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Abstract

This paper examines the allocation of resources and estimates individual poverty rates within households in Suriname. It employs a collective model estimation framework that enables the allocation of resources across men, women, and children in nuclear households to be identified. Using the Suriname 2016/2017 Survey of Living Conditions, the results show that there are considerable differences between men and women, but that there is no gender bias among children. They also show that children are generally the least poor members of households.

JEL Codes: D12, D13, I31, I32, J12, J13

Keywords: collective model, intra-household inequality, poverty, resource shares, Suriname

1 Introduction

As the smallest country in South America, Suriname's historical economic performance has been characterised by high volatility and relatively low economic growth. The country's average growth rate from 1975, the year Suriname obtained independence, to 2000 was significantly lower (1.1 percent) than the Latin America and Caribbean average of 2.97 percent. The commodity boom of the 2000s, which was associated with favourable commodity prices and large investments in the mining sector, caused a period of sustained economic growth averaging 4.4 percent from 2001 to 2014. However, the growth in per-capita income did not translate into much-improved social statistics, as reflected in education and health outcomes (see IDB, 2017).

In 2015, a reversal of commodity fortunes contributed to a drastic change in the country's economic performance: real GDP declined by 9 percent from 2014 to 2016, and fiscal and external imbalances increased along with a rapid rise in government debt. The 2015 commodity shock also had adverse social implications: unemployment rose to almost 10 percent in 2016, accompanied by a large exchange rate devaluation and high double-digit inflation, contributing to a sharp rise in the cost of living. In this context, the 2017 Survey of Living Conditions for Suriname estimated an overall poverty headcount rate of 26 percent. However, poverty in the country's interior was much higher, at 47.9 percent, with almost one in every two households being classified as poor. There are also challenges related to gender inequality. Suriname is ranked 95 out of 159 countries in the Gender Inequality Index, which shows that women are underrepresented in the labour market and face health challenges.

While some data are available to understand Suriname's macroeconomic performance, until now it was not possible to empirically explore issues related to the underlying drivers of poverty due to the absence of publicly available micro data. The recent publication of the 2016/2017 Suriname Survey of Living Conditions (SSLC hereafter) now makes it possible to empirically assess some poverty-related issues for Suriname. Using the SSLC, this study explicitly explores one possible underlying determinant of wealth within the household, namely the allocation of resources across household members. Its approach enables the distribution of resources among members to be identified; it also enables individual poverty rates to be calculated.

Resource allocation within the household is generally difficult to measure because most household survey datasets measure consumption expenditure at the household level. Even in situations where data on individual consumption is available (see Menon et al., 2012

or Cherchye et al., 2012), the level of intra-household inequality may still be difficult to estimate since certain goods can be shared among members of the household. Becker's (1964; 1965) model is one of the first attempts to peek into the black box of the household by extending the standard neoclassical model of individual demand to households or families. His model of the household, known as the unitary model, basically assumes that every member of the household is treated equally. This implies that the household, like an individual, can be treated as a rational economic unit. However, many empirical papers have found that the predictions of this model do not hold in reality (see Alderman et al., 1995 and Chiappori and Meghir, 2014 for reviews of this literature).

The rejection of the unitary model led to the emergence of a category of household models that employ a multi-utility framework. In these models, each member of the household is assumed to have preferences that are unique to them, making conflict a possibility within the household. The household as a whole is also assumed to make Pareto-efficient decisions. The first set of these models, known as bargaining models, use tools from game theory to model the complex interactions that occur within the household (Manser and Brown, 1980; McElroy and Horney, 1981). Originating from the work of Chiappori (1988), Chiappori (1992), and Apps and Rees (1988), collective household models make up the second set of models that employ the multi-utility framework. These models measure individual well-being and bargaining power within the household by identifying changes in or the level of a quantity known as resource shares. Resource shares can be defined as the proportion of total household expenditure that is allocated to each member of the household.

