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Abstract

This paper uses 1998 household level data from urban Malawi to look at the impact on consumption patterns of the share of total household income accruing to different individuals within the household. Specifically, male and female income shares and other factors which may influence intra-household bargaining such as education are analysed. The study finds that for some categories of good such as personal and household hygiene and clothing, unitary household models are unsuitable as intra-household relationships and differing preferences of individuals play a key role in consumption choices. Overall the results indicate that females favour household hygiene, vehicle repair and girls' clothing while males favour male clothing. Consumption choices are influenced by both the income and education of the main male and female members, and crucially, the impact of income shares on household consumption is non-linear.

1. Introduction

By 2015 all 191 members of the United Nations have pledged to meet agreed development goals. These include ensuring that all boys and girls complete a full course of primary schooling; reducing by two thirds the mortality rates of children under 5 years; reversing the spread of AIDS, malaria and other diseases; reducing by three quarters the maternal mortality rate and reducing by half the proportion of people suffering from hunger[2]. Clearly, in order to meet these challenging targets resources need to be targeted towards the correct areas. Developing country output needs to rise and their economies need to become more productive.

Households in developing countries are able to choose where to spend their income based on their own preference structure. Where their preferences coincide with those of the United Nations, more resources will be targeted towards the above goals as households increase their expenditure on, for example health, education and agricultural production.

However, preferences within families may differ as different categories of goods enter individual utility functions in different ways; some members preferring to spend more on, say, health, while others prefer to spend more on clothing. The weight of each member in the bargaining process may influence the final outcome. Understanding intra-household relationships may then be important in helping to meet Government (or U.N.) targets, as money can be directed towards those judged to spend it in the most "desirable" way.

The first part of this study looks at the theory of household decision-making and the empirical results with special regards to developing countries. We then look at expenditure patterns in urban households in Malawi focussing particularly upon the influence which different household members may exert upon the decision-making process and how this may impact upon final outcomes. The final section concludes.

2. Literature Review

This section aims to give a very brief overview of the competing theoretical models of household income and expenditure choices. We then review the empirical literature of both developing and developed countries paying special attention to any patterns which emerge as well as any salient results.

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[2] For information regarding the U.N. Millennium Development Goals, see: http://www.un.org/millenniumgoals/.

2.1. Theoretical Models

Despite the fact that micro-economic theory places a great deal of emphasis on the individual, analyses of household expenditure in both a developed and developing country context have often regarded the household as a single decision-making unit. As such, traditional theoretical neo-classical models of household expenditure choices treat the family as a single unit. This view however is challenged by other theoretical models that treat the household as being composed of heterogeneous individuals with diverse preferences[3]. These non-unitary models can further be divided into two broad approaches; the "bargaining approach" of McElroy[4] and the "collective approach" of Chiappori[5].

We first present a traditional neo-classical household welfare function before showing how this model differs from non-unitary models. This unitary "Beckerian" type model can be summarised as the head of the household composed of J individuals maximising his or her utility subject to the household budget constraint. Expenditure can be either public (G) (household heating or lighting for example) or private (c_j) (one person's consumption automatically precludes another from consuming the same good). As shown in equation (1) such a dictatorial model allows for either benevolent dictatorship, where the others' consumption plays an important role in the utility of the decision-maker, or extreme selfishness. An example can be found in Bergstrom's (1989) beautifully-written paper, "Puzzles: Love and Spaghetti". Here, he models a loving couple who, other than love, consume only one good: spaghetti. Each person's utility function is positively affected by the other's consumption of spaghetti.

$$\max_C W = u_1(c_1,...,c_J,G;\theta,\varepsilon) \tag{1}$$

s.t. budget constraint.

where θ, ε represent respectively the observable and unobservable characteristics of individual 1.

Rangel (2004) designs a model in order to test the unitary household model against Chiappori's collective model (described below). Total consumption of a household is given by:

$$C = \sum_{j=1}^{J} c_j + G \tag{2}$$

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[3] See Bergstrom (2002) for a comprehensive review of theory of (optimal) individual behaviour within a social context.
[4] For theoretical and estimation techniques of this model see McElroy (1990)
[5] For a reduced form of this model, see Browning *et al.* (1994)

Expenditure is given by **e=P′C** where **P** and **C** are price and consumption vectors respectively and total household income is generated by wage income, *wH*, exogenous income, *y* and production activities (farming for example), π.

$$I = \sum_{j=1}^{J}(wH + y_j) + \pi \qquad (3)$$

The utility function of members allows for externalities (one member cares about another's consumption) and selfishness. Thus the utility of *j* can be influenced by the consumption of other members:

$$u_j = u_j(c_1,...,c_J,G;\theta,\varepsilon) \qquad (4)$$

In a unitary model all members have identical preferences. This can be attained either through a Beckerian dictatorial model where one member (the head of household) makes all the expenditure decisions for the household, or though a Samuelson (1956) "stable consensus"-type model where every individual has the same utility function. In the alternative, non-unitary approach, individuals bargain over different allocation depending upon their personal preferences and power allocations of resources within the household.

In Chiappori's model, members agree on a Pareto-efficient allocation of public and private goods. Distribution of private goods is then achieved through intra-household lump-sum transfers to individuals who then choose their own private consumption bundle in order to maximise their own utility.

The weight each individual commands in the bargaining process, μ_j, gives their private consumption. The household utility maximisation problem below shows that if all weights are set to zero we find ourselves again in the context of a dictatorial model where the head (modelled below as individual 1) makes all the decisions for the household as per equation (1).

$$\max_C W = u_1(c_1,...,c_J,G;\theta,\varepsilon) + \sum_{j=2}^{J}\mu_j(P,I)u_j(c_1,...,c_J,G;\theta,\varepsilon)$$
$$s.t.: e = P'C = I \qquad (5)$$

In contrast to the collective model illustrated by equation (1), where $\sum_{j=1}^{J}\mu_j = 1$, the bargaining approach favoured by McElroy (1990) specifies a model where household members maximise the product of their gains from belonging to the household. The Nash-bargained solution

is influenced by the power of each individual, which is given by his or her "threat point" or "reservation utility" – the maximum utility attainable outside of the household. The threat point depends upon what McElroy calls "extra household environmental parameters" or EEP's such as the marriage market or institutional characteristics such as divorce laws and on individual characteristics. Thus a household may split when, for example, a child's utility outside of the household, V_j, becomes great enough to assert his or her independence. The bargaining model can thus be specified as in Maitra and Ray (2003) as:

$$MaxW_C = \prod_{j=1}^{J} \left[U_j \left(c_1, ..., c_J, G; \theta, \varepsilon \right) - V_j \left(p, \tilde{\theta}, E \right) \right] \tag{6}$$

where the reservation utility, V_j, is a function of prices, p, a set of individual characteristics, $\tilde{\theta}$, and a set of EEP's, E.

Current consensus favours a non-unitary hypothesis for households composed of more than one adult. However, little agreement has been reached regarding which of the alternatives is more pertinent[6]. Our analysis does not require that the demand function be generated by the "bargaining model" or the "collective model".

2.2. Main Empirical Results

Empirical results for both developed and developing countries tend to support the non-unitary hypothesis. Even in countries where a unitary model should work well, such as "macho" Brazil, Thomas (1990) finds evidence that unearned income in the hands of different household members contribute differently to total household expenditure. He looks specifically at family health when unearned income is in the hands of mothers and fathers. Using data from the National Study on Household Expenditure he finds that income controlled by mothers has a beneficial impact on child survival probabilities and nutrient intake. Whilst both parents use unearned income to improve family health, the absolute impact of "female" income on child survival probability is 20 times greater that that for "male" income and 4 to 7 times bigger for nutrient intake. This, the author suggests, is because whilst both parents care about child health, this variable enters their utility functions differently.

