlation in the data between child labour and the share of tobacco spending that was reported in Section 5.3. However, in the m-demand formulation, the effect of income on tobacco consumption is entirely captured by its effect on the “reference good”, child labour (which may therefore be instrumented by income): see Section 3. So, while it is useful to set the estimates of the altruism parameter in the context of other knowledge (income-elasticities) of spending behaviour, our key result is not driven by omission of a third factor (income) which moves child labour and tobacco spending in the same direction²⁹.

7.3. Gender Differences in Altruism

This question has been investigated by experimentalists and the evidence is mixed. Indeed, Andreoni and Vesterlund (1998) find that the male and female demand curves for altruism cross: at high prices, women demand more and, at low prices, men demand more. Also, men are more likely to be both perfectly selfish and perfectly selfless, while women tend to be “equalitarians”. While the prices interpretation is not inconsistent with the results in this paper, our analysis does not allow for differences in the altruism parameter across men in the sample. Analyses of microdata, especially for developing countries, have revealed again and again, in several contexts, that resources in the hands of women improve child welfare significantly more than the same resources in the hands of men (see Strauss and Thomas (1995) or, more recently, Pitt *et al* (2000), for example). Although we do not follow this literature in modeling preference heterogeneity between men and women, our finding that altruism is not rejected for adult goods in general but is rejected for an adult good that is predominantly male, concurs with

²⁸ Similar evidence obtains for historical England as well as for contemporary England (e.g. Banks, Blundell and Lewbel, 1997).

²⁹ In order to obtain the tests of overidentifying restrictions reported in Table 6, income and its square were introduced as regressors in the m-demand for adult consumption and, for every category, they were completely insignificant.

available evidence on gender differences in altruism. Both the raw data (Table 3) and our estimates also suggest that, where altruism is rejected, the rejection is stronger in the context of girl's work than it is for boy's work.

8. Conclusions

This paper estimates m-demands for adult and child consumption to investigate the hypothesis of parent altruism. It shows that this corresponds to a unique sign on a parameter in an estimable equation. The main result is that estimates of tobacco demand equations reject parent altruism towards children in the contexts of both child labour and child consumption. On the other hand, the demands for adult clothing and footwear, for ceremonies and for child clothing and footwear are all consistent with altruistic behaviour of parents towards young children. While the main specification of the model relates to adult consumption and child labour, exploration of alternative models in which adult consumption is replaced by child consumption, and in which child labour is replaced by child consumption indicates the robustness of these results. The robustness of these results is further confirmed by varying the definition of child labour and by introducing some variation in the expenditure categories considered.

A possible interpretation of these findings, given that tobacco is a predominantly male good, is that there is a scale of altruistic behaviour of parents towards children on which women are further along than men. Preference heterogeneity between mothers and fathers could be explicitly modeled, as has been done before but, in this paper, we impose very little structure on the model and focus on altruism of decision-making parents towards children, rather than on the question of how multiple decision makers reach a consensus.

The analysis was motivated to inform current analysis and policy debate relating to the causes of child labour, as much as to investigate altruism *per se*. Policies that have been proposed as offering ways of reducing child labour include providing income subsidies to households with working children, the introduction of adult minimum wages, trade sanctions and bans on child labour. Our results raise the concern that the policy of providing income subsidies to households with working children may encourage smoking rather than discourage child labour. Indeed, the results in this paper suggest that an efficient way to reduce child labour might be to introduce tobacco taxes³⁰. As a matter of fact, American introduced alcohol taxes around the time that it introduced child labour legislation in the nineteenth century, although there does not appear then to have been any recognition of the possible complementarity of these measures. Tobacco taxes will, in the same way as many of the alternative policies on the agenda, be difficult to monitor in rural informal economies. However, community organisations supported by local governments and NGOs have demonstrated effectiveness in many developing countries including India and Bangladesh. If they were to control consumption of tobacco, they might, in one stroke, contribute to reducing child labour and to improving adult health.

³⁰Even though smoking is addictive, estimates of cigarette demand equations for the US indicate that price increases reduce demand. More addicted (more myopic) individuals display relatively large price elasticities in the long run (see Chaloupka, 1991).

Table 1
Expenditure Shares

<u>Variable</u>	<u>Mean</u>	<u>Std. Dev</u>
Tobacco	0.020	0.028
Tea & coffee	0.018	0.014
Adult clothing & footwear	0.043	0.035
<u>Adult goods</u>	0.082	0.050
Ceremonies	0.031	0.065
Child clothing & footwear	0.028	0.024
Food	0.537	0.165
Education	0.035	0.053
Health	0.103	0.137

Notes: The figures are shares of total household expenditure. *Adult goods* is the composite of the three adult consumption categories in the Table.

Table 2
A Profile of Child Activities

	<u>Boys</u>	<u>Girls</u>
<i>Participation Rates</i>		
Wage work	6.2%	11.9%
Household farm work	22.1%	28.1%
<i>Household enterprise work</i>	2.3%	1.6%
<i>School</i>	72.8%	30.5%
<i>None of the above activities</i>	14.0%	42.4%
<i>Domestic work</i>	n.a.	99.4%
Number of children	1209	1096

Notes: Children are defined as 10-14 year-olds. n.a.=not available.

