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Three essays on intra-household distribution of resources and poverty

Maira Colacce

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POUR OBTENIR LE GRADE DE

DOCTEUR DE L'UNIVERSITÉ DE BORDEAUX

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SPÉCIALITÉ SCIENCES ÉCONOMIQUES

Par Maira COLACCE

TROIS ESSAIS SUR LA RÉPARTITION DES RESSOURCES AU SEIN
DES MÉNAGES ET LA PAUVERTÉ

THREE ESSAYS ON INTRA-HOUSEHOLD DISTRIBUTION OF
RESOURCES AND POVERTY

Sous la direction de : **Olivier BARGAIN**

Soutenue le 4 juillet 2024

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TROIS ESSAIS SUR LA RÉPARTITION DES RESSOURCES AU SEIN DES MÉNAGES ET LA PAUVERTÉ

Résumé :

Cette thèse analyse les modèles d'inégalités intra-ménage dans les pays non développés et la manière dont ils sont affectés par la culture et les politiques. À l'aide d'enquêtes sur les dépenses des ménages, j'utilise un modèle collectif pour analyser la répartition de la consommation des ménages et ses moteurs, et pour évaluer ses implications pour la pauvreté individuelle. Dans le premier chapitre, je présente des résultats inédits sur la répartition des ressources au sein des ménages dans 45 pays à revenu faible ou intermédiaire. Les résultats révèlent que les femmes sont presque deux fois plus pauvres que les hommes à l'échelle mondiale, et que les enfants sont encore plus démunis. En outre, les disparités au sein des ménages sont plus prononcées dans les pays pauvres et, au sein des pays, parmi les ménages pauvres. Dans le deuxième chapitre, je cherche à savoir si les coutumes de résidence post-matrimoniale fondées sur la parenté - en particulier la patrilocalité (résidence avec les parents du marié) et la matrilocité (résidence avec les parents de la mariée) - continuent d'influencer le partage de la consommation des ménages et les niveaux de pauvreté individuels au Ghana et au Malawi. L'analyse indique que la patrilocalité ancestrale, comparée à la matrilocité, correspond à une allocation réduite des ressources aux femmes et à une incidence notablement plus élevée de la pauvreté chez les femmes pour les différents niveaux de consommation des ménages. Dans le troisième chapitre, j'examine l'impact du plus grand programme d'aide sociale de l'Uruguay, qui cible les familles pauvres avec enfants et qui est versé aux femmes. En utilisant un modèle de discontinuité de la régression dans un cadre d'estimation structurelle, je constate une augmentation significative de l'allocation des ressources aux femmes éligibles dans les zones rurales, sans effets sur les enfants. Je traduis ces résultats en termes de pauvreté individuelle : tous les membres de la famille bénéficient de l'effet de revenu, mais l'effet de négociation réduit encore plus la pauvreté des femmes.

Mots-clés : Décisions au sein des ménages, pauvreté individuelle, modèle collectif, règle de partage, normes culturelles, transferts monétaires

THREE ESSAYS ON INTRA-HOUSEHOLD DISTRIBUTION OF RESOURCES AND POVERTY

Abstract: This dissertation analyzes the patterns of intra-household inequalities in non-developed countries and how they are affected by culture and policies. Using household expenditure surveys, I employ a collective model to analyze household consumption allocation and its drivers, and to assess its implications for individual poverty. In the first chapter, I present novel findings on intra-household resource distribution for 45 low- and middle-income countries. The results reveal that women are nearly twice as poor as men on a global scale, with children experiencing even greater deprivation. Furthermore, intra-household disparities are more pronounced in poor countries and, within countries, among poor households. In the second chapter, I investigate whether kinship-based post-marital residence customs—specifically, patrilocality (residing with the groom’s parents) and matrilocality (residing with the bride’s parents)—continue to influence household consumption sharing and individual poverty levels in Ghana and Malawi. Analysis indicates that ancestral patrilocality, compared to matrilocality, corresponds with reduced resource allocation to women and a notably higher incidence of poverty among women across various household consumption levels. In the third chapter, I examine the impact of Uruguay’s largest social assistance program, which targets poor families with children and paid to women. Employing a regression discontinuity design within a structural estimation framework, I find a significant increase in resource allocation to eligible women in rural areas, with no effects on children. I translate these results into terms of individual poverty: all family members benefit from the income effect, but the bargaining effect reduces women’s poverty even more.

Keywords: Intra-household decisions, Individual poverty, Collective Model, Sharing rule, Cultural norms, Cash transfers

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To my daughters, Juana and Antonia

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that we can all be who we want to be.

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Contents

Introduction	1
1 Global Evidence on Gender Gaps and Child Poverty in Consumption	4
1.1 Introduction	4
1.2 Empirical Strategy	7
1.2.1 Identification of Individual Resource Shares	7
1.2.2 Household Expenditure Data and Key Variables	10
1.3 Results	14
1.3.1 Patterns of Intra-Household Inequality	14
1.3.2 Implication for Individual Poverty	17
1.3.3 Cross-Validation with Nutrition	20
1.3.4 Additional Sensitivity Analyses	23
1.4 Concluding Remarks	26
1.5 Appendix	27
1.5.1 Estimation Procedure and Endogeneity	27
1.5.2 Data Sources and Descriptive Statistics	28
1.5.3 Detailed Estimates of the Resource Share Functions	38
1.5.4 Pattern of Intra-Household Inequality: Estimates, Literature and Checks	41
1.5.5 Implication for Individual Poverty: Checks and Additional Results	45
1.5.6 Cross-Validation: Checks and Additional Results	49
2 Culture, Intra-household Distribution and Individual Poverty	53
2.1 Introduction	53
2.2 Background	55
2.2.1 Existing Literature	55
2.2.2 Traditional Norms in Ghana and Malawi	57
2.3 Empirical strategy	59
2.3.1 Identification of the Resource Allocation Process	59
2.3.2 Specification and Estimation Method	61
2.3.3 Expenditure Data and Key Variables	62
2.3.4 Cultural Data and Matching Procedures	63

2.3.5	Summary Statistics	64
2.4	Results	65
2.4.1	Baseline Resource Share Estimations	65
2.4.2	Robustness Checks and Age Heterogeneity	69
2.4.3	Cultural Norms and Individual Poverty	71
2.5	Concluding remarks	74
2.6	Appendix	75
2.6.1	Estimation Procedure and Endogeneity	75
2.6.2	Geographic Matching Procedure	75
2.6.3	Additional Results	77
3	Gender-Targeted Policies and Intra-household Resource Allocation: A Structural RDD	
	Approach	83
3.1	Introduction	83
3.2	Institutional Background	86
3.3	Empirical Strategy	88
3.3.1	Resource Share Estimations	88
3.3.2	Specification and Estimation Method	91
3.3.3	Data and Selection	93
3.3.4	First Inspection of Data	94
3.4	Results	95
3.4.1	Baseline Estimates	95
3.4.2	RDD-Type of Robustness Checks	98
3.4.3	Sensitivity Analysis	100
3.4.4	Implications for Individual Poverty	104
3.5	Concluding Remarks	107
3.6	Appendix	109
3.6.1	Model with Children as Public Goods	109
3.6.2	Additional Results	110
	General Conclusion	124
	Bibliography	138
	List of Tables	140
	List of Figures	141

Introduction

Poverty estimates are commonly based on per-capita measures of household welfare; however, poverty is inherently experienced at the individual level rather than at the household level. Despite offering significant methodological advantages, such as simplicity and cross-country comparability, per-capita measures essentially fail to account for important elements that shape how poverty is experienced individually. In particular, this approach does not capture within-household inequality. There is growing evidence that the presence of intra-household inequality derives in a large share of poor individuals, generally women and children, living in non-poor households (Brown et al.; 2019a; Haddad and Kanbur; 1990a,b; World Bank; 2018). Ignoring intra-household inequalities may significantly impair the assessment of countries' relative achievements in terms of child- or gender-specific poverty and the effect of policies on individual rather than household poverty.

The main objective of my dissertation is to analyze the patterns of intra-household inequalities in non-developed countries and how they are affected by culture and policies. This allows me to measure poverty at the individual level (for men, women and children). An increasingly used strategy in the literature, inherited from the collective models (Chiappori; 1992), is to retrieve the household's resource sharing between men, women and children (Bargain and Donni; 2012; Dunbar et al.; 2013) that can be used to infer individual measures of poverty, the effects of cultural traits (Calvi and Keskar; 2021), and impact of policies (Belete; 2021; Tommasi; 2019). This approach is based on simple restrictions on individual preferences and the observation of some exclusive or assignable goods, i.e. spending that can be ascribed as exclusively for the benefit of one type of person. The complete allocation rule can be retrieved and the estimated shares of resources accruing to each person used to compute children's, men's, and women's individual poverty status. In the absence of surveys collecting all the information about resource sharing, this approach is the main available solution to evaluate individual consumption and living standards.¹

¹Some studies rely on the direct observation of *some* of the individual expenditures (such as food, e.g. in Brown et al. 2021 or D'Souza and Tandon 2019). Yet, it gives only a partial view of the reality of women's control over household resources and the consequences for individual poverty. Fully individualized expenditure data is costly and rare. An exception is a dataset from Bangladesh used in Bargain, Lacroix and Tiberti (2022) to validate the present approach by comparing observed and estimated resource shares.

In Chapter 1, which is joint work with Ulugbek Aminjonov and Olivier Bargain, we estimate the intra-household distribution of resources for 45 low- and middle-income countries to provide a global mapping of gender inequality and child poverty that is consistent and comparable across countries. It shows a frequent imbalance in adults, with women getting a significantly smaller share of resources than men resulting in women experiencing poverty almost twice more than men. Children are much poorer. Child resources are lowest in poor countries (or in poor households within countries), which is consistent with higher fertility rates in poor settings, i.e. an unfavorable child quality-quantity trade-off. Translated into individual poverty terms, these results mean that child poverty declines more slowly than adult poverty as living standards begin to rise, so the child-adult poverty gap is largest for countries in intermediate positions in our sample. Sensitivity analyses show that this gap can be explained only partly by differences in needs and, to a lesser degree, by economies of scale among siblings (such as the reuse of clothing). Even when incorporating both dimensions, significant child-adult poverty gaps persist for a substantial number of countries. Finally, we provide cross-validation checks between consumption and nutrition. Precisely, we show how child undernutrition and child poverty in consumption correlate across living standards, at the macro level and at the household level for a subset of countries. We emphasize the fact that child undernutrition is not only due to low household consumption levels but also to the degree of intra-household inequality exacerbating child deprivation.

In Chapter 2, in joint work with Ulugbek Aminjonov, Olivier Bargain and Luca Tiberti, we study whether kinship ancestries of post-marital residence – i.e. living with the parents of the groom (patrilocality) or the bride (matrilocality) – still affect household consumption sharing and individual poverty. We use household consumption surveys that can be matched to kinship traditions of post-marriage residence reported in the Ethnographic Atlas. The norm is introduced as an original determinant of the resource allocation function and we derive its implications in terms of individual poverty and gender inequality. Our application focuses on Ghana and Malawi, two countries in which both patrilocality and matrilocality norms are present. Exploiting within-country ethnic variation, our estimations show that women's resource shares decrease with patrilocality. This result is a common feature in both countries. This gender bias in consumption is interpreted as the general distributional effect of ancestral norms, which may correspond to differences in bargaining power or simply to cultural values inherited from the factors that have shaped these norms. It leads to large differences in poverty between women in the patrilocal and matrilocality groups, on average and across a large part of the household consumption distribution. Children's resource shares show less systematic patterns but tend to decrease with patrilocality in Ghana. Finally, we find that, unlike other cultural contexts (such as India), women's control over resources tends to increase with age. In Ghana especially, age and ethnic norms are mutually reinforcing.

Last, in Chapter 3 I assess, together with Olivier Bargain, the effect on intra-household distribu-

tion of a large conditional cash transfer paid to women in Uruguay (AFAM). Many cash transfer programs explicitly aim to influence the distribution of resources within households and alleviate child poverty by empowering women. However, households' own decision-making rules may defeat the objectives of redistributive policies targeted at specific individuals, and we still have limited and mixed evidence on the intra-household effect of cash transfers. We propose an original methodology design, embedding a Regression Discontinuity Design (RDD) in the structural estimation of resource shares using a household expenditure survey in which we replicate the poverty score. This allows us to measure the AFAM intention-to-treat effects on men's, women's and children's individual resources and, consequently, in individual poverty. Thus, we can assess whether a gender-targeted CCT affects women's empowerment (proxied as their share of household resources), and children's wellbeing. Results show that AFAM reduces household poverty with larger effects for women via the bargaining effect generated by gender-targeting. We present suggestive evidence of an overall positive effect of AFAM on women's resource shares. These results are driven mainly by a strong effect on rural households, consistent with these areas being less progressive in terms of gender empowerment and attitudes than the rest of the country. However, we do not find effects of AFAM on children's shares. Our estimations evidence that poor households in Uruguay already allocate a large share of resources to children. Thus, the marginal utility of spending extra money on children is lower than spending it on adults.

This dissertation thesis yields several significant contributions to the field. Our comprehensive international analysis of intra-household resource allocation represents a novel endeavor, offering a broad-scale estimation of gender disparities in consumption and child-specific poverty. Through this mapping, we uncover pervasive patterns of gender and age inequalities, illuminating diverse relationships between intra-household inequities and individual poverty levels across economies at varying stages of development. Additionally, our research encompasses two focused studies that explore the influence of specific determinants on the allocation of resources within households, conducted in diverse contexts. They show how intrahousehold allocation of resources can be shaped by ancestral cultural traits and social programs. Taken together, our findings highlight the importance of intra-household inequalities and the relevance individual poverty.

Chapter 1

Global Evidence on Gender Gaps and Child Poverty in Consumption

1.1 Introduction¹

Global poverty estimates typically rely on per-capita measures of household welfare. Despite offering significant methodological advantages, such as simplicity and cross-country comparability (Ferreira et al.; 2016), this approach essentially fails to account for important elements that shape how poverty is experienced individually (Lanjouw and Ravallion; 1995). First, the per-capita approach does not capture within-household inequality. This is problematic given the growing evidence that disparities within households account for a substantial share of overall inequality.² Ignoring intra-household inequalities may significantly impair the assessment of countries' relative achievements in terms of child- or gender-specific poverty. Second, the per-capita approach overlooks differences in needs among household members,³ and does not consider economies of scale in multi-person households (while the gains from joint consumption tend to change patterns of global poverty, cf. Jolliffe and Baah; 2024; Batana et al.; 2013).

This chapter proposes to address the first point more systematically than the existing literature, while the second set of issues will be tackled through sensitivity analyses. Precisely, we estimate the intra-household distribution of resources for a large number of low- and middle-income countries (plus a few richer Latin American countries). Our main motivation is the following: while

¹This chapter is joint work with Ulugbek Aminjonov and Olivier Bargain.

²The evidence relied first on nutritional data because it allows comparison of the caloric intakes of different household members with their (age- and gender-specific) requirements. Intra-household inequality in nutrition has been observed in Haddad and Kanbur (1990a,b), Haddad and Hoddinott (1994), Hoddinott and Skoufias (2004), D'Souza and Tandon (2019) and Brown et al. (2019a) for specific countries.

³There are possibly many reasons for this, including the lack of reliable information on family composition for some countries (in surveys and for the administrations responsible for implementing social programs), the fact that the estimates of relative child needs are not very stable, or the fact that these estimates tend to refer only to nutrients (Lanjouw and Ravallion; 1995; Deaton; 1997; Blundell and Lewbel; 1991; Ravallion; 2015).

there is some evidence that women often get less than an equal share of household resources (World Bank; 2018), very few studies have systematically investigated gender inequalities in individual consumption across many countries. Similarly, while children may not receive a fair share of household resources, there is no global mapping of child poverty based on the levels of resources actually accruing to them. In particular, poverty gaps between children and adults may reflect consumption inequalities in contexts where fertility choices (the quantity-quality trade-off) work to the disadvantage of children.⁴

To provide global patterns of gender inequality and child poverty, we mobilize expenditure surveys for a large number of countries. We start with intensive data work to assess the frequency with which sharing rule estimation methods (following Browning et al.; 2013) can be carried out. This leads to a selection of countries for which expenditure data and basic demographics can be reliably exploited. In particular, a central requirement is that surveys contain, in addition to total household expenditure, spending on "exclusive" goods, i.e. goods consumed exclusively by men, women or children. For this, we rely on clothing as an assignable good, since a majority of consumption data record clothing expenditure for adult men, adult women and children separately. With these data and simple restrictions on individual preferences, the resource-sharing function can be recovered in the case of nuclear households (Dunbar et al.; 2013) or more complex family compositions (Bargain, Lacroix and Tiberti; 2022). Under these conditions, we are able to estimate individual resources and therefore the specific poverty level of men, women and children in 45 (mostly) low- and middle-income countries.⁵

The result is a global mapping of gender inequality and child poverty that is consistent and comparable across countries. It shows a frequent imbalance in adults, with women getting a significantly smaller share of resources than men in a majority of countries and on average (-20%). As a result, women experience poverty almost twice more than men (an international average of 12.4% versus 6.8% at the \$1.9/day line). Children are much poorer (their average poverty rate is four times that of women without needs adjustment but still above 18% when assuming extremely low child needs compared to adults). Child resources are lowest in poor countries (or in poor households within countries), which is consistent with higher fertility rates in poor settings, i.e. an unfavorable child quality-quantity trade-off. Translated into individual poverty terms, these results mean that child poverty declines more slowly than adult poverty as living standards begin to rise, so the child-adult poverty gap is largest for countries in intermediate positions in

⁴With the per-capita approach, children appear twice poorer than adults (World Bank and Unicef; 2020) but this is simply because they disproportionately live in poor households (Chen and Ravallion; 2010), i.e. poor households tend to have more children. This mechanical child-adult poverty gap partly disappears when difference in needs is taken into account (Batana et al.; 2013).

⁵Note that the World Bank has developed the Global Income Distribution Dynamics (GIDD) dataset, which also combines household-level survey data for 121 countries and has been used to estimate global poverty rates for children and adults (Batana et al.; 2013). Yet, we cannot evaluate the feasibility of resource share estimations with this global dataset due to restricted access and, as far as we know, the dataset does not records consumption data for exclusive/assignable goods.

our sample. Sensitivity analyses show that this gap can be explained only partly by differences in needs and, to a lesser degree, by economies of scale among siblings (such as the reuse of clothing). Even when incorporating both dimensions, significant child-adult poverty gaps persist for a substantial number of countries. Finally, we provide cross-validation checks between consumption and nutrition. Precisely, we show how child undernutrition and child poverty in consumption correlate across living standards, at the macro level and at the household level for a subset of countries. We emphasize the fact that child undernutrition is not only due to low household consumption levels but also to the degree of intra-household inequality exacerbating child deprivation. The concluding section draws important measurement and policy implications from these results.

This chapter makes several contributions. *First*, international comparisons of gender inequality and child poverty usually focus on broad indicators at the household level, i.e. using the per-capita approach. Our study is, we believe, an original attempt to estimate gender gaps in consumption and child-specific poverty extensively and at a large scale. *Second*, the rare studies that focus, like us, on women’s and children’s welfare within households are typically based on specific measures readily available at the individual level, such as nutrition.⁶ This is the case in public health studies suggesting global comparisons of child nutrition (such as [Bredenkamp et al.; 2014](#)) or economic papers, such as [Brown et al. \(2019a\)](#), which illustrates intra-household inequality using nutrition data for more than 30 African countries. Alternatively, and in complementary ways, our international comparison of child- and women-specific levels of deprivation is based on individual consumption. Since undernutrition partly pertains to low access to resources, leading to insufficient caloric and protein intake ([Steckel; 1995](#)), we also suggest some cross-validation between nutrition and consumption measures. *Third*, the wide international range of living standards for which we report results allows us to comment on the relationship between intra-household inequality and individual poverty across economies at different stages of development. Thus, we contribute to the discussion initiated by [Jayachandran \(2015a\)](#) about whether intra-household inequality narrows as countries grow or whether it is the case that many countries that are poor today happen to have cultural norms that exacerbate favoritism toward males. *Fourth*, this chapter provides a data-intensive contribution to assessing how often, among all publicly available expenditure surveys for poor and middle-income countries, a collective consumption model identified through assignable goods can be operationalized. It also contributes to the recent validation effort, which has compared resource share estimates with actual resource shares in rare surveys when consumption is fully individualized (see [Bargain, Lacroix and Tiberti; 2022](#)). Here we rely on nutrition proxies (child wasting and stunting), which tend to be consistent

⁶An exception is [Bose-Duker et al. \(2021\)](#), which contains an estimation of resource shares for 6 countries. Other international comparisons use broader human capital variables, focusing on health ([Kennedy et al.; 2020](#)), education ([Klasen and Lamanna; 2009](#)) or both (e.g. [Alkire and Foster; 2011](#) for gender gaps or [Alkire et al.; 2019](#) for child poverty). These are important dimensions but quite different from monetary measures of individual poverty as derived here.

with low access to per-person consumption both at the country level and the micro level.

The rest of the chapter is structured as follows. Section 2 describes the empirical strategy and the data used in the estimation of intra-household resource allocation. Section 3 presents our main results on resource shares and individual poverty, and provides the cross-validation of estimated resource shares and nutrition measures for children. Section 4 concludes.

1.2 Empirical Strategy

1.2.1 Identification of Individual Resource Shares

Our approach belongs to the broad family of collective household models. These models, unlike the unitary approach, account for the bargaining process underlying household decisions (Bourguignon and Chiappori; 1992) and ultimately allow recovering the intra-household allocation of resources (Browning et al.; 2013). Initially, this approach assumed that households make efficient decisions (Chiappori; 1988), which rationalizes the decentralization of the household decision process leading to a sharing rule interpretation.⁷ While efficiency is questionable, especially in the context of poor countries (Browning et al.; 2013), it turns out not to be necessary to justify our approach. Efficiency is just a commonly accepted way to support a sharing rule interpretation but probably not the only one (see Lewbel and Pendakur; 2022). Thus, we simply assume the existence of a rule governing the distribution of resources in the household and follow recent studies (Browning et al.; 2013; Bargain and Donni; 2012; Dunbar et al.; 2013; Bargain, Donni and Hentati; 2022), which suggest a tractable and transparent framework to identify it using household-level consumption data, assignable goods and preference restrictions.

Sharing Rule and Notations. Let us now introduce some notations. Denote x the log of total private expenditure and $\eta_{i,s}(z')$ the share of total private expenditure $\exp(x)$ accruing to each group of individuals $i = m, f, c$, i.e. men, women, and children, in a household of composition s . Household composition corresponds to the number s_i of persons of each type i , stacked in the vector $s = (s_m, s_f, s_c)$. Resource shares depend on several factors, denoted by vector z' , including household demographic characteristics. We ignore dependence on price variation as our set-up is static, i.e. all the households of a given country at a point in time are assumed to face the same price vector (Lewbel and Pendakur; 2008). Each person of type i in a family of composition s is assumed to consume private resources $x_{i,s} = x + \ln \eta_{i,s} - \ln s_i$, written in log terms, which we later use to calculate individual poverty. From this expression, we make explicit the fact that all the persons of the same type obtain the same share, i.e. we identify only the total resource share of each person type $i = m, f, c$ but not the shares of specific individuals (e.g. girls) within

⁷This is a direct application of the Second Welfare Theorem (Chiappori; 1992). That is, household decisions are as if total resources were first shared among household members and then each individual decides about her consumption bundle based on her resources and preferences.

a person type (e.g. children). This is merely a data limitation but it means that we will slightly underestimate the scope of intra-household inequality.⁸ This is not really an impediment as we focus mainly on gender gaps among adults and on overall child poverty. Moreover, by including the proportion of boys (among all children) in z^r , we can capture whether the resource shares for children are biased in favor of boys, i.e. a gender gap among children (see [Dunbar et al.; 2013](#); [Bargain et al.; 2018](#)).

Structural Engel Curves at Individual and Household Levels. We opt for a semi-parametric identification as in [Dunbar et al. \(2013\)](#). Assuming Piglog indirect utility functions for each individual ([Deaton and Muellbauer 1980](#)), we obtain *individual* Engel curves that are linear in the logarithm of individual resources. That is, the *individual budget share* for a good k consumed by each individual of type i in a household of type s is written:

$$w_{i,s}^k = \alpha_{i,s}(z^p) + \beta_{i,s}(z^p) \cdot x_{i,s}(z^r), \quad (1.1)$$

with preference shifters z^p and sharing rule determinants z^r . The key data requirement for the identification of resource shares is the presence of exclusive goods, i.e. goods consumed only by one specific demographic group (ex: tobacco for adults), or assignable goods (ex: clothing, the consumption of which can often be distinguished between men, women and children). We index these exclusive/assignable goods k_m, k_f, k_c for men, women, and children, respectively. For instance, if k_f corresponds to women's clothing, $w_{f,s}^{k_f}$ is the proportion that each woman spends from her own resources $\exp(x_{f,s})$ on female clothing. From the structure placed on individual demand in equation (3.1), we can derive *household* Engel curves. For example, in a nuclear household, if we multiply $w_{f,s}^{k_f}$ by $\eta_{f,s} = \exp(x_{f,s})/\exp(x_s)$, we obtain the level of spending on the woman's clothing as a fraction of total expenditure, i.e., the *family budget share* on that good, denoted $W_s^{k_f}$. Thus, we can write a system of household budget shares for exclusive goods k_i , $i = m, f, c$:

$$\begin{aligned} W_s^{k_m} &= \eta_{m,s}(z^r) \cdot (\alpha_{m,s}(z^p) + \beta_{m,s}(z^p) \cdot (x + \ln \eta_{m,s}(z^r) - \ln s_m)) \\ W_s^{k_f} &= \eta_{f,s}(z^r) \cdot (\alpha_{f,s}(z^p) + \beta_{f,s}(z^p) \cdot (x + \ln \eta_{f,s}(z^r) - \ln s_f)) \\ W_s^{k_c} &= \eta_{c,s}(z^r) \cdot (\alpha_{c,s}(z^p) + \beta_{c,s}(z^p) \cdot (x + \ln \eta_{c,s}(z^r) - \ln s_c)) \end{aligned} \quad (1.2)$$

where the left-hand terms are observed.

Restrictions and Identification. We need to retrieve the key elements from the estimation of a reduced form of the above system, i.e., from the estimation of family budget shares (for exclusive goods) on log expenditure. Note that the men's resource share can be written as the residual to

⁸To derive resource sharing among siblings or among women of different age groups, for instance, one would need to observe the expenditures of goods exclusively consumed by these sub-groups of persons (by boys vs. girls, by young adult women vs. older adult women).

one of the women's and children's shares, i.e. $\eta_{m,s} = 1 - \eta_{f,s} - \eta_{c,s}$, and is automatically recovered once women's and children's shares are. Hence, the derivatives with respect to log expenditure of the system above yield:

$$\begin{aligned}\partial W_s^{k_f} / \partial x &= \eta_{f,s}(z^r) \cdot \beta_{f,s}(z^p) \\ \partial W_s^{k_c} / \partial x &= \eta_{c,s}(z^r) \cdot \beta_{c,s}(z^p) \\ \partial W_s^{k_m} / \partial x &= (1 - \eta_{f,s}(z^r) - \eta_{c,s}(z^r)) \cdot \beta_{m,s}(z^p)\end{aligned}\tag{1.3}$$

for each s out of a total of S different household types (family compositions). The left-hand derivatives are observed, at least when household Engel curves are not flat, which is an applicability condition that we check in the empirical analysis. The system above have $3S$ equations and $5S$ unknowns ($\eta_{f,s}, \eta_{c,s}, \beta_{m,s}, \beta_{f,s}$ and $\beta_{c,s}$ for each s). Here the identification of resource shares requires additional restrictions on the preference terms $\beta_{i,s}$. We rely on the Similarity Across People (SAP) assumption suggested by [Dunbar et al. \(2013\)](#), which states that for exclusive goods, the shape of individual Engel curves is similar across person types $i = m, f, c$ of a given household type s . Formally, SAP is written as: $\beta_{m,s} = \beta_{f,s} = \beta_{c,s} = \beta_s$ for each s . It yields $3S$ unknowns in total ($\eta_{f,s}, \eta_{c,s}$ and β_s for each s) and, hence, an exact identification. Note that SAP is a commonly used preference restriction in the demand literature and a weaker version of shape-invariance defined by [Lewbel \(2010\)](#) and has been tested in recent studies. Using direct observations of resource shares in microdata for Bangladesh, [Bargain, Lacroix and Tiberti \(2022\)](#) tends not to reject SAP for clothing.⁹

Specification and Estimation Method. The semi-parametric approach provides the log-linear specification of Engel curves derived from Piglog preferences, as written in equation (3.1). We model resource shares using logistic functions to guarantee that the shares are in range $(0, 1)$ and sum up to 1. To estimate the model, we add error terms to household Engel curves for men's, women's, and children's exclusive goods in the demand system (3.5) and impose the SAP condition. That is, we estimate the system:

$$\begin{aligned}W_s^{k_m} &= \eta_{m,s}(z^r) \cdot (\alpha_{m,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{m,s}(z^r) - \ln s_m)) + \epsilon_{m,s} \\ W_s^{k_f} &= \eta_{f,s}(z^r) \cdot (\alpha_{f,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{f,s}(z^r) - \ln s_f)) + \epsilon_{f,s} \\ W_s^{k_c} &= \eta_{c,s}(z^r) \cdot (\alpha_{c,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{c,s}(z^r) - \ln s_c)) + \epsilon_{c,s}\end{aligned}\tag{1.4}$$

⁹Other tests hinge on indirect methods, i.e. start from alternative identification approaches that do not require SAP and test it as a restriction. This is notably the case using identification based on distribution factors in [Dunbar et al. \(2021\)](#) and [Brown et al. \(2021\)](#), with a relative support for SAP using data from Malawi and Bangladesh respectively.

with

$$\eta_{f,s} = \exp(\gamma_f z^r)/D, \eta_{c,s} = \exp(\gamma_c z^r)/D, \eta_{m,s} = 1/D$$

and $D = 1 + \exp(\gamma_f z^r) + \exp(\gamma_c z^r)$.

Since the error terms of the model are likely to be correlated across equations, each system is estimated using Non-Linear Seemingly Unrelated Regressions. Details about the estimation procedure are explained in Appendix 1.5.1. To maximize the number of countries in our analysis and for the sake of comparability, we have kept the specification of the model parsimonious. Engel curve parameters $\alpha(z^p)$ and $\beta(z^p)$ vary with preference shifters z^p that include household composition (namely s_m, s_f, s_c) and an urban dummy. For the sharing rule, we specify the logistic form with a set z^r of variables equivalent to z^p , i.e. including household composition and a urban dummy, plus other demographic characteristics, namely the average age of each person type and the proportion of boys among the children. We systematically apply this specification, with the same set of variables, across all countries in our database, with few exceptions.¹⁰

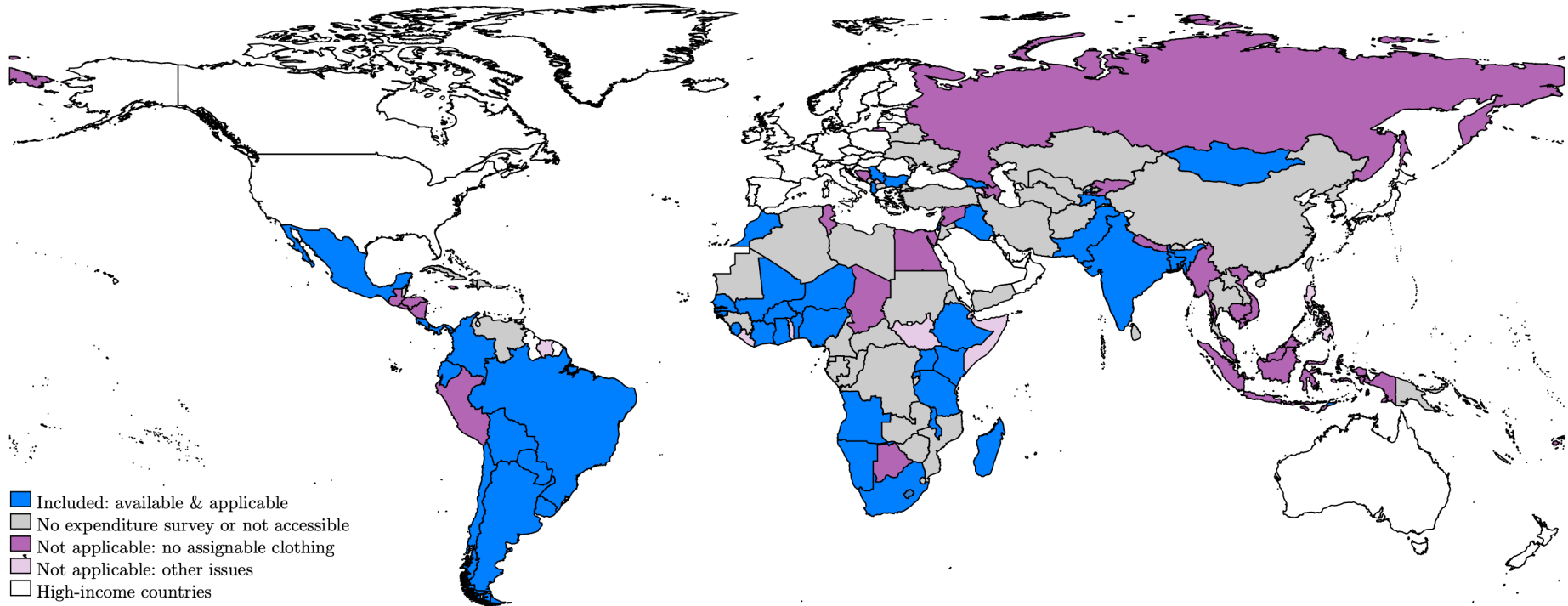
1.2.2 Household Expenditure Data and Key Variables

Country and Data Selection. As mentioned in the introduction, the selection of countries in our sample is exclusively based on the availability of household expenditure surveys that allow the estimation of the model described above. We identified expenditure surveys for 126 low- and middle-income countries, plus a few richer countries in Latin America, of which 81 have accessible microdata and data documentation. A key element for the identification of individual resource shares is the availability of expenditure data on goods that are exclusive to men, women, and children – specifically, the assignability of clothing expenditure, as further discussed below. We also need a parsimonious set of variables on demographics (household composition, the age of household members, and the urban/rural location). For each country, we choose the most recent survey data that satisfies the above criteria and is publicly available at the data preparation stage of our project. It turns out that 26 countries do not have assignable clothing expenditure, and an additional 10 have missing information that prevents estimating the collective model specified above (e.g. total expenditure could not be recovered or key demographic variables are missing). All excluded surveys are listed in Table 1.A1 with details of the exclusion reason.

This leaves us with a final sample of 45 countries (36% of the initial set), mostly low- and middle-income countries, listed in Table 1.A2 with the year and the name of survey data. Figure 1.1 illustrates the geographical coverage of countries in our analysis as well as the general feasibility of resource share estimations. This data assessment and country selection provide valuable in-

¹⁰Specifically, for Argentina, Chile and Panama, the urban dummy is not included as the surveys are implemented only in urban areas.

Figure 1.1: Country Selection and Survey Availability



Notes: The figure maps the availability of expenditure surveys that comply with the collective model estimation requirements. "No expenditure survey or not accessible" category includes countries with (i) no expenditure surveys (11 surveys, 20% of the category), (ii) no access to the expenditure survey data but only to its documentation showing that expenditure data on assignable clothing is possibly collected (35 surveys, 62% of the category), but we cannot completely assess the applicability without checking the data, and (iii) no access to the expenditure survey data and nor its documentation (10 surveys, 18% of the category), so we cannot assess the applicability. Table 1.A1 reports the details of excluded surveys and their exclusion reason. Table 1.A2 provides detailed information about the included surveys.

formation, as we document to what extent it is globally possible to estimate individual resource shares on the basis of collective models using exclusive/attributable goods and publicly available data for low- and middle-income countries. As shown, out of 126 expenditure surveys, 35.7% were not available, 20.6% did not contain assignable clothing and 7.9% were not usable due to critical missings.¹¹ The countries included in our analysis represent 42% of the global population. The regions with better representation are Latin America, with 11 countries representing 78% of the total population of this region, and Africa, with 21 countries representing 60% of the African population. We also consider 8 Asian and 4 middle-income European countries. The survey years range from 2002 to 2019, with 29 surveys dated after 2014 (64%).¹²

Expenditure Data. All the surveys used in our analysis contain the required information on household consumption, assignable clothing and demographic characteristics, as noted above. The choice of clothing for resource share identification is primarily practical. The set of exclusive goods available in standard surveys is extremely limited. A few types of exclusive goods have been suggested in the literature, most often some adult goods used to retrieve the cost of children with the Rothbarth approach (Deaton; 1989). Adult goods comprise alcohol and tobacco for instance, which pose problems of misreporting (Deaton; 1997). Also, these goods generally do not allow the distinction between men and women. Children’s, men’s, and women’s clothing expenditures are often reported separately so they can be used as exclusive goods. As seen above, assignable clothing is frequent in standard expenditure surveys (present in 71% of the initial 126 countries and in 67.9% of available surveys). Moreover, contrary to other goods, clothing is not necessarily subject to large consumption externalities.¹³ For these reasons, this good has been extensively used to retrieve child resources with the Rothbarth approach (Deaton; 1997), to test efficiency in early collective models of consumption (e.g., Bourguignon et al.; 2009) or to identify resource sharing in households with children (as cited before). The use of clothing expenditure for resource share identification is also supported by recent validation tests (Bargain, Lacroix and Tiberti; 2022).

Sample Selection. For each country, we aim to carry out an individual poverty analysis on the most representative sample possible. Hence, we impose very few exclusion conditions and simply discard households with missing basic information, i.e. expenditure and demographics. To reduce measurement errors, we also eliminate a few observations corresponding to outliers in terms of total household expenditure and budget shares for clothing. As in recent contributions

¹¹Note that a majority of the surveys used here stem from the Living Standards Measurement Study (LSMS) program while many others were collected nationally but often adopting a similar methodology to LSMS. Regarding countries with non-accessible surveys, some could potentially meet the model requirements. However, even if questionnaires suggest that expenditure data on assignable clothing is available in some of them, the data quality could not be verified.

¹²We try to focus on expenditure surveys implemented before the COVID-19 pandemic to avoid any potential distortions in the data due to the pandemic. Note that further work could look at dynamic patterns, i.e. time variation in resource shares, for the few countries for which older expenditure surveys are available.

¹³We show that our main results are robust to the existence of economies of scale in child clothing consumption.

(Calvi; 2020; Bargain, Lacroix and Tiberti; 2022; Brown et al.; 2021), and since the objective is to discuss the intra-household distribution of resources between men, women and children, we consider all types of households with at least one of these person types. As a result, samples include nuclear families and more complex households with several adults of the same gender, which is often the case in poor countries. Our final sample size for each country is presented in Table 1.A2.

Summary Statistics. Table 1.A3 reports the mean and standard deviation of the demographic variables used in the estimation of the structural model (all households with men, women and children). The number of children in the household varies widely across countries, reflecting the different stages of demographic transition that countries are in. For instance, Latin American and European countries, India, Mongolia, and South Africa have, on average, two children per household or less, while households in all the other countries have an average of three or more children per household.¹⁴ As we shall see, this heterogeneity in fertility is likely to be an important correlate of country differences in resource allocation to children. The average number of men and women reflects the inclusion of non-nuclear households in the analysis. As expected, poorer countries, mainly in Africa, are also more rural. Table 1.A4 reports statistics on household expenditure. Annual total household expenditure ranges from around 2,700 dollars (2011 PPP) in Madagascar to almost 31,500 dollars in Chile, illustrating the wide range of living standards in our sample of countries. This allows us to discuss the relationship between intra-household inequality and individual poverty across different stages of economic development. In almost all countries, households systematically tend to spend, on average, 1%-5% of the household budget on clothing of each person type. The infrequency of clothing purchases is not an issue (see Dunbar et al. 2013). The proportion of households with zero clothing consumption is within reasonable bounds for all countries. Cross-country differences may be explained by data collection strategies (in particular, zero clothing expenditures are more frequent when the recall period for clothing expenditures is short, as seen in Table 1.A2). Additionally, we verify that our poverty calculations are in line with official poverty statistics.¹⁵

¹⁴Bangladesh, Ghana, Madagascar, Malawi, Morocco, Namibia, and Rwanda have an average of around 2.5 children per household

¹⁵Figure 1.A1 compares poverty rates reported by the World Bank with our estimates for the poverty line corresponding to each country's income level. Graph (a) illustrates our estimates of poverty for the full sample (vertical axis) against the official poverty rate (horizontal axis). Reassuringly, our poverty estimates in the full sample align with World Bank estimates, even for countries in which the official estimates are not based on the same survey or welfare aggregate (income vs. consumption). Graph (b) compares World Bank's poverty with poverty estimates for our considered sample - households with men, women, and children. With this sample restriction, we tend to see larger household poverty estimates compared to official poverty rates for the whole population, as expected (World Bank; 2018; Munoz Boudet et al.; 2018). This is more pronounced in Latin American countries, where single people and couples without children tend to be richer. There are a few exceptions (e.g. Malawi, Senegal, Gabon), however, where single people are particularly poor, so our poverty estimates ignoring singles are lower than the official figures.

1.3 Results

1.3.1 Patterns of Intra-Household Inequality

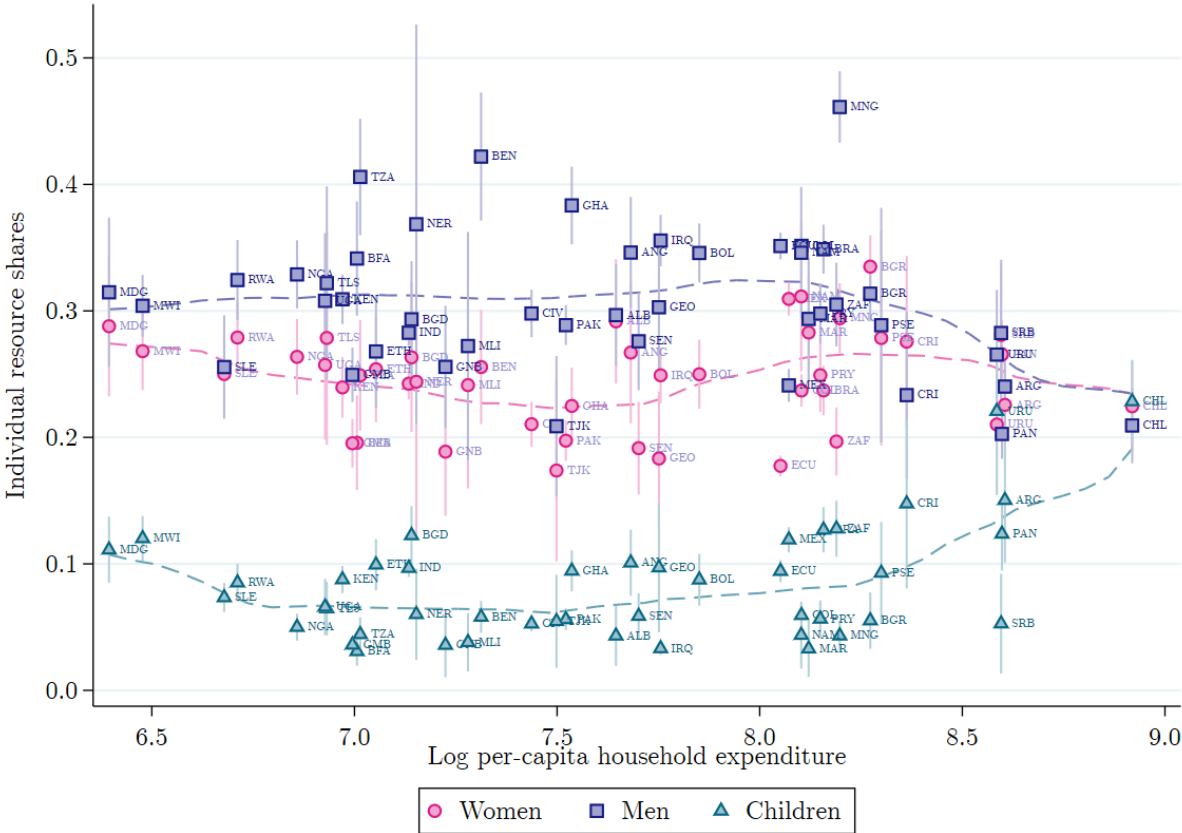
Overall Intra-Household Inequality. Estimates of the resource sharing functions for each country are presented in Appendix 1.5.3 (see the discussion of detailed estimates of marginal effects in Tables 1.A5 and 1.A6). The results are in line with, and generalize, the findings of related studies. These estimations of the sharing function allow us to predict average individual resource shares and their standard errors using sample mean covariates for each country. Results are presented in Table 1.A7. In column (1) we provide a pre-test of the method applicability, i.e. we verify that the estimated slope β of clothing Engel curves is statistically different from zero for a large majority of households in each country.¹⁶ Columns (2)-(4) report per-person resource shares at the sample means for men, women, and children respectively. Overall, we find a frequent pattern of intra-household inequality in resource allocation: men tend to receive larger shares of resources than women, while children's shares are considerably smaller than adults'. Each man consumes between 20%-46% of household resources (with a global average of 30.3%), women receive between 17%-33% (a global average of 24.6%), and children between 3%-23% (a global average of 8.2%). Resource shares for children partly reflect differences in needs and cannot directly be interpreted as inequality – we discuss this point extensively below. Focusing on the adult gender gap, we see that men get a larger share of household resources than women in most countries, with a statistically significant gap in 23 countries. There are a few exceptions where the gender gap is reversed (it is significant in Mexico and Panama, and insignificant otherwise, for instance in Bulgaria). The average gender gap represents almost 6 percentage points globally, as detailed in column (5) of Table 1.A7, which means that women get on average 18.8% less than men.

This global assessment of the gender gap in consumption, based on resource-sharing estimates, is the first one at such a large scale in the literature. It is also consistent with existing evidence for single countries or specific groups of countries, as summarized in the review of Table 1.A8. Note that this review is merely indicative since several studies cannot readily be compared to ours as they focus on nuclear households only. Yet, the literature converges on salient features, namely a frequent gender gap in consumption (with some exceptions such as Mexico and Bulgaria).¹⁷ Results for children are discussed below in relation to individual poverty, but we can stress here that our findings are also in line with past estimates reported in Table 1.A8. For instance, we reach similar conclusions regarding salient results, such as the very small level of child resources in Iraq.

