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Culture, Intra-household Distribution and Individual Poverty*

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Abstract

Traditional family structures often have persistent effects on household decisions. We question 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 focus on Ghana and Malawi, two countries in which patrilocal and matrilocal traditions coexist in the present-day ethnic distribution. We estimate a model of resource allocation using household expenditure surveys and information on prevalent ethnic norms. Estimations show that ancestral patrilocality, relative to matrilocality, 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 matrilocal groups. These results indicate how a combination of cultural and demographic factors can be used to improve policies targeted at poor individuals (rather than poor households).

Keywords: Cultural norms, Collective Model, Sharing rule, Individual poverty, Intra-household inequality

JEL codes: D13, I15, J12, J16, Z13

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1 Introduction

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). There is increasing evidence on the relationship between women's outcomes and ancestral norms such as patrilocality, patrilineality, dowries or bride price.[1] Ancestral family rules and 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, as discussed below, 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. Among different possible arrangements, patrilocality and matrilocality represent two polar traditions characterizing countries (usually poor ones) where people tend to live in large groups. They correspond to the practice of living after marriage with or near the groom's versus the bride's parents, respectively. Compared to couples living without their parents (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

[1] See 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).

patrilocality.[2] Globally, a negative country correlation between traditional patrilocality and progressive views about gender roles has been reported (for instance in Jayachandran 2015). To our knowledge, however, the present paper is the first to test whether belonging to ethnic groups with a patrilocal tradition, relative to a matrilocal 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, i.e. ancestral residence norms were 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, interpreted as the pure bargaining effect of ancestral norms, leads to large differences in poverty between women of patrilocal and matrilocal groups, on average and over a large part of the distribution of household consumption. Children's resource shares show less systematic patterns but tend to decrease with patrilocality in Ghana. 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:

[2]See 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.

the resource gender gap is confirmed in this case. 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 paper 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, 2015; 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 (i.e. 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. Policy targeting based on observable factors (e.g. proxy-means test approaches) could incorporate household residency norms, combined with demographic factors such as age, as relevant information to 'tag' households with a higher prevalence of poverty among women and children. In this way, policy design could be adjusted to better target vulnerable individuals rather than households as a whole.

This paper 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 Background

2.1 Existing Literature

Ancestral Norms and Gender Bias. Policy often mistargets poor individuals living in non-poor households (Brown et al., 2019). 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., 2022). Admittedly, the correlation between current residence practices and women's outcomes is indicative,[3] 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.[4] 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) 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). Matrilocal contexts have increased women' position in case of disagreement, improving their ability to take-up legal reforms helping divorce (Bargain et al., 2020). In

[3] For 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.

[4] See Jayachandran (2015) 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).

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), which are favorable conditions for patrilineality, i.e., the kinship system that prescribes that lineage and inheritance are traced through men. Closely related to patrilocality, patrilinearity is itself associated with pro-male discrimination (Lowes, 2020) and reduced incentives to invest in daughters.[5]

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 1990; 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.[6]

[5]Both norms may have co-evolved (Opie et al., 2014), notably because matrilineality is related to the risk of non-paternity of the son's children (Fortunato, 2012). If not overlapping, they 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). Some of the matrilineal systems are explicitly associated with matrilocality and the idea that women hold more resources and have a higher status (Fox, 1983).

[6]Some 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

2.2 Traditional Norms in Ghana and Malawi

Ghana and Malawi are culturally diverse countries characterized by the coexistence of matrilocal 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, intrahousehold 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,[7] the Nyanja, which are also matrilocal and predominate in the South, and the Tumbuka, which are traditionally pa-

expenditure data is costly and rare. An exception is a dataset from Bangladesh used in Bargain et al. (2022) to validate the present approach by comparing observed and estimated resource shares.

[7]While their ancestors were matrilocal, according to the Ethnographic Atlas, this group currently practices patrilocality (Dessy et al., 2022) and has transited from a matrilineal to a patrilineal kinship society.

trilocal 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. (2022) 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).

3 Empirical strategy

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 (Chiappori and Bourguignon, 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.[8]

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 paper is that it will depend on bargaining 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.[9] 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 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

[8] Because 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.