Thomas' focus on health as being an important variable is justified by Strauss and Thomas' (1998) survey on health and development. They point to the concave relationship between these

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[6] See, for example, McElroy (1990) for the debate between the collective and bargaining approaches.

two variables making investment in health particularly important in developing countries where such investment is already low. Furthermore, these authors show evidence of a positive correlation between a global health variable and labour supply. This is particularly important in a developing country context given the high proportion of the population which agriculture supports (over 90% of the Malawian population are supported by agriculture, generating 45% of GDP[7]) and the consequent reliance on own-labour supply. Regular studies in developed countries affirm a relationship between health and educational performance[8], the latter also being seen as a catalyst for economic growth in many endogenous growth models. According to Graham (2004) women's education is an important factor in female mortality rates. For these reasons our own study looks at health expenditure.

Katz (1995) assumes that the sources of finance of a purchase, as well as the person motivating the purchase are observable. Using data from rural Guatemala, she finds that husbands and wives tend to finance the purchases they motivate, usually related to their "sphere of responsibility" within the household. This is not always the case as financial and labour transfers (wives helping husbands farm crops for example) are made within the household. So, for example, certain purchases, such as family celebrations tend to be male financed but female purchased.

Katz's analysis suggests that husbands tend to finance agricultural equipment, housing repairs, land and male clothing, whilst wives tend to finance domestic technology and health care. These purchasing habits clearly relate to household spheres of responsibilities.

Using South African household level data, Maitra and Ray (2003) test for different effects on household expenditure patterns of income accruing from different sources. In particular, they note that public and private transfers tend to accrue to different household members (male and female respectively), and that male and female-headed households tend to have different expenditure habits.

One should not be surprised that different results are found for different countries since economic, social and historical characteristics will influence behaviour.

The authors note that male-headed households tend to spend less on entertainment, clothing and child-care but more on food, education and fuel. We note briefly that this result is different

[7] Country Brief, World Bank. Available at: http://web.worldbank.org/ .
[8] See, for example, the 2002 report: "A strategy for delivering Government's sport and physical activity objectives", written for the British Prime Minister's Office. Available at: http://www.number-10.gov.uk/su/sport/report/02.htm.

from that of Thomas (1990) where "male" income is less likely to be used for nutritional purposes than "female" income.

Similarly to Thomas (1990) and Katz (1995), Maitra and Ray (2003) reject the hypothesis of a unitary household model.

Rangel (2004) notes that households in developing countries are often composed of members from several generations, and are not simply headed by two parents with children. He uses cross-sectional data from the 1991/92 and 1998/99 Ghana Living Standards Survey to analyse the effects of changes in relative prices of 11 key commodities on household expenditure habits.

He tests the response of a change in household demand for a commodity following a change in its price. This demand is decomposed as per the Slutsky equation into an income and substitution effect. In a collective bargaining model, these responses will be adjusted by an effect related to each individual's weight in the bargaining process. Similarly to Browning *et al.* (1994), Rangel (2004) notes that the Slutsky matrix will be symmetrical under the income-pooling (unitary household) hypothesis. That is, a change in price of a commodity will have the same impact regardless of the different members' preferences. This provides a testable hypothesis.

Rangel rejects the unitary model, but finds a number of interesting results. Firstly he notes that "[In] households where adult women outnumber adult men, efficient outcomes are achieved". Here, "efficient outcomes" are the Pareto efficient outcomes in the allocation of resources as defined in Chiapppori's model described in part 2.1 of this paper. This is not the case where males outnumber females.

Rangel further finds that where adult men outnumber adult women, a household with greater than two adults can be effectively modelled as one with only two adults. Thus gender and inter-generational relations within extended families are important. He concludes that "coalitions are formed in 3-adult households with two adult males but not in ones with two adult females".

This result is important because it suggests that, in many cases, whilst a unitary household model is not sufficient, a dual household model may be, even where households have greater than two adult members.

Rangel's (2004) result suggesting inter-generational relationships are important is supported by Thomas (1994) who uses American, Brazilian and Ghanaian data to find that fathers tend to spend more on sons and mothers on daughters.

Analysing twenty Sub-Saharan African countries, Morrison and Linskins (2000) find that mothers' characteristics are determinant in the nutritional intake of the child. The education, media

access, health, activity and social situation of the mother play a critical role in the dietary habits of children. Since the impact of these variables is not found to be the same as for fathers' characteristics, one can conclude that the mother has different preferences and chooses to spend income differently. As Thomas (1994), these authors find that mothers are especially concerned with their daughters' welfare.

Although, *a priori*, there is no reason to believe that one model should always dominate since household expenditure can be strongly influenced by culture various studies have consistently found that developed countries are also better modelled by non-unitary models.

Using Canadian data on married couples, Browning *et al.* (1994) analyse expenditure on clothing. They suggest that clothing may be considered a public good up to a certain point after which it becomes a private good. That is, the clothing expenditure of one member positively enters the utility function of other members up to a certain threshold after which it enters with a zero coefficient. They find that, in a marriage, the wife receives a greater proportion of total expenditure as total income increases – the wife's purchases could be regarded as luxury goods. Furthermore, as the wife's income increases with respect to the husband's, the authors find an increase in female clothing expenditure but no significant effect on men's clothing expenditure. This is taken as evidence against income pooling hypothesis.

Using British data, Lundberg and Pollak (1993) agree with Browning *et al.* (1994)'s rejection of the unitary household hypothesis. These authors note that the income-pooling hypothesis is testable following a change in U.K. policy in 1977 when child benefit was given directly to the mother. A change in household expenditure habits would support the idea that the mother had more weight in the decision-making process following this change. The unitary household hypothesis would thus be rejected.

3. Data and Analysis

This section uses the Malawian 1998 Integrated Household Survey (IHS98) to measure consumption of different categories of goods. Particular attention is paid to the impact of share of total household income accruing to the principal male and female in the household. Since the approximation of a "western-style" model of a household containing a nuclear family cannot be applied to rural households where several generations and extended family often exist as part of a single household, we look only at expenditure habits of urban households. The data represent well the breakdown of the Malawian population where less than 15% of the population is urban. Of a

total of over 10,000 households included on a national level, we use only 1,350 urban households, each with an average of just over 4 members. Following the literature, we hypothesise that members have different preferences and a higher share of total income increases individual j's bargaining power within the household. A greater share of household income is then spent according to j's preferences. So, for example, we would expect that a greater share of household accruing to the principal female to have an impact on household consumption choices.

3.1. Data Issues and the Creation of Variables

We examine consumption of 15 categories including 4 sub-categories that represent the key consumption patterns of urban households in Malawi. Each category is summarised in the table below:

Table 1 – categories of goods used as dependent variables

Consumption	Share of Total Consumption	Description
Housing	11.50%	Includes rent, upkeep, improvements.
Fuel	8.50%	Including for heating and cooking.
Food	45.50%	
Education	2.10%	
Gifts	7.10%	Includes cash gifts and value of in-kind gifts to people outside the household.
Farm	1.20%	
Health	2.00%	
Hygiene	3.40%	Includes all personal and household hygiene.
Traditional Feminine Domain	2.40%	Includes all products that may be regarded as being in the traditional feminine domain such as kitchen utensils, household products such as irons, linen etc.
Clothing	7.10%	Total clothing. The breakdown does not include "other clothing expenditure" meaning they do not sum to 7.10%
Clothing-Men's	2.60%	Men's clothing.
Clothing-Women's	2.20%	Women's clothing.
Clothing-Boys	1.10%	Boys clothing.
Clothing-Girls	0.08%	Girls clothing.
Other	9.20%	All other non-durable consumption including pensions, fines and legal fees, communication etc.

Some of these categories deserve some discussion. Clothing is sub-divided into separate male and female categories following the findings in other studies which suggest that the greater

the mother's share of income, the greater the consumption of women's and girls' clothing[9]. Due to the low consumption share on each category of goods which might be counted as being in the traditional feminine domain of household (kitchen utensils, linen etc), these goods have been grouped together for the analysis. For some categories, it is not immediately clear whether mothers or fathers will be more inclined to bias their consumption towards these items. Certain categories may enter their utility functions equally meaning that, for that category, the family effectively behaves according to the unitary model.