Some studies, such as Browning et al. (1994), Chiappori et al. (2002) and Vermeulen (2002), use variables known as distribution factors to identify changes in the proportion of total expenditure allocated to each household member. Distribution factors are external variables that affect resource shares but do not affect preferences or the budget constraint of the household. Since it can be quite difficult to test whether a variable is indeed a distribution factor, a recent strand of literature on collective models identifies the level of resource shares by imposing either non-parametric or semi-parametric restrictions on individual preferences. Examples of this group of collective models include Browning et al. (2013), Lewbel and Pendakur (2008), Bargain et al. (2010), Bargain and Donni (2012), and Bargain et al. (2014). This study applies one of these models developed by Dunbar, Lewbel, and Pendakur (2013) (DLP hereafter) to the 2016/2017 SSLC to estimate the proportion of total expenditure allocated to each individual in nuclear households.

The rest of the paper is organised as follows. Section 2 provides a brief description of

the DLP framework. Section 3 describes the datasets, presents summary statistics, and discusses the empirical implementation of the DLP model. The main results are discussed in Section 4, while Section 5 concludes.

2 Theoretical Framework

As previously mentioned, the DLP model is a modern collective household model which identifies individual resource shares by applying restrictions on the individual preferences of household members. It additionally allows for bargaining among parents and economies of scale in the joint consumption of goods. Under the DLP framework, household budget-share equations of private assignable goods for each member of the household are estimated as follows:

$$\begin{aligned} W_{ms}(y) &= \eta_{ms}(\delta_{ms} + \beta_{ms}\, ln\, \eta_{ms}) + \eta_{ms}\, \beta_{ms}\, ln\, y \\ W_{fs}(y) &= \eta_{fs}\big(\delta_{fs} + \beta_{fs}\, ln\, \eta_{fs}\big) + \eta_{fs}\, \beta_{fs}\, ln\, y \\ W_{cs}(y) &= \eta_{cs}(\delta_{cs} + \beta_{cs}\, ln\, \eta_{cs}) + s\eta_{cs}\, \beta_{cs}\, ln\, y \end{aligned} \tag{1}$$

where the subscript *t* refers to the individual types, in that an adult male or father is denoted by $t = m$, an adult female or mother is denoted by $t = f$ and children by $t = c$. The subscript *s* represents household types or the number of children in a household. Since the Surinamese data contain households with up to four children, couples' number of children are indexed in the range $s = 1, 2, 3, 4$. W_{ts} stands for the household budget share of each household member's private assignable good. These are goods observable by the researcher from the data and are consumed by only one member of the household. In the SSLC, men's clothing and footwear are identified as the adult male's private assignable good, women's clothing and footwear as the adult female's private assignable good, and children's clothing and footwear as the children's private assignable goods. *y* denotes total household expenditure, η_{ts} the resource share of individual *t* in household type *s*, δ_{ts} represents intercept preference parameters, and $\beta_{ts}$the latent slope preference parameters. Demographic variables such as age and education are suppressed here to simplify notation. In the actual estimation, however, they are allowed to affect intercept and slope preference parameters and resource shares.

Two important restrictions enable identification of Equation 1. First, resource shares η_{ts} and household expenditures *y* are assumed to be independent of each other. While this may seem like a rather restrictive assumption, Menon et al. (2012) and Cherchye et al. (2012), using Italian and Dutch data, respectively, find that it holds. Moreover, other variables that are highly correlated with household expenditures such as income or wealth can be used instead. The second identifying assumption involves invoking at least one of the following