¹⁶Recall that zero slopes, i.e. flat Engel curve, would prevent the identification of resource shares (Dunbar et al.; 2013).

¹⁷For Mexico, past analyses point to a relatively large per-woman share, ranging from 0.29 to 0.38 across studies for nuclear households and 0.34 for complex households in Calvi et al. (2023). For Bulgaria, a reversed gap is also found in Bose-Duker et al. (2021).

Figure 1.2: Individual Resource Shares by Living Standards (Baseline Calculated at Sample Means)



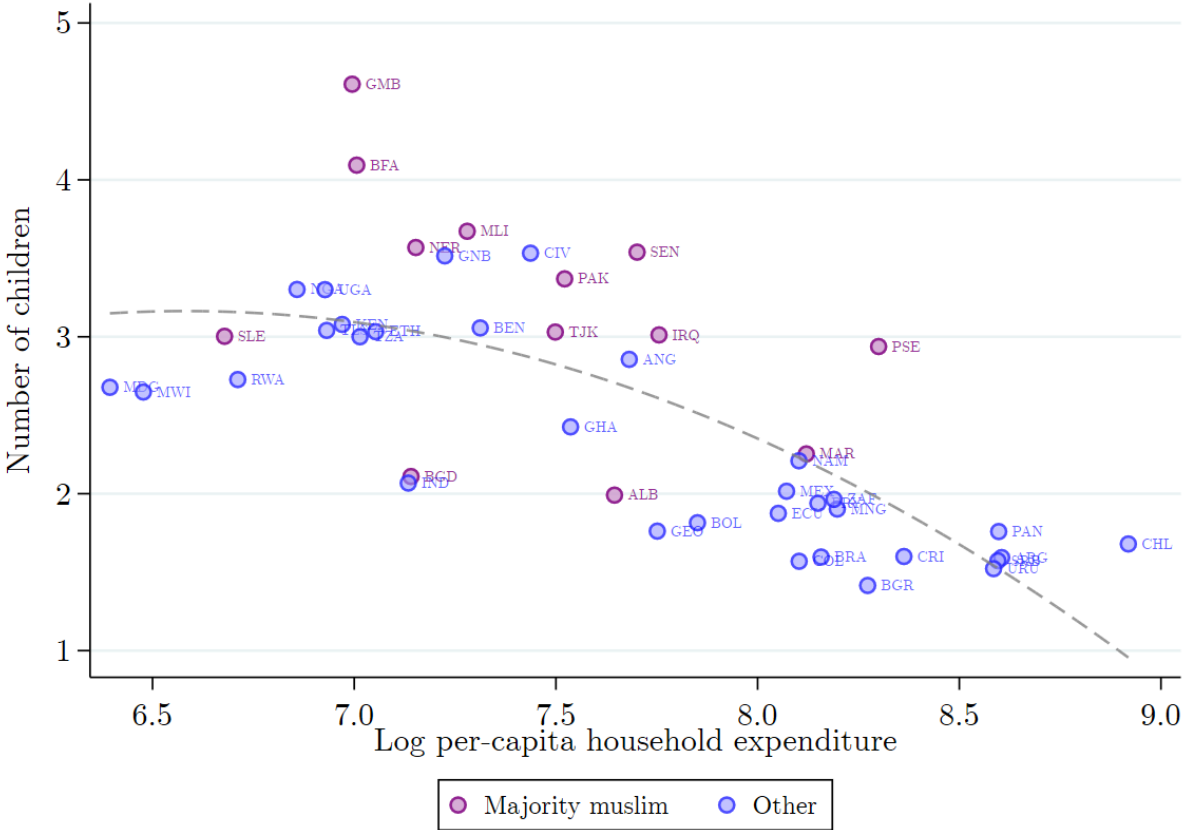
Source: Authors' estimations using the data from household expenditure surveys of 45 countries. Notes: Figure illustrates per-man, per-woman, and per-child resource shares predicted using country-level mean household characteristics by log per-capita household expenditure. Mean household characteristics and log per-capita household expenditure are based on the sample of households with men, women and children. Per-person shares do not add up to one due to the different number of members of each demographic group within households. Spike lines represent 95% confidence intervals. Smooth lines are based on locally weighted regressions of resource shares on log household expenditure.

Intra-Household Inequality by Living Standards. Beyond the evidence of an overall gender consumption gap, the dispersion of estimated resource shares across countries is high, which could possibly be explained by the degree of development or its correlates (e.g. gender roles, cultural norms, democracy, etc.). Bringing country estimates together, we visualize the extent of intra-household consumption inequality by standard of living in Figure 1.2. We depict country resource shares, estimated at country sample means, against (log) mean per-capita household expenditure. Overall, we find that intra-household inequality tends to decrease with living standards. More specifically, gender inequality is prevalent, as noted before, but tends to disappear at higher development stages. The adult-child gap is more pronounced: child shares are much lower in poor countries and the gap tends to vanish in countries with higher living standards.¹⁸

¹⁸Note that Figure 1.2 is based on country-level resource shares predicted at the sample mean characteristics for each country. Alternatively, appendix Figure 1.A2 shows country resource shares calculated as the average predictions over all households in each country, i.e. using the full variation in household covariates. While these two approaches could yield different results, given the non-linearity of resource share functions, they reassuringly lead to very similar

Interpretation for Child Deprivation. Most of the intra-household disparity is driven by the adult-child divide. An admittedly simple interpretation can be suggested in terms of child quality-quantity trade-offs (Becker; 1960), with child investments expressed here in terms of consumption allocation. Precisely, if fertility decreases with household wealth, children with many siblings should get a smaller share of total resources than children with fewer siblings, conditional on the budget constraint.

Figure 1.3: Average Number of Children by Living Standards



Source: Authors’ estimations using the data from household expenditure surveys for 45 countries. Notes: Figure illustrates the country-level average number of children in households with children, women, and men, by log per-capita household expenditure. Smooth line is based on quadratic regressions of the number of children on log per-capita household expenditure. Majority Muslim indicates if the share of Muslim households in a country is equal to or above 50%.

We also document the fact that the country’s mean number of children indeed decreases with per-capita household resources, as illustrated in Figure 1.3.¹⁹ This plausible explanation may be related to cultural factors such as more patriarchal behaviors in poorer countries, with men being more inclined to have more children and, at the same time, exerting more control over household decisions and redistributing less to each child. Note that cultural traits may also explain heterogeneity at different development levels, i.e. the vertical dispersion in Figure 1.3. In particular, we

patterns.

¹⁹More generally, a negative relation between income and fertility is widely observed: see reviews by Doepke et al. (2022) and Guo et al. (2022).

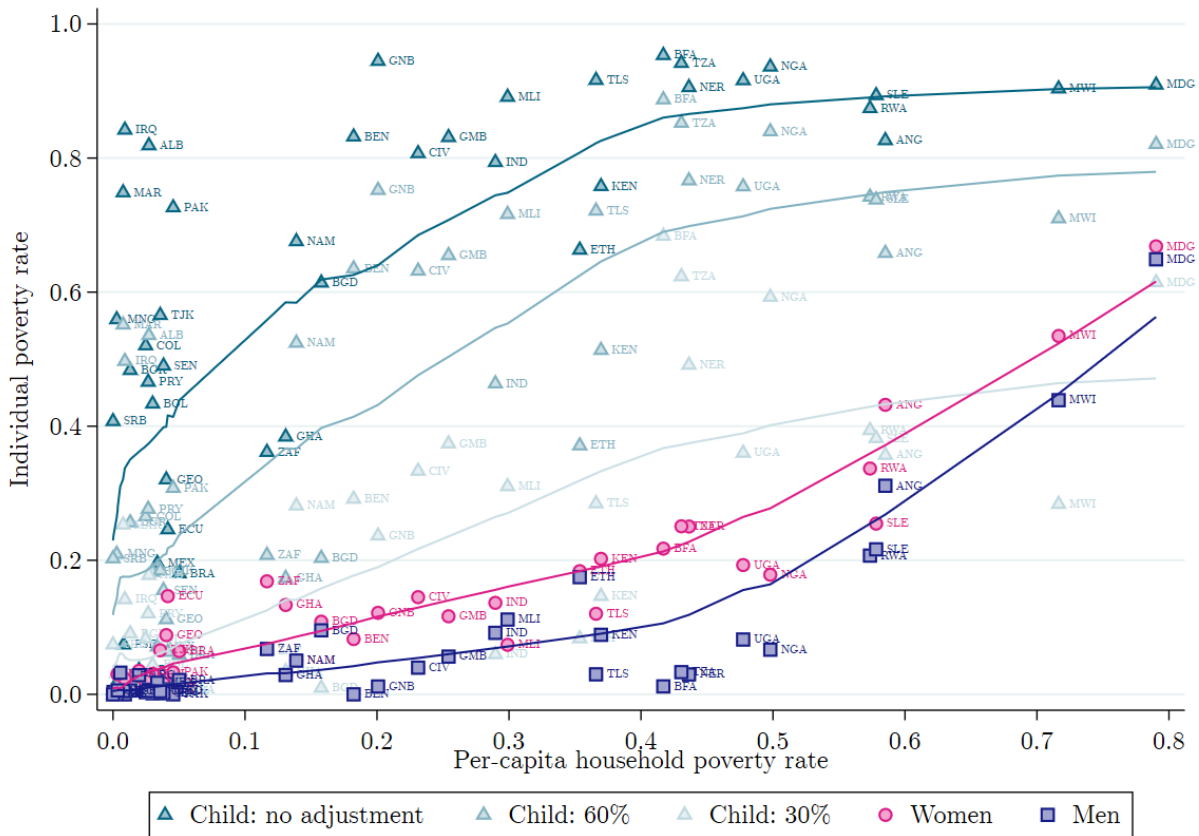
highlight the fact that among poorer countries, Muslim countries tend to have a higher fertility conditional on living standards (see also [Heaton; 2011](#)). This is at least the case for Gambia, Burkina Faso, Mali, Niger, Pakistan, Senegal, Tajikistan and Iraq. Consistently, most of these countries are below the trend line in terms of child resource shares in [Figure 1.2](#).

1.3.2 Implication for Individual Poverty

Translating Intra-Household Inequality into Individual Poverty. Having estimated individual resource shares, we can calculate individual *levels* of consumption for children, women, and men and subsequently their respective poverty rates. We focus on the international extreme poverty line of \$1.9 per person/day (2011 PPP), but most of our conclusions are similar when using higher poverty lines commonly used for middle-income countries ([Ravallion; 2020](#)). In [Figure 1.4](#), we plot individual poverty rates for men, women, and children against the household per-capita poverty of their country. In line with the general pattern of resource sharing in [Figure 1.2](#), children's poverty rates are higher than adults' (we focus on the 'no adjustment' scenario for now, i.e. we ignore differences in needs), and women's poverty is higher than men's. International average poverty rate of men is around 6.8%, and it is almost twice higher for women, with a poverty rate of 12.4% (+82% compared to men). For children, the average poverty rate is around 59.3% in the 'no adjustment' scenario. Clearly, there is also a monotonic relationship between individual and per-capita poverty, but it is non-linear and reflects to some extent the slowly declining pattern of intra-household inequality previously described. That is, as countries get richer and household per-capita poverty declines, i.e. moving from right to left on the horizontal axis of [Figure 1.4](#), child poverty first diminishes slowly because intra-household inequality remains high (as seen in [Figure 1.2](#)), then this inequality disappears and children catch up to adults in terms of experiencing a more marked decline in poverty rates.

Accounting for Differences in Needs. A key unknown is the difference in needs between adults and children. This aspect is usually not addressed in the collective model literature (see the discussion in [Bargain, Lacroix and Tiberti; 2022](#)), although it is critical: indeed, it might explain part of the child-adult inequality revealed by resource share estimations. A reasonable step is to provide sensitivity analyses. There is no consensus on the scales that should be adopted for overall consumption (scales exist for nutritional requirements, see [FAO/WHO/UNU; 1985](#)). In standard poverty analyses, equivalence scales are used that usually incorporate differences in needs between household members (in addition to scale economies in the household). For instance, the modified OECD equivalence scale gives a weight of 1 for the first adult, 0.5 for the rest adults, and 0.3 for the children, meaning that a child represents 60% of an adult benefiting from maximum scale economies ($=0.3/0.5$) or 40% of an average adult ($=0.3/(1.5/2)$). With economies of scale as per the modified OECD rule, and assuming a fair distribution of resources, i.e. an egalitarian allocation proportional to needs, each child in a couple with 2 children should receive $0.3/2.1=14.3\%$

Figure 1.4: Individual versus Per-Capita Household Poverty (Poverty Line at \$1.9/day, 2011 PPP)



Source: Authors' estimations using the data from household expenditure surveys of 45 countries. Notes: Figure illustrates country-level individual poverty rates of men, women, and children by per-capita household poverty estimates. Poverty rates are calculated for the sample of households with men, women, and children. Individual poverty rates are based on predicted resource shares for women, men, and children. Results for child poverty are presented for three equivalence scales: (i) the same as an adult (no adjustment), (ii) 60% of an adult, and (iii) 30% of an adult. Smooth lines are based on locally weighted regressions of individual poverty on per-capita household poverty.

of total household resources. This is probably a lower bound of the children's resource shares observed for rich countries in previous studies (see the discussion in [Bargain, Donni and Hentati; 2022](#)), and in the order of magnitude of what we obtain for the richest countries in our sample (for instance around 14% in Argentina and above 20% in Uruguay and Chile). The fact that child shares are much lower in poorer countries (we find an average per-child share of 8.2% in our international sample) reflects either greater intra-household inequality in these countries, as suggested above, or the fact that children's needs are overestimated. To investigate this question, we recompute child poverty assuming that child needs are equivalent to 60% or 30% those of an adult. These flat-rate adjustments are relatively conservative. The 60% adjustment is standard (see e.g. [Dunbar et al.; 2013](#)) and more conservative than nutrition scales.²⁰ Thus, the 30% adjustment can be seen as an extreme case, i.e. the lower bound of what child needs could be. Strikingly, Figure 1.4 shows that our conclusion about the child-adult poverty gap, especially in

²⁰Indeed, age-based adjustment factors established by the [FAO/WHO/UNU \(1985\)](#) give a weight of around 70% for children under 10, for instance. These scales concern nutrition only but it is an interesting approximation as nutrition represents the largest part of consumption for poor countries.

countries with intermediate living standards, holds with the 60% adjustment. It is only by assuming extremely low needs for children that this gap can be reduced or eliminated, depending on the country.²¹ On average, in our international sample, child poverty rates remain significantly higher than those for adults, namely 40.7% and 18.6% if needs are at 60% and 30% of an adult respectively.

Individual vs. Per-Capita Poverty. Accounting for intra-household inequality implies higher risks of individual poverty compared to per-capita poverty since poor individuals may be found within households deemed non-poor according to the per-capita approach (see also [Brown et al.; 2021](#)). Computing mean individual poverty (over the different person types) for each country, we confront the two notions in Figure 1.A4, i.e. we plot country-level individual versus per-capita poverty rates, for alternative assumptions on child needs. When child needs are very low, their poverty status becomes more similar to adults', as seen before, so there is less difference between the overall individual versus per-capita poverty rates. However, for the intermediate scenario (60%), we observe much higher levels of individual poverty, compared to per-capita poverty, driven by children in middle-expenditure countries. Additionally, Figure 1.A5 shows that most poor individuals who live in non-poor households are children. In contrast, the poverty misclassification – i.e. finding poor individuals in non-poor households – is virtually zero for men. On average, 50% of poor children live in non-poor households (for a \$1.9 per day poverty line and needs at 60%).²²

Micro-Level Evidence. The discussion above was based on estimates for different countries, reflecting the fact that country-specific coefficients incorporate some of the dimensions that may explain variation in child poverty (culture, living standards). We now transpose this analysis at the micro level. To start with, we can focus on the way demographic structures affect the resource sharing function. In particular, Figure 1.A6 shows resource shares for the first, second and third child. Estimates convey that in all countries, child shares increase with the number of children but at a decreasing rate. Such a pattern is also found in related studies considering nuclear households ([Bargain et al.; 2015](#); [Dunbar et al.; 2013](#)) or complex households ([Calvi; 2020](#); [Bargain, Lacroix and Tiberti; 2022](#)). There are several explanations among which the classic quality-quantity trade-off and the possibility of scale economies among siblings. The potential implications of the latter will be addressed in sensitivity analyses later on. Regarding the former mechanism related to fertility, we can examine whether child resource shares and family size show similar patterns to those observed at the macro level. Figure 1.5 plots the average child shares and number of children along the household per-capita expenditure for 20 bins of equal size defined according to the distribution of per-capita household expenditure. We focus on countries used below for cross-validation with nutrition data, but the central result generalizes to all

²¹Figure 1.A3 in the appendix shows very similar results with the poverty line of \$3.2 per day.

²²These general trends hold also for alternative poverty lines and for different equivalence scales (results available upon request).

countries: consistent with macro patterns, richer households tend to have fewer children and allocate more resources per child, which aligns with the proposed interpretation based on the quantity-quality trade-off.

1.3.3 Cross-Validation with Nutrition

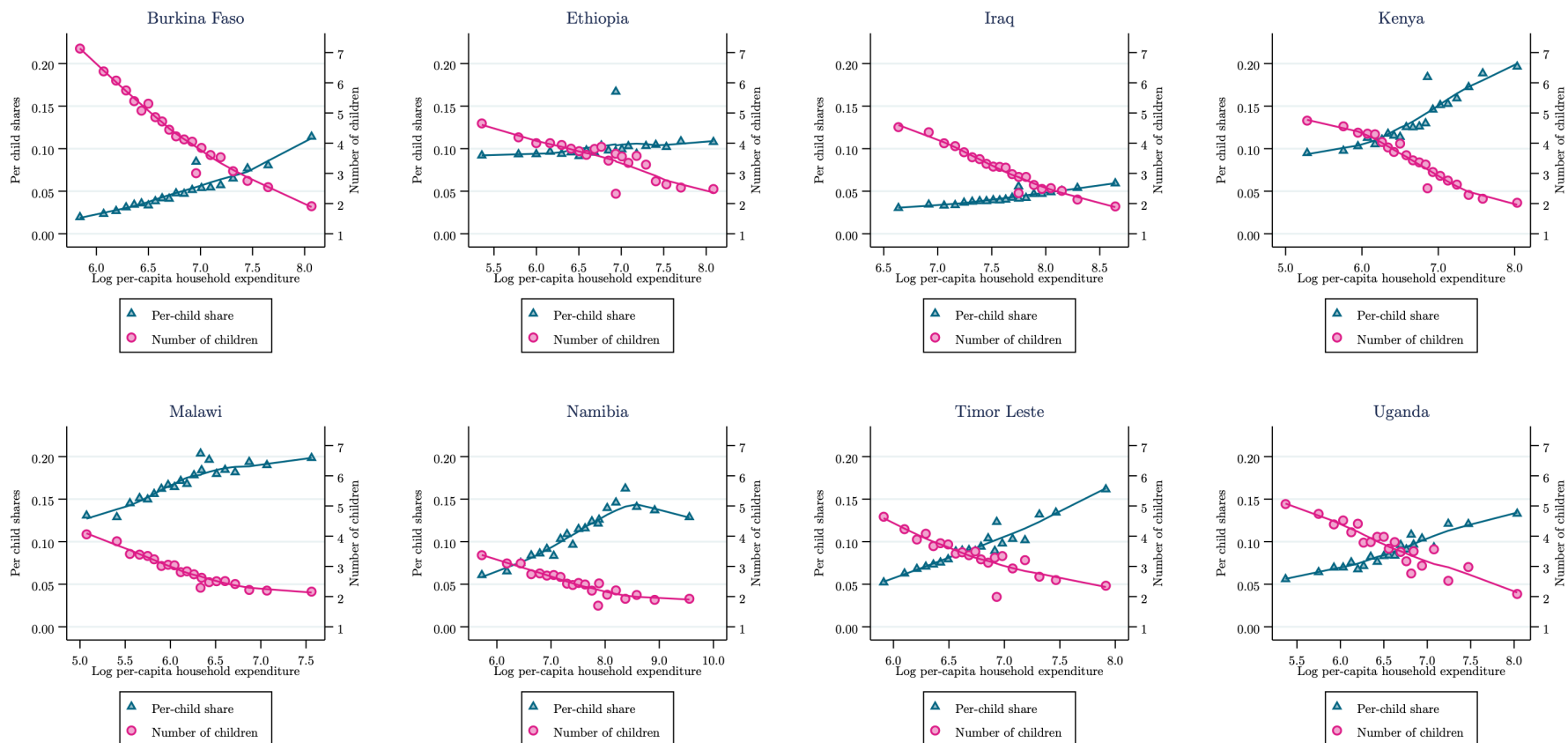
We carry out a cross-validation exercise by extending our international comparisons using proxies for nutrition. We expect child deprivation in terms of general consumption to reflect deprivation in nutritional terms to some extent. We focus on child *wasting* as a short-term indicator of nutrition and, as such, more directly comparable to current child access to resources than other nutrition measures.²³ We nonetheless provide sensitivity checks using child *stunting*.²⁴

Macro Comparisons. We start by comparing the country-level prevalence of wasted or stunted children (proportion of wasted or stunted children under five as reported by the World Health Organization, WHO) against two measures of poverty: per-capita poverty (based on per-capita household consumption, assuming equal distribution of resources within household) and individual poverty for children (based on our resource share estimates). Correlation coefficients reported in the first row of Table 1.A9 show that the latter measure tends to yield a greater correlation with child undernutrition than the former. We interpret it as follows: child poverty accounts not only for the overall welfare of households but also for the amount of resources accruing specifically to children. For instance, the correlation of wasting prevalence with child poverty, measured by setting child needs at 60% of an adult and the poverty line of \$1.9/day, is around 0.49 (column 3) while the correlation with per-capita poverty is 0.23 (column 2). A similar pattern is also found with child stunting (columns 5 and 6). Nonetheless, these results are only suggestive. In particular, the inequality dimension contained in child poverty measures may simply pertain to the correlation between living standards and intra-household inequality documented before (cf. Figure 1.2). To go slightly further, we regress country rates of child wasting on both per-capita poverty and average child resource shares. Results are reported in the first three columns of Table 1.1, showing the expected role of the former (column 1) and latter variables (column 2), but also the fact that intra-household inequality contributes significantly to child wasting independently and additionally to household poverty (column 3). Child shares indeed contribute to a substantial increase in the explained variance of wasting (as illustrated by the increase in the adjusted R-squared), supporting the idea that child malnutrition is not only due to poverty but also unequal sharing within families.

²³Wasting refers to low weight-for-height, also known as acute malnutrition, and is a frequently used proxy for short-term food deprivations or illness.

²⁴Stunting is measured as low height-for-age, which is an indicator of chronic malnutrition, which carries long-term developmental risks. This indicator relates to a history of undernutrition and may be less directly related to the proportion of resources children are receiving at a certain moment.

Figure 1.5: Average Number of Children and Per-Child Shares by Living Standards within Country (Selected Countries)



Source: Authors' estimations using the data from household expenditure surveys for eight countries that record micro-level information on child anthropometrics. *Notes:* Graphs illustrate the number of children and per-child resource shares, averaged over 20 bins of per-capita household expenditure, by log per-capita household expenditure. Smooth lines are based on locally weighted regressions of the average number of children on log per-capita household expenditure.

Table 1.1: Correlation of Child Resource Shares with Child Wasting.

	Prevalence of child wasting (reported by WHO)			Proportion of wasted children in the household (calculated in microdata)		
	(1)	(2)	(3)	(4)	(5)	(6)
Per-capita household poverty	0.0635** (0.0272)		0.0614** (0.0260)	0.0195*** (0.0027)		0.0208*** (0.0027)
Per-child share		-0.286** (0.131)	-0.275** (0.125)		-0.1181*** (0.0145)	-0.1118*** (0.0145)
Country FE	n.a	n.a	n.a	YES	YES	YES
Observations	44	44	44	31,061	31,061	31,061
Adjusted R-squared	0.094	0.080	0.171	0.016	0.019	0.037

Source: Authors' estimations using the data from household expenditure surveys for 44 countries, WHO reports on wasting (columns 1-3), and data from household expenditure surveys for seven countries that record micro-level information on child anthropometrics (columns 4-6). *Notes:* Table reports the coefficients from regressions of child wasting (children up to 5 years of age) against per-capita poverty and estimated child shares. Timor Leste is excluded because of extreme child-wasting prevalence in 2007. Poverty line is set at \$1.9/day (2011 PPP) and child needs at 100% of an adult. Households with men, women, and children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Micro Comparisons. We bring this cross-validation exercise at the micro level using anthropometric information for some countries. We compare the prevalence of wasting (or stunting) among children with their estimated resource shares and poverty rates. Note that we previously used the WHO data on country-level nutrition statistics, which are based on very different sources (sometimes even small surveys conducted in outpatient health services). For micro-validation, we focus on eight surveys in our global sample, which include information on children's weight, height, and age in months, so we can compute standardized wasting (and stunting) measures.²⁵ In Figure 1.6, for each country, we plot average per-child resource shares and the proportion of wasted children across 20 bins defined according to the distribution of per-capita household expenditure. We highlight richer (green triangles) and poorer (pink circles) groups of households: nutritional deprivation seems actually present in both groups. However, there is some complementarity between inequality and poverty: wasted children tend to live in both poorer and more unequal households. Arguably, in some countries such as Kenya, living in a poor household tends to be enough to identify a higher propensity of wasted children. But even in those settings, inequality still matters. There is a negative correlation between child shares and undernourishment, visible in both consumption groups.²⁶ Finally, we further explore the correlation of child undernutrition with per-child and household per-capita poverty at the micro level. Table 1.A9 reports correlation coefficients for each of the selected eight countries and shows that the prevalence of child wasting is more correlated with child poverty than with household per-capita poverty (columns 1-3). Correlations with child stunting (columns 4-6) tend to exhibit similar patterns, even if not systematically. Additionally, we regress child wasting on household per-capita poverty and child resource shares in the pooled microdata of the eight countries (weighting ob-

²⁵For each child, we construct weight-for-height and height-for-age z-scores (using WHO's anthro package in Stata for standardization). A child is considered wasted (stunted) if her weight-for-height (height-for-age) is two standard deviations below the average of her reference group (i.e. z-score<-2).

²⁶Figure 1.A7 provides similar results for stunting. Note also that our results are consistent with Brown et al. (2019a), who shows that child undernutrition is spread across the wealth distribution in 30 African countries and that part of it is explained by intra-household inequality (inequality in nutrition status in their case).

servations by one over country sample size to avoid the overrepresentation of some countries). Results presented in Table 1.1 confirm at the micro level that child wasting is associated with poverty in general (column 5) but that intra-household inequality plays a strong additional role (column 6).

1.3.4 Additional Sensitivity Analyses

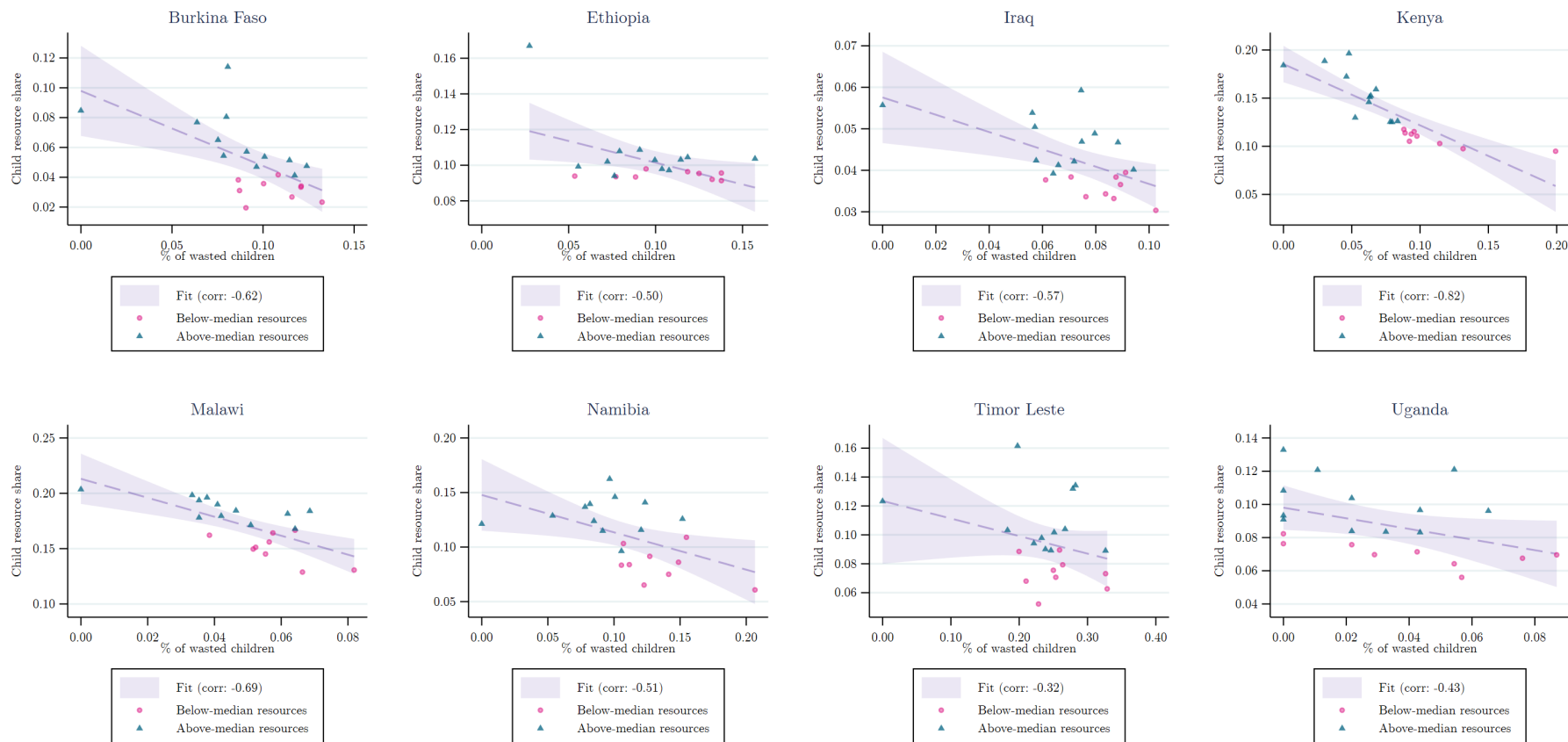
Model Specification. In our baseline specification, individual resource shares are assumed to be independent from total household expenditure, i.e. the ‘independent of the base’ (IB) assumption that is necessary for identification (see Menon et al.; 2012; Bargain, Lacroix and Tiberti; 2022; Dunbar et al.; 2013; Bargain, Donni and Hentati; 2022 for extensive discussions and tests). This might be seen as a limitation in the context of the micro-validation above. Indeed we exploit variation in intra-household inequality across living standards *within* countries, which is generated mainly by the variation in demographic structures across households (and additional determinants of the sharing function). Namely, variation in child shares across households depends essentially on the fact that poor households have more children and redistribute less per child. To enrich the specification and account for the direct effect of household wealth on sharing, we suggest a sensitivity analysis that also aims to circumvent the IB assumption. Precisely, we introduce an indicator of whether household expenditure is above or below country-level median. This way, identification (i.e. respecting IB) is obtained within each half population. It turns out that the coefficient for this additional variable is not always significant and is small in magnitude,²⁷ so that all the results presented so far are preserved.

Joint Consumption among Siblings and Scale Economies. We have seen that children receive considerably smaller shares of resources than adults, especially among poor countries (or, within countries, among poor households). While this cannot really be explained by differences in needs, we have put forward a simpler interpretation in terms of child quantity-quality trade-off (poorer countries/households have more children and redistribute less). Yet, an additional factor may be the presence of economies of scale among children (for instance re-using siblings’ clothes), which could be larger among the poor. Strikingly, the literature on this question is very limited. Previous studies such as Browning et al. (2013) and Bargain and Donni (2012) have primarily focused on estimating scale economies for adults using data on singles. To the best of our knowledge, the only attempt to estimate scale economies for children is Calvi et al. (2023). They show that scale economies among large families in Bangladesh and Mexico can be significant.²⁸ Drawing from these results, we provide sensitivity analyses focusing on the gap between child and adult

²⁷It ranges from -0.0044 (0.00176) for Kenya to 0.0023 (0.00381) for Ethiopia.

²⁸Scales are larger in Mexico than in Bangladesh, as a larger proportion of the household budget is assigned to food (a typical non-shared good) in poorer countries like Bangladesh. Notably, their findings highlight that poverty estimates exhibit relatively minor variations when using individual expenditure (obtained using individual resource shares only) or individual consumption (incorporating economies of scale in individual expenditure), while both measures diverge from traditional per-capita poverty.

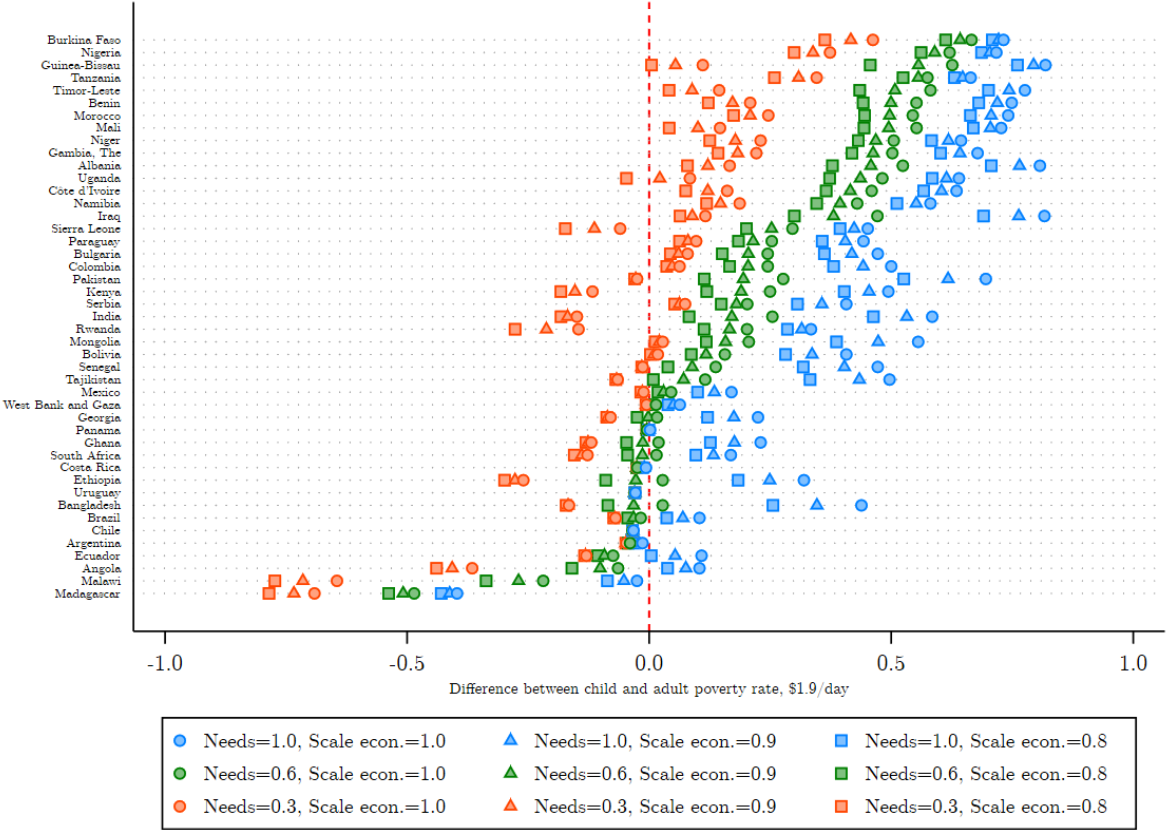
Figure 1.6: Micro Cross-Validation: Per-Child Resource Shares and Household Welfare vs. Child Wasting Prevalence (Selected Countries)



Source: Authors' estimations using the data from household expenditure surveys for eight countries that record micro-level information on child anthropometrics. *Notes:* Graphs illustrate per-child shares by the prevalence of child wasting averaged over 20 bins of per-capita household expenditure, differentiating between households with above- or below-median per-capita resources. Correlations between child resource shares and child wasting are reported in legends.

poverty, recomputed for different combinations of child needs and economies of scale among siblings. We use the three levels of child needs considered before (no adjustment, 0.6 and 0.3 of an adult) and three values of scale economies (1 = no gain, 0.9 = an intermediate case, and 0.8 = maximum gain from scale economies) following Calvi et al. (2023)'s estimates. Figure 1.7 plots the nine estimates of the child-adult poverty gap for each country. In the intermediate scenario (child needs of 0.6 and scale economies of 0.9), 62% of the countries show large adult-child poverty gaps. Scale economies seem to play a role only at the margin in closing the gap (this is especially visible in the intermediary scenario for needs - in green). The overall picture is that poverty gaps are mainly modified by children's needs, even if extreme values (needs at 0.3) have to be reached to narrow the gap. In this case (in orange), at least 10 countries still demonstrate significant poverty gaps whatever the extent of scale economies.

Figure 1.7: Difference Between Child and Adult Poverty Rates at Various Combinations of Child Needs and Economies of Scale



Source: Authors' estimations using data from household expenditure surveys of 45 countries. Notes: Figure illustrates the difference between child and adult poverty at different combinations of scale economies and adult equivalence of child needs. Three levels of scale economies (1, 0.9, and 0.8) and three levels of adult equivalence of child needs (1, 0.6, and 0.3) are considered. Marker shapes indicate the levels of scale economies and colors indicate the levels of child needs. Poverty rate is estimated at the poverty line of \$1.9 (PPP 2011) dollars a day.

1.4 Concluding Remarks

This chapter estimates child, women, and men’s resource shares using expenditure surveys from 45 countries, mostly low- and middle-income countries, providing the largest exercise of this kind so far. It yields a global mapping of gender and age gaps in consumption, which can be transposed in terms of individual poverty. The data assessment documents how often intra-household resource distribution can be estimated using assignable goods (such as clothing expenditure) and recent resource share estimation techniques. Results complete previous evidence on international comparisons of gender gaps or child deprivation, using here an individualized concept of monetary poverty rather than direct observation of individual outcomes based on nutrition or human capital variables.

Results point to a substantial gender consumption gap: women are almost twice poorer than men. Children are even poorer, which could be due to lower needs compared to adults or the presence of scale economies. We suggest that these two factors, even combined, cannot explain the child-poverty gap in all countries. We also show that intra-household inequality is the largest among the poorest countries or, within countries, among the poorest households. A plausible explanation pertains to high fertility, i.e. a child quantity-quality trade-off making children even poorer than the households they live in. We also provide suggestive evidence of cross-validation with nutrition proxies: both household poverty and the fact that poor households redistribute less to children contributes to child undernutrition. This result is remarkable as both measures, child consumption shares and nutrition proxy, derive from completely different sources of information (i.e. resource shares are identified on assignable clothing in one case and wasting measure based on child weight and height in the other). These findings provide some reassurance that the way collective models are identified is valid to a certain extent and allows capturing (some) intra-household consumption inequality. They also corroborate the idea that child undernourishment is not only a problem of overall household poverty but also a question of inequality within households.

Our results have implications in terms of poverty and inequality measurement but also for policy design. Targeting poor households means helping children that are possibly even poorer than what per-capita measures tell us. Nonetheless, poor children are also located in non-poor households so exclusion errors can be committed by traditional targeting methods – we extend the conclusions of [Brown et al. \(2019a\)](#), based on nutrition data, to consumption poverty. The limits of our work are first those highlighted in previous methodological contributions ([Bargain, Lacroix and Tiberti; 2022](#)). Admittedly, the sharing rule identification used here, drawing from [Dunbar et al. \(2013\)](#), rests on transparent assumptions and estimations are easily carried out with standard expenditure data containing exclusive/assignable expenditure (such as clothing). Yet, further work is needed to relax the preference restriction used for identification or to further

confirm its validity. Moreover, international comparisons and welfare analyses in terms of monetary poverty for individuals rather than households must be enriched with explicit modeling and estimations of economies of scale (due to joint consumption and to the public nature of some goods consumed in the household). Finally, some of the intra-household disparity may not be as inequitable as it seems. In very poor settings especially, inequality in nutrient intake may be due to labor market specialization of certain family members in energy-intensive tasks (Pitt et al.; 1990). This is a difficult question but further work should try to address it both empirically and normatively.

1.5 Appendix

1.5.1 Estimation Procedure and Endogeneity

Since the error terms of the empirical model are likely to be correlated across equations, the system of household Engel curves for the different household compositions is estimated using Non-Linear Seemingly Unrelated Regressions (NL-SUR). The SUR estimator is iterated until the estimated parameters and error covariance matrices settle (the iterated SUR is equivalent to maximum likelihood with multivariate normal errors). The likely correlation between the error terms in each budget-share function and the log total expenditure is a frequent source of endogeneity (especially if total expenditure suffers from measurement errors). Each budget share equation is then augmented with the Wu-Hausman residuals obtained from reduced-form estimations of x on all exogenous variables used in the model plus some instruments, namely a quadratic form of the log household disposable income (see Banks et al. 1997; Blundell and Robin 1999). These instruments are very strong in predicting the log of expenditure (the F statistic on the excluded instruments is well above the usual threshold in all cases).²⁹

²⁹For Indian and Moroccan data, there were no income variables available. For India, we used the logarithm of the value of assets owned by the household as an instrument for household expenditure. For Moroccan this was not available in the data either, so household expenditure was not instrumented.

1.5.2 Data Sources and Descriptive Statistics

- Table 1.A1: Description of Non-Included Surveys
- Table 1.A2: Description of Included Household Surveys
- Table 1.A3: Descriptive Statistics, Demographics
- Table 1.A4: Descriptive Statistics, Expenditure
- Figure 1.A1: Per-capita Poverty Rates: Validation with External Sources

Table 1.A1: Description of Non-Included Surveys

Country	Code	WB income group	Survey name	Reason for exclusion	Observations
Afghanistan	AFG	Low	Living Conditions Survey 2016-2017	No access to data	Questionnaires report differentiated clothing expenditure.
Armenia	ARM	Upper middle	Integrated Living Conditions Survey 2016	Not applicable (other issues)	Not possible to identify age cutoff for children clothing expenditure
Azerbaijan	AZE	Upper middle	Household Budget Survey 2005	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Burundi	BDI	Low	Enquête sur les conditions de vie des ménages 2019-2020	No access to data	Questionnaires report differentiated clothing expenditure.
Bosnia and Herzegovina	BIH	Upper middle	Living Standards Measurement Survey 2004 (Wave 4 Panel)	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Belarus	BLR	Upper middle	Household Sample Survey 2020	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Belize	BLZ	Upper middle	Household Expenditure Survey 2008-2009	No access to data	Questionnaires report differentiated clothing expenditure.
Bhutan	BTN	Lower middle	Living Standards Survey 2003	No access to data	Questionnaires report differentiated clothing expenditure.
Botswana	BWA	Upper middle	Multi-Topic Household Survey 2015 - 2016	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Central African Republic	CAF	Low	Enquête Harmonisé sur les Conditions de Vie des Ménages 2021	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
China	CHN	Upper middle	Household income and expenditure and living conditions survey 2022	No access to data	Questionnaires report differentiated clothing expenditure.
Cameroon	CMR	Lower middle	Fifth Cameroon household survey (ECAM 5)	No access to data	Questionnaires report differentiated clothing expenditure.
Congo, Dem. Rep.	ZAR	Low	Enquete sur L'Emploi, Le Secteur Informel et sur la Consommation des Menages 2012	No access to data	Questionnaires report differentiated clothing expenditure.
Congo, Rep.	COG	Lower middle	Enquête Congolaise Auprès des Ménages pour le Suivi et l'Évaluation de la Pauvreté 2011	No access to data	Questionnaires report differentiated clothing expenditure.
Comoros	COM	Lower middle	Enquête sur les Dépenses de Consommation des Ménages 2014	Not applicable (other issues)	No detailed household roster data
Cabo Verde	CPV	Lower middle	Inquérito às Despesas e Receitas Familiares 2014-2015	No access to data	Questionnaires report differentiated clothing expenditure.
Djibouti	DJI	Lower middle	Enquête Djiboutienne Auprès des Ménages =Budget Consommation - EDAM/BC 2013	Not applicable (other issues)	Small sample (150 households)
Algeria	DZA	Lower middle	Enquete Nationale sur la Mesure des Niveaux de Vie des Minages Algiriens 2011	No access to data and documentation	Not possible to check if clothing expenditure is differentiated

Description of Non-Included Surveys (Cont.)

Country	Code	WB income group	Survey name	Reason for exclusion	Observations
Egypt, Arab Rep.	EGY	Lower middle	Household Income, Expenditure, and Consumption Survey, HIECS 2019/2020	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Fiji	FJI	Upper middle	Household Income and Expenditure Survey 2008	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Micronesia, Fed. Sts.	FSM	Lower middle	Household Income and Expenditure Survey 2013-2014	No access to data	Questionnaires report differentiated clothing expenditure.
Gabon	GAB	Upper middle	Enquête Gabonaise pour l'Evaluation et le Suivi de la Pauvreté 2017	No access to data	Questionnaires report differentiated clothing expenditure.
Guinea	GIN	Lower middle	Enquête Légère pour l'Evaluation de la Pauvreté 2012	No access to data	Questionnaires report differentiated clothing expenditure.
Grenada	GRD	Upper middle	Survey of Living Conditions and Household Expenditure and Income 2007-2008	No access to data	Questionnaires report differentiated clothing expenditure.
Guatemala	GTM	Upper middle	Encuesta Nacional sobre Condiciones de Vida 2000	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Honduras	HND	Lower middle	Encuesta Nacional Ingresos y Gastos 2006-2007	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Haiti	HTI	Lower middle	Enquête sur les Conditions de Vie des Ménages après Séisme 2012	No access to data	Questionnaires report differentiated clothing expenditure.
Indonesia	IDN	Upper middle	Indonesia Family Life Survey, Wave 5 (2014)	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Indonesia	IDN	Upper middle	National Socio-Economic Survey 2012	No access to data	Questionnaires report differentiated clothing expenditure.
Iran, Islamic Rep.	IRN	Lower middle	Households Income and Expenditure Survey 2019	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Jamaica	JAM	Upper middle	Survey of Living Conditions 2004	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Jordan	JOR	Lower middle	Household Expenditure and Income Survey 2017	No access to data	Questionnaires report differentiated clothing expenditure.
Kazakhstan	KAZ	Upper middle	Household Budget Survey 2015	No access to data	Questionnaires report differentiated clothing expenditure.
Kyrgyz Republic	KGZ	Lower middle	Kyrgyz Integrated Household Survey 2010	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Cambodia	KHM	Lower middle	Living Standards Measurement Study - Plus 2019-2020	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Kiribati	KIR	Lower middle	Household Income and Expenditure Survey 2019	No access to data	Questionnaires report differentiated clothing expenditure.