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

individual budget share for a good k consumed by any person i is written:

$$w_{i,s}^{k} = \delta_{i,s}(z^p) + \beta_{i,s}(z^p) \cdot x_{i,s}(z^r), \tag{1}$$

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, $W_s^{k_f} = \eta_{f,s}.w_{f,s}^{k_f}$. 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, $i = f, m, c$:

$$\begin{aligned}
W_s^{k_f} &= s_f \cdot \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_{f,s}(z^p) \cdot (x + \ln \eta_{f,s}(z^r))) \\
W_s^{k_m} &= s_m \cdot \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_{m,s}(z^p) \cdot (x + \ln \eta_{m,s}(z^r))) \\
W_s^{k_c} &= s_c \cdot \eta_{c,s}(z^r) \cdot (\delta_{c,s}(z^p) + \beta_{c,s}(z^p) \cdot (x + \ln \eta_{c,s}(z^r)))
\end{aligned} \tag{2}$$

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:

$$\begin{aligned} \partial W_s^{k_f}/\partial x &= s_f \cdot \eta_{f,s}(z^r) \cdot \beta_{f,s}(z^p) \\ \partial W_s^{k_m}/\partial x &= s_m \cdot \eta_{m,s}(z^r) \cdot \beta_{m,s}(z^p) \\ \partial W_s^{k_c}/\partial x &= s_c \cdot (1 - \eta_{f,s}(z^r) - \eta_{m,s}(z^r)) \cdot \beta_{m,s}(z^p) \end{aligned} \tag{3}$$

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 (η_{fs}, η_{ms}, $\beta_{f,s}$, $\beta_{m,s}$ 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 cuves 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.[10] Note that SAP is a commonly used preference restriction in the demand literature and a weaker version of shape-invariance defined by Lewbel (2010).[11]

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 (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 (2), while imposing the SAP

[10] The 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.

[11] Bargain et al. (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 in Dunbar et al. 2021 or Brown et al. 2021), and test it as a restriction.

condition. Thus, we estimate the following system:

$$\begin{aligned} W_s^{k_f} &= s_f \eta_{f,s}(z^r) \cdot (\delta_{f,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{f,s}(z^r))) + \epsilon_{f,s} \\ W_s^{k_m} &= s_m \eta_{m,s}(z^r) \cdot (\delta_{m,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{m,s}(z^r))) + \epsilon_{m,s} \\ W_s^{k_c} &= s_c \eta_{c,s}(z^r) \cdot (\delta_{c,s}(z^p) + \beta_s(z^p)(x + \ln \eta_{c,s}(z^r))) + \epsilon_{c,s} \end{aligned} \tag{4}$$

with

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

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.[12] For the sharing rule, we specify the logistic form with a set $\boldsymbol{z}^r$ 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.

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.[13] 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. 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 lan-

[12] Note 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.

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

guages 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 et al., 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 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.

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.[14] 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.[15] We follow the sequence suggested by Nunn and 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*.[16] This approach allows matching a further 63%

[14] Situations 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 paper.

[15] For 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).

[16] Ethnologue: https://www.ethnologue.com/; Joshua Project: https://joshuaproject.net/

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 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.

3.5 Summary Statistics

Table 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 children, women, and men. The infrequency of clothing purchase is not an issue (see Dunbar et al. 2013) but country

Table 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/).

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 A2 completes this description with statistics for households of matrilocal versus patrilocal ancestries. Both groups have similar socio-demographic characteristics overall, especially in Malawi. In Ghana, ethnicities of patrilocal tradition are more often located in rural areas, have slightly more children and are significantly poorer than those of matrilocal ancestry.

4 Results

4.1 Baseline Resource Share Estimations

We present estimates of the resource shares in Table 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).[17]

Average Resource Shares. We start with a general overview of our sharing rule estimates. Panel (a) of Table 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 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.[18] 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%-

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

[18] Regarding 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: Baseline results: Predicted individual resource shares, Ghana and Malawi