semi-parametric restrictions on the individual budget-share equations, which can be interpreted as Engel curves (Lewbel and Pendakur, 2008). The SAP (Similar Across People) restriction assumes that the tastes of individuals (with respect to their private assignable goods) within a specific household type are similar in certain limited ways. This implies, for instance, that individuals in one-child households have similar tastes in clothing and footwear. As a consequence, β_{ts} is specified as β_s for all *t*. The SAT (Similar Across Types) restriction, in contrast, supposes that the preferences of individuals are similar across household types. For example, under the SAT restriction, fathers would have similar preferences irrespective of the number of children they have. In correspondence, β_{ts} is denoted as β_t for all *s*. If one assumes both SAP and SAT, then β_{ts} becomes β for all *t* and *s*. Importantly, employing SAP, SAT, or both allows resource shares (η_{ts}) of household members to be identified by observing how household expenditures on each member's private assignable good (W_{ts}) vary with total household expenditure (*y*).[1]

3 Empirical Implementation

The first part of this section discusses the data set and the sample of Surinamese households. Summary statistics are also presented. The second subsection discusses model specification and the estimation techniques used to estimate the DLP model.

3.1 Data and Sample Selection

The SSLC is a nationally representative household survey that collects data on various socio-demographic variables to measure and explain social well-being. The survey was undertaken through the collective effort of the Energy Company of Suriname, the Central Bank of Suriname, and the Inter-American Development Bank. Using questionnaires, data are collected on education, health, security, housing, labour supply, consumption patterns, fertility, early childhood development, and migration. This study uses the 2016/2017 round, which surveyed about 2100 households from all 10 districts of the country using a two-stage sampling process. Data were collected over a twelve-month period (October 2016 to September 2017) to capture seasonality.

Due to the private assignable goods that the data set provides, we restrict our sample to nuclear monogamous households that are either male-headed or female-headed. We exclude households consisting of children who are 15 years and over to ensure that clothing and footwear

[1] See the online appendix of DLP for a detailed discussion on the identification of resource shares using this model at http://dx.doi.org/10.1257/aer.103.1.438.

cannot be shared between adults and children.[2] Moreover, individuals aged 15 years and over are deemed to be adults in the SSLC and hence are allowed to enter the labour market. We also exclude obvious outlying observation such as households with extremely high or extremely low total expenditure levels and households with zero food expenditure. Our final sample consists of 298 households (1153 individuals) consisting of couples with 1 to 4 children who are 14 years or younger.