Description of Non-Included Surveys (Cont.)

Country	Code	WB income group	Survey name	Reason for exclusion	Observations
Lao PDR	LAO	Lower middle	Expenditure and Consumption Survey 2018-2019	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Lebanon	LBN	Lower middle	Household Budget Survey 2011	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Liberia	LBR	Low	Household Income and Expenditure Survey (HIES) 2016	Not applicable (other issues)	Aggregate expenditure differs from international references
Sri Lanka	LKA	Lower middle	Household Income and Expenditure Survey 2019	No access to data	Questionnaires report differentiated clothing expenditure.
Lesotho	LSO	Lower middle	Household Budget Survey 2017-2018	No access to data	Questionnaires report differentiated clothing expenditure.
Moldova	MDA	Upper middle	Household Budget Survey 2017	No access to data	Questionnaires report differentiated clothing expenditure.
Maldives	MDV	Upper middle	Household Income and Expenditure Survey 2009-2010	No access to data	Questionnaires report differentiated clothing expenditure.
Marshall Islands	MHL	Upper middle	Household Income and Expenditure Survey 2019	No access to data	Questionnaires report differentiated clothing expenditure.
North Macedonia	MKD	Upper middle	Household Budget Survey 2008	No access to data	Questionnaires report differentiated clothing expenditure.
Myanmar	MMR	Lower middle	Poverty and Living Conditions Survey 2014-2015	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Montenegro	MNE	Upper middle	Household Budget Survey 2013	No access to data	Questionnaires report differentiated clothing expenditure.
Mozambique	MOZ	Low	Inquérito sobre Orcamento Familiar 2014-2015	No access to data	Questionnaires report differentiated clothing expenditure.
Mauritania	MRT	Lower middle	Enquête Permanente sur les Conditions de Vie des ménages 2014	No access to data	Questionnaires report differentiated clothing expenditure.
Mauritius	MUS	Upper middle	Household Budget Survey 2017	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Malaysia	MYS	Upper middle	Household Income, Expenditure and Basic Amenities Survey 2019	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Nicaragua	NIC	Lower middle	Encuesta Nacional de Hogares sobre Medición de Nivel de Vida	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Nepal	NPL	Lower middle	Living Standards Survey 2010-2011	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Peru	PER	Upper middle	Encuesta Nacional de Hogares	No assignable clothing	Clothing expenditure not differentiated by men, women, and children

Description of Non-Included Surveys (Cont.)

Country	Code	WB income group	Survey name	Reason for exclusion	Observations
Philippines	PHL	Lower middle	Family Income and Expenditure Survey 2021	Not applicable (other issues)	No detailed household roster data
Papua New Guinea	PNG	Lower middle	Household Income and Expenditure Survey 2009-2010	No access to data	Questionnaires report differentiated clothing expenditure.
Russian Federation	RUS	Upper middle	Russian Longitudinal Monitoring Survey (RLMS) 2022	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Russian Federation	RUS	Upper middle	Russian Household Budget Survey	No access to data	Questionnaires report differentiated clothing expenditure
Sudan	SDN	Low	National Baseline Household Survey, NBHS 2009	No access to data	Questionnaires report differentiated clothing expenditure.
Solomon Islands	SLB	Lower middle	Household Income and Expenditure Survey 2012-2013	No access to data	Questionnaires report differentiated clothing expenditure.
El Salvador	SLV	Upper middle	Encuesta de Ingresos y Gastos de los Hogares 2005-2006	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Somalia	SOM	Low	Somaliland Household Survey 2013	Not applicable (other issues)	High proportion of infrequency of clothing purchases
South Sudan	SSD	Low	High Frequency Survey 2015	Not applicable (other issues)	High proportion of missing data in model variables
São Tomé and Príncipe	STP	Lower middle	Inquerito Aos Orcamentos Familiares 2017	No access to data	Questionnaires report differentiated clothing expenditure.
Suriname	SUR	Upper middle	Survey of Living Conditions 2016	Not applicable (other issues)	High proportion of infrequency of clothing purchases
Eswatini	SWZ	Lower middle	Household Income and Expenditure Survey 2009-2010	No access to data	Questionnaires report differentiated clothing expenditure.
Syrian Arab Republic	SYR	Low	Household Income and Expenditure Survey 2003-2004	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Chad	TCD	Low	Enquête Harmonisée sur les Conditions de Vie des Ménages 2018	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Togo	TGO	Low	Enquête Harmonisée sur le Conditions de Vie des Ménages 2018-2019	Not applicable (other issues)	High proportion of households with flat Engle curve
Thailand	THA	Upper middle	Household Socio-Economic Survey 2019	No access to data	Questionnaires report differentiated clothing expenditure.
Tonga	TON	Upper middle	Household Income and Expenditure Survey 2015-2016	No assignable clothing	Clothing expenditure not differentiated by men, women, and children

Description of Non-Included Surveys (Cont.)

Country	Code	WB income group	Survey name	Reason for exclusion	Observations
Tunisia	TUN	Lower middle	Enquête Nationale sur le Budget, la Consommation et le Niveau de vie des ménages 2015	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Türkiye	TUR	Upper middle	Household Income and Consumption Expenditures Survey 2019	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Tuvalu	TUV	Upper middle	Household Income, Consumption and Expenditure Survey 2016	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Ukraine	UKR	Lower middle	Household Living Conditions Survey 2019	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Uzbekistan	UZB	Lower middle	Household Budget Survey 2002	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Vietnam	VNM	Lower middle	Household Living Standard Survey 2010	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Vanuatu	VUT	Lower middle	Household income and expenditure survey 2019	No assignable clothing	Clothing expenditure not differentiated by men, women, and children
Samoa	WSM	Lower middle	Household Income and Expenditure Survey 2013	No access to data and documentation	Not possible to check if clothing expenditure is differentiated
Kosovo	XKX	Upper middle	Living Standards Measurement Study 2000	Not applicable (other issues)	Not possible to identify age cutoff for children expenditure
Yemen, Rep.	YEM	Low	Household budget survey 2014	No access to data	Questionnaires report differentiated clothing expenditure.
Zambia	ZMB	Lower middle	Living Conditions Monitoring Survey 2015	No access to data	Questionnaires report differentiated clothing expenditure.
Zimbabwe	ZWE	Lower middle	Income, Consumption and Expenditure Survey 2017-2019	No access to data	Questionnaires report differentiated clothing expenditure.

Table 1.A2: Description of Household Survey Data

Country	Country code	Year	Survey name	World Bank LSMS	Recall period for clothing expenditure (months)	Sample size for estimation
Angola	AGO	2018	Inquérito Sobre Despesas, Receitas e Emprego em Angola (IDREA) 2018-2019		3	7,329
Albania	ALB	2005	Living Standard Measurement Survey 2005	Yes	6	2,603
Argentina	ARG	2018	Encuesta Nacional de Gastos de los Hogares 2017-2018		1	20,946
Bangladesh	BGD	2015	Bangladesh Integrated Household Survey 2015		12	3,171
Benin	BEN	2018	Enquête Harmonisée sur le Conditions de Vie des Ménages 2018-2019	Yes	12	3,893
Bolivia	BOL	2019	Encuesta de Hogares - 2019		3	11,044
Brazil	BRA	2017	Pesquisa de Orçamentos Familiares 2017-2018		3	53,681
Bulgaria	BGR	2007	Multitopic Household Survey 2007	Yes	12	2,690
Burkina Faso	BFA	2014	Enquête Multisectorielle Continue 2014 - passage 2	Yes	3	7,090
Chile	CHL	2017	Encuesta de Presupuestos Familiares VIII		3	14,497
Colombia	COL	2017	Encuesta Nacional de Presupuestos de los Hogares 2016-2017		3	81,936
Costa Rica	CRI	2018	Encuesta Nacional de Ingresos y Gastos de los Hogares 2018		3	4,863
Cote d'Ivoire	CIV	2002	Enquete Niveau de Vie des Menages 2002	Yes	12	7,997
Ecuador	ECU	2011	Encuesta Nacional de Ingresos y Gastos de los Hogares Urbanos y Rurales 2011-2012		6	37,059
Ethiopia	ETH	2015	Ethiopia Socioeconomic Survey 2015-2016, Wave 3	Yes	12	4,052
Gambia	GMB	2015	Integrated Household Survey 2015		3	11,130
Georgia	GEO	2019	Households Incomes and Expenditures Survey 2019		3	9,769
Ghana	GHA	2017	Ghana Living Standards Survey 2017	Yes	12	6,204
Guinea-Bissau	GNB	2019	Inquérito Harmonizado sobre as Condições de vida dos Agregados Familiares 2018-2019	Yes	12	2,873
India	IND	2011	Household Consumer Expenditure, Type 1: July 2011 - June 2012, NSS 68th Round		12	72,189
Iraq	IRQ	2012	Iraq Household Socio-Economic Survey 2012, Second Round	Yes	3	11,346
Kenya	KEN	2015	Integrated Household Budget Survey 2015-2016		3	16,817
Madagascar	MGD	2011	Enquête Nationale sur le Suivi des Indicateurs des Objectifs du Millénaire pour le Développement		12	8,927
Malawi	MWI	2016	Integrated Household Panel Survey (IHPS) 2016	Yes	3	9,678
Mali	MLI	2014	Enquête Agricole de Conjoncture Intégrée 2014	Yes	6	1,353
Mexico	MEX	2018	Encuesta Nacional de Ingresos y Gastos de los Hogares 2018		3	63,195
Mongolia	MNG	2016	Household Socio-Economic Survey 2016		12	9,046
Morocco	MAR	2013	Enquete Nationale sur la Consommation et les Dépense des Ménages 2013		12	12,031
Namibia	NAM	2015	Household Income and Expenditure Survey, 2015/16		3	4,639
Niger	NER	2014	Enquête National sur les Conditions de Vie des Ménages et Agriculture 2014, Wave 2	Yes	6	1,733
Nigeria	NGA	2019	General Household Survey, Panel 2015-2016, Wave 3	Yes	6	3,262
Pakistan	PAK	2015	Household Integrated Income and Consumption Survey (HIICS) 2015/16		12	17,412
Panama	PAN	2008	Encuesta de Niveles de Vida 2008	Yes	3	8,480
Paraguay	PRY	2011	Encuesta de Ingresos y Gastos y de Condiciones de Vida 2011-2012		3	5,274
Rwanda	RWA	2016	Integrated Household Living Conditions Survey, 2016-2017, VUP		12	12,575
Senegal	SEN	2018	Enquête Harmonisée sur le Conditions de Vie des Ménages 2018-2019	Yes	12	2,260
Serbia	SRB	2007	Living Standards Measurement Survey 2007	Yes	3	3,149
Sierra Leone	SLE	2011	Integrated Household Survey 2011		12	6,109
South Africa	ZAF	2014	Living Conditions Survey 2014/2015		12	8,838
Tajikistan	TJK	2009	Living Standards Survey 2009	Yes	6	974
Tanzania	TZA	2014	National Panel Survey 2014-2015, Wave 4	Yes	12	2,433
Timor-Leste	TLS	2007	Timor-Leste - Survey of Living Standards 2007	Yes	12	2,492
Uganda	UGA	2015	National Panel Survey 2015-2016	Yes	12	2,432
Uruguay	URU	2016	Encuesta Nacional de Ingresos y Gastos de los Hogares 2016-2017		3	4,262
West Bank and Gaza	PSE	2016	Palestinian Expenditure and Consumption Survey 2016		1	2,212

Table 1.A3: Descriptive Statistics, Demographics

Country	Year	Number of men	Number of women	Number of children	Average age of men	Average age of women	Average age of children	Proportion of boys	Urban
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Albania	2005	1.50 (0.73)	1.61 (0.71)	1.99 (0.83)	41.20 (8.83)	39.13 (9.47)	6.96 (3.79)	0.55 (0.38)	0.52 (0.50)
Angola	2018	1.16 (0.47)	1.17 (0.47)	2.86 (1.47)	34.85 (10.48)	30.37 (9.27)	5.13 (2.78)	0.49 (0.34)	0.62 (0.49)
Argentina	2018	1.58 (0.90)	1.68 (0.93)	1.59 (0.86)	34.09 (10.97)	33.32 (8.82)	5.17 (2.73)	0.51 (0.43)	1.00 (0.00)
Bangladesh	2015	1.29 (0.55)	1.38 (0.60)	2.11 (0.97)	40.59 (10.18)	36.43 (8.98)	8.60 (4.08)	0.52 (0.38)	0.10 (0.30)
Benin	2018	1.17 (0.49)	1.28 (0.58)	3.06 (1.64)	35.61 (8.95)	31.13 (7.83)	5.32 (2.99)	0.51 (0.34)	0.47 (0.50)
Bolivia	2019	1.38 (0.68)	1.45 (0.73)	1.82 (0.97)	34.01 (10.93)	32.84 (9.70)	6.08 (3.09)	0.50 (0.42)	0.78 (0.41)
Brazil	2017	1.34 (0.66)	1.39 (0.68)	1.60 (0.87)	37.42 (11.35)	35.85 (10.16)	7.29 (3.89)	0.52 (0.44)	0.75 (0.43)
Bulgaria	2007	1.40 (0.64)	1.44 (0.60)	1.42 (0.63)	39.39 (9.29)	37.40 (9.18)	7.49 (4.33)	0.51 (0.45)	0.74 (0.44)
Burkina Faso	2014	1.54 (0.92)	1.78 (1.07)	4.09 (2.57)	38.60 (10.84)	33.96 (9.33)	6.75 (3.19)	0.51 (0.31)	0.36 (0.48)
Chile	2017	1.36 (0.65)	1.48 (0.72)	1.68 (0.85)	40.62 (11.66)	39.59 (9.83)	8.49 (4.65)	0.51 (0.43)	1.00 (0.00)
Colombia	2017	1.48 (0.79)	1.63 (0.87)	1.57 (0.83)	35.86 (12.24)	34.71 (10.18)	6.15 (3.30)	0.52 (0.44)	0.93 (0.26)
Costa Rica	2018	1.44 (0.72)	1.55 (0.78)	1.60 (0.83)	35.70 (12.06)	34.14 (9.01)	6.39 (3.28)	0.53 (0.44)	0.63 (0.48)
Cote d'Ivoire	2002	1.56 (0.96)	1.65 (1.00)	3.53 (2.12)	38.01 (11.02)	32.87 (9.51)	7.52 (3.72)	0.50 (0.33)	0.43 (0.50)
Ecuador	2011	1.55 (0.84)	1.58 (0.84)	1.87 (1.04)	34.46 (11.39)	33.07 (9.67)	6.17 (3.21)	0.51 (0.41)	0.73 (0.44)
Ethiopia	2015	1.37 (0.68)	1.31 (0.61)	3.03 (1.60)	38.87 (11.84)	35.49 (10.14)	8.54 (3.75)	0.51 (0.34)	0.27 (0.44)
Gambia	2015	1.70 (1.03)	2.10 (1.22)	4.61 (2.72)	40.55 (11.17)	35.15 (8.69)	7.38 (3.17)	0.49 (0.29)	0.21 (0.41)
Georgia	2019	1.64 (0.68)	1.81 (0.65)	1.76 (0.68)	42.77 (9.46)	41.93 (8.81)	5.62 (3.19)	0.51 (0.41)	0.45 (0.50)
Ghana	2017	1.68 (1.05)	1.79 (1.07)	2.64 (1.65)	34.91 (12.21)	35.18 (10.89)	6.59 (3.08)	0.51 (0.37)	0.33 (0.47)
Guinea-Bissau	2018	1.85 (1.14)	2.13 (1.25)	3.52 (2.15)	37.62 (10.56)	35.03 (9.22)	6.39 (2.83)	0.50 (0.33)	0.34 (0.48)
India	2011	1.51 (0.81)	1.55 (0.76)	2.07 (1.00)	38.09 (8.56)	35.24 (8.28)	6.54 (3.73)	0.55 (0.33)	0.38 (0.49)
Iraq	2012	1.43 (0.93)	1.57 (1.02)	3.01 (1.51)	34.98 (7.86)	32.99 (7.84)	4.11 (2.31)	0.51 (0.33)	0.62 (0.49)
Kenya	2015	1.35 (0.72)	1.31 (0.63)	3.08 (1.76)	38.03 (12.49)	35.43 (11.43)	7.96 (4.01)	0.51 (0.34)	0.35 (0.48)
Madagascar	2012	1.17 (0.47)	1.16 (0.45)	2.68 (1.52)	36.59 (11.40)	32.91 (10.60)	5.94 (3.40)	0.51 (0.36)	0.24 (0.42)
Malawi	2016	1.21 (0.51)	1.18 (0.48)	2.65 (1.42)	36.67 (12.50)	34.04 (11.88)	7.24 (3.86)	0.50 (0.36)	0.18 (0.38)
Mali	2014	1.60 (0.88)	1.77 (0.92)	3.67 (1.90)	39.51 (10.10)	33.85 (9.71)	5.89 (2.69)	0.49 (0.31)	0.43 (0.49)
Mexico	2018	1.34 (0.62)	1.41 (0.67)	2.02 (1.04)	38.82 (11.35)	37.07 (9.80)	8.72 (4.48)	0.51 (0.40)	0.59 (0.49)
Mongolia	2016	1.19 (0.49)	1.25 (0.55)	1.90 (0.88)	34.48 (8.10)	33.39 (7.41)	5.33 (3.16)	0.51 (0.40)	0.57 (0.50)
Morocco	2013	1.61 (0.95)	1.60 (0.91)	2.25 (1.23)	41.20 (9.42)	37.69 (8.41)	8.52 (4.55)	0.51 (0.38)	0.62 (0.49)
Namibia	2015	1.34 (0.66)	1.42 (0.69)	2.21 (1.31)	38.30 (12.54)	37.13 (11.92)	5.27 (3.09)	0.50 (0.40)	0.42 (0.49)
Niger	2014	1.22 (0.57)	1.38 (0.69)	3.57 (2.04)	40.84 (11.24)	33.83 (9.69)	6.21 (2.84)	0.50 (0.33)	0.35 (0.48)
Nigeria	2019	1.36 (0.76)	1.47 (0.78)	3.30 (2.08)	40.07 (11.34)	34.86 (9.92)	7.16 (3.49)	0.51 (0.34)	0.30 (0.46)
Pakistan	2015	1.67 (0.96)	1.67 (0.93)	3.37 (1.87)	37.30 (8.29)	35.16 (7.28)	8.34 (4.37)	0.52 (0.32)	0.66 (0.47)
Panama	2008	1.60 (0.92)	1.73 (0.94)	1.76 (1.07)	34.66 (11.75)	33.61 (9.75)	5.63 (3.05)	0.52 (0.42)	1.00 (0.00)
Paraguay	2011	1.62 (0.91)	1.64 (0.90)	1.94 (1.16)	36.10 (11.69)	34.90 (11.18)	6.62 (3.48)	0.51 (0.41)	0.59 (0.49)
Rwanda	2016	1.25 (0.56)	1.30 (0.60)	2.73 (1.44)	37.67 (11.67)	35.91 (10.43)	7.68 (4.21)	0.50 (0.35)	0.14 (0.35)
Senegal	2018	1.61 (0.87)	1.81 (0.92)	3.54 (1.78)	38.72 (10.19)	34.44 (8.01)	6.40 (2.95)	0.49 (0.32)	0.52 (0.50)
Serbia	2007	1.56 (0.70)	1.70 (0.71)	1.57 (0.62)	41.44 (9.40)	40.04 (9.36)	5.59 (3.41)	0.52 (0.43)	0.55 (0.50)
Sierra Leona	2011	1.47 (0.76)	1.62 (0.83)	3.00 (1.57)	39.72 (11.88)	35.34 (10.27)	8.44 (3.48)	0.52 (0.33)	0.32 (0.47)
South Africa	2014	1.42 (0.71)	1.61 (0.81)	1.96 (1.10)	38.28 (12.72)	39.32 (11.99)	6.07 (3.26)	0.50 (0.41)	0.63 (0.48)
Tajikistan	2009	2.10 (1.16)	2.28 (1.19)	3.03 (1.57)	38.94 (8.85)	37.54 (7.69)	7.18 (3.86)	0.51 (0.34)	0.30 (0.46)
Tanzania	2014	1.33 (0.71)	1.32 (0.67)	3.00 (1.91)	36.76 (10.52)	33.18 (9.76)	6.45 (3.75)	0.50 (0.35)	0.35 (0.48)
Timor Leste	2007	1.35 (0.72)	1.33 (0.63)	3.04 (1.55)	37.02 (9.26)	34.12 (8.94)	5.94 (3.19)	0.50 (0.33)	0.44 (0.50)
Uganda	2015	1.40 (0.70)	1.37 (0.66)	3.30 (1.81)	37.12 (11.91)	35.54 (11.00)	8.48 (3.67)	0.51 (0.33)	0.23 (0.42)
Uruguay	2016	1.36 (0.67)	1.44 (0.70)	1.52 (0.75)	35.49 (10.96)	33.82 (8.78)	5.59 (3.09)	0.52 (0.44)	0.74 (0.44)
West Bank and Gaza	2016	1.30 (0.73)	1.26 (0.63)	2.94 (1.43)	36.01 (7.53)	32.34 (7.60)	5.79 (3.55)	0.51 (0.34)	0.57 (0.50)

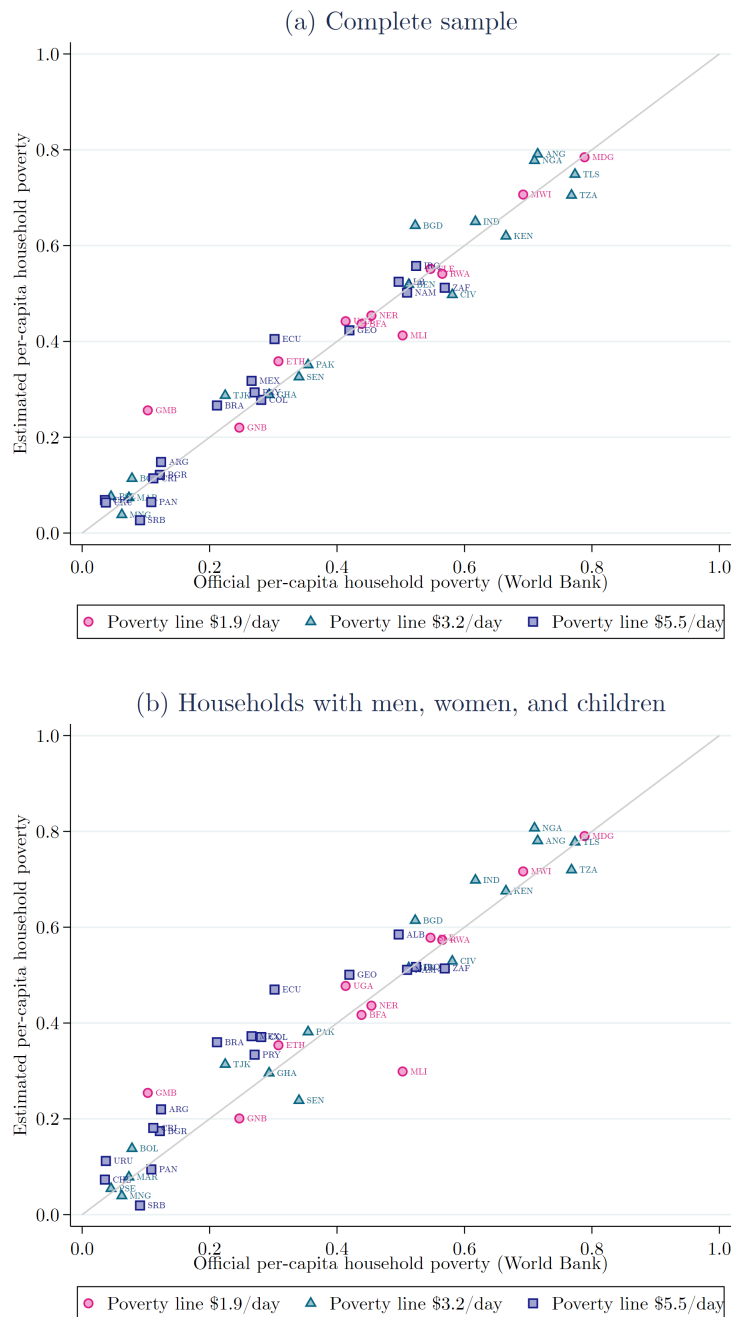
Source: Authors' calculations using the data from household expenditure surveys of each country. Notes: Sample of households with men, women, and children. Standard deviations in parentheses.

Table 1.A4: Descriptive Statistics, Expenditure

Country	Year	Annual HH expenditure (2011 PPPs)	Household budget share for clothing			% of zeros in clothing budget shares		
			Men	Women	Children	Men	Women	Children
			(1)	(2)	(3)	(4)	(5)	(6)
Albania	2005	10,250	0.015	0.018	0.022	0.288	0.214	0.100
		(5,995)	(0.016)	(0.020)	(0.019)	(0.453)	(0.410)	(0.301)
Angola	2018	10,746	0.018	0.016	0.033	0.547	0.500	0.327
		(59,717)	(0.035)	(0.029)	(0.050)	(0.498)	(0.500)	(0.469)
Argentina	2018	23,510	0.028	0.024	0.033	0.591	0.589	0.479
		(19,133)	(0.047)	(0.041)	(0.049)	(0.492)	(0.492)	(0.500)
Bangladesh	2015	5,950	0.015	0.013	0.012	0.010	0.095	0.192
		(4,274)	(0.010)	(0.009)	(0.010)	(0.098)	(0.293)	(0.394)
Benin	2018	7,706	0.008	0.008	0.009	0.240	0.164	0.118
		(4,801)	(0.010)	(0.010)	(0.012)	(0.427)	(0.370)	(0.323)
Bolivia	2019	11,229	0.006	0.007	0.014	0.744	0.717	0.565
		(5,774)	(0.012)	(0.013)	(0.020)	(0.436)	(0.451)	(0.496)
Brazil	2017	13,945	0.020	0.018	0.016	0.475	0.515	0.489
		(11,846)	(0.030)	(0.029)	(0.026)	(0.499)	(0.500)	(0.500)
Bulgaria	2007	15,598	0.019	0.022	0.025	0.140	0.111	0.189
		(7,237)	(0.015)	(0.018)	(0.022)	(0.347)	(0.314)	(0.391)
Burkina Faso	2014	7,110	0.013	0.013	0.016	0.368	0.262	0.200
		(3,910)	(0.018)	(0.016)	(0.016)	(0.482)	(0.440)	(0.400)
Chile	2017	31,454	0.009	0.009	0.022	0.535	0.428	0.093
		(24,112)	(0.014)	(0.013)	(0.021)	(0.499)	(0.495)	(0.291)
Colombia	2017	14,293	0.013	0.014	0.016	0.675	0.616	0.528
		(8,302)	(0.025)	(0.025)	(0.026)	(0.468)	(0.486)	(0.499)
Costa Rica	2018	18,290	0.010	0.012	0.024	0.536	0.451	0.206
		(12,081)	(0.016)	(0.019)	(0.028)	(0.499)	(0.498)	(0.405)
Cote d'Ivoire	2002	10,719	0.018	0.034	0.029	0.260	0.147	0.079
		(15,259)	(0.019)	(0.029)	(0.024)	(0.439)	(0.354)	(0.270)
Ecuador	2011	14,441	0.032	0.035	0.035	0.077	0.091	0.052
		(10,676)	(0.027)	(0.030)	(0.028)	(0.266)	(0.288)	(0.222)
Ethiopia	2015	3723	0.039	0.032	0.046	0.220	0.201	0.105
		(2,657)	(0.050)	(0.042)	(0.051)	(0.414)	(0.400)	(0.306)
Gambia	2015	7,979	0.010	0.011	0.025	0.334	0.184	0.202
		(5,315)	(0.013)	(0.014)	(0.030)	(0.472)	(0.388)	(0.402)
Georgia	2019	11,695	0.014	0.015	0.042	0.575	0.513	0.279
		(7,663)	(0.025)	(0.022)	(0.045)	(0.494)	(0.500)	(0.449)
Ghana	2017	8,545	0.028	0.023	0.028	0.115	0.068	0.064
		(6,644)	(0.029)	(0.021)	(0.024)	(0.318)	(0.252)	(0.245)
Guinea-Bissau	2018	9,312	0.010	0.008	0.009	0.282	0.258	0.176
		(5,618)	(0.013)	(0.010)	(0.009)	(0.450)	(0.438)	(0.381)
India	2011	6,090	0.019	0.016	0.007	0.105	0.124	0.348
		(3,444)	(0.016)	(0.012)	(0.008)	(0.306)	(0.330)	(0.476)
Iraq	2012	12,959	0.039	0.029	0.032	0.040	0.051	0.044
		(7,242)	(0.029)	(0.024)	(0.024)	(0.195)	(0.221)	(0.205)
Kenya	2015	5,620	0.015	0.018	0.028	0.533	0.427	0.316
		(7,901)	(0.025)	(0.026)	(0.037)	(0.499)	(0.495)	(0.465)
Madagascar	2012	2,729	0.035	0.036	0.058	0.216	0.197	0.143
		(4,394)	(0.051)	(0.048)	(0.075)	(0.411)	(0.398)	(0.351)
Malawi	2016	3,123	0.005	0.009	0.013	0.758	0.548	0.463
		(2,810)	(0.011)	(0.014)	(0.019)	(0.428)	(0.498)	(0.499)
Mali	2014	9,002	0.015	0.016	0.007	0.176	0.131	0.429
		(6,121)	(0.018)	(0.028)	(0.011)	(0.381)	(0.338)	(0.495)
Mexico	2018	14,341	0.012	0.012	0.034	0.596	0.546	0.222
		(12,205)	(0.023)	(0.021)	(0.037)	(0.491)	(0.498)	(0.416)
Mongolia	2016	15,089	0.031	0.037	0.033	0.022	0.009	0.034
		(8,836)	(0.026)	(0.027)	(0.023)	(0.147)	(0.094)	(0.181)
Morocco	2013	16,872	0.011	0.013	0.015	0.517	0.403	0.411
		(10,900)	(0.019)	(0.018)	(0.020)	(0.500)	(0.491)	(0.492)
Namibia	2015	15,048	0.022	0.020	0.028	0.668	0.594	0.472
		(19,378)	(0.051)	(0.040)	(0.048)	(0.471)	(0.491)	(0.499)
Niger	2014	7,538	0.015	0.013	0.019	0.191	0.114	0.100
		(4,614)	(0.018)	(0.016)	(0.020)	(0.393)	(0.318)	(0.301)
Nigeria	2019	5,297	0.009	0.011	0.023	0.412	0.332	0.141
		(5,007)	(0.013)	(0.013)	(0.023)	(0.492)	(0.471)	(0.348)
Pakistan	2015	11,536	0.013	0.011	0.013	0.007	0.015	0.134
		(6,336)	(0.007)	(0.007)	(0.011)	(0.081)	(0.121)	(0.340)
Panama	2008	24,883	0.029	0.024	0.026	0.194	0.172	0.148
		(16,104)	(0.030)	(0.023)	(0.026)	(0.395)	(0.377)	(0.355)
Paraguay	2011	16,728	0.012	0.024	0.014	0.460	0.115	0.405
		(12,248)	(0.019)	(0.023)	(0.020)	(0.498)	(0.319)	(0.491)
Rwanda	2016	4,224	0.011	0.014	0.010	0.125	0.054	0.074
		(3,573)	(0.013)	(0.013)	(0.010)	(0.330)	(0.226)	(0.262)
Senegal	2018	14,044	0.007	0.008	0.009	0.312	0.176	0.139
		(9,818)	(0.011)	(0.011)	(0.011)	(0.464)	(0.381)	(0.346)
Serbia	2007	24,918	0.004	0.004	0.007	0.817	0.713	0.515
		(10,451)	(0.007)	(0.009)	(0.011)	(0.386)	(0.452)	(0.500)
Sierra Leone	2011	4,578	0.014	0.008	0.013	0.158	0.159	0.187
		(3,003)	(0.022)	(0.014)	(0.020)	(0.365)	(0.366)	(0.390)
South Africa	2014	15,869	0.036	0.034	0.055	0.333	0.242	0.122
		(18,972)	(0.045)	(0.038)	(0.052)	(0.471)	(0.429)	(0.327)
Tajikistan	2009	12,487	0.020	0.025	0.020	0.251	0.141	0.174
		(6,461)	(0.023)	(0.029)	(0.027)	(0.434)	(0.348)	(0.379)
Tanzania	2014	5,700	0.016	0.019	0.014	0.143	0.091	0.222
		(3,586)	(0.016)	(0.018)	(0.017)	(0.350)	(0.287)	(0.416)
Timor Leste	2007	5,540	0.018	0.018	0.024	0.293	0.284	0.243
		(4,868)	(0.031)	(0.029)	(0.036)	(0.455)	(0.451)	(0.429)
Uganda	2015	5,824	0.009	0.009	0.011	0.311	0.271	0.180
		(6,403)	(0.010)	(0.010)	(0.010)	(0.463)	(0.445)	(0.384)
Uruguay	2016	21,397	0.016	0.020	0.035	0.396	0.313	0.062
		(14,179)	(0.022)	(0.024)	(0.029)	(0.489)	(0.464)	(0.241)
West Bank and Gaza	2016	20,718	0.013	0.022	0.037	0.674	0.513	0.358
		(10,748)	(0.029)	(0.039)	(0.053)	(0.469)	(0.500)	(0.480)

Source: Authors' calculations using the data from household expenditure surveys of each country. Notes: Sample of households with men, women, and children. Standard deviations in parentheses.

Figure 1.A1: Official (World Bank) vs. Estimated Per-Capita Household Poverty



Source: World Bank poverty statistics and authors' estimations using the data from household expenditure surveys for 45 countries. Notes: Figure compares national per-capita household poverty rates based on the official (World Bank) statistics and own estimations. Results are presented for the poverty line that corresponds to each country according to the World Bank income classification. Graph (a) presents estimated poverty for the complete sample and graph (b) to the selected sample for this study (households with men, women, and children). Differences between the two sources of poverty statistics may arise from the use of different surveys and welfare indicators. For Latin American countries, World Bank poverty estimates are based on household income, not expenditure. Panama's official poverty refers to all the country but the expenditure survey used is only urban. We applied a correction factor to the official poverty to reflect urban poverty based on the urban/total ratio published for 2021. Ethiopia's expenditure was adjusted to reflect official poverty.

1.5.3 Detailed Estimates of the Resource Share Functions

We discuss here the estimations of the resource share functions. Among determinants z^r of the sharing function, we can distinguish two categories. The first one corresponds to the demographic structure s , and in particular the number of children. Since the number of each person type enters in several places in the model (i.e. in the sharing function and as a deflator of resource shares for all persons of a given type, cf equation 2), we will simply compute resource shares for the first, second and third child to assess the overall effect of the demographic structure. Results are presented in the Appendix 1.5.6 (Figure 1.A6). The second category of sharing rule determinants corresponds to the other covariates, namely the average age of person types, the proportion of boys, and being urban. We present the marginal effects of these variables on per-child and per-woman resource shares in Tables 1.A5 and 1.A6 respectively. The results are in line with, and generalize, the findings of related studies (for instance Dunbar et al.; 2013 and Penglase; 2021 for Malawi, Bargain et al.; 2015 for Ivory Coast or Brown et al.; 2021 and Bargain, Lacroix and Tiberti; 2022 for Bangladesh). In particular, we find no systematic evidence of gender gaps between siblings: there is a significantly positive association between child shares and the proportion of boys in only 11 countries (and an opposite pattern in 4 countries). The gender gap among children is especially limited in Africa.³⁰ Children receive more resources in urban households but the pattern is not very marked (living in urban areas is significantly associated with larger child shares in 10 countries while the opposite result appears in 5 countries). Relatively older women, with respect to men in the household, tend to receive less in a majority of countries but the age pattern does not need to be linear.³¹ Notice that women tend to receive fewer resources when children are mainly composed of boys.

³⁰A significant pro-boy advantage is found in only 4 of the 21 African countries in our sample (Burkina Faso, Gambia, Kenya, and Senegal): such a limited gender bias in Africa is in line with past evidence (Haddad and Hoddinott; 1994; Bargain et al.; 2015). It is interpreted by Deaton (1997) as due to the relatively high rate of economically productive women in many African countries (so that girls are not seen as a burden by their parents).

³¹For Southern Asia, there is evidence that women's health status deteriorates when they get older (Anderson and Ray; 2010; Calvi; 2020). Opposite patterns are found in several African countries (Aminjonov, Bargain, Colacce and Tiberti; 2024) and being relatively younger can be associated with early marriages and lower women's empowerment (Cameron et al.; 2023).

Table 1.A5: Marginal Effects on Per-Child Resource Shares

Country	Year	Per-child resource shares				
		Average age of children	Average adult age	Age difference between women and men	Proportion of boys	Urban
		(1)	(2)	(3)	(4)	(5)
Albania	2005	0.018*** (0.005)	-0.001 (0.002)	0.007*** (0.002)	0.004* (0.003)	0.011** (0.005)
Angola	2018	-0.043*** (0.007)	0.007*** (0.002)	0.003 (0.002)	0.000* (0.004)	-0.008 (0.008)
Argentina	2018	-0.036*** (0.010)	-0.004 (0.004)	0.004 (0.004)	0.009 (0.006)	- -
Bangladesh	2015	-0.077*** (0.009)	-0.004 (0.004)	0.007* (0.004)	0.040*** (0.007)	-0.061* (0.032)
Benin	2018	-0.018*** (0.004)	-0.005*** (0.001)	-0.004*** (0.001)	-0.003 (0.002)	-0.003 (0.005)
Bolivia	2019	-0.024*** (0.005)	-0.004** (0.002)	0.000 (0.002)	-0.002 (0.003)	-0.019*** (0.006)
Brazil	2017	-0.038*** (0.003)	0.003* (0.002)	-0.011*** (0.002)	-0.006** (0.003)	-0.004 (0.007)
Bulgaria	2007	-0.035*** (0.008)	0.001 (0.002)	0.003 (0.002)	-0.005* (0.003)	0.009 (0.007)
Burkina Faso	2014	0.000 (0.001)	0.002*** (0.001)	-0.001 (0.001)	0.003** (0.001)	-0.002 (0.002)
Chile	2017	-0.004 (0.007)	-0.003 (0.005)	0.010** (0.005)	0.020*** (0.007)	- -
Colombia	2017	-0.020*** (0.002)	-0.001** (0.001)	0.000 (0.001)	-0.001 (0.001)	-0.004 (0.004)
Costa Rica	2018	-0.052*** (0.015)	0.016*** (0.006)	0.009 (0.006)	-0.002 (0.008)	-0.034 (0.021)
Cote d'Ivoire	2002	0.002* (0.001)	0.003*** (0.000)	-0.003*** (0.000)	-0.001 (0.001)	0.009*** (0.002)
Ecuador	2011	0.008*** (0.001)	0.004*** (0.001)	-0.008*** (0.001)	-0.002** (0.001)	0.000 (0.003)
Ethiopia	2015	0.038*** (0.005)	0.011*** (0.002)	0.001 (0.002)	0.001 (0.005)	-0.006 (0.011)
Gambia	2015	0.001 (0.007)	0.002 (0.003)	0.003 (0.003)	-0.004 (0.005)	0.022 (0.019)
Georgia	2019	0.004*** (0.001)	0.003*** (0.001)	0.001** (0.001)	0.006*** (0.001)	0.001 (0.002)
Ghana	2017	-0.006 (0.005)	0.000 (0.002)	0.004** (0.002)	-0.001 (0.003)	0.018** (0.008)
Guinea-Bissau	2018	-0.006** (0.003)	0.004*** (0.001)	-0.002 (0.001)	0.002 (0.002)	-0.018** (0.009)
India	2011	0.025*** (0.001)	0.004*** (0.001)	0.000 (0.001)	0.003** (0.001)	0.003 (0.002)
Iraq	2012	0.009*** (0.001)	0.000 (0.000)	-0.002*** (0.000)	0.001 (0.001)	0.003** (0.002)
Kenya	2015	0.006*** (0.002)	0.001* (0.001)	0.002** (0.001)	0.004** (0.002)	0.001 (0.003)
Madagascar	2012	0.016*** (0.004)	-0.001 (0.002)	-0.001 (0.002)	0.004 (0.003)	0.007 (0.007)
Malawi	2016	-0.006* (0.003)	0.000 (0.001)	0.001 (0.001)	0.000 (0.003)	0.013* (0.008)
Mali	2014	-0.009** (0.005)	-0.003* (0.002)	0.000 (0.002)	-0.002 (0.003)	0.004 (0.007)
Mexico	2018	0.006*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.000 (0.001)	0.003 (0.004)
Mongolia	2016	0.003** (0.001)	0.003*** (0.001)	-0.003*** (0.001)	-0.001 (0.001)	-0.022*** (0.003)
Morocco	2013	0.009** (0.004)	0.000 (0.001)	-0.001 (0.001)	0.002 (0.002)	0.004 (0.003)
Namibia	2015	-0.020*** (0.007)	-0.003** (0.001)	0.001 (0.001)	0.000 (0.003)	0.008** (0.004)
Niger	2014	0.008 (0.005)	0.001 (0.002)	-0.003* (0.002)	0.002 (0.003)	-0.014* (0.008)
Nigeria	2019	-0.004* (0.002)	-0.001 (0.001)	0.000 (0.001)	0.002 (0.003)	0.008** (0.003)
Pakistan	2015	0.000 (0.001)	0.002*** (0.001)	-0.003*** (0.001)	-0.006*** (0.001)	0.006*** (0.002)
Panama	2008	-0.086*** (0.009)	0.003 (0.002)	-0.004* (0.002)	0.006* (0.003)	- -
Paraguay	2011	-0.060*** (0.007)	0.000 (0.001)	-0.002 (0.001)	0.010*** (0.003)	0.005 (0.005)
Rwanda	2016	-0.015*** (0.002)	0.000 (0.001)	0.000 (0.001)	0.001 (0.002)	0.023*** (0.006)
Senegal	2018	-0.013*** (0.004)	0.006*** (0.002)	-0.001 (0.002)	0.006* (0.003)	0.008 (0.006)
Serbia	2007	-0.045*** (0.015)	0.007 (0.005)	0.003 (0.005)	-0.004 (0.006)	0.003 (0.010)
Sierra Leone	2011	0.007*** (0.002)	0.000 (0.001)	0.002** (0.001)	-0.002 (0.003)	0.037*** (0.005)
South Africa	2014	0.004 (0.006)	-0.003 (0.002)	-0.002 (0.002)	0.002 (0.004)	-0.001 (0.008)
Tajikistan	2009	-0.004 (0.004)	0.005 (0.003)	-0.003 (0.003)	0.013 (0.004)	0.010 (0.008)
Tanzania	2014	-0.017*** (0.004)	0.002* (0.001)	-0.004*** (0.001)	0.003 (0.003)	-0.007 (0.006)
Timor Leste	2007	-0.040*** (0.008)	0.003 (0.003)	0.002 (0.003)	0.003 (0.004)	0.009 (0.008)
Uganda	2015	0.011*** (0.003)	-0.003** (0.001)	-0.003** (0.001)	-0.004 (0.003)	0.007 (0.008)
Uruguay	2016	0.024* (0.013)	-0.024*** (0.006)	0.000 (0.006)	0.011 (0.008)	0.006 (0.021)
West Bank and Gaza	2016	0.006 (0.011)	0.002 (0.006)	-0.003 (0.006)	0.007 (0.008)	0.016* (0.010)

Source: Authors' estimations using the data from household expenditure surveys for 45 countries. Notes: Table reports the marginal effects of selected variables on per-child resource shares. Sample of households with men, women, and children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 1.A6: Marginal effects on Per-Woman Resource Shares

Country	Year	Per-woman resource shares				
		Average age of children	Average adult age	Age difference between women and men	Proportion of boys	Urban
		(1)	(2)	(3)	(4)	(5)
Albania	2005	0.008 (0.007)	-0.001 (0.003)	-0.023*** (0.003)	0.001 (0.006)	-0.014 (0.019)
Angola	2018	0.048*** (0.015)	-0.005 (0.006)	-0.019*** (0.006)	0.010 (0.010)	-0.001 (0.016)
Argentina	2018	0.012 (0.010)	0.008*** (0.003)	-0.025*** (0.003)	-0.019** (0.008)	-
Bangladesh	2015	-0.011 (0.006)	0.024*** (0.002)	0.013*** (0.002)	0.026*** (0.005)	-0.044 (0.012)
Benin	2018	0.032*** (0.010)	-0.002 (0.005)	-0.014*** (0.005)	-0.008 (0.007)	-0.005 (0.010)
Bolivia	2007	0.010* (0.006)	-0.001 (0.002)	-0.011*** (0.002)	0.003 (0.005)	0.020 (0.012)
Brazil	2014	0.018*** (0.004)	-0.002 (0.002)	0.032*** (0.002)	0.014*** (0.003)	-0.002 (0.007)
Bulgaria	2017	0.028*** (0.006)	-0.002 (0.003)	-0.035*** (0.003)	-0.017*** (0.005)	-0.001 (0.016)
Burkina Faso	2019	0.006 (0.006)	0.001 (0.003)	-0.015*** (0.003)	0.001 (0.006)	-0.019** (0.008)
Chile	2017	-0.017* (0.009)	0.000 (0.004)	-0.019*** (0.004)	-0.025** (0.010)	-
Colombia	2018	0.013*** (0.003)	-0.002** (0.001)	-0.019*** (0.001)	-0.004* (0.002)	-0.006 (0.010)
Costa Rica	2002	0.038*** (0.013)	-0.005 (0.005)	-0.031*** (0.005)	-0.016* (0.010)	0.005 (0.025)
Cote d'Ivoire	2017	-0.004 (0.003)	0.003* (0.002)	-0.002 (0.002)	0.000 (0.003)	-0.006 (0.005)
Ecuador	2011	-0.009*** (0.002)	-0.001* (0.001)	0.029*** (0.001)	0.001 (0.001)	-0.004 (0.003)
Ethiopia	2015	-0.039*** (0.011)	-0.009 (0.007)	-0.043*** (0.007)	-0.009 (0.011)	-0.043** (0.019)
Gambia	2015	0.008** (0.003)	0.003* (0.002)	-0.007*** (0.002)	-0.011*** (0.004)	0.011* (0.006)
Georgia	2019	-0.001 (0.014)	0.003 (0.004)	-0.050*** (0.004)	0.003 (0.012)	-0.036* (0.021)
Ghana	2017	-0.012 (0.009)	-0.001 (0.003)	-0.004 (0.003)	-0.013* (0.007)	-0.001 (0.011)
Guinea-Bissau	2018	0.021*** (0.006)	0.001 (0.003)	-0.018*** (0.003)	-0.009 (0.006)	0.022 (0.015)
India	2011	-0.007*** (0.002)	-0.008*** (0.001)	-0.006*** (0.001)	-0.013*** (0.002)	0.001 (0.004)
Iraq	2017	-0.001 (0.003)	0.001 (0.001)	-0.020*** (0.001)	-0.001 (0.002)	0.003 (0.005)
Kenya	2012	-0.007** (0.004)	-0.001 (0.002)	-0.006*** (0.002)	-0.005 (0.004)	-0.003 (0.007)
Madagascar	2012	-0.010 (0.007)	-0.005 (0.003)	-0.009*** (0.003)	-0.006 (0.005)	-0.001 (0.023)
Malawi	2018	0.007 (0.006)	-0.002 (0.003)	-0.005* (0.003)	0.000 (0.006)	-0.038*** (0.014)
Mali	2016	0.008 (0.012)	0.001 (0.005)	-0.010** (0.005)	0.007 (0.010)	-0.049 (0.034)
Mexico	2015	-0.004* (0.002)	-0.007*** (0.001)	-0.043*** (0.001)	-0.002 (0.003)	0.001 (0.006)
Mongolia	2014	0.003 (0.004)	-0.005** (0.002)	-0.031*** (0.002)	-0.007** (0.003)	-0.031*** (0.008)
Morocco	2013	-0.010 (0.009)	0.001 (0.007)	-0.016** (0.007)	0.015** (0.011)	-0.032*** (0.010)
Namibia	2016	0.012 (0.015)	0.012** (0.005)	0.003 (0.005)	0.005 (0.012)	-0.034* (0.018)
Niger	2015	0.008 (0.016)	0.003 (0.007)	-0.027*** (0.007)	-0.023** (0.012)	0.097*** (0.037)
Nigeria	2014	0.007 (0.005)	0.003 (0.003)	0.001 (0.003)	-0.001 (0.006)	-0.020* (0.011)
Pakistan	2015	-0.002 (0.001)	-0.005*** (0.001)	-0.004*** (0.001)	-0.019*** (0.005)	0.008 (0.005)
Panama	2019	0.064*** (0.007)	0.007*** (0.002)	-0.023*** (0.002)	-0.011** (0.005)	-
Paraguay	2008	0.061*** (0.006)	-0.004* (0.003)	0.020*** (0.003)	-0.005 (0.005)	-0.007 (0.008)
Rwanda	2011	0.021*** (0.004)	0.001 (0.002)	-0.018*** (0.002)	-0.013*** (0.004)	-0.039*** (0.012)
Senegal	2018	0.020** (0.009)	0.002 (0.004)	-0.016*** (0.004)	-0.018** (0.008)	-0.013 (0.011)
Serbia	2007	0.025 (0.017)	-0.015*** (0.005)	-0.040*** (0.005)	0.007 (0.013)	0.056*** (0.019)
Sierra Leone	2016	0.012* (0.007)	0.005** (0.002)	0.004** (0.002)	-0.011 (0.011)	-0.043*** (0.014)
South Africa	2015	0.015** (0.006)	0.003 (0.002)	-0.025*** (0.002)	0.007 (0.005)	0.029* (0.015)
Tajikistan	2011	0.010 (0.006)	-0.001 (0.004)	-0.010*** (0.004)	-0.011 (0.007)	0.015 (0.017)
Tanzania	2009	0.053*** (0.008)	0.003 (0.004)	-0.008** (0.004)	-0.047*** (0.007)	0.005 (0.014)
Timor Leste	2014	0.050*** (0.012)	-0.006 (0.005)	-0.022*** (0.005)	-0.022*** (0.010)	0.006 (0.021)
Uganda	2014	0.002 (0.009)	0.004 (0.004)	0.004 (0.004)	-0.003 (0.008)	0.002 (0.015)
Uruguay	2007	-0.018 (0.011)	0.013*** (0.004)	-0.024*** (0.004)	0.000 (0.009)	-0.009 (0.022)
West Bank and Gaza	2016	-0.045* (0.027)	-0.029** (0.013)	-0.051*** (0.013)	-0.027 (0.024)	-0.026 (0.034)

Source: Authors' estimations using the data from household expenditure surveys for 45 countries. Notes: Table reports the marginal effects of selected variables on per-woman resource shares. Sample of households with men, women, and children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

1.5.4 Pattern of Intra-Household Inequality: Estimates, Literature and Checks

We present here our estimates of resource shares, calculated as $\exp(\tilde{\gamma}_i \bar{z}^r) / (1 + \exp(\tilde{\gamma}_f \bar{z}^r) + \exp(\tilde{\gamma}_c \bar{z}^r))$ for $i = f, c$. In the baseline, shares are computed at sample means \bar{z}^r in order to derive confidence intervals.

