Intra Household Resource Allocation And Their Impact On Expenditure Patterns:

Comparative Evidence From South Africa And Pakistan

by

Pushkar Maitra
Department of Economics
Monash University
Clayton Campus
Victoria 3168
Australia

Pushkar.Maitra@BusEco.monash.edu.au

Ranjan Ray
School of Economics
University of Tasmania
GPO Box 252-85
Hobart, Tasmania 7001
Australia

Ranjan.Ray@utas.edu.au

September 2000

Acknowledgements:
The authors are grateful to Geoffrey Lancaster for research assistance. Ranjan Ray acknowledges financial support from the University of Tasmania. The authors would like to thank the International Food Policy Research Institute (IFPRI), Washington DC for allowing them access to the KIDS 1998 data set.

ABSTRACT

This paper tests, using data from South Africa and Pakistan, two major implications of the unitary household model, namely, that (a) each individual pools the various components of her/his non labour earnings, and (b) men and women pool their non labour earnings between themselves. The study uses a three stage least squares procedure that, besides recognising the endogeneity of all the income variables, allows for simultaneity between all the income and expenditure equations. The study finds that men and women are much less likely to pool their transfer receipts than other types of income. This paper, also, investigates the crowding out of private transfers by public transfers in both countries. While it finds no crowding out in Pakistan, it reports strong evidence of such crowding out in South Africa in 1993/94 and that too for the poor but not the non poor households. However, the negative impact of social pensions on private transfers in South Africa seems to have weakened over 1993-98. This study also finds that, in 1993/94 though not in 1998, social pensions had a negative impact on earned income of members, especially of females, in the household. The social pensions scheme in South Africa, as prevailing in 1993/94, was not as generous towards black households or as redistributive towards the poor, as commonly believed. However, the pensions scheme seems to have changed in both these respects over 1993-98.

JEL Classification:
I32, I38, D12, C32

Keywords:
Private Transfers, Social Pensions, Unemployment Insurance,
Poverty, Expenditure Shares, South Africa

1. INTRODUCTION

Empirical analysis of household expenditure pattern has, traditionally, been based on the idea that family members maximise a single utility function – the unitary household or common preference model. The assumption of common preference ordering among family members, underlying such analysis, can be traced to Samuelson (1956) and Becker (1981). While this approach has proved useful for its elegance and analytical tractability[1], the underlying hypothesis of a single utility function encompassing all family members has been increasingly challenged in recent years. Such challenges, which have included attempts at modelling individual utility to incorporate divergent and conflicting preference of different family members, can be, broadly, divided into three types:

(a) the cooperative bargaining models [Manser and Brown (1980), McElroy and Horney (1981)],

(b) non cooperative bargaining models [Kanbur and Haddad (1994), Lundberg and Pollak (1994)], and

(c) a "collective" approach based on a model of intra family resource allocation that obeys a Pareto efficient sharing rule satisfying certain regularity conditions [Chiappori (1988), Apps and Rees (1997), Browning and Chiappori (1998)].

Crucial to the non-unitary models is the relative power of individual members in the household [see Pollak (1994)].

Alongside these developments of non unitary models of household behaviour, there has been a rapidly expanding empirical literature that tests the major implication of the common preference model, namely, the pooling of all income by the household members so that only total family income, not its components, will affect household expenditure patterns. In other words, the identity of the income recipient has no effect on a household outcome. Examples of studies that test, on a variety of data sets, the idea of income pooling between

[1] The design of taxes provides an illustrative example of the usefulness of unitary household models in policy applications [see Atkinson and Stiglitz (1980)]. See Apps and Rees (1988) for an analysis of the implications of non unitary, ie. individualistic, utility functions for tax policy.

household members include Schultz (1990), Thomas (1990), Hoddinott and Haddad (1995), Lundberg, Pollak and Wales (1997), Phipps and Burton (1998), Thomas, Contreras and Frankenberg (1999), and Quinsumbing and Malucco (2000)[2]. All these studies test the principal implication of the pooling hypothesis underlying the unitary model, namely, that the sum of the husband's and wife's income, not their individual incomes separately, affects household outcome. While Phipps and Burton (1998) use "earned income" in their test of pooling on household expenditure data, Thomas (1990) uses total unearned income and Schultz (1990) uses income from particular sources such as property income or transfers. The use of "earned income" in tests of pooling has been criticised by Lundberg, Pollak and Wales (1997, p465) on the ground that "earnings are clearly endogenous with respect to the household's allocation decisions ... differential effects of husband's earnings and wife's earnings on consumption patterns are consistent with the common preference framework, because households with different ratios of husband's earnings to wife's earnings are likely to face different prices and have different preferences, even with total household income held constant".

Consequently, much of the above cited literature on tests of pooling of resources among household members have done so using unearned or non-labour income since, unlike earned income, they are not contaminated by price effects. However, as Lundberg, et. al. (1997, p. 465) point out, though unearned income do not suffer from endogeneity with respect to household outcome to the same extent as earned income, they are not completely exogenous either. In particular, as Schultz (1990) notes, and as further discussed in Lundberg, et. al. (1997), the "unearned income" variable that much of the previous literature has used in tests of pooling contains elements such as property income and pensions that are correlated

[2] See also the volume edited by Haddad, Hoddinott and Alderman (1997). The issue of intra household resource allocation, also, figures in the study on Pakistani survey data by Bhalotra and Atfield (1998).

with past labour supply and, especially in case of the former, with present labour earnings as well. Moreover, in lumping together all non-labour income under "unearned income" and conducting pooling tests based on this heterogenous item, the literature overlooks the fact that unearned income consists of different components (asset returns, pensions and transfers) that have different sets of determinants and recipients, have different behavioural and welfare impact and, most seriously, are simultaneously determined with household outcomes such as expenditure patterns. Further, there is no test of whether households pool these different components of unearned income. Implicitly, the literature has assumed pooling of these different components of unearned income by lumping them together. Yet in most households the recipients of the different components of unearned income are different individuals (often belonging to different generations), with different preferences and the results might be significantly biased if we assume pooling of income accruing from the different sources. In our recent study [Maitra and Ray (1999)], we (a) established the significant impact of pensions on transfers [a result similar to that obtained by Jensen (1998)], and (b) observed that the treatment of pensions and transfers as separate, endogenous variables in the estimated budget share equations gave results that are qualitatively different from those in the literature. For example, we found that remittances or private transfers[3] have quite a different impact on budget shares from pensions or asset income. These results are at variance with those of Case and Deaton (1998) who argue (page 1360) that "pension income is spent in much the same way as other income" and that a Rand is a Rand irrespective of the source. The omission of transfers in the analysis of pensions in South Africa is a significant limitation of the Case and Deaton (1998) study for, at least, two reasons. First, as we report later, private transfers have a significant direct effect on expenditure pattern that is generally much stronger than that of

[3] In this paper, "transfers" refer to remittances or "private transfer", while "pensions" refer to "social pension" or public pension. We do not consider private pensions in this study.

pensions. Second, the crowding out of transfers by pensions, that we observe later, means that the welfare and behavioural impact of pensions is overestimated in the absence of transfers.

The principal motivation of this study is to address the limitations of the empirical literature on pooling discussed above. This paper proposes and performs tests of the unitary household model explicitly recognising:

(a) The endogeneity of earned income, unearned income, pensions and transfers in the budget share equations,

(b) The need to treat these resource flows as separate variables and test for their different impact on the budget shares,

(c) The dependence of transfers on pensions, and of pensions and transfers, jointly, on earned income, and

(d) The need to test both types of pooling as discussed above.

This paper therefore departs from the previous literature by adopting a simultaneous equations estimation framework that allows for correlation between errors in the different equations using the systems based, three stage least squares (3SLS) procedure. This paper extends Maitra and Ray (1999) in, principally, the following respects.

(i) We distinguish between male and female income recipients in investigating the impact of resource flows on one another, and on the household's expenditure pattern.

(ii) The study throws further light on our earlier result on the crowding out of transfers by pension in South Africa by providing disaggregated evidence, by gender, on the interaction between these two resource inflows.

(iii) While our earlier study was restricted to the data set from the 1993 South African Integrated Household Survey (SIHS), the present paper provides additional evidence from the more recent 1998 Kwazulu-Natal Income Dynamics Survey (KIDS) data set from South Africa and data from the Pakistan Integrated Household Survey (PIHS) conducted in 1991. While a comparison between the results of the two South African surveys is instructive in examining the impact of the demise of apartheid on pensions and transfers, the Pakistani evidence allows an interesting cross country comparison of the tests of pooling both over gender (i.e. male and female unearned income, pensions and transfer) and over these three components of non labour earnings, separately for men and women.[4]

[4] In case of Pakistan, social pension is replaced by unemployment insurance payments received separately by men and women within the household.

This paper ideally requires data sets where all the four components of household income, namely, earned income, unearned income, public and private transfers are available. In view of the joint family nature of South African and Pakistani households where members from three generations or even more tend to live together, data sets from these two countries seem well suited for the present purpose. The choice of the South African and Pakistani data sets is also particularly appropriate in the present context in view of the large inflow of remittances in both countries.

The interest in the South African experience in this paper also stems from the long history of private transfers in that country[5]. Black households in rural South Africa have long been dependent on income transfers from members who work away from home in mines, factories and plantations as a consequence of the policies followed by the apartheid regime in South Africa, leading to what Wilson (1972) calls the "oscillatory migratory labour system"[6]. In contrast to private transfers, the universal social pensions scheme in South Africa is a relatively recent development. While a system of public support for the elderly and unemployed Whites has been in place for many years, it is only with the recent demise of apartheid and demand for equal coverage and racial parity that the system has been extended to include non Whites. The maximum benefit in 1993 was Rand (R) 370 a month, increased to R520 in 1998, and is paid to all women above the age of 60 and all men above the age of 65, subject to a "means" test – see Lund (1993) for more details. The social pension system in South Africa has recently attracted considerable attention in view of its potential in securing large scale redistribution in favour of the black households who have suffered under white minority rule (see, for example, Case and Deaton (1998), Bertrand, Miller and Mullainathan (2000) and Duflo (2000)). This paper adds to the growing literature on the beneficial effects

[5] See Cox and Jimenez (1995), Jensen (1998) for surveys of private inter household transfers in South Africa.
[6] During the Apartheid era, South Africa's ruling National Party officially classified all individuals as falling into one of four races: Black (African), Coloured (Mixed Race), Indian (Asian) and White (Caucasian). To maintain consistency with the data (and the existing literature), this paper will stick to this terminology.

of the social pensions program by examining the following two important questions: (a) Does the social pensions scheme in South Africa favour the black households substantially more than the white – in other words, discriminate positively? (b) Within the black community, do the poor households benefit substantially more than the non-poor from the scheme? The results of our study portray, however, a much less favourable picture for the social pensions scheme in South Africa in terms of its "generosity" towards Black households and re-distributive impact in favour of the poor than has been claimed in some of the earlier studies.

In keeping with the non-unitary model, we subdivide household income into the following components:

(i) earned income of men and women

(ii) unearned income of men and women

(iii) social pension received by the household in South Africa (unemployment insurance in case of Pakistan), disaggregated by the gender of the recipient, and

(iv) private transfers, similarly disaggregated by gender of the recipient.

We estimate a system of equations where the endogenous variables are (i) – (iv), and the expenditure shares. The 3SLS estimation procedure, used here, not only takes note of the joint endogeneity of these variables, but also of the feedback in the equations through a non-diagonal covariance matrix of the estimated errors. The Breusch and Pagan (1980) statistic[7] reported later, confirm that in all the 3 data sets the 3SLS procedure is a significant improvement over the single equation based 2SLS procedure used before.

The rest of this paper is organised as follows. Section 2 is divided into 2 parts. Section 2.1 briefly reviews the literature on non-unitary models. Section 2.2 presents the estimating equations and the alternative hypotheses on pooling. Section 3 describes the data sets, discusses key summary measures, and reports the kennel density estimates of the components

[7] Under the null hypothesis of a diagonal covariance matrix, the Breusch Pagan statistic has a χ^2 distribution with degrees of freedom = M(M – 1)/2, where M is the number of equations estimated.

of income. The results are presented and discussed in Section 4. The concluding comments are contained in Section 5.

2. THEORY

2.1 Models of Household Behaviour[8]

Consider a household consisting of S members. The utility of each member depends on the commodity consumption of all the household members, namely, $x = \{x_{is}\}; i = 1,\ldots,I;$ $s = 1,...,S,$ (where i indexes commodity, s indexes the individual), leisure $l = \{l_s\}_{s=1}^{S}$, and health, $\psi = \{\psi\}_{s=1}^{S}$, of the household members. Each member's utility U^s is therefore, defined over the set of outcomes $\xi = \{x, l, \psi\}$, i.e., $U^s = U^s(\xi, \theta, \varepsilon); s = 1,\ldots,S$ where θ and ε denote the set of household and individual level characteristics that affect the utility of each individual. The household welfare function is given by

$$W = W\left[\{U^s(\xi;\theta,\in)\}_{s=1}^{S}\right] \tag{1}$$

The full income constraint of the household is given by

$$p'X = \sum_{s=1}^{S}\left[w_s(T - l_s) + I_s\right] \tag{2}$$

where p denotes the price vector, X is the vector of aggregate demand $\left(X_i = \sum_s x_{is}\right)$, T denotes the time endowment of each individual, w_s denotes the wage rate, and I_s the non-labour income of individual s. p and w_s are assumed to be fixed exogenously. Maximising (1) with respect to (2) gives a set of reduced form demand functions for each outcome k for each individual s as follows

[8] This section draws on Behrman (1997), Thomas, Contreras and Frankenberg (1999) and Quinsumbing and Malucco (2000). The reader is referred to these papers for more detail.

$$\xi_{ks} = \xi_{ks}\left(I_1,...,I_s; w_s, p, \theta, \varepsilon_{ks}\right) \tag{3}$$

The unitary household model assumes identical preferences across individuals, with the household being thought of as a single unit. This implies that only the sum of non-labour earnings in the household, not its distribution between individuals, will affect household outcomes. In other words,

$$\xi_{ks} = \xi_{ks}\left(\sum_{s=1}^{S} I_s; w_s, p, \theta, \varepsilon_{ks}\right) \tag{4}$$

There are two broad approaches to the formulation of non-unitary models. The first includes the bargaining models of the household [Manser and Brown (1980), McElroy and Horney (1981)]. These assume that each member has a reservation utility level, V^s, which is a function of prices, p, and a set of characteristics, $\tilde{\theta}$, that enable each individual, s to assert her/his independence. The individual quits the household in case the utility level U^s, enjoyed as part of the household, falls below this reservation level. The household maximises

$$W = \prod_{s=1}^{S}\left[U^s(\xi;\theta,\varepsilon) - V^s\left(p,\tilde{\theta}\right)\right] \tag{5}$$

subject to the budget constraint given by equation (2). This gives us the following set of household outcome equations

$$\xi_{ks} = \xi_{ks}\left[\sum_{s=1}^{S} I_s, \tilde{\theta}(I_1,...,I_s; Z_1,...,Z_s;\phi); w^s, p, \varepsilon_{ks}\right] \tag{6}$$

The "threat point" of individual *s*, reflected in the reservation utility level V^s, is assumed to depend on the distribution of non-labour income within the household $(I_1,\ldots,I_s)$, along with assets brought to the marriage $(Z_1,\ldots,Z_s)$ and other individual, family and community characteristics (ε_{ks},ϕ). Unlike the unitary household model [equation (4)], the bargaining models [equation (6)] imply that the redistribution of resources within the household will affect household outcomes.

The second approach to non unitary models [Chiappori (1988), Apps and Rees (1997) and Browning and Chiappori (1998)] is the individualist model based on the idea of Pareto efficient resource allocations, i.e., resources are allocated such that no member can be made better off without the other person being worse off. In this approach, the household maximises a welfare function, which is a weighted function of individual utilities, i.e.,

$$W = \sum_{s=1}^{S} \lambda^s U^s\left(\{\xi\}_{s=1}^{S}; \theta, \in\right) \tag{7}$$

where the weights λ^s sum to unity, subject to the full income constraint [equation (2)]. The optimisation program, in this scenario, is a two-stage process. In stage 1, the household pools all the income of the individual members and allocates it according to a Pareto efficient sharing rule that is functionally related to the weights, λ. In the second stage, each individual member maximises her/his utility given the income share. The result is the set of reduced form household outcome equations: or

$$\xi_{ks} = \xi_{ks}\left(\sum_{s=1}^{S} I_s; w^s, p, \theta, \{\lambda^s\}_{s=1}^{S}, \in_{ks}\right) \tag{8}$$

Note that, apart from the Pareto weights $\lambda^s(I_1, \ldots, I_s)$, equation (8) is exactly the same as that obtained in the unitary household model [equation (4)]. The weights, λ^s, which determine the sharing rule, depend on individual incomes, prices and other individual, household and community characteristics. Equation (8) further implies that the household outcome functions can be written as:

$$\xi_{ks} = \xi_{ks}\left[\sum_{s=1}^{S} I_s, \lambda(I_1, ..., I_s; Z_1, ..., Z_s; \phi); w^s, p, \varepsilon_{ks}\right] \tag{9}$$

As before, $\{Z_s\}_{s=1}^{S}$ denote variables such as assets at time of marriage that affect the "power" of individual s. Asset at marriage is possibly the most common measure of the "power" of the individual in the household, because it is completely exogenous to any decisions made during

married life which is likely to affect other asset holdings. Assets at marriage therefore define the outside option available to each member of the household.