Table 3
Differences in Mean Budget-Shares: T-tests

<u>Commodity</u>	<u>Mean share</u>	<u>All Children</u>	<u>Boys</u>	<u>Girls</u>
Adult goods	0.086	- 0.86	1.04	-3.42
Tobacco	0.023	- 3.24	-1.36	-2.79
<i>Tea</i>	0.019	- 1.21	-0.60	-2.06
<i>Adult clothing</i>	0.033	1.52	2.54	-1.98
<i>Adult footwear</i>	0.012	1.54	2.01	-0.69
Education	0.024	5.74	7.74	1.97
Food	0.544	- 4.66	-3.86	-2.70

Notes: A dummy (D) is defined as 1 if the household has at least one working child, and 0 otherwise. The mean budget share of households with D=1 is then compared with that in households for which D=0. The null hypothesis is: mean(D=0)-mean(D=1)=0. Where the t-test associated with this hypothesis is significant, it is in bold. For adult goods: $t \leq 0$ indicates rejection of altruism. Work refers to either of wage employment or employment on the household farm or enterprise. N=1343, which is the sample of households with at least one 10-14 year old.

Table 3A
Differences in Mean Budget-Shares: T-tests
Distinguishing market work and household farm/enterprise work

<u>Commodity</u>	<u>Wage labour</u>			<u>Own farm/enterprise</u>		
	<u>All</u>	<u>Boys</u>	<u>Girls</u>	<u>All</u>	<u>Boys</u>	<u>Girls</u>
Adult goods	-1.18	1.66	-3.60	-0.62	1.01	-2.96
Tobacco	-2.66	-0.10	-2.55	-2.49	-1.17	-2.00
<i>Tea</i>	1.10	0.18	-0.22	-1.95	-0.74	-2.45
<i>Adult clothing</i>	-0.18	2.14	-3.01	1.53	2.43	-1.80
Adult footwear	0.41	1.81	-1.54	1.65	1.90	-0.57
Education	2.57	6.60	-1.57	5.41	6.98	1.83
Food	-2.44	-2.12	-0.70	-5.21	-4.06	-2.42

Notes: See Notes to Table 3.

Table 4
M-Demands for Adult Consumption, Ceremonies and Child Consumption

	Tobacco	Tea & Coffee	Adult Wear	Adult Goods	Ceremony	Child Wear
prop. children in work	1.851 (2.63)**	-0.876 (2.66)**	-1.914 (5.20)**	-1.149 (4.27)**	-1.397 [2.51]*	-2.343 (6.04)**
ln child wage	-0.110 (1.41)	0.018 (0.25)	-0.141 (2.93)**	-0.101 (2.29)*	-0.095 [0.99]	-0.058 (1.16)
ln adult wage	0.601 (1.99)*	0.422 (2.08)*	0.237 (1.15)	0.411 (2.59)*	0.007 [0.03]	0.291 (2.00)*
ln household size	0.056 (0.29)	-0.552 (5.83)**	-0.426 (3.42)**	-0.432 (4.71)**	0.766 [4.31]**	-0.357 (3.09)**
prop 10-14 boys	0.763 (0.92)	-0.055 (0.14)	0.495 (1.09)	0.269 (0.83)	1.250 [2.08]*	-0.450 (1.01)
prop males 15-24	-0.741 (1.19)	-1.822 (6.70)**	-1.154 (3.30)**	-1.447 (5.97)**	0.337 [0.65]	0.051 (0.14)
prop males 25-59	1.029 (1.03)	-0.939 (2.13)*	-0.622 (1.22)	-0.417 (1.19)	1.366 [1.68]+	0.157 (0.26)
prop males >60	-0.944 (0.79)	-1.255 (2.31)*	-0.574 (0.83)	-0.934 (2.00)*	0.304 [0.30]	1.059 (1.37)
prop 10-14 girls	-0.957 (1.07)	0.283 (0.63)	1.428 (3.37)**	0.584 (1.73)	1.410 [1.79]+	0.931 (2.04)*
prop females 15-24	-2.440 (3.33)**	-2.373 (7.07)**	-1.372 (3.49)**	-1.667 (6.11)**	0.509 [1.07]	0.318 (0.74)
prop females 25-59	0.254 (0.19)	-1.282 (2.23)*	-0.896 (1.31)	-1.125 (2.53)*	1.632 [1.40]	1.022 (1.56)
prop females >60	-0.841 (0.60)	-3.899 (6.31)**	-3.178 (3.88)**	-3.361 (6.15)**	-2.236 [2.01]*	-2.005 (2.27)*
1(non-muslim)	0.607 (1.87)	0.132 (0.97)	0.210 (0.78)	0.289 (1.70)	0.607 [2.29]*	0.577 (2.39)*
1(female head)	-0.083 (0.24)	0.010 (0.06)	0.105 (0.51)	0.118 (0.98)	0.263 [0.99]	0.206 (1.01)
acres land	0.007 (2.14)*	0.007 (3.81)**	0.007 (2.62)**	0.006 (3.37)**	0.003 [0.95]	0.006 (2.24)*
1(rent land)	-0.626 (2.91)**	-0.083 (0.63)	0.222 (1.73)	0.030 (0.30)	0.225 [1.04]	0.255 (2.01)*
1(sharecrop)	-0.307 (1.57)	-0.011 (0.11)	0.282 (2.63)**	0.098 (1.13)	-0.113 [0.68]	0.256 (2.06)*
1(own land)	-0.374 (2.23)*	0.193 (2.36)*	0.240 (2.73)**	0.126 (1.98)*	0.145 [1.19]	0.295 (3.36)**
1(own enterprise)	0.014 (0.10)	-0.002 (0.03)	0.094 (1.17)	0.088 (1.57)	-0.133 [1.18]	0.108 (1.47)
Observations	1318	1318	1318	1318	887	1193