- Table 1.A7: Baseline results where resource shares are computed at sample means
- Table 1.A8: We present a review of country-specific resource share estimations
- Figure 1.A2: Individual resource shares by living standards (here as a robustness check where resource shares are predicted for each household and averaged for each country)

Table 1.A7: Estimates of Per-Person Resource Shares (Calculated at Sample Mean)

Country	Year	% of households with non-flat Engel curve	Resource shares at mean			Gender gap at mean
			Per man	Per woman	Per child	
		(1)	(2)	(3)	(4)	(5)
Albania	2005	0.90	0.297 (0.020)	0.292 (0.025)	0.043 (0.012)	0.005 (0.043)
Angola	2018	1.00	0.346 (0.022)	0.267 (0.029)	0.101 (0.013)	0.079** (0.040)
Argentina	2018	1.00	0.240 (0.016)	0.226 (0.021)	0.150 (0.025)	0.014 (0.029)
Bangladesh	2015	0.96	0.293 (0.023)	0.263 (0.030)	0.122 (0.012)	0.030 (0.051)
Benin	2018	0.98	0.422 (0.026)	0.256 (0.023)	0.058 (0.006)	0.166*** (0.046)
Bolivia	2019	1.00	0.346 (0.012)	0.250 (0.014)	0.087 (0.010)	0.096*** (0.022)
Brazil	2017	1.00	0.349 (0.010)	0.237 (0.010)	0.127 (0.009)	0.112*** (0.017)
Bulgaria	2007	1.00	0.314 (0.011)	0.335 (0.013)	0.055 (0.011)	-0.021 (0.021)
Burkina Faso	2014	1.00	0.341 (0.023)	0.196 (0.019)	0.031 (0.006)	0.146*** (0.040)
Chile	2017	0.91	0.209 (0.015)	0.225 (0.018)	0.228 (0.017)	-0.015 (0.027)
Colombia	2017	1.00	0.351 (0.005)	0.237 (0.006)	0.059 (0.005)	0.114*** (0.011)
Costa Rica	2018	0.87	0.233 (0.034)	0.276 (0.035)	0.148 (0.034)	-0.042 (0.058)
Cote d'Ivoire	2002	1.00	0.298 (0.010)	0.210 (0.009)	0.053 (0.003)	0.088*** (0.017)
Ecuador	2011	0.99	0.351 (0.005)	0.177 (0.004)	0.094 (0.004)	0.174*** (0.008)
Ethiopia	2015	0.78	0.268 (0.023)	0.254 (0.021)	0.099 (0.010)	0.014 (0.038)
Gambia	2015	0.90	0.249 (0.011)	0.195 (0.010)	0.036 (0.003)	0.054*** (0.019)
Georgia	2019	0.87	0.303 (0.026)	0.183 (0.027)	0.097 (0.026)	0.120*** (0.046)
Ghana	2017	1.00	0.273 (0.014)	0.226 (0.014)	0.054 (0.009)	0.047* (0.024)
Guinea-Bissau	2018	0.93	0.256 (0.025)	0.189 (0.026)	0.036 (0.013)	0.067 (0.045)
India	2011	0.97	0.283 (0.005)	0.242 (0.006)	0.097 (0.004)	0.040*** (0.011)
Iraq	2012	1.00	0.356 (0.010)	0.249 (0.011)	0.033 (0.003)	0.106*** (0.021)
Kenya	2015	1.00	0.309 (0.010)	0.239 (0.012)	0.088 (0.005)	0.070*** (0.018)
Madagascar	2012	0.99	0.315 (0.030)	0.288 (0.028)	0.111 (0.013)	0.027 (0.050)
Malawi	2016	1.00	0.304 (0.012)	0.268 (0.016)	0.120 (0.009)	0.036* (0.020)
Mali	2014	0.80	0.272 (0.046)	0.241 (0.042)	0.038 (0.012)	0.031 (0.084)
Mexico	2018	1.00	0.241 (0.007)	0.309 (0.007)	0.119 (0.005)	-0.068*** (0.011)
Mongolia	2016	1.00	0.461 (0.014)	0.294 (0.014)	0.043 (0.006)	0.167*** (0.027)
Morocco	2013	1.00	0.294 (0.025)	0.283 (0.023)	0.033 (0.011)	0.011 (0.045)
Namibia	2015	1.00	0.346 (0.027)	0.311 (0.030)	0.044 (0.013)	0.035 (0.053)
Niger	2014	0.80	0.368 (0.081)	0.244 (0.063)	0.060 (0.018)	0.125 (0.135)
Nigeria	2019	0.98	0.329 (0.014)	0.264 (0.015)	0.050 (0.005)	0.065** (0.026)
Pakistan	2015	1.00	0.289 (0.008)	0.197 (0.008)	0.056 (0.004)	0.091*** (0.014)
Panama	2008	1.00	0.203 (0.010)	0.266 (0.014)	0.124 (0.015)	-0.063*** (0.019)
Paraguay	2011	1.00	0.298 (0.012)	0.249 (0.015)	0.056 (0.007)	0.049* (0.026)
Rwanda	2016	1.00	0.324 (0.016)	0.279 (0.015)	0.085 (0.008)	0.045* (0.026)
Senegal	2018	1.00	0.276 (0.020)	0.191 (0.019)	0.059 (0.009)	0.084** (0.033)
Serbia	2007	1.00	0.283 (0.030)	0.281 (0.029)	0.053 (0.020)	0.002 (0.055)
Sierra Leona	2011	1.00	0.256 (0.021)	0.250 (0.017)	0.073 (0.006)	0.006 (0.036)
South Africa	2014	0.86	0.305 (0.017)	0.197 (0.014)	0.128 (0.011)	0.108*** (0.027)
Tajikistan	2009	1.00	0.209 (0.028)	0.174 (0.037)	0.055 (0.019)	0.035 (0.061)
Tanzania	2014	0.97	0.406 (0.023)	0.249 (0.022)	0.044 (0.007)	0.157*** (0.043)
Timor Leste	2007	0.79	0.322 (0.039)	0.279 (0.043)	0.065 (0.011)	0.043 (0.079)
Uganda	2015	0.90	0.308 (0.027)	0.257 (0.030)	0.066 (0.011)	0.051 (0.051)
Uruguay	2016	0.81	0.265 (0.026)	0.210 (0.028)	0.221 (0.034)	0.055 (0.041)
West Bank and Gaza	2016	0.78	0.289 (0.047)	0.279 (0.043)	0.093 (0.021)	0.010 (0.078)
# countries with significantly positive gender gaps						23
# countries with significantly negative gender gaps						2
International means			0.303	0.246	0.082	0.057

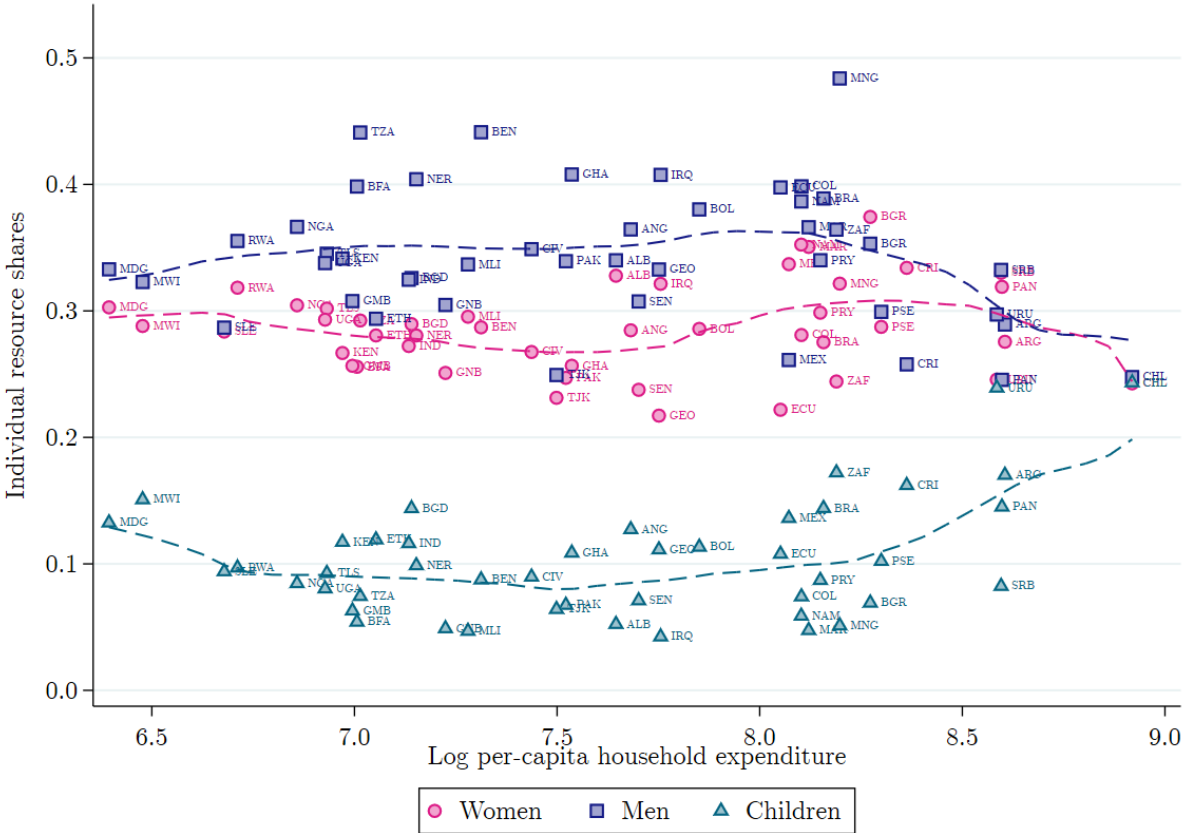
Source: Authors' estimations using the data from household expenditure surveys for 45 countries. Notes: Table reports the per-man, per-woman, per-child resource shares and gender gap in resource shares predicted using country-level mean household characteristics. Mean household characteristics are based on the sample of households with men, women and children. Per-person shares do not add up to one due to the different number of members of each demographic group within households. International means are the arithmetic mean of country shares/gaps. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 1.A8: A Review of Country-Specific Resource Share Estimations

Country	Sample	Per-woman resource shares		Per-child resource shares		Authors
		households with children, women and men	households with women and men	Mean across household compositions	Range across household compositions	
Albania	Complex households	0.26	0.29	0.13	-	Bose-Duker et al. (2021)
Albania	Couples with one child	0.26		0.39	-	Mangiavacchi et al. (2018)
Albania	Couples with children	0.28		0.39	-	Betti et al. (2020)
Argentina	Household with men and women	0.23-0.26	0.29	0.12	0.07-0.14	Bargain (2023)
Argentina	Couples with children and single parents	-	-	-	0.22-0.61	Echeverría et al. (2019)
Bangladesh	Complex households	0.25	-	-	0.15-0.16	Brown et al. (2021)
Bangladesh	Complex households	0.27	-	0.13	-	Calvi et al. (2023)
Bangladesh	Complex households	0.28	-	-	0.15-0.24	Bargain, Lacroix and Tiberti (2022)
Bangladesh	Complex households	0.29	-	-	0.14	Bose-Duker et al. (2021)
Brazil	Couples with/without children	0.34-0.41	0.47	-	0.10-0.23	Gómez and Coelho (2017)
Brazil	Singles and couples with/without children	0.32-0.39	0.47	-	0.11-0.20	Iglesias and Coelho (2020)
Bulgaria	Complex households	0.39	0.45	0.17	-	Bose-Duker et al. (2021)
Côte d'Ivoire	Singles and couples with/without children	0.38-0.42	0.52	-	0.09-0.19	Bargain et al. (2015)
Ethiopia	Couples with children and single mothers	-	-	0.19	0.15-0.32	Belete et al. (2019)
Ghana	Complex households	0.24-0.28	0.31	0.07	0.06-0.08	Aminjonov, Bargain, Colacce and Tiberti (2024)
Iraq	Complex households	0.21	0.26	0.05	-	Bose-Duker et al. (2021)
India(*)	Complex households	0.32	-	0.18	-	Calvi (2020)
Malawi	Couples with children	0.30	-	0.10	0.07-0.14	Dunbar et al. (2013)
Malawi	Complex households	0.29	-	0.12	0.11-0.14	Penglase (2021)
Malawi	Complex households	0.27	0.28	0.13	0.07-0.15	Bose-Duker et al. (2021)
Malawi	Complex households	0.28	0.37	0.15	0.14-0.16	Aminjonov, Bargain, Colacce and Tiberti (2024)
Mexico	Poor nuclear households (PROGRESA)	0.31-0.38	-	-	0.09-0.32	Tommasi and Wolf (2016)
Mexico	Poor nuclear households (PROGRESA)	0.34-0.37	-	-	0.07-0.12	Sokullu and Valente (2022)
Mexico	Poor nuclear households (PROGRESA)	0.29-0.31	-	-	0.11-0.28	Tommasi (2019)
Mexico	Complex households	0.34	-	0.16	-	Calvi et al. (2023)
Russia	Couples without children, both employed	-	0.345-0.618	-	-	Cherchye et al. (2011)
South Africa	Couples with children	0.28-0.36	0.45	-	0.12-0.20	Bargain et al. (2018)
South Africa	Household with men and women	0.18-0.29	0.29	0.18	0.10-0.24	Bargain (2023)

Notes: (*) Results from Calvi (2020) refer to shares of all women and all children in the household.

Figure 1.A2: Individual Resource Shares by Living Standards (Robustness Check Based on Within-Country Mean Resource Shares)

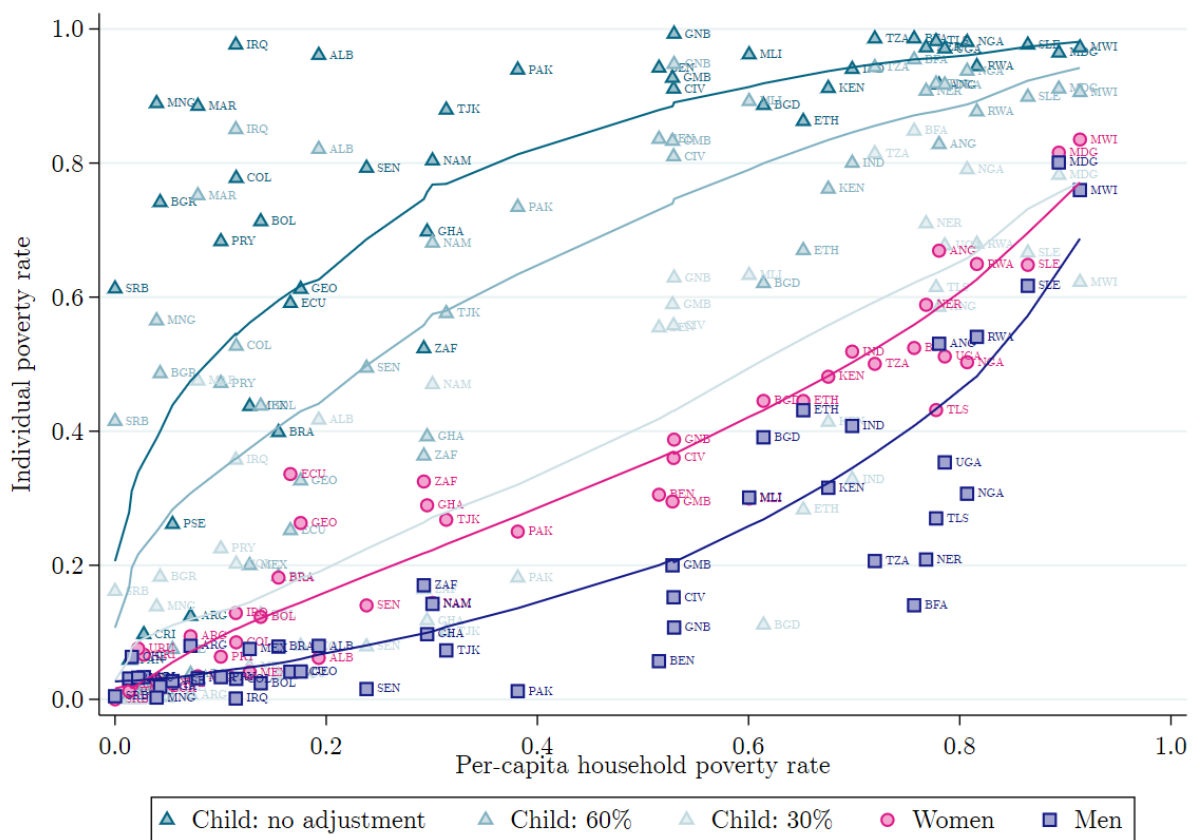


Source: Authors' estimations using the data from household expenditure surveys of 45 countries. Notes: Figure illustrates country-level average of predicted per-man, per-woman, and per-child resource shares by log per-capita household expenditure. Country-level averages of resource shares and log per-capita household expenditure are based on the sample of households with men, women and children. Per-person shares do not add up to one due to the different number of members of each demographic group within households. Smooth lines are based on locally weighted regressions of resource shares on log household expenditure.

1.5.5 Implication for Individual Poverty: Checks and Additional Results

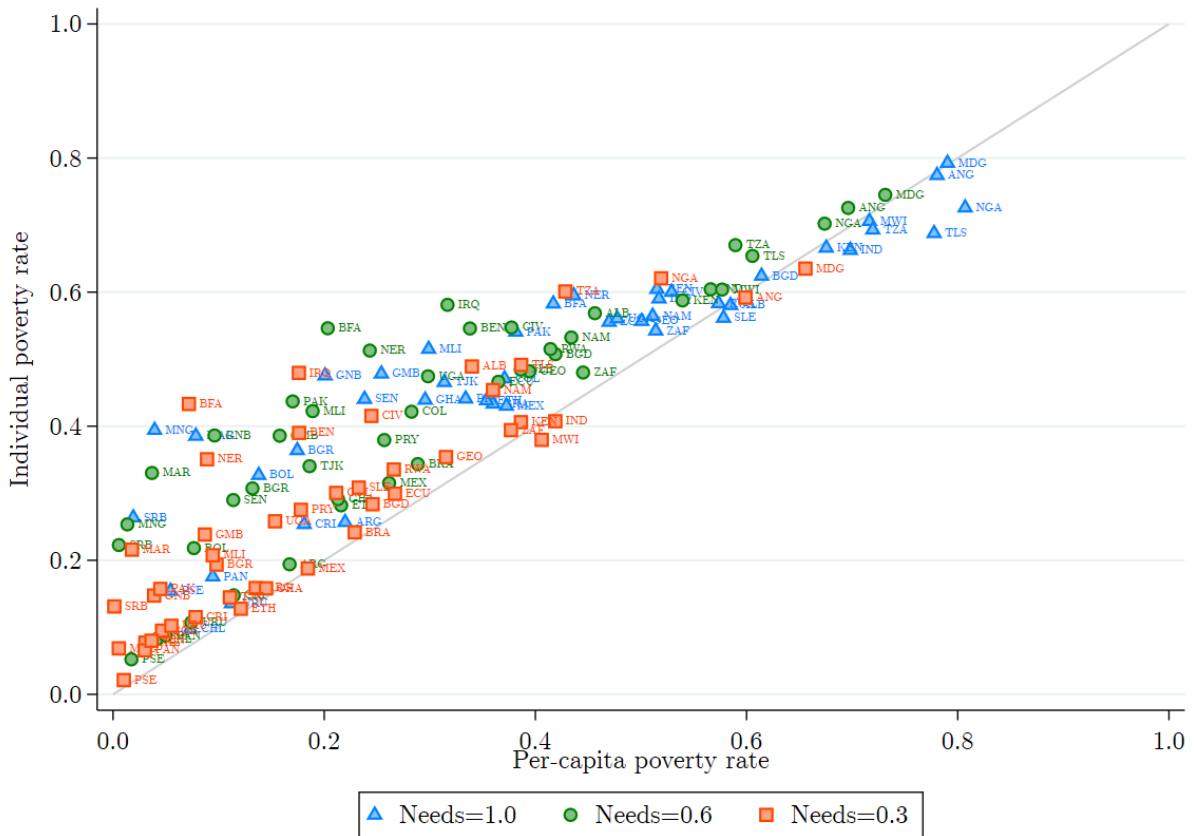
- Figure 1.A3: Individual versus per-capita household poverty using alternative poverty line (at \$3.2/day)
- Figure 1.A4: Overall individual versus per-capita poverty rates (average over different person type, per country)
- Figure 1.A5: Proportion of poor individuals in non-poor households (i.e. in households deemed non-poor according to the per-capita approach)

Figure 1.A3: Individual vs. Per-Capita Household Poverty (Alternative Poverty Line at \$3.2/day, 2011 PPP)



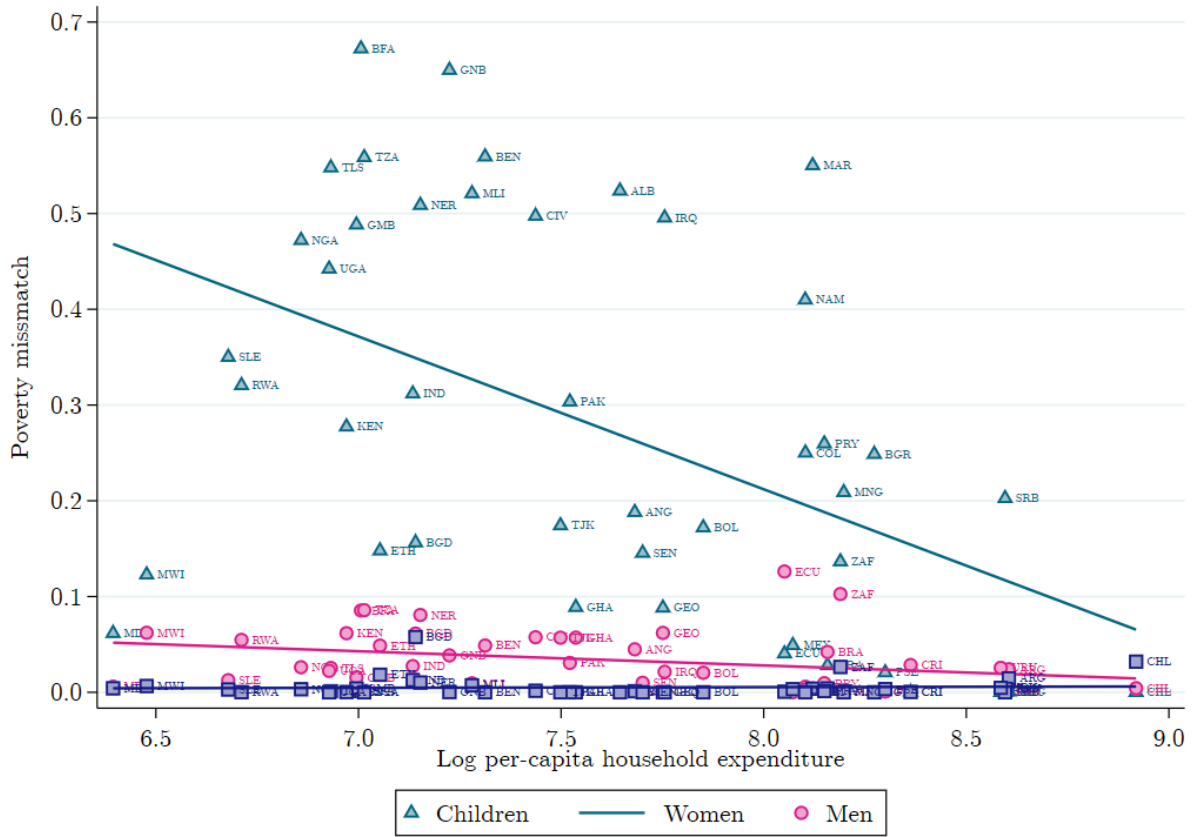
Source: Authors' estimations using the data from household expenditure surveys of 45 countries. *Notes:* Figure illustrates country-level individual poverty rates of men, women, and children by per-capita household poverty estimates. Poverty rates are calculated for the sample of households with men, women, and children. Individual poverty rates are based on predicted resource shares for women, men, and children. Results for child poverty are presented for three equivalence scales: (i) the same as an adult (no adjustment), (ii) 60% of an adult, and (iii) 30% of an adult. Smooth lines are based on locally weighted regressions of individual poverty on per-capita household poverty.

Figure 1.A4: Overall Individual vs. Per-Capita Poverty Rates (Country Average)



Source: Authors' estimations using the data from household expenditure surveys of 45 countries. *Notes:* Figure illustrates country-level individual poverty rates and per-capita poverty estimations. Poverty rates are calculated for the sample of households with men, women, and children. Individual poverty rates are based on predicted resource shares for women, men, and children. Results for child poverty are presented for three equivalence scales: (i) the same as an adult (no adjustment), (ii) 60% of an adult, and (iii) 30% of an adult. Results are presented for the poverty line that corresponds to each country according to the World Bank income classification.

Figure 1.A5: Proportion of Poor Individuals in Non-Poor Households



Source: Authors' estimations using the data from household expenditure surveys of 45 countries. Notes: Figure illustrates the proportion of non-poor individuals living in poor households. Poverty rates are calculated for the sample of households with men, women, and children. Individual poverty rates are based on predicted resource shares for women, men, and children. Poverty line of \$1.9/day (2011 PPP) and equivalence scale of 60%. The trend lines represent fitted regression of poverty mismatch on log per-capita household expenditure. Child poverty mismatch in Madagascar and Malawi is low due to their high level of child poverty in both measures.

1.5.6 Cross-Validation: Checks and Additional Results

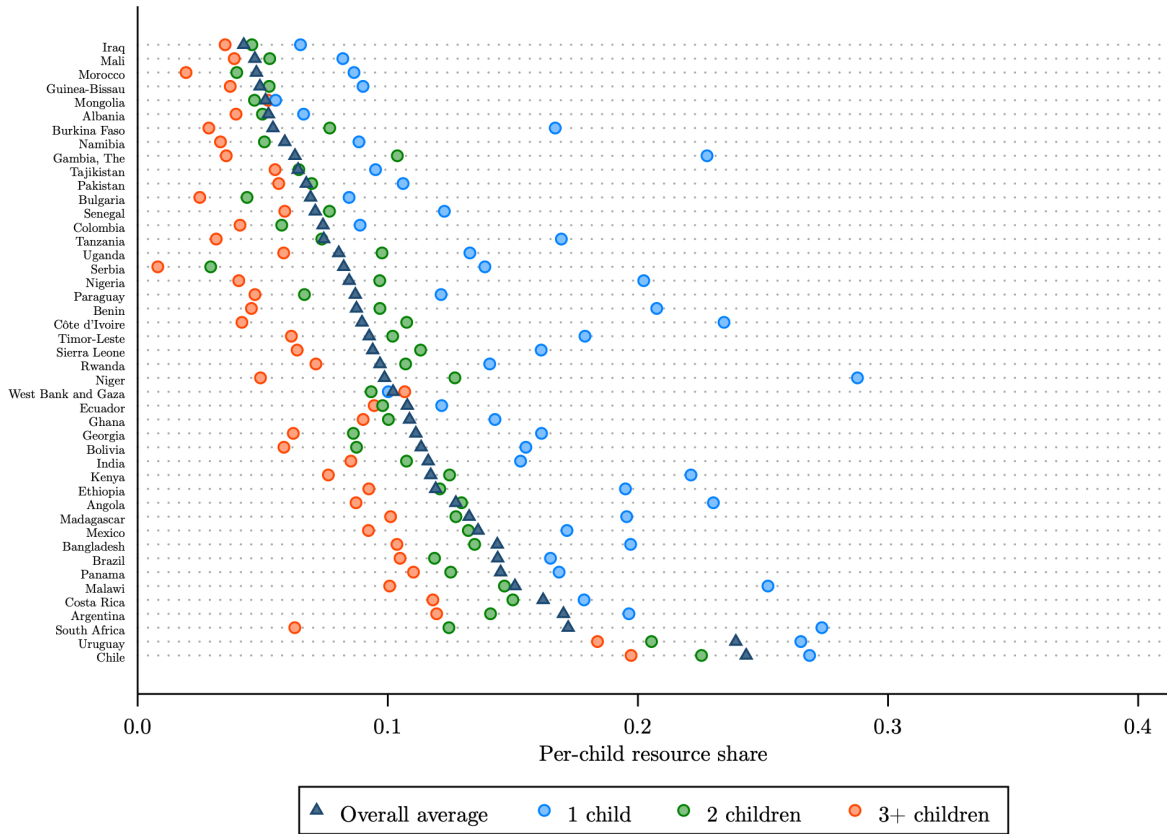
- Table 1.A9: Child undernutrition, per-child resource shares and poverty correlations
- Figure 1.A6: Child resource shares by number of children in the household
- Figure 1.A7: Sensitivity of micro cross-validation: per-child resource shares and poverty vs. child stunting (selected countries)

Table 1.A9: Child Undernutrition, Per-Child Resource Shares and Poverty Correlations

	Correlation with child wasting			Correlation with child stunting		
	Child resource share	Per-capita poverty	Child poverty	Child resource share	Per-capita poverty	Child poverty
	(1)	(2)	(3)	(4)	(5)	(6)
Macro-level correlation	-0.29	0.23	0.49	-0.23	0.67	0.73
Burkina Faso	-0.62	0.21	0.52	-0.78	0.56	0.61
Ethiopia	-0.50	0.00	0.18	-0.63	0.16	0.36
Iraq	-0.57	0.28	0.34	-0.78	0.25	0.84
Kenya	-0.82	0.68	0.73	-0.87	0.61	0.71
Malawi	-0.69	0.32	0.41	-0.33	0.34	0.36
Namibia	-0.51	0.46	0.52	-0.82	0.31	0.86
Timor Leste	-0.32	0.09	0.18	-0.21	0.05	-0.04
Uganda	-0.43	0.31	0.33	-0.58	0.46	0.41

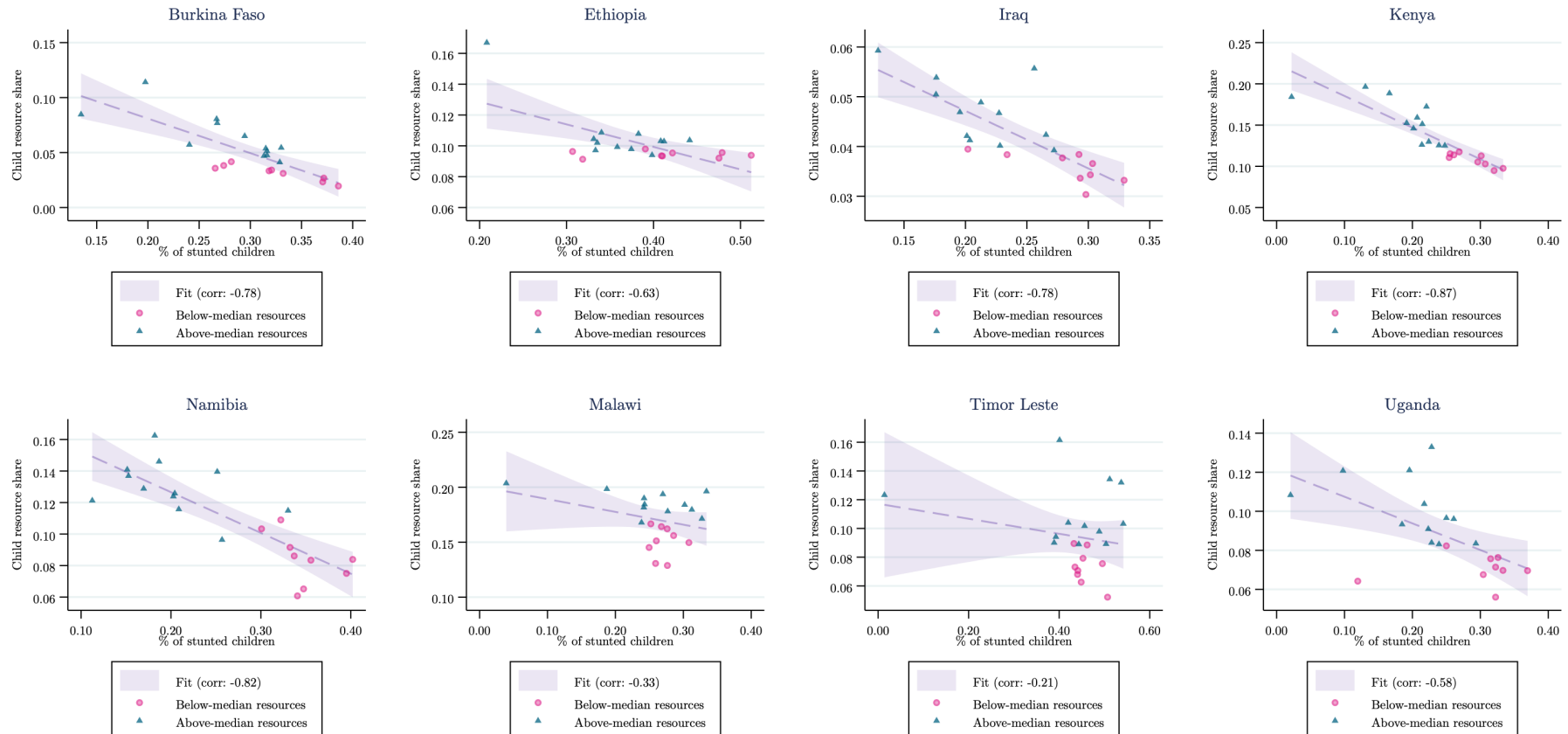
Source: Authors' estimations using the data from household expenditure surveys for 45 countries for macro-level correlations and eight countries that record micro-level information on child anthropometrics for micro-level correlations. *Notes:* Table reports the cross-country (macro-level) and within-country correlation coefficients between child undernutrition indicators, per-child shares, and poverty (household and per-child). Poverty line is set at \$1.9/day (2011 PPP) and child weight at 60% of an adult. Sample of households with men, women, and children.

Figure 1.A6: Child Resource Shares by Number of Children



Source: Authors' estimations using the data from household expenditure surveys of 45 countries. *Notes:* Figure illustrates country-level average of predicted per-child resource shares for all households, households with one child, two children, and three or more children. Country-level averages of resource shares are based on the sample of households with men, women and children.

Figure 1.A7: Sensitivity of Micro Cross-Validation: Per-Child Resource Shares and Poverty vs. Child Stunting (Selected Countries)



Source: Authors' estimations using the data from household expenditure surveys for eight countries that record micro-level information on child anthropometrics. *Notes:* Graphs illustrate average per-child shares by the prevalence of child stunting averaged over 20 bins of per-capita household expenditure, differentiating between households with above- or below-median per-capita resources. Correlations between child resource shares and child stunting are reported in legends.

Chapter 2

Culture, Intra-household Distribution and Individual Poverty

2.1 Introduction¹

Culture and informal norms have received much attention in economics recently (Baland et al.; 2020; Nunn; 2020; Bau and Fernández; 2022). In particular, traditional family organizations varying across ethnic groups seem to be crucially associated with the large gender differences in various socio-economic outcomes (Jayachandran; 2021). For instance, there is increasing evidence on the relationship between women's outcomes and ancestral norms such as patrilocality, patrilineality, dowries or bride price.² Ancestral norms may affect empowerment and gender roles through the way they still influence human capital investment and saving decisions within the household (La Ferrara and Milazzo; 2017; Bau; 2021; Ashraf et al.; 2020). They also shape women's autonomy through family rules, customs that exacerbate favoritism toward males or ongoing practices that can change the amount of resources controlled by women (Anderson and Bidner; 2022; Giuliano; 2020). These different channels probably explain part of the substantial intra-household inequality documented in several low and middle income countries. However, very few studies have examined and tried to quantify the way social norms affect the allocation of resources within families, and the subsequent poverty of women and children specifically.

We aim to fill this gap while focusing on a central norm, namely post-marital residency. This norm corresponds to the practice of living after marriage with or near the parents of the groom (patrilocal) versus the bride (matrilocal), respectively. Compared to couples living without their parents

¹This chapter is joint work with Ulugbek Aminjonov, Olivier Bargain, and Luca Tiberti and has been accepted for publication in *Economic Development and Cultural Change* (scheduled for October 2024, vol. 73, no. 1).

²See for instance Alesina and Ferrara (2005), La Ferrara (2007), Lowes and Nunn (2017), Corno et al. (2020), Lowes (2020), Calvi and Keskar (2021), Loper (2021).

(neolocal) or free to choose which family to reside with (ambilocal), these family arrangements are often opposed to each other because of the other norms, customs and beliefs they relate to, notably in terms of women's role and power in the household. In particular, since the woman will leave her parents' house and family at marriage, returns on investment in a daughter's health and education are lower than for boys. Consistently, several anthropological and economic studies attribute lower education, a lower marriage age and low levels of autonomy to women in groups adopting patrilocality.³ Globally, a negative country correlation between traditional patrilocality and progressive views about gender roles has been reported (for instance in [Jayachandran 2015b](#)). To our knowledge, however, the present chapter is the study first to test whether belonging to ethnic groups with a patrilocal tradition, relative to a matriloal one, implies a more limited access to household resources for women, and to quantify the consequences in terms of women's and children's poverty.

For that purpose, we estimate a collective model that allows eliciting the complete consumption allocation between men, women and children ([Bargain and Donni; 2012](#); [Dunbar et al.; 2013](#)). We use household consumption surveys that can be matched to kinship traditions of post-marriage residence reported in the Ethnographic Atlas. The norm is introduced as an original determinant of the resource allocation function and we derive its implications in terms of individual poverty and gender inequality. Our application focuses on Ghana and Malawi, two countries in which both patrilocality and matrilocality norms are present. These countries offer an ideal setting to test the relative effect of these norms in terms of resource sharing also because the norms are mutually exclusive: ancestral residence norms were almost always matriloal or patrilocal (i.e. almost never ambilocal or neolocal). In addition, as highlighted by [Giuliano \(2020\)](#), analyses based on within-country variation often lack external validity so that the focus on two countries with possibly different set-ups is of interest here. As a matter of fact, the prevalence of the residence norm is contrasted: traditional patrilocality prevails in Ghana while matrilocality is more frequent in Malawi.

Exploiting within-country ethnic variation, our estimations show that women's resource shares decrease with patrilocality. This result is a common feature to both countries: overall, living in patrilocal households decreases women's average resources by around 9 percent in Ghana and 11 percent in Malawi. This gender bias in consumption is interpreted as the general distributional effect of ancestral norms, which may correspond to differences in bargaining power or simply to cultural values inherited from the factors that have shaped these norms. This consumption imbalance leads to large differences in poverty between women in the patrilocal and matriloal groups, on average and across a large part of the household consumption distribution. Children's resource shares show less systematic patterns but tend to decrease with patrilocality in Ghana.

³See for instance [Dyson and Moore \(1983\)](#) for northern India, [Garg and Morduch \(1998\)](#) for Ghana, [Buttenheim and Nobles \(2009\)](#) for Indonesia and [Bau \(2021\)](#) for Ghana and Indonesia.

For our baseline results, households are matched to a traditional norm using their ethnicity or language. For sensitivity analyses, we use a geographic matching based on the dominant norm surrounding a household: the resource gender gap is confirmed in this case. Even if there is less variation in lineage tradition, the results are also corroborated when considering patrilineality instead of patrilocality. Finally, we find that, unlike other cultural contexts (such as India), women’s control over resources tends to increase with age. In Ghana especially, age and ethnic norm are mutually reinforcing.

This chapter makes several contributions. First, we suggest one of the first studies measuring how traditional customs shift the allocation of resources within households. In the same spirit, [Calvi and Keskar \(2021\)](#) focus on the payment of dowries in India and analyze how it shapes women’s resource allocation. We show here that ancestral residency norms may be critical markers of women’s resources and of their risk of poverty. Second, our estimates consolidate existing evidence on the role of post-marriage residence specifically, which has been documented in other contexts and for other types of women’s outcomes ([Jayachandran; 2015b](#); [Bau; 2021](#); [Alesina et al.; 2021](#); [Robinson and Gottlieb; 2021](#)). In particular, we show how this norm affects individual poverty or the age-gradient of women’s control over consumption. Third, our results complement previous evidence on resource sharing estimations (in particular [Dunbar et al. 2013](#) and [Penglase 2021](#) for Malawi) but corroborate only part of the past conclusions (in particular, we find no evidence of pro-boy discrimination when considering a broader group than nuclear households). Fourth, we illustrate the fact that accounting for both intra-household inequality and the way it is driven by cultural norms is critical for evaluating policy interventions aimed at poverty reduction. If future policy targeting can be designed to reach vulnerable individuals, rather than poor households as a whole, then a set of observable factors will be needed to augment proxy-means test approaches with indications about who receives less within households. Our results indicate that household residence norms, combined with demographic factors such as age, could be part of this relevant informational set used to ‘tag’ households with a higher prevalence of poverty among women and children.