Note that equation (9) is observationally equivalent to the general model [equation (3)]. The distinguishing feature of equation (9) is the characteristic of Pareto efficiency that generates it. The testable restriction of Pareto efficiency can be described as follows. Consider the effect of transferring the bargaining power from one member of the household to another. To do so, let us differentiate equation (9) by the "power" of s, given by the asset of s at time of marriage, namely, Z_s.

$$\frac{\partial \xi_{ks}}{\partial Z_s} = \frac{\partial \xi_{ks}}{\partial \lambda} \cdot \frac{\partial \lambda}{\partial Z_s} \tag{10}$$

Equation (10) implies that for two individuals m and f $(m \neq f)$,

$$\Pi_{mf}^{k} = \frac{\dfrac{\partial \xi_{km}}{\partial Z_m}}{\dfrac{\partial \xi_{kf}}{\partial Z_f}} = \frac{\dfrac{\partial \xi_{km}}{\partial \lambda} \cdot \dfrac{\partial \lambda}{\partial Z_m}}{\dfrac{\partial \xi_{kf}}{\partial \lambda} \cdot \dfrac{\partial \lambda}{\partial Z_f}} = \Pi_{mf}, \forall k \tag{11}$$

Letting m and f denote men and women, respectively, and Z_m and Z_f their assets at marriage, (11) provides the Paretian efficiency condition, namely, that the ratio of the asset effects is constant across all outcomes (expenditures on different items in this paper). In this scenario, since allocations are Pareto efficient, the power of each individual plays a role only in the first stage, not in the second. Of the three data sets used in the present study, only one, namely, the 1998 Kwazulu-Natal Income Dynamics Survey in South Africa contained the required information on assets brought to marriage. Hence, the test of Pareto efficiency was performed only on this data set.

2.2 Estimating Equations and Tests of the Pooling Hypotheses

In the context of our study, the general non-unitary household model [equation (3)] yields the following set of leisure and commodity demand equations as outcomes for individual *s*.

$$w_s H_s \equiv E_s = \xi_{1s}\left[\{I_s\}_{s=1}^{S}, w_s, p, \{Z_s\}_{s=1}^{S}; \theta, \varepsilon\right] \tag{12}$$

$$x_{is} = \xi_{2is}\left[\{I_s\}_{s=1}^{S}, w_s, p, \{Z_s\}_{s=1}^{S}; \theta, \varepsilon\right] \tag{13}$$

$$s = 1,\ldots,S$$

where $H_s = T - l_s$, x_{is} is expenditure on commodity i by individual s, and E_s is "earned income" or labour earnings of s. Since we do not observe individual consumption of goods, we aggregate equation (13) over the S individuals to obtain

$$x_i = \sum_s x_{is} = \xi_{2i}\left[\{I_s\}_{s=1}^{S}, \{w_s\}_{s=1}^{S}, p, \{Z_s\}_{s=1}^{S}; \theta, \varepsilon\right] \tag{14}$$

Traditionally, the non-labour income variable, I_s, is defined as the sum of asset earnings, pension and transfer received by the household. Moreover, (14) has generally been estimated treating I_s and, hence, all its individual components as exogenous variables. As noted earlier, we depart from the literature in both these respects. In the present study, non-labour income has 6 components: U_m (unearned income of males), U_f (unearned income of females), P_m (male pensions), P_f (female pensions), R_m (transfers/remittances received by men), R_f (transfers/remittances received by women). These resource inflows, together with the labour earnings of men (E_m) and women (E_f), constitute the total income of the household.

Denoting m and f for male and female respectively and expressing the commodity expenditure equations in budget share form, b_i, we have the following set of estimable equations.

$$U_m^h = f_1\left(Z_1^h;\theta_1\right)+\eta_1^h \tag{15}$$

$$U_f^h = f_2\left(Z_2^h;\theta_2\right)+\eta_2^h \tag{16}$$

$$E_m^h = f_3\left(Z_3^h,\underline{U_m^h},\underline{U_f^h};\theta_3\right)+\eta_3^h \tag{17}$$

$$E_f^h = f_4\left(Z_4^h,\underline{U_m^h},\underline{U_f^h};\theta_4\right)+\eta_4^h \tag{18}$$

$$P_m^h = f_5\left(Z_5^h,\underline{U_m^h},\underline{U_f^h},\underline{E_m^h},\underline{E_f^h};\theta_5\right)+\eta_5^h \tag{19}$$

$$P_f^h = f_6\left(Z_6^h,\underline{U_m^h},\underline{U_f^h},\underline{E_m^h},\underline{E_f^h};\theta_6\right)+\eta_6^h \tag{20}$$

$$R_m^h = f_7\left(Z_7^h,\underline{U_m^h},\underline{U_f^h},\underline{E_m^h},\underline{E_f^h},\underline{P_m^h},\underline{P_f^h};\theta_7\right)+\eta_7^h \tag{21}$$

$$R_f^h = f_8\left(Z_8^h,\underline{U_m^h},\underline{U_f^h},\underline{E_m^h},\underline{E_f^h},\underline{P_m^h},\underline{P_f^h};\theta_8\right)+\eta_8^h \tag{22}$$

$$b_i^h = f_{8+i}^h\left(Z_9^h,\underline{U_m^h},\underline{U_f^h},\underline{E_m^h},\underline{E_f^h},\underline{P_m^h},\underline{P_f^h},\underline{R_m^h},\underline{R_f^h};\theta_{8+i}\right)+\eta_{8+i}^h \tag{23}$$

$i = 1,\ldots,n$

where the superscript h denotes household, the Z^hs are the predetermined, exogenous vector of determinants, the η^hs are the stochastic error terms, the θ's denote the parameter vectors, and the other variables are as defined before. The endogenous variables appearing on the right hand side of the estimating equations have been underlined. Note that all the eight income (resource) variables $\left(U_m, U_f, E_m, E_f, P_m, P_f, R_m, R_f\right)$ are defined in per equivalent adult terms by deflating the household values of these variables by the equivalence scale, m_o. See Ray (2000) for the estimates of m_o used in this paper.

Equations (15) – (23) reflect a 5-stage decision making process. In stage 1, the household members learn the quantum of their "unearned income" $\left(U_m, U_f\right)$, which is a function of a set of their individual and family characteristics. In stage 2, conditional on their unearned income levels and of others in the household, the individuals decide on their labour hours and, hence, on their labour earnings $\left(E_m, E_f\right)$, again as a function of individual and family attributes. In stage 3, conditional on their "unearned" and "earned" income levels, the

government in South Africa decides on the pension levels of men, aged 65 years and above (P_m), and that of women aged 60 years and above (P_f). In case of Pakistan, pension is replaced by unemployment insurance (UIC_m, UIC_f). In stage 4, conditional on the resource inflows determined in the three previous stages, individuals decide on whether to migrate and on the volume of remittance (R_m, R_f) as a function of their individual and family attributes. Finally, in stage 5, the household decides on its expenditure outlays by aggregating the individual demands, which are dependent on, besides the exogenous determinants, the 8 distinct income variables, which are determined in the previous four stages.

Besides investigating the behavioural and welfare consequences of the various recourse inflows, this study tests on the three data sets an important consequence of the unitary models, namely, validity of the pooling hypotheses relating to the 3 non-labour income components, name, unearned income (U), pensions (P) and remittances (R). Note that while the rejection of pooling is inconsistent with the unitary model, it does not necessarily support the bargaining or the collective household models discussed earlier. Five pooling hypotheses are tested in this study. These are:

(a) Men pool their unearned income, pensions and transfers received (i.e., $U_m + P_m + R_m$ appears in the determinants, rather than the three separately).

(b) Similarly, for women: $U_f + P_f + R_f$

(c) Unearned income (U) is pooled between men and women (i.e., $U = U_m + U_f$ appears on the right hand side rather than U_m and U_f separately).

(d) Similarly, for pensions $(P = P_m + P_f)$ in case of South Africa, unemployment insurance in case of Pakistan $(UIC_m + UIC_f)$.

(e) Similarly, for transfers $R = R_m + R_f$.

The pooling hypotheses are specified as testable restrictions on the parameters of the budget share equations [equation (23)]. Let $f_{8+i}^{R,h}$ denote the income dependent component of the budget share equation of item i in household h. Following Phipps and Burton (1998), we

introduce linear, square and interaction terms in the non-labour income components to ensure that the pooling hypotheses are not rejected because of a misspecified linearity assumption. The resource dependent component, f_{8+i}^{Rh} of the budget share equation is specified as follows.

$$
\begin{aligned}
f_{8+i}^{R,h} = {} & \alpha_{i,1}U_m + \alpha_{i,2}U_f + \alpha_{i,3}P_m + \alpha_{i,4}P_f \\
& + \alpha_{i,5}R_m + \alpha_{i,6}R_f + \alpha_{i,7}E_m + \alpha_{i,8}E_f \\
& + \alpha_{i,9}(U_m)^2 + \alpha_{i,10}(U_f)^2 + \alpha_{i,11}(P_m)^2 + \alpha_{i,12}(P_f)^2 \\
& + \alpha_{i,13}(R_m)^2 + \alpha_{i,14}(R_f)^2 + \alpha_{i,15}(E_m)^2 + \alpha_{i,16}(E_f)^2 \\
& + \alpha_{i,17}(U_m * U_f) + \alpha_{i,18}(P_m * P_f) + \alpha_{i,19}(R_m * R_f) + \alpha_{i,20}(E_m * E_f) \\
& + \alpha_{i,21}(U_m * P_m) + \alpha_{i,22}(U_m * R_m) + \alpha_{i,23}(U_f * P_f) + \alpha_{i,24}(U_f * R_f) \\
& + \alpha_{i,25}(P_m * R_m) + \alpha_{i,26}(P_f * R_f) \\
& + \alpha_{i,27}(U * BLACK) + \alpha_{i,28}(P * BLACK) + \alpha_{i,29}(R * BLACK) \\
& + \alpha_{i,30}(U * POV) + \alpha_{i,31}(P * POV) + \alpha_{i,32}(R * POV)
\end{aligned}
\qquad (24)
$$

$$i = 1,\ldots,n$$

Here BLACK is a Race dummy that takes the value 1 for Black households, 0 otherwise and POV is a poverty dummy that takes the value 1 for households below the poverty line and 0 otherwise[9]. Note, incidentally, that, while the calculations reported below assume exogeneity of Poverty, the estimates are insensitive to its treatment as an endogenous or an exogenous regressor.

The pooling hypotheses, described in (a) – (e) above and referred to as H_A to H_E below, imply the following nested restrictions on the parameters of the budget share equations [equations (23) and (24)]. The testing involves using Chi square based on the likelihood ratio tests, in case of the SA1 data set, with 14 degrees of freedom for hypotheses H_A, H_B and 7 degrees of freedom for hypotheses H_C – H_E[10].

[9] The poverty variable captures the discrete jump in preferences for some items that occurs when the household crosses the poverty line. The poverty line is constructed taking account the household size and composition effect as in Maitra and Ray (1999). While the South African line was set at the value used by Carter and May (1999), for Pakistan we use the standard figure of US $1 a day to compute the poverty line.

[10] The degrees of freedom are different for the Pakistan and South Africa 2 data sets.

A. Males' Pooling of Unearned Income, Pensions and Transfers

$$H_A : \alpha_{i,1} = \alpha_{i,3} = \alpha_{i,5} \tag{25a}$$

$$\alpha_{i,9} = \alpha_{i,11} = \alpha_{i,13} = \left(\alpha_{i,21}/2\right) = \left(\alpha_{i,22}/2\right) = \left(\alpha_{i,25}/2\right) \tag{25b}$$

$$\alpha_{i,17} = \alpha_{i,18} = \alpha_{i,19} = 0 \tag{25c}$$

$$\alpha_{i,27} = \alpha_{i,28} = \alpha_{i,29} \tag{25d}$$

$$\alpha_{i,30} = \alpha_{i,31} = \alpha_{i,32} \tag{25e}$$

$$i = 1, \ldots, n$$

B. Females' Pooling of Unearned Income, Pensions and Transfers

$$H_B : \alpha_{i,2} = \alpha_{i,4} = \alpha_{i,6} \tag{26a}$$

$$\alpha_{i,10} = \alpha_{i,12} = \alpha_{i,14} = \left(\alpha_{i,23}/2\right) = \left(\alpha_{i,24}/2\right) = \left(\alpha_{i,26}/2\right) \tag{26b}$$

$$\alpha_{i,17} = \alpha_{i,18} = \alpha_{i,19} = 0 \tag{26c}$$

$$\alpha_{i,27} = \alpha_{i,28} = \alpha_{i,29} \tag{26d}$$

$$\alpha_{i,30} = \alpha_{i,31} = \alpha_{i,32} \tag{26e}$$

$$i = 1, \ldots, n$$

C. Pooling of Male and Female Unearned Income

$$H_C : \alpha_{i,1} = \alpha_{i,2} \tag{27a}$$

$$\alpha_{i,9} = \alpha_{i,10} = \left(\alpha_{i,17}/2\right) \tag{27b}$$

$$\alpha_{i,21} = \alpha_{i,22} = \alpha_{i,23} = \alpha_{i,24} = 0 \tag{27c}$$

$$i = 1, \ldots, n$$

D. Pooling of Male and Female Pensions/Unemployment Insurance

$$H_D : \alpha_{i,3} = \alpha_{i,4} \tag{28a}$$

$$\alpha_{i,11} = \alpha_{i,12} = \left(\alpha_{i,18}/2\right) \tag{28b}$$

$$\alpha_{i,21} = \alpha_{i,23} = \alpha_{i,25} = \alpha_{i,26} = 0 \tag{28c}$$

$$i = 1, \ldots, n$$

E. Pooling of Transfers Received by Men and Women

$$H_E : \alpha_{i,5} = \alpha_{i,6} \tag{29a}$$

$$\alpha_{i,13} = \alpha_{i,14} = \left(\alpha_{i,19} / 2 \right) \tag{29b}$$

$$\alpha_{i,22} = \alpha_{i,24} = \alpha_{i,25} = \alpha_{i,26} = 0 \tag{29c}$$

$$i = 1, \ldots, n$$

In each of the pooling tests described above we have incorporated sufficiency conditions for the pooling hypothesis. For example, in the Male pooling of Unearned Income, Pensions and Transfers, the restrictions (25c) – (25e) are sufficient conditions, but not necessary. The same holds for conditions (26c) – (26e) and (27c), (28c) and (29c). We are therefore testing a stronger version of the pooling hypothesis compared to what the literature has attempted before. In the SA2 data set, in any given household either only males or only females (never both) receive transfers. So the pooling of male and female transfers is not relevant here, since $R_m R_f = 0$. Also, in the case of Pakistan the variables $U*BLACK, P*BLACK, R*BLACK$ are not defined.

In addition to the pooling tests, we perform and report tests of Pareto efficiency [equation (11)] for only the 1998 Kwazulu Natal Income Dynamic Survey (SA2 data set), since the other two data sets do not contain the required information. In the present context, (11) implies that the ratio of male to female asset effects is the same for every commodity i.e., the Paretian efficiency condition implies a set of (n – 1) nested restrictions on the unrestricted non-unitary demand model given by (23), for each asset that is acquired independently by each spouse before marriage.

3. DATA AND DESCRIPTIVE STATISTICS

Three different data sets are used in this study, namely, the 1993 South Africa Integrated Household Survey (SIHS), the 1998 Kwazulu-Natal Income Dynamics Survey

(KIDS) and the 1991 Pakistan Integrated Household Survey (PIHS). The first two data sets will, hence forth, be referred to as SA1 and SA2 respectively.

The SA1 data set was obtained from a survey conducted jointly by the World Bank and the South Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town, as a part of the Living Standard Measurement study (LSMS) in a number of developing countries. The survey was conducted in the nine months preceding the historic 1994 elections. The main instrument used in this survey was a comprehensive household questionnaire covering a wide range of topics including demography, household services and expenditures, remittances and marital maintenance, land access and use, employment and income, health status and anthropometry. SA1 survey is the first that covers the entire South African population, including those in the predominantly Black "homelands". The complete sample consists of approximately 9000 households drawn randomly from 360 clusters. The questionnaire and summary statistics are contained in SALDRU (1994). The sample used here consists of 7701 households of which 77.39% are Blacks, 6.75% are Coloured, 2.82% are Whites and 13.04% are Indians. The sample is fairly representative of the South African population structure.