Figure 1: Distribution of Per Capita Household Expenditure

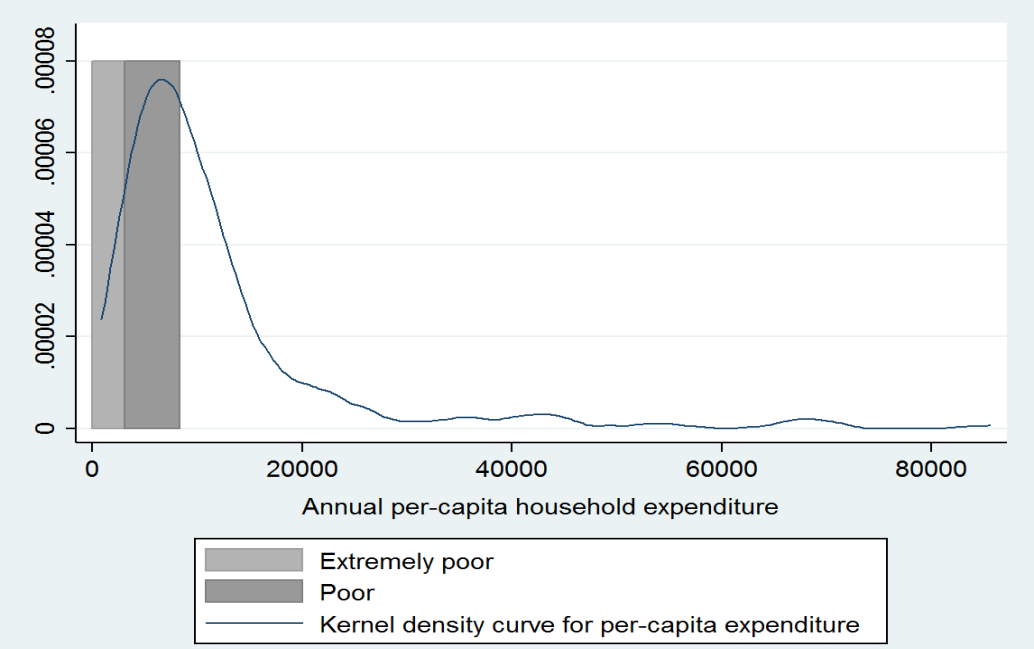

Figure 1 depicts a kernel density distribution of annual consumption per-capita expenditure across households in Suriname. As can be seen, there is considerable wealth inequality among households. Identifying those households with per-capita annual consumption of less than SRD8,295.72 as poor and those with less than SRD3,103.80 as very poor, 43 per cent would be classified as poor, and another 9 per cent as extremely poor. Thus, over half of the households in our sample are considered to be either poor or extremely poor in per-capita terms.

Table 1 presents summary statistics according to household types. While men are generally older than women, women are more likely to have tertiary education. Overall, the more children an adult has, the less likely it is that the adult has tertiary education. Generally, the sample consists of more girls than boys with the average age of 6 for all children within the sample. About 9 percent of the households are female-headed and 6 percent live in the interior region of the country. As expected, larger households tend to be relatively poorer on

[2] Data on health and education expenditures were not considered, as health expenses are only available at the household level and education spending would be negligible for adults.

average. From Table 1, the dollar equivalent[3] of the per-capita expenditure per day of a four-child household is half that of a one-child household.

Table 1: Summary Statistics for Sample by Household Size

	Couples with				All
	1 child	2 children	3 children	4 children	
General characteristics					
Men's age	39.0	38.6	38.4	36.1	38.6
	(11.25)	(8.38)	(9.59)	(5.40)	(9.62)
Women's age	34.5	34.2	34.8	33.7	34.4
	(11.43)	(7.45)	(7.44)	(6.35)	(9.10)
Man has tertiary education	0.18	0.10	0.07	0.20	0.13
	(0.38)	(0.30)	(0.25)	(0.41)	(0.33)
Woman has tertiary education	0.20	0.12	0.09	0.20	0.15
	(0.40)	(0.33)	(0.29)	(0.41)	(0.36)
Proportion of male children	0.48	0.44	0.51	0.53	0.47
	(0.50)	(0.37)	(0.32)	(0.21)	(0.41)
Average age of children	5.20	6.60	7.20	7.40	6.20
	(4.29)	(3.02)	(2.51)	(1.92)	(3.54)
Female-headed household	0.08	0.12	0.02	0.13	0.09
	(0.27)	(0.33)	(0.15)	(0.35)	(0.29)
Household lives in the interior region	0.07	0.06	0.04	0.07	0.06
	(0.26)	(0.25)	(0.21)	(0.26)	(0.24)
Per capita expenditure per day in USD*	5.14	4.13	2.85	2.58	4.25
Budget shares					
Food	0.46	0.46	0.51	0.56	0.47
	(0.17)	(0.19)	(0.17)	(0.16)	(0.18)
Housing	0.21	0.22	0.19	0.19	0.21
	(0.15)	(0.18)	(0.15)	(0.16)	(0.17)
Transportation and communication	0.09	0.07	0.07	0.03	0.08
	(0.13)	(0.08)	(0.11)	(0.04)	(0.11)
Tobacco and alcohol	0.04	0.03	0.03	0.03	0.03
	(0.08)	(0.07)	(0.05)	(0.06)	(0.07)
Men's clothing and footwear	0.01	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Women's clothing and footwear	0.01	0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Children's clothing and footwear	0.01	0.02	0.02	0.02	0.02
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Sample size	114	124	45	15	298

Standard deviations are in parentheses.