	Ghana		Malawi	
	children, women and men	*women and men*	*children, women and men*	*women and men*
	(1)	(2)	(3)	(4)
(a) Resource shares				
Children	0.145	-	0.324	-
	(0.054)	-	(0.082)	-
Women	0.349	0.415	0.322	0.417
	(0.095)	(0.114)	(0.056)	(0.083)
Men	0.506	0.585	0.354	0.583
	(0.124)	(0.114)	(0.086)	(0.083)
Per child	0.068	-	0.149	-
	(0.029)	-	(0.062)	-
Per woman	0.244	0.315	0.287	0.374
	(0.111)	(0.134)	(0.073)	(0.120)
Per man	0.354	0.425	0.299	0.481
	(0.101)	(0.127)	(0.061)	(0.104)
(b) Marginal effects on per person resource shares				
Women's resource shares:				
Patrilocal (=1)	-0.026 ***	-0.018 ***	-0.032 ***	-0.041 ***
	(0.004)	(0.005)	(0.007)	(0.010)
Proportion of boys	-0.007 *	-	-0.005	-
	(0.004)	-	(0.007)	-
Urban (=1)	0.006	0.013	-0.013	-0.014
	(0.007)	(0.008)	(0.023)	(0.026)
Children's resource shares:				
Patrilocal (=1)	-0.015 ***	-	0.004	-
	(0.003)	-	(0.004)	-
Proportion of boys	0.000	-	0.000	-
	(0.001)	-	(0.004)	-
Urban (=1)	0.006	-	0.003	-
	(0.004)	-	(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.

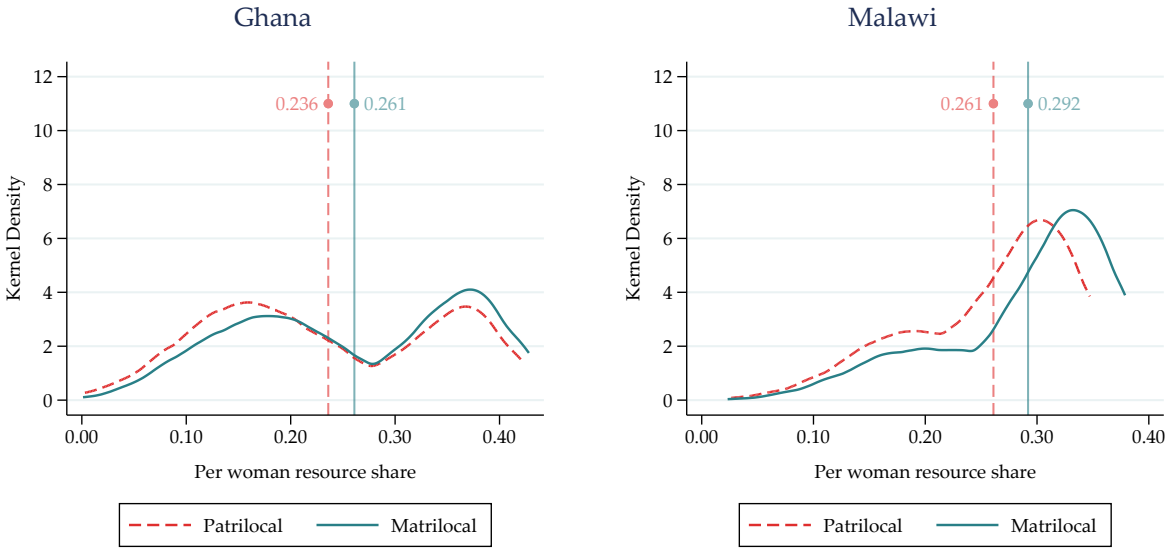
4.1% in Malawi. Thus, relative to the average per-woman resource shares, ancestral patrilocality accounts for a reduction of women's resources by 9% overall in Ghana (11% in household with children and 6% in others) and 11% in Malawi (similar across household types). The patrilocality effect, just like 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 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 (which may be the case here but only to some extent, as previously discussed).[19] 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 matrilocal 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 Hoddinott (1994) and Bargain et al. (2015) for Cote d'Ivoire (a neighbor of Ghana where a third of the population is also from Akan matrilocal tradition). Deaton (1997) suggests that little evidence on child gender bias may be due to the rela-

[19] On the one hand, in matrilocal/matrilineal 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).

Figure 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 1 for a summary of matching methods). Vertical lines represent mean resource shares for patrilocal/matrilocal households.

tively high rate of economically productive women in many African countries, so girls are not seen as a burden by their parents.[20] A pro-boy bias is found in the restricted case of nuclear households in Malawi (Dunbar et al., 2013) but not 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.

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 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

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

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.