Households in the SA1 data set that resided in the Kwazulu-Natal province were re-interviewed in 1998 for the Kwazulu-Natal Income Dynamics Study (KIDS) giving us the SA2 data set. Kwazulu-Natal is the home of a fifth of the population of South Africa and was formed by combining the former Zulu Homeland and province of Natal. The SA2 data set consists of 1212 households of which 1041 are Black and the remaining are Indians. Selected households from SA1 data set and households from SA2 form a panel, but for the purposes of this paper we do not use the panel aspect of the data. We intend to use the panel structure of the data in future research.

The Pakistan data was obtained from the Pakistan Integrated Household Survey (PIHS) conducted in 1991. This survey was conducted jointly by the Federal Bureau of Statistics, the Government of Pakistan and the World Bank again as a part of the Living Standard Measurement Study (LSMS) household surveys. The PIHS teams visited 4800 households residing in rural and urban communities. The nation-wide survey gathered individual and household level data using a multi-purpose questionnaire. In this paper the Pakistan sample consists of 4033 households.

Table 1 presents comparative evidence on the importance of private transfers in reducing household poverty rates in South Africa and Pakistan. Remittances from migrants cause the poverty rates to drop by (approximately) 2% in each country. The South African evidence, further, allows a comparison of social pensions and private transfers in this regard, and confirms that they play similar roles in poverty reduction. These estimates underline the importance of considering pensions and transfers together, especially of their interaction, in the South African context. In case of crowding out of private transfers by public pensions there, for which evidence is presented in Maitra and Ray (1999), Jensen (1998) and in the next section, the ability of the former to reduce poverty is considerably weakened by the pensions program. It is worth adding that the unemployment insurance scheme in Pakistan, considered here, is not directed at any poor household, and plays no part in poverty reduction in that country.

The data sets contained individual specific information on receipt of the alternative income components discussed earlier. Following Thomas (1990), all income from agricultural profits and from household enterprises were treated as the unearned income of the household head. This could somewhat bias the results, given the prevalence of male-headed households in both these countries, particularly in Pakistan, where only 4% of the households are female-headed.

Table 2 presents the quantum of the 8 income inflows into the "average" household in the SA1 data set, disaggregated by the 4 races. Table 2A provides for the black households, the disaggregation of this information between the poor and non-poor households. The following points are worth noting:

(i) The huge dominance of the unearned and earned income levels of the White over the Black households is consistent with the racially discriminatory polices in education and employment that prevailed in South Africa until recently.

(ii) In general, social pensions in 1993 were not playing the positive discriminatory role in favour of black households that they were supposed to play in post apartheid South Africa. For example, while female pensions received in the Black households were nearly the same as in the White households, White male pensioners in the "average" household were receiving much more than their Black counterparts. Since the Black households have, typically, larger family size than the White ones due to the tendency of three generations to live together in the former, the per capita benefit from social pensions was much larger in the affluent White households in 1993.

(iii) Within the Black households, there is no reason to believe that pensions were playing a large redistributive role, since on average the poor and non-poor households were receiving roughly similar pension amounts. However, the composition between its male and female recipients is quite different between households above and below the poverty line.

(iv) In the Black households, the importance of private transfers increases sharply for the poor as compared to the non-poor, confirming our earlier observation that remittances play a significant role in reducing household poverty. Note, incidentally, the manifold increase in the income share of female receipt of private transfer as the household falls into poverty.

Table 2B provides corresponding information in case of Pakistan. As in South Africa, private transfers constitute a larger share of resources for the poor than the non poor. Note that unemployment insurance in Pakistan does not enjoy the same importance as public or social pensions in South Africa. Note, also, that while poor households do not receive any unemployment insurance, in the non poor households the recipients are mainly men.

Table 3 presents the corresponding mean income shares and levels of the eight resource inflows in the black households of the SA2 data set. A comparison of Tables 2 and 3 is instructive in giving us some idea on whether the situation has changed much in the first 4 years (1994 - 98) of majority rule in South Africa. The following points are worth noting:

(i) The pension levels in the average black household have risen much more for the poor than the non-poor over the period 1993-98. Consequently, in 1998, in Kwazulu-Natal province, pensions were playing much more of a redistributive role within the Black households there than was the case for Black South Africans as a whole in 1994.

(ii) Transfers continued to be an important source of income for the Black households, though its importance vis-a-vis pensions fell over the second half of the 1990s. The figures also suggest that much of the transfers was targeted at female recipients in the poor households, thus, reemphasising their importance in poverty alleviation and redistribution.

Figure 1 presents the Kernel Density estimates for the following:

$$\begin{aligned}
&\text{INCOME1} = \log(E_j),\ j = m, f \\
&\text{INCOME2} = \log(E_j + U_j),\ j = m, f \\
&\text{INCOME3} = \log(E_j + U_j + P_j),\ j = m, f \\
&\text{INCOME4} = \log(E_j + U_j + P_j + R_j),\ j = m, f
\end{aligned}$$

where all the terms are as defined above. Panel A contains the estimates for SA1, Panels B, C contain those for SA2 and Pakistan, respectively. For South Africa, we present the kernel estimates only for the Black households. Let us note that for SA1 and Pakistan, earned income by males is significantly skewed to the right (relative to earned income by females) and the opposite is true for SA2. When we add all the components of income (Income 4), female income is significantly flatter for SA2 and Pakistan, and the other way round for SA1.

Turning to the expenditure data, the present study considers an eleven-item disaggregation for SA1, a nine-item disaggregation for SA2 and a six-item disaggregation for Pakistan. The SA1 commodity disaggregation is: Food, Alcohol and Tobacco, Entertainment, Health, Education, Fuel, Clothing, Childcare, Food eaten outside home, Transfers sent to other households and Other items. The SA2 disaggregation is: Food, Clothing, Health, Other Regular Non Food, Other Occasional Non Food, Education, Water and Rates, Other Energy and Other items. The Pakistani disaggregation is: Food, Fuel and Light, Clothing, Health, Education and Other items. In each case the category “other items” is regarded as the omitted category.

4. RESULTS

Table 4 (Panels A, B) presents the 3SLS estimates of the nineteen-equation system for SA1 consisting, respectively, of the two unearned [equations (15), (16)], two earned [equations (17), (18)], two pensions [equations (19), (20)], two transfers [equations (21), (22)] and the eleven budget share equations [equation (23)]. Note that, because of the adding up conditions on the budget share equations, only eighteen of the equations are independent[11]. The Breusch-Pagan statistic of 4282.473, on a Chi square test with 153 degrees of freedom, shows a clear rejection of the hypothesis of diagonal covariance matrix of the disturbances, thus, justifying the 3SLS technique used here. Further, the F values, reported in Table 5 using Davidson and Mackinnon (1993)'s procedure, show that the null hypothesis of exogeneity of the income variables is rejected for each of the eleven budget shares. Hence, consistent with our earlier study [Maitra and Ray (1999)], the present results point to the need to treat the income (resource) variables as jointly endogenous in the estimation procedure.

Table 4 (Panel A) presents the 3SLS estimated coefficients for the eight resource flow variables $(U_m, U_f, E_m, E_f, P_m, P_f, R_m, R_f)$, while Table 4 (Panel B) presents the estimates for the eleven expenditure shares. The description of all the variable names is contained in the Appendix (Table A1). While we will focus primarily on the results for P_m, P_f, R_m, R_f, it is worth noting that unearned per equivalent adult income for both males and females (U_m, U_f) increase significantly with average age, though much more sharply for men than for women. The Race dummies show strong racial influence on earned income. A comparison of the estimates shows, however, that the impact of Race is considerably weaker for female earnings than for male earned income.

[11] The estimates for the 19th equation (Budget share of other items) were obtained using the adding up condition.

There are some significant differences between the parameter estimates of the male and female pension equations. For example, households where the head is a pensioner receive higher female pensions but much lower male pensions. A possible explanation lies in the fact that such households are likely to be female-headed households. The unearned income variables exert significant impact on pensions, with the gender of the recipient dictating the nature of this association. Unearned income of women has a strong positive impact on female pension receipts while unearned income of men has a negative and significant effect on female pension receipts. The significant negative impact of earned income on pensions reflects the "means test" that is applied to social pensions in South Africa. The significantly negative coefficient estimate of the Race dummy of the Black households does not support the notion that social pensions were effectively targeting them to overcome the legacy of apartheid. Household composition has very similar effects on male and female pensions.

Dissimilarities between the male and female estimates hold in case of the transfers received equations as well. For example, white women receive significantly higher transfers compared to women in the Non-white households – in contrast, the Race of the household does not have much of an impact on the value of transfers received by men. Of particular interest are the coefficient estimates of the male and female pension variables (P_m, P_f) and of the interaction term of aggregate pensions with the poverty variable (Pensions*POV). Consistent with the results obtained by Maitra and Ray (1999), they point to a crowding out of transfers by pensions. This is more so for the poor than the non-poor, as evident from the statistical significance of the negative coefficient estimate of the interaction term (Pensions*POV). The estimates also point to gender differences – male pensions have a stronger and statistically more significant crowding out effect on transfers than female pensions. Apart from its impact through the aggregate pensions variable (P) via the interaction term, the household's poverty status has a strong positive impact on the receipt of

transfers by men but not that by women. The presence of an unemployed adult in the household increases transfers received by both men and women.

The budget share estimates (Table 4, Panel B) reveal the following:[12]

(i) Strong differences exist between the income variables in regard to their impact on the various budget shares. For example, while all the eight linear coefficient estimates in the Food share equation are significant, the effects are negative for unearned male (U_m), earned female (E_f) and female transfer income (R_f), and are significant and positive for the others. In general, private transfers have a significantly higher impact on the budget shares compared to the other income components, and the sign, magnitude and significance of the estimated transfer coefficients are often highly sensitive to the gender of the recipient of the private transfer.

(ii) The statistical significance of the poverty coefficient and of its interaction with the income variables in the case of many items, including the principal item Food, points to a large shift in preferences that occurs when the household crosses the poverty line.

(iii) The Race of the household has a strong impact on budget shares, both directly and through the interaction of the Race dummy for Black households with the aggregate income components (U^*BLACK, P^*BLACK, R^*BLACK).

The principal message of these estimates is that the lumping together of the three non labour earnings variables into a consolidated variable called "unearned income", as in the recent empirical demand literature using non unitary household models, hides sharp differences between the income source and gender of the recipient leading to severely mis-specified demand equations.

As already noted, the Breusch-Pagan statistic implies that the covariance matrix is not diagonal justifying the use of the 3SLS estimation procedure. As a point of comparison, however, we do compute the OLS and 2SLS estimates and, in Table 6, present the three sets of estimates (3SLS, 2SLS and OLS) for the Food share equation. It is clear that, in several cases, the estimates differ sharply not only in magnitude and significance but in the sign as well. However, one of the more significant results of this study, namely, that the estimated

[12] The estimated coefficients and the standard errors have been multiplied by 1000 to provide easier understanding of the numbers.

income coefficient is sensitive to the income source and gender of the recipient is seen to be quite robust between the three estimation procedures. Moreover, the result that transfer income has a greater impact on the budget shares than pensions and unearned income holds true for the 2SLS and OLS estimates as well, though the OLS estimation procedure significantly under estimates the effect of private transfers on the budget share of Food.

Table 7 (Panels A, B) presents the 3SLS estimates of the seventeen equation system for SA2. As noted earlier, the SA2 sample, which is considerably smaller than SA1, involved only Black and Indian households living in the Kwazulu-Natal province of South Africa. The Breusch Pagan statistic of 334.301, on a Chi square test with 120 degrees of freedom, shows once again a decisive rejection of the hypothesis of diagonal matrix of disturbances. Further, the F statistics, reported in Table 8, show rejection of the hypothesis of exogeneity of the income variables in case of six of the items. It is interesting to note, however, that the assumption of exogeneity of the resource flow variables cannot be rejected in case of the smaller items of expenditure, namely, Health, Other Regular Non Food and Other Occasional Non Food.

Turning to the parameter estimates we find a much greater similarity between the male and female pensions estimates than recorded, in the earlier period, for the more heterogenous sample of SA1. The negative impact of male earned income on pensions reflects the means tested nature of the social pensions programme in South Africa. However, the positive impact of male unearned income on male pensions suggests that there is scope for better targeting of the pensions by including asset earnings in the calculation of “means”.

The estimates of the pensions equations provide weak evidence on the SA2 data set of the crowding out of female transfers received (i.e. transfers received by females) by male pensions. However, male pensions do not crowd out female transfers received. The negative coefficient estimates of the interaction term between aggregate pensions and the poverty

variable suggests that, consistent with the result obtained earlier on SA1, the crowding out of transfers by pensions is stronger for households below the poverty line than for those above it. A comparison between the coefficient estimates of this interaction term in the two "transfers received" equations also confirms that the crowding out of female transfers received by pensions is stronger than is the case with male transfers received. This became more evident when we re-estimated the transfers equations after dropping the poverty term and its interactions. While the coefficient estimates of both the pensions variables in the "male transfers received" equation remained insignificant, the estimated coefficient of male pensions in the "female transfers received" equation recorded a value of –0.137 which, with a t value of 2.44, is highly significant. It is interesting to report that, in contrast, the estimated coefficient of female pensions in the same equation continues to be insignificant. A comparison with the SA1 estimates presented in Table 4 (Panel A) shows, however, that the crowding out of transfers by pensions, especially in case of poor households, has weakened considerably over the period 1993-98.

The 3SLS estimates of the nine budget share equations for SA2 are presented in Table 7 (Panel B)[13]. The demand estimates are, generally, less well determined in case of SA2 compared to SA1, reflecting the much larger sample size of the latter. The coefficient estimates of the income variables differ widely, thus, confirming the earlier result on the sensitivity of the impact of income on expenditure patterns to the income source and gender of the recipient. Moreover, also consistent with earlier evidence, transfer income has a greater impact on budget share than that of other types of income. This, coupled with the fact that several of the interaction terms involving the individual components of income are significant, constitute prima facie evidence against one of the major implications of the

[13] The 2SLS and OLS estimates are not presented because of space constraints. They are however available on request.

unitary household model, namely, the pooling of non-labour incomes. More formal evidence n the pooling hypotheses are presented below. Keeping in mind that the SA2 sample involved only black and Indian households, the coefficient estimates of the Race dummy show that the former spend a significantly greater share of their budget share on Clothing, Education and Non Water Energy and a smaller share on Water and Rates than the latter.

Unlike the other two data sets used in this study, SA2 allows us to examine the impact of the value of assets brought into marriage[14] by the spouses on expenditure pattern. The asset effects are, generally, insignificant which do not support the contention of the bargaining models that households with different mix of bargaining power between men and women will have different expenditure outcomes[15]. One notable exception is the men's share of assets at marriage, which has a significantly negative impact on the budget share of Food and Other Non Food. It is common to use assets at marriage as the main measure of bargaining power of any member of the household because assets at marriage are exogenous to any post marital decisions made. In our analysis we also conduct tests of efficiency using the share of financial assets owned, the share of gifts received after marriage and the share of consumer durables owned as measures of bargaining power, with the caveat that these are possibly not exogenous to post marital decisions. The test of Pareto efficiency [eqn (11)], reported in Table 9, shows that the null hypothesis cannot be rejected in case of any of the four assets at marriage, consistent with the evidence presented in Thomas, et al (1999, Table 7).

Turning to the Pakistani results, Table 10 (Panel A,B) presents the 3SLS parameter estimates of the fourteen equation system for Pakistan. The Breusch Pagan statistic of 1217.303 shows once again, on a Chi square test with 78 degrees of freedom, decisive rejection of the hypothesis of a diagonal covariance matrix of the error terms. The F statistics,

[14] Measured by *lobola* and *umbondo* payments.
[15] See, however, Thomas, Contreras and Frankenberg (1999) for evidence of significant asset effects on child welfare outcomes, namely, morbidity, survival and health.

presented in Table 11, show rejection of the hypothesis of exogeneity of the income variables in case of all the estimated budget shares.[16] Unlike in South Africa, the non-poor households receive more transfers in value terms, compared to the poor households. Again, unlike the social pensions in South Africa, unemployment insurance do not crowd out transfers or, at least, to the same extent. In fact, unemployment insurance received by females in the Pakistani household has a complementary, i.e. positive, impact on the inflow of private transfers to females. Unemployment insurance in Pakistan differs from social pensions in South Africa in nature and motivation. Female-headed households receive more female unemployment insurance than the others. Since such households, typically, do not have a male breadwinner, the unemployment insurance is quite correctly targeted to such households. The budget share equation estimates (Table 10, Panel B) confirm, yet again, that the income coefficient estimates differ from one another. A comparison with the earlier estimates shows, however, that the size and statistical significance of the estimated income coefficients is generally much weaker in Pakistan than in South Africa.

Table 12 presents the Chi square values for the test of pooling of male and female income on the three data sets [recall eqns (27) – (29)]. Note that since, in case of South Africa 2 (ie, the KIDS data set), *either* R_m *or* $R_f \neq 0$, ie men and women in a household cannot simultaneously receive transfers so that (R_m). (R_f) is always zero, eqn (29) is inapplicable. Consequently, a test of pooling of male and female transfers is inapplicable on this data set. The following results emerge from this table.