Control variables include dummies for the age, occupation and education level of the principal male and female in the household. Total household income and a dummy to indicate whether a household is below the poverty line are included since households with different incomes are likely to exhibit different consumption patterns. Since the logs of expenditure and of total income are entered in each side of the regression, these coefficients may be interpreted as marginal propensities to consumption. The shares of total household income accruing to the head male and female are included, as well as their squares. We would not expect that these two variables to significantly differ from each other or from zero under the income pooling hypothesis.

3.2. Descriptive Statistics

Of 1,350 urban households in this study, 234 are headed by females. A greater proportion of total consumption in female-headed households tend to be on women's and girl's clothes, "feminine" domain goods, education, personal and household hygiene and farming. Male-headed households consume relatively more housing, fuel, men's clothes, appliances (not included in the regression since they are durable goods) and gifts. They consume a similar proportion of food (an essential) clothing (suggesting an overall clothing budget which is then allocated depending partly upon income share), and health. Vehicle upkeep is counted in the "other" category of consumption due to the small amount spent (less than 1%), but it is interesting to note that female-headed households tend to spend a greater share of their income on motor-vehicles. This may be due to differing levels of technical competence of men and women with females preferring to pay someone to do repairs whilst males may do them themselves or to do with interpersonal communication; female city-dwellers may have more sociological need to be mobile than males, preferring to escort children to school in a car for example.

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[9] See, for example Browning *et al.* (1994), Thomas (1994), Morrison and Linskins (2000).

On average, females receive around 19% of the total household income. However, this masks huge differences across households. Over 50% of females receive no income direct to themselves at all, while 38% of females receive greater than 19% of income. We compare the consumption patterns of households where females receive over 19% with other households.

Households where the female contribution to income is greater tend to spend a greater proportion of their incomes on women's clothes; the "feminine domain"; education; vehicle upkeep; hygiene; gifts and farming. These households consume less fuel; men's clothes; health and food.

Some of these results confirm the previous results, going some way to confirm the idea that different categories of goods enter the female utility function differently to the male utility function. For example, consumption of goods in the traditional feminine domain, women's clothing, education and motor vehicle upkeep is higher as a proportion of total consumption in both categories. Other categories, such as gifts now appear to be positively associated with female control. This could be the result of intra-household dynamics which we do not examine in this study. As noted by Katz (1995), intra-household labour and financial exchanges are common. Furthermore, as shown in the theoretical section of this paper, certain goods (including housing and fuel) may be regarded as public goods (within the context of the household) and the formal testing of different theoretical models would be necessary to disentangle the different utility functions to this degree. This is beyond the scope of this study.

It is reasonable to think that females with a higher level of education may exert a greater influence in household consumption decisions. Around one third of adult women in this study have secondary education or above. For this reason, we look here at expenditure choices, comparing results from households where the female has at least a secondary-level of education with other households.

Households with more educated females spend greater proportions of their incomes on housing; education, women's and girl's clothing; the "feminine domain" and motor vehicle upkeep. They spend less on fuel and men's clothing. Theses choices could however capture the fact that education and income are likely to be strongly positively correlated and may capture more the different consumption bundles consumed by the wealthier households.

Education for the female is positively correlated (0.36) with both her total income and the part she contributes to household income (0.31). Interestingly, for males, although there is positive correlation (0.37) between income and education, there is not a significant relationship between

education and the share of total household income he contributes. There is also a strong correlation (0.57) between the level of education of the principal male and female in the household.

An increased level of education for females appears to reduce what McElroy (1990) calls the "threat point" for women. Better educated women are capable of earning higher wages, and thus more capable of supporting themselves outside of the marriage. This increases their bargaining power, and household expenditure is more likely to reflect their preferences.

The effects on expenditure habits from having a female head of household, greater influence of female income and higher female education are summarised in the table below:

Table 2 – Impact on expenditure habits of (i) female head of household, (ii) female contributing over 19% of total household income and (iii) female having secondary education or higher.

Consumption	Impact of following on expenditure compared to average (positive, negative or equal)		
	Fem share above average	Greater female education	Female head
Housing	=	+	-
Fuel	-	-	-
Food	-	=	=
Education	+	+	+
Gifts	+	-	-
Farm	+	+	+
Health	-	=	=
Hygiene	+	+	+
Traditional Feminine Domain	+	+	+
Clothing	=	=	=
Clothing-Men's	-	-	-
Clothing-Women's	+	+	+
Clothing-Boys	=	=	=
Clothing-Girls	=	+	+
Vehicle Upkeep	+	+	+

With regards to poverty, our data do not support Chant's (2004) affirmation that poverty is increasingly seen as being a "feminine problem" and that "single-parent headed households headed by women [are] the "poorest of the poor". Female-headed households in urban Malawi actually have a slightly higher income compared with their male counterparts but this difference is not significantly different from zero.

3.3. Estimation and Results

Since some households do not consume certain categories of good, our estimation is done using the Heckman two-step estimator[10]. In the first step, we estimate probits using as the dependant variable whether the household does or does not consume a particular category of good. In the second stage, we estimate a simple OLS regression with the log of expenditure on each category of good as the dependant variable. In order to ensure consistent estimates, we correct for potential selection bias by placing the Inverse Mill's Ratio (IMR) recuperated from the probit estimation into the second stage regression. In each stage we estimate consumption functions for each of the 15 categories of good described above. The same independent variables are used in each stage.

The first stage regression models the probability that a household chooses to consume category i at all given certain characteristics:

$$P(Cons_i=1 \mid X=x) = \Phi(X\beta) \tag{7}$$

where i represents the consumption category and is equal to 1 for households that consume i and 0 otherwise and Φ represents the cumulative distribution function of the normal distribution.

The second stage regression is given by:

$$\ln\left(cons_i\right) = X\beta + \sigma\frac{\phi_i}{\Phi_i} + \varepsilon_i \tag{8}$$

where ε_i are $iid(0,\sigma^2)$ and ϕ_i/Φ_i is the density function of the normal distribution divided by its cumulative distribution, recuperated from the first step probit estimation on the likelihood of a household exhibiting positive consumption of good i.

In both the first and second stage regression X includes the log of total household income to account for the fact that households with different income levels will have different consumption patterns. This ensures that the coefficients on income represent the marginal propensities to consume (MPCs) each category of good. X also includes the share of household income accruing to the principal male and female in the household and their squares. These are not collinear since there is some income (such as farming) which does not accrue to any particular member and is treated as general household income. Control variables include the age, education and occupation

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[10] Heckman (1976).

of both main household members and, in the second stage, the IMR recuperated from the first stage probit estimation. The baseline for education is "no education", and for occupation it is "salaried work".

We do not expect all coefficients to be significant for all consumption categories. However, for certain variables which could be considered to belong to the male "sphere of responsibility" we would expect a positive coefficient on the share the principal male contributes to total household income, and similarly for female "spheres of responsibility". If the unitary model described in part 2.1 holds, we would expect to consistently find that the coefficients on shares of total income accruing to the husband and wife (and their squares) to be equal zero.

Results from both stages are reported in table 3 in the appendix. Here we summarise the principal results, focussing on the second-stage OLS regressions which give the consumption functions and the impact of income shares.

Table 3 [about here]

Since the OLS regressions model consumption functions, the coefficients on the log of total income represent household MPC and constant elasticities of consumption. Thus, the MPC food is 0.26.

Concentrating initially on the signs of the coefficients on the share of income accruing to the main male and female in the household, we find that increasing the share of male income in total household income initially has a negative (and significant) impact on clothing consumption. Once the share of male income reaches a certain threshold however, the impact of increasing it further becomes positive (although the coefficient is not significant). Thus the impact changing income shares have on expenditure appears to be non-linear. This is in line with Phipps and Burton (1998) who find similar results for Canada.

Females tend to favour girls' clothing. As her share of total household income increases, consumption of girls' clothing will also increase. Both share of income and education level of household members play a role in the bargaining positions. Lower male education is correlated with lower consumption of girls' while households where the female has university-level education consume more girls' clothes. If the female has at least secondary education consumption of women's clothes is also higher. Results from the probit regression indicate that households are significantly more likely to exhibit positive consumption of men's clothing if the male's share of

total household income is higher and if he is aged above 65 years. The zero MPC girls' clothing but a high coefficient on the constant representing autonomous consumption suggests that girls' clothing is seen as an essential good. A similar analysis suggests that women's clothing is seen as a luxury good.