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) and show relatively 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).[21]

To our knowledge, there is so far no attempt to quantify the empowerment age-gradient in an African context using resource allocation estimations. Such a result is proposed in Figure 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 dum-

[21] For 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.

mies). 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.[22]

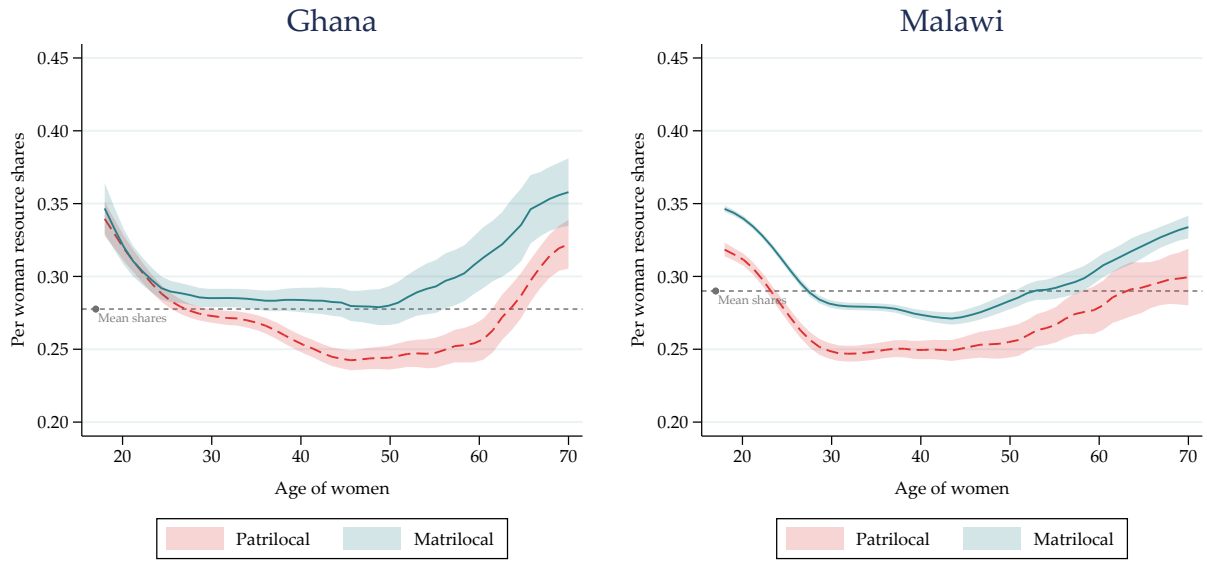
As an informal check of these results, we also use a self-reported answer to the question about the control of earned income ("Who in your household mainly decides on the use of the payment you received?"). This is of course much more specific because of the limited number of women who receive a wage (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 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 matrilocal ancestry. As for resource shares, this trend is especially pronounced in Ghana.

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 A4. 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 is higher among households of patrilocal tradition in Ghana, while Malawi is much poorer overall. Household poverty

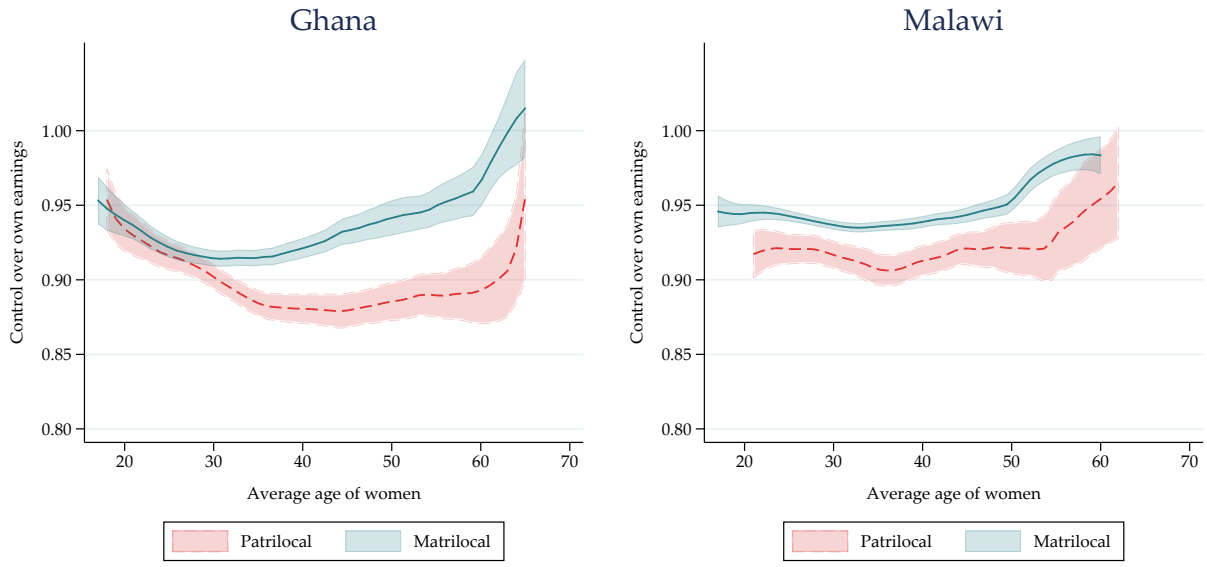
[22]Note that the situation of older women may be more contrasted than the simple characterization suggested here, since many widows may find themselves isolated at older age or have a restricted access to their late husband's resources depending on the inheritance rule Oppong (2006).