*The exchange rate used is $1= 7.445 SRD (Source: Central Bank of Suriname).

With respect to the budget shares for each household type, larger households tend to spend more than half of total expenditure on food. This is not surprising since the budget shares for goods that are largely private (like food) tend to rise as the household size increases. On the other hand, housing, transportation, and communication can be considered to be public

[3] The exchange rate used is the average of monthly rates provided by the Central Bank of Suriname over the period the survey was undertaken.

goods since the budget shares of these goods generally fall as the household size grows. This could also be an indication of the presence of economies of scale to consumption. For the private assignable goods, we expect adult shares to decrease as the number of children increases, as children are known to impose economic costs on their parents or guardians (Bargain et al., 2010; Bargain and Donni, 2012). Although this pattern is clearly seen with women's clothing and footwear, it is not obvious for men's clothing and footwear. It is comforting to see that the budget share used for tobacco and alcohol, which can also be taken as private assignable goods for adults, generally follows the expected pattern. Unsurprisingly, the budget share on children's clothing and footwear increases as the household becomes larger.

3.2 Model Specification and Estimation Method

Assuming exogenous regressors,[4] we estimate Equation 1 using non-linear Seemingly Unrelated Regression (SUR) to allow for the correlation of errors across equations. Estimators are also iterated.

The following 10 socio-demographic variables are used to estimate the model: a dummy indicating the household is located in the interior region of the country, the age of the man minus 39 (the average age of men in the sample), the age of the woman minus 34 (the average age of women in the sample), the average age of children in the household minus 6 (the average age of children in the sample), the proportion of children who are boys, dummies indicating whether the man and woman completed tertiary education, a dummy indicating whether the household owns their home, a dummy indicating whether the household receives rental income, and a dummy indicating whether the household is female-headed.

Let $e = (e1, e2, ..., e10)$ be a vector of these demographic variables and let $g = (g1, ..., g4)$ be a vector of four dummy variables, each indicating a household type. The vector g generally plays the role of a constant for each household type in η_{ts}, δ_{ts}, and β_{ts}. η_{ts} and δ_{ts} are specified as linear in g and e for a total of 14 coefficients each. As already mentioned, β_{ts} is specified according to the semi-parametric restriction imposed on the individual budget share equations. When only SAP is imposed, β_{ts} is specified as linear in b and g for a total of 14 coefficients. When only SAT is imposed, β_{ts} is specified as linear in a constant and e for each of the 3 individual types for a total of 33 coefficients. When both restrictions are imposed, β_{ts} is specified as linear

[4] Similar to DLP, we attempt to carry out a GMM estimation instrumenting for household expenditure and the number of children in the household. Unfortunately, our results do not converge. This is probably due to the small size of the sample.

in a constant and *e* for a total of 11 coefficients.

4 Empirical Results

The main findings of this study are presented and discussed in this section. The first part presents estimates of individual resource shares and the marginal effects of demographic variables for Surinamese households. In the second part, we discuss the implications of these results for poverty.

4.1 Resource Share Estimates

This section presents the results from estimating Equation 1 when both SAP and SAT restrictions are imposed, as this provides the most precise estimates.[5] In the first four rows of Table 2, the levels of resource shares of individuals in representative households are presented. A representative household is one which has all demographic variables equaling zero. In our case, a representative household consists of a man and woman aged 39 and 34, respectively, who have not completed tertiary education and have only female children. The representative household is also headed by a male, is located in the coastal region of Suriname, and does not receive any rental income. The remaining rows show the marginal effects of the 10 demographic variables on resource shares.

From the first four rows of Table 2, we see that women tend to have higher shares of household expenditure than men except in households consisting of three children. It is also clear that both parents bear the cost of children, as resources shares of both men and women decrease appreciably as the number of children in the household rises. Children also tend to have substantial shares of resources allocated to them although the per-capita share for children gradually decreases as the household becomes larger.