Consumption of personal and household hygiene products are strongly influenced by female income. As her share of household income increases, the household is likely to actually *reduce* consumption of these products. Beyond a certain threshold, it will begin to increase such consumption. Although not significant, males exhibit the opposite pattern, illustrated below:

Figure 1: The impact of income share on household consumption of hygiene goods
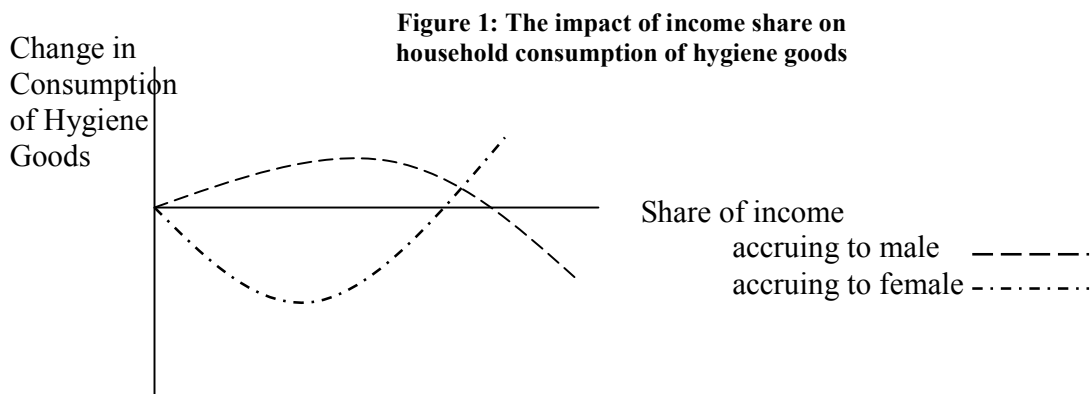
The turning points are calculated at 45% of income for males and 40% for females. Thus, as the female's share of total income increases to 40%, the household is reducing the consumption of these products. As her share increases past 40% the household begins to consume more.

Households with men between 46 and 65 consume more health and hygiene products. Interestingly, the same does not hold for females in the same age group. It could be that men of this age are both more likely to get ill than their younger counterparts, and more likely to be in a position to argue for such expenditure than more elderly men and women. More female education positively influences consumption of hygiene products.

It is interesting to find that share of female income does not impact on consumption of goods in the traditional feminine sphere including linen and kitchen utensils. Having primary education impacts positively on such consumption, but increases in education after this level has no impact compared to the baseline of no education. It could be that females with primary education are less likely to work, but have greater bargaining power than their uneducated counterparts to encourage such consumption. We also find that households whose principal males are "dependants" register significantly lower consumption in this category compared to all other

groups. Probit results indicate that households where the principal male is married are more likely to exhibit positive consumption on this category than other households.

With regards to housing consumption (including rent, repairs and upkeep), males and females exhibit similar preference structures. Whether the share or male of female income is increased, consumption on this category will initially decrease. As her share increases beyond 74% however, she will encourage an increase in housing consumption whereas the male influence will remain negative.

Figure 2: The impact of income share on household consumption of housing

Change in Consumption of Housing

Share of income
accruing to male – – – –
accruing to female – · – · – · –

It is important to recognise that while the income-share of one is increasing, it is necessarily decreasing for the other. Thus, focussing on hygiene goods, we can identify three domains in the division of total household income illustrated in figure 3. In (1) as their share of income increases, both males and females are encouraging increases in consumption in this area. In (3), as their shares increase, both the male and female are encouraging decreasing consumption. As the male's share is rising however, the female's is decreasing, that is, in figure 1, the male is moving rightwards, while the female is moving leftwards. In (2), there is conflict as the female is contributing, through the bargaining process, to increased consumption in the domain, while the male is advocating decreasing consumption.

Figure 3: Hygiene Consumption Related to Income Shares

Male Income=0%   Male Income=100%

| 1 | 2 | 3 |

Female Income=100%   Female Income=0%

Income shares and education level have no impact on health consumption. Rather, the male's age appears to have a greater impact. Households with males aged between 26 and 65 spend more on health than those with younger or older males. The econometric results are unable to confirm the descriptive statistics which suggest that greater females bargaining power positively influence education consumption. There is in fact, some evidence from the probit regression that households where the female controls a greater share of income are less likely to exhibit positive expenditure at all in this category.

The Mill's Ratios are ratios are significant only in the cases of girls' clothing and farming consumption. There is thus very little sample selection bias in these models.

The results suggest that intra-household bargaining is an important factor for the consumption of some categories of goods, but not for others. Although income shares play a role, this is not the only variable that might influence bargaining power; education also plays a key role. The results show that preferences may be non-linear in nature and that there is some distinction between male and female preferences. The unitary model of household consumption is called into question for some categories of good, notably hygiene, clothing and gifts. Furthermore, Government policy must take into account the initial situation if it is to successfully influence household expenditure.

4.1. Conclusions

Although the unitary model of household bargaining may be a good approximation in some circumstances it is not necessarily the best framework in which to analysis household expenditure patterns. Our results demonstrate that males and females have different preferences with regards to consumption of some categories of good. Thus the share of total income accruing to different members and education levels of different members can influence the consumption habits of the household. Although these results do not support any particular non-unitary model, they do indicate that households do not always act as a single unit.

The results have clear implications for Government policy. Different household members prefer to spend money in different ways. A Government can thus influence household consumption habits by designing policies which increase a particular member's share of income while leaving total household income unchanged. One such example can be found in the U.K. when, in 1978, the British Government redirected child support payments directly to the mother. Authors analysing these results have found a change in household consumption habits following this change.

Governments can thus use redistributive policies to redirect money to particular household members whose preferences are close to their own policy objectives. This may involve redirecting money towards, say, mothers when child nutrition in seen as being an important area to target, or towards fathers when agriculture is viewed as being an important area to develop. Money may even be redistributed directly to children as currently happens in the U.K. and Norway where newly-born children are given an account and money by the Government. (These are known as "baby-bonds" in the U.K.)

Other policies that may be considered include the subsidising of child-care to allow females to participate more easily in the labour market, so raising their share of total household income. Or, in developing countries, subsidising agricultural products to increase male share of income.

Our own results are unusual in that they show that the impact on consumption increases in both "male" and "female" share of income is non-linear. Thus an initial increase in the part of income accruing to the female has the effect of decreasing hygiene consumption. After a certain threshold however, efforts to further increase the female's share of income will actually have the effect of increasing consumption of hygiene products.

With different non-linear preferences, a family may be at a point where increasing the share of income of either the male or the female will have the same effect. In these cases, the impact Government policy can have is very limited and efforts to influence household expenditure choices will be ineffective and potentially costly.

In order to analyse the impact of changing compositions of household income, these results show that a non-unitary model is useful. Furthermore, a Government wishing to influence household expenditure must recognise the diversity amongst members, and the impact this can have on expenditure patterns.

Appendix

Table3a: Second Stage Regressions: OLS with Dependent Variables the Logs of household expenditure on each category.