(i) The test results on pooling are quite sensitive to the data set, and to the non labour income component that is under consideration. For example, while rejection of pooling occurs everywhere on the SA1 data set, it is quite an isolated occurrence in case of the other two data sets. In case of Pakistan, with the significant exception of Transfers in the context of Food expenditure, and unemployment Insurance vis-à-vis Education, the Chi Square values do not reject pooling. The sensitivity of the pooling

[16] Once again, the OLS and 2SLS estimates are not presented because of space constraints. They are however available on request.

test results to the item is consistent with the Canadian evidence presented in Phipps and Burton (1998).

(ii) The South Africa 1 and Pakistani data sets show wide variation in the Chi Square values between unearned income, pension and transfer. The last, ie. transfer, generally records much higher values than the others. In other words, men and women are much less likely to pool their transfer income than their other types of income. It is significant that, even in case of Pakistan, the rejection of pooling of transfer income between men and women is quite decisive in case of Food expenditures. This result is consistent with the evidence, presented earlier, that the behavioural impact of transfers on expenditure is highly sensitive to the gender of the transfer recipient.

The Chi square values for testing the hypothesis of pooling of the three components of non labour income, separately for males and females, [equations (25), (26)] are presented in Table 13 (South Africa – SA1, SA2) and Table 14 (Pakistan). The following features emerge.

(i) The rejection of pooling is much more widespread in South Africa (especially, on SA1) than in Pakistan. It is significant that, in Pakistan, females do not pool their receipts of unearned income, pensions and transfers in deciding on their expenditure allocation on Food and Education, in sharp contrast to the males.

(ii) More generally, the Pakistani evidence suggests that, with the solitary exception of Fuel and Light, women there are much less likely to pool their non labour earnings than their male counterparts.

The central message of these results is that, in conducting the tests of pooling of male and female non labour earnings, it is important to not only recognise their endogeneity in the expenditure decisions, but, also, to distinguish between the various components of non labour income. As the SA2 and Pakistani data sets confirm, it is quite possible for pooling to be rejected in regard to one component, but not the others. The above results also underline the need to test for another type of pooling not performed before, namely, the pooling of the individual components of non labour income. In fact, the latter pooling is implicitly assumed in the literature cited above.

The 5 stage decision making process, underlying the estimated equations, does not allow earned income to be affected by social pensions in South Africa. The recent results of Bertrand, Miller and Mullainathan (2000), which show that the social pensions program in

South Africa has an adverse effect on labour supply, suggest otherwise. To allow for this possibility and throw light on Bertrand, et. al. (2000)'s results, we reestimated the equation system (15) – (23) on SA1 and SA2, with the pensions equations now including the earned income variables as additional endogenous regressors. The coefficient estimates of the earned income variables in the 3 SLS estimation of the pensions equations are presented in Table 15. The results show that, on the SA1 data set, male pensions, though not female pensions, crowd out earned male income. Consistent with the results of Bertrand, et. al. (2000) on this data set, both the pensions variables adversely and significantly affect earned female income. However, as the SA2 estimates show, similar to the effect of pensions on private transfer, the crowding out of earned income by social pensions weakened considerably to the point of insignificance over 1993-98.

5. SUMMARY AND CONCLUSION

This study is set in the background of a large and expanding literature on the behavioural and welfare implications of transfers to households. While both private and public transfers have been considered before, it is unusual to consider them simultaneously in an interdependent framework. The present study investigates the joint impact of public and private transfers on household expenditure using a framework that allows and tests for the possibility that transfers, other types of income, and expenditure are determined simultaneously. The study provides evidence on the impact of public on private transfers, an issue with considerable policy significance.

Other distinguishing features of this study include the following:

(a) Each income stream is distinguished by the gender of the income recipient in keeping with the spirit of non unitary household models that has characterised much of the recent literature on household behaviour.

(b) We distinguish between the various types of non labour income, namely, unearned income, (mainly, asset returns), pensions/unemployment insurance (i.e. public transfers) and private transfers that have been lumped together in several recent

studies. Moreover, we recognise the endogeneity of such resource inflows in the tests of income pooling conducted here.

(c) Following on from (a) and (b), we test the hypothesis of income pooling not only between men and women, as several studies have done recently, but, also, pooling of the three components of non labour earnings, mentioned above, separately for men and women. To our knowledge, no previous study has tested for this latter type of pooling preferring to simply assume it.

(d) The 3SLS estimation procedure used here not only tackles the issue of endogeneity of the income variables, as discussed above, but, also, recognises the possibility of a non diagonal covariance matrix of the residuals of the income and expenditure equations. The latter allows mutual feedback between the estimated equations, in addition to the joint endogeneity of income and expenditure. This paper provides evidence which suggests considerable sensitivity to the estimation procedure, namely, between the 3SLS estimates and those from the single equation based, IV or 2SLS estimation procedure adopted in most previous studies.

The choice of data sets from South Africa and Pakistan was dictated by the fact that both public and private transfers are significant in these countries. The social pensions scheme in South Africa has recently attracted considerable attention. Nearly all the evidence on this scheme is based on the 1993 SIHS data set. This study updates such evidence by presenting the results based on the 1998 KIDS data set as well. The 1993-98 time period provided an opportunity for South Africa to move away from the legacies of the past and, hence, a comparison between the two data sets is of considerable significance. The unemployment insurance scheme in Pakistan is quite different from the social pensions scheme in South Africa in motivation, coverage and content. Consequently, a comparison between the South African and Pakistani results is, also, of interest.

The principal results of this study can be summarised as follows:

(i) The social pensions scheme in South Africa, as is widely acknowledged, is generous in transferring large sums of public funds to households via the pensioners living in them. However, in 1993, they were not playing a positive discriminatory role in favour of black households to overcome the legacies of apartheid. Nor were they effectively targeting poor households. However, the KIDS data set suggests that the situation may have changed in both these respects over 1993-98. The unemployment insurance scheme in Pakistan, in contrast to the social pensions scheme in South Africa, did not reach any poor household. However, female headed households were being effectively targeted by female unemployment insurance in Pakistan.

(ii) All the three data sets provide evidence in favour of the 3SLS procedure adopted here over the IV or 2SLS methods used in other studies. Moreover, excepting a few smaller items in the KIDS (1998) data, all the others reject the exogeneity assumption on the income variables in the budget share equations.

(iii) In South Africa, but not in Pakistan, public transfers crowd out private transfers. While this result is generally true in case of the 1993 SALDRU/SIHS data set, we find that in 1998 in Kwazulu-Natal province only male pensions were crowding out transfers received by females. Moreover, the crowding out effect seems to have weakened over 1993-98. The crowding out of private by public transfers detracts from the effectiveness of the social pensions scheme in improving the welfare of the poor, especially since they are heavily dependent on private transfer. The result here is analogous to that of Bertrand, et. al. (2000) who observe that social pensions led to a reduction in the labour supply of working adults.

(iv) The estimated income coefficients in the budget share equations are sensitive to the nature of income, and gender of the recipient. Private transfers, generally, have a larger impact on expenditure pattern than other types of income.

(v) The results of the pooling tests are sensitive to the data set, and the item under consideration. While rejections are widespread in case of the 1993 SIHS data, they are rare in case of Pakistan. The study reveals some interesting gender differences between the results on testing the hypothesis that an individual pools all the different components of non labour income. An interesting result that seems to hold generally is that men and women are much less likely to pool their transfer income than other types of income.

(vi) The social pensions program in South Africa had, in 1994, an adverse effect on earned income inflow into the household. However, this effect weakened considerably over the period 1994-1998.

The results of this study have wider implications than the immediate contexts of South Africa and Pakistan. The rejection of pooling has been interpreted as evidence against the unitary household model. This has the following policy implications. First, the effectiveness of public transfer programs is likely to depend on who, within the household, receives the transfer. Second, the response of the non recipients of public transfer to the transfer is of considerable importance, especially since it could nullify its welfare improving impact. Third, the present results point to a wide range of policies that can be used to affect household allocation outcomes.

Table 1: Impact of Private Transfers and Pensions on Household Poverty Rates[a]

	South Africa[b] (KIDS, 1998)	Pakistan (PIHS, 1991)
All Income	61.47	46.00
Income Net of Private Transfers	62.87	48.18
Income Net of Private Transfers and Pensions in South Africa, Unemployment Insurance in Pakistan	64.85	48.18

[a] Head count measure of poverty (in percentage)
[b] Only Black households living in Kwazulu Natal province in 1998

Table 1A: Comparison Between Races of the Poverty Reducing Impact of Private Transfers and Social Pensions in South Africa (SA1)[a]

	Household Poverty Rates[b]				
	Black	Coloured	Indian	White	South Africa (Aggregate)
All Income	66.83	42.61	17.21	5.40	55.60
Income Net of Private Transfers	67.86	44.16	17.21	5.80	56.56
Income Net of Private Transfers and Social Pensions	69.93	46.30	21.86	10.81	59.10

[a] Based on the SALDRU (1994) data set
[b] Head count measure of poverty (in percentage)

Table 2: Amount (Rand Per Month) and Share of Income Components in South Africa (SA1)

Income Variable	Black			Coloured			Indian			White		
	Aggregate	Per Equivalent Adult	Share	Aggregate	Per Equivalent Adult	Share	Aggregate	Per Equivalent Adult	Share	Aggregate	Per Equivalent Adult	Share
Unearned Men	71.3	23.6	0.091	112.9	39.9	0.079	323.3	112.7	0.120	1364.6	583.3	0.154
Unearned Women	26.2	8.1	0.043	77.6	25.6	0.074	74.6	34.6	0.042	155.4	94.2	0.045
Earned Men	478.5	230.2	0.354	973.6	387.8	0.464	2407.6	884.8	0.557	3325.7	1625.7	0.471
Earned Women	234.3	88.1	0.190	535.3	195.3	0.262	691.6	268.0	0.200	1232.9	616.5	0.212
Male Pensions Received	51.7	16.9	0.050	27.4	9.8	0.024	59.4	18.5	0.015	329.6	192.1	0.076
Female Pensions Received	80.5	26.1	0.114	46.7	18.0	0.051	66.3	30.3	0.039	80.3	51.6	0.025
Private Transfers Received by Men	10.3	3.7	0.022	6.2	2.2	0.008	6.2	2.7	0.002	4.2	2.2	0.003
Private Transfers Received by Women	65.7	19.5	0.136	43.9	15.8	0.037	19.0	7.7	0.026	25.8	12.8	0.013
TOTAL INCOME	*1018.5*	*416.1*	*1.0*	*1823.5*	*694.4*	*1.0*	*3647.9*	*1359.3*	*1.0*	*6518.4*	*3178.3*	*1.0*

Table 2A: Disaggregation of Income Inflows Between Poor and Non Poor Black Households in South Africa (SA1)

Income Variable	Poor		Non Poor	
	Amount[a]	Share	Amount[a]	Share
Unearned Men	43.9	0.139	97.8	0.044
Unearned Women	20.7	0.066	31.5	0.020
Earned Men	70.1	0.144	873.6	0.557
Earned Women	60.9	0.148	402.0	0.231
Male Pensions Received	37.0	0.062	65.9	0.037
Female Pensions Received	93.8	0.167	67.7	0.063
Private Transfers Received by Men	10.9	0.037	9.8	0.008
Private Transfers Received by Women	85.0	0.236	47.0	0.040
Total Income	*422.3*	*1.0*	*1595.4*	*1.0*

[a] Denotes Rand per month.

Table 2B: Disaggregation of Income Inflows Between Poor and Non Poor Households in Pakistan

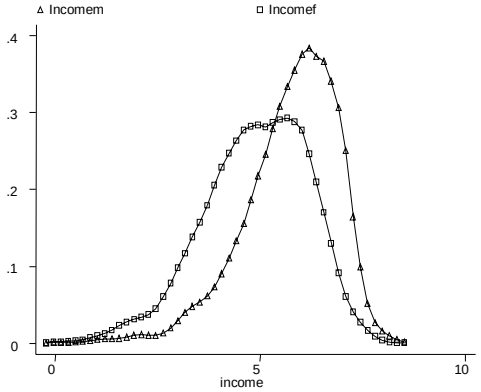
Income Variable	Poor		Non Poor	
	Amount[a]	Share	Amount[a]	Share
Unearned Men	2304.21	0.915	58110.55	0.746
Unearned Women	99.23	0.039	1153.84	0.015
Earned Men	5.12	0.002	14775.26	0.190
Earned Women	0.65	0.000	1627.05	0.021
Unemployment Insurance Received by Men	0.00	0.000	1063.70	0.014
Unemployment Insurance Reced by Women	0.00	0.000	16.56	0.000
Private Transfers Received by Men	50.10	0.020	700.73	0.009
Private Transfers Received by Women	60.29	0.024	469.76	0.006
Total Income	*2519.60*	*1.0*	*77917.45*	*1.0*

[a] Rupees per year.

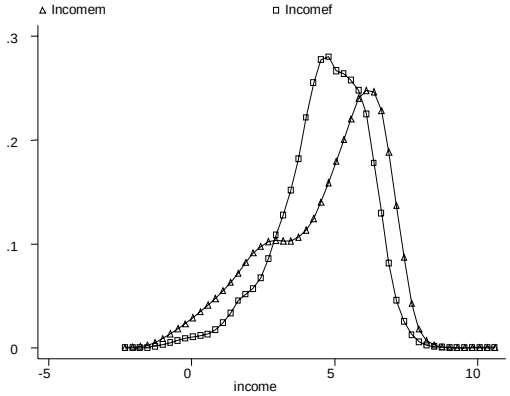
Table 3: Aggregate Income Inflows in the Average Black Household in SA2

	All Black Households		Poor Black Households		Non Poor Black Households	
	Aggregate	Share	Aggregate	Share	Aggregate	Share
Unearned Men	819.6	0.305	186.7	0.166	2397.5	0.368
Unearned Women	325.5	0.121	145.2	0.126	773.0	0.119
Earned Male	709.1	0.264	263.7	0.228	1819.6	0.280
Earned Female	500.6	0.186	169.6	0.145	1325.9	0.204
Male Pensions Received	50.9	0.019	56.7	0.049	36.2	0.006
Female Pensions Received	141.0	0.052	162.8	0.139	86.7	0.013
Private Transfers Received by Men	13.3	0.005	14.3	0.015	10.8	0.002
Private Transfers Received by Women	126.7	0.047	158.6	0.133	47.3	0.007
Total Income	*2686.6*	*1.0*	*1157.6*	*1.0*	*6499.0*	*1.0*

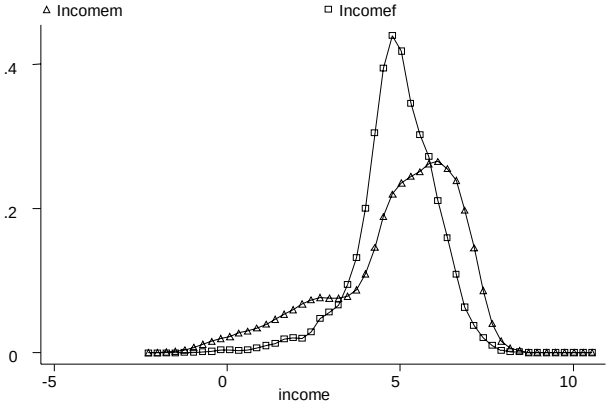
Figure 1: Kernel Density Estimates of Income by Source
Panel A: South Africa I