Table 2: Resource Share Estimates for Surinamese Households

Variable	Individual type	Estimate	Standard error
One child	man	0.310***	0.090
	woman	0.395***	0.073
	children	0.295***	0.098
	each child	0.295***	0.098
Two children	man	0.258***	0.086
	woman	0.326***	0.077
	children	0.416***	0.095
	each child	0.208***	0.048
Three children	man	0.366**	0.183
	woman	0.211***	0.063
	children	0.423***	0.156

[5] The results from imposing each restriction alone are not robust because of the size of our sample. Households consisting of three and four children are especially few in numbers.

	each child	0.141***	0.052
Four children	man	0.163	0.101
	woman	0.277***	0.097
	children	0.560***	0.123
	each child	0.140***	0.031
Interior region	man	0.175*	0.102
	woman	-0.212***	0.071
	children	0.037	0.104
Man's age	man	-0.011***	0.002
	woman	0.004***	0.001
	children	0.008***	0.001
Woman's age	man	0.007**	0.004
	woman	0.002	0.003
	children	-0.009**	0.004
Average age of children	man	0.01	0.013
	woman	-0.017**	0.007
	children	0.007	0.012
Proportion of male children	man	-0.101	0.074
	woman	0.021	0.050
	children	0.080	0.059
Man completed tertiary education	man	0.399***	0.095
	woman	-0.094	0.073
	children	-0.305***	0.061
Woman completed tertiary education	man	-0.169**	0.077
	woman	-0.076	0.071
	children	0.245***	0.065
Household owns home	man	0.121**	0.066
	woman	-0.016	0.040
	children	-0.105	0.070
Household receives rental income	man	-0.004	0.098
	woman	-0.267***	0.073
	children	0.272**	0.118
Female-headed household	man	-0.229***	0.086
	woman	-0.060	0.092
	children	0.289***	0.096

Standard errors robust to all forms of heteroskedasticity. * p < 0.10, ** p < 0.05, *** p < 0.01

Let us now turn to the demographic variables. First, women who live in the interior region of Suriname tend to have significantly smaller shares of resources allocated to them. Our findings show that 21.2 percent of the woman's share is diverted mainly to the man and then to the children (the effect on children is not statistically significant). The ages of both adults also affect the distribution of resources within the household. Older men tend to divert resources from themselves to other members of the household, while older women seem to divert resources from the children to her spouse and to themselves. On the other hand, a woman who has older children on average appears to have her share of total expenditure reduced by 1.7 percent.

The educational attainment of each adult has opposite effects on the resource shares

of children in the household. Our results show that a man who has tertiary education increases his share of household resources by about 40 percent, where three-quarters of this increase are diverted from children. On the contrary, a woman who has completed tertiary education diverts almost 17 percent of the man's resource share to her children, whose resource shares increase by 24.5 percent. Children are also advantaged with respect to resource shares when the household receives some rental income and when it is headed by a female. In households that receive rental income, almost all of the cost of this increase (27 percent) is borne by the woman. The opposite is true in female-headed households, where most of the cost of increasing the shares of children is borne by the man.

Table 2 also shows that men have higher resource shares when the households owns their home. Lastly, it is important to note that we do not find any evidence of gender bias in our sample since the proportion of boys in the household is not shown to have any statistically significant effect on the distribution of resources.

4.2 Poverty Analysis

Calculating poverty and inequality measures at the individual rather than the household level is one of the main reasons behind the estimation of resource shares. In this subsection, we calculate individual poverty rates using our estimated resource shares and compare them to standard per-capita rates. Table 3 presents average resource shares of individuals and poverty rates for each household type within the sample.

Columns 3 and 4 present the mean and standard deviation of resource shares. Average resource shares provide a wider perspective of resource distribution within all households than the levels of shares in representative households. As distinct from what we find in our reference household, Table 3 shows that men in nuclear households generally tend to have higher resource shares than women. Children also have a substantial share of resources, with per-capita shares decreasing as the number of children increases.