Figure 2: Heterogeneity of Women's Resource Shares by Age



Figures represent predicted mean women's resource shares across age of women for patrilocal and matrilocal 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 1 for description of matching methods).

Figure 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'sage, patrilocality, interacted age and patrilocality, demographics).

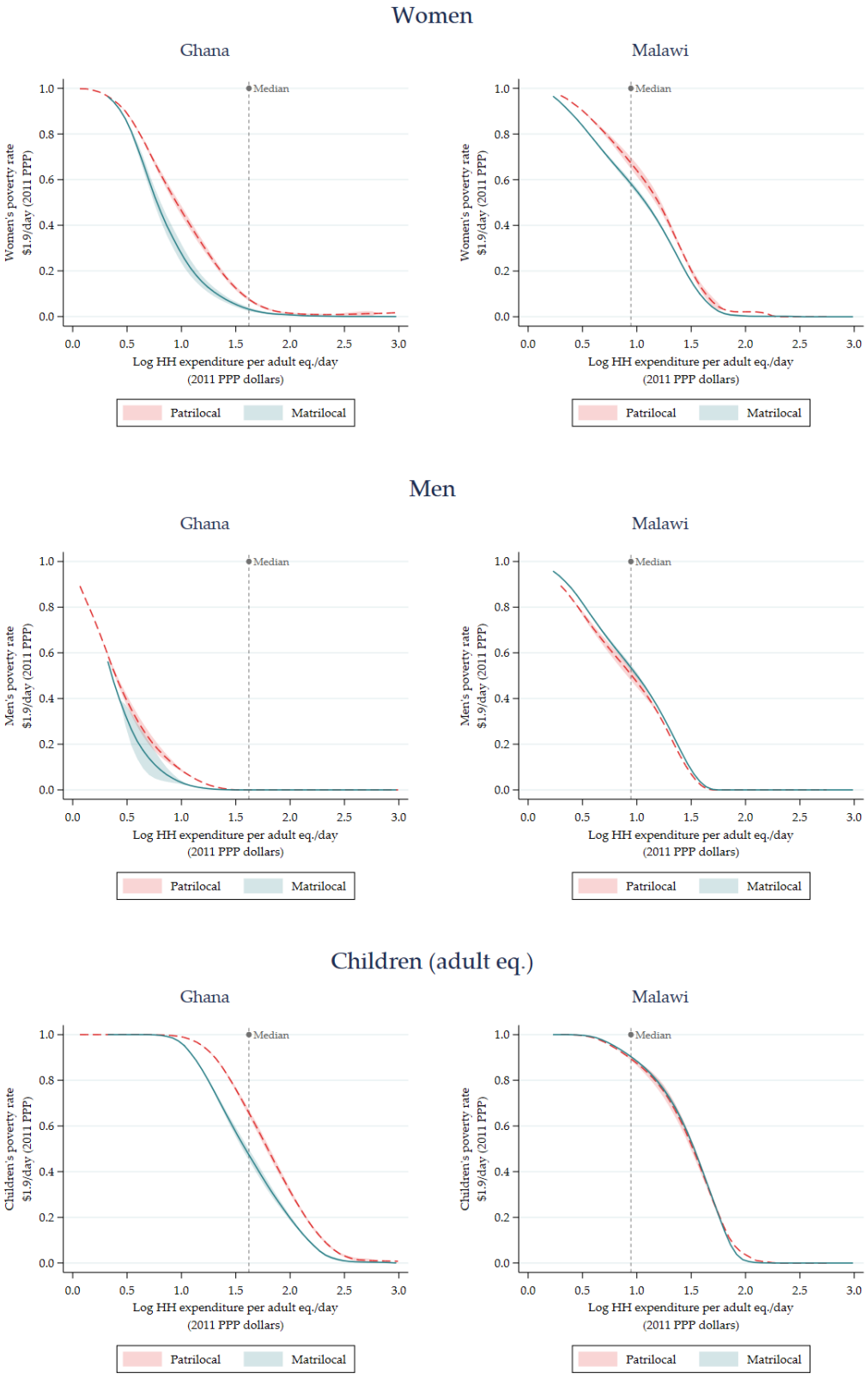
based on per-adult equivalent consumption is slightly smaller than the per-capita measure because the number of children in the deflator is replaced by smaller weights accounting for lower needs compared to adults (we use the gender/age-specific scale of FAO-WHO-UNICEF).