This chapter is structured as follows. Section 2 presents the existing literature and cultural backgrounds for the countries under study. Section 3 describes the empirical strategy, expenditure data, and the matching with ethnic norms. Section 4 reports the empirical results while Section 5 suggests concluding remarks.

2.2 Background

2.2.1 Existing Literature

Ancestral Norms and Gender Bias. Policy often mistargets poor individuals living in non-poor households ([Brown et al.; 2019b](#)). To improve policy targeting, it is essential to better identify

observable demographic or cultural traits that may be associated with a higher prevalence of poverty for specific individuals. We conjecture that ancestral patrilocality, relative to matrilocality, is associated with a bias favoring men and we attempt to quantify it in terms of resource allocation. As further discussed in the empirical section, we focus on *ancestral* rather than actual residence practice. Ancestral norms are likely to embody deep household heterogeneity in terms of gender rights and role. Customs that gave a higher status to men in the past may have been transmitted over generations and may persist today in the form of differences in gender norms (Giuliano; 2020; Bau and Fernández; 2022) and the way women exert decision-making power (Dessy et al.; 2023). Admittedly, the correlation between current residence practices and women's outcomes is indicative,⁴ but the literature also shows that modern evolution and policy changes have altered this norm and its common practice (e.g., Bau 2021). Therefore, more relevant to us is the persistent role of culture in gender roles and power.

Cross-country correlations reveal a systematic relationship between pro-women's outcomes and ancestral matrilocality.⁵ The underlying mechanisms of such a relationship can originate from the roots of post-marriage residence norms (see the extensive discussion of Bau 2021). Specifically, patrilocality might have stemmed from a greater productive role attributed to sons (Alesina et al.; 2013), occurred in pastoral societies with access to cattle (Becker; 2023; Holden and Mace; 2003), or from the need to locate multiple women within a husband's household in a polygynous setting (Edlund; 2001). Patrilocality also prescribes that men become their parents' source of old-age support (Bau; 2021), dissuading parents from investing in their daughters (Sundaram and Vanneman; 2008). Matrilocality contexts have increased women's position in case of disagreement, improving their ability to take-up legal reforms helping divorce (Bargain et al.; 2020). In contrast, better outside options for patrilocal men may be due to the pressure exerted by the presence of their own relatives on the wife. The uncertainty about men's paternity also decreased by their parents' monitoring of the wife's sexual behavior (Guha; 2010; Becker; 2023), which are favorable conditions for patrilineality, i.e., the kinship system that prescribes that lineage and inheritance are traced through men.

Interplay with Related Norms. We do not focus on lineage as the main source of heterogeneity across ethnic groups. This is in part because marriage customs seem to be a stronger marker of intra-household inequality than lineage (Bau and Fernández; 2022). Inheritance rules may also be less clear-cut regarding the redistributive attitudes of men towards their children or concerning gender imbalances (for children, the bias may even be the opposite of intuition, see Mwale et al. 2020). In addition, lineage tends to show less variation (Lowes; 2020): indeed, while patrilocal marriages always adopt the men's inheritance line (Dessy et al.; 2023; Mtika and Doctor;

⁴For instance, Robinson and Gottlieb (2021) argue that when women live among their kin, this translates into greater personal security and better outside options if they leave their husbands.

⁵See Jayachandran (2015b) and Bargain et al. (2020). Ancestral patrilocality is also positively associated with domestic violence against women, both its practice and acceptance (Alesina et al.; 2021).

2002; Berge et al.; 2014), some matrilineal groups have been shown to adopt patrilocal practices. Nonetheless, patrilinearity is closely related to patrilocality and is itself often associated with pro-male discrimination (Lowes; 2020) and reduced incentives to invest in daughters. Both norms may have actually co-evolved (Opie et al.; 2014) – notably because matrilineality is related to the risk of non-paternity of the son’s children (Fortunato; 2012), as mentioned above – and are correlated both globally and within countries Bau (2021). Women in matrilineal systems benefit from more support from their relatives, a more central social position in the kinship structures (La Ferrara; 2007; Lowes; 2020; Loper; 2021) and better political participation (Robinson and Gottlieb; 2021).⁶ For these reasons, we will suggest additional estimations in which we focus on the intra-household redistributive effect of patrilineality.

Recovering the Resource Sharing Process. Poverty and inequality analyses are typically based on per capita or equivalized household expenditure, ignoring intra-household inequality. Nonetheless, the disparity of treatment across family members is evidenced using variables directly associated with women’s or children’s outcomes, such as their health status (e.g., Thomas 1997) or nutritional outcomes (e.g., Haddad and Kanbur 1990a; Hoddinott and Skoufias 2004). Other analyses hinge on self-reported measures of women’s control over household decisions (e.g., Anderson and Eswaran 2009; Lépine and Strobl 2013; De Brauw et al. 2014). While insightful, these approaches are limited in scope and do not allow quantifying the link between social norms and women’s and children’s poverty. Alternatively, it is possible to infer the actual sharing process using recent extensions of the collective model literature (Bargain and Donni; 2012; Dunbar et al.; 2013). The approach we use is based on simple restrictions on individual preferences and the observation of some exclusive or assignable goods, i.e. spending that can be ascribed as exclusively for the benefit of one type of person. The complete allocation rule can be retrieved and the estimated shares of resources accruing to each person used to compute children’s, men’s, and women’s individual poverty status. In the absence of surveys collecting all the information about resource sharing, this approach is the main available solution to evaluate individual consumption and living standards.⁷

2.2.2 Traditional Norms in Ghana and Malawi

Ghana and Malawi are culturally diverse countries characterized by the coexistence of matrilo- cal and patrilocal systems of kinship, both in their ancestral ethnic groups and in their current practices. This diversity offers a suitable setting to study the nexus between cultural traits, intra-

⁶Some of the matrilineal systems are explicitly associated with matrilocality and the idea that women hold more resources and have a higher status (Fox; 1983).

⁷Some studies rely on the direct observation of *some* of the individual expenditures (such as food, e.g. in Brown et al. 2021 or D’Souza and Tandon 2019). Yet, it gives only a partial view of the reality of women’s control over household resources and of the consequences for individual poverty. Fully individualized expenditure data is costly and rare. An exception is a dataset from Bangladesh used in Bargain, Lacroix and Tiberti (2022) to validate the present approach by comparing observed and estimated resource shares.

household inequality, and individual poverty. As discussed above, it also slightly enhances the external validity of our results.

Ghana. Ethnic groups in Ghana present an important heterogeneity in the post-marital tradition of their ancestors. In the Ethnographic Atlas, 29 ethnic groups are represented. The main one, the Akan (or Ashanti, in the Ghanaian context), is traditionally matrilocal and matrilineal. Other smaller groups are also matrilocal (for instance, the Baule, Chamba, and Ga) while the rest of the country is patrilocal (the largest group being the Ewe). [Bau \(2021\)](#) points to a strong persistence of ancestral patrilocality in Ghana. She finds that, before the implementation of a formal old-age pension scheme, male children in patrilocal communities, unlike matrilocal ones, were more likely to be enrolled in school relative to their sisters. Yet, the investment in boys' education then decreased since parents' well-being in old age became less dependent on their sons after the reform. [La Ferrara and Milazzo \(2017\)](#) exploit another policy that increased the land that children can inherit from their fathers, counteracting the Akan matrilineal tradition of bequest through the mother line. Before the reform, parents had to overinvest in their children's education as a compensation for not transmitting land to their sons. There was less need to do so after the reform, so that the education of Akan boys decreased compared to that of other groups.

Malawi. Malawi is part of the *matrilineal belt*, which identifies the African areas in the south-central region surrounding the Zambezi River where matrilineal ethnic groups are predominant. There is nonetheless some heterogeneity among the 9 ethnic groups of Malawi reported in the Ethnographic Atlas. The most prevalent group is the Chewas, located in the central regions and traditionally matrilocal,⁸ the Nyanja, which are also matrilocal and predominate in the South, and the Tumbuka, which are traditionally patrilocal and reside in the North. Several other groups also coexist but are smaller (namely the Laketonga, Li, Ngonde, Nuakyusa, Safwa and Yao). [Dessy et al. \(2023\)](#) show that in Malawi, patrilocality induces a gender bias against women in terms of education. Also, relative to women in matrilocal marriages, women in patrilocal communities exert less decision-making power in their families and want more sons than daughters. As discussed above, even if not overlapping, matrilinearity is correlated with matrilocality and induces, in the context of the matrilineal belt, greater bargaining power and autonomy for women ([Lowes; 2020](#); [Loper; 2021](#)). In Malawi, in particular, greater material control and increased education for girls also lead to greater female political participation in the matrilineal context ([Robinson and Gottlieb; 2021](#)).

⁸While their ancestors were matrilocal, according to the Ethnographic Atlas, this group currently practices patrilocality ([Dessy et al.; 2023](#)) and has transited from a matrilineal to a patrilineal kinship society.

2.3 Empirical strategy

2.3.1 Identification of the Resource Allocation Process

Collective Models and the Sharing Rule Interpretation. The approach we suggest is inherited from the literature on collective models of household decision-making. These models have been designed to account for the bargaining process underlying household decisions (Bourguignon and Chiappori; 1992) and, ultimately, to recover the intra-household resource allocation. This approach initially rests on the assumption that households make efficient decisions. This assumption allows for the decentralization of the decision process that leads to a sharing rule interpretation: household decisions are *as if* total resources were shared between members then decisions made individually on the basis of each person’s resources and preferences (Chiappori; 1992). Recently, several studies have suggested ways to identify this allocation process using consumption data. The first set of contributions have allowed identifying the sharing rule in childless couples (Browning et al.; 2013; Lewbel and Pendakur; 2008), while the more recent ones extend the approach to couples with children (Bargain and Donni; 2012; Dunbar et al.; 2013). In these studies, identification requires additional assumptions (i.e., preference stability, explained hereafter) and extra information (notably the use of single data and/or assignable goods). Our set-up will be located in this tradition, but does not necessarily need the efficiency assumption – efficiency is questionable, especially in the context of poor countries (see Baland and Ziparo 2018). As in related studies, we only need to assume that total expenditure is shared among household members according to some rule, which we identify and estimate.⁹

Sharing Rule. We start by assuming the existence of a sharing rule that governs the distribution of resources in the household. The key aspect in this chapter is that it will depend on distributional factors such as ancestral norms that, as discussed earlier, may be related with the intra-household balance of power. Denote x the log of total private expenditure and $\eta_{i,s}(z^r)$ the share of total private expenditure $\exp(x)$ accruing to each individual of type $i = f, m, c$, i.e. women, men and children, in a household of composition s . Resource shares depend upon several determinants in vector z^r including household demographic characteristics and, originally, cultural traits, which will essentially be a binary variable for patrilocality.¹⁰ Household composition corresponds to the number of individuals in each of the three groups, which are denoted by s_f, s_m and s_c , respectively, and are stacked in the vector $s = (s_f, s_m, s_c)$. Each household member of type i in a family of composition s is endowed with her own private resources written in log terms as $x_{i,s} = x + \ln \eta_{i,s}$ and used to calculate individual poverty. In non-nuclear households, the approach does not allow estimating resource shares among several persons of the same type

⁹Because of the collective model literature, the efficiency paradigm is the most commonly accepted way to justify decentralization, but probably not the only one supporting such a sharing process. See Lewbel and Pendakur (2022) for a departure from efficiency.

¹⁰They also depend on prices, but our setting is static and we can ignore time variation in market prices.

i (for instance among several adult women). This is a mere data limitation: to do so, we would simply need goods that are assignable to sub-groups of persons (for instance goods consumed by old women but not by young ones). This is not an impediment for two reasons. First, we focus mainly on male vs. female vs. child poverty overall. Second, we can specify the sharing function in a heterogeneous way, for instance introducing women's age to check if women obtain more resource when older. We will illustrate this possibility in our empirical work.

Structural Engel Curves at Individual and Household Levels. Next, we adopt a semi-parametric identification as in [Dunbar et al. \(2013\)](#), based on the assumption of Piglog indirect utility functions (see [Deaton and Muellbauer 1980](#)). It conveniently yields individual Engel curves that are linear in the logarithm of individual resources. That is, the *individual budget share* for a good k consumed by any person i is written:

$$w_{i,s}^k = \delta_{i,s}(z^p) + \beta_{i,s}(z^p) \cdot x_{i,s}(z^r), \quad (2.1)$$

with preference shifters z^p and sharing rule determinants z^r . For the sake of identification, we must assume the presence of exclusive goods, i.e., goods consumed only by specific types of individuals. We index them k_c, k_f, k_m for children, women and men, respectively. For instance, if k_f corresponds to female clothing, $w_{f,s}^{k_f}$ is the proportion of her resources, $\exp(x_{i,s})$ that a woman in household type s spends on her clothing. As a function of (log) individual expenditure, the expression above defines *individual* Engel curves. From the structure placed on individual demand, we can also derive *household* Engel curves. For instance in a nuclear household, if we multiply $w_{f,s}^{k_f}$ by $\eta_{f,s} = \exp(x_{f,s})/\exp(x_s)$, we obtain the level of spending on the wife's clothing as a fraction of total expenditure, i.e., the *family budget share* on that good, $W_s^{k_f} = \eta_{f,s} \cdot w_{f,s}^{k_f}$. If there are several adult women in the family, the latter is simply multiplied by s_f . Importantly, family budget shares are available in standard expenditure surveys. Thus, we can write a system of household budget shares for exclusive goods $k_i, i = f, m, c$:

$$\begin{aligned} W_s^{k_f} &= s_f \cdot \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_{f,s}(z^p) \cdot (x + \ln \eta_{f,s}(z^r))) \\ W_s^{k_m} &= s_m \cdot \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_{m,s}(z^p) \cdot (x + \ln \eta_{m,s}(z^r))) \\ W_s^{k_c} &= s_c \cdot \eta_{c,s}(z^r) \cdot (\delta_{c,s}(z^p) + \beta_{c,s}(z^p) \cdot (x + \ln \eta_{c,s}(z^r))) \end{aligned} \quad (2.2)$$

where the left-hand terms are observed.

Restrictions and Identification. The question is whether we can retrieve key elements from the estimation of a reduced form of the above system, i.e., from the estimation of family budget shares on log expenditure. Before making necessary identifying assumptions, note that the children's resource share can be written as the complement to one of adult shares, i.e. $s_c \eta_{k,s} = 1 - s_f \eta_{f,s} - s_m \eta_{m,s}$, and is automatically recovered once adult shares are. Then, the derivatives with respect

to log expenditure of the system above yield:

$$\begin{aligned}\partial W_s^{k_f} / \partial x &= s_f \cdot \eta_{f,s}(z^r) \cdot \beta_{f,s}(z^p) \\ \partial W_s^{k_m} / \partial x &= s_m \cdot \eta_{m,s}(z^r) \cdot \beta_{m,s}(z^p) \\ \partial W_s^{k_c} / \partial x &= s_c \cdot (1 - \eta_{f,s}(z^r) - \eta_{m,s}(z^r)) \cdot \beta_{m,s}(z^p)\end{aligned}\tag{2.3}$$

for each s out of a total of S different family compositions. The left-hand derivatives are observed, at least when household Engel curves are not flat, which is an applicability condition that we check in the empirical analysis. The system above corresponds to $3S$ equations and $5S$ unknowns ($\eta_{f,s}, \eta_{m,s}, \beta_{f,s}, \beta_{m,s}$ and $\beta_{c,s}$ for each s). Thus, identification requires additional restrictions on the preference term β . We rely on the Similarity Across People (SAP) assumption suggested by [Dunbar et al. \(2013\)](#), which states that for exclusive goods, the shape of individual Engel curves is similar across person types $i = f, m, c$ of a given household type s . Formally, SAP is written as: $\beta_{f,s} = \beta_{m,s} = \beta_{c,s} = \beta_s$ for each $s > 0$. It leads to $3S$ unknowns in total ($\eta_{f,s}, \eta_{m,s}$ and β_s for each s) and, hence, to an exact identification.¹¹ Note that SAP is a commonly used preference restriction in the demand literature and a weaker version of shape-invariance defined by [Lewbel \(2010\)](#).¹²

2.3.2 Specification and Estimation Method

The semi-parametric approach provides the log-linear specification of Engel curves derived from Piglog preferences, as written in equation (3.1). Additionally, we model resource shares using logistic functions to guarantee that the shares are below 1 and sum up to 1. To estimate the model, we add error terms to household Engel curves for women's, men's and children's exclusive goods in the demand system (3.5), while imposing the SAP condition. Thus, we estimate the following system:

$$\begin{aligned}W_s^{k_f} &= s_f \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{f,s}(z^r))) + \epsilon_{f,s} \\ W_s^{k_m} &= s_m \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{m,s}(z^r))) + \epsilon_{m,s} \\ W_s^{k_c} &= s_c \eta_{c,s}(z^r) \cdot (\delta_{c,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{c,s}(z^r))) + \epsilon_{c,s}\end{aligned}\tag{2.4}$$

with

$$\begin{aligned}\eta_{f,s} &= \exp(\gamma_f z^r) / D, \quad \eta_{c,s} = \exp(\gamma_c z^r) / D, \quad \eta_{m,s} = 1 / D \\ \text{and } D &= 1 + \exp(\gamma_f z^r) + \exp(\gamma_c z^r).\end{aligned}$$

¹¹The same result is true if we consider households with only two of the three groups of persons, for instance with $i = f, m$ only. For childless couples, there is one unknown less, $\eta_{c,s}$ and one equation less, hence $3S$ unknowns and equations after imposing SAP.

¹²[Bargain, Lacroix and Tiberti \(2022\)](#), using direct observations of resource shares, tend not to reject SAP. Other tests hinge on indirect methods, i.e. start from alternative identification approaches that do not require SAP (e.g., using distribution factors [Dunbar et al. 2021](#) or [Brown et al. 2021](#)), and test it as a restriction.

Engel curve parameters $\delta(z^p)$ and $\beta(z^p)$ vary with preference shifters z^p , which include household composition (namely s_f, s_m, s_c) and a urban dummy.¹³ For the sharing rule, we specify the logistic form with a set z^r of variables equivalent to z^p plus other demographic characteristics (e.g. the proportion of boys) and the dummy for patrilocality. Since the error terms of the model are likely to be correlated across equations, each system is estimated using Non-Linear Seemingly Unrelated Regressions. Details about the estimation procedure are explained in the Appendix.

2.3.3 Expenditure Data and Key Variables

Household Expenditure Surveys. We exploit data from the 7th wave of the Ghana Living Standards Survey and the 4th wave of the Malawi Integrated Household Survey, both conducted in 2016/2017.¹⁴ Both surveys collect detailed information on household consumption and socio-demographic characteristics. We construct a variable for total expenditure, which aggregates spending on food and non-food goods.¹⁵ We retrieve information on clothing expenditure, which is assignable to men, women and children. Another essential feature here is the set of ethnographic data used to match households with a traditional residence norm, as explained in detail below. Available information includes the ethnic group to which the respondents belong for Ghana and spoken languages for Malawi.

Assignable Expenditure. Assignable clothing, i.e., private expenses on men's, women's, and children's clothing items, is key for the identification of resource shares. The choice of clothing is primarily practical. Indeed, the set of assignable goods available in standard surveys is extremely limited, while children's, men's and women's clothing expenditures can generally be distinguished. For this reason, clothing has been extensively used to retrieve child costs with the Rothbarth approach (see [Deaton 1997](#)) or to estimate collective models of consumption (e.g., [Browning et al. 1994](#), [Bourguignon et al. 2009](#) or [Dunbar et al. 2013](#); see [Browning et al. 2014](#) for a survey). The use of clothing for resource share identification is also supported by recent validation tests ([Bargain, Lacroix and Tiberti; 2022](#)).

Sample Selection. The ultimate goal of our resource sharing estimations is to pursue individual poverty analysis as broadly as possible, so that our selection imposes few exclusions. We discard households for whom basic information is missing (e.g., expenditure, household composition), which represent less than 0.1% in each country. We also trim the top one percent of clothing

¹³Note that results are robust to the introduction of some non-linearity $\beta(z^p)$, notably by adding a squared term for the number of children s_c to improve accuracy in the estimation of Engel shapes $\beta(z^p)$ and, ultimately, identification of resource shares.

¹⁴Note that majority of survey interviews in Ghana took place in 2017, while for Malawi a large share of interviews were in 2016.

¹⁵Both surveys report expenditure for household members defined as people who "normally live in the surveyed household". However, we cannot exclude that household consumption also includes expenses on non-resident individuals, for instance men who spend time at their sisters' home. While this issue may arise for frequent purchases such as food, our identification relies on clothing expenditure and should be less affected by potential consumption mis-measurement.

budget shares to avoid outliers and reduce measurement error. We exclude households for whom ethnographic information such as language or ethnic group is missing, which represent 2% of the sample in Ghana and 3% in Malawi. As described below, an additional 9% of the sample cannot be used in Ghana due to limitations in terms of residence norm information. Our final sample comprises 7,756 multi-person households for Ghana and 8,429 for Malawi.

2.3.4 Cultural Data and Matching Procedures

General Principles. We focus on the within-country heterogeneity of ancestral post-marriage residency norms, as provided by the Ethnographic Atlas (Murdock; 1967). This ethnicity-level database collects traditional, pre-modernization cultural practices for the majority of all ethnic groups worldwide. It has been used extensively in the vibrant literature on the historical roots of current institutions, including family arrangements and norms (Baland et al.; 2020; Nunn; 2020; Bau and Fernández; 2022; Giuliano; 2020). In particular, it has been mobilized to measure post-marital residency traditions across ethnic groups of Ghana (Bau; 2021) and Malawi (Robinson and Gottlieb; 2021).

As many of these authors, we assign to each household in our data a measure of *ancestral* post-marital residency norm. As discussed, *actual* residency choices are not the focus of interest. First, they may reflect various aspects pertaining to a couple's environment than divert us from the ethnic cultural characteristics attached to gender roles (for instance, the way local policies can alter actual practices or make them inoperative: see, e.g., Bau 2021 or La Ferrara and Milazzo 2017). Also, actual residence decisions are likely to depend on households' unobserved characteristics, including the women's specific degree of influence on decisions.¹⁶ Finally, and more fundamentally, our study is really about the tradition rather than the practice, as the custom relates to a set of historically inherited characteristics that together can influence intra-household decisions and inequalities (see section 2.1).

Matching Strategy. The Ethnographic Atlas contains over one hundred cultural variables, including ethnic-specific ancestral practices of post-marital residence, inheritance rules, bride price or dowry. We aim to assign an ancestral residency norm to each household in the expenditure data by linking the household to the ethnic group to which it is most likely to belong. For our baseline results, we adopt an *individual matching* whereby the ethnicity (for Ghana) or the language (for Malawi) declared by the household head in the expenditure data is matched to an ethnic group available in the Atlas.¹⁷ We follow the sequence suggested by Nunn and

¹⁶Situations where actual choices diverge from the norm are in fact interesting and may reveal relevant heterogeneity in terms of the intra-household balance power. This remark alludes to potential future work, but is beyond the scope of the present chapter.

¹⁷For Malawi, ethnicity is not available in the survey so we use the declared language spoken as a proxy for ethnicity, as done for instance in Alesina et al. (2021) and Bau (2021). This assumes that cultural traits are passed on in the same way as language, which is itself an important vertically transmitted trait (Giuliano and Nunn; 2018).

Wantchekon (2011) and applied by several authors (Alesina et al.; 2021; Bau; 2021; Ashraf et al.; 2020; Michalopoulos et al.; 2019). In a first step, we attempt to directly match the data, for as many ethnic groups as possible, when the name in the Ethnographic Atlas coincides with the declared ethnicity or language in the household surveys. We obtain an exact match for 32% (86%) of households in Ghana (Malawi). Then, when direct match is not possible, we adopt alternative concordances for ethnicities/languages based on the Afrobarometer (as suggested by Nunn and Wantchekon 2011), the *Ethnologue* (as suggested by Giuliano and Nunn 2018 using the language classification of Gordon 2009), or alternate names from both the *Ethnologue* and the *Joshua Project*.¹⁸ This approach allows matching a further 63% of households for Ghana and 11% in Malawi. Yet, for Ghana, information on ancestral post-marital residency is missing for some minor groups corresponding to 7% of the sample. Overall, despite missing ethnicity/language information in the surveys (2% for Ghana, 3% for Malawi) and unmatched groups or missing residence information in the Atlas (9% for Ghana), we manage to associate post-marriage residence norms to the bulk of our samples (89% for Ghana, 97% for Malawi, which is similar in magnitude, or exceed, those reported in previous studies adopting similar methods, e.g. Michalopoulos et al. 2019; Alesina et al. 2021). For sensitivity checks, we also consider the *geographical match* often used in the literature and based on the geographical location of the household (Alesina et al.; 2013; Giuliano and Nunn; 2021; Cao et al.; 2021). As further explained in the appendix, it links the current location of residence declared in the household survey (subnational region or enumeration area) to the local prevalence of ethnic groups and their ancestral post-marital residency norms, drawing from the *Ancestral Characteristics Database* of Giuliano and Nunn (2018). The correlation between the residency norm and resource sharing may be attenuated or, on the contrary, may be stronger if what matters is the dominant norm within a particular area (more than the actual tradition of a household's own ethnicity). We shall check this in our sensitivity analysis. Table 2.1 suggests a summary of matching methods and their results. Ancestral patrilocality represents a bit more than half of the sample in Ghana, while matrilocality prevails in Malawi. Other post-marital residency norms (ambilocal/neolocal) are marginal, and we shall ignore them to focus on the divide between patrilocal and matrilocal ancestries in what follows.

2.3.5 Summary Statistics

Table 2.A1 reports the mean and standard deviation of key variables used in the estimation of the structural model presented above. Columns (1) and (3) report results for households with children, women, and men, and columns (2) and (4) for households with women and men only. Ghana is substantially richer than Malawi, with an annual level of household private expenditure of around \$7,000 (in 2011 PPP\$) compared to \$2,150 in Malawi. As expected given these differential living standards, Ghana is much more urban, but demographic characteristics do not differ significantly between the two countries. We also report average clothing shares for chil-

¹⁸Ethnologue: <https://www.ethnologue.com/>; Joshua Project: <https://joshuaproject.net/>

Table 2.1: Matching strategies

Matching method	Description	Country	Matching variables	Matching results		
				Patrilocal	Matrilocal	Neo/ambilocal
Individual	Ethnicity/language declared in the surveys is linked to the closest match in the Ethnographic Atlas and the corresponding ancestral post-marital residency	Ghana	Declared ethnicity	65.9%	34.0%	0.1%
		Malawi	Declared language	17.0%	82.9%	0.1%
Geographic	Current area of residence (subnational region or enumeration area) is matched to the local prevalence of ethnic groups and their ancestral post-marital residency	Ghana	Sub-national region	62.8%	37.1%	0.1%
		Malawi	GPS location	8.8%	91.1%	0.1%

Both individual and geographic matching procedures are applied to the Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016, leading to the prevalence of patrilocal ancestry as reported in the table. Note: individual matching is based on the following sequence: (1) Direct match using the declared ethnicity name and the name in the Atlas. (2) Nunn and Wantchekon (2011)'s match between Afrobarometer ethnicity names and Atlas names. (3) Giuliano and Nunn (2018)'s match between Ethnologue language names and Atlas names. (4) Ethnologue/Joshua Alternate Name: the survey ethnicity name and the Atlas name are "alternative names" in either the Ethnologue (<http://www.ethnologue.com/>) or the Joshua Project (<http://joshuaproject.net/>).

dren, women, and men. The infrequency of clothing purchase is not an issue (see [Dunbar et al. 2013](#)) but country differences are explained by data collection: the relatively lower share of zero-values in Ghana comes from a longer recall period for clothing expenditure (12 months, versus 3 months for Malawi). Table 2.A2 completes this description with statistics for households of matrilineal versus patrilineal ancestries. Both groups have similar socio-demographic characteristics overall, especially in Malawi. In Ghana, ethnicities of patrilineal tradition are more often located in rural areas, have slightly more children and are significantly poorer than those of matrilineal ancestry.

2.4 Results

2.4.1 Baseline Resource Share Estimations

We present estimates of the resource shares in Table 2.2, as well as the marginal effects of the key determinants of the sharing rule. Other estimated coefficients of the model are broadly in line with the literature. In particular, we verify that the estimated values of the slopes β of individual Engel curves are statistically significantly different from zero for almost all observations in both countries and irrespective of the household composition (cf. statistics reported three rows from the end in the table).¹⁹

¹⁹As discussed before, zero latent slopes would lead to an indeterminacy of the resource shares ([Dunbar et al.; 2013](#)).

Average Resource Shares. We start with a general overview of our sharing rule estimates. Panel (a) of Table 2.2 reports total and per-person resource shares for each individual type, i.e., children, women, and men, averaged over all the values of demographic factors in the population. We present results separately for each country and for two groups of interest: households including children, women, and men in columns (1) and (3), and households with both women and men but no children in columns (2) and (4). In both family settings, and in both countries, we find larger resource shares for men. Men absorb between around 35% and 42% of household resources in Ghana and between 30% and 48% in Malawi. Women receive only 24-31% of resources in Ghana and 28%-37% in Malawi. This pattern of gender inequality is generally found in related studies on Malawi (e.g., Dunbar et al. 2013; Penglase 2021) and for other African countries (Bargain et al. 2015 for Côte d’Ivoire, Bargain et al. 2018 for South Africa). Note that most of the past studies focus on nuclear households, so the results are not entirely comparable. Considering all families, especially those with multiple adults, is important in the context of low- and middle-income countries. Among the exceptions, i.e., studies also addressing complex households, we can cite Calvi (2020) or Penglase (2021). The latter focuses on Malawi, and our estimates of male and female shares are particularly close. Children’s allocations are also very much in line with the literature. For instance, Dunbar et al. (2013) report per-child shares of around 10%, and between 7% and 14% across family compositions. Lechene et al. (2022) find overall per-child shares between 4.5% and 18.8% across different low-income countries. Closest to us, Penglase (2021) reports child shares between 11% and 15% for Malawi.

Household Heterogeneity and Cultural Norms. Panel (b) of Table 2.2 reports marginal effects $\partial\eta_{i,s}/\partial z^r$ for key sharing rule determinants that are observable and potentially used for policy targeting: the gender composition of children, a urban dummy and our patrilocality measure.²⁰ Ancestral patrilocality is significantly associated with lower resources shares for women in both countries. The order of magnitude is a reduction in per-women shares corresponding to 1.8%-2.6% of the total household resources in Ghana and 3.2%-4.1% in Malawi. Thus, relative to the average per-woman resource shares, ancestral patrilocality accounts for a reduction of women’s resources by 9% overall in Ghana (11% in household with children and 6% in others) and 11% in Malawi (similar across household types). The patrilocality effect, just like the other marginal effects, is assessed at the mean household characteristics of each group. Alternatively, we can exploit population heterogeneity and represent the full distribution of individual resource shares for patrilocal versus matrilocal ancestries. Results are plotted in Figure 2.1 and confirm that in both countries, women obtain larger consumption shares in households of matrilocal tradition.

The relationship between resource shares and ancestral norms is more mixed regarding children. Several forces may oppose each other to the extent that matrilocality and matrilineality overlap

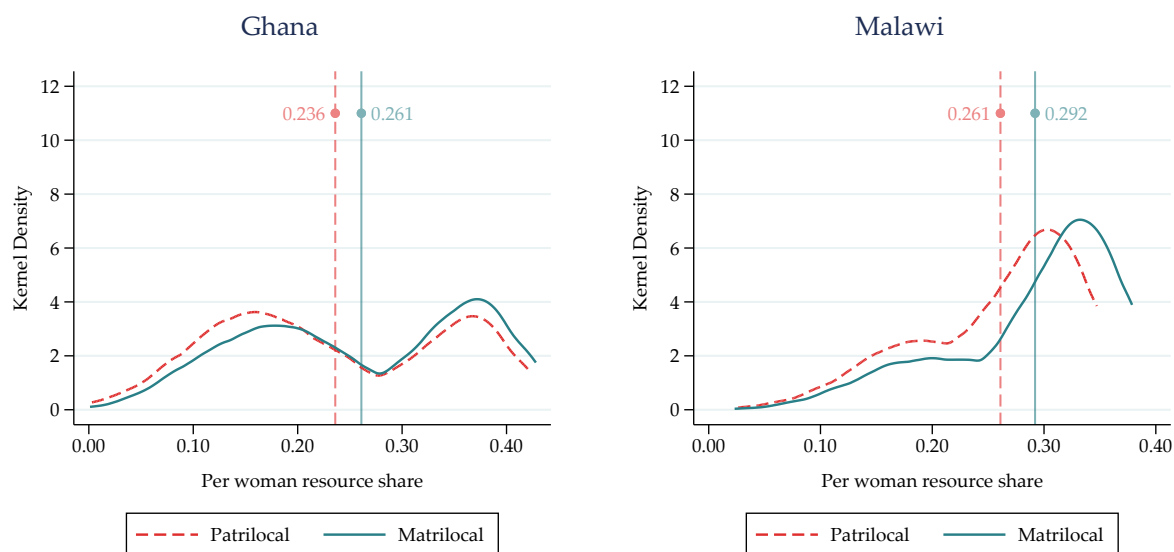
²⁰Regarding the other covariates, which capture household composition, we find as expected that the share of a given person type (child, male, female) increases with the number of persons of that type but at a decreasing rate (see also Dunbar et al. 2013 or Calvi 2020).

Table 2.2: Baseline results: Predicted individual resource shares, Ghana and Malawi

	Ghana		Malawi	
	<i>children, women and men</i>	<i>women and men</i>	<i>children, women and men</i>	<i>women and men</i>
	(1)	(2)	(3)	(4)
(a) Resource shares				
Children	0.145 (0.054)	- -	0.324 (0.082)	- -
Women	0.349 (0.095)	0.415 (0.114)	0.322 (0.056)	0.417 (0.083)
Men	0.506 (0.124)	0.585 (0.114)	0.354 (0.086)	0.583 (0.083)
Per child	0.068 (0.029)	- -	0.149 (0.062)	- -
Per woman	0.244 (0.111)	0.315 (0.134)	0.287 (0.073)	0.374 (0.120)
Per man	0.354 (0.101)	0.425 (0.127)	0.299 (0.061)	0.481 (0.104)
(b) Marginal effects on per person resource shares				
<i>Women's resource shares:</i>				
Patrilocal (=1)	-0.026 *** (0.004)	-0.018 *** (0.005)	-0.032 *** (0.007)	-0.041 *** (0.010)
Proportion of boys	-0.007 * (0.004)	- -	-0.005 (0.007)	- -
Urban (=1)	0.006 (0.007)	0.013 (0.008)	-0.013 (0.023)	-0.014 (0.026)
<i>Children's resource shares:</i>				
Patrilocal (=1)	-0.015 *** (0.003)	- -	0.004 (0.004)	- -
Proportion of boys	0.000 (0.001)	- -	0.000 (0.004)	- -
Urban (=1)	0.006 (0.004)	- -	0.003 (0.011)	- -
% of HHs with non-flat Engel curve	0.999	1.000	1.000	0.989
% of patrilocality	0.675	0.595	0.170	0.169
N	6204	1552	7462	967

Source: authors' estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Notes: Table reports baseline results by household compositions for each country. Columns (1) and (3) report estimation results for households with children, women and men. Columns (2) and (4) report results for households with women and men only. Panel (a) reports mean resource shares (total and per person) predicted based on collective model estimations for each individual type. Standard deviations in parantheses. Panel (b) reports marginal effects for key determinants of sharing rule of women and children. Marginal effects are estimated based on average household characteristics for the sample specified in columns. Standard errors in parantheses. *, **, *** indicate 10%, 5% and 1% significance level.

Figure 2.1: Distribution of Women’s Resource Shares by Post-marital Residency Norm



Source: authors’ estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Notes: Figures illustrate Kernel density of predicted per-woman resource shares. Patrilocal/matrilocal households are identified based on the ‘individual matching’ approach linking the surveys to the Ethnographic Atlas (see Table 2.1 for a summary of matching methods). Vertical lines represent mean resource shares for patrilocal/matrilocal households.

(which may be the case here but only to some extent, as previously discussed).²¹ Probably the main mechanism at play is the fact that stronger bargaining power in the hand of women may also benefit to children. If women are indeed less empowered in patrilocal culture, relative to matrilineal tradition, resources accruing to children may also be substantially smaller. For Ghana, this situation seems to prevail: per-child shares of household consumption are 1.5 percentage points smaller. The coefficient for Malawi is statistically insignificant. The portrait of intra-household distribution in Ghana is consistent with earlier evidence showing that women tend to invest more resources in children than men (see, e.g., [Duflo 2000](#) for South Africa, [Quisumbing and Maluccio 2003](#) for various African and Asian countries, [Malapit and Quisumbing 2015](#) for Ghana, and recent experimental evidence for Uganda in [Dizon-Ross and Jayachandran 2022](#)).

Regarding other factors, we find no evidence of discrimination in favor of boys among children. This is in line with past evidence in the context of West Africa, notably [Deaton \(1989\)](#), [Haddad and Hodinott \(1994\)](#) and [Bargain et al. \(2015\)](#) for Cote d’Ivoire (a neighbor of Ghana where a third of the population is also from Akan matrilineal tradition). [Deaton \(1997\)](#) suggests that little evidence on child gender bias may be due to the relatively high rate of economically productive women in many African countries, so girls are not seen as a burden by their parents.²² A pro-boy bias is found in the restricted case of nuclear households in Malawi ([Dunbar et al.; 2013](#)) but not

²¹On the one hand, in matrilineal/matrilocal systems, children are more strongly related to their mother’s family. Matrilineal uncles tend to exert a greater authority than fathers since boys inherit their wealth. Thus, it is possible that fathers care more about their sisters’ children, all the more so as children are male. On the other hand, matrilineal parents anticipate that their heirs (the nephews) will not be their main caretaker in old age, hence invest more in their own children to ensure they can support them later on ([La Ferrara and Milazzo; 2017](#)).

²²Female labor force participation is 63 percent in Ghana and 72 percent in Malawi (ILO estimates).

here when we consider a broader group of households. In Ghana, men gain more resources at the expense of women when the group of children is composed by a majority of boys: further estimations with interaction terms show that this effect is entirely due to patrilocal families. Finally, resource shares do not seem to depend significantly on whether households are urban or rural.

2.4.2 Robustness Checks and Age Heterogeneity

Alternative Matching Procedure. As a form of cross-validation, we replicate our estimations while using the geographic matching procedure to import information about ancestral residency norms in the surveys. Results are reported in Table 2.A3 for households with children, women and men. Columns (1) and (4) reiterate our baseline results while columns (2) and (5) present estimates based on geographically matched ethnographic data, using the exact same sample for comparability. Reassuringly, resources shares are similar for all three individual types. For Ghana, the effect of patrilocality on women's shares is slightly larger with this method, yet not far from the baseline. This trend can potentially be explained by a stronger effect of locally dominant norms than those of the ethnicity of origin. For Malawi, patrilocality measured by geographic matching leads to almost the same drop in women's shares as in the baseline. Overall, these results are encouraging for future research on related questions and situations where researchers must choose one or the other matching approach due to data availability.

Alternative Norms. Additionally, we estimate the collective model considering ancestral patrilineality instead of patrilocality. Ancestral patrilineality is likely to persist today in the form of a gender bias in different dimensions of life including control over resources. More generally, patrilineality has been proven to be associated with greater bargaining power and autonomy for women (Lowes; 2020; Loper; 2021). A difficulty is that traditional patrilocality and patrilineality are often highly correlated, which is evidenced both globally and within countries (Bau; 2021). In the case of Malawi, these ancestral practices almost perfectly overlap; using ethnic matching, we find 9 of 10 ethnic groups for which ancestral patrilocality is associated with patrilineality (and ancestral matrilocality with matrilineality). The correlation is 0.987 when we use micro data, i.e. when each ethnic group is implicitly weighted its size in the sample. Hence, the effect of patrilineality is trivially identical to that of patrilocality in Malawi. For Ghana, the correlation is weaker ($\rho = 0.613$), which justifies evaluating whether patrilineality generates a redistributive effect similar to that of patrilocality. Resource shares and marginal effects of the relevant variables are reported in Table 2.A4. Note that the number of observations is higher in the specifications using lineage because the locality information was not available in the Ethnographic Atlas for three Ghanaian ethnic groups. Resource shares are very close to the ones obtained in the model with patrilocality for all three individual types and different household compositions. Furthermore, the effects of patrilineality on women's and children's resource shares are similar in magnitude

and significance to those previously observed with patrilocality. This result strengthens the finding that different traits of ancestral culture play a persistent role on the distribution of resources within households.

Heterogeneity of Resource Shares by Age of Women Our baseline rests on a relatively parsimonious specification of the sharing rule. We suggest a variant where we add the average age of women and men as determinants. Estimates are reported in columns (3) and (6) of Table 2.A3, and show stable results for both the relative resource shares and the role of patrilocality. Similar conclusions are obtained with alternative specifications where we make the age effect more flexible, i.e. interacting age and patrilocality, using age group dummies, or both. These results are reassuring since we also aim to estimate heterogeneous patrilocality effects that vary with age. The age profile of women’s empowerment, health status and mortality has received much attention in the context of India and Southern Asia in general (see, e.g., [Anderson and Ray 2010](#)). In particular, [Calvi \(2020\)](#) finds a falling share of resources accruing to Indian women as they get older and a compelling correlation between this pattern and that of women’s mortality. The context of Africa might be different, however. Several authors have recognized that women’s power can actually increase over the life course ([Gupta; 1995](#)). The age gradient does not need to be monotonic if young women fare better in the remarriage market ([McElroy; 1990](#)), but in general, life experience makes that older wives often gain a greater influence upon decision-making, which could also lead to positive outcomes for children ([Chari et al.; 2017](#)).²³

To our knowledge, there is so far no attempt to quantify the empowerment age-gradient in an African context using resource allocation estimations.²⁴ Such a result is proposed in Figure 2.2, using the estimates of the model including adult age and age interacted with patrilocality (similar results are obtained when replacing linear age by age group dummies). We confirm the presence of a significant gap between matrilocal and patrilocal groups at all ages. Per-woman resource shares display a U-shape pattern. In particular, women’s control over resources tends to increase after 45-50 years old and in matrilocal groups especially. In Ghana, the gender resource gap between patrilocal and matrilocal families can be up to twice the baseline after 40 years of age, i.e. a gap of 5 points corresponding to an advantage of around 20% for matrilocal women.²⁵

As an informal check of these results, we also use a self-reported answer to the question about the

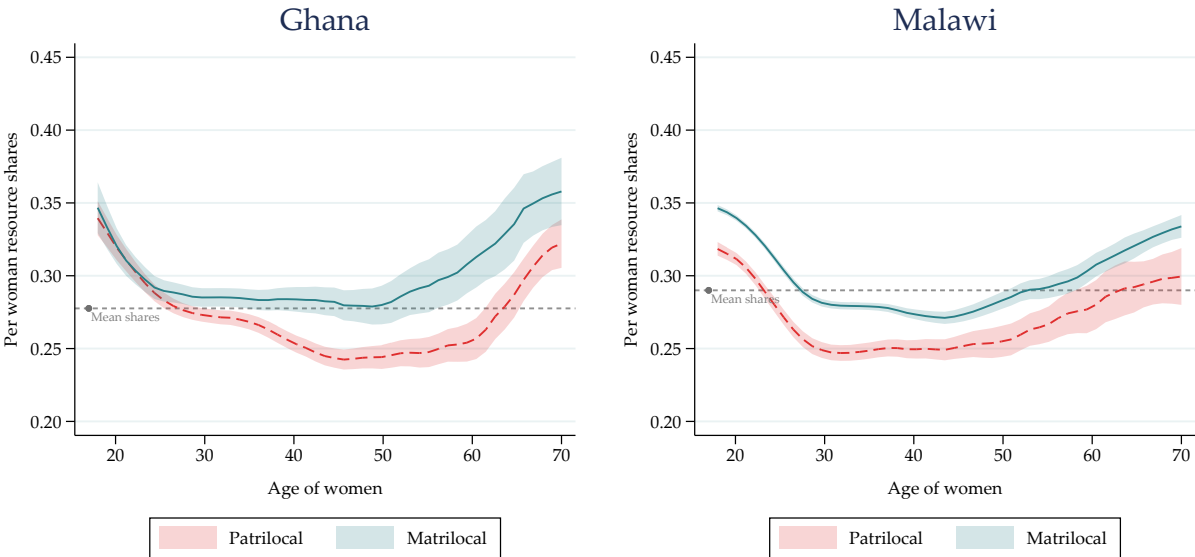
²³For several African countries, [Arestoff and Djemai \(2016\)](#) show that, over the life cycle, women tend to think that marital violence is less and less justifiable. We obtain similar results using the Demographic and Health Surveys (DHS) for Ghana and Malawi in estimations of violence-related questions on patrilocality interacted with age.

²⁴Several studies point to cultural factors affecting women’s competitiveness and hence potential bargaining power. They show that women are more prone to competition in matrilineal setting ([Gneezy et al.; 2009](#)) or when becoming adults ([Andersen et al.; 2013](#)). Related to our findings here, [Flory et al. \(2020\)](#) find that the gender gap in competitiveness varies both with residence norms and within women’s lifetimes: in the context of Malawi, they show that competitiveness is the lowest in patrilocal societies (as opposed to matrilocal ones) and for intermediate age groups.

²⁵Note that the situation of older women may be more contrasted than the simple characterization suggested here, since many widows may find themselves isolated at older age or have a restricted access to their late husband’s resources depending on the inheritance rule [Oppong \(2006\)](#).

control of earned income ("Who in your household mainly decides on the use of the payment you received?"). This is of course much more specific because of the limited number of women who receive a wage (the sample of women working for a wage comprises 698 observations in Ghana and 385 in Malawi). However, the overall trend might still be indicative of the fact that women's authority strengthens with age, especially in a context where women have more responsibility due to kinship traditions. We estimate the 'earnings control' variable on a similar specification as the sharing rule and plot predicted values in Figure 2.3. The resulting pattern is strikingly close, both in terms of patrilocal-matrilocal divide and age gradient: for this subset of women working for a wage, empowerment tends to be U-shaped, increasing after mid-life and more rapidly for women of matrilineal ancestry. As for resource shares, this trend is especially pronounced in Ghana.