Columns 5 to 8 of Table 3 present estimated poverty rates across household types for the sample, with columns 5 and 6 showing overall poverty rates and 7 and 8 showing extreme poverty rates. While columns 5 and 7 present individual poverty rates based on the resource shares estimated in Table 2, columns 6 and 8 show standard poverty rates using per-capita calculations. The poverty thresholds used are calculated using consumption data from the SSLC itself. For the overall poverty threshold, an adult needs SRD733.10, SRD590.23, and SRD533.27 a month to purchase essential food and non-food items in the Paramaribo district, other coastal areas, and the interior region, respectively. Similarly, for the extreme poverty

threshold, an adult needs SRD265.29, SRD250.48, and SRD206.69 a month to purchase enough food to meet the WHO caloric requirement in the Paramaribo district, other coastal areas, and the interior region, respectively. Since children have fewer needs than adults, we follow the OECD and estimate that children's needs are 60 percent of that of an adult.

With respect to the poverty rates, the patterns are very similar for both overall poverty and extreme poverty. It is clear that individual poverty rates are different from standard per-capita measurements where equal shares are assumed. For instance, for one-child households, standard poverty rates underestimate the poverty rate for men but overestimate that of women and children. A similar scenario is present in households that have two children. In households consisting of a couple and three children, women and children are more likely than men to be poor. It is interesting to see that while 13.3 percent of adults in households with four children are extremely poor, none of the children fall in the same category. In fact, when poverty rates are calculated for all households (in the fifth row), children are found to have the lowest poverty rates.

Table 3: Average Resource Shares and Poverty Rates

		Resource shares		Poor		Extremely poor	
Household type	Individual type	Mean	Standard deviation	Using unequal shares	Using equal shares	Using unequal shares	Using equal shares
One child	man	0.377	0.164	0.368	0.342	0.123	0.096
	woman	0.352	0.101	0.333		0.07	
	children	0.271	0.131	0.307		0.044	
	each child	0.271	0.131				
Two children	man	0.313	0.145	0.427	0.403	0.129	0.089
	woman	0.271	0.087	0.395		0.113	
	children	0.416	0.138	0.298		0.073	
	each child	0.213	0.069				
Three children	man	0.421	0.134	0.2	0.711	0.022	0.067
	woman	0.168	0.069	0.689		0.2	
	children	0.411	0.102	0.622		0.067	
	each child	0.137	0.034				
Four children	man	0.246	0.136	0.333	0.467	0.133	0.133
	woman	0.189	0.082	0.6		0.133	
	children	0.565	0.121	0.4		0	
	each child	0.141	0.03				
All households	man	0.351	0.157	0.366	0.43	0.111	0.091
	woman	0.282	0.111	0.426		0.111	
	children	0.368	0.154	0.356		0.057	
	each child	0.218	0.106				
All persons	all	0.258	0.133	0.393	0.45	0.085	0.09

5 Conclusion

This study investigates the allocation of resources and poverty within households in

Suriname. To this end, it used a collective model estimation framework that enables the allocation of resources among household members and its determinants to be identified. The model is written for a 'standard' husband-wife-child household. The results indicate that women tend to have higher shares of household expenditure than men if the number of children is not too large, although the difference is smaller for women living in households in the interior region of Suriname. Both parents tend to bear the cost of children, but this cost falls as the number of children rises, possibly due to economies of scale in children's goods. Education plays a different role across adults according to their gender. Specifically, a more educated male tends to divert resources away from the children, while his female counterpart tends to spend more on children. A similar pattern arises when the household is headed by a woman rather than a man. Nevertheless, while there are clear differences in the gender allocation of resources at the adult level, there appears to be no gender bias in terms of expenditure for girls and boys.