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 et al. (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.[23]

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 consistently with the gender resource bias previously estimated, it is also partly due to lower living standards among households of patrilocal ancestry. To extract the pure bargaining effect of patrilocality, Figure 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 found for men in Figure 4. In Ghana, child poverty is larger among households of patrilocal tradition, as expected

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

Figure 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 1 for description of matching methods). The median log expenditure is indicated by the vertical dashed line.

given resource share estimates. Finally, as can be seen in Figure A1, results are qualitatively similar when using the poverty line at 3.2 PPP$ per capita/day.

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 paper provide policy-relevant insights on the implications of cultural norms for individual poverty and intra-household inequality. Ancestral practices can 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.

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Appendix

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).

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.[24] 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.

[24]Following the previous literature, we link the *Ancestral Characteristics Database* shapefile to the grid-cell level population estimates from Landscan, 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/

Additional Results

Table A1: Summary Statistics: Differentiating Household Types

	Ghana		Malawi	
Households with:	*children, women and men*	*women and men*	*children, women and men*	*women and men*
Household characteristics				
Number of children	2.6	-	2.7	-
	(1.65)	-	(1.42)	-
Number of women	1.8	1.6	1.2	1.3
	(1.07)	(0.87)	(0.54)	(0.59)
Number of men	1.7	1.6	1.3	1.4
	(1.05)	(0.98)	(0.59)	(0.71)
Average age of kids	6.6	-	7.4	-
	(3.08)	-	(3.87)	-
Average age of women	35.2	43.9	34.1	45.5
	(10.89)	(16.78)	(11.76)	(19.41)
Average age of men	34.9	40.7	36.1	43.0
	(12.21)	(18.39)	(12.39)	(20.17)
Proportion of boys	0.51		0.49	
	(0.368)		(0.360)	
Urban	0.33	0.46	0.19	0.21
	(0.471)	(0.499)	(0.391)	(0.409)
Annual HH expenditure (2011 PPP$)	7,003	6,426	2,152	1,991
	(5197)	(4811)	(2699)	(3498)
Household budget share for clothing				
Children	0.028	-	0.018	-
	(0.024)	-	(0.028)	-
Women	0.023	0.026	0.012	0.015
	(0.021)	(0.025)	(0.021)	(0.027)
Men	0.028	0.033	0.006	0.008
	(0.029)	(0.033)	(0.014)	(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 A2: Summary Statistics: Differentiating across Ancestral Residency Norms