	Clothing (Total)	Men's Clothing	Women's Clothing	Girls' Clothing	Boy's Clothing	Food	Gifts	Education
Income Variables								
income(total)	0.47***	0.50***	0.40***	-0.71	0.66***	0.26***	0.45**	0.60***
	6.28	6.01	3.28	-1.33	3.10	6.34	2.28	3.00
share(female)	-0.43	-0.94	0.84	3.71*	-0.26	0.00	-2.35*	0.37
	-0.38	-0.37	0.75	1.67	-0.20	0.00	-1.85	0.21
square share(female)	0.27	0.17	-0.57	-1.33	-1.7	0.15	1.48	-0.61
	0.26	0.08	-0.49	-0.98	-0.78	0.27	1.00	-0.4
share(male)	-2.27*	-3.16	-0.08	0.91	-3.09	0.87	-2.06*	0.87
	-1.79	-0.77	-0.07	0.73	-1.45	1.42	-1.75	0.56
square share(male)	1.44	1.88	0.25	-0.86	1.79	-0.96*	1.05	-0.78
	1.31	0.56	0.31	-0.83	1.15	-1.89	1.04	-0.55
Household Characteristics								
household size	0.01	0.05	0	0.18*	-0.07	0.01	-0.03	-0.03
	0.32	0.79	-0.04	1.96	-1.45	0.5	-0.54	-0.32
number of childres	0.01	0	0.05	-0.12	0.08	-0.02	0.07	0.08
	0.19	0	0.48	-1.53	0.98	-0.62	0.79	0.64
dummy(female head)	0.02	0.06	0.15	1.68**	-0.31	-0.03	-0.07	-0.15
	0.22	0.32	1.33	2.11	-0.82	-0.54	-0.36	-0.77
dummy(poor)	0.23	0.03	0.86**	-3.66**	0.61		-0.37	1.27*
	0.4	0.04	1.98	-2	1.38		-0.51	1.77
Male's Characteristics								
dummy(married)	0.2	0.01	-0.52	-0.83**	0.9	0.09	0.48	0.11
	0.84	0.02	-0.6	-2.05	1.42	0.67	1.13	0.3
age(26-45)	0.16	0.09	0.16	-0.62	0.18	0.09	0.1	-0.06
	0.77	0.44	0.44	-1.48	0.42	0.91	0.3	-0.14
age(46-65)	0.24	-0.07	0.58	-1.19	0.61*	0.36***	0.33	0.43
	0.76	-0.13	0.92	-1.53	1.76	3.01	0.76	0.47
age(above 66)	0.03	1.39	0.52*	-3.74*	-1.19*	-0.18	0.08	0.24
	0.12	0.78	1.9	-1.91	-1.84	-1.12	0.1	0.62
dummy(student)		-1.32	-0.24	2.80*	1.83		-2.11*	
		-0.92	-0.3	1.82	1.46		-1.68	
dummy(business)	-0.1	-0.27	0.25	1.45*	0.36	0.05	0.07	0.3
	-0.63	-0.71	1.13	1.84	0.71	0.49	0.26	0.73
dummy(home)	-0.42*	-0.44	-0.31	-0.5	0.33		-0.45	0.6
	-1.7	-0.96	-1.26	-1.55	1.02		-0.52	1.24
dummy(family business)	-0.08	-0.27	-0.57	-0.17	1.23	0.24	0.32	0.70*
	-0.27	-0.68	-0.93	-0.48	1.64	1.52	0.85	1.68
dummy(dependant)	-0.47	-1.07	0.9	-1.13*	-0.47		-1.21	0.88
	-1.01	-0.9	0.67	-1.92	-0.77		-1.44	0.98
dummy(other activity)	-1.03***	0.01	0.22	-2.47***	-0.39		-0.37	1.27
	-3.44	0.01	0.54	-3.65	-0.55		-0.78	1.28
dummy(literate)	-0.16	0.03	-0.23	-0.99**	0.06	0	-0.26	-0.01
	-0.87	0.12	-1.51	-2.44	0.2	-0.02	-1.11	-0.03
dummy(primary education)	-0.21	0.16	-0.49	-0.96**	1.2	0.11	-0.26	-1.18
	-0.49	0.42	-1.45	-2.13	1.21	0.61	-0.58	-1.6
dummy(secondary education)	-0.04	-0.16	-0.55	-1.37**	1.44	0.25	0.12	-0.89
	-0.1	-0.35	-1.64	-2.35	1.27	1.38	0.25	-1.14

dummy(high school)	0.17	0.14	-0.19	-0.68	1.24	0.24	0.11	-0.6
	0.38	0.25	-0.46	-1.61	1.45	1.34	0.17	-0.79
dummy(university)	0.11	0.39	-0.04	-0.08	1.81	0.36*	0.35	0.02
	0.18	0.6	-0.11	-0.18	1.61	1.74	0.46	0.02
dummy(other education)	0.19	-0.09	-0.52	-1.96**	2.51	0.34	0.68	0.6
	0.28	-0.1	-0.96	-2.31	1.4	1.58	0.95	0.86
Female's Characteristics								
dummy(married)	0.18	-0.19	0.03	-0.91	0.19	-0.14	-0.42	-0.19
	0.64	-0.24	0.06	-1.61	0.31	-0.71	-1.06	-0.39
age(26-45)	-0.27	-0.14	-0.07	-0.86**	0.84	0.08	0.11	0.28
	-1.5	-0.25	-0.18	-2.11	1.27	1.25	0.37	0.55
age(46-65)	0	0.31	0.14	0.87*	0.75	0.03	0.17	0.44
	-0.01	0.45	0.25	1.7	0.89	0.24	0.2	1.16
age(above 66)	0.24	0.09	0.37	4.58**	-0.51	0.08	-0.19	-0.12
	0.64	0.26	0.38	2.28	-0.98	0.52	-0.46	-0.2
dummy(student)	0.13	0.11	0.57*	-2.79**	0.6	0.02	-0.01	0.72
	0.44	0.28	1.9	-1.98	0.87	0.14	-0.03	1.2
dummy(business)	0.04	-0.27	-0.22	-0.7	-0.45		-0.36	-0.4
	0.13	-0.71	-0.53	-1.36	-0.76		-0.68	-0.63
dummy(home)	0.11	0.16	0.21	1.27**	-1.13	0.11	-0.16	0.54
	0.46	0.56	0.84	2.26	-1.22	0.9	-0.6	1.54
dummy(family business)	0.55	0.5	0.17	1.10*	-0.67	0.16	-0.25	0.75
	1.59	1.04	0.56	1.94	-0.93	0.86	-0.33	1.48
dummy(dependant)	-0.07	0.23	0.72	-0.08	-0.45	0.18	0.02	0.52
	-0.26	0.45	1.26	-0.22	-1.17	0.96	0.02	1.02
dummy(other activity)	-0.25	-0.07	-0.6	-2.49**	-0.93		-0.32	0.09
	-0.42	-0.08	-0.82	-2.12	-0.89		-0.46	0.09
dummy(literate)	-0.05	0.22	0.44	-0.15	-1.07	-0.05	-0.05	0.03
	-0.19	0.58	1.34	-0.8	-1.24	-0.59	-0.23	0.09
dummy(primary education)	0.08	0.05	0.5	-0.77	-0.69	0.19	0.06	-0.34
	0.2	0.09	1.48	-1.55	-1.09	1.32	0.18	-0.72
dummy(secondary education)	0.25	0.23	0.58*	0.24	-0.65	0.2	0.13	0.42
	0.66	0.48	1.89	0.74	-0.96	1.31	0.22	0.8
dummy(high school)	0.29	0.38	0.79**	-0.53	-2.3	0.32**	0.63*	0.77
	0.56	0.44	2	-0.97	-1.2	1.99	1.69	1.38
dummy(university)	0.7	0.94	1.18	2.02***	-2.18	0.05	0.66	0.47
	0.76	0.82	1.02	2.76	-0.89	0.2	0.72	0.63
dummy(other education)	0.27	0.21	1.22**	2.57**	-1.61	0.39*	-0.1	0.56
	0.44	0.24	2.43	2.58	-0.89	1.75	-0.2	0.71
Mill's Ratios								
mills(girls' clothes)				10.15**				
				2.19				
mills(boys' clothes)					-4.66			
					-1.24			
mills(food)						0.08		
						0.17		
mills(gifts)							0.37	
							0.17	
mills(education)								-0.28
								-0.19
mills(clothing)	1.06							
	0.61							

mills(men's clothing)		1.15					
		0.49					
mills(women's clothing)			1.51				
			0.76				
constant	3.44***	3.77*	3.39	25.45**	-3.98	6.29***	4.8	0.37
	3.01	1.76	1.29	2.4	-0.68	13.39	1.36	0.1
N	760	423	509	372	405	776	384	355
r2	0.32	0.31	0.4	0.37	0.38	0.29	0.51	0.46
F	8.29	4.03	7.26	4.57	5.22	8.44	8.61	6.48

