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Female Headship and Poverty in the Arab Region: Analysis of Trends and Dynamics Based on a New Typology

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ABSTRACT

Female Headship and Poverty in the Arab Region: Analysis of Trends and Dynamics Based on a New Typology*

Various challenges are thought to render female-headed households (FHHs) vulnerable to poverty in the Arab region. Yet, previous studies have mixed results and despite the availability of cross-sectional data, the absence of household panel survey data hinders analysis of poverty dynamics. We address these challenges by proposing a novel typology of FHHs and analyze synthetic panels that we constructed from 20 rounds of repeated cross-sectional surveys spanning the past two decades from Egypt, Iraq, Jordan, Mauritania, Palestine, and Tunisia. We find that the definition of FHHs matters for measuring poverty levels and dynamics. Most types of FHHs are less poor, but FHHs with a major share of female adults are generally poorer. FHHs are more likely to escape poverty than households on average, but FHHs without children are most likely to do so. While more children are generally associated with more poverty for FHHs, there is heterogeneity across countries in addition to heterogeneity across FHH measures. Our findings provide useful inputs for social protection and employment programs aiming at reducing gender inequalities and poverty in the Arab region.

JEL Classification: I3, J16, N35, O1

Keywords: poverty, feminization, female-headedness typology, synthetic panels, Arab region, household surveys

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1. Introduction

Is poverty in the Arab region becoming feminized? Social and cultural barriers have often hindered women's economic participation in the region and several recent studies have found that women are at an increasing disadvantage compared to men in the labor market (Amara and Jemmali, 2018; AlAzzawi and Hlasny, 2022). The ongoing COVID-19 pandemic has further deepened gender inequality in many countries (Dang and Nguyen, 2021; Alon *et al.*, 2022). Yet, few studies have investigated the trends and manifestations of feminization of poverty in the region. These are important policy questions since many countries specifically target female-headed households (FHHs), based on the premise that they are more vulnerable to poverty and hence such targeting would have a strong impact on poverty alleviation. Furthermore, the Arab region is home to countries of different income levels with diverse social and cultural circumstances, resulting in different factors contributing to poverty feminization among different countries.

That poverty is more prevalent among women than men is widely assumed, and various explanations have been offered for it. These include lower rates of school enrolment and less work experience (Grant and Behrman, 2010), limited access to income-generating assets such as land (Deere and Leon, 2003), credit and other financial services (Demirguc-Kunt *et al.*, 2013), physical and social capital, and technology (World Bank, 2011; Klasen *et al.*, 2015), and market discrimination (Buvinic and Gupta, 1997).

There is, however, far less agreement on the existence of "feminization of poverty" (Chant, 2010; Duflo, 2012; Klasen *et al.*, 2015; Bradshaw *et al.*, 2017). Buvinic and Gupta (1997) observe that out of 65 studies covering Africa, Asia, Latin America and the Caribbean, 38 studies find that FHHs were overrepresented among the poor, 15 others found that poverty was associated with

certain types of FHHs or for different poverty indicators, and the remaining eight studies show no such relationship. While Quisumbing *et al.* (2001) and Medeiros and Costa (2008) find FHHs to be consistently poorer in only 10 developing countries in Africa, Asia and Latin America, Chant (2003) fails to obtain a similar finding in studies for the three continents. More recently, Milazzo and van de Walle (2017) even find that despite a growing population share of FHHs in Africa, FHHs have seen faster poverty reduction than male-headed households (MHHs). Furthermore, one particular challenge in understanding the current literature on poverty feminization is variations in how FHHs are defined (see Appendix A, Table A.1; we return to this discussion in Section 2.1).

Several authors investigated the gender dimension of poverty in the Arab region before the onset of the Arab Spring uprisings in 2011 (Nassar, 1997; Datt *et al.*, 2001; El-Laithy, 2001). More recent post Arab-Spring studies have examined poverty dynamics for the whole population and different population groups (e.g., Dang and Ianchovichina, 2018). Yet, these studies do not investigate the gender prism; only a handful of studies have explicitly considered the issue of feminization of poverty but specifically on a single-country basis only (AlAzzawi, 2018; Amara and Jemmali, 2018; AbdelLatif *et al.*, 2019). Furthermore, these few studies stopped short of examining poverty dynamics due to the lack of panel data.¹ These knowledge gaps prevent efficient and cost-effective policy interventions, since policies that address chronic poverty could be quite different from those that tackle transient poverty.²

¹ Notably, there are also mixed results regarding static poverty across countries. For example, comparison between MHHs and FHHs by self-reported headship has revealed that for Egypt, FHHs are less likely to be poor (AlAzzawi, 2018; AbdelLatif *et al.*, 2019) while the opposite result holds for Tunisia (Amara and Jemmali, 2018).

² For example, while social safety-net programs better address transient poverty (e.g., as they help prevent the non-poor but vulnerable households from falling into poverty), longer-term investments in human capital and infrastructure can tackle chronic poverty. See, e.g., Barret (2005) and Ravallion (2016) for further discussion on different policy interventions regarding chronic poverty versus transitory poverty.