	Ghana			Malawi		
	Matrilocal	Patrilocal	Diff.	Matrilocal	Patrilocal	Diff.
Household characteristics						
Number of children	2.4	2.7	0.31	2.7	2.6	-0.03
	(0.03)	(0.03)	(0.04)	(0.02)	(0.04)	(0.04)
Number of women	1.7	1.8	0.15	1.2	1.3	0.04
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)
Number of men	1.6	1.7	0.13	1.3	1.3	0.02
	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)
Average age of kids	6.7	6.6	-0.09	7.4	7.7	0.30
	(0.07)	(0.05)	(0.09)	(0.05)	(0.11)	(0.12)
Average age of women	34.3	35.6	1.28	34.0	34.6	0.64
	(0.23)	(0.17)	(0.28)	(0.15)	(0.34)	(0.37)
Average age of men	34.5	35.1	0.64	36.0	36.8	0.81
	(0.27)	(0.19)	(0.33)	(0.16)	(0.35)	(0.39)
Proportion of boys	0.50	0.51	0.01	0.49	0.48	-0.01
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Urban	0.48	0.26	-0.21	0.19	0.20	0.02
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Annual HH expenditure (2011 PPP$)	8,376	6,342	-2,035	2,148	2,171	22
	(6216)	(4706)	(7797)	(2694)	(2722)	(3830)
Household budget share for clothing						
Children	0.032	0.026	-0.006	0.018	0.020	0.002
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Women	0.025	0.022	-0.003	0.012	0.013	0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)
Men	0.029	0.028	-0.001	0.006	0.007	0.001
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Percentage of zeros in clothing budget share						
Children	0.051	0.071	0.020	0.469	0.442	-0.028
	(0.005)	(0.004)	(0.006)	(0.006)	(0.014)	(0.015)
Women	0.049	0.064	0.015	0.547	0.558	0.011
	(0.005)	(0.004)	(0.006)	(0.006)	(0.014)	(0.015)
Men	0.128	0.119	-0.009	0.759	0.756	-0.003
	(0.007)	(0.005)	(0.009)	(0.005)	(0.012)	(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 matrilocal and patrilocal 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 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	0.132	0.150	0.324	0.333	0.309
	(0.054)	(0.050)	(0.055)	(0.082)	(0.083)	(0.080)
Women	0.349	0.347	0.400	0.322	0.307	0.326
	(0.095)	(0.096)	(0.089)	(0.056)	(0.056)	(0.056)
Men	0.506	0.522	0.450	0.354	0.360	0.365
	(0.124)	(0.124)	(0.113)	(0.086)	(0.088)	(0.085)
Per child	0.068	0.062	0.071	0.149	0.153	0.142
	(0.029)	(0.028)	(0.031)	(0.062)	(0.063)	(0.060)
Per woman	0.244	0.243	0.278	0.287	0.274	0.290
	(0.111)	(0.111)	(0.114)	(0.073)	(0.074)	(0.073)
Per man	0.354	0.366	0.317	0.299	0.304	0.309
	(0.101)	(0.105)	(0.096)	(0.061)	(0.063)	(0.060)
(b) Marginal effect of patrilocality on per person resource shares						
Women's resource shares	-0.026 ***	-0.034 ***	-0.021 ***	-0.032 ***	-0.033 ***	-0.031 ***
	(0.004)	(0.004)	(0.003)	(0.007)	(0.010)	(0.007)
Children's resource shares	-0.015 ***	-0.016 ***	-0.014 ***	0.004	0.015 ***	0.004
	(0.003)	(0.003)	(0.002)	(0.004)	(0.005)	(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 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. *, **, *** indicate 10%, 5% and 1% significance level.

Table A4: 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	0.046	0.191	0.703	0.702	0.710
	(0.329)	(0.210)	(0.393)	(0.457)	(0.457)	(0.454)
Per adult eq.	0.095	0.032	0.151	0.627	0.627	0.633
	(0.293)	(0.175)	(0.358)	(0.483)	(0.484)	(0.482)
(b) World Bank poverty rate (%)	0.127			0.692		
(c) Individual poverty rates (%)						
Children (per child)	0.587	0.448	0.699	0.906	0.907	0.902
	(0.492)	(0.497)	(0.459)	(0.291)	(0.291)	(0.297)
Children (per adult eq.)	0.437	0.287	0.557	0.820	0.821	0.814
	(0.496)	(0.453)	(0.497)	(0.384)	(0.384)	(0.389)
Women	0.104	0.040	0.163	0.508	0.500	0.566
	(0.306)	(0.197)	(0.370)	(0.500)	(0.500)	(0.496)
Men	0.029	0.007	0.049	0.448	0.450	0.432
	(0.169)	(0.085)	(0.216)	(0.497)	(0.498)	(0.495)
(d) Misclassification (fraction of poor individuals in non-poor households)						
Children (per child)	0.794	0.891	0.668	0.248	0.269	0.273
	(0.404)	(0.312)	(0.471)	(0.432)	(0.444)	(0.445)
Children (per adult eq.)	0.723	0.826	0.600	0.168	0.164	0.158
	(0.447)	(0.379)	(0.490)	(0.374)	(0.370)	(0.364)
Women	0.305	0.361	0.188	0.068	0.039	0.082
	(0.461)	(0.482)	(0.391)	(0.252)	(0.193)	(0.274)
Men	0.000	0.000	0.000	0.001	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.031)	(0.038)	(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.