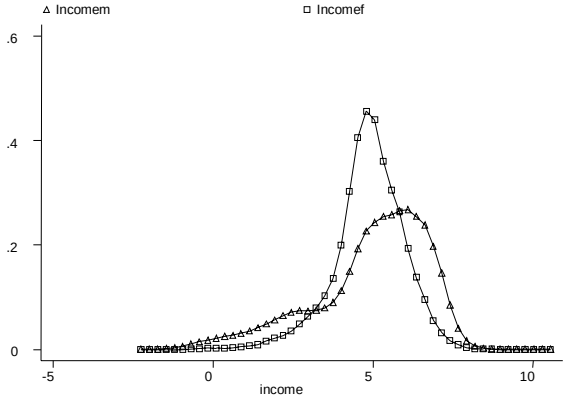
Income1



Income2

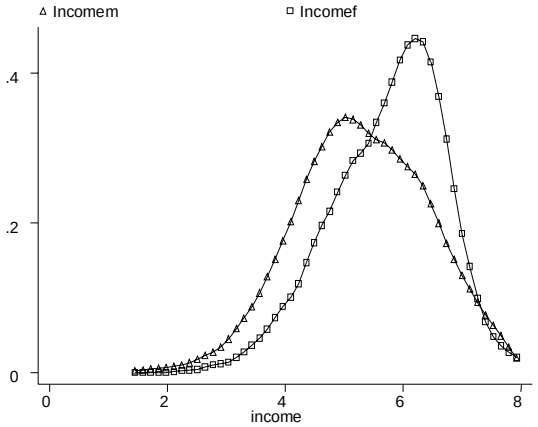


Income3

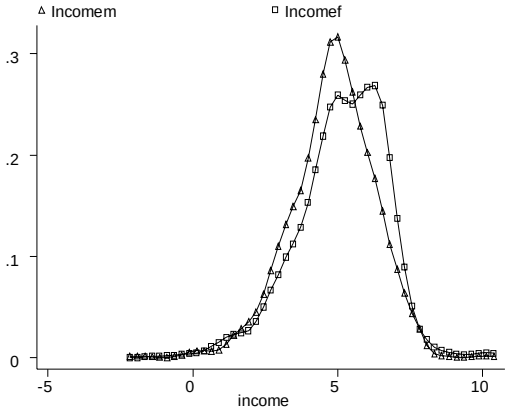


Income 4

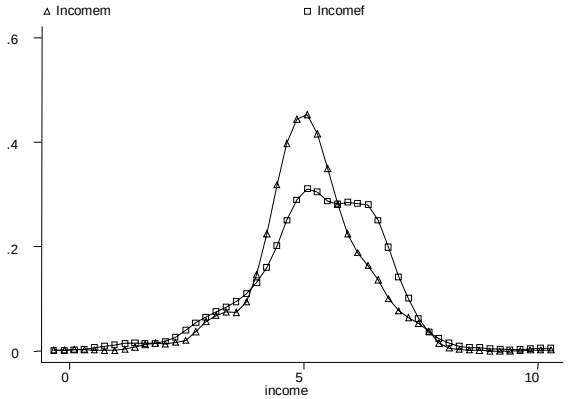
Panel B: South Africa II



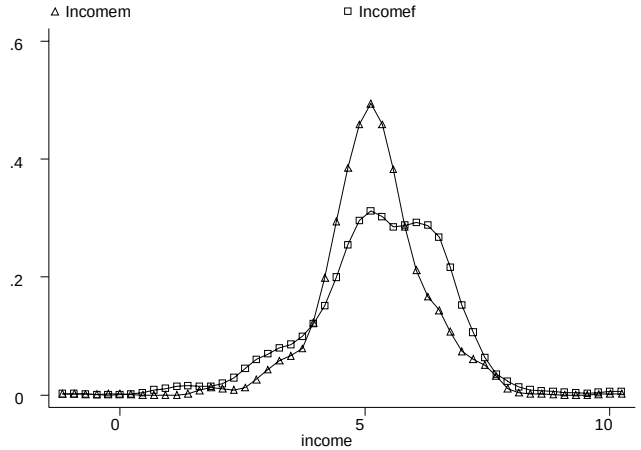
Income1



Income2

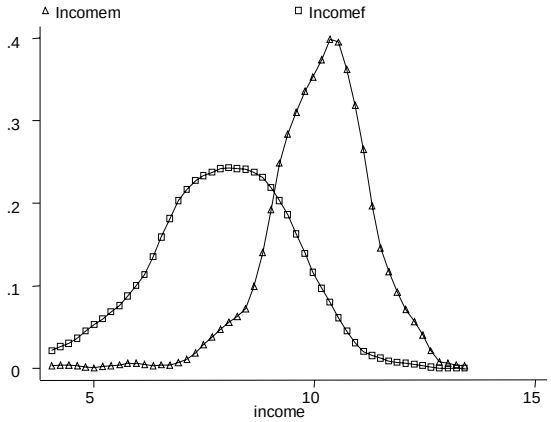


Income3

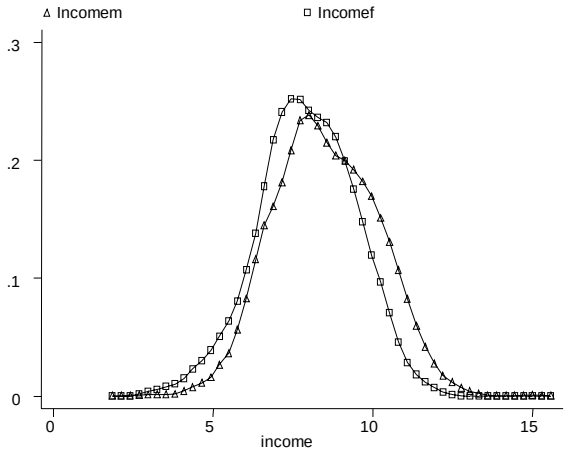


Income4

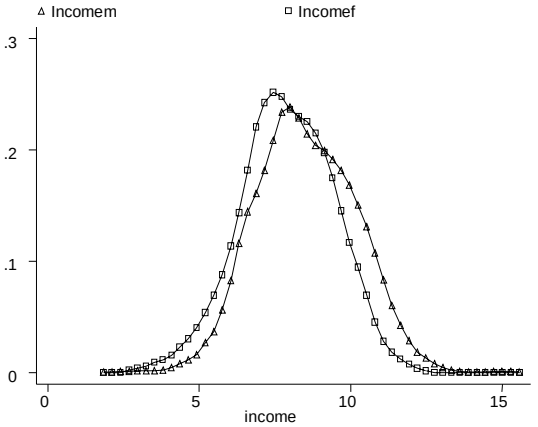
Panel C: Pakistan



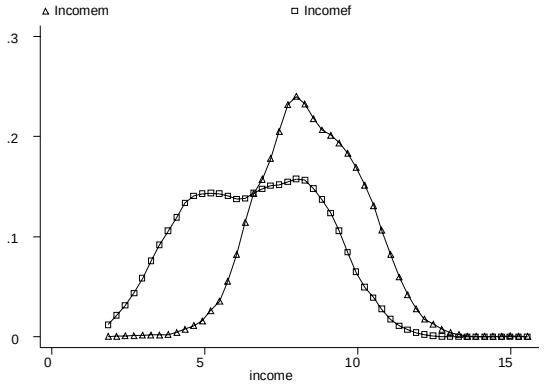
Income1



Income2



Income3



Income4

Table 4: 3 SLS Estimates (with t values) of the Nineteen Equation System for South Africa (SA1)
Panel A: Estimates, with t values, of the Income Equations

Unearned Male Income		Unearned Female Income		Earned Male Income		Earned Female Income	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Connecte	14.534 (0.514)	Connecte	-15.773 (3.181)	Unearned Male Income	-0.009 (0.630)	Unearned Male Income	-0.022 (4.751)
House C	-2.590 (0.457)	House C	2.599 (2.583)	Unearned Female Income	-0.21 (2.444)	Unearned Female Income	-0.043 (1.541)
Own House	10.517 (0.357)	Own House	2.752 (0.518)	Total Child	-57.403 (7.163)	Total Child	23.647 (8.813)
Male Ed 1	18.438 (5.309)	Fem Ed 1	2.005 (3.081)	Total Adult	-15.493 (1.306)	Total Adult	1.103 (0.294)
Male Ed 2	-2.151 (0.386)	Fem Ed 2	-2.756 (2.718)	Total Elderly	-147.500 (4.038)	Total Elderly	-29.531 (2.492)
Male Ed 3	13.226 (1.607)	Fem Ed 3	1.150 (0.893)	Sexhead	204.932 (5.825)	Sexhead	-172.204 (15.321)
Bond Owe	-0.006 (10.141)	Bond Owe	-0.001 (9.905)	Agehead	-1.734 (0.277)	Agehead	-6.849 (3.371)
Sale Value	0.004 (18.187)	Sale Value	0.001 (13.837)	Agehead 2	-0.010 (0.165)	Agehead 2	0.034 (1.660)
Ave age M	4.401 (5.247)	Ave age F	1.192 (8.371)	Male Ed 1	47.504 (9.711)	Fem Ed 1	25.143 (15.830)
Constant	-167.140 (2.956)	Constant	-11.408 (1.207)	Male Ed 2	1.326 (0.203)	Fem Ed 2	-4.199 (1.878)

Table 4: Panel A (Continued)

Earned Male Income		Earned Female Income	
Variable	**Coefficient**	**Variable**	**Coefficient**
Male Ed 3	-15.402 (1.638)	Fem Ed 3	0.527 (0.181)
Rural	-101.09 (2.843)	Rural	-19.941 (1.727)
Black	-287.287 (3.204)	Black	-172.589 (6.034)
Coloured	-615.549 (7.805)	Coloured	-237.194 (9.280)
Indian	-426.011 (4.377)	Indian	-260.177 (8.240)
Car	230.010 (8.604)	Car	49.251 (5.710)
Radio	76.989 (3.960)	Radio	23.855 (3.790)
Fridge	10.933 (0.341)	Fridge	38.934 (3.739)
Stove	-28.491 (0.701)	Stove	70.796 (5.374)
Constant	704.627 (4.365)	Constant	565.240 (10.955)

Table 4: Panel A (Continued)

Male Pensions		Female Pensions		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Unearned Male Income	0.023 (7.063)	Unearned Male Income	-0.007 (6.156)	Unearned Male Income	0.000 (0.054)	Unearned Male Income	-0.002 (2.328)
Unearned Female Income	-0.051 (2.577)	Unearned Female Income	0.128 (18.811)	Unearned Female Income	-0.002 (1.139)	Unearned Female Income	0.003 (0.769)
Earned Male Income	-0.013 (4.442)	Earned Male Income	-0.001 (0.935)	Earned Male Income	0.000 (1.115)	Earned Male Income	-0.003 (4.583)
Earned Female Income	-0.076 (7.688)	Earned Female Income	-0.010 (2.956)	Earned Female Income	-0.003 (4.112)	Earned Female Income	-0.005 (2.138)
Pens H	-101.521 (7.609)	Pens H	39.294 (8.606)	Male Pensions	-0.002 (2.008)	Male Pensions	-0.004 (1.494)
Total Child	-8.279 (4.483)	Total Child	-3.210 (5.073)	Female Pensions	0.000 (0.159)	Female Pensions	-0.011 (1.386)
Total Adult	-16.326 (6.715)	Total Adult	-5.823 (6.995)	Total Child	-0.829 (5.340)	Total Child	-0.831 (2.030)
Total Elderly	66.767 (7.829)	Total Elderly	41.625 (14.243)	Total Adult	0.133 (0.643)	Total Adult	0.348 (0.670)
Sexhead	47.670 (5.817)	Sexhead	-27.762 (9.888)	Total Elderly	0.612 (0.901)	Total Elderly	-1.693 (0.975)
Agehead	2.997 (2.059)	Agehead	1.387 (2.781)	Sexhead	2.707 (4.150)	Sexhead	-11.506 (6.910)
Agehead 2	0.009 (0.582)	Agehead 2	-0.009 (1.826)	Agehead	-0.601 (5.317)	Agehead	-0.514 (1.782)
Max Ed	6.608 (5.791)	Max Ed	0.651 (1.671)	Agehead 2	0.006 (4.951)	Agehead 2	0.003 (1.022)
Rural	-22.221 (2.839)	Rural	5.744 (2.142)	Male Ed 1	0.162 (2.225)	Male Ed 1	1.213 (5.780)

Table 4: Panel A: Continued

Male Pensions		Female Pensions		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Black	-153.382 (11.629)	Black	-30.799 (6.816)	Male Ed 2	0.048 (0.456)	Male Ed 2	-0.101 (0.331)
Coloured	-166.936 (9.797)	Coloured	-26.194 (4.486)	Male Ed 3	0.200 (1.277)	Male Ed 3	-0.086 (0.214)
Indian	-167.300 (7.579)	Indian	-9.620 (1.272)	Rural	0.728 (1.043)	Rural	9.672 (5.345)
Constant	8.621 (0.230)	Constant	26.313 (2.045)	Black	0.503 (0.484)	Black	-8.375 (3.191)
			26.313 (2.045)	Coloured	-1.086 (0.813)	Coloured	-3.630 (1.069)
				Indian	-0.825 (0.476)	Indian	-10.495 (2.370)
				Dunemp	3.354 (4.141)	Dunemp	11.626 (5.234)
				D Sick	-0.527 (0.581)	D Sick	-0.295 (0.119)
				D Preg	-1.989 (1.691)	D Preg	-2.349 (0.731)
				W Source	-0.012 (0.094)	W Source	1.259 (3.627)
				Toilet	-0.306 (1.522)	Toilet	0.748 (1.353)
				Pov	2.198 (3.047)	Pov	0.746 (0.404)
				(Pov) (Pensions)	-0.025 (3.433)	(Pov) (Pensions)	-0.093 (5.029)
				Constant	13.415 (4.665)	Constant	27.061 (3.737)

Table 4: (Continued) -- Panel B: Estimates of the Budget Share Equations

Variable	Food	Alcohol & Tobacco	Entertain-ment	Health	Education	Fuel	Clothing	Child Care	Food Eaten Outside Home	Transfers Sent	Other Items
Unearned Male Income	-0.203 (2.853)	-0.055 (2.926)	-0.013 (4.981)	-0.136 (3.307)	0.372 (3.147)	-0.03 (1.43)	-0.01 (1.15)	0.00 (0.44)	-0.02 (2.21)	-0.14 (3.24)	0.23 (3.53)
Unearned Female Income	0.569 (1.778)	0.168 (2.003)	0.055 (4.550)	0.688 (3.715)	-1.325 (2.489)	0.10 (1.14)	0.05 (0.97)	-0.01 (0.28)	0.05 (1.25)	0.61 (3.24)	-0.96 (3.28)
Earned Male Income	0.130 (3.632)	0.021 (2.261)	0.008 (5.756)	0.053 (2.569)	-0.171 (2.882)	0.01 (1.07)	-0.00 (0.49)	-0.00 (0.49)	0.02 (4.17)	0.05 (2.42)	-0.12 (3.60)
Earned Female Income	-0.258 (5.057)	-0.086 (6.502)	0.001 (0.439)	-0.071 (2.411)	0.298 (3.538)	-0.06 (4.42)	0.03 (3.50)	0.01 (1.45)	-0.01 (1.33)	-0.04 (1.41)	0.20 (4.20)
Male Pensions	0.644 (3.453)	0.046 (0.921)	0.013 (1.861)	0.401 (3.706)	-0.359 (1.157)	0.20 (3.81)	-0.03 (0.96)	-0.05 (3.06)	0.01 (0.21)	-0.14 (1.23)	-0.73 (4.24)
Female Pensions	1.124 (3.411)	-0.188 (2.157)	-0.029 (2.279)	-0.295 (1.546)	0.336 (0.614)	0.40 (4.35)	-0.17 (3.34)	-0.11 (3.93)	-0.05 (1.19)	-1.13 (5.71)	0.12 (0.39)
Transfers Received by Men	-15.978 (3.241)	-3.990 (3.116)	0.038 (0.210)	-14.074 (4.953)	50.074 (6.123)	-3.79 (2.83)	1.50 (2.02)	-0.93 (2.24)	-0.68 (1.06)	-5.94 (2.06)	-6.23 (1.40)
Transfers Received by Women	9.288 (2.433)	-2.041 (2.041)	-0.109 (0.759)	1.063 (0.481)	11.186 (1.761)	1.68 (1.61)	-0.67 (1.16)	-0.67 (2.07)	0.89 (1.78)	-7.78 (3.45)	-12.84 (3.69)
Total Child	-13.546 (3.684)	5.618 (5.973)	0.082 (0.619)	-4.796 (2.267)	39.274 (6.427)	-5.32 (5.38)	0.28 (0.52)	0.12 (0.40)	-0.78 (1.66)	-4.94 (2.34)	-4.76 (1.46)
Total Adult	0.936 (0.234)	4.063 (3.994)	0.472 (3.292)	9.206 (4.019)	-6.961 (1.055)	2.91 (2.71)	-1.59 (2.72)	-0.81 (2.50)	-2.09 (4.12)	-5.53 (2.41)	-0.60 (0.17)
Total Elderly	-45.315 (2.754)	5.048 (1.197)	0.447 (0.749)	15.380 (1.629)	-37.26 (1.371)	-14.12 (3.18)	4.66 (1.91)	5.69 (4.19)	2.36 (1.12)	37.38 (3.93)	25.73 (1.75)
Sexhead	50.427 (2.708)	3.483 (0.723)	-1.182 (1.728)	25.511 (2.377)	-56.539 (1.829)	14.68 (2.91)	-6.50 (2.33)	-2.59 (1.67)	4.42 (1.83)	-31.25 (2.88)	-0.46 (0.03)
Agehead	-6.162 (2.631)	-1.199 (2.021)	-0.537 (6.457)	-3.917 (2.920)	17.121 (4.417)	-1.07 (1.71)	-0.42 (1.24)	-0.33 (1.75)	-0.13 (0.43)	-1.37 (1.03)	-1.99 (0.96)
Agehead 2	0.052 (2.198)	0.008 (1.357)	0. 005 (5.368)	0.034 (2.475)	-0.152 (3.860)	0.01 (1.68)	0.00 (0.77)	0.00 (1.77)	0.00 (1.07)	0.01 (0.96)	0.02 (0.97)