Our study makes several new contributions to the literature. First, we propose and evaluate a novel typology of FHHs in order to shed light on poverty feminization among specific types of households. This typology consists of four main types and several sub-types of FHHs, which are based on different self-reported responses, demographic, and socio-economic characteristics. Our proposed typology calls for more attention to the important role of children in defining FHHs, since FHHs with children could show remarkably different, static and dynamic, poverty outcomes from those of FHHs without any children or those of non-FHHs. Second, we show the trends in the poverty–gender nexus, and the extent of chronic versus transitory poverty, for six countries across the Arab region—namely Egypt, Iraq, Jordan, Mauritania, Palestine and Tunisia—for which precious little knowledge exists in relation to poverty feminization. Third, despite the absence of actual panel data, we construct synthetic panels that allow us to examine poverty dynamics for these countries. By conducting analyses on both poverty incidence and dynamics, we contribute to a better understanding of the dynamic economic well-being of FHHs over time. In fact, to our knowledge, we offer the first multi-country study that investigates whether feminization of poverty exists across the Arab region, and whether FHHs, according to a variety of household types, are more likely to enter or escape poverty over time, using recent survey data. Incidentally, we also make a new data contribution by carefully assembling and harmonizing relevant, up-to-date surveys from multiple sources in a region that is well recognized for limited data access.

We find that the shares of FHHs widely vary, ranging from 10 percent to more than 40 percent depending on the countries and definitions. Also depending on the analytical model, compared with non-FHHs, most types of FHHs (including self-reported, potential, and most-educated-female-adult FHHs) are 1 percent to 4 percent less likely to be poor while FHHs with a majority

share of female adults are 3 percent to 5 percent more likely to be poor. However, majority-female-adult FHHs are 3 percent to 5 percent to 3 percent more likely to be poor than non-FHHs.

We also find considerable mobility in and out of poverty over the past decade, with the average poor household having between 21 and 54 percent chance of escaping poverty, depending on the country. Yet, country heterogeneity exists, with Iraq, Jordan, and Mauritania having upward mobility rates of between 41 and 54 percent, and Egypt, Palestine and Tunisia having upward mobility rates between 21 and 31 percent. More children are generally associated with more poverty and lower chances of escaping poverty. The upward mobility rates out of poverty for FHHs without children, FHHs with children, and non-FHHs across all countries are respectively 42 percent, 37 percent, and 36 percent. The corresponding figures for downward movement into poverty for these FHH types are respectively 14 percent, 17 percent, and 19 percent.

The rest of the paper is organized as follows. Section 2 discusses the various definitions of households identified as female-headed or female-maintained in the existing literature before proposing our new typology of female-headed households (Section 2.1) and introduces our analytical approach to constructing the synthetic panels that allows us to assess poverty feminization dynamically in the absence of actual panel data (Section 2.2). Section 3 reviews the available data (Section 3.1), welfare aggregates and standardization measures (Section 3.2), and presents descriptive statistics (Section 3.3). Section 4 reports the main results for cross-sectional poverty (Section 4.1) and poverty dynamics (Section 4.2), and Section 5 concludes with key findings and policy implications. Appendixes A and B present additional estimation results and descriptive statistics, Appendix C discusses the synthetic panel method, and Appendix D provides further analyses with equivalence scales.

2. Analytical Framework

2.1. Typology of female-headed households

Households vary in their composition, and socioeconomic characteristics. Many are what may be considered the “typical household”: a married couple with one- or two-income earners, with or without children. Single-head households vary broadly: from a widowed retiree who may have already worked for many years and is now living with older children who might be supporting them, to a middle-aged mother who got divorced or lost her husband and is struggling to meet ends by joining the labor market for the first time. Among this group, the presence of another adult male, whether an earner or not, is yet another confounding factor, as well as the presence of children. Such distinctions are accompanied by different challenges and opportunities, highlighting the need for research that distinguishes the different household types in any analysis of the nexus between gender and poverty.

The heterogeneous nature of FHHs and the need to study different types of FHHs separately have been discussed extensively in the literature on poverty feminization (e.g. Kabeer, 1997; Quisumbing, *et al.*, 2001; Klasen *et al.*, 2015; Beegle *et al.*, 2016; Munoz Boudet *et al.*, 2018). The variety of household-headship designations in existing studies has led to mixed results regarding poverty feminization and propensities for falling or remaining trapped in poverty or moving out of it. Our (inexhaustive) review of some selected studies in the literature in the past two decades suggest that while FHHs are not observed to be poorer than non-FHHs in many cases, FHHs can be poorer or have lower consumption levels depending on the specific type as well as country context (Appendix A, Table A.1). Advancing an FHH typology can thus be critical for clearing the apparent inconsistencies and for re-classifying households with what may be considered “*de facto* female heads” based on demographic or socioeconomic characteristics, as

opposed to self-reported “*de jure* female heads”. This also has important implications for poverty reduction efforts targeted at vulnerable population groups.

Figure 1 presents our proposed typology of FHHs, which consists of several layers. For the first layer, existing studies can be broadly grouped under two categories: “*de jure* FHH” and “*de facto* FHH” (second row). For the second layer, we consider three approaches under these two groups: the self-reported approach (under “*de jure* FHH”) and the demographic approach and the socioeconomic approach (under “*de facto* FHH”) (third row). For the third layer, we consider four main types of FHHs under these three approaches, which include i) Type 1: self-reported FHHs, ii) Type 2: FHHs defined using the majority share of females in the household (i.e., majority-female-adult FHHs), iii) Type 3: potential FHHs, and iv) Type 4: FHHs defined as those where the most-educated member is female and no working-age employed male is present (i.e., most-educated-female-adult FHHs) (fourth row). Furthermore, under these four main types, we also consider five alternative sub-types, which include *de jure* and married FHHs (under self-reported FHHs), FHHs defined using the majority share of employed females in the household (under majority-female-adult FHHs), and asset and core FHHs (under potential FHHs) (fifth row).³ Finally, all these types of FHHs should be considered separately with or without any children (last row), since the presence of children plays a crucial role in FHHs’ poverty as discussed below.