Notes: Robust t-statistics in brackets. + significant at 10%; * significant at 5%; ** significant at 1%. Province dummies included though not shown. Adult Goods refers to the sum of the goods in columns 1-3. Adult/Child “Wear” refers to clothing plus footwear. In columns 1-4, the dependent variable is ln(expenditure per adult). In column 5 it is log expenditure and in column 6, ln(expenditure per child).

Table 5
M-Demands for Adult Consumption: Variants
Coefficients on Child Labour & School Variables
Dependent Variable= ln(expenditure per adult)

<u>Child Work Participation or Work Hours or School</u>	Tobacco	Tea & Coffee	Adult Wear	Adult Goods
ALL WORK				
pr children in work	1.851 (2.63)**	-0.876 (2.66)**	-1.914 (5.20)**	-1.149 (4.27)**
pr boys in work	0.979 (0.36)	3.124 (1.41)	0.804 (0.42)	1.860 (1.07)
pr girls in work	2.521 (1.18)	-3.946 (2.27)*	-4.000 (2.66)**	-3.459 (2.54)*
WAGE WORK				
pr children in wage work	3.530 (2.54)*	-1.883 (3.02)**	-2.633 (2.97)**	-1.672 (3.00)**
pr boys in wage work	2.250 (0.31)	1.495 (0.36)	1.747 (0.33)	2.171 (0.59)
pr girls in wage work	4.321 (0.92)	-3.970 (1.53)	-5.340 (1.68)	-4.047 (1.76)
SCHOOL				
pr children in school	-1.109 (2.33)*	0.727 (3.81)**	1.358 (6.43)**	0.881 (5.43)**
pr boys in school	-1.791 (0.78)	0.513 (0.50)	-1.965 (1.12)	-1.015 (0.90)
pr girls in school	-0.560 (0.30)	0.899 (1.07)	4.031 (2.82)**	2.406 (2.63)**
HOURS (ALL WORK)				
child hours of work	0.051 (1.90)	-0.033 (2.40)*	-0.059 (3.74)**	-0.037 (3.06)**
boy hours of work	0.105 (2.10)*	-0.016 (0.65)	-0.102 (3.16)**	-0.045 (2.25)*
girl hours of work	-0.026 (0.37)	-0.058 (1.37)	0.003 (0.05)	-0.026 (0.68)
Observations	1318	1318	1318	1318

Notes: Robust t-statistics in brackets. + significant at 10%; * significant at 5%; ** significant at 1%. Adult Goods refers to the sum of the goods in columns 1-3. Adult/Child "Wear" refers to clothing plus footwear.