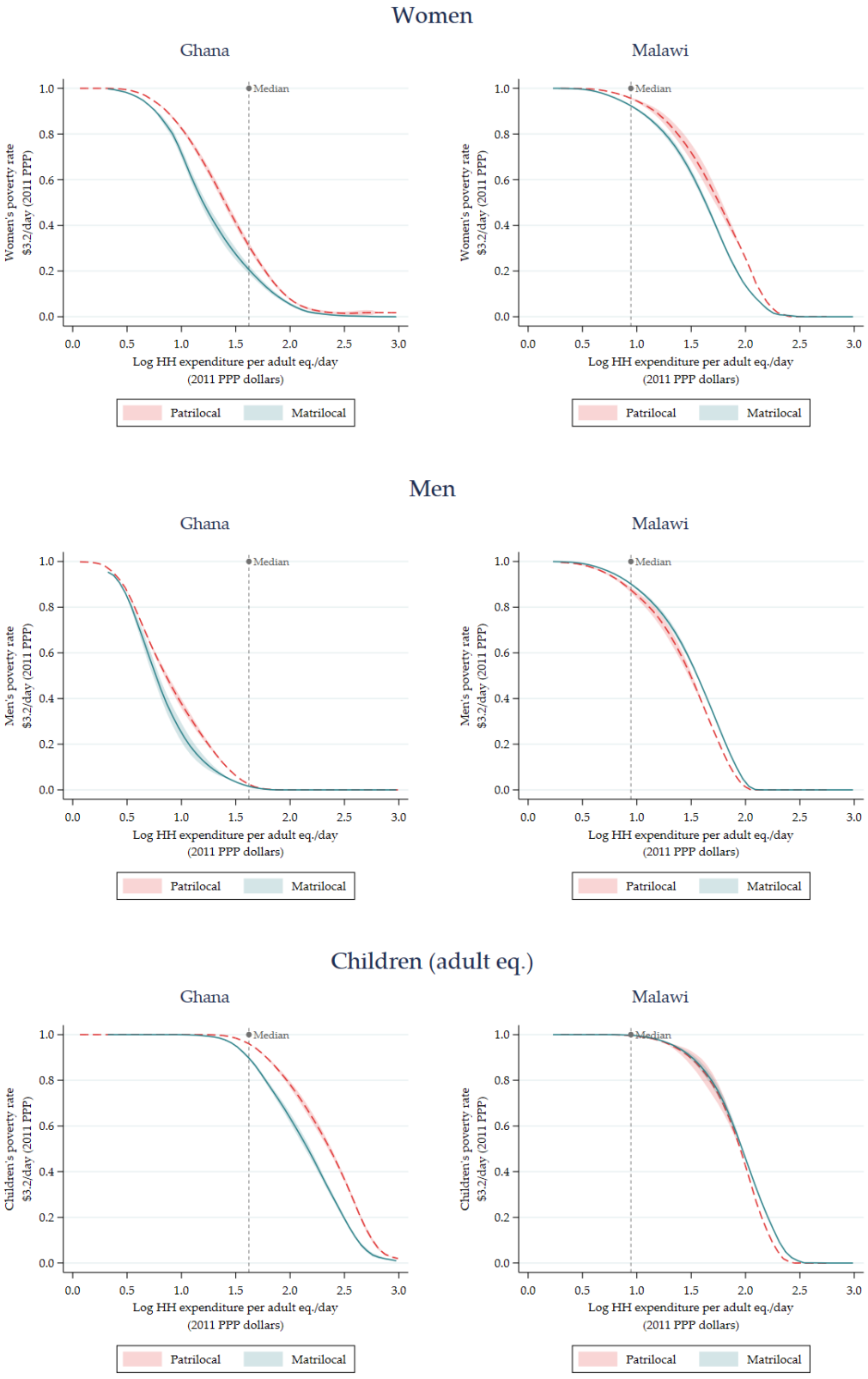
Panel (b) reports the official statistics from the World Bank (iresearch.worldbank.org/PovcalNet/).

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 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 1 for description of matching methods). The median log expenditure is indicated by the vertical dashed line.