The typology is motivated by both our review of the literature and our empirical analysis for each type of FHHs in the Arab region. Figure 1 briefly refers to some illustrative studies that employ these approaches and we elaborate below on this new typology.

“De jure” FHHs: self-reported approach

³ While we propose these three approaches and types for classification purposes, they are not mutually exclusive and existing studies have combined one or more in defining female headship.

A natural departure point to analyzing FHHs is to adopt the self-reported identification of the head by the survey respondent (our first type, self-reported FHHs), which commonly falls under the *de jure* FHHs group. Marital status is a key characteristic in this respect. A large share of FHHs are formed as the result of a major marital shock such as divorce or widowhood. If, prior to the shock, the husband was the primary bread-winner (i.e., the means through which livelihood opportunities and assets were acquired), the newly formed FHH may be more likely to fall into poverty (Brown and van de Walle, 2021). FHHs that are formed through widowhood, especially at a young age with children present, can exhibit both more poverty and higher persistence of poverty (Appleton, 1996; Dreze and Srinivasan, 1997; Horrell and Krishnan, 2007; van de Walle, 2013; Munoz Boudet *et al.*, 2018; Brown and van de Walle, 2021) than FHHs formed largely “by choice”, through divorce or migration of the male spouse (Quisumbing, *et al.*, 2001; Klasen *et al.*, 2015; Beegle *et al.*, 2016; Bradshaw *et al.*, 2017).

Females who never marry or who seek divorce might have chosen this status because they have strong prospects for supporting their newly-formed households on their own, such as higher personal income, social status or a family-support system that allows them to enjoy a comparable living standard while single. Ignoring such considerations could mask differences between self-reported FHHs that are financially secure and those that are economically vulnerable (Kabeer, 1997; van de Walle, 2013; Milazzo and van de Walle, 2017). Consequently, it may also be useful to consider alternative types of households based on their marital status—never married, divorced or separated, widowed, and married.

Yet, in our samples, most self-reported MHHs are married, and this group is the largest in the sample. By contrast, from 69 to 77 percent of self-reported FHHs in all countries are widowed, except for Mauritania and Palestine, where widowed households represent 35 and 53 percent,

respectively, of self-reported FHHs when considering all years together (Appendix B, Tables B.1-B.7). The second largest group of self-reported FHHs have a married head, but this share typically remains about 20 percent or below in all countries and years, except for Mauritania where it rose rapidly to almost 40 percent after 2008.⁴

“De facto” FHHs: demographic and socioeconomic approaches

The term “head” is a loaded term carrying strong connotations about decision-making power within households that has traditionally been given to the oldest male member (whether or not he is the main breadwinner). This is certainly an issue in the Arab region, where the traditional patriarchal system may preclude the designation of the female as “head” in the presence of a disabled adult male or a son (regardless of age), even if the woman is the main income earner.

A *de facto* FHH can thus be defined as one where the male head is temporarily or regularly absent, or (if co-resident) is not the main breadwinner (Buvinic and Youssef, 1978; Buvinic *et al.*, 1983; Klasen *et al.*, 2015). *De facto* headship thus accounts for the demographic composition of the household, as well as the socioeconomic circumstances determining the respective members’ relative contribution to household resources (Rosenhouse, 1989; Handa, 1994, 1996; Rogers, 1995; Varley, 1996; Buvinic and Gupta, 1997; Fuwa, 2000; Posel, 2001; Budlender, 2008; Grown and Valodia, 2010; Chant, 2010; Rogan, 2013; Klasen, 2015).

⁴ One complication in classifying married self-reported FHHs arises in the case of households where one spouse works overseas and sends home remittances to support the family, which is quite common in the region. If the overseas spouse is the male, the stay-behind spouse might designate herself as the household head in the absence of the husband, or she might not. This can underestimate poverty among “true” FHHs, where the female head does not rely on others for support, since some of the female self-declared heads or main income-earners are in fact temporary designees while the main income-contributing spouses are overseas. In the surveys for all years, remittances are major sources of income for self-reported FHHs, consisting for example of 68% of the consumption per capita in Egypt, and 37% of the consumption per capita in Jordan (Appendix B, Tables B.1 and B.4, all years columns). However, the surveys lump together remittances from domestic and overseas sources, and do not identify the relations between the remitters and the households. This complicates matters as such remittances might be alimony or in-kind support. Unfortunately, the data do not allow any further breakdown of this income-source category, or information from which one could infer the amount of remittances from abroad.

A *de facto* FHH may be more vulnerable to poverty for several reasons. In many societies the absence of male connections to local economic and social institutions can be debilitating. *De facto* FHHs residing with the female heads' fathers or older sons may still be better off than MHHs who do not have support of working-age males (Rogan, 2013; Brown and van de Walle, 2021). These FHHs also face differences in their access to productive assets such as livestock and lower access to extension services. Agricultural production may become especially harder simply as a result of having a smaller number of working-age household members to work on the farm (Rogan, 2013; Brown and van de Walle, 2021). Moreover, women in Arab labor markets have far fewer job opportunities compared to men. In recent years, their labor-force participation rates are among the lowest in the world; their unemployment rates are also four times that of the world average (UNDP, 2022). When they do work, they tend to face wage and occupational discrimination (Elhamidi and Said, 2008) or are overrepresented in the informal sector with low pay and no social insurance. Several studies have found that residing in a majority female household, or in one where the majority of earners are female affects the propensity of being poor (Rogan, 2013; Munoz Boudet *et al.*, 2018).