Figure 2.2: Heterogeneity of Women's Resource Shares by Age

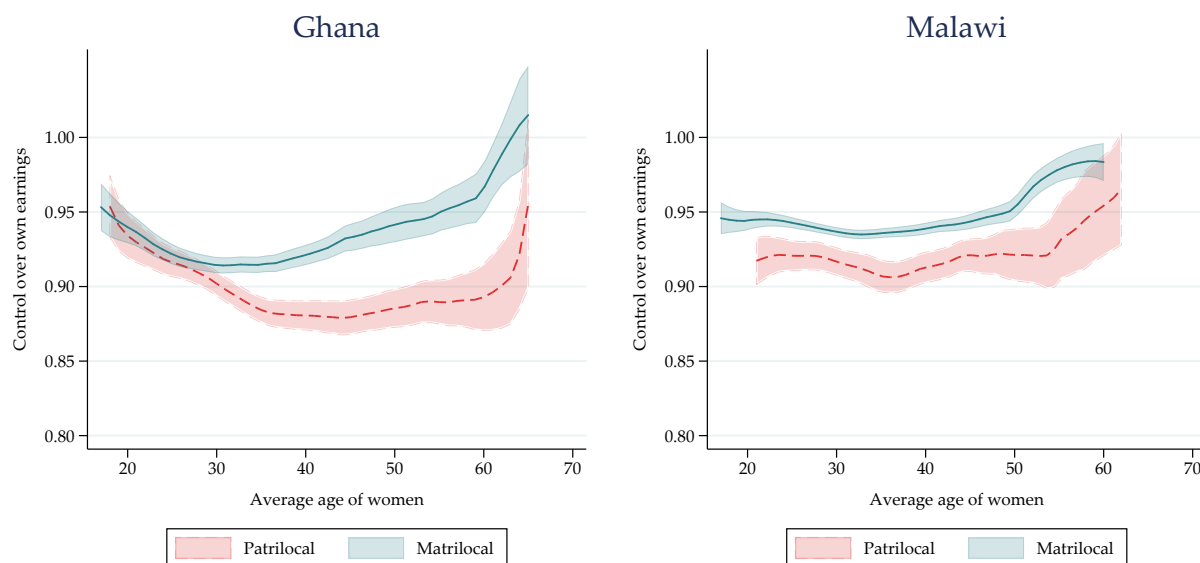


Figures represent predicted mean women's resource shares across age of women for patrilocal and matrilineal households using the Ghana Living Standards Survey 2016/2017 and the Malawi Integrated Household Survey 2016 for households with children, women and men. Mean resource shares at each age and locality are based on local polynomial fit with 90% confidence interval. Horizontal dashed lines indicate overall estimated mean resource shares of women. Patrilocal/matrilocal households are identified based on the individual matching of ethnographic data (see Table 2.1 for description of matching methods).

2.4.3 Cultural Norms and Individual Poverty

Household vs. Individual Poverty. To illustrate the implication of unequal resource sharing on poverty, we provide a series of poverty headcount calculations in Table 2.A5. We focus on the international extreme poverty line of 1.9 PPP\$ per capita/day, but as examined later, our conclusions are very similar when using different poverty lines, for instance the 3.2 PPP\$ threshold commonly used for middle-income countries. Reassuringly, household poverty rates based on the traditional per-capita consumption approach in panel (a) are very similar to those from the World Bank in panel (b). Consistently with descriptive statistics on average expenditure, poverty

Figure 2.3: Heterogeneity of Women’s Control over Earnings by Age



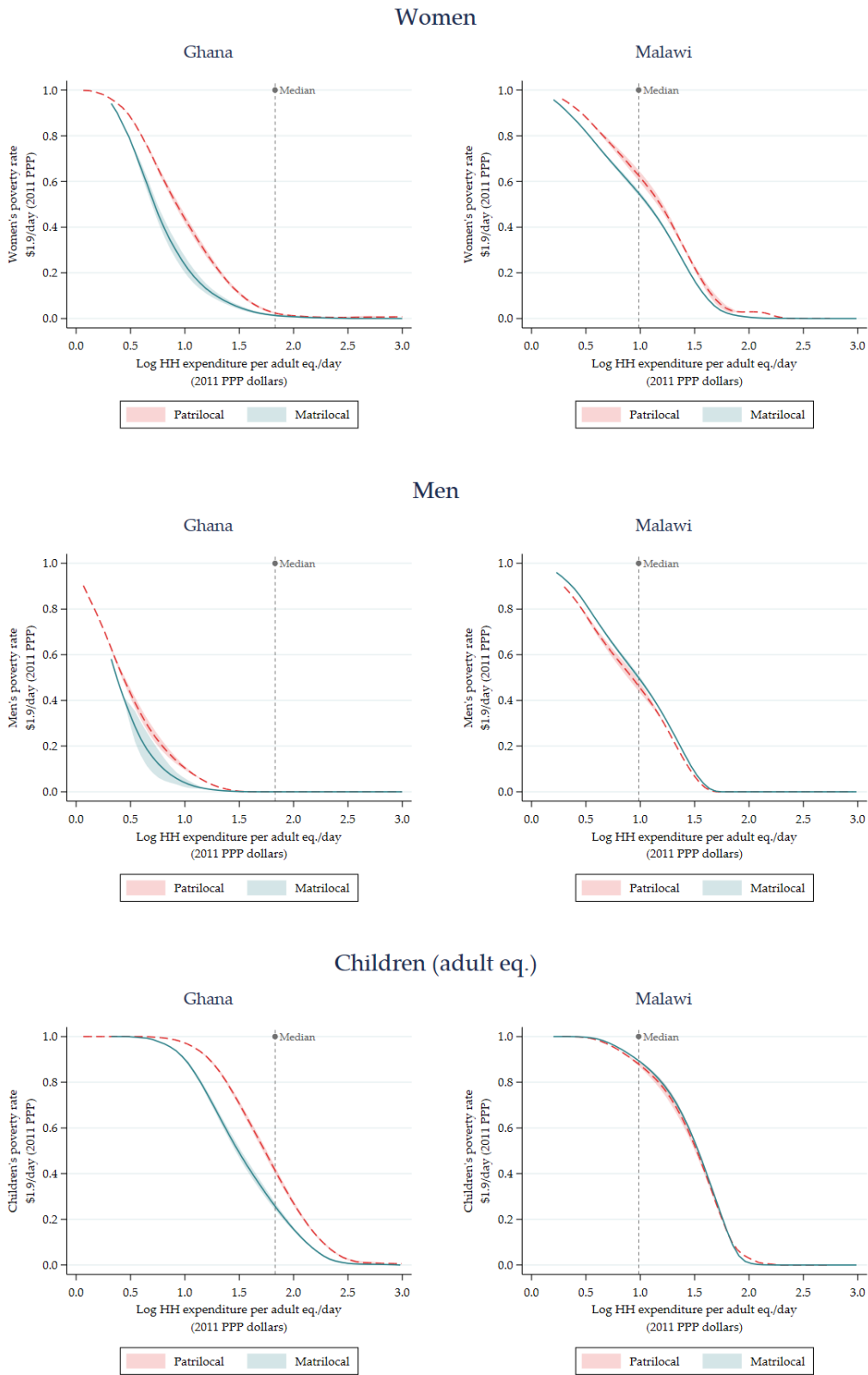
Figures represent women’s control over their earnings for working women in the Ghana Living Standards Survey 2016/2017 and the Malawi Integrated Household Survey 2016. Estimates obtained from a reduced-form estimation on the answer to the question “Who in your household mainly decides on the use of the payment you received?” using similar covariates as in the structural model (women’s age, patrilocality, interacted age and patrilocality, demographics).

is higher among households of patrilocal tradition in Ghana, while Malawi is much poorer overall. Household poverty based on per-adult equivalent consumption is slightly smaller than the per-capita measure because the number of children in the deflator is replaced by smaller weights accounting for lower needs compared to adults (we use the gender/age-specific scale of FAO-WHO-UNICEF).

Using estimated resource shares, we can calculate individual resources $\eta_i \exp(x)$ and individual poverty rates for individuals of type $i = f, m, c$. Panel (c) shows that in both countries, women’s poverty is close to household poverty based on per adult equivalent while the incidence of poverty among men is much lower and children’s poverty is higher, even when accounting for lower needs compared to adults. Panel (d) suggests a similar exercise as in [Brown et al. \(2021\)](#) or [Bargain, Lacroix and Tiberti \(2022\)](#), namely a measure of the misclassification of poor individuals when using the traditional per-capita or per-adult equivalent approach. We report the fraction of individuals, for each type, that belong to nonpoor households according to the traditional approach but who are individually poor according to resource share estimations. It turns out that a large proportion of children, and a non-negligible share of women, are misclassified as non-poor compared to men.²⁶

²⁶We see that, when poverty incidence is low, it may lead to a higher misclassification rate. For instance, for matrilocality women in Ghana, it is easier to miss the few poor women if targeted on the basis of the household poverty definition.

Figure 2.4: Poverty Effects of Ancestral Patrilocality (poverty line at 1.9 PPP\$)



Source: authors' estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Notes: Figures illustrate local polynomial fit with 95% CI of poverty headcount ratio at the poverty line of \$1.9 (2011 PPP) a day across values of log total household expenditure per adult eq./day. Observations are weighted by household sampling weights for each demographic group. Individual poverty rates are based on predicted resource shares for women, men and children. Patrilocal/matrilocal households are identified based on the individual matching of ethnographic data (see Table 2.1 for description of matching methods). The median log expenditure is indicated by the vertical dashed line.

Effect of Patrilocality on Poverty. We find a larger incidence of poverty among women of patrilocal tradition, in Ghana in particular. While this result is consistent with the gender resource bias previously estimated, it is also partly due to lower living standards among households of patrilocal ancestry. To extract the distributional effect of patrilocality, Figure 2.4 plots individual headcount poverty curves for individuals of matrilocal versus patrilocal tradition at different levels of per-adult equivalent household expenditure. In both countries, poverty curves for patrilocal women dominate those for matrilocal women. This is particularly the case below (around) the median expenditure level, depicted by the vertical line, in Ghana (Malawi). In any case, confidence bounds indicate a significantly higher prevalence of poverty among women of patrilocal ancestry at most expenditure levels. This result is not surprising, given previous estimations, but it is nonetheless relatively large: a gap of 5 (10) points in individual poverty around the median consumption in Ghana (Malawi) and a lot larger in the lowest half of the distribution in Ghana. As expected, an opposite pattern is suggested for men in Figure 2.4, although the confidence intervals overlap at some parts of the distribution. In Ghana, child poverty is larger among households of patrilocal tradition, as expected given resource share estimates. Finally, as can be seen in Figure 2.A1, results are qualitatively similar when using the poverty line at 3.2 PPP\$ per capita/day.

2.5 Concluding remarks

Ancestral residence norms may contain broad information about gender rights within ethnic groups. In particular, women's bargaining power in the allocation of family resources may be impaired in patrilocal societies relative to ethnicities of matrilocal tradition. Evidence is limited to cross-country variation or within-country differences in self-reported decision power. The present study provides concrete measures of variation in intra-household inequality due to these norms and their implications for women's and children's poverty.

We use expenditure data for Ghana and Malawi to estimate household resource sharing and exploit within-country ethnic variation to investigate the role of kinship traditions of patrilocality versus matrilocality. We show that women's resource shares decrease with patrilocality, and so do children's resources in the case of Ghana. Moreover, women's control over household resources tends to increase with their age but this effect is more pronounced among matrilocal groups. We cross-validate our results using alternative strategies to match individual data with ancestral practices. The extent of intra-household inequality associated with ancestral patrilocality (relative to matrilocality) has strong implications for the prevalence of poverty among women and children.

The findings of this chapter provide policy-relevant insights on the implications of cultural norms for individual poverty and intra-household inequality. Ancestral practices may be used together

with other household characteristics, such as the woman's age, as relevant observable information to design programs that target vulnerable individuals, and not just households deemed poor according to standard poverty measures. Such interventions may shift intra-household bargaining power in favor of women (Cherchye et al.; 2021), providing them with more control over family resources (De Mel et al.; 2008) or inducing a better balance of work and household chores (Dinkelman; 2011). Finally, note that policies can sometimes undermine the *raison d'être* of specific cultural practices (Aldashev et al.; 2012). This is the case of old age pension plans in Indonesia and Ghana (Bau; 2021) or climate risk insurance and risk financing in Mali (Dessy et al.; 2021), for instance. These policies, extensively discussed in Jayachandran (2021), may directly change individuals' and communities' beliefs that exacerbate gender discrimination, so they could be analyzed, using the present framework, in the light of their implications in terms of intra-household inequality and individual poverty.

2.6 Appendix

2.6.1 Estimation Procedure and Endogeneity

Since the error terms of the empirical model are likely to be correlated across equations, the system of household Engel curves for the different household compositions is estimated using Non-Linear Seemingly Unrelated Regressions (NL-SUR). The SUR estimator is iterated until the estimated parameters and error covariance matrices settle (the iterated SUR is equivalent to maximum likelihood with multivariate normal errors). The likely correlation between the error terms in each budget-share function and the log total expenditure is a frequent source of endogeneity (especially if total expenditure suffers from measurement errors). Each budget share equation is then augmented with the Wu-Hausman residuals obtained from reduced-form estimations of x on all exogenous variables used in the model plus some instruments, namely a quadratic form of the log household disposable income (see Banks et al. 1997; Blundell and Robin 1999). These instruments are very strong in predicting the log of expenditure (the F statistic on the excluded instruments is well above the usual threshold in all cases).

2.6.2 Geographic Matching Procedure

As a robustness check, we consider a matching approach used in the literature and based on the geographical location of the household (Alesina et al.; 2013; Giuliano and Nunn; 2021; Cao et al.; 2021). We link the current location of residence declared in the household survey to a local measure of patrilocality based on the *Ancestral Characteristics Database* of Giuliano and Nunn (2018). This database divides the world's land into polygons, and each polygon indicates the location of a specific language/dialect in 2003 (as drawn from Gordon 2009), which is matched to the Atlas's ethnic groups. Thus, it offers a complete mapping of ethnic groups and their ancestral norms.

For Ghana, the consumption survey reports only the region where the household is located, so we aggregate prevalence of patrilocality at the regional level while correcting for the fact that some polygons are more populated than others in a given region.²⁷ To obtain a dichotomous patrilocality indicator, we consider a region to be traditionally patrilocal if the average prevalence is above the median. For Malawi, the survey provides the GPS coordinates of the enumeration area of each household; therefore, we can assign each household to the polygon defined in the *Ancestral Characteristics* map (Giuliano and Nunn; 2018) and its ethnicity group, as well as the corresponding residency norm.

²⁷Following the previous literature, we link the *Ancestral Characteristics Database* shapefile to the grid-cell level population estimates from Landsat, reporting the population that lives in each square kilometer in 2019. Then, we estimate the population-weighted average prevalence of patrilocality in each region. See: <https://landscan.ornl.gov/>

2.6.3 Additional Results

Table 2.A1: Summary Statistics: Differentiating Household Types

Households with:	Ghana		Malawi	
	<i>children, women and men</i>	<i>women and men</i>	<i>children, women and men</i>	<i>women and men</i>
Household characteristics				
Number of children	2.6 (1.65)	-	2.7 (1.42)	-
Number of women	1.8 (1.07)	1.6 (0.87)	1.2 (0.54)	1.3 (0.59)
Number of men	1.7 (1.05)	1.6 (0.98)	1.3 (0.59)	1.4 (0.71)
Average age of kids	6.6 (3.08)	-	7.4 (3.87)	-
Average age of women	35.2 (10.89)	43.9 (16.78)	34.1 (11.76)	45.5 (19.41)
Average age of men	34.9 (12.21)	40.7 (18.39)	36.1 (12.39)	43.0 (20.17)
Proportion of boys	0.51 (0.368)		0.49 (0.360)	
Urban	0.33 (0.471)	0.46 (0.499)	0.19 (0.391)	0.21 (0.409)
Annual HH expenditure (2011 PPP\$)	7,003 (5197)	6,426 (4811)	2,152 (2699)	1,991 (3498)
Household budget share for clothing				
Children	0.028 (0.024)	-	0.018 (0.028)	-
Women	0.023 (0.021)	0.026 (0.025)	0.012 (0.021)	0.015 (0.027)
Men	0.028 (0.029)	0.033 (0.033)	0.006 (0.014)	0.008 (0.019)
Percentage of zeros in clothing budget share				
Children	0.064	-	0.487	-
Women	0.068	0.068	0.568	0.568
Men	0.115	0.115	0.746	0.746
Sample size	6,204	1,552	7,462	967

Descriptive statistics for key variables used in the analysis, based on selected sample from the Ghana Living Standards Survey 2016/2017 and the Malawi Integrated Household Survey 2016. Standard deviation in parentheses.

Table 2.A2: Summary Statistics: Differentiating across Ancestral Residency Norms

	Ghana			Malawi		
	Matrilocal	Patrilocal	Diff.	Matrilocal	Patrilocal	Diff.
Household characteristics						
Number of children	2.4 (0.03)	2.7 (0.03)	0.31 (0.04)	2.7 (0.02)	2.6 (0.04)	-0.03 (0.04)
Number of women	1.7 (0.02)	1.8 (0.02)	0.15 (0.03)	1.2 (0.01)	1.3 (0.02)	0.04 (0.02)
Number of men	1.6 (0.02)	1.7 (0.02)	0.13 (0.03)	1.3 (0.01)	1.3 (0.02)	0.02 (0.02)
Average age of kids	6.7 (0.07)	6.6 (0.05)	-0.09 (0.09)	7.4 (0.05)	7.7 (0.11)	0.30 (0.12)
Average age of women	34.3 (0.23)	35.6 (0.17)	1.28 (0.28)	34.0 (0.15)	34.6 (0.34)	0.64 (0.37)
Average age of men	34.5 (0.27)	35.1 (0.19)	0.64 (0.33)	36.0 (0.16)	36.8 (0.35)	0.81 (0.39)
Proportion of boys	0.50 (0.01)	0.51 (0.01)	0.01 (0.01)	0.49 (0.00)	0.48 (0.01)	-0.01 (0.01)
Urban	0.48 (0.01)	0.26 (0.01)	-0.21 (0.01)	0.19 (0.00)	0.20 (0.01)	0.02 (0.01)
Annual HH expenditure (2011 PPP\$)	8,376 (6216)	6,342 (4706)	-2,035 (7797)	2,148 (2694)	2,171 (2722)	22 (3830)
Household budget share for clothing						
Children	0.032 (0.001)	0.026 (0.000)	-0.006 (0.001)	0.018 (0.000)	0.020 (0.001)	0.002 (0.001)
Women	0.025 (0.000)	0.022 (0.000)	-0.003 (0.001)	0.012 (0.000)	0.013 (0.001)	0.000 (0.001)
Men	0.029 (0.001)	0.028 (0.000)	-0.001 (0.001)	0.006 (0.000)	0.007 (0.000)	0.001 (0.000)
Percentage of zeros in clothing budget share						
Children	0.051 (0.005)	0.071 (0.004)	0.020 (0.006)	0.469 (0.006)	0.442 (0.014)	-0.028 (0.015)
Women	0.049 (0.005)	0.064 (0.004)	0.015 (0.006)	0.547 (0.006)	0.558 (0.014)	0.011 (0.015)
Men	0.128 (0.007)	0.119 (0.005)	-0.009 (0.009)	0.759 (0.005)	0.756 (0.012)	-0.003 (0.013)
Sample size	2,016	4,188		6,194	1,268	

Descriptive statistics for key variables used in the analysis, differentiated between households of matrilineal and patrilineal ancestry. These statistics are based on selected samples of households with children, women and men (kfm) from the Ghana Living Standards Survey 2016/2017 and the Malawi Integrated Household Survey 2016. Standard deviation in parentheses.

Table 2.A3: Robustness Tests: Alternative Matching and Model Specification

	Ghana			Malawi		
	Baseline	Geographic matching of ethnographic data	Alternative model specification	Baseline	Geographic matching of ethnographic data	Alternative model specification
	(1)	(2)	(3)	(4)	(5)	(6)
(a) Resource shares						
Children	0.145 (0.054)	0.132 (0.050)	0.150 (0.055)	0.324 (0.082)	0.333 (0.083)	0.309 (0.080)
Women	0.349 (0.095)	0.347 (0.096)	0.400 (0.089)	0.322 (0.056)	0.307 (0.056)	0.326 (0.056)
Men	0.506 (0.124)	0.522 (0.124)	0.450 (0.113)	0.354 (0.086)	0.360 (0.088)	0.365 (0.085)
Per child	0.068 (0.029)	0.062 (0.028)	0.071 (0.031)	0.149 (0.062)	0.153 (0.063)	0.142 (0.060)
Per woman	0.244 (0.111)	0.243 (0.111)	0.278 (0.114)	0.287 (0.073)	0.274 (0.074)	0.290 (0.073)
Per man	0.354 (0.101)	0.366 (0.105)	0.317 (0.096)	0.299 (0.061)	0.304 (0.063)	0.309 (0.060)
(b) Marginal effect of patrilocality on per person resource shares						
Women's resource shares	-0.026 *** (0.004)	-0.034 *** (0.004)	-0.021 *** (0.003)	-0.032 *** (0.007)	-0.033 *** (0.010)	-0.031 *** (0.007)
Children's resource shares	-0.015 *** (0.003)	-0.016 *** (0.003)	-0.014 *** (0.002)	0.004 (0.004)	0.015 *** (0.005)	0.004 (0.003)
% of HHs with non-flat Engel curve	0.999	0.999	1.000	1.000	1.000	1.000
% of patrilocality	0.675	0.645	0.679	0.170	0.089	0.170
N	6204	6204	6204	7462	7462	7462

Source: authors' estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Notes: Table reports results from baseline and robustness checks for households with children, women and men. Columns (1) and (4) report resource shares predicted based on baseline estimations. Columns (2) and (5) report resource shares predicted based on estimations using geographically matched ethnographic data. Columns (3) and (6) report resource shares based on estimates from alternative model specification where we additionally control for average age of women and men in the sharing rule equations. Panel (a) reports mean resource shares (total and per person) predicted based on collective model estimations for each individual type. Standard deviations in parentheses. Panel (b) reports marginal effects for key determinants of sharing rule of women and children. Marginal effects are estimated based on average household characteristics for the sample specified in columns. *, **, *** indicate 10%, 5% and 1% significance level.

Table 2.A4: Robustness Tests: Effects of patrilineality - Ghana

	Patrilineality	
	<i>children, women and men</i>	<i>women and men</i>
	(1)	(2)
(a) Resource shares		
Children	0.138 (0.052)	- -
Women	0.343 (0.096)	0.399 (0.114)
Men	0.519 (0.126)	0.601 (0.114)
Per child	0.065 (0.029)	- -
Per woman	0.241 (0.110)	0.303 (0.130)
Per man	0.364 (0.105)	0.439 (0.131)
(b) Marginal effects on per person resource shares		
<i>Women's resource shares:</i>		
Patrilocal (=1) or Patrilineal (=1)	-0.019 *** (0.003)	-0.013 *** (0.004)
Proportion of boys	-0.004 (0.004)	- -
Urban (=1)	0.004 (0.006)	0.011 *** (0.007)
<i>Children's resource shares:</i>		
Patrilocal (=1) or Patrilineal (=1)	-0.012 *** (0.003)	- -
Proportion of boys	0.001 (0.001)	- -
Urban (=1)	0.008 (0.004)	- -
% of HHs with non-flat Engel curve	0.999	1.000
% of patrilocal//patrilineality	0.401	0.385
N	6697	1674

Source: authors' estimations using the data from Ghana Living Standards Survey 2016/2017. Notes: the table reports estimates for Ghana using alternative estimations with patrilineality instead of patrilocal. Column (1) shows estimation results for households with children, women and men, column (2) for households with women and men only. Panel (a) reports mean resource shares (total and per person) predicted based on collective model estimations for each individual type. Panel (b) reports marginal effects for key determinants of sharing rule of women and children. Marginal effects are estimated based on average household characteristics for the sample specified in columns. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 2.A5: Poverty Estimates (poverty line at 1.9 PPP\$)

	Ghana			Malawi		
	All	Matrilocal	Patrilocal	All	Matrilocal	Patrilocal
	(1)	(2)	(3)	(4)	(5)	(6)
(a) Household poverty rates (%)						
Per capita	0.124 (0.329)	0.046 (0.210)	0.191 (0.393)	0.703 (0.457)	0.702 (0.457)	0.710 (0.454)
Per adult eq.	0.095 (0.293)	0.032 (0.175)	0.151 (0.358)	0.627 (0.483)	0.627 (0.484)	0.633 (0.482)
(b) World Bank poverty rate (%)						
	0.127			0.692		
(c) Individual poverty rates (%)						
Children (per child)	0.587 (0.492)	0.448 (0.497)	0.699 (0.459)	0.906 (0.291)	0.907 (0.291)	0.902 (0.297)
Children (per adult eq.)	0.437 (0.496)	0.287 (0.453)	0.557 (0.497)	0.820 (0.384)	0.821 (0.384)	0.814 (0.389)
Women	0.104 (0.306)	0.040 (0.197)	0.163 (0.370)	0.508 (0.500)	0.500 (0.500)	0.566 (0.496)
Men	0.029 (0.169)	0.007 (0.085)	0.049 (0.216)	0.448 (0.497)	0.450 (0.498)	0.432 (0.495)
(d) Misclassification (fraction of poor individuals in non-poor households)						
Children (per child)	0.794 (0.404)	0.891 (0.312)	0.668 (0.471)	0.248 (0.432)	0.269 (0.444)	0.273 (0.445)
Children (per adult eq.)	0.723 (0.447)	0.826 (0.379)	0.600 (0.490)	0.168 (0.374)	0.164 (0.370)	0.158 (0.364)
Women	0.305 (0.461)	0.361 (0.482)	0.188 (0.391)	0.068 (0.252)	0.039 (0.193)	0.082 (0.274)
Men	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.031)	0.001 (0.038)	0.000 (0.000)
N	11,996	4,635	7,361	11,280	9,394	1,886

Sources: Panels (a), (b) and (d): authors' estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Panel (b): World Bank data extracted from the PovcalNet database.

Panel (a) reports poverty headcount ratios for the poverty line of \$1.9 (2011 PPP) using per capita or per adult equivalent measures, interpreted as individual poverty when intrahousehold inequality of consumption is ignored. The per-adult equivalent is obtained using the gender/age-specific FAO-WHO-UNICEF weights for children.

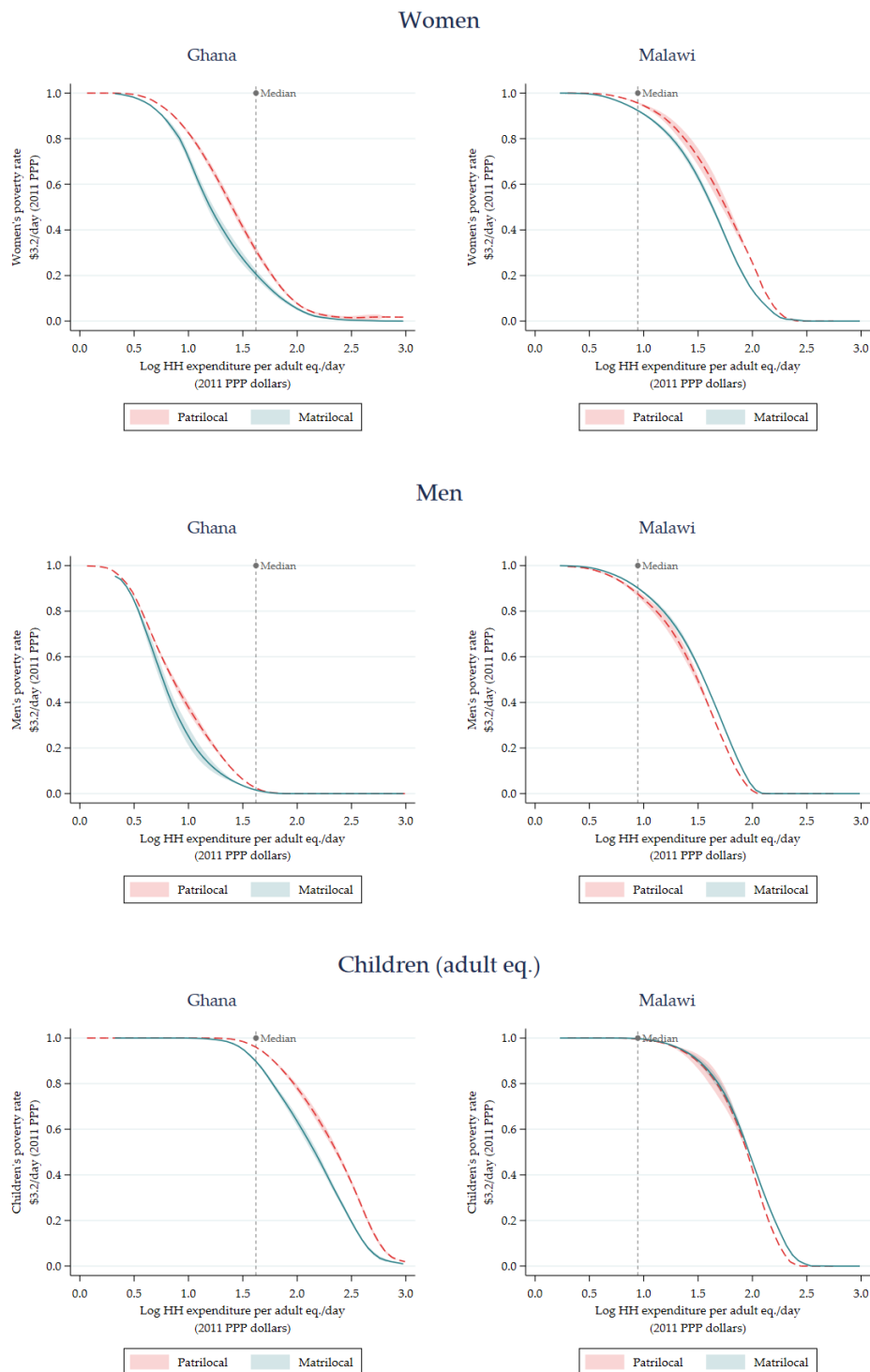
Panel (b) reports the official statistics from the World Bank ([iresearch.worldbank.org/PovcalNet/](http://research.worldbank.org/PovcalNet/)).

Panel (c) reports poverty headcount ratios for the poverty line of \$1.9 (2011 PPP) using individual resources based on our estimations of the resource shares per person type (children, women, men). For children, it corresponds to a per-person measure or a per-adult equivalent measure obtained using the gender/age-specific FAO-WHO-UNICEF weights.

Panel (d) reports the misclassification of individual poverty, namely the fraction, for each person type, of individuals deemed poor according to individual poverty estimates but nonpoor according to the person's household poverty status.

Standard deviation in parentheses.

Figure 2.A1: Poverty Effects of Ancestral Patrilocality (poverty line at 3.2 PPP\$)



Source: authors' estimations using the data from Ghana Living Standards Survey 2016/2017 and Malawi Integrated Household Survey 2016. Notes: Figures illustrate local polynomial fit with 95% CI of poverty headcount ratio at the poverty line of \$3.2 (2011 PPP) a day across values of log total household expenditure per adult eq./day. Observations are weighted by household sampling weights for each demographic group. Individual poverty rates are based on predicted resource shares for women, men and children. Patrilocal/matrilocal households are identified based on the individual matching of ethnographic data (see Table 2.1 for description of matching methods). The median log expenditure is indicated by the vertical dashed line.

Chapter 3

Gender-Targeted Policies and Intra-household Resource Allocation: A Structural RDD Approach

3.1 Introduction¹

Standard poverty measures are based on household per-capita consumption, but poverty is intrinsically experienced by individuals, not households. There is ample evidence that the presence of intra-household inequality derives in a large share of poor individuals, generally women and children, living in non-poor households (Aminjonov, Bargain and Colacce; 2024; Brown et al.; 2019a). Some policies explicitly aim to influence the distribution of resources within households and alleviate child poverty by empowering women. Many cash transfer programs have been designed with this objective and are paid to women, especially in Latin America (Handa et al.; 2009). Gender-based targeting responds to the intention of promoting gender equality but also to the belief that this would imply a redirection of household resources to children (Dizon-Ross and Jayachandran; 2022; Doepke and Tertilt; 2009; Duflo; 2012; Fiszbein and Schady; 2009). However, households' own decision-making rules may defeat the objectives of redistributive policies targeted at specific individuals, and we still have limited and mixed evidence on the intra-household effect of cash transfers. The evidence based on randomized CCT such as PROGRESA tends to show redistribution to children, but it is difficult to disentangle the confounding roles of the income effect and child-specific conditionalities (Attanasio and Lechene; 2002, 2014; Bobonis; 2009). Recent studies based on conditional cash transfers that randomize the gender of the recipients are inconclusive.² Thus, the question of the effectiveness of gender-based targeting in redirecting

¹This chapter is joint work with Olivier Bargain.

²Armand et al. (2020) for Macedonia find positive effects of targeting women but Akresh et al. (2016) for Burkina Faso, Benhassine et al. (2015) for Morocco, Almâs et al. (2020) for India, and Haushofer and Shapiro (2016) for Kenya

household resources to children is still open.

Another open issue is how we obtain a measure of women's empowerment and bargaining power within the household, and more importantly, a comprehensive measure of resource sharing and individual poverty that allows the measurement of the programs' effects at the individual level. Most of the previous work evaluating the individual-based effects of social policies has focused on specific outcomes or expenditures such as child education, health outcomes and health expenditure (Akresh et al.; 2016; Benhassine et al.; 2015; Haushofer and Shapiro; 2016), women's health expenditure (Thomas; 1997), or women and child clothing (Almås et al.; 2020; Armand et al.; 2020; Hoddinott and Skoufias; 2004). Bargaining power is often measured in the literature based on individuals' survey responses to questions about decision-making within the household (Almås et al. 2020; Lépine and Strobl 2013; Sadania 2016; Bergolo and Galván 2018 for the same program as us; De Brauw et al. 2014; Handa et al. 2009 for similar cash transfers in the region). Although this literature offers very suggestive results in terms of the differential effects of the programs within households, they do not provide a comprehensive measure of the control over total resources. Hence, we cannot conclude about individual poverty, which is the ultimate goal of social policies. An increasingly used strategy in the literature, inherited from the collective models (Bourguignon and Chiappori; 1992), is to retrieve the household's resource sharing between men, women and children (Bargain and Donni; 2012; Dunbar et al.; 2013) that can be used to infer individual measures of poverty and impact of policies (Belete; 2021; Tommasi; 2019).

In this chapter, we assess the effect on intra-household distribution of a conditional cash transfer paid to women in Uruguay - Family Allowances (henceforth AFAM). The identification of AFAM effects relies on the program's eligibility poverty score, which is based on a household's predicted level of poverty as a function of its characteristics (proxy means test). The strong enforcement of the eligibility rule by the government and the available evidence of non-manipulation of the assignment by applicants allows us to exploit the discontinuity at the cutoff to identify AFAM effects. We propose an original methodology design, embedding a Regression Discontinuity Design (RDD) in the structural estimation of resource shares using a household expenditure survey in which we replicate the poverty score. This allows us to measure the AFAM intention-to-treat effects on men's, women's and children's individual resources and, consequently, in individual poverty. Thus, we can assess whether a gender-targeted CCT affects women's empowerment (proxied as their share of household resources), and children's wellbeing.

We find that AFAM reduces household poverty with larger effects for women via the bargaining effect generated by gender-targeting. We present suggestive evidence of an overall positive effect of AFAM on women's resource shares. These results are driven mainly by a strong effect on rural households (21% increase in their shares), consistent with these areas being less progressive

find no differential results.

in terms of gender empowerment and attitudes than the rest of the country. However, we do not find effects of AFAM on children's shares. Our estimations evidence that poor households in Uruguay already allocate a large share of resources to children, with individual child poverty lower than household per-capita poverty. Poor households prioritize children's consumption at the expense of adults. Thus, the marginal utility of spending extra money on children is lower than spending it on adults. Results are robust to alternative specifications of the functional form of the score, alternative specifications of the sharing rule, and different bandwidths around the cutoff. We also find robust results to alternative specifications of the collective model. We propose three different models: first we estimate a general model for households with men, women and children (including multi-adult families); second, we focus on nuclear households, the usual practice in the intra-household distribution literature as the bargaining process between a couple can be more directly interpreted; last, we consider a model in which the household distributes resources only between the couple while children are treated as household public goods in the spirit of [Blundell et al. \(2005\)](#).

This chapter makes several contributions. *First*, on the main question of the intra-household effects of gender-targeted cash transfers, we provide new evidence that escapes from some of the limitations of past studies. On the one hand, we can isolate the disturbance from the income effect. In our model, the increase in income impacts total expenditure in the structure of the model while we estimate the potential shift in the resource share function as a pure bargaining effect. On the other hand, most of the studies cited above face interpretation challenges related to dealing with conditional or labeled cash transfer programs. The conditionality or labeling may affect expenditure patterns directly through nudging, preference shifts, and/or the intention to comply with the program providers' intentions ([Manzur and Pendakur; 2023](#)). In our case, the conditionalities of the program are rarely binding as education assistance is almost universal for our sample (children under 14 years old). This allows us to relate our study to the rare cases that evaluate universal cash transfers as [Almås et al. \(2020\)](#) and [Haushofer and Shapiro \(2016\)](#). Taken together, our setup is close to that of policies that shift recipient identity ([Lundberg et al.; 1997](#); [Ward-Batts; 2008](#)) or randomize it ([Akresh et al.; 2016](#); [Almås et al.; 2020](#); [Armand et al.; 2020](#); [Benhassine et al.; 2015](#); [Haushofer and Shapiro; 2016](#)), but in a structural form that directly measures empowerment effect in terms of resource shares. *Second*, we estimate the intra-household impact of redistributive policies combining resource share estimation with (quasi)experimental approaches. While the usual reduced-form estimation would allow us to estimate the treatment effect on observable variables, such as the budget share, our approach, incorporating RDD methodology within the estimation of the structural model, allows us to estimate the treatment effect on unobserved objects, as the resource shares. Previous work has explored the effect of conditional cash transfers on intra-household distribution of resources through PROGRESA randomization ([Sokullu and Valente 2022](#); [Tommasi 2019](#); [Tommasi and Wolf 2016](#) with opposed results), difference-in-difference

(Borga and D’Ambrosio 2020 for social policies in Peru, India, and Ethiopia, and Manzur and Pendakur 2023 for a child benefit reform in Canada), or inverse-probability-weighted regression adjustment (Belete 2021 for a public-work and direct support program in Ethiopia).³ To our knowledge, this is the first study incorporating regression discontinuity design. *Third*, we reassess the empowerment effect of AFAM, in a way that allows the cross-validation of methods. Indeed, we extend and confirm the findings of Bergolo and Galván (2018) who provide suggestive evidence of a positive effect of AFAM on women’s empowerment based on final say questions on food expenditure and additional household income. Here, we obtain the same results based on actual resource shares, a more comprehensive empowerment measure. The use of ‘final say’ questions can be seen as reflecting the delegation of power more than power itself (Baland and Ziparo; 2018). Also, differences in the perception of contributions to decision-making may vary by contextual factors such as gender itself (Acosta et al.; 2020). Thus, the converging conclusions from two very different approaches are reassuring. In comparison, a clear advantage of structural estimation of the resource shares instead of ‘final say’ questions is the possibility of transposing results in terms of individual poverty of men, women and children.

The rest of the chapter is structured as follows. Section 3.2 provides institutional background information on AFAM while Section 3.3 describes the empirical strategy and the data used in the estimation of intra-household resource allocation. Section 3.4 presents our main results on the effect of AFAM on resource shares and individual poverty and Section 3.5 concludes.

3.2 Institutional Background

Uruguay is a high-income developing country in South America, with a population of about 3.3 million people. In December 2007 the program *Asignaciones Familiares del Plan de Equidad* (Family Allowance, AFAM for its acronym in Spanish) was created after one of the most severe social and economic crises the country experienced between 2001 and 2003. It is currently the most important social assistance program directed to families with children, both in terms of coverage (387,000 beneficiaries in 2017 representing 44% of children under 18 years in the country) and in terms of the resources allocated to it (0.33% of GDP in 2017). It is a means-tested conditional cash transfer directed to households with children under 18 years old in poor households. AFAM has two conditionalities, children’s assistance to education and regular health check-ups. While the health conditionality was not enforced, school attendance was checked at least once a year. However, this conditionality is not binding in our sample (households with children under 14 years old) as the school attendance of children between 6 and 13 years is almost universal

³Other studies also evaluate the effects of social assistance policies on intra-household distribution in the tradition of collective models. They use different resource-share identification strategies, based on distributional factors instead of preference assumptions and assignable goods like us. De Brauw et al. (2014), Flores (2022), and Klein and Barham (2018) evaluate the effects of PROGRESA based in the program randomization, and Echeverría (2020) evaluates a conditional cash transfer in Argentina based on inverse-probability-weighted regression adjustment.

in Uruguay (over 90% in this age group). According to the evaluation reports of the program (Bérgolo et al.; 2016; Rivero et al.; 2020), AFAM had positive effects on education attendance, but only in secondary school (13 to 17 years), in which attendance was not universal. Therefore, as the conditionalities are not effective for the population we are studying, we can almost treat AFAM as a universal transfer for poor households with school-aged children. The eligibility rule is based on a proxy means test that entails computing a predicted poverty score for applicant households based on their baseline socioeconomic characteristics at the moment of the application. The households above a certain threshold are eligible for the cash transfer, which generates a strong discontinuity in the probability of being assigned to the program. Importantly, the score is complex and not easily manipulated, which enables us to use it as running variable. The index structure was never disclosed to the public and includes several structural variables that reduce the probability of manipulation by potential beneficiaries.⁴ Yet, we can only identify eligibility, and our setting corresponds to one of a fuzzy RDD and our estimate will be an *Intent-to-Treat* (ITT).

The beneficiary households are entitled to a monthly cash transfer of about 50 dollars per child up to 12 years old. The amount of the transfer is larger (70 dollars) for those over 12 as an incentive to enroll in secondary school.⁵ An equivalence scale of 0.6 operates, which reduces the per-capita transfer as the number of beneficiaries within the household increases. In short, the transfer amount is based on:

$$AFAM = \alpha * (Children < 18)^{0.6} + \beta * (ChildrenSecondarySchool)^{0.6}$$

with $\alpha \approx 50$ and $\beta \approx 20$. The level of the benefit is adjusted annually by the Consumer Price Index. The cash transfer is generous for the beneficiary households. For instance, the minimum transfer (50 dollars) accounts for 36% of the World Bank's poverty line for Uruguay (5.5 dollars per day per person). According to the data used in this chapter (ENIGH), the total transfer represents 13.5% of beneficiaries' total household income. As is usual in this type of program, the transfer is assigned to the mother (or other woman in the household). According to administrative records, in over 90% of the cases, the money is assigned to a woman (Bérgolo and Galván; 2018), increasing to 94% in two-parent households. Hence, it is appropriate for our study for its potential consequences in terms of intra-household redistribution.⁶

Eligible households may not receive the program because they did not apply. Also, due to very low reassessment of the household situation, households may change their situation after applying to the program. We can test whether the program generates the expected increase in house-

⁴In Section 3.4.2 we run usual manipulation tests to prove the absence of manipulation.

⁵The difference is not necessarily large enough to study heterogeneity across family configurations due to sample size restrictions.

⁶Our sample is based on households with men, women, and children. This increases the probability of women receiving the transfer.

hold income in our expenditure survey data. We estimate a simple RD with total household income as the outcome against alternative functions of the running variable and the eligibility dummy. Table 3.A1 shows the coefficient associated with the eligibility dummy in all the specifications, considering the average effect and an alternative model that incorporates heterogeneous effects for urban and rural households. The results show a positive and statistically significant effect of AFAM on total household income in both the average and heterogeneous specifications. The average effect on income is between 20 and 33% depending on the specification, with stronger effects for rural households in all cases.

3.3 Empirical Strategy

3.3.1 Resource Share Estimations

The approach we use is inherited from the literature on collective models of household decision-making. These models have been designed to account for the bargaining process underlying household decisions (Chiappori; 1992) and, ultimately, to recover the intra-household resource allocation. This approach initially assumed that households make efficient decisions. This assumption allows for the decentralization of the decision process that leads to the direct sharing rule interpretation that household decisions are *as if* total resources were shared between members and then decisions made individually on the basis of each person's resources and preferences (Chiappori; 1992). Recently, several studies have suggested ways to identify this allocation process using expenditure data. The first set of contributions has allowed identifying the sharing rule in childless couples (Browning et al.; 2013; Lewbel and Pendakur; 2008), while the more recent ones extend the approach to couples with children (Bargain and Donni; 2012; Bargain, Donni and Hentati; 2022; Dunbar et al.; 2013). In these studies, identification requires additional assumptions (i.e., preference stability, explained hereafter) and extra information (notably the use of single data and/or assignable goods). Our setup relates to this tradition, but does not necessarily need the efficiency assumption – efficiency is questionable, especially in the context of poor countries (see Baland and Ziparo 2018). As in related studies, we only need to assume that total expenditure is shared among household members according to some rule, which we identify and estimate.⁷

We start by assuming the existence of a sharing rule that governs the distribution of resources in the household. The key aspect in this chapter is that it will depend on the eligibility condition for AFAM. Denote x the log of total private expenditure and $\eta_{i,s}$ the share of total private expenditure $\exp(x)$ accruing to each individual of type $i = f, m, c$, i.e. women, men and children, in a household of composition s . Household composition corresponds to the number of individuals

⁷The efficiency paradigm is the most commonly accepted way to justify decentralization, but probably not the only one supporting such a sharing process. See Lewbel and Pendakur (2022) for a departure from efficiency.

in each of the three groups, which are denoted by s_f, s_m and s_c , respectively, and are stacked in the vector $s = (s_f, s_m, s_c)$. Each household demographic group of type i in a family of composition s is endowed with their own private resources written in log terms as $x_{i,s} = x + \ln \eta_{i,s}$ and used to calculate individual poverty. Note that shares are identified for the demographic group (men, women and children of the household, not the individual).⁸ In non-nuclear households, the approach does not allow estimating resource shares among several persons of the same type i (for instance among several adult women). This is a mere data limitation, to do so, we would simply need goods that are assignable to sub-groups of persons (for instance goods consumed by old women but not by young ones). This is not an impediment for three reasons. First, we focus mainly on male vs. female vs. child poverty effects overall. Second, we can specify the sharing function in a heterogeneous way, for instance introducing children's age to check if they obtain more resources when older. Third, to check the robustness of our results, we further estimate two alternative specifications of the collective model to better understand the bargaining effects of the cash transfer. We estimate the model for nuclear households ($s_f = 1, s_m = 1$), and we propose a model in which children are treated as household public goods following [Blundell et al. \(2005\)](#) and applications by [Tommasi and Wolf \(2016\)](#) and [Manzur and Pendakur \(2023\)](#).