Table 6
Alternative Estimators and Control Variables

	Tobacco		Adult Clothing & Footwear			
	IV	IV	OLS	IV	IV	OLS
pr children in work	1.654	1.851	0.329	-0.904	-1.914	-0.159
	[2.68]**	(2.63)**	(2.49)*	[3.07]**	(5.20)**	(2.49)*
ln child wage	-0.045	-0.110	-0.080	-0.135	-0.141	-0.177
	[0.40]	(1.41)	(1.20)	[2.20]*	(2.93)**	(3.80)**
ln adult wage	0.647	0.601	0.500	-0.124	0.237	0.391
	[2.19]*	(1.99)*	(1.68)	[0.64]	(1.15)	(2.19)*
ln household size		0.056	-0.147		-0.426	-0.212
		(0.29)	(0.83)		(3.42)**	(2.28)*
prop 10-14 boys		0.763	0.437		0.495	0.846
		(0.92)	(0.57)		(1.09)	(2.57)*
prop males 15-24		-0.741	-1.343		-1.154	-0.535
		(1.19)	(2.53)*		(3.30)**	(2.20)*
prop males 25-59		1.029	0.688		-0.622	-0.448
		(1.03)	(0.74)		(1.22)	(1.09)
prop males >60		-0.944	-0.602		-0.574	-1.050
		(0.79)	(0.52)		(0.83)	(2.30)*
prop 10-14 girls		-0.957	-0.519		1.428	0.884
		(1.07)	(0.63)		(3.37)**	(2.79)**
prop females 15-24		-2.440	-2.709		-1.372	-1.001
		(3.33)**	(3.96)**		(3.49)**	(3.65)**
prop females 25-59		0.254	-0.290		-0.896	-0.140
		(0.19)	(0.23)		(1.31)	(0.28)
prop females >60		-0.841	-2.380		-3.178	-1.360
		(0.60)	(2.01)*		(3.88)**	(2.33)*
1(non-muslim)		0.607	0.852		0.210	-0.077
		(1.87)	(3.01)**		(0.78)	(0.35)
1(female head)		-0.083	0.033		0.105	-0.037
		(0.24)	(0.10)		(0.51)	(0.24)
acres land		0.007	0.007		0.007	0.007
		(2.14)*	(2.37)*		(2.62)**	(3.09)**
1(rent land)		-0.626	-0.463		0.222	0.039
		(2.91)**	(2.24)*		(1.73)	(0.45)
1(sharecrop)		-0.307	-0.032		0.282	-0.015
		(1.57)	(0.20)		(2.63)**	(0.21)
1(own land)		-0.374	-0.200		0.240	0.048
		(2.23)*	(1.51)		(2.73)**	(0.72)
1(own enterprise)		0.014	0.025		0.094	0.065
		(0.10)	(0.18)		(1.17)	(0.94)
Observations	1329	1318	1327	1329	1318	1327

*Notes: Robust t-statistics in brackets. + significant at 10%; * significant at 5%; ** significant at 1%. Province dummies included though not shown.*

Table 7
M-Demands for Adult Consumption
Reference Good = Child Consumption

	Tobacco	Adult Wear
ln expenditure on child wear	-0.712 (2.18)*	0.817 (9.67)**
ln child wage	-0.108 (1.17)	-0.096 (2.94)**
ln adult wage	0.682 (1.87)	0.067 (0.51)
ln household size	0.407 (1.20)	-0.887 (8.18)**
prop 10-14 boys	0.337 (0.39)	0.623 (2.27)*
prop males 15-24	-2.039 (2.63)**	0.206 (0.82)
prop males 25-59	0.057 (0.05)	0.122 (0.29)
prop males >60	-3.117 (2.26)*	0.013 (0.03)
prop 10-14 girls	-0.045 (0.05)	0.405 (1.65)
prop females 15-24	-4.068 (4.36)**	-0.290 (1.04)
prop females 25-59	-0.537 (0.35)	-0.692 (1.49)
prop females >60	-3.579 (2.35)*	-1.120 (2.33)*
1(non-muslim)	0.903 (3.25)**	-0.157 (1.03)
1(female head)	0.257 (0.72)	-0.077 (0.56)
acres land	0.012 (3.09)**	0.002 (0.66)
1(rent land)	-0.444 (1.90)	0.030 (0.44)
1(sharecrop)	-0.093 (0.48)	0.123 (1.97)
1(own land)	-0.184 (1.23)	-0.001 (0.02)
1(own enterprise)	0.095 (0.61)	0.058 (1.15)
Observations	1193	1193

Notes: The dependent variable is log expenditure on adult consumption (tobacco or clothing & footwear) per adult. Child wear is child clothing and footwear.

Table 8
Tests on the Instruments

	Tobacco	Tea & Coffee	Adult Wear	Adult Goods	Ceremony	Child Wear
Overidentifying Restrictions⁺						
Excl. school indicators						
$\chi^2(5)$, [p-value]	3.23 [0.67]	8.64 [0.12]	11.9 [0.04]	15.6 [0.01]	1.3 [0.94]	9.8 [0.08]
$\chi^2(2)$, [p-value]	1.33 [0.51]	0.49 [0.79]	5.0 [0.08]	1.69 [0.43]	0.61 [0.74]	5.1 [0.08]
$\chi^2(2)$, [p-value]	1.19 [0.55]	4.73 [0.09]	5.3 [0.07]	11.4 [0.0]	0.19 [0.91]	5.6 [0.06]
Power of the Instruments*						
$\chi^2(8)$, [p-value]	65.32 [0.0]					
$\chi^2(5)$, [p-value]	61.13 [0.0]					
$\chi^2(2)$, [p-value]	9.84 [0.0]					
R ² of auxiliary model	0.15					
Observations	1318	1318	1318	1318	887	1193

Notes: These tests are for the equations in Table 4. Refer to Section 4.1 of the text for a discussion of the instruments. *The t-tests on each variable in each equation are insignificant even though sets of variables are occasionally jointly significant.*

+: We first impose the restriction that variables indicating presence of schools in the village do not directly affect the (conditional) variation in consumption. Then $\chi^2(5)$ is a test of the joint significance in the spending equation of household income, its square, father's years of education, mother's years of education and the regional unemployment rate. We next present the $\chi^2(2)$ statistic for income and its square. The second set of $\chi^2(2)$ statistics refer to the joint significance of father's and mother's years of education.