Ideally, an objective criterion would be used to assign headship to the family member whose income or decision-making contributes most to maintaining the family. For instance, Gammage (1998) found that using the *maintenance* criteria to define FHHs in El Salvador and Costa Rica gave rise to a markedly higher percentage of such female-maintained households (FMHs) compared to the *de jure* FHH group, as well as higher incidence of poverty among them.

Unfortunately, household surveys in the Arab region do not provide information about individual income or total earnings, only aggregates for the household.⁵

In the absence of such information, we operationalize several alternative definitions of *de facto* FHHs based on demographic and socioeconomic criteria as suggested by the existing literature (Table A.1 in Appendix A), enabling a more multifaceted understanding of FHHs. Regarding household composition, we consider households where the *proportion of females among (working age) adults exceeds 0.5* (second type, majority-female-adult FHHs). We define another type of FHHs without adult male earners: *potential FHHs* are those households where there are no working-age males present (third type, potential FHHs). The final type of FHHs combines the demographic and socioeconomic criteria and consists of *households with no employed males, whose most educated adult member is female* (fourth type, most-educated-female-adult FHHs).

Notably, these main types of FHHs can also include subcategories. For example, under the second-type majority-female-adult FHHs, we can consider those where the *proportion of employed females exceeds that of employed males (majority-employed-female-adult FHHs)*. Similarly, under the third-type potential FHH, we can consider a subcategory called *core FHH* that encompasses only the potential FHHs with employed females, and another subcategory called *asset FHH* encompassing only households with females who have ownership rights over the dwellings they reside in.

Key confounding factors: presence of children

⁵ Some surveys include self-assessments by respondents of which household member contributes most to household income, however, these can be subject to reporting bias. For example, in the Mauritanian 2008 survey, 90% of surveyed households reported that the household head contributed most, while their offspring (spouse, father/mother, other parent, unrelated household member) contributed most in 6.2% (2.5%, 0.1%, 1.1%, 0.1%, respectively) of households. Among MHHs, 3.8% self-reported being supported by female household members. This means that a number of self-declared MHHs in the sample may really be female-maintained households, or *de facto* FHHs that our data fails to capture.

To account for additional household circumstances interacting with household poverty status, we should also distinguish FHHs *with and without children* for different reasons. Access to childcare affects women's labor force participation in many countries around the world, rich and poor alike (Akgunduz and Plantega, 2018; Clark *et al.*, 2019). In European countries, childless women (with or without a partner) and single mothers are found to have higher personal earnings than women whose family trajectories combined parenthood and partnership (Muller *et al.*, 2020). In Egypt, childcare similarly presents a considerable barrier to women's employment (Caria *et al.*, 2022). Yet, only a handful of previous studies have examined how poverty differs with and without children, but mostly for self-reported FHHs (Medeiros and Costa, 2008; Liu *et al.*, 2017; AlAzzawi, 2018). The exception is Munoz Boudet *et al.* (2018), who look at household gender composition with and without children. Importantly, the common finding in these few studies is that FHHs with children are generally poorer than FHHs without children.

Furthermore, a related economics literature on equivalence scales suggests that scale adjustments (for different numbers of adults and children) could have substantial effects on poverty and profiles of the poor for various countries at different income levels (Lanjouw and Ravallion, 1995; Newhouse *et al.*, 2017; Abanokova *et al.*, 2022). This is especially for FHHs; for example, FHHs tend to have smaller households, but higher dependency ratios (World Bank, 2011; Klasen *et al.*, 2015).

In our sample (Appendix B, Table B.7), across all years and countries, the average size of FHHs is 5.7, while that of MHHs is 7.4. The average age of female heads is much higher than that of male heads (average age 56 for FHHs vs. 48 for MHHs). Female heads are also mostly widowed (70.7%, compared to 1.3% for male heads), and their offspring are typically already grown, independent adults who might be contributing to household expenses from their own earnings. The

current welfare of these female heads is likely to be a function of their lifetime earnings, or more likely those of their deceased or living spouses, and thus are not strictly comparable to (male or female) heads with children who rely on current labor market earnings to support themselves and their families. This distinction is especially pertinent to the dynamic analysis. If the full sample of female or male heads was treated as a single group this would unduly bias the results in favor of the elderly, widowed female heads without children, and against the much younger working male heads with children. Consequently, it is important to examine poverty incidence and dynamics among FHHs with or without children.

In summary, our new typology consists of four main types of FHHs and their associated five sub-types (variants). We investigate poverty trends and dynamics of these four types of FHHs for households with and without children, further differentiating between those with different number of children.

2.2. Empirical framework

We provide both static and dynamic analyses of the feminization of (headcount) poverty in the Arab region. For static analysis, we examine the differences in poverty between different types of FHHs and non-FHHs. Furthermore, we estimate the following linear probability model

$$p_{ijch} = \gamma_h FHH_{ijch} + \theta_h FHH_{ijch} * Children_{ijch} + \beta'_h Z_{ijch} + \mu_c + \tau_j + \varepsilon_{ijch} \quad (1)$$

where p_{ijhl} is a binary variable representing the poverty status (i.e., equals 1 if poor and 0 otherwise) for household i , $i = 1, \dots, n$ in survey round j , $j = 1$ or 2 , country c , $c = 1, \dots, 6$, for FHH type h (FHH_{ijch}) under consideration. $Children_{ijch}$ is the number of young children age 0-14 in the household (who are generally not old enough to enter the labor force). Z_{ijch} is a vector of control variables, including household employment and demographic characteristics as well as

residence area (i.e., urban/ rural residence). μ_c and τ_j are respectively the country and survey round (year) fixed effects that control for unobserved macro factors that can affect the whole country in specific years, and ε_{ijch} is the error term.