t-ratios below coefficients. Significance Levels: * 10%, ** 5% and ***1%

	Health	Hygiene	Farm	Feminine Sphere	Housing	Fuel	Other
Income Variables							
income(total)	0.56***	0.34***	0.49***	0.42***	0.54***	0.29***	0.74***
	5.95	3.37	3.75	4.13	9.52	5.96	9.16
share(female)	-1.12	-1.37*	-1.53	1.24	-2.18***	-0.88	-2.47*
	-1	-1.74	-1	1.03	-2.62	-1.17	-1.79
square share(female)	1.03	1.73**	-0.32	-1.52	1.47*	0.17	1.64
	0.68	2.18	-0.2	-1.51	1.76	0.23	1.14
share(male)	-1.78	0.26	-2.48*	-0.78	-1.81*	-1.31*	-1.21
	-0.47	0.26	-1.75	-0.21	-1.89	-1.65	-0.71
square share(male)	1.23	-0.29	0.2	0.44	0.92	0.33	0.46
	0.45	-0.33	0.17	0.16	1.09	0.46	0.29
Household Characteristics							
household size	0	-0.04	-0.15	0.01	0.03	-0.04	-0.10*
	0.05	-1.01	-1.35	0.17	0.75	-1.2	-1.78
number of childres	0.05	0.02	0.20*	-0.09	-0.01	0.06	0.14*
	0.4	0.47	1.66	-0.84	-0.19	1.48	1.91
dummy(female head)	-0.17	-0.14	0.18	-0.05	0.06	-0.07	-0.22
	-0.65	-1.53	0.85	-0.33	0.52	-0.83	-1.54
dummy(poor)	0.64	0.65**	2.15***	0.02	0.23	( )	1.57***
	1.24	1.97	2.83	0.05	0.68		3.79
Male's Characteristics							
dummy(married)	0	0.04	-0.07	0.54	0.4	0.30*	-0.08
	0.01	0.18	-0.18	0.41	1.61	1.88	-0.19
age(26-45)	0.52*	0.33	-0.06	-0.19	0.29	0.31***	0.04
	1.87	1.43	-0.22	-0.95	1.25	2.62	0.16
age(46-65)	0.69**	0.45**	1.00***	-0.37	0.28	0.22	0.53*
	1.97	2.51	2.76	-1.39	1.18	1.37	1.75
age(above 66)	0.15	0.12	0.92**	0.39	0.29	-0.07	0.51
	0.36	0.64	2.34	0.6	1.15	-0.43	1.64
dummy(student)			1.95	-0.98	0.37		
			1.6	-1.1	0.4		
dummy(business)	-0.13	-0.23	-0.05	0.22	-0.07	-0.06	0.03
	-0.22	-1.41	-0.19	0.69	-0.44	-0.51	0.12
dummy(home)	-0.05	-0.19	0.22	-0.15	-1.06***	-0.12	-0.78**
	-0.12	-0.73	0.45	-0.44	-4.23	-0.66	-2.03
dummy(family business)	0.32	0.02	-3.14***	0.24	0.1	0.06	-0.14
	0.47	0.1	-3.23	0.4	0.41	0.29	-0.41

dummy(dependant)	-1.16		-0.62	-1.97***	-0.29		
	-0.78		-0.77	-3.33	-0.64		
dummy(other activity)	-0.28	-0.51	-1.37	-1.27**	-0.15	-0.33	-0.69
	-0.4	-1.62	-1.33	-2.54	-0.51	-1.35	-1.19
dummy(literate)	-0.50**	-0.25*	1.55***	-0.27	0.01	-0.18	0.52**
	-2.04	-1.74	3.12	-1.55	0.06	-1.61	2.3
dummy(primary education)	-0.35	-0.59**	2.47***	-0.19	0	-0.2	1.27***
	-0.86	-2.02	3.09	-0.21	0.01	-0.98	3.21
dummy(secondary education)	0.01	-0.59	2.55***	0.02	-0.02	-0.09	1.30***
	0.01	-1.58	3.16	0.02	-0.05	-0.4	3.12
dummy(high school)	-0.28	-0.37	1.99***	0.23	0.33	0.19	1.37***
	-0.52	-1.23	2.66	0.3	1.16	0.86	3.33
dummy(university)	-0.3	-0.4	1.70*	0.11	0.24	0.28	1.44***
	-0.59	-1.14	1.93	0.18	0.69	1.17	2.93
dummy(other education)	0.01	0.13	1.29	0.03	0.24	0.36	1.99***
	0.02	0.39	1.61	0.03	0.72	1.37	3.99
Female's Characteristics							
dummy(married)	0.38	-0.24	0.12	-0.01	-0.23	-0.27	0.38
	0.82	-0.98	0.25	-0.03	-0.76	-1.27	0.86
age(26-45)	0.15	0.02	0.23	-0.34	0.1	0.16*	-0.11
	0.36	0.19	1.17	-0.57	0.87	1.9	-0.71
age(46-65)	0.41	-0.03	0.1	-0.47	0.22	0.22	-0.58**
	0.69	-0.11	0.3	-0.55	1.12	1.54	-2.11
age(above 66)	0.29	0.09	0.42	0.02	-0.11	-0.01	-0.17
	0.44	0.24	0.73	0.05	-0.4	-0.07	-0.47
dummy(student)	0.61	-0.32	-0.46	-0.29	-0.02	0.08	0.17
	1.63	-1.3	-0.96	-1	-0.08	0.41	0.48
dummy(business)	-0.24	-0.22	0.95*	-0.14	-0.51	-0.44**	
	-0.48	-0.9	1.82	-0.16	-1.07	-2.16	
dummy(home)	0.17	-0.13	0.07	-0.37	-0.21	0.16	-0.46*
	0.3	-0.69	0.2	-1.27	-1.16	1.15	-1.68
dummy(family business)	0.59	-0.26	-0.66	0.12	-0.15	0.35	0.5
	1.43	-0.88	-0.81	0.35	-0.46	1.64	1.22
dummy(dependant)	0.73*	0.12	0.03	-0.44	-0.37	0.18	0.15
	1.94	0.35	0.05	-0.97	-1.39	0.83	0.35
dummy(other activity)	0.38	0.24		0.42	0.74		
	0.24	0.43		0.48	1.09		
dummy(literate)	-0.18	0.08	-0.15	0.16	-0.16	-0.08	-0.02
	-0.99	0.73	-0.51	0.75	-1.21	-0.77	-0.12
dummy(primary education)	-0.61	0.21	0.45	0.40*	-0.54**	-0.1	0
	-1.34	1.08	0.69	1.69	-2.25	-0.59	0.01
dummy(secondary education)	-0.35	0.19	0.22	0.24	-0.1	0.11	0.18
	-1.09	0.91	0.33	0.9	-0.42	0.63	0.54
dummy(high school)	0.09	0.46*	0.16	-0.02	0.02	0.06	0.87**
	0.25	1.9	0.3	-0.05	0.08	0.33	2.39
dummy(university)	0.22	1.68**	0.56	0.01	0.43	0.24	1.2
	0.45	2.19	0.79	0.01	0.63	0.73	1.53
dummy(other education)	-0.2	0.46	-2.27	1.00**	0.42	0.03	1.13**
	-0.29	1.22	-1.52	2.23	1.06	0.11	2.26
Mill's Ratios							
mills(other)							0.03
							0.02

mills(health)	1.3						
	0.33						
mills(hygiene)		1.7					
		1					
mills(farm)			-2.99**				
			-2.56				
mills(femsphere)				-2.13			
				-0.5			
mills(housing)					-0.49		
					-0.32		
mills(fuel)						-0.5	
						-0.69	
constant	1.47	4.07***	-3.22	1.57	3.07***	5.12***	-0.58
	0.6	5.6	-1.13	0.3	4.07	9.28	-0.54
N	643	797	202	586	806	825	817
r2	0.33	0.2	0.43	0.28	0.38	0.35	0.37
F	7.26	4.84	2.92	5.11	11.33	11.09	11.83

t-ratios below coefficients. Significance Levels: * 10%, ** 5% and ***1%

Table 3b: First Stage Probit Regression Results: Likelihood of Household having Positive Consumption of each Category of Good