Resource shares depend upon several determinants in vector z^r including household demographic characteristics such as age, number of children, and whether the household is located in an urban region.⁹ Importantly, the sharing rule also depends on the eligibility score p . As in standard Regression Discontinuity Design (RDD), we include two types of variables as determinants of the sharing rule. The first is the binary treatment variable $T(p) = 1$ when $p > \bar{p}$ which captures the potentially discontinuous effect associated with the eligibility threshold \bar{p} , normalized at zero. The second is a smooth function of the score $f(p)$. Given that the RDD is embedded in a structural framework, we cannot easily use nonparametric approaches. Hence we shall rely on the parametric strategy for RDD whereby alternative functions $f(p)$ will be suggested to check if results are independent from the model specification.

Structural Engel Curves at Individual and Household Levels. Next, we adopt a semi-parametric identification as in [Dunbar et al. \(2013\)](#), based on the assumption of Piglog indirect utility functions (see [Deaton and Muellbauer 1980](#)). It conveniently yields demographic-group Engel curves that are linear in the logarithm of their resources. That is, the *demographic-group budget share* for a good k consumed by any group i is written:

$$w_{i,s}^k = \delta_{i,s}(z^p) + \beta_{i,s}(z^p) \cdot x_{i,s}(z^r, p) \quad (3.1)$$

⁸To obtain individual shares for poverty analysis we need to divide the estimated share among the number of members of the demographic group in the household.

⁹They could also depend on prices, but our setting is static and we can ignore time variation in market prices.

with preference shifters z^p and sharing rule determinants z^r . For the sake of identification, we must assume the presence of exclusive goods, i.e., goods consumed only by specific types of individuals. We index them k_c, k_f, k_m for children, women, and men, respectively. For instance, if k_f corresponds to female clothing, $w_{f,s}^{k_f}$ is the proportion of their resources, $(\exp(x_{i,s}))$, that women in household type s spends on her clothing. As a function of (log) individual expenditure, the expression above defines *demographic-group* Engel curves. From the structure placed on demographic-group demand, we can also derive *household* Engel curves. For instance in a nuclear household, if we multiply $w_{f,s}^{k_f}$ by $\eta_{f,s} = \exp(x_{f,s})/\exp(x_s)$, we obtain the level of spending on the wife's clothing as a fraction of total expenditure, i.e., the *family budget share* on that good, $W_s^{k_f} = \eta_{f,s} \cdot w_{f,s}^{k_f}$. If there are several adult women in the household, $\eta_{f,s}$ represents the share of household resources allocated to all of them, and we can obtain per-women shares by $\eta_{f,s}/s_f$. Importantly, household budget shares are available in standard expenditure surveys. Thus, we can write a system of household budget shares for exclusive goods $k_i, i = f, m, c$:

$$\begin{aligned} W_s^{k_f} &= \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_{f,s}(z^p) \cdot (x + \ln \eta_{f,s}(z^r, p))) \\ W_s^{k_c} &= \eta_{c,s}(z^r) \cdot (\delta_{c,s}(z^p) + \beta_{c,s}(z^p) \cdot (x + \ln \eta_{c,s}(z^r, p))) \\ W_s^{k_m} &= \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_{m,s}(z^p) \cdot (x + \ln \eta_{m,s}(z^r, p))) \end{aligned} \quad (3.2)$$

where the left-hand terms are observed.

Restrictions and Identification. The question is whether we can retrieve key elements from the estimation of a reduced form of the above system, i.e., from the estimation of household budget shares on log expenditure. Before making necessary identifying assumptions, note that men's resource shares can be written as the complement to one of women's and children's shares, i.e. $\eta_{m,s} = 1 - \eta_{f,s} - \eta_{c,s}$, and is automatically recovered once women and children shares are. Then, the derivatives with respect to log expenditure of the system above yield:

$$\begin{aligned} \partial W_s^{k_f} / \partial x &= \eta_{f,s}(z^r, p) \cdot \beta_{f,s}(z^p) \\ \partial W_s^{k_c} / \partial x &= \eta_{c,s}(z^r, p) \cdot \beta_{c,s}(z^p) \\ \partial W_s^{k_m} / \partial x &= (1 - \eta_{f,s}(z^r, p) - \eta_{c,s}(z^r, p)) \cdot \beta_{m,s}(z^p) \end{aligned} \quad (3.3)$$

for each s out of a total of S different family compositions. The left-hand derivatives are observed, at least when household Engel curves are not flat.¹⁰ The system above corresponds to $3S$ equations and $5S$ unknowns ($\eta_{f,s}, \eta_{c,s}, \beta_{f,s}, \beta_{c,s}$ and $\beta_{m,s}$ for each s). Thus, identification requires additional restrictions on the preference term β . We rely on the Similarity Across People (SAP) assumption suggested by [Dunbar et al. \(2013\)](#), which states that for exclusive goods, the shape

¹⁰Note that the independence of base assumption is also needed to obtain these derivatives. This entails assuming that $\eta_{i,s}$ does not depend on total expenditure x . This assumption has not been rejected by [Bargain, Lacroix and Tiberti \(2022\)](#) and [Menon et al. \(2012\)](#)

of individual Engel curves is similar across person types $i = f, m, c$ of a given household type s . Formally, SAP is written as: $\beta_{f,s} = \beta_{m,s} = \beta_{c,s} = \beta_s$ for each s . It leads to 3S unknowns in total ($\eta_{f,s}$, $\eta_{c,s}$ and β_s for each s) and, hence, to an exact identification. Note that SAP is a commonly used preference restriction in the demand literature and a weaker version of shape-invariance defined by [Pendakur \(1999\)](#) and [Lewbel \(2010\)](#).¹¹

3.3.2 Specification and Estimation Method

The semi-parametric approach provides the log-linear specification of Engel curves derived from Piglog preferences, as written in equation (3.1). Additionally, we model resource shares using logistic functions to guarantee that the shares are below one and sum up to one. To estimate the model, we add error terms to household Engel curves for women's, men's and children's exclusive goods in the demand system (3.2), while imposing the SAP condition. Thus, we estimate the following system:

$$\begin{aligned} W_s^{kf} &= \eta_{f,s}(z^r, p) \cdot (\delta_{f,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{f,s}(z^r, p))) + \epsilon_{f,s} \\ W_s^{kc} &= \eta_{c,s}(z^r, p) \cdot (\delta_{c,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{c,s}(z^r, p))) + \epsilon_{c,s} \\ W_s^{km} &= \eta_{m,s}(z^r, p) \cdot (\delta_{m,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{m,s}(z^r, p))) + \epsilon_{m,s} \end{aligned} \quad (3.4)$$

with

$$\begin{aligned} \eta_{f,s} &= \exp(\alpha + \gamma_f z^r + \psi_f T + \rho_f f(p)) / D \\ \eta_{c,s} &= \exp(\alpha + \gamma_c z^r + \psi_c T + \rho_c f(p)) / D \\ \eta_{m,s} &= 1 / D \\ D &= 1 + \exp(\alpha + \gamma_f z^r + \psi_f T + \rho_f f(p)) + \exp(\alpha + \gamma_c z^r + \psi_c T + \rho_c f(p)). \end{aligned}$$

Engel curve parameters $\delta(z^p)$ and $\beta(z^p)$ vary with preference shifters z^p , which include household composition (namely s_f, s_m, s_c) and a urban dummy. For the sharing rule, we specify the logistic form with a set z^r of variables equivalent to z^p plus other demographic characteristics (e.g. education of men and women) and add the RDD variables, namely smooth functions of p , and the intention-to-treat variable T as determinants of the sharing rule. Note that this specification mirrors a classic RDD specification, embedded here in the resource share function. Since the error terms of the model are likely to be correlated across equations, each system is estimated using Non-Linear Seemingly Unrelated Regressions (as in [Bargain, Lacroix and Tiberti 2022](#) and [Calvi 2020](#)). The SUR estimator is iterated until the estimated parameters and error covariance

¹¹[Bargain, Lacroix and Tiberti \(2022\)](#), using direct observations of resource shares, tend not to reject SAP. Other tests hinge on indirect methods, i.e. start from alternative identification approaches that do not require SAP (e.g., using distribution factors as in [Brown et al. 2021](#) or [Dunbar et al. 2021](#)), and test it as a restriction.

matrices settle (the iterated SUR is equivalent to maximum likelihood with multivariate normal errors). The likely correlation between the error terms in each budget-share function and the log total expenditure is a frequent source of endogeneity (especially if total expenditure suffers from measurement errors). Each budget share equation is then augmented with the Wu-Hausman residuals obtained from a reduced-form estimation of x on all exogenous variables used in the model plus some instruments, namely the log household disposable income and its quadratic term (see [Banks et al. 1997](#); [Blundell and Robin 1999](#)).¹²

This structure allows us to be very transparent about the impact of the cash transfer on the resource shares. Aside from the expected income effect of AFAM through the increase in total household's resources x , evidenced in [Table 3.A1](#), the gender-based targeting of the program implies a potential bargaining effect through the intra-household distribution of resources $\eta_{i,s}(T)$. This captures the fact that becoming eligible ($T = 1$) potentially makes women more empowered and, hence, in control of a larger share of total expenditure. Note that there might be an indirect effect on resource sharing if AFAM entails labor market responses of women who belong to beneficiary households. [Bérgolo and Cruces \(2021\)](#), based on labor administrative records, find a six percentage point reduction of registered employment of adult members, especially women, in AFAM beneficiary households increasing inactivity and informal work in equal proportions.¹³ This could imply a reduction in the control of resources of specific members that could offset the bargaining effect of AFAM. Additionally, the reduction in employment is related to the reduction of expenditure on work-related goods, such as clothing and ready meals. We account for it through additional controls included in z' , namely the proportion of formal working women, the proportion of formal working adult members, and formal and total household income.¹⁴

An additional remark is needed regarding the potential endogeneities due to the conditionalities of the program. As mentioned before, the program has two conditionalities, health checkups and school attendance, but only school attendance was enforced. If the program had effects on school attendance, and this had further effects on consumption behavior, the program's effect on the reallocation of resources could be mistaken for effects on schooling. Endogeneity arises from the fact that the unobserved taste for school may be correlated with an unobserved taste for the assignable good (clothing) ([Tommasi; 2019](#)). However, as mentioned in [Section 3.2](#), this conditionality is not binding in our sample as we restrict our analysis to households with children under 14. Then, the potential effects cannot be attributed to increased education attainment.

¹²These instruments are very strong in predicting the log of expenditure (the F statistic on the excluded instruments is well above the usual threshold in all cases).

¹³[Bérgolo and Galván \(2018\)](#) based on a follow-up evaluation household survey for AFAM also find a negative impact on the registered employment of married women.

¹⁴The inclusion of these variables implies the assumption of separability between expenditure sharing and labor supply ([Bargain, Donni and Hentati; 2022](#))

3.3.3 Data and Selection

Expenditure Data and Key Variables. Our analysis is based on Uruguay's National Expenditure Survey (*Encuesta Nacional de Gasto e Ingreso de los Hogares*, ENGIH for its acronym in Spanish) provided by the National Institute of Statistics. It was conducted between November 2016 and November 2017 and is nationally representative with a total sample of 6,889 households.¹⁵ The survey collected detailed information on household expenditure and socio-demographic characteristics. We can construct total household expenditure, which aggregates spending on food and non-food items. We can also retrieve assignable goods, namely men's, women's and children's clothing. A key element for individual resource share identification is the availability of expenditure data on exclusive goods for men, women and children – specifically, the assignability of clothing expenditure. The choice of clothing is primarily practical. Indeed, the set of assignable goods available in standard surveys is extremely limited, while children's, men's, and women's clothing expenditures can generally be distinguished. Adult goods such as alcohol and tobacco pose problems of misreporting (Deaton; 1997) and generally do not allow the distinction between men and women. For this reason, clothing has been extensively used to retrieve child costs with the Rothbarth approach (see Deaton 1997) or to estimate collective models of consumption (e.g., Bourguignon et al. 2009, Browning et al. 1994, or Dunbar et al. 2013; see Browning et al. 2014 for a survey). The use of clothing for resource share identification is also supported by recent validation tests (Bargain, Lacroix and Tiberti; 2022). In our data, clothing expenditure is based on a 3-month recall for men, women and children (under 14 years old). Older children are not differentiated from adults in clothing expenditure and are treated as adults. Additionally, all the variables that allow for the construction of the poverty index that determines the inclusion to the program (p) were included in the survey. Thus, we reproduce the poverty score and normalize the cutoff to zero in the household survey, identifying the eligible households as those with positive values in this score ($T = 1$ if $p > 0$). As we are based on a household survey, we can estimate this index for all the households, regardless of whether they have applied to the program. It is important to note that even in the cases of households that have applied to the program, the score estimated in the survey may differ from the actual score calculated by the program administration as the variables that compose the index may have changed since the moment of the application.

Sample Selection. Our objective is to estimate the effect of a gender-targeted CCT on intra-household distribution between men, women and children, and its implications on individual poverty. Thus, as in recent contributions (Aminjonov, Bargain, Colacce and Tiberti; 2024; Bargain, Lacroix and Tiberti; 2022; Calvi; 2020), we consider all types of households with at least a man, a woman, and a child. As a result, the sample includes nuclear families but also households with

¹⁵The survey is based on a 7-day booklet to register food and regular expenditures completed by the person responsible for household expenses, and individual booklets for all the adults in the household in which they register daily individual expenditures. Longer-period expenditures (monthly, trimester, semester, and annual) are based on a specific questionnaire that enquires about the recalled expenditure item by item.

several adults of the same gender. Alternatively, we focus on nuclear households as the bargaining process is much more clear in couples than in multi-adult families. This implies an important reduction of the sample (and of precision) but clarifies who is impacted by the program. In both samples, we exclude households with at least one teenager between 14 and 17 years old. Clothing expenditure of children between 14 and 17 is recorded as adult clothing. As AFAM is targeted at children under 18 years old, the inclusion of this age group could imply the confounding of children/adult effects.¹⁶ The main sample (1,355 households) and the nuclear household sample (984 households) represent 62% and 45% of the total sample of households with children, respectively (Table 3.A2).

3.3.4 First Inspection of Data

Table 3.A3 reports the mean and standard deviation of key variables of the model (household characteristics used as determinants of the sharing rule and clothing expenditure used for identification). The first column reports statistics for our main sample and columns 2, 3, and 4 for households with one, two, and three or four children respectively. The average number of men and women reflects the inclusion of non-nuclear households in the analysis. AFAM eligibility, based on the poverty index, is 30% for the total sample and increases for larger households, as expected due to the relation between the household size and the poverty index. We also report average clothing shares and the proportion of households with non-zero children, women, and men's clothing expenditure. The infrequency of clothing purchases is not an issue (see Dunbar et al. 2013) and the proportion of households with zero clothing consumption is within reasonable bounds. The presence of children reduces the budget devoted by adults to their consumption. For instance, women with one child allocate 1.7% of household resources to clothing, while the budget share on female clothing decreases to 1.5% with the second and 1.1% with the third and fourth child. This pattern is consistent with the Rothbarth's intuition as it reveals the resource shift towards children.

We explore potential heterogeneities in gender awareness and empowerment, which could explain different effects of AFAM on intra-household distribution of resources. Table 3.A4 reports indirect women's empowerment indicators (couple's age ratio, weight of women's income in household income, and women's labor participation) and women's views on gender norms for urban and rural households. It shows a statistically significant empowerment difference in all indicators, signaling less progressive views in rural areas than in urban ones. One could then expect a larger margin of improvement for AFAM among rural women than urban women. This is consistent with anecdotal evidence that rural women have little control over money, due to lower labor market attachment and family production commercialized exclusively by men. Thus, if any

¹⁶We further discard households for whom basic information is missing (e.g. income), which represent under 0.1% of the sample.

effect of AFAM were found, we should expect it to be stronger for rural contexts.

Before turning to the estimation of the collective model, we perform a reduced-form analysis of the effect of AFAM on the control of resources to explore the direction of potential results. We estimate a simple RD considering the share of women's and children's clothing relative to men's as the outcome against the AFAM eligibility dummy and alternative functions of the poverty score. This approach follows the early works on the evaluation of the effects of cash transfers in intra-household distribution of resources that focused on child- or women-specific goods to suggest empowerment effects of the programs (Lundberg et al.; 1997; Ward-Batts; 2008). Table 3.A5 shows the coefficient associated with the eligibility dummy for different specifications of the running variable for the average model and the model considering urban/rural heterogeneity. We find systematic evidence of a positive jump in women's clothing share for eligible households and no effect for children. In line with the heterogeneity in women's empowerment indicators, results are always larger for rural women than for urban ones.

3.4 Results

3.4.1 Baseline Estimates

We present our baseline estimates of the resource shares in Table 3.1. The sharing rule determinants included in the model, aside from the eligibility dummy and the function of the poverty score, are the number of children, women, and men in the household, the average age of children, an urban dummy, and the average years of education of men and women. This estimation allows us to predict individual resource shares for each household. We find that children have larger resource shares on average than adults, receiving 28% of household resources per child and that men absorb a larger share than women (27 vs. 25% per person). Alternatively, we present the resource shares predicted at the sample mean. While these two approaches could yield different results, given the non-linearity of resource share functions, they reassuringly lead to similar patterns. Shares at the sample mean are close to those presented in Aminjonov, Bargain and Colacce (2024) for Uruguay in households with men, women and children (27, 21, 22%, respectively), standing out as one of the less unequal countries in their study.¹⁷ They also reported no statistically significant gender gap in resource shares.

Table 3.1 also reports the marginal effects of AFAM on each demographic group (effects on all children, women, and men in the household) for the two most flexible specifications of the running

¹⁷This is consistent with the global trend they identify, based on estimates of resource shares for 45 developing countries. Intra-household disparities tend to decrease with living standards, mainly driven by a lower per child share in poorer countries that contributes to aggravating child poverty. Uruguay stands out as one of the richer countries in their country selection and one of the most egalitarian.

variable (linear and quadratic spline).¹⁸ The first row of each panel reports the marginal average effects. We find traces of an overall 4.6 percentage point increase in women’s resource shares due to AFAM in quadratic spline specification (3.8 percentage point increase per woman on average). The linear spline specification points in the same direction but with no statistically significant effects. This, and the low significance of quadratic spline effects, are probably due to the lack of power ($N = 1355$). No effects are found for children and men. The second and third rows of each panel of Table 3.1 report heterogeneous effects for urban and rural households.¹⁹ As expected, results show a redistributive effect of AFAM towards women of eligible rural households and no effect for urban households. In the linear spline specification, we observe a 6.3 percentage point increase in rural women’s resource share compared to ineligible households, which translates to a 5.2 percentage point increase in per woman shares (21%). In Table 3.A6 we present the same estimations for alternative specifications of the running variable and the results are consistent. The marginal effect for rural women ranges from 6.1 to 7.4 (20 to 24% increase in per woman shares) and is always statistically significant. Again, we find no redistributive effects of AFAM in children and men. These results align with the reduced-form-approach estimates presented in Tables 3.A1 and 3.A5 that show an effect of AFAM on household income and women’s clothing expenditure relative to men, both stronger on rural households and no effects for children.

Our estimate is an ITT as our eligibility identification only refers to potential beneficiaries (poverty score over zero), but not actual access to the program. As mentioned before, some eligible households may not apply to the program, and some non-eligible households may receive the program due to low reassessment of the households’ poverty score.²⁰ To obtain an approximation of the Average Treatment Effect (ATE), we divide the ITT effect by an AFAM take-up estimation. Ghazarian (2021), based on household surveys, provides estimates for AFAM non-take-up of 29.1% for 2017. Thus, the ITT AFAM effect of 6.3 percentage points on rural women’s resource shares translates to an 8.9 percentage point average effect (ATE). This implies a 7.4 percentage point increase in per women’s share (30%) in response to AFAM.

The redistributive effects on rural women align with the urban/rural differences in indirect gender empowerment and gender roles indicators discussed previously, which suggest that gender norms are more traditional in rural contexts (Table 3.A4). We expected larger effects of AFAM on rural women than on urban ones as the margin for action in gender empowerment in rural areas was broader than in urban locations. Indeed, the gender distribution of work in these areas (lower female labor market attachment and dominantly men’s commercialization of produce) induces women to have less chance of handling their own money. This transfer offers

¹⁸The per-person average effect is obtained by dividing the estimated marginal effect by the average number of children, men, or women in the household respectively.

¹⁹This comes from the interaction of eligibility and rural dummies.

²⁰Recall that we reconstruct the poverty index in our data. Even if the household has applied to the program, its situation may have changed between the application and the survey date.

unique access to personal income, promoting empowerment and an increase in their share of household expenditure. The increase in women's resource shares due to the implementation of a gender-targeted CCT is also observed in [Tommasi \(2019\)](#) for PROGRESA and in homeowners in [Manzur and Pendakur \(2023\)](#) for Canada's child benefit reform.²¹ More importantly, our results align with [Bergolo and Galván \(2018\)](#) that identifies a positive effect of AFAM on gender empowerment through declared decision-making power on food expenses and on how to spend additional money. Thus, our results complement and confirm theirs using a more comprehensive empowerment measure. Converging conclusions from two different approaches is reassuring, especially for final say measures which could reflect the delegation of power instead of power shifts ([Baland and Ziparo; 2018](#)).²²

The observed expansion in women's shares does not trickle down to children, opposite to what has been found for PROGRESA ([Sokullu and Valente; 2022](#); [Tommasi; 2019](#); [Tommasi and Wolf; 2016](#)). However, our results are consistent with previous findings for AFAM in primary school-aged children. The effects on education attendance and health checkups were null as both were virtually universal in this age group, and no effects have been found on child nutrition ([Bérgolo et al.; 2016](#)) nor on expenditure on child goods ([Rivero et al.; 2020](#)). A possible explanation for these results is that redistributive effects depend on the previous level of women's and children's individual welfare. The marginal utility of women's expenditure relative to children's expenditure is larger as she is poorer (reflecting complementarity between her utility and child's utility) or as their children are richer (reflecting a lower marginal utility for the child). The estimated child shares for Uruguay are high (Table 3.1 and [Aminjonov, Bargain and Colacce 2024](#)), higher than traditional per-capita shares and larger than most of the estimates for other developing countries, in particular for Mexico.²³ In this context, our results are consistent with the lower marginal utility of spending in children. Additionally, recent experiments (conducted mainly in Africa) showed mixed effects of increasing female bargaining power on children's spending ([Almås et al.; 2020](#); [Bjorvatn et al.; 2020](#); [Cherchye et al.; 2021](#); [Dimova et al.; 2022](#); [Ringdal and Sjørusen; 2021](#); [Schürz; 2020](#)). Randomization of the recipient's identity has mainly shown no differences in child results when mothers or fathers receive the transfer ([Almås et al.; 2020](#); [Akresh et al.; 2016](#); [Armand et al.; 2020](#); [Benhassine et al.; 2015](#); [Haushofer and Shapiro; 2016](#)).²⁴ In sum, these results tend to indicate that empowerment is the argument to retain in favor of directing transfers to women, rather

²¹These results are based on nuclear households. We consider nuclear households in Section 3.4.3 and discuss further their results. Opposite results for PROGRESA are found in [Sokullu and Valente \(2022\)](#) and [Tommasi and Wolf \(2016\)](#).

²²[Bergolo and Galván \(2018\)](#) discuss thoroughly the limitations of the use of women's self-reported ability to participate decisions within the household as a quantitative measure of the impacts of transfer programs on women's decision-making or agency.

²³Children resource share estimations for Mexico are 12% in [Aminjonov, Bargain and Colacce \(2024\)](#), between 7 and 12% for [Sokullu and Valente \(2022\)](#), and between 11 and 28% in [Tommasi \(2019\)](#).

²⁴Most of these studies are based on cash transfers that represent a very small share of households' total expenditure or on experiments with small or no rewards. Some questions arise on whether they are only valid for marginal transfers or could be extended to larger programs. Our results align with them in the context of a generous CCT and low levels of children's poverty.

than improving consumption, savings, nutrition, and hence children’s conditions.

Table 3.1: Marginal Effects of AFAM on Children, Women, and Men Resource Shares

	Children	Women	Men
<i>Linear Spline</i>			
Eligible	-0.016 (0.027)	0.017 (0.025)	-0.002 (0.017)
Eligible rural	-0.025 (0.033)	0.063 ** (0.032)	-0.038 (0.030)
Eligible urban	-0.013 (0.032)	-0.011 (0.025)	0.024 (0.032)
<i>Quadratic spline</i>			
Eligible	-0.032 (0.033)	0.046 * (0.027)	-0.014 (0.031)
Eligible rural	-0.039 (0.040)	0.074 ** (0.035)	-0.035 (0.033)
Eligible urban	-0.032 (0.038)	0.007 (0.036)	0.025 (0.028)
Average per person shares (linear spline)	0.28	0.25	0.27
Shares at sample mean and std. dev. (linear spline)	0.26 (0.043)	0.25 (0.045)	0.26 (0.050)
Observations		1355	

Source: Household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men. Marginal effects refer to the effect of the variable on the demographic group resource share, not on per-person shares. They are estimated based on average household characteristics for the sample in the specified row. Marginal effects are estimated based on the average model for the first row of each panel and on the heterogeneous model specification for the second and third rows. Households with men, women, and 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

3.4.2 RDD-Type of Robustness Checks

Manipulation and Balance Tests. A first set of robustness checks is based on the applicability of the RD methodology to our setting to check for possible biases in the observed effects of AFAM on resource shares because of manipulation or jumps in covariables.²⁵ Manipulation refers to the situation in which potential beneficiaries can alter their poverty score to influence the program assignment. Manipulation is possible if applicants to the program have knowledge of the cut-off value and have incentives to change the score to ensure being assigned to AFAM. The score structure is complex and includes several structural variables, which reduces the manipulation possibility of the potential beneficiaries. In addition, neither the score nor the cutoff were disclosed to the public. We perform the Cattaneo et al. (2018) manipulation test based on a local polynomial density estimator, which does not require prebinning of the data. Results are de-

²⁵One of the most important challenges for our estimation is that the main outcome is not observable. Thus, we cannot visually inspect for a discontinuity of the outcome at the cutoff of the eligibility score nor present other traditional RDD tests.

picted in Figure 3.A1 and indicate that there is no statistical evidence of systematic manipulation of the running variable p . This validates the use of the poverty score as the running variable. We further explore whether the covariables of the model present a jump around the cutoff, which could imply that our results could be artificially driven by them. Figure 3.A2 presents graphical and statistical evidence of the balance tests that check for systematic imbalances of covariates at each side of the cutoff. Reassuringly, we do not find any discontinuity in the main explanatory variables used in the model.

Specification and Bandwidth. We then explore the robustness of the results to different model specifications, considering alternative sharing rule determinants z' and different bandwidths around the poverty score cutoff. Using as baseline the Spline function for the poverty score Table 3.2 presents the effects of AFAM on intra-household distribution of resources in rural and urban households for different specifications of the sharing rule. The first panel keeps only basic demographic controls, excluding men's and women's education, and Panel 2 replicates our baseline results. Panels 3 and 4 explore if results are robust to the inclusion of variables associated with formal labor. [Bérgolo and Cruces \(2021\)](#) found negative effects of AFAM on formal employment, which could affect the allocation of resources within the household. Also, the reduction in female employment could be directly related to a reduction in clothing expenditure. Last, the gender distribution of resources could be associated with the economic position of the households and AFAM implies an increase in total income. Panels 5 and 6 include income variables to disentangle the 'gender targeting' effect (in the Eligible variable) from a potential income effect on the sharing rule. The results are robust to all the alternative specifications, indicating that the formal employment and the income channels do not affect the eligibility effect. AFAM increases rural women's shares with an effect ranging from 5.1 to 6.6 percentage points, translating to a 16 to 22% increase in per women's share. Additionally, Table 3.A7 presents the marginal effects of the other variables considered in sharing rule estimation. These are some of the possible determinants of the distribution of resources within the household and can be related to bargaining power, although we should not interpret them as casual parameters. The formal employment channel does not affect resource shares. However, we find statistically significant effects for the income channel. For higher household income, women's shares increase but children's shares decrease. This could be explained by poor households mobilizing a large proportion of their resources to ensure children's well-being; as income increases, child needs do not increase at the same rate and households devote higher shares to adult consumption, particularly to women.

We now turn to a different set of robustness checks, based on the restriction of the bandwidths around the cutoff in line with the local sense of RD. As our outcome is not observable, the optimal bandwidth of [Calonico et al. \(2020\)](#) is not applicable. Instead, we explore whether the results are robust to successive symmetric 10 percentage point reduction of the sample around the cutoff. Due to the small sample restriction, we can only reduce the sample as far as 60% of the original.

Table 3.3 presents the marginal effects of AFAM on intra-household distribution of resources in rural and urban households for the different bandwidths, again based on the Spline function of the score and for the baseline specification of the resource share determinants. Reassuringly, results hold for different bandwidths. Moreover, we observe traces of larger effects of AFAM on rural women's resource shares as we approach the cutoff. For the smaller possible sample (60% of the original sample) we observe an 8.1 percentage point increase in rural women's shares, equivalent to a 27% increase in per woman shares.

3.4.3 Sensitivity Analysis

In this section, we explore alternative versions of the structural model to test if the positive effect of AFAM on rural women's resource shares holds. We focus on nuclear households (couples with children) as the bargaining process is more direct in couples than in multi-adult families. This implies an important reduction of the sample, of around 27% ($n = 984$), on an already small sample, which comes at the cost of less statistical power. However, results are interpreted more easily compared to multi-adult families in which the bargaining effect may be diluted. In nuclear households the husband vs. wife bargaining interpretation is straightforward. For instance, note that the interpretation of the marginal effects of AFAM on men's and women's resource shares refers directly to per-person shares as they are only composed of one man and one woman. The consideration of only nuclear households is a usual practice in the intra-household distribution literature and the inclusion of multi-adult households has only been presented in recent contributions (Aminjonov, Bargain, Colacce and Tiberti; 2024; Aminjonov, Bargain and Colacce; 2024; Bargain, Lacroix and Tiberti; 2022; Calvi; 2020). Indeed, all the previous work on the effect of CCTs on intra-household distribution of resources has exclusively focused on nuclear households (Manzur and Pendakur 2023; Sokullu and Valente 2022; Tommasi 2019; Tommasi and Wolf 2016 for PROGRESA and Bergolo and Galván 2018 for AFAM).

Table 3.2: Marginal Effects of AFAM on Children, Women, and Men Resource Shares.
Alternative Specifications of the Sharing Rule

	Children	Women	Men
<i>(1) Basic (Urban, Average age of children)</i>			
Eligible rural	-0.029 (0.033)	0.066 ** (0.031)	-0.037 (0.029)
Eligible urban	-0.013 (0.032)	-0.010 (0.025)	0.022 (0.031)
Observations	1355		
<i>(2) Basic specification + education of men and women (Baseline)</i>			
Eligible rural	-0.025 (0.033)	0.063 ** (0.032)	-0.038 (0.030)
Eligible urban	-0.013 (0.032)	-0.011 (0.025)	0.024 (0.032)
Observations	1355		
<i>(3) Basic specification + education, women formal work</i>			
Eligible rural	-0.016 (0.036)	0.054 * (0.029)	-0.038 (0.031)
Eligible urban	-0.005 (0.032)	-0.009 (0.030)	0.013 (0.021)
Observations	1355		
<i>(4) Basic specification + education, members formal work</i>			
Eligible rural	-0.018 (0.036)	0.053 * (0.030)	-0.036 (0.032)
Eligible urban	-0.005 (0.033)	-0.004 (0.031)	0.009 (0.017)
Observations	1355		
<i>(5) Basic specification + education, household total income</i>			
Eligible rural	-0.017 (0.035)	0.052 * (0.030)	-0.034 (0.031)
Eligible urban	-0.008 (0.031)	-0.012 (0.030)	0.021 (0.023)
Observations	1355		
<i>(6) Basic specification + education, household formal income</i>			
Eligible rural	-0.017 (0.035)	0.051 * (0.029)	-0.034 (0.031)
Eligible urban	-0.008 (0.032)	-0.010 (0.030)	0.018 (0.022)
Observations	1355		

Source: Household expenditure survey (ENGIH 2016/2017). Notes: The table reports marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men based on different specifications of the sharing rule. Marginal effects refer to the effect of the variable on the demographic group resource share, not on per-person shares. They are estimated based on average household characteristics for the sample in the specified row. Marginal effects are estimated based on the heterogeneous effect of AFAM mo and spline specification. Households with men, women, and 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.3: Marginal Effects of AFAM on Children, Women, and Men Resource Shares.
Alternative Bandwidths around Eligibility Cutoff

	Children	Women	Men
<i>Bandwidth: complete sample (baseline)</i>			
Eligible rural	-0.025 (0.033)	0.063 ** (0.032)	-0.038 (0.030)
Eligible urban	-0.013 (0.032)	-0.011 (0.025)	0.024 (0.032)
Observations	1355		
<i>Bandwidth: 90% of total sample</i>			
Eligible rural	-0.028 (0.032)	0.069 * (0.037)	-0.041 (0.044)
Eligible urban	-0.022 (0.034)	-0.024 (0.033)	0.047 (0.034)
Observations	1220		
<i>Bandwidth: 80% of total sample</i>			
Eligible rural	-0.032 (0.034)	0.066 * (0.037)	-0.033 (0.041)
Eligible urban	-0.006 (0.038)	-0.020 (0.034)	0.026 (0.031)
Observations	1085		
<i>Bandwidth: 70% of total sample</i>			
Eligible rural	-0.030 (0.036)	0.068 * (0.039)	-0.038 (0.043)
Eligible urban	-0.004 (0.038)	-0.012 (0.036)	0.016 (0.028)
Observations	949		
<i>Bandwidth: 60% of total sample</i>			
Eligible rural	-0.052 (0.034)	0.081 ** (0.040)	-0.029 (0.044)
Eligible urban	-0.019 (0.040)	-0.011 (0.035)	0.031 (0.030)
Observations	814		

Source: Household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men in different symmetric bandwidths around the eligibility cutoff. Marginal effects refer to the effect of the variable on the demographic group resource share, not on per-person shares. They are estimated based on average household characteristics for the sample in the specified row. Marginal effects are estimated based on the heterogeneous effect of AFAM mo and spline specification. Households with men, women, and 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Nuclear Households. We start by estimating the full collective model on the nuclear household sample. Results of the marginal effects of AFAM eligibility are presented in Table 3.A8 for alternative specifications of the poverty score, in Table 3.A9 for alternative resource share determinants, and in Table 3.A10 for decreasing symmetric bandwidths around the cutoff. Results are stronger

than when including multi-adult households. We find suggestive evidence of positive overall effects on the wife's share as for the significant effect on the more flexible specifications (linear and quadratic spline). The overall increase in shares is five to seven percentage points. This result is driven by strong effects on rural women, for which we observe a consistently significant positive effect of AFAM ranging from 7 to 12 percentage points across specifications. When including multi-adult households, the per-woman effect in rural contexts ranged from 4 to 7 percentage points. Interestingly, we find a negative effect for rural men in most of the specifications.²⁶ These results are in line with Tommasi (2019) who found positive effects for women and negative effects for men of PROGRESA in nuclear households, although the size of his effects was smaller than ours. Unlike us, he found positive effects on children. These differences may be reconciled when considering the different levels of individual child poverty in Uruguayan and Mexican households, as mentioned before.²⁷

Children as Public Goods. Last, we focus our analysis on husband/wife bargaining. We turn to a model in which the sharing rule that dominates the intra-household distribution of resources only refers to men and women. Children are treated as household public goods, and men and women benefit both from them. The model, briefly described in the Appendix, is inspired by Blundell et al. (2005) and the specification follows further applications of Tommasi and Wolf (2016) and Manzur and Pendakur (2023) for the Dunbar et al. (2013)-type of resource-share identification strategy. We present the results in Table 3.A11 for alternative specifications of the poverty score, in Table 3.A12 including alternative controls in the sharing rule, and in Table 3.A13 for different bandwidths. As in this model the household resources are only distributed among two members, the effects on the husband will always be the opposite of those observed for the wife. Reassuringly, we obtain similar results as in the full version for nuclear households. We observe consistent, strong, and positive effects of AFAM on rural women and the corresponding negative effect on men.

Taken together, these results confirm that the bargaining process in nuclear households is straightforward. In multi-adult households, the other men (aside from the husband) can be directly related to the targeted woman and she might divert part of her resources to them when receiving the program, but probably not to her husband (as the negative effect on men's shares in nuclear households suggests). For instance, 30% of adult men in non-nuclear households are adult sons of the wife. Consistent with our hypothesis of lower marginal utility of spending on children

²⁶We find negative effects for the husband in three out of five specifications of the poverty score (Table 3.A8), all the specifications when varying the resource share determinants (Table 3.A9), and two out of five bandwidths (Table 3.A10).

²⁷Other studies for PROGRESA, all in nuclear households, find negative effects on women, null or negative effects for men, and positive effects on children shares (Sokullu and Valente; 2022; Tommasi and Wolf; 2016). Sokullu and Valente (2022) argue, based on anthropological work, that the program provides an excuse for men to share less income with their wives, which may not be compensated by the program's transfer. Also, they state that local program implementers are reported to pressure women to spend the transfers on their children.

in the context of large pre-program child shares, women might opt to invest in their adult sons instead of in their children (as the marginal utility would be larger).

3.4.4 Implications for Individual Poverty

Having estimated individual resource shares, we can calculate individual expenditure *levels* of children, women, and men to estimate their poverty rates. We compute individual-level expenditure as the product of total household expenditure and the estimated individual resource shares and compare them to poverty lines. We use the World Bank's poverty line for high-income countries of \$5.5 per person/day (2011 PPP).²⁸ Figure 3.1 illustrates per-person expenditure for children, women, and men against the poverty score for rural and urban households. As expected, expenditure is negatively related to the poverty score. Figure 3.1 reveals both the income and bargaining effect of AFAM. The income effect is observed for all demographic and regional groups. Men, women and children in eligible households have higher per-person expenditures because total household resources are larger. However, the largest gains are observed in rural women due to the bargaining effect emerging from their increase in resource shares. In return, the total effect in rural men is modest, since the bargaining effect almost cancels the income effect.²⁹

We are now able to appropriately quantify the welfare effects of AFAM in terms of the change in individual poverty for each household member. Table 3.4 reports individual poverty levels of children, women, and men, and household poverty (considering per-capita expenditure) for eligible households as close to the cutoff as possible. To begin with, we focus on observed poverty (last row of the first panel). Poor households redistribute resources to children, as children's poverty is lower than household per-capita poverty. On the other side, adults who live with children are poorer when considering per-person expenditure than when considering per-capita expenditure.³⁰ This is an interesting feature as households with children are significantly poorer than households without children in Uruguay,³¹ which has driven a lot of attention from public opinion and policymakers to the reduction of child poverty. However, we provide evidence that poor households with children prioritize their consumption, at the expense of adults. In this sense, we could state that those who are worse off are adults living in poor households with children.

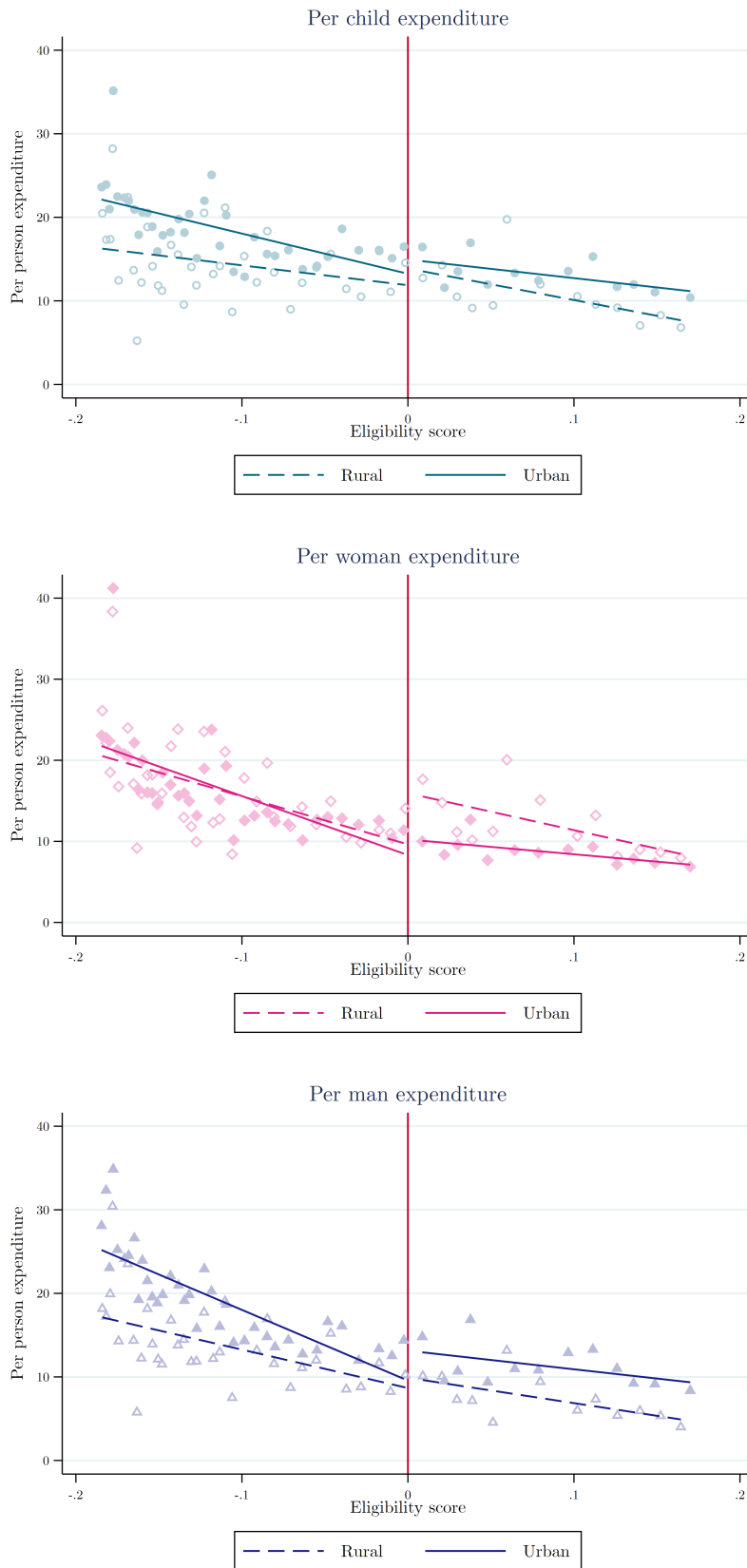
²⁸We use per-capita poverty lines, equal for men, women and children as the World Bank and national official estimations for the country.

²⁹Similar results are found in PROGRESA's evaluations. Tommasi (2019) observes an increase in expenditure of men, women and children, despite the decrease in men's shares, and Sokullu and Valente (2022) compute an increase in women's individual consumption even though they identify a decrease in their resource shares.

³⁰Although men are slightly poorer than women, this difference is not statistically significant.

³¹Official poverty rates published by the National Statistics Institute for 2017 show that poverty for children between 0 and 14 years old was 16% while the figure was 9% for adults (18 to 54 years old). These figures are based on income, not expenditure, on a different survey than ours (ECH), and on the national poverty lines instead of the World Bank's line.

Figure 3.1: Individual Per Person Consumption



Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The figure illustrates individual per person consumption (2011 PPP dollars per day) for men, women and children by region, averaged over 50 bins of poverty score. Individual per-person consumption is based on predicted resource shares for women, men and children (baseline estimations). Households with men, women, and 1 to 4 children as close to the eligibility cutoff as possible (bandwidth 60%, N=814). Urban households refer to localities with more than 5,000 inhabitants.

To better understand the effect of AFAM on individual poverty and disentangle the income and bargaining effects, we propose a counterfactual analysis sequentially withdrawing AFAM from individual expenditure and from estimated shares, and estimating poverty in each case. We calculate a counterfactual individual expenditure without AFAM in which i) we subtract the AFAM transfer that would correspond to each household from the total expenditure, and ii) we simulate resource shares for each individual discounting the marginal effect of AFAM obtained in Table 3.1. Individual poverty without AFAM (first row of Table 3.4) is the result of comparing individual expenditure obtained from i) and ii) to the poverty line. The income effect (second row of Table 3.4) results from only adding the AFAM transfer to expenditure and keeping the 'resource shares without AFAM', and the bargaining effect (third row of Table 3.4) derives from only considering observed shares, but keeping the 'household expenditure without AFAM'. The poverty effect of AFAM is obtained by comparing the first and fourth rows of Table 3.4. AFAM reduces poverty for men, women and children, derived from positive income effects in all the demographic groups. Effects are larger for women, due to a positive bargaining effect, in contrast to men and children. This differential reduction in poverty implies that women after AFAM are less poor than men, in contrast to the without AFAM counterfactual. Note that child poverty was already low before AFAM, and significantly smaller than adult poverty. This supports our hypothesis that the marginal utility of spending extra money on children is low for Uruguayan poor households, which explains the lack of effects of AFAM on children's resource shares. To accurately gauge the contribution of the income and bargaining effects, we carry out a Shapley-Owen-Shorrocks decomposition (SOS) proposed by Shorrocks (1999) based on Shapley (1953) and Owen (1977). Its main advantage is not being affected by the order in which we consider the effects. The results show that the income effect is positive for all the demographic groups but the bargaining effect is only positive for women. For them, 56% of the poverty reduction due to AFAM is explained by the income effect and 44% by the bargaining effect.

Table 3.4: Children, Women, and Men Individual Poverty and Household Per-Capita Poverty.