In Equation (1), γ_h and θ_h are the coefficients of interest. Compared to non-FHHs, γ_h presents the association between poverty and different types of FHHs without any children, $\gamma_h + \theta_h$ presents this association for FHHs with exactly one child, and so on. For easier interpretation, we can also fix the number of children at the mean ($\overline{Children}_{ijch}$) and consider the association between poverty and different types of FHHs with the average number of children as $\gamma_h + \theta_h \overline{Children}_{ijch}$.

It is useful to estimate and compare two different versions of Equation (1), one without the control variables Z_{ijch} and one with these control variables. If the estimate for γ_h considerably changes (or weakens) where the control variables are added, this indicates that the specified FHH type's exposure to poverty is sensitive to these control variables. Put differently, this presents a test of the capacity of the specified FHH type to capture a relationship with poverty that is not explained by those of the control variable (i.e., how good the definition of the specified FHH type is). The findings based on our review of the literature suggest that FHHs' exposure to poverty (γ_h and to some extent θ_h) are likely sensitive to household composition and employment characteristics.

For the dynamic analysis, let y_{ijch} represent type h FHH's household consumption (or income) per capita, and z_{jch} be the poverty line in period j for country c . We are interested in knowing the unconditional measures of upward poverty mobility such as

$$P(y_{i1ch} < z_{1c} \text{ and } y_{i2cl} > z_{2c}) \quad (2)$$

which represents the percentage of type c FHHs that are poor in the first survey round (year) but nonpoor in the second survey round, or the conditional upward mobility measures such as

$$P(y_{i2ch} > z_{2c} | y_{i1ch} < z_{1c}) \quad (3)$$

which represents the percentage of poor households in the first round that escape poverty in the second round. If true panel data were available, we could straightforwardly estimate the quantities in (2) and (3); but in the absence of such data, we can use synthetic panels to study mobility. We employ recent advances with synthetic panel data methods (Dang and Lanjouw, 2023) to construct synthetic panel data and provide more insights into the dynamics of poverty for FHHs over time.⁶ Different from traditional pseudo-panel methods that require multiple rounds of cross-sectional surveys to study poverty mobility at the cohort level, the method that we apply works with as few as two survey rounds and provide poverty estimates at the household level. This method essentially exploits the time-invariant variables across the cross-sectional surveys to link different cohorts, in combination with additional cohort-based assumptions about the error terms, to construct the synthetic panels. Further discussion of this method and detailed estimates are provided in Appendix C.

3. Data and descriptive statistics

3.1. Data

We analyze 20 survey rounds from six countries: Egypt, Iraq, Jordan, Mauritania, Palestine and Tunisia. For Egypt, we use the Household Income, Expenditure and Consumption Surveys (HIECs) for 2012-2013, 2015, 2017-2018, and 2019-2020; for Iraq, the Household Socio-

⁶ Recent validations and applications of the synthetic panel methods by various researchers for different country contexts in Africa, Latin America, the Middle East, and Europe have been encouraging in terms of accurate projections of economic status (Ferreira *et al.*, 2012; Beegle *et al.*, 2016; UNDP, 2016; OECD, 2018; Salvuci and Tarp, 2021; Ghomi, 2022).

Economic Survey (IHSESs) for 2007 and 2012; for Jordan the Household Expenditure and Income Surveys (HIESs) for 2010-2011 and 2013-2014; for Mauritania, the Permanent Survey of Living Conditions of Households (EPCVs) for 2004, 2008, 2014, and 2019; for Palestine, the Expenditure and Consumption Survey (PECSs) for 2007, 2009, 2011, and 2016-2017; and for Tunisia, the National Survey on Household Budget, Consumption and Standard of Living (NSHBCs) for 2005, 2010, 2015, and 2021. These surveys provide rich information on household expenditures, as well as various household and individual characteristics for the different household types.

Several of these surveys were harmonized by the Economic Research Forum (Egypt's 2012-2013, 2015, 2017-2018 HIECSs; Iraq's 2007 and 2012 IHSESs; Jordan's 2010-2011, and 2013-2014 HIESs; Palestine's 2009 and 2011 PECSs; and Tunisia's 2005 and 2010 NSHBCs. The most recent surveys for Egypt (2019-2020), Palestine (2016-2017), Tunisia (2015 and 2021), and the Mauritanian EPCVs were obtained from national statistical agencies CAPMAS, PCBS, INS and ONS, respectively. We implemented careful harmonization of these surveys with the previous survey years, and translated the variables from Arabic or French to English.

We compiled the poverty lines for the six countries from official sources and World Bank publications and present them in Tables A.2-A.7 (Appendix A). We used region-specific poverty lines within each country to account for spatial differences in patterns of consumption (expenditure) and price levels.⁷ Since our focus is on poverty analysis, we used consumption values and poverty lines in local currency units and in survey-year prices to sidestep issues with conversion (with either the PPP or market exchange rates) and adjustment for inflation. Consumption is used in household per capita terms, based on the nationally defined poverty lines.