Table 4: (Continued) -- Panel B: Estimates of the Budget Share Equations

Variable	Food	Alcohol & Tobacco	Entertain-ment	Health	Education	Fuel	Clothing	Child Care	Food Eaten Outside Home	Transfers Sent	Other Items
Educhd 1	-24.345 (1.967)	-8.08 (2.455)	-0.349 (0.735)	-4.143 (0.578)	15.882 (0.773)	-0.85 (0.25)	4.08 (2.13)	0.69 (0.64)	-0.71 (0.42)	12.83 (1.73)	4.99 (0.43)
Educhd 2	-38.918 (2.747)	-10.873 (2.89)	1.020 (1.881)	-3.656 (0.445)	25.162 (1.068)	-1.23 (0.32)	4.66 (2.13)	0.01 (0.01)	-1.48 (0.78)	5.77 (0.68)	19.55 (1.49)
Educhd 3	-23.425 (1.270)	-21.673 (4.46)	0.464 (0.666)	-17.935 (1.680)	50.882 (1.658)	6.46 (1.28)	-2.49 (0.89)	-3.29 (2.09)	0.03 (0.01)	-29.67 (2.71)	40.66 (2.40)
Rural	-7.044 (0.523)	-3.57 (1.045)	-0.014 (0.03)	-3.465 (0.448)	21.902 (0.981)	-16.93 (4.69)	4.84 (2.46)	2.78 (2.56)	-2.26 (1.33)	17.53 (2.29)	-13.77 (1.16)
Black	225.34 (4.283)	6.435 (.466)	3.115 (1.571)	-37.966 (1.246)	-79.146 (0.904)	17.20 (1.19)	29.12 (3.64)	-3.19 (0.71)	20.74 (2.99)	18.04 (0.58)	-199.69 (4.15)
Coloured	20.547 (5.334)	6.897 (0.694)	3.072 (2.174)	-32.329 (1.459)	-200.752 (3.149)	46.80 (4.48)	25.63 (4.46)	-1.15 (0.36)	3.66 (0.74)	27.35 (1.22)	-84.73 (2.44)
Indian	81.790 (2.128)	-17.342 (1.767)	4.123 (2.975)	8.498 (0.386)	-79.69 (1.256)	27.13 (2.62)	22.77 (4.02)	-6.08 (1.93)	6.12 (1.25)	-14.44 (0.65)	-32.88 (0.96)
Pov	155.707 (6.041)	-8.292 (1.232)	0.447 (0.463)	18.228 (1.224)	3.025 (0.071)	49.81 (7.07)	-19.22 (4.92)	-8.96 (4.11)	4.12 (1.22)	-62.71 (4.13)	-132.16 (5.62)
(Pov) (Transfers)	-1.885 (1.81)	0.448 (1.64)	0.018 (0.465)	0.270 (0.447)	-3.813 (2.201)	-0.37 (1.28)	0.14 (0.89)	0.19 (2.2)	-0.17 (1.22)	2.01 (3.25)	3.15 (3.31)
(Pov) (Unearned Income)	-0.002 (0.014)	-0.028 (0.899)	0.008 (1.796)	0.113 (1.648)	-0.068 (0.348)	-0.01 (0.39)	0.01 (0.52)	-0.00 (0.09)	0.02 (1.51)	0.05 (0.73)	-0.09 (0.86)
(Pov) (Earned Income)	-0.108 (1.886)	0.031 (1.994)	-0.003 (1.271)	-0.033 (0.985)	0.092 (0.971)	-0.04 (2.51)	0.02 (2.30)	0.00 (0.22)	-0.01 (1.05)	-0.00 (0.03)	0.05 (0.90)
(Pov) (Pensions)	-0.461 (2.759)	-0.058 (1.353)	-0.001 (0.121)	-0.126 (1.305)	0.559 (2.022)	-0.25 (5.61)	0.07 (2.68)	0.04 (2.51)	-0.02 (1.02)	0.21 (2.17)	0.05 (0.34)
Constant	142.650 (1.967)	108.256 (5.77)	11.56 (4.33)	168.45 (4.04)	-334.78 (2.79)	58.91 (2.99)	48.81 (4.50)	27.11 (4.49)	-11.25 (1.20)	151.16 (3.57)	629.12 (9.61)

Notes: (i) The coefficient estimates in the budget share equations have been multiplied by 1000.
(ii) Figures in brackets denote t ratios.
(iii) To save space, we have presented the coefficient estimates of only some of the interaction variables; the others are available on request.
(iv) See Appendix (Table A1) for full description of the abbreviations used above.
(v) Breusch Pagan statistic: $\chi^2_{153} = 4282.473.$

Table 5: Testing for Endogeneity of the Eight Resource Variables in the Budget Share Equations (South Africa – SA1)

Item	F Value [From augmented regression suggested by Davidson and Mackinnon (1993)]
Food	31.11*
Alcohol and Tobacco	17.09*
Entertainment	5.89*
Health	14.84*
Education	74.21*
Fuel	12.22*
Clothing	4.04*
Child Care	6.82*
Food Eaten Outside Home	2.78*
Transfers Sent	49.92*
Other Items	21.78*

Note: * denotes significance at 5% level.

Table 6: Comparison of the 3SLS, 2SLS and OLS Estimates (with t ratios) for Food Share Equation in South Africa (SA1)

Variable	3SLS	2SLS	OLS	Variable	3SLS	2SLS	OLS
Unearned Male Income	-0.20 (2.85)	-0.24 (3.09)	-0.01 (1.99)	Educd 1	-24.35 (1.97)	-31.41 (2.25)	-31.41 (5.90)
Unearned Female Income	0.57 (1.78)	0.66 (1.88)	-0.01 (0.25)	Educd 2	-38.92 (2.75)	-47.93 (3.02)	-47.93 (7.90)
Earned Male Income	0.13 (3.63)	0.14 (3.47)	-0.003 (0.88)	Educd 3	-23.43 (1.27)	-24.07 (1.18)	-24.07 (3.09)
Earned Female Income	-0.26 (5.06)	-0.20 (3.54)	-0.01 (1.91)	Rural	-7.04 (0.52)	8.33 (0.60)	8.33 (1.56)
Male Pensions	0.64 (3.45)	0.64 (3.07)	0.01 (0.60)	Black	225.34 (4.28)	254.37 (4.40)	254.37 (11.50)
Female Pensions	1.12 (3.41)	1.05 (2.84)	0.03 (0.75)	Coloured	20.55 (5.33)	213.53 (5.18)	213.53 (13.55)
Transfers Received by Men	-15.98 (3.24)	-12.82 (2.41)	0.17 (1.01)	Indian	81.79 (2.13)	79.40 (1.97)	79.40 (5.14)
Transfers Rec'd by Women	9.29 (2.43)	11.33 (2.72)	-0.07 (0.79)	Pov	155.71 (6.04)	174.54 (6.20)	174.54 (16.21)
Total Child	-13.55 (3.68)	-13.39 (3.47)	-13.39 (9.08)	(Pov) (Transfers)	-1.89 (1.81)	-2.80 (2.46)	-2.80 (6.42)
Total Adult	0.94 (0.23)	-1.52 (0.37)	-1.52 (0.95)	(Pov) (Unearned Income)	-0.002 (0.014)	0.04 (0.32)	0.04 (0.85)
Total Elderly	-45.32 (2.75)	-43.60 (2.50)	-43.60 (6.54)	(Pov) (Earned Income)	-0.11 (1.89)	-0.12 (1.85)	-0.12 (4.84)
Sexhead	50.43 (2.71)	51.20 (2.57)	51.20 (6.71)	(Pov) (Pensions)	-0.46 (2.76)	-0.59 (3.35)	-0.59 (8.75)
AgehHead	-6.16 (2.63)	-3.97 (1.64)	-3.97 (4.29)	Constant	142.65 (1.97)	58.46 (0.75)	58.46 (1.97)
Agehead2	0.05 (2.20)	0.04 (1.41)	0.04 (3.68)				

Notes: (i) The coefficient estimates have been multiplied by 1000.
(ii) Figures in brackets denote t ratios.
(iii) To save space, we have presented the coefficient estimates of only some of the interaction variables; the others are available on request.
(iv) See Appendix (Table A1) for full description of the abbreviations used above.

Table 7: 3 SLS Estimates of the Seventeen Equation System for the KIDS Data Set in South Africa (SA2)

Panel A: Estimates of the Income Equation

Unearned Male Income		Unearned Female Income		Earned Male Income		Earned Female Income	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Sexhead	138.49 (1.05)	Sexhead	-37.54 (0.26)	Unearned Male Income	-0.01 (1.59)	Unearned Male Income	-0.00 (0.61)
Ave age M	31.05 (1.44)	Ave age F	8.02 (0.25)	Unearned Female Income	-0.01 (2.41)	Unearned Female Income	-0.01 (1.66)
Ave age M2	-0.22 (0.96)	Ave age F2	0.10 (0.27)	Sexhead	61.99 (1.99)	Sexhead	-45.80 (1.75)
Max Male Ed	55.50 (3.07)	Max Fem Ed	74.27 (3.45)	Average M	3.80 (0.76)	Average F	0.41 (0.07)
Total child	-22.94 (1.22)	Total child	-3.23 (0.15)	Average M2	-0.06 (1.10)	Average F2	-0.03 (0.43)
Total adult m	57.94 (1.65)	Total adult m	10.46 (0.29)	Educ 1M	146.47 (2.16)	Educ 1F	7.69 (0.12)
Total adult f	-15.70 (0.50)	Total adult f	-31.24 (0.77)	Educ 2M	189.79 (2.80)	Educ 2F	35.26 (0.55)
Total eld rm	8.43 (0.06)	Total eld rm	-56.05 (0.35)	Educ 3M	354.06 (4.57)	Educ 3F	251.08 (3.49)
Total eld rf	-38.68 (0.44)	Total eld. rf	-57.73 (0.56)	Total child	-12.89 (2.82)	Total child	-4.39 (1.09)
Race	3.95 (0.02)	Race	-226.44 (1.27)	Total adult m	9.71 (1.19)	Total adult m	-24.44 (3.71)
Tot. lob	-0.01 (0.76)	Tot. umb	-0.01 (0.12)	Total adult f	-21.86 (2.95)	Total adult f	-5.27 (0.74)
Share m	-7.34 (0.04)	Share f	139.40 (0.72)	Total eld rm	–86.23 (2.57)	Total eld rm	-18.20 (0.63)
Share j	92.43 (0.60)	Share j	121.92 (0.76)	Total eld rf	-41.18 (1.98)	Total eld rf	-27.99 (1.50)
Gift m	-36.44 (0.17)	Gift f	-221.91 (1.04)	Race	-221.85 (4.69)	Race	-77.07 (1.98)

Table 7: Panel A (Continued)

Unearned Male Income		Unearned Female Income		Earned Male Income		Earned Female Income	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Gift j	-276.90 (0.46)	Gift j	-26.49 (0.04)	Total lob	-0.00 (1.07)	Total umb	0.03 (1.40)
Shfin m	644.43 (1.66)	Shfin f	252.79 (0.61)	Share m	121.35 (3.07)	Share f	79.32 (2.26)
Shfin j	289.17 (1.30)	Shfin j	-135.91 (0.46)	Share j	95.16 (2.58)	Share j	59.57 (2.04)
Constant	-1167.89 (2.18)	Constant	-611.57 (0.79)	Gift m	-22.83 (0.46)	Gift f	12.47 (0.33)
				Gift j	161.72 (1.16)	Gift j	86.45 (0.72)
				Shfin m	515.84 (5.63)	Shfin f	263.65 (3.56)
				Shfin j	123.08 (2.31)	Shfin j	95.96 (1.82)
				Mater	-9.56 (0.36)	Mater	-47.62 (2.07)
				Rooms	9.37 (1.82)	Rooms	10.57 (2.37)
				Own house	63.34 (2.01)	Own house	35.55 (1.30)
				W Source	106.83 (2.62)	W Source	68.33 (1.94)
				W fetch	-93.25 (2.85)	W fetch	-65.894 (2.32)
				Toiltyp	3.72 (0.13)	Toiltyp	9.80 (0.39)
				Toiloc	-53.56 (1.80)	Toiloc	-10.20 (0.40)
				Elect.	59.71 (2.21)	Elect.	57.09 (2.46)
				Constant	66.42 (0.48)	Constant	139.14 (0.92)

Table 7: Panel A (Continued)

Male Pensions Received		Female Pensions Received		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Earned Male Income	-0.01 (2.42)	Earned Male Income	-0.01 (2.36)	Earned Male Income	-0.01 (2.46)	Earned Male Income	-0.02 (6.30)
Earned Female Income	-0.00 (0.65)	Earned Female Income	0.01 (1.94)	Earned Female Income	0.00 (0.10)	Earned Female Income	-0.01 (1.24)
Unearned Male Income	0.00 (3.81)	Unearned Male Income	-0.00 (1.51)	Unearned Male Income	0.00 (1.05)	Unearned Male Income	-0.00 (1.03)
Unearned Female Income	0.00 (0.22)	Unearned Female Income	0.00 (0.03)	Unearned Female Income	0.00 (0.96)	Unearned Female Income	-0.00 (1.49)
Pens H	41.43 (17.16)	Pens H	47.34 (13.71)	Sexhead	5.05 (3.25)	Sexhead	-4.52 (1.73)
Sexhead	13.60 (7.90)	Sexhead	-7.77 (3.15)	Agehead	-0.17 (0.53)	Agehead	0.51 (0.98)
Agehead	0.51 (1.42)	Agehead	0.36 (0.70)	Agehead 2	0.00 (0.90)	Agehead 2	-0.01 (1.02)
Agehead 2	-0.00 (1.28)	Agehead 2	0.00 (0.54)	Hdeduc 1	2.00 (1.16)	Hdeduc 1	-1.92 (0.66)
Hdeduc 1	-0.07 (0.04)	Hdeduc 1	2.88 (1.03)	Hdeduc 2	4.46 (2.11)	Hdeduc 2	-7.19 (2.02)
Hdeduc 2	-0.18 (0.08)	Hdeduc 2	4.46 (1.33)	Hdeduc 3	1.34 (0.35)	Hdeduc 3	0.43 (0.07)
Hdeduc 3	3.68 (0.84)	Hdeduc 3	-3.68 (0.59)	Total child	-0.32 (1.20)	Total child	-0.19 (0.42)
Total Child	-0.79 (2.68)	Total Child	-1.55 (3.70)	Total adltm	0.20 (0.47)	Total adltm	0.99 (1.35)
Total adltm	-0.45 (0.92)	Total adltm	-1.68 (2.39)	Total adltf	0.08 (0.19)	Total adltf	1.39 (1.89)
Total adltf	-0.41 (0.83)	Total adltf	-3.87 (5.48)	Total eldrm	-2.70 (1.16)	Total eldrm	0.44 (0.11)
Total eldrm	39.03 (16.82)	Total eldrm	-23.84 7.18)	Total eldf	-1.39 (0.89)	Total eldf	1.62 (0.62)

Table 7: Panel A (Continued)

Male Pensions Received		Female Pensions Received		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Total eldrf	-10.57 (7.01)	Total eldrf	39.94 (18.51)	Race	-3.64 (1.68)	Race	1.38 (0.38)
Race	1.51 (0.62)	Race	0.05 (.01)	Numnshk	0.45 (0.77)	Numnshk	-1.47 (1.30)
Constant	-17.73 (1.75)	Constant	1.38 (.10)	Shockn	-0.00 (1.95)	Shockn	0.00 (3.62)
				Numpshk	1.00 (0.93)	Numpshk	-0.24 (0.12)
				Shockp	0.00 (1.09)	Shockp	0.00 (0.90)
				Male Pensions	0.02 (0.78)	Male Pensions	-0.11 (1.76)
				Female Pensions	-0.01 (0.44)	Female Pensions	0.01 (0.20)
				Pov	-1.55 (0.71)	Pov	0.46 (0.09)
				(Pov) (Unearned Income)	-0.001 (0.08)	(Pov) (Unearned Income)	-0.045 (1.91)
				(Pov) (Pensions)	-0.005 (0.25)	(Pov) (Pensions)	-0.05 (1.11)
				Constant	3.31 (0.37)	Constant	17.20 (1.13)