*****: Tests for the power of instruments refer to the auxiliary equation for child labour and are therefore the same for all expenditure categories. They are reported in column 1, the other columns being left blank. The χ^2 tests of the power of the instruments denote their joint significance in the auxiliary equation for child labour (or schooling). $\chi^2(8)$ refers to the full set of instruments: 1(primary school), 1(middle school), 1(secondary school), household income, its square, father's years of education, mother's years of education and the regional unemployment rate. $\chi^2(5)$ refers to the above set minus the school indicators: the idea is to establish that the preferred overidentifying restrictions contribute significantly to efficiency. $\chi^2(2)$ refers to income and its square alone: the idea is to establish the significance of the instrument suggested by theory.

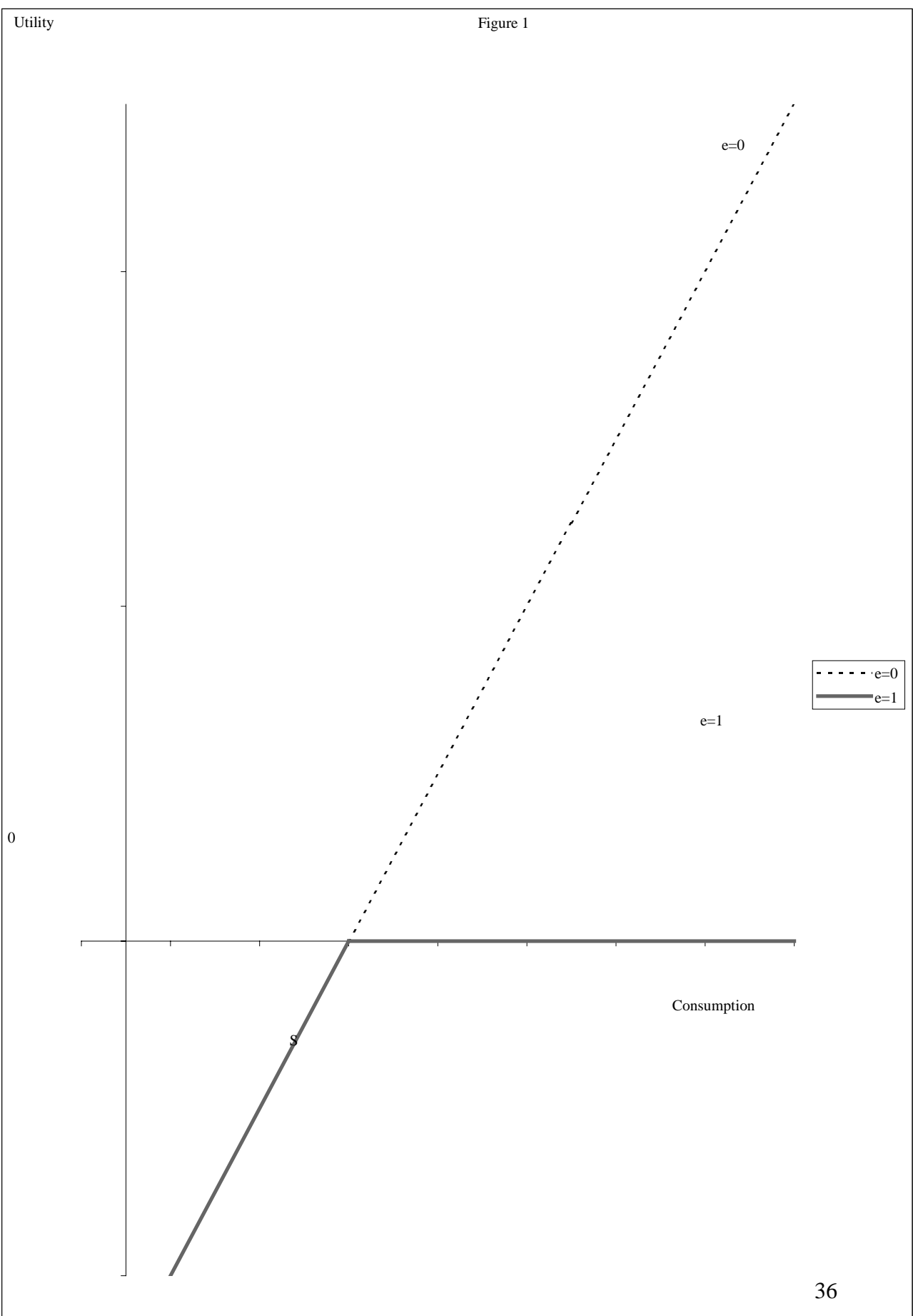


Figure 2: Semiparametric Engel Curves

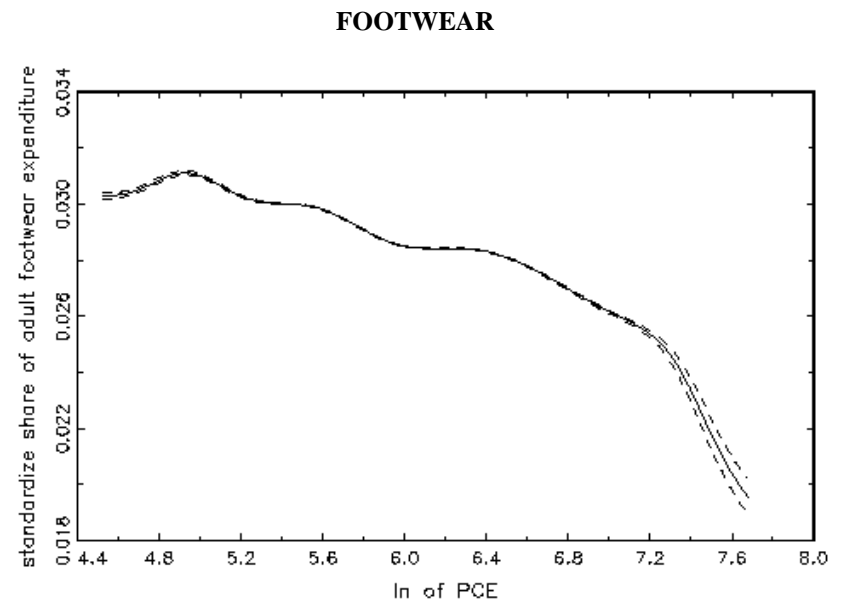
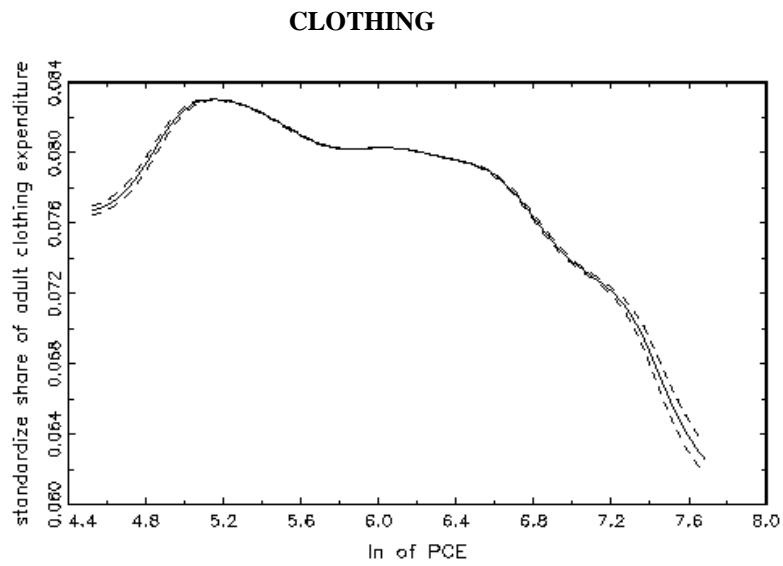
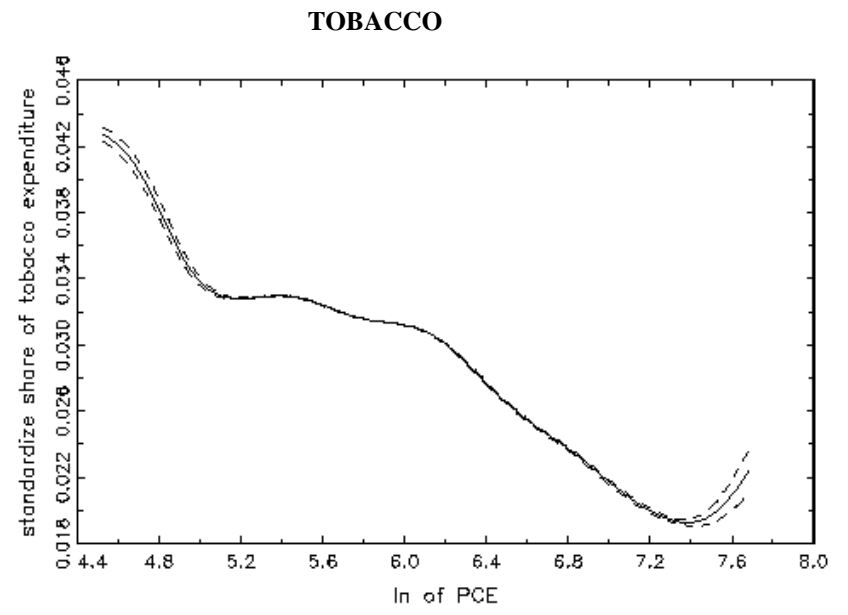
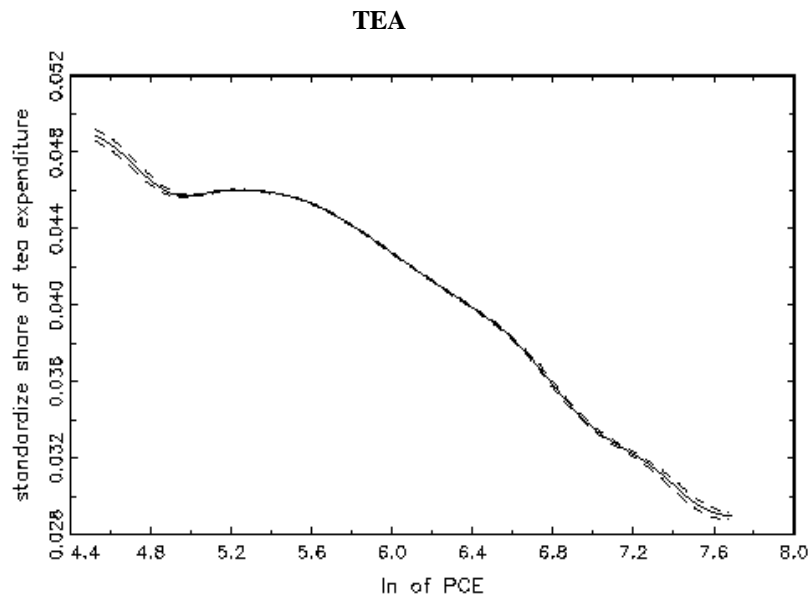