⁷ We were able to do this for all countries in our sample except for Jordan and Mauritania. According to DOS reports, Jordan's Department of Statistics (DOS) did not publish region-specific poverty lines and, used a single poverty line for all of Jordan in 2010 and 2013. Jordan's DOS does not publish region-specific Consumer Price Indices so we were unable to take spatial price differences into consideration.

3.2. Living-standards indicator

Expenditure is widely regarded as a better indicator of permanent income when households, particularly in poorer countries, exercise consumption smoothing and use savings to augment unstable incomes due to seasonal or informal employment or unexpected shocks (Deaton, 1997; Deaton and Zaidi, 2002; Mancini and Vecchi, 2022). In this paper, we use household consumption expenditures per capita as the welfare measure underlying poverty analysis.⁸ This includes all monetary expenditures on consumer goods and non-monetary consumption, such as imputed rents, use value of durables, own production and in-kind transfers (i.e., gifts) received by households. Food consumption includes food that the household has purchased, grown and received from other sources. Non-food consumption is the sum of expenditure on all non-food items, including expenditure on fuel, clothing, schooling, health and miscellaneous items, and in-kind transfers.

It can be useful to ensure comparability of household expenditures across different contexts by accounting for potential differences in households' age and size compositions, as well as economies of scale in consumption. Studies have examined individual-level, rather than household-level, consumption to better disaggregate expenditures by gender (Dunbar *et al.*, 2013; De Vreyer and Lambert, 2021). Unfortunately, the available surveys provide data on household consumption aggregates rather than individual-level consumption, therefore this approach cannot be applied to the available data.

Another approach is to calculate the Adult Equivalent Expenditure (AEE) (or income) for each household, which gives smaller weight to children than adults and may take economies of scale in

⁸ This is also the most common approach employed in recent studies of poverty in countries in the Middle East (Marotta *et al.*, 2011; CAPMAS, 2013).

consumption into consideration. For example, Deaton and Paxson (1998) suggest using a parametric form of an equivalence scale, where a child is assumed to require a fraction α of what an adult needs, and where the elasticity of needs with respect to adjusted household size is a constant θ . This gives rise to the following formula

$$y_{ij}^* = \left(\frac{y_{ij}}{(a_{ij} + \alpha k_{ij})^\delta} \right) \quad (4)$$

where y_{ij}^* is the AEE for household i in survey j , which is an adjusted version of household expenditure conditional on the number of adults a_{ij} and children k_{ij} (we suppress the country and FHH type indexes for less cluttered notation). The smaller α is, the smaller the relative weight of children; the higher the θ , the smaller the degree of economies of scale assumed. We construct several different AEE levels for each household based on this method, using different values for the weight of children (α) and degree of economies of scale (δ) and show the results in Figure D.1, Appendix D. The relationship between household size and poverty dynamics reveals varying scenarios for FHHs, with FHHs generally having a higher likelihood of escaping poverty than non-FHHs when assessing consumption on a per capita basis.⁹

3.3. Descriptive statistics

Table 1 presents some key sample statistics on the prevalence of FHHs defined according to our proposed typology (Section 2.1) across the six Arab countries and different (survey) years. The four main types of FHHs are shown in bold while the alternative sub-types are shown in regular font. The shares of self-reported FHHs remain relatively stable over time in most countries, except for Mauritania. In recent years, this share hovers from around 10 percent (Iraq, Palestine)

⁹ These results are consistent with Abanokova *et al.*'s (2022) finding regarding the sensitivity of income dynamics to scale parameters, showing a persistent upward mobility when income is evaluated on a per capita basis for Russia.

to 13 percent (Jordan) and 18 percent (Egypt, Tunisia).¹⁰ Mauritania has the largest share of self-reported FHHs, which has almost doubled from 18.9 percent in 2004 to 36.6 percent in 2019. Majority-female-adult FHHs have a significantly higher share in all countries, with this share ranging from 21 percent (Egypt) to 44 percent (Mauritania) in the most recent years. Potential FHHs are as prevalent as those identified by self-reporting in all the countries except Iraq, where they are half as prevalent. Finally, most-educated-female-adult FHHs have relatively low prevalence rates, ranging from around 6 percent in Iraq to 25 percent in Mauritania. There is a weak to medium correlation among the four FHH types (i.e., ranging from 0.27 to 0.51; Appendix A, Table A.8), suggesting that each of the proposed FHH types captures new information about female headship.

Compared with the main four types, the alternative subtypes all provide lower to almost negligible prevalence of FHHs. For example, under the self-reported FHH type, while *de jure* FHHs account for between 8 percent and 17 percent of households for all countries and years, the corresponding figures for married FHHs are between 1 percent and 4 percent for all the countries, except for Mauritania in 2008 and later years. Under the majority-female-adults FHH type, the alternative definition of the majority share of employed females relative to that of employed males, however, yields a much smaller group of FHHs (that ranges from around one-half to two-thirds as small). This is expected given the very low female labor-force participation rates in the region, especially in such countries as Iraq and Jordan where they are among the lowest in the world.