	Children	Women	Men	Household
Counterfactual without AFAM	0.070 (0.255)	0.214 (0.411)	0.191 (0.394)	-- --
AFAM: income effect	0.051 (0.221)	0.158 (0.366)	0.163 (0.370)	-- --
AFAM: bargaining effect	0.088 (0.284)	0.167 (0.374)	0.200 (0.401)	0.116 (0.321)
AFAM: total effect	0.056 (0.230)	0.140 (0.347)	0.163 (0.370)	0.079 (0.270)
Total change in poverty rate	-20%	-35%	-15%	
Contribution (Shapley decomposition):				
income effect	183%	56%	117%	
bargaining effect	-83%	44%	-17%	

Source: Household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports individual poverty rates of men, women and children and per-capita household poverty estimates. Poverty rates are calculated for eligible households with men, women, and 1 to 4 children as close to the eligibility cutoff as possible (60% of the total sample, $N = 215$). Individual poverty rates are based on predicted resource shares for women, men and children. For counterfactual estimation of poverty without AFAM we extract AFAM income from total household consumption and subtract the average marginal effect of AFAM (Table 3.1) from the resource shares. The income effects arise from only incorporating the AFAM income in expenditure and the bargaining effect from only incorporating the actual estimated shares. Household poverty refers to traditional per capita poverty. Standard deviations in parenthesis.

3.5 Concluding Remarks

Conditional cash transfers have been targeted to women in the household with the explicit aim of influencing the distribution of resources within households and alleviating child poverty. Most of the previous work has focused on specific individual outcomes such as expenditure on child and women goods, nutrition or education, or ‘final say’ questions on decision making. In this chapter, we test gender empowerment and reallocation of resources towards children by evaluating the effects of a gender-targeted cash transfer (Uruguay’s AFAM) on the intra-household distribution of resources. We embed an RDD in the structural estimation of resource shares to estimate the intention-to-treat effects of the program on men, women and children’s shares. The advantage of this structural approach is that it allows disentangling the income and bargaining effects as the increase in income impacts total expenditure in the structure of the changes in the resource shares can be directly interpreted as bargaining effects. Moreover, this allows us to translate results into individual poverty effects. As AFAM conditionalities are not binding for our sample, our set up is close to the studies that evaluate universal cash transfers [Almås et al. \(2020\)](#); [Haushofer and Shapiro \(2016\)](#). The RDD identification strategy relates our study to those that randomize or shift the recipient identity [Akresh et al. \(2016\)](#); [Almås et al. \(2020\)](#); [Armand et al. \(2020\)](#); [Benhassine et al. \(2015\)](#); [Lundberg et al. \(1997\)](#); [Ward-Batts \(2008\)](#), but in a structural form that allows for a direct measure of empowerment. Further, compared to these experiments, which often offer small

transfers, AFAM represents a large redistribution to households which rules out the marginal transfer problem.

We show that AFAM, by giving the monetary transfer directly to women, improves their bargaining power within the household, increasing their resource share. We confirm and extend previous results found by [Bergolo and Galván \(2018\)](#) who considered women's perceived control over decisions. We can conclude from our study that the positive effect on women is driven by rural women, who were lagging behind in terms of gender empowerment and attitudes, and thus the program had more margin of action to promote empowerment than in urban contexts. On the other hand, we do not find results for children. This can be understood in the specific context of the already large redistribution of resources to children in poor households. Child resource shares are large, and child poverty is low, especially in relation to adult poverty. Thus, for women, the marginal utility of spending on children is lower than spending on themselves. In terms of individual poverty, we find that the AFAM's income effect reduces poverty for men, women and children in eligible households, and the bargaining effect generates stronger results for women.

Our results reinforce the relevance of households' own decision-making rules in the outcomes of social policies. In addition, our findings highlight the importance of the context on the potential effects of social policies on final outcomes, questioning the external validity of previous results, for instance, those based on the Mexican population from [Tommasi \(2019\)](#).

The main limitation of our work refers to the limited sample size for a Regression Discontinuity Design. However, as expenditure data is required we need to rely on household surveys and it is not possible to use large administrative data as in [Bérgolo and Cruces \(2021\)](#). Larger expenditure data is needed to give more power to this analysis and extend it to consider other possible heterogeneities and arms of the program, as for instance the differential transfer to secondary school children. Further limitations are those highlighted in previous methodological contributions ([Bargain, Lacroix and Tiberti; 2022](#)). Admittedly, the collective model framework and the sharing rule identification used here rest on transparent assumptions and are easily operationalized with standard expenditure data containing information on exclusive or assignable goods (such as male, female and child clothing). Yet, further work is needed to relax the preference restriction used for identification or to further confirm its validity.

3.6 Appendix

3.6.1 Model with Children as Public Goods

We present the collective model estimated in Section 3.4.3. This model is inspired by [Blundell et al. \(2005\)](#)'s original proposition that children can be considered as public goods within the households to evaluate the effect of a gender-targeted cash transfer. The specification is based on further work by [Tommasi and Wolf \(2016\)](#) and [Manzur and Pendakur \(2023\)](#) who incorporate this idea on a [Dunbar et al. \(2013\)](#) model context. In this case, we assume that household resources are only distributed between adults in the household (wife and husband). Then, we assume that there are two types of individuals in the household $i = f, m$, i.e. women and men. The system of household budget shares for the exclusive goods are

$$\begin{aligned}W_s^{k_f} &= \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_{f,s}(z^p) \cdot (x + \ln \eta_{f,s}(z^r, p))) \\W_s^{k_m} &= \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_{m,s}(z^p) \cdot (x + \ln \eta_{m,s}(z^r, p)))\end{aligned}$$

where the left-hand terms are observed.

Applying the same assumptions as in the full model (SAP) and recalling that the shares add up to one, the derivatives with respect to log expenditure of the above system are

$$\begin{aligned}\partial W_s^{k_f} / \partial x &= \eta_{f,s}(z^r, p) \cdot \beta_s(z^p) \\ \partial W_s^{k_c} / \partial x &= (1 - \eta_{f,s}(z^r, p)) \cdot \beta_s(z^p)\end{aligned}$$

for each s out of a total of S different family compositions. As we are only considering nuclear households, the family compositions are only defined by the number of children. The specification and estimation methods are the same as in the full model.

3.6.2 Additional Results

Table 3.A1: AFAM Effect on Total Income

	Quadratic	Cubic	Quartic	Spline	Quadratic Spline
Eligible	0.330 *** (0.087)	0.266 *** (0.093)	0.274 ** (0.115)	0.238 *** (0.082)	0.197 * (0.120)
R-squared	0.304	0.304	0.305	0.302	0.305
Eligible rural	0.391 *** (0.102)	0.325 *** (0.108)	0.330 *** (0.126)	0.302 *** (0.098)	0.258 ** (0.131)
Eligible urban	0.306 *** (0.089)	0.245 *** (0.095)	0.249 ** (0.117)	0.215 ** (0.084)	0.174 (0.122)
R-squared	0.304	0.306	0.306	0.303	0.306
Observations	1,355				

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table shows the result of the coefficient associated with eligible households (poverty score over zero) on (log) total income. Columns refer to different specifications of the inclusion of the score (running variable). No other controls are included. Households with men, women, and 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A2: Sample Selection

	Households	% of total sample
Total sample	6,889	
Households with at least one child under 14 (a)	2,185	100%
Households with 1 to 4 children	2,163	99%
Households with both male and female adults	1,854	85%
Excluding teenage adults (b)	1,365	62%
No missing, expenditure trimming / main sample	1,355	62%
Keep only if one couple / sample of nuclear households	984	45%

Source: Household expenditure survey (ENGIH 2016/2017). *Notes:* Total sample considers households with children (under 18). (a) 14 years of age is the limit below a child is identified as such in clothing expenditure. (b) Excludes children between 14 and 18 whose clothing is labeled as 'adult' clothing.

Table 3.A3: Descriptive Statistics

	Total sample	Households with 1 child	Housholds with 2 children	Households with 3-4 children
Proportion of sample	1.00	0.55	0.34	0.11
Number of men	1.15 (0.410)	1.18 (0.442)	1.09 (0.327)	1.17 (0.455)
Number of women	1.21 (0.480)	1.26 (0.521)	1.15 (0.415)	1.17 (0.430)
Number of children	1.58 (0.732)	1.00 (0.000)	2.00 (0.000)	3.16 (0.368)
Children average age	6.36 (3.687)	6.42 (4.255)	6.17 (3.062)	6.66 (2.035)
Urban	0.75 (0.432)	0.78 (0.418)	0.73 (0.446)	0.71 (0.454)
Years of education (women)	10.42 (3.930)	10.23 (3.681)	10.90 (4.164)	9.84 (4.246)
Years of education (women)	9.54 (3.745)	9.36 (3.522)	9.96 (3.991)	9.15 (3.938)
Eligible household	0.30 (0.459)	0.22 (0.412)	0.32 (0.469)	0.65 (0.478)
Eligible Urban	0.20 (0.400)	0.15 (0.353)	0.21 (0.409)	0.43 (0.496)
Eligible Rural	0.10 (0.304)	0.07 (0.258)	0.11 (0.316)	0.23 (0.420)
Household income (PPP 2011)	2,340 (2024)	2,229 (1702)	2,538 (2317)	2,279 (2449)
Household formal income (PPP 2011)	1,338 (1376)	1,312 (1178)	1,439 (1607)	1,162 (1490)
Household expenditure (PPP 2011)	1,817 (1393)	1,676 (1149)	1,973 (1554)	2,030 (1838)
<i>Share of clothing expenditure</i>				
Men	0.013 (0.018)	0.014 (0.019)	0.012 (0.016)	0.008 (0.013)
Women	0.016 (0.020)	0.017 (0.021)	0.015 (0.019)	0.011 (0.015)
Children	0.024 (0.023)	0.020 (0.020)	0.028 (0.023)	0.033 (0.030)
<i>Proportion of non-zero clothing expenditure</i>				
Men	0.614 (0.487)	0.619 (0.486)	0.617 (0.487)	0.580 (0.495)
Women	0.702 (0.458)	0.716 (0.451)	0.706 (0.456)	0.620 (0.487)
Children	0.913 (0.282)	0.892 (0.310)	0.935 (0.247)	0.947 (0.225)
Observations	1,355	743	462	150

Source: Household expenditure survey (ENGIH 2016/2017). Notes: Sample of households with men, women, and 1 to 4 children. Standard deviations in parentheses.

Table 3.A4: Women's Relative Characteristics and Views on Gender Roles

	Urban	Rural	Diff.
a. Women's relative characteristics (nuclear households)			
Age ratio (woman's age over man's age)	0.926 (0.147)	0.898 (0.151)	0.028 ***
Weight of women's income in total household income	0.368 (0.269)	0.278 (0.261)	0.090 ***
Women's labor market participation (%)	0.736 (0.441)	0.626 (0.485)	0.110 ***
b. Women's views on gender roles (ENAJ data)			
Raising children should be the primary task of the women	0.260 (0.439)	0.356 (0.480)	-0.096 ***
Women should choose careers that don't interfere with a future family project.	0.238 (0.426)	0.353 (0.479)	-0.115 ***
If I could I would stop working to dedicate myself exclusively to my family	0.330 (0.470)	0.439 (0.497)	-0.109 ***
If my partner's wage was higher, I would stop working.	0.213 (0.409)	0.279 (0.449)	-0.066 ***
Even if my household income was sufficient, I would not stop working to maintain my autonomy. (Disagree)	0.220 (0.414)	0.351 (0.478)	-0.131 ***
It is natural for women and men to have differently jobs	0.638 (0.481)	0.714 (0.453)	-0.076 ***
It is preferable for women to take care of the family and children instead of working	0.143 (0.351)	0.235 (0.425)	-0.092 ***
Gender role index	0.292 (0.250)	0.393 (0.280)	-0.101 ***

Source: Panel a. authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). Panel b. authors' estimations using the data from Youth National Survey (ENAJ) 2018. Notes: Panel a. presents results for nuclear households with children under 14 years of age (n=984). Panel b. presents opinions regarding gender norms and attitudes for women between 25 and 35 (n=2582). Percentage of agreement with the sentence (Completely agree or Agree), except for the question "Even if my household income was sufficient, I would not stop working to maintain my autonomy" for which percentage of disagreement is presented. The gender role index is the average of the answers to the seven questions. Urban households refer to localities with more than 5,000 inhabitants. Standard deviations in parentheses. *, **, *** indicate 10%, 5% and 1% significance level of t-test.

Table 3.A5: AFAM Effect on Female/Children's Clothing Expenditure Relative to Men's

	Quadratic		Cubic		Quartic		Spline		Quadratic Spline	
	Women	Children	Women	Children	Women	Children	Women	Children	Women	Children
Eligible	1.585 ** (0.777)	1.229 (1.059)	1.562 * (0.856)	1.754 (1.165)	1.383 (1.055)	0.775 (1.435)	1.622 ** (0.739)	1.443 (1.006)	1.552 (1.098)	1.643 (1.495)
R-squared	0.006	0.021	0.006	0.022	0.006	0.024	0.006	0.021	0.006	0.021
Eligible rural	1.881 ** (0.935)	1.100 (1.274)	1.860 * (1.004)	1.634 (1.367)	1.676 (1.170)	0.682 (1.592)	1.918 ** (0.908)	1.312 (1.237)	1.846 (1.213)	1.515 (1.653)
Eligible urban	1.477 * (0.800)	1.276 (1.090)	1.457 * (0.876)	1.796 (1.192)	1.266 (1.074)	0.812 (1.461)	1.521 ** (0.761)	1.487 (1.036)	1.443 (1.115)	1.690 (1.519)
R-squared	0.007	0.021	0.007	0.022	0.007	0.024	0.007	0.021	0.007	0.022
Observations	832									

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table shows the result of the coefficient associated with eligible households (poverty score over zero) on female and children clothing expenditure relative to men's. Columns refer to different specifications of the inclusion of the score (running variable). No other controls are included. Urban households refer to localities with more than 5,000 inhabitants. Households with men, women, and 1 to 4 children with positive share of men's clothing. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A6: Marginal Effects of AFAM on Children, Women, and Men Resource Shares, Alternative Specifications of Running Variable

	Children	Women	Men
<i>Smooth function of score: quadratic</i>			
Eligible	-0.026 (0.000)	0.021 (0.027)	0.005 (0.034)
Eligible rural	-0.035 (0.038)	0.061 * (0.036)	-0.026 (0.037)
Eligible urban	-0.022 (0.038)	-0.011 (0.031)	0.033 (0.038)
Observations		1355	
<i>Smooth function of score: cubic</i>			
Eligible	-0.005 (0.037)	0.031 (0.030)	-0.026 (0.040)
Eligible rural	-0.019 (0.039)	0.074 * (0.039)	-0.054 (0.042)
Eligible urban	0.001 (0.040)	-0.001 (0.034)	0.000 (0.043)
Observations		1355	
<i>Smooth function of score: quartic</i>			
Eligible	-0.042 (0.041)	0.032 (0.034)	0.009 (0.044)
Eligible rural	-0.048 (0.043)	0.072 * (0.040)	-0.025 (0.044)
Eligible urban	-0.036 (0.045)	-0.006 (0.038)	0.043 (0.048)
Observations		1355	

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men. Marginal effects refer to the effect of the variable on the demographic group resource share, not on per-person shares. They are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification, except for the average effect of AFAM (first row of each panel). Urban households refer to localities with more than 5,000 inhabitants. Households with men, women, and 1 to 4 children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A7: Marginal Effects of Determinants of Sharing Rule in Alternative Specifications

	(1)		(2)		(3)		(4)		(5)		(6)	
	Children	Women	Children	Women	Children	Women	Children	Women	Children	Women	Children	Women
Eligible rural	-0.029 (0.033)	0.066 ** (0.031)	-0.025 (0.033)	0.063 ** (0.032)	-0.016 (0.036)	0.054 * (0.029)	-0.018 (0.036)	0.053 * (0.030)	-0.017 (0.035)	0.052 * (0.030)	-0.017 (0.035)	0.051 * (0.029)
Eligible urban	-0.013 (0.032)	-0.010 (0.025)	-0.013 (0.032)	-0.011 (0.025)	-0.005 (0.032)	-0.009 (0.030)	-0.005 (0.033)	-0.004 (0.031)	-0.008 (0.031)	-0.012 (0.030)	-0.008 (0.032)	-0.010 (0.030)
Number of children	0.125 *** (0.034)	-0.005 (0.032)	0.137 *** (0.033)	-0.011 (0.031)	0.153 *** (0.033)	-0.114 *** (0.042)	0.154 *** (0.030)	-0.125 *** (0.036)	0.153 *** (0.035)	-0.107 ** (0.045)	0.153 *** (0.034)	-0.110 ** (0.043)
Number of women	-0.166 *** (0.061)	0.155 *** (0.045)	-0.160 *** (0.061)	0.150 *** (0.044)	-0.125 ** (0.057)	0.150 *** (0.044)	-0.126 ** (0.057)	0.168 *** (0.043)	-0.117 ** (0.059)	0.142 *** (0.046)	-0.121 ** (0.057)	0.151 *** (0.045)
Number of men	-0.040 (0.056)	-0.032 (0.043)	-0.042 (0.056)	-0.029 (0.045)	-0.039 (0.061)	-0.056 (0.063)	-0.031 (0.065)	-0.043 (0.058)	-0.024 (0.063)	-0.081 (0.065)	-0.032 (0.060)	-0.068 (0.063)
Average age of children	-0.088 *** (0.022)	0.071 *** (0.019)	-0.102 *** (0.022)	0.079 *** (0.019)	-0.110 *** (0.023)	0.104 *** (0.022)	-0.114 *** (0.024)	0.111 *** (0.023)	-0.106 *** (0.023)	0.100 *** (0.021)	-0.110 *** (0.023)	0.103 *** (0.022)
Urban	0.053 (0.072)	-0.071 (0.059)	0.042 (0.068)	-0.071 (0.059)	0.007 (0.072)	0.118 (0.082)	0.007 (0.073)	0.135 * (0.079)	0.001 (0.069)	0.105 (0.080)	0.006 (0.070)	0.114 (0.080)
Years education women			-0.036 (0.028)	0.046 * (0.023)	-0.049 * (0.029)	0.049 * (0.027)	-0.054 * (0.029)	0.060 ** (0.027)	-0.035 (0.029)	0.049 * (0.026)	-0.041 (0.028)	0.050 * (0.026)
Years education men			-0.055 ** (0.027)	0.005 (0.022)	-0.046 * (0.027)	0.022 (0.026)	-0.041 (0.027)	0.023 (0.026)	-0.032 (0.027)	0.012 (0.026)	-0.032 (0.028)	0.009 (0.026)
Women's formal work					-0.005 (0.018)	0.021 (0.017)						
Member's formal work							-0.015 (0.027)	0.029 (0.025)				
Household total income (exc. AFAM)									-0.059 *** (0.020)	0.033 * (0.018)		
Household formal income											-0.074 *** (0.028)	0.059 ** (0.025)
Observations	1355		1355		1355		1355		1355		1355	

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* Table reports the marginal effects of determinants on children, women, and men resource shares for different specifications of the sharing rule. Marginal effects refer to the effect of the variable on the demographic group resource share, not on per-person shares. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification. The spline specification is used for the running variable. AFAM eligibility is determined by poverty score over zero. The variables in years (age and education) are divided between 10. Formal work refers to the presence of a formal working woman (3) or member (4) in the household. Households with men, women, and 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A8: Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men's Resource Shares. Alternative Specifications of Running Variable

	Children	Women	Men
<i>Smooth function of score: quadratic</i>			
Eligible	0.005 (0.040)	0.026 (0.035)	-0.031 (0.030)
Eligible rural	-0.010 (0.043)	0.073 * (0.040)	-0.063 * (0.036)
Eligible urban	0.032 (0.049)	-0.030 (0.043)	-0.001 (0.025)
Observations	984		
<i>Smooth function of score: cubic</i>			
Eligible	0.012 (0.042)	0.021 (0.038)	-0.034 (0.035)
Eligible rural	-0.005 (0.044)	0.067 * (0.042)	-0.062 (0.040)
Eligible urban	0.037 (0.051)	-0.036 (0.046)	-0.001 (0.028)
Observations	984		
<i>Smooth function of score: quartic</i>			
Eligible	-0.019 (0.049)	0.041 (0.044)	-0.022 (0.038)
Eligible rural	-0.028 (0.049)	0.079 * (0.046)	-0.052 (0.045)
Eligible urban	0.010 (0.059)	-0.021 (0.053)	0.010 (0.032)
Observations	984		
<i>Smooth function of score: spline (baseline)</i>			
Eligible	-0.015 (0.034)	0.050 * (0.027)	-0.035 (0.027)
Eligible rural	-0.042 (0.038)	0.108 *** (0.036)	-0.066 * (0.031)
Eligible urban	0.006 (0.042)	-0.004 (0.038)	-0.002 (0.035)
Observations	984		
<i>Smooth function of score: quadratic spline</i>			
Eligible	-0.052 (0.044)	0.072 * (0.039)	-0.020 (0.027)
Eligible rural	-0.069 (0.047)	0.124 *** (0.045)	-0.055 * (0.034)
Eligible urban	-0.023 (0.042)	0.016 (0.045)	0.007 (0.025)
Observations	984		

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). Notes: The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men. Marginal effects of children refer to the effect of the variable on all the children's resource share, not on per-child shares. Marginal effects on adults' shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification, except for the average effect of AFAM (first row of each panel). Urban households refer to localities with more than 5,000 inhabitants. Households with couples with 1 to 4 children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A9: Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men's Resource Shares. Alternative Specifications of the Sharing Rule

	Children	Women	Men
<i>Basic (Urban, Average age of children)</i>			
Eligible rural	-0.042 (0.038)	0.107 *** (0.036)	-0.065 ** (0.030)
Eligible urban	0.010 (0.042)	-0.007 (0.036)	-0.003 (0.020)
Observations	984		
<i>Basic specification + education of men and women (baseline)</i>			
Eligible rural	-0.042 (0.038)	0.108 *** (0.036)	-0.066 ** (0.031)
Eligible urban	0.006 (0.041)	-0.004 (0.036)	-0.002 (0.021)
Observations	984		
<i>Basic specification + education, women formal work</i>			
Eligible rural	-0.042 (0.038)	0.109 *** (0.036)	-0.068 ** (0.031)
Eligible urban	0.005 (0.042)	-0.003 (0.036)	-0.002 (0.021)
Observations	984		
<i>Basic specification + education, members formal work</i>			
Eligible rural	-0.039 (0.040)	0.113 *** (0.037)	-0.073 ** (0.032)
Eligible urban	0.005 (0.041)	0.001 (0.036)	-0.006 (0.021)
Observations	984		
<i>Basic specification + education, household total income</i>			
Eligible rural	-0.044 (0.038)	0.105 *** (0.036)	-0.060 * (0.031)
Eligible urban	0.002 (0.041)	-0.001 (0.032)	-0.001 (0.033)
Observations	984		
<i>Basic specification + education, household formal income</i>			
Eligible rural	-0.039 (0.037)	0.106 *** (0.036)	-0.066 ** (0.031)
Eligible urban	0.002 (0.041)	-0.001 (0.036)	-0.001 (0.023)
Observations	984		

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men based on different specifications of the sharing rule. Marginal effects of children refer to the effect of the variable on all the children's resource share, not on per-child shares. Marginal effects on adults' shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification. The spline specification is used for the running variable. Households with couples with 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A10: Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men's Resource Shares. Alternative Bandwidths around Eligibility Cutoff

	Children	Women	Men
<i>Bandwidth: complete sample (baseline)</i>			
Eligible rural	-0.042 (0.038)	0.108 *** (0.036)	-0.066 ** (0.031)
Eligible urban	0.006 (0.053)	-0.004 (0.034)	-0.002 (0.044)
Observations		984	
<i>Bandwidth: 90% of total sample</i>			
Eligible rural	-0.033 (0.037)	0.101 ** (0.040)	-0.068 * (0.042)
Eligible urban	0.009 (0.051)	-0.018 (0.041)	0.009 (0.034)
Observations		887	
<i>Bandwidth: 80% of total sample</i>			
Eligible rural	-0.036 (0.033)	0.088 ** (0.044)	-0.052 (0.043)
Eligible urban	0.038 (0.052)	-0.003 (0.029)	-0.034 (0.047)
Observations		786	
<i>Bandwidth: 70% of total sample</i>			
Eligible rural	-0.032 (0.033)	0.100 ** (0.047)	-0.068 (0.048)
Eligible urban	0.037 (0.053)	-0.008 (0.034)	-0.030 (0.044)
Observations		689	
<i>Bandwidth: 60% of total sample</i>			
Eligible rural	-0.043 (0.034)	0.112 ** (0.045)	-0.069 (0.052)
Eligible urban	0.040 (0.057)	-0.021 (0.029)	-0.019 (0.047)
Observations		590	

Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men in different symmetric bandwidths around the eligibility cutoff. Marginal effects of children refer to the effect of the variable on all the children's resource share, not on per-child shares. Marginal effects on adults' shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification. The spline specification is used for the running variable. Households with couples with 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A11: Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Specifications of Running Variable

	Women	Men
<i>Smooth function of score: quadratic</i>		
Eligible	0.062 (0.044)	-0.062 (0.044)
Eligible rural	0.102 ** (0.047)	-0.102 ** (0.047)
Eligible urban	-0.010 (0.052)	0.010 (0.052)
Observations	984	
<i>Smooth function of score: cubic</i>		
Eligible	0.061 (0.049)	-0.061 (0.049)
Eligible rural	0.094 * (0.051)	-0.094 * (0.051)
Eligible urban	-0.021 (0.056)	0.021 (0.056)
Observations	984	
<i>Smooth function of score: quartic</i>		
Eligible	0.053 (0.056)	-0.053 (0.056)
Eligible rural	0.084 (0.057)	-0.084 (0.057)
Eligible urban	-0.032 (0.061)	0.032 (0.061)
Observations	984	
<i>Smooth function of score: spline (baseline)</i>		
Eligible	0.068 ** (0.034)	-0.068 ** (0.034)
Eligible rural	0.117 *** (0.037)	-0.117 *** (0.037)
Eligible urban	0.001 (0.043)	-0.001 (0.043)
Observations	984	
<i>Smooth function of score: quadratic spline</i>		
Eligible	0.060 (0.041)	-0.060 (0.041)
Eligible rural	0.107 ** (0.044)	-0.107 ** (0.044)
Eligible urban	-0.009 (0.048)	0.009 (0.048)
Observations	984	

Source: authors’ estimations using the data from household expenditure survey (ENGIH 2016/2017). Notes: The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men. Children are considered as a household public good and the sharing rule is only determined between men and women in the household. Marginal effects on adults’ shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification, except for the average effect of AFAM (first row of each panel). Urban households refer to localities with more than 5,000 inhabitants. Households with couples with 1 to 4 children. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A12: Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Specifications of the Sharing Rule

	Women	Men
<i>Basic (Urban, Average age of children)</i>		
Eligible rural	0.116 *** (0.038)	-0.116 *** (0.038)
Eligible urban	0.001 (0.043)	-0.001 (0.043)
Observations	984	
<i>Basic specification + education of men and women (baseline)</i>		
Eligible rural	0.117 *** (0.037)	-0.117 *** (0.037)
Eligible urban	0.001 (0.043)	-0.001 (0.043)
Observations	984	
<i>Basic specification + education, women formal work</i>		
Eligible rural	0.119 *** (0.037)	-0.119 *** (0.037)
Eligible urban	0.004 (0.043)	-0.004 (0.043)
Observations	984	
<i>Basic specification + education, members formal work</i>		
Eligible rural	0.127 *** (0.038)	-0.127 *** (0.038)
Eligible urban	0.014 (0.044)	-0.014 (0.044)
Observations	984	
<i>Basic specification + education, household total income</i>		
Eligible rural	0.117 *** (0.036)	-0.117 *** (0.036)
Eligible urban	0.001 (0.043)	-0.001 (0.043)
Observations	984	
<i>Basic specification + education, household formal income</i>		
Eligible rural	0.117 *** (0.038)	-0.117 *** (0.038)
Eligible urban	0.002 (0.043)	-0.002 (0.043)
Observations	984	

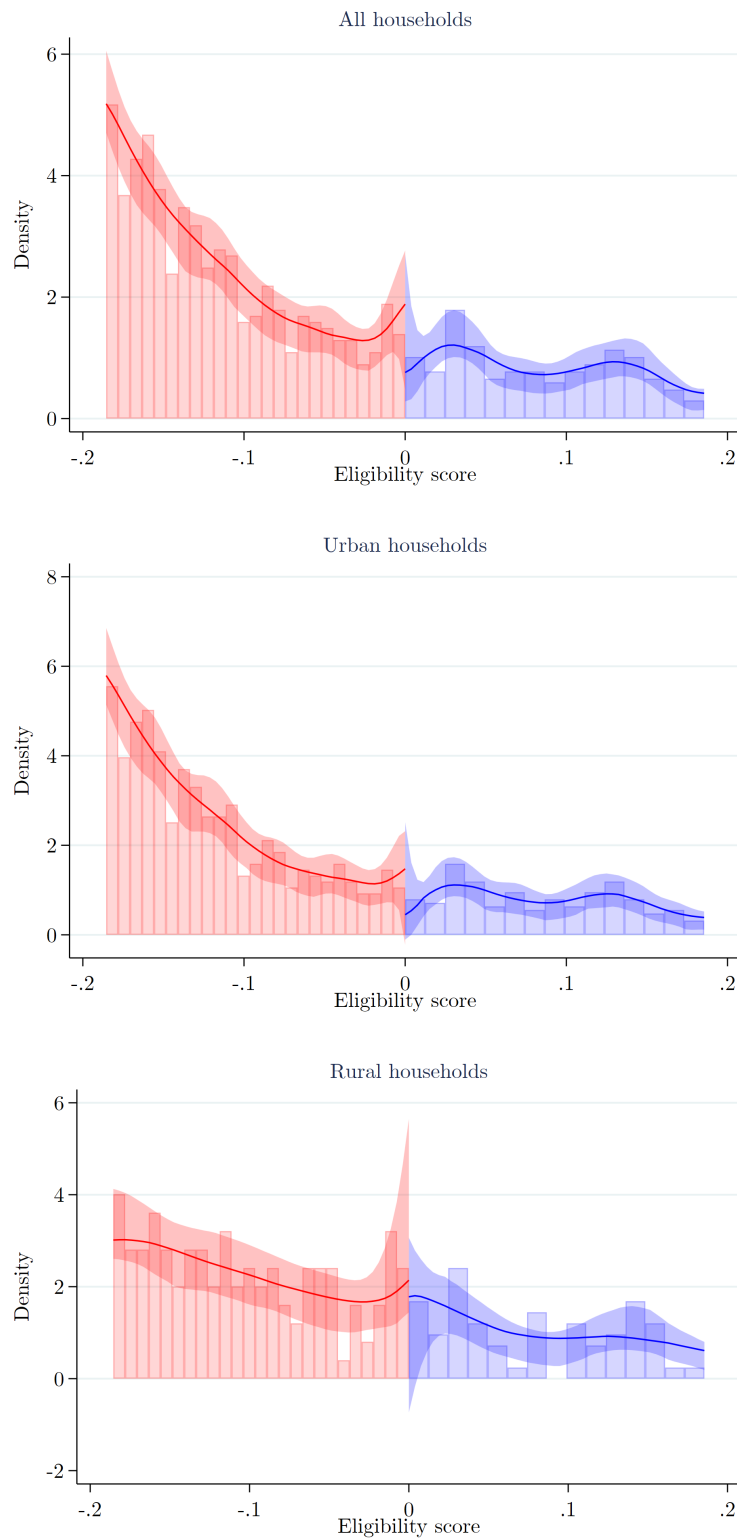
Source: authors’ estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports base-line results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men based on different specifications of the sharing rule. Children are considered as a household public good and the sharing rule is only determined between men and women in the household. Marginal effects on adults’ shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification. The spline specification is used for the running variable. Households with couples with 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Table 3.A13: Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Bandwidths around Eligibility Cutoff

	Women	Men
<i>Complete sample</i>		
Eligible rural	0.117 *** (0.037)	-0.117 *** (0.037)
Eligible urban	0.001 (0.043)	-0.001 (0.043)
Observations	984	
<i>Bandwidth: 90% of total sample</i>		
Eligible rural	0.099 ** (0.043)	-0.099 ** (0.043)
Eligible urban	-0.017 (0.050)	0.017 (0.050)
Observations	887	
<i>Bandwidth: 80% of total sample</i>		
Eligible rural	0.079 * (0.044)	-0.079 * (0.044)
Eligible urban	0.015 (0.051)	-0.015 (0.051)
Observations	786	
<i>Bandwidth: 70% of total sample</i>		
Eligible rural	0.095 ** (0.048)	-0.095 ** (0.048)
Eligible urban	0.016 (0.054)	-0.016 (0.054)
Observations	689	
<i>Bandwidth: 60% of total sample</i>		
Eligible rural	0.104 ** (0.048)	-0.104 ** (0.048)
Eligible urban	-0.027 (0.053)	0.027 (0.053)
Observations	590	

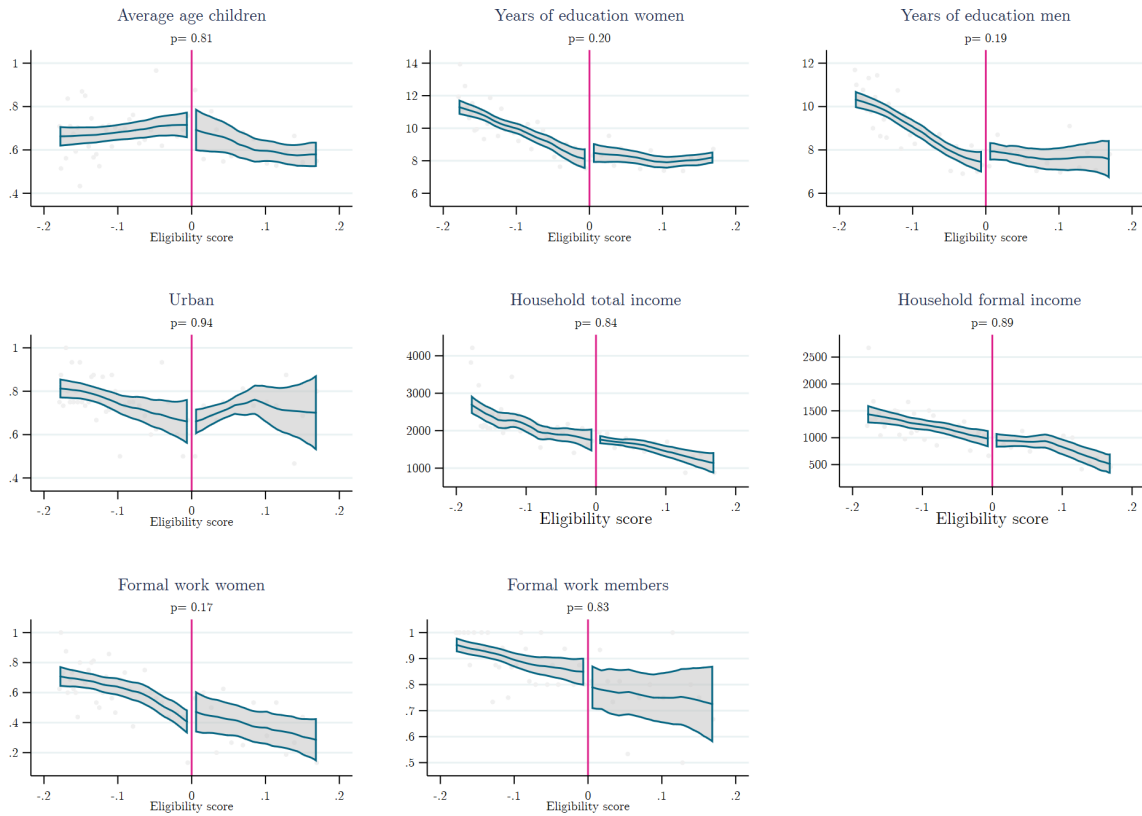
Source: authors’ estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* The table reports baseline results of marginal effects for AFAM eligibility (poverty score over zero) on the sharing rule of children, women, and men in different symmetric bandwidths around the eligibility cutoff. Children are considered as a household public good and the sharing rule is only determined between men and women in the household. Marginal effects on adults’ shares refer to per-person shares as nuclear households are composed of one man and one woman. Marginal effects are estimated based on average household characteristics for the sample in the specified row and based on the heterogeneous effect of AFAM model specification. The spline specification is used for the running variable. Households with couples with 1 to 4 children. Urban households refer to localities with more than 5,000 inhabitants. Standard errors in parentheses. *, **, *** indicate 10%, 5% and 1% significance level.

Figure 3.A1: Manipulation Test



Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* Cattaneo et al. (2018) manipulation test based on a local polynomial density estimator, which does not require pre-binning of the data (optimal bandwidth). For the complete sample, the final manipulation test yields a statistic of -0.1451 with a p-value of 0.8846, indicating no statistical evidence of systematic manipulation of the running variable. p-value for Urban Households is 0.8629 and 0.1372 for Rural Households. Households with men, women, and 1 to 4 children for households as close to the eligibility cutoff as possible (bandwidth 60%, N=814). Urban households refer to localities with more than 5,000 inhabitants.

Figure 3.A2: Balances Tests for Covariables



Source: authors' estimations using the data from household expenditure survey (ENGIH 2016/2017). *Notes:* These figures exhibit graphical evidence of the balance tests that check for systematic imbalances of covariates at each side of the cutoff. The dots represent the mean value of the covariates over 50 bins of the poverty score. The lines represent the locally weighted regressions of the variables on the poverty score and the 95% confidence intervals. Subtitles report the p-value of the RDD regression of covariates as dependent variables using the quadratic spline specification of the running variable. Households with men, women, and 1 to 4 children for households as close to the eligibility cutoff as possible (bandwidth 60%, N=814).

General Conclusion

This dissertation analyzes the patterns of intra-household inequalities in non-developed countries and how they are affected by culture and policies. We analyze the patterns of intra-household resource allocation that ultimately allow measuring poverty at the individual level (for men, women and children). This research is the largest exercise of this kind so far, providing a global mapping of gender and age gaps in poverty gaps. It also shows how social norms and policies can affect the allocation of resources within families. The contribution is also methodological as the data assessment documents how often intra-household resource distribution can be estimated using assignable goods (such as clothing expenditure) and recent resource share estimation techniques. It contributes to the recent validation effort, which has compared resource share estimates with actual resource shares in rare surveys when consumption is fully individualized (see [Bargain, Lacroix and Tiberti; 2022](#)). In this case, we provide suggestive evidence of cross-validation with nutrition proxies in Chapter 1: both household poverty and the fact that poor households redistribute less to children contribute to child undernutrition. In Chapters 2 and 3, we validate our results against final-say questions of control of resources within the household. Finally, in Chapter 3, we propose a unique strategy of evaluation of the effects of a conditional cash transfer on intrahousehold distribution through the incorporation of a regression discontinuity design in the structural estimation. The advantage of this structural approach is that it allows disentangling the income and bargaining effects as the increase in income impacts total expenditure in the structure of the model and changes in the resource shares can be directly interpreted as bargaining effects.

In Chapter 1 we derive global mappings of gender inequality and child poverty that are consistent and comparable across 45 low- and middle-income countries. Our estimates suggest a frequent imbalance in adults: women are almost twice as poor as men on average worldwide (their resource shares are around 20% lower on average). Children are even poorer, which cannot be fully explained by differences in needs with adults or among-siblings economies of scale. Intra-household disparities are greater in poor countries and, within countries, among poor households.

In Chapter 2, we question whether kinship ancestries of post-marital residence still affect house-

hold consumption sharing and individual poverty. We focus on Ghana and Malawi, two countries in which patrilocal and matrilineal traditions coexist in the present-day ethnic distribution. Estimations show that ancestral patrilocality, relative to matrilineality, corresponds to a 10 percent lower share of resources accruing to women on average and a substantially higher prevalence of poverty for women at most household consumption levels. Women's resource shares tend to increase with age, a pattern more pronounced for matrilineal groups. These results indicate how a combination of cultural and demographic factors may be used to improve policies targeted at poor individuals (rather than poor households).

Chapter 3 analyzes whether gender-targeted cash transfers effectively redistribute resources to women and children in poor households. We focus on the largest social assistance program in Uruguay (AFAM), directed to poor families with children and paid to women. Results point to a significant increase in resource shares for eligible women in rural areas - for them, margins for improvement were greater given more traditional gender views. Resource shares for children are large ex ante and therefore do not increase further with AFAM. We translate these results into terms of individual poverty: all family members benefit from the income effect, but the bargaining effect reduces women's poverty even more.

Our results have implications in terms of poverty and inequality measurement but also for policy design. Targeting poor households means helping children that are possibly even poorer than what per-capita measures tell us. Nonetheless, poor children are also located in non-poor households so exclusion errors can be committed by traditional targeting methods - we extend the conclusions of [Brown et al. \(2019a\)](#), based on nutrition data, to consumption poverty. As suggested in Chapter 2, ancestral practices may be used together with other household characteristics, such as the woman's age, as relevant observable information to design programs that target vulnerable individuals, and not just households deemed poor according to standard poverty measures. Such interventions may shift intra-household bargaining power in favor of women ([Cherchye et al.; 2021](#)), providing them with more control over family resources ([De Mel et al.; 2008](#)) or inducing a better balance of work and household chores ([Dinkelman; 2011](#)). However, our findings highlight the importance of the context on intra-household inequalities and on the potential effects of social policies on final outcomes. The potential bargaining effect generated by gender-targeting may not translate to better results for children, as evidenced in Chapter 3. Our results also reinforce the relevance of households' own decision-making rules in the outcomes of social policies. Households' own decision-making rules may defeat the objectives of redistributive policies targeted at specific individuals.

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List of Tables

- 1.1 Correlation of Child Resource Shares with Child Wasting 22
- 1.A1 Description of Non-Included Surveys 29
- 1.A2 Description of Household Survey Data 34
- 1.A3 Descriptive Statistics, Demographics 35
- 1.A4 Descriptive Statistics, Expenditure 36
- 1.A5 Marginal Effects on Per-Child Resource Shares 39
- 1.A6 Marginal effects on Per-Woman Resource Shares 40
- 1.A7 Estimates of Per-Person Resource Shares (Calculated at Sample Mean) 42
- 1.A8 A Review of Country-Specific Resource Share Estimations 43
- 1.A9 Child Undernutrition, Per-Child Resource Shares and Poverty Correlations 50

- 2.1 Matching strategies 65
- 2.2 Baseline results: Predicted individual resource shares, Ghana and Malawi 67
- 2.A1 Summary Statistics: Differentiating Household Types 77
- 2.A2 Summary Statistics: Differentiating across Ancestral Residency Norms 78
- 2.A3 Robustness Tests: Alternative Matching and Model Specification 79
- 2.A4 Robustness Tests: Effects of patrilineality - Ghana 80
- 2.A5 Poverty Estimates (poverty line at 1.9 PPP\$) 81

- 3.1 Marginal Effects of AFAM on Children, Women, and Men Resource Shares 98
- 3.2 Marginal Effects of AFAM on Children, Women, and Men Resource Shares. Alternative Specifications of the Sharing Rule 101
- 3.3 Marginal Effects of AFAM on Children, Women, and Men Resource Shares. Alternative Bandwidths around Eligibility Cutoff 102
- 3.4 Children, Women, and Men Individual Poverty and Household Per-Capita Poverty. 107
- 3.A1 AFAM Effect on Total Income 110
- 3.A2 Sample Selection 110
- 3.A3 Descriptive Statistics 111
- 3.A4 Women’s Relative Characteristics and Views on Gender Roles 112
- 3.A5 AFAM Effect on Female/Children’s Clothing Expenditure Relative to Men’s 113
- 3.A6 Marginal Effects of AFAM on Children, Women, and Men Resource Shares, Alternative Specifications of Running Variable 114

3.A7	Marginal Effects of Determinants of Sharing Rule in Alternative Specifications	115
3.A8	Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men’s Resource Shares. Alternative Specifications of Running Variable	116
3.A9	Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men’s Resource Shares. Alternative Specifications of the Sharing Rule	117
3.A10	Nuclear Households. Marginal Effects of AFAM on Children, Women, and Men’s Resource Shares. Alternative Bandwidths around Eligibility Cutoff	118
3.A11	Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Specifications of Running Variable	119
3.A12	Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Specifications of the Sharing Rule	120
3.A13	Nuclear Households. Marginal Effects of AFAM Women’s Resource Shares in Model with Children as Public Goods. Alternative Bandwidths around Eligibility Cutoff	121

List of Figures

- 1.1 Country Selection and Survey Availability 11
- 1.2 Individual Resource Shares by Living Standards (Baseline Calculated at Sample Means) 15
- 1.3 Average Number of Children by Living Standards 16
- 1.4 Individual versus Per-Capita Household Poverty (Poverty Line at \$1.9/day, 2011 PPP) 18
- 1.5 Average Number of Children and Per-Child Shares by Living Standards within Country (Selected Countries) 21
- 1.6 Micro Cross-Validation: Per-Child Resource Shares and Household Welfare vs. Child Wasting Prevalence (Selected Countries) 24
- 1.7 Difference Between Child and Adult Poverty Rates at Various Combinations of Child Needs and Economies of Scale 25
- 1.A1 Official (World Bank) vs. Estimated Per-Capita Household Poverty 37
- 1.A2 Individual Resource Shares by Living Standards (Robustness Check Based on Within-Country Mean Resource Shares) 44
- 1.A3 Individual vs. Per-Capita Household Poverty (Alternative Poverty Line at \$3.2/day, 2011 PPP) 46
- 1.A4 Overall Individual vs. Per-Capita Poverty Rates (Country Average) 47
- 1.A5 Proportion of Poor Individuals in Non-Poor Households 48
- 1.A6 Child Resource Shares by Number of Children 51
- 1.A7 Sensitivity of Micro Cross-Validation: Per-Child Resource Shares and Poverty vs. Child Stunting (Selected Countries) 52

- 2.1 Distribution of Women’s Resource Shares by Post-marital Residency Norm 68
- 2.2 Heterogeneity of Women’s Resource Shares by Age 71
- 2.3 Heterogeneity of Women’s Control over Earnings by Age 72
- 2.4 Poverty Effects of Ancestral Patrilocality (poverty line at 1.9 PPP\$) 73
- 2.A1 Poverty Effects of Ancestral Patrilocality (poverty line at 3.2 PPP\$) 82

- 3.1 Individual Per Person Consumption 105
- 3.A1 Manipulation Test 122
- 3.A2 Balances Tests for Covariables 123