Figure 3
Child Participation Rates by Quartiles of Food Expenditure Per Capita

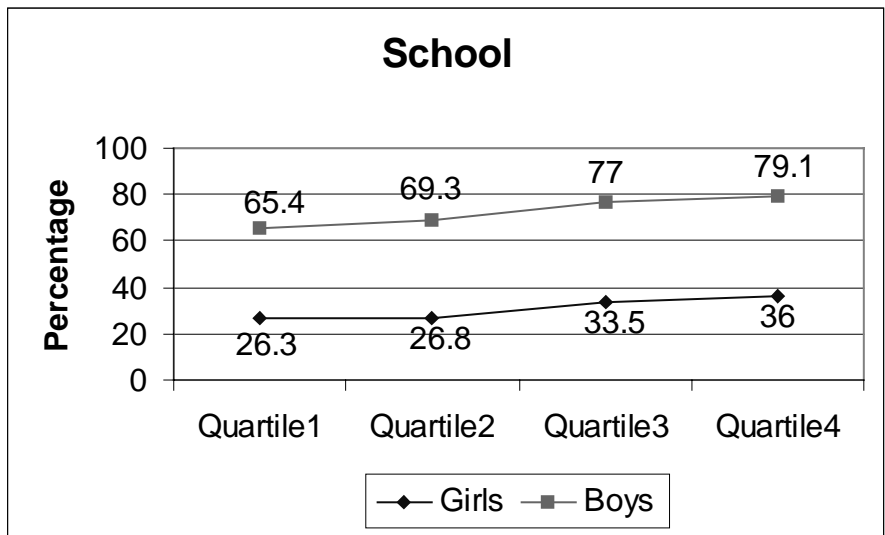
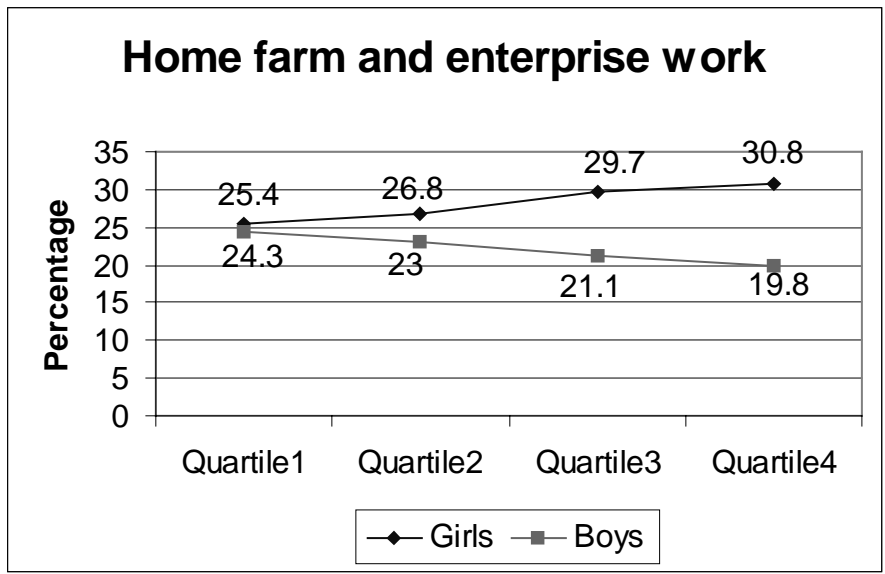
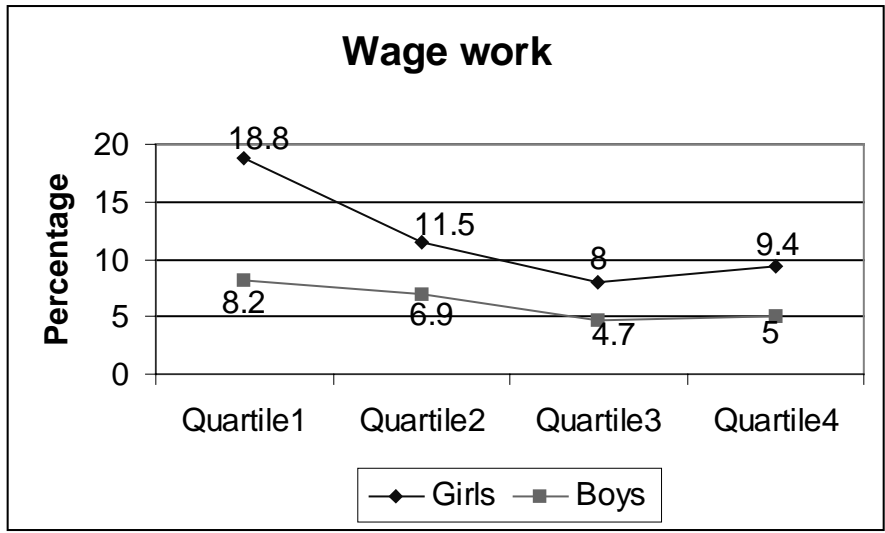
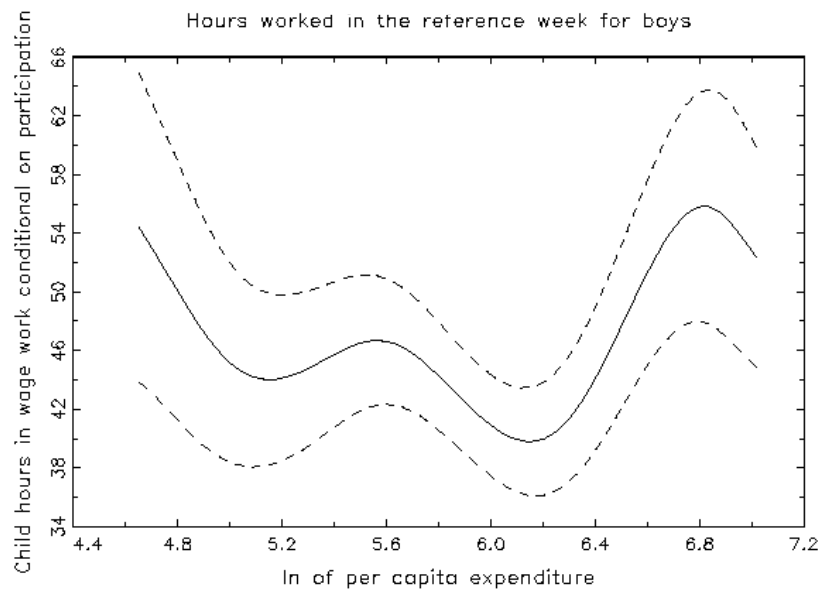
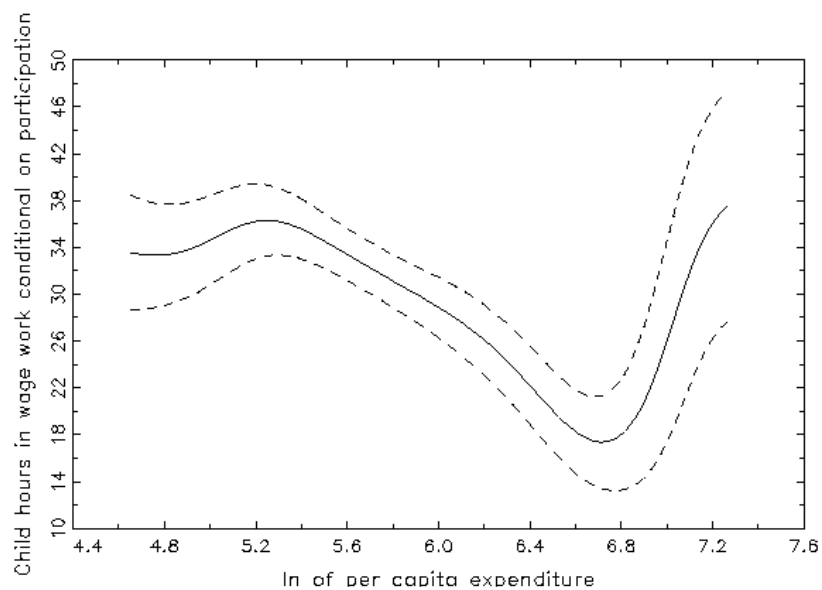


Figure 4
The Relation of Hours of Child Wage Work and Household Expenditure: Nonparametric Estimates

Boys



Girls



Notes: Child hours in wage work conditional on participation as a function of the logarithm of per capita expenditure of the household. The nonparametric estimation uses a Gaussian Kernel.