Table 7: Panel B: Estimates of the Budget Share Equations

Variable	Food	Clothing	Health	Other Regular Non food	Other Occasional Non Food	Education	Water and Rates	Other Energy	Other Items
Unearned Male Income	0.03 (0.441)	0.019 (1.20)	0.01 (0.63)	0.02 (1.45)	-0.00 (0.04)	0.02 (1.26)	-0.03 (0.74)	0.03 (1.17)	-0.10 (1.41)
Unearned Female Income	-0.03 (.10)	0.12 (1.80)	-0.01 (0.38)	-0.01 (0.13)	-0.10 (0.80)	0.11 (1.44)	-0.28 (2.01)	0.16 (1.42)	0.05 (0.16)
Earned Male Income	-0.21 (0.91)	0.13 (2.67)	0.02 (0.88)	0.02 (0.54)	-0.01 (0.12)	0.08 (1.42)	0.04 (0.39)	-0.09 (1.09)	0.02 (0.11)
Earned Female Income	-0.91 (3.77)	-0.01 (0.17)	-0.01 (0.42)	-0.08 (2.28)	0.08 (0.80)	0.03 (0.45)	0.25 (2.37)	-0.20 (2.30)	0.85 (3.72)
Male Pensions	1.21 (0.68)	0.00 (0.01)	-0.15 (0.81)	-0.05 (0.18)	-0.82 (1.14)	0.06 (0.15)	1.23 (0.55)	-0.79 (1.25)	-0.69 (0.41)
Female Pensions	-0.61 (0.31)	0.50 (1.21)	0.16 (0.78)	0.09 (0.32)	-0.34 (0.43)	-0.05 (0.12)	-1.62 (1.86)	1.18 (1.69)	0.70 (.37)
Transfers Received by Males	7.42 (2.12)	2.96 (4.07)	0.77 (2.14)	0.42 (0.84)	-2.73 (1.97)	0.30 (0.37)	-2.29 (1.49)	1.24 (1.01)	-8.08 (2.44)
Transfers Received by Females	7.50 (2.21)	1.64 (2.32)	0.45 (1.29)	-0.09 (0.19)	-1.66 (1.24)	0.44 (0.55)	-3.58 (2.40)	2.74 (2.29)	-7.43 (2.32)
Pov.	-14.34 (0.19)	53.65 (3.38)	7.34 (0.96)	-1.01 (0.10)	-10.75 (0.36)	25.13 (1.46)	-13.17 (0.40)	1.21 (0.05)	-48.06 (0.69)
(Pov) (Unearned Income)	-0.50 (3.91)	-0.02 (0.79)	0.01 (0.98)	-0.05 (2.90)	0.01 (0.18)	0.02 (0.75)	0.09 (1.58)	-0.11 (2.45)	0.55 (4.55)
(Pov) (Pensions)	(0.22) (0.57)	-0.04 (0.43)	0.07 (1.66)	-0.00 (0.08)	0.00 (0.01)	0.05 (0.53)	-0.10 (0.59)	0.10 (0.75)	-0.29 (0.81)
(Pov) (Transfers)	-2.08 (3.35)	-0.64 (4.86)	-0.17 (2.63)	-0.02 (0.27)	0.84 (3.39)	-0.07 (0.50)	0.88 (3.20)	-0.61 (2.79)	1.88 (3.20)
Race	165.53 (1.62)	64.03 (3.01)	7.13 (0.68)	9.79 (0.68)	-21.69 (0.54)	48.85 (2.05)	-160.75 (3.57)	72.83 (2.02)	-185.70 (1.92)
(Race) (Unearned Income)	-0.05 (0.70)	-0.02 (1.55)	0.00 (0.25)	-0.00 (0.41)	0.03 (1.12)	-0.02 (1.39)	0.08 (2.56)	-0.05 (2.09)	0.04 (0.57)
(Race) (Pensions)	-0.34 (0.38)	-0.28 (1.53)	-0.07 (0.80)	0.01 (0.05)	0.28 (0.78)	-0.00 (0.01)	0.60 (1.53)	-0.41 (1.32)	0.23 (0.27)
(Race) (Transfers)	-5.83 (1.89)	-1.05 (1.64)	-0.31 (0.98)	0.07 (0.16)	1.02 (0.84)	-0.26 (0.36)	2.69 (1.99)	-2.10 (1.94)	5.76 (1.98)
Sexhead	-26.74 (0.60)	2.86 (0.31)	0.30 (0.07)	-4.05 (0.65)	-18.24 (1.04)	8.39 (0.81)	-49.16 (2.50)	32.84 (2.09)	53.81 (1.27)
Agehead	-11.27 (2.70)	-1.06 (1.15)	-0.20 (0.45)	0.32 (0.54)	2.32 (1.37)	0.45 (0.46)	3.39 (1.84)	-2.65 (1.79)	8.70 (2.20)
Agehead 2	0.09 (2.39)	0.01 (0.80)	0.00 (0.18)	-0.00 (0.74)	-0.02 (0.96)	-0.00 (0.52)	-0.03 (1.71)	0.02 (1.62)	-0.07 (1.89)
Hd educ 1	-29.34 (1.53)	-2.09 (0.48)	-0.81 (0.40)	-0.93 (0.35)	13.61 (1.73)	-0.30 (0.07)	0.06 (0.01)	-1.15 (0.17)	20.96 (1.15)
Hd educ 2	-57.87 (2.30)	-1.83 (0.32)	-2.37 (0.90)	-0.82 (0.23)	17.66 (1.71)	0.84 (0.14)	-7.13 (0.64)	8.19 (0.92)	45.01 (1.89)
Hd educ 3	-8.61 (0.15)	-4.17 (0.34)	-4.49 (0.77)	16.61 (2.10)	20.28 (0.89)	12.85 (0.98)	-42.87 (1.72)	23.13 (1.16)	-12.73 (0.24)
Tot child	0.45 (0.16)	2.79 (3.82)	0.41 (1.20)	-0.55 (1.19)	0.53 (0.40)	1.66 (2.82)	-2.88 (1.98)	0.84 (0.72)	-3.33 (1.06)

Table 7: Panel B (Continued)

Variable	Food	Clothing	Health	Other Regular Non food	Other Occasional Non Food	Education	Water and Rates	Other Energy	Other Items
Tot adult m	-17.78 (2.89)	-2.91 (2.17)	-0.67 (1.06)	-0.39 (0.46)	2.32 (0.94)	-0.88 (0.63)	1.29 (0.48)	-2.41 (1.12)	21.43 (3.68)
Tot adult f	-2.16 (0.37)	0.46 (0.36)	0.71 (1.18)	1.31 (1.61)	0.62 (0.26)	1.70 (1.28)	0.50 (0.20)	-1.37 (0.67)	-1.77 (0.32)
Tot eld rm	-56.10 (1.21)	15.00 (1.51)	6.44 (1.35)	6.20 (0.95)	33.64 (1.82)	-2.55 (0.24)	-43.63 (2.14)	23.85 (1.46)	17.14 (6.39)
Tot eld rf	-11.69 (0.30)	-0.15 (0.02)	-4.15 (1.06)	-0.98 (0.18)	8.40 (0.55)	2.01 (0.23)	47.63 (2.82)	-34.03 (2.52)	-7.04 (0.19)
Tot umb	-0.00 (0.19)	0.00 (0.98)	0.00 (0.26)	0.00 (1.47)	-0.01 (1.02)	0.00 (1.21)	-0.01 (0.76)	0.01 (1.09)	-0.00 (0.12)
Tot lob	0.00 (0.12)	-0.00 (1.31)	0.00 (0.36)	0.00 (1.46)	0.01 (1.12)	0.00 (0.29)	0.00 (1.01)	0.00 (0.26)	-0.00 (0.82)
Share m	-68.70 (2.71)	-8.72 (1.68)	-0.84 (0.33)	-10.44 (2.93)	5.57 (0.56)	-5.71 (0.97)	15.62 (1.41)	-18.62 (2.10)	91.84 (3.83)
Share f	2.03 (0.06)	2.46 (0.35)	2.53 (0.73)	5.47 (1.14)	-15.38 (1.15)	0.84 (0.11)	4.81 (0.32)	-8.95 (0.75)	6.19 (0.19)
Gift m	4.58 (0.13)	9.79 (1.34)	-4.09 (1.14)	2.06 (0.42)	1.71 (0.12)	14.52 (1.77)	-13.36 (0.87)	6.82 (0.55)	-22.04 (0.67)
Gift f	23.23 (0.76)	7.33 (1.18)	-1.00 (0.33)	-1.52 (0.36)	-5.57 (0.47)	7.65 (1.09)	-13.91 (1.04)	16.13 (1.52)	-32.34 (1.12)
Shfin m	21.55 (0.31)	-9.15 (0.63)	-2.65 (0.37)	1.98 (0.20)	5.03 (0.18)	-18.73 (1.20)	-39.31 (1.28)	20.82 (0.85)	21.44 (0.33)
Shfin f	56.84 (1.04)	-5.37 (0.48)	3.30 (0.68)	28.53 (3.72)	-12.99 (0.61)	2.57 (0.20)	-21.83 (0.91)	7.41 (0.39)	-58.46 (1.13)
Constant	880.93 (5.80)	-65.49 (1.97)	0.12 (0/01)	18.35 (0.86)	-29.33 (0.48)	-79.04 (2.248)	125.05 (1.86)	51.82 (0.97)	97.60 (0.68)

Notes: (i) The coefficient estimates in the budget share equations have been multiplied by 1000.
(ii) Figures in brackets denote t ratios.
(iii) To save space, we have presented the coefficient estimates of only some of the interaction variables; the others are available on request.
(iv) See Appendix (Table A1) for full description of the abbreviations used above.
(v) Breusch Pagan statistic: $\chi^2_{153} = 4282.473.$

Table 8: Testing for Endogeneity of the Eight Resource Variables in the Budget Share Equations (South Africa – SA2)

Item	F Value [From Augumented Regression Suggested by Davidson and Mackinnon (1993)]
Food	11.16*
Clothing	3.24*
Health	1.26
Other Regular Non Food	1.61
Other Occasional Non Food	1.18
Education	2.45*
Water and Rates	10.44*
Other Energy	8.91*
Other Items	7.08*

Note: * denotes significance at 5% level.

Table 9: Testing for Pareto Efficiency in Intra Household Resource Sharing on South African Data (SA2)

Measure of Bargaining Power	Chi Square Value[a]
Lobola and Umbondo Payments	2.29 (7)
Share of Consumer Durables Owned	1.91 (7)
Share of Gifts Received in Marriage	0.95 (7)
Share of Financial Assets Owned	1.60 (7)

[a] Figure in brackets denotes degrees of freedom.

Table 10: 3 SLS Estimates of the Fourteen Equation System for the PIHS Data Set in Pakistan (t values in brackets)

Panel A: Estimates of the Income Equations

Unearned Male Income		Unearned Female Income		Earned Male Income		Earned Female Income	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
FHH	-15525.78 (1.88)	FHH	6988.62 (33.11)	Unearned Male Income	0.03 (8.98)	Unearned Male Income	0.01 (8.95)
Ave Agem	-440.75 (0.90)	Ave Agef	6.44 (0.47)	Unearned Female Income	-0.05 (0.38)	Unearned Female Income	-0.01 (0.40)
Max edm 1	5652.32 (1.28)	Max edf 1	-35.57 (0.32)	FHH	-1517.67 (0.85)	FHH	163.30 (0.49)
Max edm 2	27407.90 (5.34)	Max edf 2	58.02 (0.56)	Aveagem	58.91 (0.69)	Aveagef	16.93 (1.00)
Max edm 3	21796.93 (2.88)	Max edm 3	304.82 (2.11)	Max edm 1	817.89 (1.07)	Max edf 1	28.60 (0.21)
Rural	-1738.06 (0.54)	Rural	-99.19 (1.19)	Max edm 2	665.57 (0.73)	Max edf 2	-83.77 (0.63)
Total Child	-734.62 (1.23)	Total Child	31.18 (1.93)	Rural	-1548.10 (1.97)	Rural	-115.37 (0.76)
Total Adtm	4799.55 (2.84)	Total Adtm	122.67 (2.77)	Tot Child	-186.80 (1.63)	Tot Child	-16.68 (0.73)
Total Adtf	-4668.05 (2.40)	Total Adtf	-71.16 (1.31)	Tdowry	-0.08 (1.37)	Tdowry	-0.01 (1.08)
Toteldm	984.13 (0.25)	Toteldm	179.07 (1.71)	Walls	1118.16 (1.47)	Walls	149.27 (1.00)
Toteldf	-591.47 (0.14)	Toteldf	82.83 (0.71)	Floor	1229.78 (1.45)	Floor	330.74 (2.01)
Tdowry	1.08 (3.53)	Tdowry	-0.00 (0.10)	Dwater	570.55 (0.81)	Dwater	411.13 (2.99)
Constant	15087.62 (1.76)	Constant	-416.61 (1.86)	Phone	3347.21 (2.41)	Phone	-16.76 (0.06)
				Constant	2900.93 (1.55)	Constant	-224.56 (0.63)

Table 10: 3 SLS Estimates of the Fourteen Equation System for the PIHS Data Set in Pakistan

Panel A: (Continued) Estimates of the Income Equations

Unemployment Insurance Received by Men		Unemployment Insurance Received by Women		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Unearned Male Income	0.004 (8.14)	Unearned Male Income	-0.000 (0.06)	Unearned Male Income	0.00 (0.57)	Unearned Male Income	0.00 (0.14)
Unearned Female Income	-0.008 (0.39)	Unearned Female Income	-0.001 (1.12)	Unearned Female Income	-0.01 (0.58)	Unearned Female Income	0.02 (2.47)
Earned Male Income	0.09 (25.60)	Earned Male Income	0.001 (6.53)	Earned Male Income	-0.00 (0.61)	Earned Male Income	-0.00 (1.13)
Earned Female Income	0.28 (15.95)	Earned Female Income	0.00 (0.40)	Earned Female Income	-0.00 (0.32)	Earned Female Income	-0.00 (0.18)
FHH	292.71 (0.98)	FHH	13.20 (1.91)	Unemplt Insurance Received by Men	0.00 (0.06)	Unemplt Insurance Received by Men	0.00 (0.31)
Age Head	3.48 (.18)	Age Head	0.13 (0.28)	Unemplt Insurance Received by Women	0.16 (0.50)	Unemplt Insurance Received by Women	-0.15 (0.51)
Rural	100.00 (0.98)	Rural	-3.28 (1.39)	FHH	-118.33 (0.90)	FHH	382.22 (3.21)
Total Child	49.49 (2.53)	Total Child	0.15 (0.34)	Age Head	2.81 (0.33)	Age Head	4.63 (0.59)
Total Adtm	49.24 (0.93)	Total Adtm	-1.39 (1.14)	Rural	-13.00 (0.29)	Rural	-12.06 (0.30)

Table 10: Panel A (Continued)

Unemployment Insurance Received by Men		Unemployment Insurance Received by Women		Transfers Received by Men		Transfers Received by Women	
Variable	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**	**Variable**	**Coefficient**
Total Adtf	-40.16 (0.64)	Total Adtf	2.07 (1.44)	Total Child	-19.02 (2.22)	Total Child	-7.19 (0.92)
Constant	-526.82 (1.14)	Constant	-0.51 (0.05)	Total Adtm	51.54 (2.21)	Total Adtm	-31.04 (1.47)
				Total Adtf	62.99 (2.30)	Total Adtf	4.81 (0.19)
				Total Eldm	-38.52 (0.56)	Total Eldm	-112.69 (1.80)
				Total Eldf	178.49 (2.89)	Total Eldf	164.09 (2.92)
				Pov	-201.91 (3.57)	Pov	-172.44 (3.36)
				Constant	37.93 (0.18)	Constant	139.38 (0.75)

Table 10:
Panel B: Estimates of the Budget Share Equations (t values in brackets)

Variable	Food	Fuel & Light	Clothing	Health	Education	Other Items
Unearned Male Income	-0.01 (3.09)	-0.00 (0.80)	0.00 (1.09)	0.00 (1.34)	0.00 (1.83)	0.01 (2.96)
Unearned Female Income	-0.15 (1.49)	-0.05 (1.89)	0.01 (0.61)	-0.02 (0.61)	0.01 (0.69)	0.10 (1.08)
Earned Male Income	-0.01 (0.62)	-0.00 (0.11)	0.00 (0.26)	0.00 (0.07)	0.00 (0.04)	0.01 (0.68)
Earned Female Income	-0.08 (1.07)	-0.01 (0.61)	0.01 (1.49)	-0.01 (0.62)	0.02 (1.43)	0.08 (1.23)
Unemployment Insurance Received by Men	-0.03 (0.23)	0.07 (2.07)	0.00 (0.04)	-0.01 (0.42)	0.05 (2.17)	0.13 (1.18)
Unemployment Insurance Received by Women	5.13 (0.81)	1.74 (1.03)	0.62 (1.14)	0.19 (0.11)	-1.68 (1.32)	-4.25 (0.71)
Transfers Received by Men	0.25 (0.81)	0.12 (1.48)	-0.03 (0.96)	0.09 (1.08)	0.00 (0.06)	-0.06 (0.21)
Transfers Received by Women	-0.47 (1.49)	-0.14 (1.70)	0.00 (0.07)	-0.18 (2.09)	-0.01 (0.15)	0.14 (0.48)
Pov	-234.44 (2.18)	-13.36 (0.47)	4.06 (0.44)	-33.12 (1.13)	27.27 (1.27)	219.28 (2.17)
FHH	680.15 (1.43)	269.41 (2.13)	-26.83 (0.66)	121.87 (0.94)	-28.31 (0.30)	-344.01 (0.77)
Total Child	-6.38 (1.42)	-2.50 (2.08)	2.38 (6.28)	-0.08 (0.07)	5.24 (5.90)	11.42 (2.73)
Constant	808.48 (6.02)	116.94 (3.26)	30.16 (2.65)	89.59 (2.44)	-53.15 (2.00)	375.06 (3.00)

Note: (i) The coefficient estimates in the budget share equations have been multiplied by 1000.
(ii) Figures in brackets denote t ratios.
(iii)To save space, we have presented the coefficient estimates of only a selection of explanatory variables, the others are available on request.
(iv) See Appendix (Table A1) for full description of the abbreviations used above.
(v) Breusch Pagan statistic: $\chi^2_{78} = 1217.303$.