Our estimation results also allow us to calculate individual poverty rates among members of Suriname households. This provides evidence that simple per-capita calculations assuming equal shares can be misleading. The results show, not surprisingly given the allocation patterns found, that men are on average better off in per-capita terms than women. Reassuringly, children appear to have the lowest poverty rates.

References

Alderman, H., P.-A. Chiappori, L. Haddad, J. Hoddinott, and R. Kanbur. 1995. Unitary versus Collective Models of the Household: Is it time to shift the burden of proof? *The World Bank Research Observer 10*(1): 1–19.

Apps, P. F. and R. Rees. 1988. Taxation and the Household. *Journal of Public Economics 35*(3): 355–369.

Bargain, O. and O. Donni. 2012. Expenditure on children: A Rothbarth-type method consistent with scale economies and parents' bargaining. *European Economic Review 56*(4): 792–813.

Bargain, O., O. Donni, and M. Gbakou (2010). The Measurement of Child Costs: Evidence from Ireland. *The Economic and Social Review 41*(1): 1–20.

Bargain, O., O. Donni, and P. Kwenda. 2014. Intrahousehold Distribution and Poverty: Evidence from Côte d'Ivoire. *Journal of Development Economics 107*: 262–276.

Becker, G. S. 1964. *Human Capital*. New York, NY: Columbia University Press.

_____. 1965. A Theory of the Allocation of time. *The Economic Journal 75*(299): 493– 517.

Browning, M., F. Bourguignon, P.-A. Chiappori, and V. Lechene. 1994. Income and Outcomes: A Structural Model of Intrahousehold Allocation. *Journal of Political Economy 102* (6): 1067–1096.

Browning, M., P.-A. Chiappori, and A. Lewbel. 2013. Estimating Consumption Economies of Scale, Adult Equivalence Scales, and Household Bargaining Power. *Review of Economic Studies 80*(4): 1267–1303.

Cherchye, L., B. De Rock, and F. Vermeulen. 2012. Married with Children: A Collective Labor Supply Model with Detailed Time Use and Intrahousehold Expenditure Information. *American Economic Review 12*(7): 3377–3405.

Chiappori, P.-A. 1988. Rational Household Labor Supply. *Econometrica 56*(1): 63–90.

Chiappori, P.-A. 1992. Collective Labor Supply and Welfare. *Journal of Political Economy 100*(3): 437–467.

Chiappori, P.-A., B. Fortin, and G. Lacroix. 2002. Marriage Market, Divorce Legislation, and Household Labor Supply. *Journal of Political Economy 110*(1): 37–73.

Chiappori, P.-A. and C. Meghir. 2014, May. Intrahousehold Inequality. Cowles Foundation Discussion Papers 1948. Cowles Foundation for Research in Economics, Yale University.

Dunbar, G. R., A. Lewbel, and K. Pendakur. 2013. Children's Resources in Collective

Households: Identification, Estimation, and an Application to Child Poverty in Malawi. *American Economic Review 103*(1), 438–471.

IDB (Inter-American Development Bank). 2017. Inter-American Development Bank Group Country Strategy with the Republic of Suriname: 2016-2020. Washington, DC: IDB.

Lewbel, A. and K. Pendakur. 2008. Estimation of Collective Household Models with Engel Curves. *Journal of Econometrics 147*(2): 350 – 358.

Manser, M. and M. Brown. 1980. Marriage and Household Decision-Making: A Bargaining Analysis. *International Economic Review 21*(1): 31–45.

McElroy, M. B. and M. J. Horney. 1981. Nash-bargained Household Decisions: Toward a Generalization of the Theory of Demand. *International Economic Review 22*(2): 333–349.

Menon, M., K. Pendakur, and F. Perali. 2012. On the Expenditure-Dependence of Children's Resource Shares. *Economics Letters 117*(3): 739–742.

Vermeulen, F. 2002. Collective Household Models: Principles and Main Results. *Journal of Economic Surveys 16*(4): 533–564.