Figure 2 illustrates the trends in poverty headcount ratios by country for the four main types of FHHs against that of the whole population for each country. This figure shows that different

¹⁰ These shares are lower than the corresponding figure of 26 percent for African households observed in Milanzo and van de Walle (2017).

types of FHHs display clear differences regarding poverty levels and trends. Specifically, while potential FHHs (purple line) show faster poverty decreases in Iraq, Jordan, Palestine, and Tunisia, most-educated-female-adult FHHs (pink line) show slightly opposite trends from those of the whole population for Iraq. This contrasts with self-reported FHHs (green line) and potential FHHs, which predominantly have less poverty than the whole population for almost all the country-year observations.¹¹

For each country, Figure 3 and Figure 4 present the FHH–non-FHH gaps in poverty rates for the four main FHH types respectively by year and by the number of children (age 0-14). Figure 3 indicates that the self-reported and potential FHH types typically have lower poverty ratios than non-FHH households across most years and countries. However, majority-female-adult FHHs tend to have higher poverty rates than the respective non-FHHs in most years and countries, except in Egypt 2017–2020. Most-educated-female-adult households have systematically more poverty than the corresponding non-FHHs in Iraq, Jordan, Palestine and Tunisia, but lower poverty rates in Egypt and Mauritania.¹² Figure 4 shows that the presence of children is associated with more poverty among FHHs for most of the countries, except for Egypt and Mauritania.

¹¹ Pooling data for all years and countries, we further show the FHH–non-FHH gaps in poverty rates for all FHH types and by the number of children in the household in Figures A.2 and A.3 (Appendix A). These figures indicate that the self-reported and potential FHH types tend to have lower poverty ratios than non-FHH households across most years and countries but the relationship between the number of children and poverty prevalence in FHHs varies across countries.

¹² Table A.9 (Appendix A) provides cross-sectional poverty rates for different household types over time in six countries. Panels B and C additionally report these poverty rates for rural and urban subgroups, and Panels D and E report the poverty rates for households with children under 14 and without children under 14. Poverty rates are typically higher in rural area than in urban areas, except for Palestine, and higher for households with younger children. Given the consistently high poverty rates among FHHs defined by the share of women among adults, we also assess the poverty rates among self-reported MHHs according to the number of female adults present in Figure A.1 (Appendix A). Poverty almost always increases with the number of females in all six countries, validating the central finding from Figure 2.

4. Estimation Results

4.1. Cross-sectional poverty

Table 2 provides the estimation results for the association between four main FHH types and poverty (γ_h in Equation (1)), without and with the household employment, demographic characteristics and residence area variables shown respectively in the first four columns and the second four columns (the full results are provided in Appendix A, Table A.10). Several interesting results stand out from this table.

First, the estimated $\hat{\gamma}_h$ is negative and strongly statistically significant for three FHH types: self-reported FHHs, potential FHHs, and most-educated-female-adult FHHs. This suggests that these three FHH types are associated with less poverty. Majority-female-adult FHHs, in contrast, are associated with more poverty. This is generally consistent with our earlier discussion for Figure 2, indicating that these types of FHHs can serve as useful definition of FHHs.

Second, the absolute magnitude of $\hat{\gamma}_h$ increases for self-reported FHHs and most-educated-female-adult FHHs but decreases for majority-female-adult FHHs and potential FHHs when the control variables are added. The t-tests for these changes are statistically significant. This suggests that, consistent with our earlier discussions of the literature (Sections 2.1 and 2.2), FHHs' exposure to poverty is also affected by the control variables (including household employment, demographic characteristics, and residence area variables). Indeed, prior research for various countries suggests that FHHs are not systematically poorer or more vulnerable (Fuwa, 2000; Klasen *et al.*, 2015; Munoz Boudet *et al.*, 2018; Brown and Van de Walle, 2021). Liu *et al.* (2017) find that in eight of 14 Latin American countries, FHHs more likely live in poorer conditions, but these gaps either disappear or reverse when they control for other household and demographic characteristics.

Table 2 shows that self-reported FHHs are about 1 percent (without control variables) to 4 percent (with control variables) less likely to be poor than non-FHHs if there are no children in the household. The corresponding changes with poverty probabilities are about 3 percent (without control variables) to 2 percent (with control variables) for potential FHHs, and 1 percent (with control variables) for most-educated-female-adult FHHs. On the other hand, majority-female-adult FHHs are 5 percent (without control variables) to 3 percent (with control variables) more likely to be poor than non-FHHs if there are no children in the household.

Finally, the estimated interaction term between FHH types and the number of children ($\hat{\theta}_l$) is positive for three of the four FHH types (self-reported FHHs, potential FHHs, and most-educated-female-adult FHHs), but negative for majority-female-adult FHHs. While the absolute magnitudes of $\hat{\theta}_h$ are small, around 1 percent (i.e., one more child is associated with 1 percent change in the probability of the household being poor), it is strongly statistically significant. Furthermore, when we fix the number of children at the mean of the estimation sample (i.e., 1.81 children), self-reported FHHs become 1 percent more likely to be poor (without control variables) and 3 percent less likely to be poor (with control variables). The corresponding probabilities, without and with control variables, become 2.5-2.8 percent more likely to be poor for most-educated-female-adult FHHs and 4-0.7 percent more likely to be poor for majority-female-adult FHHs. On the other hand, potential FHHs are 0.2 percent (without control variables) less likely to be poor and are 0.3 percent (with control variables) more likely to be poor. In addition, having more children (or larger household sizes) is associated with greater risks of poverty (Appendix A, Table A.10). This result concurs with the finding by Munoz Boudet *et al.* (2018) that adult couple households with children are the largest and overrepresented group among poor households. This provides supportive evidence for our proposed typology that we should consider children in defining FHH types.

The five remaining subtypes of FHHs are qualitatively similar, showing that most FHH types are associated with less poverty, except for majority-employed-female-adult FHHs where the opposite result holds (Appendix A, Table A.11). This table also shows the interaction terms between FHH types and the number of children, which are mostly statistically significant. The results using the alternative logit model are qualitatively similar, albeit somewhat weaker for the most-educated-female-adult FHHs (Appendix A, Tables A.12 and A.13).¹³ We further consider the overlaps of three main FHH types (self-reported, potential FHHs, and most-educated-female-adult FHHs) and all four main FHH types and show the estimation results in Appendix A, Table A.14, which remain qualitatively similar.