	Clothing (Total)	Men's Clothing	Women's Clothing	Girls' Clothing	Boy's Clothing	Food	Gifts	Education
Income Variables								
income(total)	0.08	0	0.09	0.17***	0.09	-0.37***	0.13**	0.19***
	1.19	0.06	1.61	2.97	1.51	-2.75	2.23	3.23
share(female)	-1.2	-1.43	-0.63	-0.61	0.31	-1.12	0.41	-1.49*
	-1.29	-1.57	-0.74	-0.74	0.37	-0.58	0.48	-1.73
square share(female)	0.87	1.13	0.65	0.23	-0.77	1.06	-0.59	0.47
	0.95	1.17	0.76	0.28	-0.93	0.57	-0.7	0.55
share(male)	1.36	2.63***	-0.43	-0.2	-0.67	2.92	-0.04	-0.72
	1.44	2.91	-0.51	-0.24	-0.83	1.34	-0.05	-0.8
square share(male)	-1.23	-2.19***	0.17	0.14	0.48	-2.64	-0.3	-0.73
Household Characteristics								
household size	-0.02	-0.02	0.04	-0.02	0	-0.01	0	-0.06
	-0.57	-0.49	0.91	-0.62	0.06	-0.1	-0.06	-1.29
number of childres	-0.02	-0.04	-0.08	0.01	-0.02	-0.06	-0.04	0.05
	-0.34	-0.76	-1.53	0.22	-0.39	-0.5	-0.76	0.91
dummy(female head)	-0.03	0.08	-0.02	-0.25**	-0.14	0.12	-0.11	0
	-0.28	0.74	-0.23	-2.37	-1.36	0.5	-1.01	-0.03
dummy(poor)	0.87**	0.42	0.27	0.32	-0.22		0.07	-0.33
	2.42	1.48	0.99	0.56	-0.41		0.12	-1
Male's Characteristics	-1.51	-2.85	0.24	0.19	0.68	-1.5	-0.42	-0.97
dummy(married)	0.21	-0.21	0.70***	0.09	0.24	1.31*	-0.24	0.24
	0.9	-0.93	3.42	0.46	1.17	1.65	-1.15	1.15
age(26-45)	-0.22	-0.07	-0.31**	0.11	0.14	-0.47	0.2	0.25
	-1.2	-0.48	-1.97	0.68	0.91	-0.79	1.28	1.33
age(46-65)	-0.39*	-0.3	-0.53***	0.23	0.09	-0.55	0.26	0.89***
	-1.77	-1.56	-2.76	1.22	0.47	-0.88	1.32	4.12
age(above 66)	0	-0.96***	0.1	0.62***	-0.21	1.30**	-0.52**	0.06
	0.02	-3.4	0.45	2.95	-0.99	2.02	-2.23	0.27
dummy(student)		-0.57	0.26	0.57**	0.04		0.42	
		-0.67	0.32	2.12	0.14		1.53	
dummy(business)	0.04	0.22	-0.13	-0.32	0.1		-0.31	-0.32*
	0.23	1.4	-0.85	-0.4	0.12		-0.41	-1.78
dummy(home)	0.05	0.1	0.02	-0.24	0.2	1.03	-0.14	-0.12
	0.19	0.35	0.09	-1.5	1.31	1.6	-0.86	-0.45
dummy(family business)	0.32	0.07	0.52**	0	0.03		-0.51*	0.05
	1.04	0.27	1.98	-0.01	0.12		-1.94	0.17
dummy(dependant)	0.24	0.82*	-0.92*	0.02	0.28	0.39	0.15	-0.45
	0.47	1.75	-1.79	0.09	1.12	0.64	0.61	-0.94
dummy(other activity)	0.15	-0.28	-0.22	0.05	0.09		-0.33	-0.56
	0.43	-0.89	-0.76	0.11	0.22		-0.71	-1.55
dummy(literate)	0.18	-0.1	0	0.2	0.26		-0.12	0.22
	1.03	-0.63	0.02	0.69	0.91		-0.4	1.3
dummy(primary education)	0.48	0.05	0.14	0.11	0.09	0.04	0.07	0.5
	1.52	0.16	0.47	0.74	0.59	0.08	0.44	1.54
dummy(secondary education)	0.44	0.18	0.12	0.08	0.35	-0.41	0.17	0.57*
	1.33	0.59	0.42	0.3	1.23	-0.51	0.58	1.72
dummy(high school)	0.47	0.27	0.23	0.14	0.41	-0.19	0.16	0.52

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	1.43	0.87	0.78	0.48	1.39	-0.24	0.53	1.59
dummy(university)	0.69*	0.32	0.12	0.04	0.29	-0.03	0.35	0.80**
	1.85	0.94	0.37	0.14	0.96	-0.03	1.18	2.19
dummy(other education)	0.88**	0.57	0.32	-0.05	0.4	0.17	0.46	0.28
Female's Characteristics	2.19	1.57	0.9	-0.14	1.21	0.21	1.38	0.74
dummy(married)	0.04	0.42	0.37	0.24	0.72**	-0.13	0.36	-0.07
	0.15	1.4	1.41	0.69	2.03	-0.15	1.03	-0.26
age(26-45)	-0.23*	-0.37***	-0.33***	0.13	0.18	0.36	-0.13	0.43***
	-1.83	-3.46	-3.1	0.49	0.66	0.42	-0.49	3.63
age(46-65)	-0.37*	-0.44**	-0.45**	0.12	0.25**	-0.49	-0.19*	0.05
	-1.78	-2.15	-2.38	1.13	2.38	-1.34	-1.74	0.26
age(above 66)	-0.44*	0	-0.71***	-0.15	0.32*	-0.77	-0.58***	0.44*
	-1.66	-0.02	-2.85	-0.78	1.72	-1.56	-2.91	1.69
dummy(student)	0.22	0.07	0.03	-0.29	-0.73**	0.91	0.03	0.42*
	0.84	0.27	0.11	-0.82	-2.06	1.16	0.08	1.7
dummy(business)	-0.1	-0.03	-0.23	0.44*	0.21	1.03*	0.12	-0.28
	-0.32	-0.11	-0.85	1.76	0.83	1.84	0.49	-0.93
dummy(home)	-0.2	-0.04	-0.13	0.11	-0.19		0.28	-0.19
	-0.99	-0.19	-0.71	0.42	-0.7		1.05	-1.04
dummy(family business)	-0.26	-0.13	0.12	-0.17	-0.36**	0.06	-0.09	0.16
	-0.85	-0.43	0.42	-0.94	-2.02	0.17	-0.5	0.55
dummy(dependant)	-0.13	-0.16	-0.39	-0.13	-0.24	0.1	0.46	0.15
	-0.43	-0.56	-1.4	-0.46	-0.84	0.15	1.62	0.53
dummy(other activity)	0.33	0.21	0.06	0.02	-0.04	0.31	-0.53*	0.38
	0.51	0.39	0.1	0.07	-0.14	0.51	-1.84	0.65
dummy(literate)	-0.33**	-0.24*	-0.26**	-0.62**	-0.15	0.55	-0.26	-0.14
	-2.19	-1.81	-2	-2.53	-0.62	0.81	-1.05	-0.96
dummy(primary education)	-0.54*	-0.44*	-0.26	0.03	-0.33**	0.46	0.07	-0.09
	-1.89	-1.88	-1.12	0.21	-2.55	1.16	0.53	-0.36
dummy(secondary education)	-0.52*	-0.29	-0.2	0.12	-0.22	0.77	-0.04	0.22
	-1.7	-1.13	-0.81	0.55	-0.99	1.4	-0.2	0.83
dummy(high school)	-0.73**	-0.59**	-0.29	0	-0.23	0.49	0.35	0.31
	-2.23	-2.19	-1.08	-0.01	-0.97	0.87	1.44	1.1
dummy(university)	-1.23***	-0.76**	-0.91**	0.13	-0.76***	0.59	-0.03	-0.54
	-3.03	-2.07	-2.5	0.51	-2.92	1	-0.11	-1.48
dummy(other education)	-0.84**	-0.52	-0.33	-0.18	-0.98***	-0.18	0.72**	0.66*
	-2.01	-1.43	-0.92	-0.53	-2.8	-0.27	1.99	1.7
constant	0.55	0.1	-0.7	-2.18***	-1.16*	4.26**	-1.11	-2.10***
	0.7	0.14	-0.99	-3.09	-1.66	2.34	-1.57	-2.81
N	948	951	951	951	951	806	951	948