Table 11: Testing for Endogeneity of the Eight Resource Variables in the Budget Share Equations (Pakistan)

Item	F Value [From Augmented Regression Suggested by Davidson and Mackinnon (1993)]
Food	37.86*
Fuel and Light	10.90*
Clothing	1.95*
Health	3.67*
Education	12.63*
Other Items	18.88*

Note: * denotes significance at 5% level.

Table 12: Testing of the Pooling of Male and Female Income

Country/Item	Chi Square Value		
South Africa (SA1)	**Unearned Income**	**Pension**	**Transfer**
Food	40.22* (7)	17.71* (7)	945.15* (7)
Alcohol and Tobacco	27.50* (7)	11.62* (7)	196.21* (7)
Entertainment	30.90* (7)	30.17* (7)	23.97* (7)
Health	94.76* (7)	26.95* (7)	936.20* (7)
Education	79.66* (7)	7.20 (7)	891.98* (7)
Fuel	30.26* (7)	28.67* (7)	570.83* (7)
Clothing	12.35* (7)	15.18* (7)	288.33* (7)
Child Care	16.53* (7)	17.03* (7)	18.09* (7)
Food Eaten Outside Home	21.94* (7)	12.00 (7)	220.07* (7)
Transfers Sent	109.06* (7)	45.71* (7)	17.53* (7)
Other Items	66.71* (7)	24.57* (7)	97.88* (7)
South Africa (SA2)			
Food	4.81 (5)	5.36 (5)	-
Clothing	8.23 (5)	2.38 (5)	-
Health	2.10 (5)	17.35* (5)	-
Other Regular Non Food	4.26 (5)	5.55 (5)	-
Other Occasional Non Food	2.32 (5)	5.03 (5)	-
Education	7.96 (5)	1.41 (5)	-
Water and Rates	4.48 (5)	10.95 (5)	-
Other Energy	2.40 (5)	6.87 (5)	-
Other Items	2.07 (5)	4.07 (5)	-
Pakistan			
Food	2.86 (7)	4.18 (7)	71.27* (7)
Fuel and Light	3.60 (7)	7.77 (7)	4.16 (7)
Clothing	0.41 (7)	4.11 (7)	4.17 (7)
Health	4.26 (7)	0.67 (7)	8.47 (7)
Education	0.99 (7)	19.60* (7)	1.28 (7)
Other Items	1.56 (7)	6.97 (7)	12.75 (7)

Note: (i) Figures in brackets denote degrees of freedom
(ii) * denotes statistical significance at 5% level

Table 13: Testing of the Pooling of Unearned Income, Pensions and Transfers in South Africa

Data Set/Item	Chi Square Value	
SA1	**Males**	**Females**
Food	875.17* (14)	260.09* (14)
Alcohol and Tobacco	411.80* (14)	43.44* (14)
Entertainment	32.10* (14)	58.26* (14)
Health	1110.06* (14)	145.29* (14)
Education	1349.00* (14)	29.67* (14)
Fuel	573.60* (14)	134.22* (14)
Clothing	265.04* (14)	77.46* (14)
Child Care	74.33* (14)	43.38* (14)
Food Eaten Outside Home	146.16* (14)	214.42* (14)
Transfers Sent	83.23* (14)	211.06* (14)
Other Items	79.02* (14)	336.33* (14)
SA2	**Males**	**Females**
Food	20.69* (9)	36.77* (9)
Clothing	28.12* (9)	55.10* (9)
Health	32.60* (9)	38.79* (9)
Other Regular Non Food	18.54* (9)	9.44 (9)
Other Occasional Non Food	17.92* (9)	25.72* (9)
Education	3.12 (9)	5.43 (9)
Water and Rates	28.60* (9)	33.55* (9)
Other Energy	27.81* (9)	38.86* (9)
Other Items	22.76* (9)	42.51* (9)

Note: (i) Figures in brackets denote degrees of freedom
(ii) * denotes statistical significance at 5% level

Table 14: Testing of the Pooling of Unearned Income, Unemployment Insurance and Transfers in Pakistan

Item	Chi Square Values	
	Male	**Female**
Food	9.68 (11)	32.94* (11)
Fuel and Light	8.42 (11)	7.44 (11)
Clothing	8.90 (11)	13.63 (11)
Health	5.58 (11)	10.20 (11)
Education	13.36 (11)	23.94* (11)
Other Items	8.48 (11)	13.96 (11)

Notes: (i) Figures in brackets denote degrees of freedom.
(ii) * denotes statistical significance at 5% level.

Table 15: 3SLS Coefficient Estimates, with t Values, of the Pensions Variables in the Earned Income Equations

Variable	Earned Male Income		Earned Female Income	
	SA1	**SA2**	**SA1**	**SA2**
Male Pensions	-0.37 (6.80)	-0,49 (1.20)	-0.13 (7.64)	-0.20 (0.55)
Female Pensions	-0.01 (0.08)	-0.19 (0.64)	-0.17 (3.07)	-0.08 (0.28)

Notes: (i) Figures in brackets denote t ratios.
(ii)To save space, we have presented the coefficient estimates of only the pensions variables in the earned income equations. The full set of estimates will be made available on request.

References

Apps, P. and R. Rees (1988), "Taxation and the Household", *Journal of Public Economics*, 35, 355-369.

Apps, P. and R. Rees (1997), "Collective Labour Supply and Household Production", *Journal of Political Economy*, 105(1), 178-190.

Atkinson, A.B. and J.E. Stiglitz (1980), *Lectures on Public Economics*, McGraw Hill, New York.

Becker, G.S. (1981), *A Treatise on the Family*, Cambridge: Harvard University Press.

Behrman, J.R. (1997), "Intra Household Distribution and the Family", in *Handbook of Population and Family Economics*, ed by M.R. Rosenzweig and O. Stark, North Holland, Amsterdam.

Bertrand, M., Miller, D. and S. Mullainathan (2000), *Public Policy and Extended Families: Evidence from South Africa*, Working Paper No. 7594, NBER Working Paper Series, Cambridge, M.A.

Bhalotra, S. and C. Atfield (1998), "Intrahousehold Resource Allocation in Rural Pakistan: A Semi Parametric Analysis", *Journal of Applied Econometrics*, 13(5), 463-480.

Breusch, T.S. and A.R. Pagan (1980), "The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics", *Review of Economic Studies*, 47, 239-254.

Browning, M. and P. Chiappori (1998), "Efficient Intra Household Allocations: A General Characterisation and Empirical Tests", *Econometrica*, 66(6), 1241-1278.

Carter, M.R. and J. May (1999), "Poverty, Livelihood and Class in Rural South Africa", *World Development*, 27(1), 1-20.

Case, A. and A. Deaton (1998), "Large Cash Transfers to the Elderly in South Africa", *Economic Journal*, 108(450), 1330-1362.

Chiappori, P.A. (1988), "Rational Household Labour Supply", *Econometrica*, 56(1), 63-89.

Cox, D. and E. Jimenez (1997), *Coping with Apartheid: Inter-Household Transfers Over the Life-Cycle in South Africa*, (mimeo), Department of Economics, Boston College, U.S.A.

Davidson, R. and J.G. Mackinnon (1993), *Estimation and Inference in Econometrics*, Oxford University Press, New York.

Duflo, E. (2000), *Grandmothers and Granddaughters: The Effects of Old Age Pension on Child Health in South Africa*, Working Paper No. 00-05, Department of Economics, M.I.T., U.S.A., (May).

Haddad, L., Hoddinott, J. and Alderman, H. (1997 eds), *Intra Household Resource Allocation in Developing Countries: Models, Methods, and Policy*, Johns Hopkins University Press, Baltimore.

Hoddinott, J. and L. Haddad (1995), "Does Female Income Share Influence Household Expenditures? Evidence from Cote d'Ivoire", *Oxford Bulletin of Economics and Statistics*, 57(1), 77-95.

Jensen, R.T. (1998), *Public Transfers, Private Transfers and the 'Crowding Out' Hypothesis: Theory and Evidence from South Africa*, (mimeo), Kennedy School of Government, Harvard University, USA (Feb).

Kanbur, R. and L. Haddad (1994), "Are Better Off Households More Unequal or Less Unequal: A Bargaining Theoretic Approach to 'Kuznets' Effects at the Micro Level", *Oxford Economic Papers*, 46(3), 445-458.

Lund, F. (1993), "State Social Benefits in South Africa", *International Social Security Review*, 46(1), 5-25.

Lundberg, S. and R.A. Pollak (1994), "Non Cooperative Bargaining Models of Marriage", *American Economic Review: Papers and Proceedings*, 84(2), 132-137.

Lundberg, S., Pollak, R. and T. Wales (1997), "Do Husbands and Wives Pool Their Resources? Evidence from the UK Child Benefit" *Journal of Human Resources*, 32(3), 463-480.

Maitra, P. and R. Ray (1999), *The Effects of Transfers on Household Expenditure Patterns and Poverty in South Africa*, University of Sydney Working Paper, 99-16.

Manser, M. and M. Brown (1980), "Marriage and Household Decision Making: A Bargaining Analysis", *International Economic Review*, 21(3), 31-44.

McElroy, M. and M. Horney (1981), "Nash Bargained Household Decisions", *International Economic Review*, 22(2), 333-350.

Pakistan Integrated Household Survey (1991), Poverty and Human Resources Division, The World Bank, Washington D.C., December 1995.

Phipps, S. and P. Burton (1980), "What's Mine is Yours? The Influence of Male and Female Incomes on Patterns of Household Expenditure", *Economica*, 65(260), 599-613.

Pollak, R. (1994), "For Better or Worse: The Roles of Power in Models of Distribution Within Marriage", *American Economic Review*, 84(2), 148-152.

Quinsumbing, A. and J. Maluccio (2000), *Intra Household Allocation and Gender Relations: New Empirical Evidence from Four Developing Countries*, FCND Discussion Paper No. 84, IFPRI, Washington, DC (April).

Ray, R. (2000), "Poverty and Expenditure Pattern of Households in Pakistan and South Africa: A Comparative Study", *Journal of International Development*, 12, 241-256.

Samuelson, P. (1956), "Social Indifference Curves", *Quarterly Journal of Economics*, 70, 1-22.

Schultz, T.P. (1990), "Testing the Neo Classical Model of Family Labour Supply and Fertility", *Journal of Human Resources*, 25(4), 599-634.

South Africa Labour Development Research Unit (1994), "South African Rich and Poor: Baseline Household Statistics", University of Cape Town, South Africa.

Thomas, D. (1990), "Intra Household Resource Allocation: An Inferential Approach", *Journal of Human Resources*, 25(4), 635-664.

Thomas, D., Contreras, D. and E. Frankenberg (1997), *Distribution of Power Within the Household and Child Health*, (Mimeo), UCLA, USA.

Wilson, F. (1972), *Migrant Labour in South Africa*, South African Council of Churches, Johannesburg.

Appendix Table A1:
Description of Abbreviated Variable Names

Data Set: South Africa 1	
Variable Name	**Description**
U_m	Unearned income of males
U_f	Unearned income of females
E_m	Labour earnings of males
E_f	Labour earnings of females
P_m	Male Pensions
P_f	Female Pensions
R_m	Transfers/remittances received by males
R_f	Transfers/remittances received by females
$U(=U_m + U_f)$	Total unearned income
$P (=P_m + P_f)$	Total pensions
$R (=R_m + R_f)$	Total transfers
Black	Race dummy that takes the value 1 for Black households, 0 otherwise
Pov	Poverty dummy that takes the value 1 for households below the poverty line, 0 otherwise
Connecte	= 1 if household is connected to electricity, 0 otherwise
House C	Type of house
Own House	= 1 if own house, 0 otherwise
Male Ed 1/Fem Ed 1	= 1 if highest education of most educated male (female) is some primary school, 0 otherwise
Male Ed 2/Fem Ed 2	= 1 if highest education of most educated male (female) is more than primary school but less than secondary school, 0 otherwise
Male Ed 3/Fem Ed 3	= 1, if highest education of most educated male (female) is secondary school or higher, 0 otherwise
Bond Owe	Value of bond owed
Sale Value	Sale value of house
Ave Age M	Average age of working males in household
Ave Age F	Average age of working females in household
Total Child	Total number of children (0-17 years) in the household
Total Adult	Total number of adults (18-64 for males, 18-59 for females) in the household
Total Elderly	Total number of pensioners (65 + for males, 60 + for females) in the household
Sexhead	= 1 if head of household is male, 0, otherwise
Agehead	Age of household head
Agehead 2	$(\text{Age head})^2$
Rural	= 1, if household resides in rural areas, 0, otherwise
Car	= 1, if household has car, 0, otherwise

Data Set: South Africa 1 (Continued)	
Variable Name	**Description**
Radio	= 1, if household has radio, 0, otherwise
Fridge	= 1, if household has fridge, 0, otherwise
Stove	= 1, if household had stove, 0, otherwise
Max Ed	Years of Education of most educated member of the household
Pens H	= 1, if the household head receives pension, 0, otherwise
Dunemp	= 1, if any adult member of the household is unemployed, 0, otherwise
Dsick	= 1, if any adult member of the household is sick, 0, otherwise
Dpreg	= 1, if any adult female member of the household is pregnant, 0, otherwise
Wsource	= 1, if main drinking water is internal pipe, 0, otherwise
Toilet	Kind of toilet facility available (1 = best, 6 = worst)
Edu Chd 1	= 1, if highest education of most educated child is some primary school, 0, otherwise
Edu Chd 2	=1, if highest education of most educated child is more than primary school but less than secondary school, 0, otherwise
Edi Chd 3	= 1, if highest education of most educated child is secondary school or higher, 0, otherwise
Data Set: South Africa 2	
Variable Name	**Description**
Ave Age M2	$(\text{Ave age M})^2$
Ave Age F2	$(\text{Ave age F})^2$
Max Male Ed	Years of education of most educated male member of household
Max Fem Ed	Years of education of most educated female member of household
Total Adult m	Total no. of male adults (18 – 64 years)
Total Adult f	Total no. of female adults (18 – 59 years)
Total Eldr m	Total no. of elderly males (65 +)
Total Eldr f	Total no. of elderly females (60 +)
Race	= 1, if household is black, 0, otherwise
Total Lob	Total Lobola paid
Total Umb	Total umbondo paid
Share m	Share of consumer durables owned by males
Share f	Share of consumer durables owned by females
Share j	Share of consumer durables owned jointly
Gift m	Share of gifts at marriage accruing to males
Gift f	Share of gifts at marriage accruing to females
Gift j	Share of gifts at marriage accruing jointly
Shfinm	Share of financial assets owned by males
Shfinf	Share of financial assets owned by females
Shfinj	Share of financial assets owned jointly

Data Set: South Africa 2 (Continued)	
Variable Name	**Description**
Educ 1M/Educ 1F	= 1, if highest education of most educated male child (female child) is some primary school, 0, otherwise
Educ 2M/Educ 2F	= 1, if highest education of most educated male child (female child) is more than primary school but less than secondary school, 0, otherwise
Educ 3M/Educ 3F	=1, if highest education of most educated male child (female child) is secondary school or higher, 0, otherwise
Mater	=1, if main material of house is cement, 0, otherwise
Rooms	Number of rooms in house
Wsource	= 1, if main source of drinking water is internal pipe, 0, otherwise
Wfetch	= 1, if water is fetched daily, 0, otherwise
Toiltyp	= 1, if toilet type is pit latrine with ventilation
Toiloc	= 1, if toilet location is outside dwelling, 0, otherwise
Elect	= 1, if household has access to electricity, 0, otherwise
Hd educ 1	= 1, if highest education of household head is some primary school, 0 otherwise
Hd educ 2	= 1, if highest education of household head is more than primary school, but less than secondary school, 0, otherwise
Hd educ 3	= 1, if highest education of household head is secondary school or higher, 0, otherwise
Numnshk	Number of negative shocks faced by the household in the last 5 years
Shockn	Total loss arising from negative shocks
Shockp	Total earnings from positive shocks
Data Set: Pakistan	
Variable Name	**Description**
FHH	= 1, if household head is female, 0, otherwise
Max edm1/Max edf 1	= 1, if highest education of most educated male (female) is some primary school, 0, otherwise
Max edm 2/Max edf 2	= 1, if highest education of most educated male (female) is more than primary school, but less than secondary school, 0, otherwise
Max edm 3/Max edf 3	= 1, if highest education of most educated male (female) is secondary school or higher, 0, otherwise
Tdowry	Total dowry payment received by the household
Walls	= 1, if walls are stones – cement bonded, 0, otherwise
Floor	= 1, if main flooring material is earth, 0, otherwise
Dwater	= 1, if main source of drinking water is tap in house, 0, otherwise
Phone	= 1, if household has a phone, 0, otherwise