t-statistics below coefficients; significance Levels: * 10%, ** 5% and ***1%

	Feminine Sphere	Housing	Fuel	Other	Health	Hygiene	Farm
Income Variables							
income(total)	0.03	0	-0.18**	-0.04	-0.03	-0.15**	0.1
	0.54	0	-2.01	-0.42	-0.5	-2.26	1.57
share(female)	0.32	0.19	-3.40**	-2.04	-0.12	-0.24	0.33
	0.39	0.19	-2.01	-1.56	-0.14	-0.24	0.36
square share(female)	0.03	-0.05	2.95**	2.06*	0.55	0.15	-0.84
	0.04	-0.05	2.01	1.67	0.64	0.16	-0.91
share(male)	1.46*	1.01	2.72*	2.87**	1.89**	1.15	-0.69
	1.79	1.01	1.65	2.13	2.19	1.14	-0.75
square share(male)	-1.1	-0.97	-3.41**	-2.88**	-1.38*	-0.96	0.01
Household Characteristics							
household size	0	0	-0.08	0	-0.03	-0.03	-0.09*
	0.08	-0.05	-1.3	0.06	-0.85	-0.73	-1.87
number of childres	-0.04	0.03	0.11	-0.03	0.05	0.01	0.08
	-0.77	0.45	1.34	-0.41	0.99	0.14	1.3
dummy(female head)	-0.05	-0.05	-0.14	0.05	-0.11	0.03	-0.03
	-0.44	-0.39	-0.83	0.31	-1.09	0.24	-0.27
dummy(poor)	0.05	-0.27			0.83	0.22	
	0.19	-0.92			1.24	0.34	
Male's Characteristics	-1.57	-1.11	-2.41	-2.42	-1.85	-1.1	0.01
dummy(married)	0.53***	-0.31	0.43	0.99**	0.22	0.12	-0.18
	2.61	-1.24	1.09	2.21	1.06	0.49	-0.77
age(26-45)	-0.05	0.33*	-0.38	0.41*	-0.1	-0.39*	-0.08
	-0.33	1.88	-1.25	1.92	-0.63	-1.85	-0.44
age(46-65)	-0.07	0.26	-0.64*	0.36	0.12	-0.14	0.15
	-0.35	1.12	-1.85	1.23	0.63	-0.55	0.7
age(above 66)	0.24	0.22	0.32	0.04	0.13	0.03	-0.12
	1.16	0.88	0.77	0.12	0.61	0.1	-0.5
dummy(student)	0.07	-0.54		0.31	0.2	-0.39	0.88***
	0.09	-0.66		0.6	0.7	-1.16	3
dummy(business)	0.12	0.12	0.32				1.45
	0.74	0.62	1.03				1.41
dummy(home)	0.08	0	0.01	0.16	0.33*	0.18	-0.04
	0.32	0.01	0.03	0.6	1.95	0.87	-0.26
dummy(family business)	-0.2	0.03	-0.3	0.52	-0.11	-0.18	0.44*
	-0.79	0.1	-0.79	1.19	-0.44	-0.66	1.71
dummy(dependant)	-0.11	0.42		0.3	0.3	0.08	-0.77**
	-0.26	0.64		0.71	1.13	0.26	-2.04
dummy(other activity)	-0.14	-0.07	-0.43		0.94		0.01
	-0.5	-0.21	-0.94		1.54		0.02
dummy(literate)	0.02	-0.30*	-0.27	-0.71**	-0.27	0.38	-0.90**
	0.11	-1.65	-1	-2.03	-0.96	0.91	-2.03
dummy(primary education)	0.35	-0.54	0.08	0.23	-0.07	0.12	0.59***
	1.25	-1.52	0.16	0.93	-0.44	0.61	3.23
dummy(secondary education)	0.39	-0.48	0.07	0.04	-0.08	0.3	0.94**
	1.34	-1.3	0.13	0.1	-0.28	0.85	2.55
dummy(high school)	0.28	-0.03	0.29	0.18	-0.27	0.56	0.90**
	0.96	-0.07	0.58	0.41	-0.88	1.51	2.37
dummy(university)	0.18	-0.28	0.11	0.12	-0.19	0.29	0.75**
	0.56	-0.65	0.2	0.27	-0.62	0.78	1.96

dummy(other education)	0.43	0.11	0.48	0.36	-0.14	0.37	0.90**
Female's Characteristics	1.25	0.23	0.8	0.71	-0.41	0.92	2.12
dummy(married)	-0.12	0.34	0.35	0.21	-0.16	0.06	0.68
	-0.45	1.06	0.74	0.39	-0.46	0.13	1.49
age(26-45)	-0.25**	-0.09	-0.12	-0.98*	0.11	-0.11	-0.05
	-2.34	-0.64	-0.68	-1.9	0.43	-0.33	-0.16
age(46-65)	-0.35*	-0.09	0	-0.01	-0.20*	0.03	-0.03
	-1.89	-0.38	0.02	-0.03	-1.79	0.23	-0.25
age(above 66)	-0.16	0.29	0.56	-0.15	-0.26	-0.36	0.04
	-0.67	0.92	1.28	-0.51	-1.36	-1.59	0.2
dummy(student)	-0.04	0.05	0.45	-0.1	0.3	0.39	-0.95
	-0.17	0.16	1.13	-0.19	0.81	0.88	-1.44
dummy(business)	0.39	-0.61**	0.3	0.3	0.06	0.13	-0.11
	1.39	-2.05	0.57	0.85	0.24	0.45	-0.37
dummy(home)	-0.09	-0.07	0.05		-0.17	-0.05	0.56*
	-0.49	-0.31	0.18		-0.6	-0.17	1.92
dummy(family business)	-0.03	-0.31	0.19	0.23	-0.25	0.13	-0.05
	-0.11	-0.93	0.39	0.86	-1.41	0.64	-0.23
dummy(dependant)	-0.11	0.04	-0.09	0.23	-0.06	-0.17	-0.4
	-0.41	0.11	-0.23	0.53	-0.21	-0.52	-1.1
dummy(other activity)	0.24	-0.52		0.36	0	-0.32	-0.1
	0.46	-0.9		0.84	-0.01	-1.05	-0.33
dummy(literate)	-0.06	-0.05	0.52*	-0.26	-0.28	-0.50*	-0.25
	-0.52	-0.35	1.88	-0.7	-1.17	-1.76	-0.85
dummy(primary education)	0.01	-0.18	0.05	-0.08	-0.04	0	0.29*
	0.05	-0.67	0.13	-0.4	-0.3	0	1.83
dummy(secondary education)	-0.03	0.17	0.09	-0.09	0.18	0.06	0.67**
	-0.1	0.55	0.21	-0.24	0.8	0.2	2.25
dummy(high school)	-0.07	-0.34	-0.09	-0.01	0.04	0.05	0.67**
	-0.26	-1.06	-0.21	-0.03	0.16	0.15	2.1
dummy(university)	-0.29	-1.00**	-0.73	0.12	-0.05	-0.07	0.16
	-0.85	-2.47	-1.43	0.28	-0.19	-0.21	0.46
dummy(other education)	-0.07	-0.42	0.24	-1.01**	-0.04	-0.74*	-0.01
	-0.2	-0.95	0.4	-2.04	-0.12	-1.8	-0.02
constant	-0.69	1.33	3.57***	1.21	0.4	2.48***	-2.31***
	-0.99	1.57	2.81	1.08	0.56	2.92	-2.73
N	951	951	892	889	948	938	944

t-statistics below coefficients; significance Levels: * 10%, ** 5% and ***1%

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