4.2. Poverty dynamics based on synthetic panels

We turn next to discussing the results on poverty dynamics based on synthetic panels. For each country, Figure 5 reports the probabilities of escaping poverty in the second survey year conditional on being poor in the first survey year (Equation (3)), for the four main types of FHHs, considered separately with and without any children. Figure 5 shows considerable (conditional) upward mobility (out of poverty) at the national average level (dashed line) for some countries. In particular, the upward mobility rate is 45 percent in Iraq during 2007-2012, 54 percent in Jordan during 2010-2013, and 41 percent in Mauritania during 2014-2019. Still, a significant degree of immobility exists in Egypt, Palestine and Tunisia, where most of the population remained poor in both years and only about one third (or less) of the poor escaped poverty in the last year: 29 percent

¹³ The estimated marginal effects for the interaction terms with children are qualitatively similar (using the Stata command “ginteff” (Radean, 2023)).

for Egypt during 2017–2020, 31 percent in Palestine during 2011–2017, and 21 percent in Tunisia during 2015–2021.¹⁴

Unsurprisingly, non-FHHs have upward mobility rates that are almost the same as the national averages, given their large shares in the population (Table 1). But interestingly, FHHs without children are most likely to experience upward mobility. Out of 24 FHH types across six countries, the probabilities of FHHs without any children escaping poverty are higher than the national averages in 22 cases. The exception is self-reported FHHs and potential FHHs in Jordan during 2010-2013, which have similar upward mobility rates as the national average. On the other hand, FHHs with children have upward-mobility rates that are clearly higher than the national averages in five cases (self-reported FHHs, majority-female-adult FHHs, and most-educated-female-adult FHHs in Egypt during 2017-2020, and self-reported FHHs in Iraq during 2007-2012 and in Mauritania during 2014-2019) and clearly lower than the national averages in six cases (self-reported FHHs, majority-female-adult FHHs, and most-educated-female-adult FHHs in Jordan 2010-2013 and Tunisia 2015-2021). FHHs with children have similar upward mobility as the national averages for the remaining cases. Overall, the upward mobility rates for FHHs without children, FHHs with children, and non-FHHs across all countries and four main FHH types are respectively 42 percent, 37 percent, and 36 percent.

Figure 6 plots the (conditional) downward mobility (i.e., falling into poverty when being initial non-poor). The results are consistent with those shown in Figure 5, with FHHs without children experiencing the least downward mobility, to be followed FHHs with children and non-FHHs. Overall, the downward mobility rates for FHHs without children, FHHs with children, and non-

¹⁴ Notably, the survey period lengths generally differ for the six countries so the estimated mobility rates are not exactly comparable across countries or to those in other studies. For a rough reference, Dang and Ianchovichina (2018) obtain a regional upward mobility rate around 52 percent in the early 2000s and 2010s.

FHHs across all countries and four main FHH types are respectively 14 percent, 17 percent, and 19 percent.

As an alternative to Figure 5, we plot the results of locally weighted regressions of upward mobility on the number of children (Appendix A, Figure A.3). This figure also shows that the number of children is negatively associated with upward mobility for most countries and FHH types. The results for other sub-types of FHHs are qualitatively similar, with FHHs without children having the most upward mobility (Appendix A, Figure A.4). The results for preceding years are however, somewhat mixed. FHHs without children had the strongest upward mobility for Egypt and Tunisia, but had similar upward mobility as FHHs with children for Mauritania and Palestine (Appendix A, Figures A.5-A.8). Finally, we plot the results for upward and downward mobility for FHH types, with and without children considered together, in Figures A.9 and A.10 (Appendix A). These figures show that FHHs have higher upward mobility and lower downward mobility than MHHs across all FHH types and countries, except for Jordan.¹⁵

5. Conclusions and policy implications

The climatic events of the Arab Spring and the following decade of structural reforms and sectoral developments have brought to the fore the importance of better understanding gender inequalities. We offer new analysis on the feminization of poverty, using 20 survey rounds spanning the past two decades for six countries across the Arab region—namely Egypt, Iraq, Jordan, Mauritania, Palestine and Tunisia—an understudied set of countries. We propose and evaluate a new typology of FHHs consisting of four main types (and several sub-types) of FHHs

¹⁵ While Milazzo and Van de Walle (2017) find self-reported FHHs to be generally poorer, they also find these households to contribute more to the overall decline in poverty in Africa.

with a new focus on the presence of children, which offers policy-relevant insights regarding the trends and dynamics of poverty feminization. We assemble and harmonize the available cross sectional data and construct synthetic panels to address the lack of actual panels.

We find that different types of FHHs display clear differences regarding poverty levels and trends. In particular, self-reported FHHs, potential FHHs, and most-educated-female-adult FHHs are less likely to be poor than non-FHHs for the six countries, while the opposite holds for majority-female-adult FHHs. Yet, more children are associated with more poverty for the former three types of FHHs and less poverty for the last type of FHHs.

We also find a considerable degree of conditional upward mobility, ranging between 21 percent and 54 percent of the initially poor in a country, across adjacent survey rounds of the past decade. Yet, country heterogeneity exists, with Iraq, Jordan, and Mauritania having relatively more upward mobility, while Egypt, Palestine and Tunisia having relatively less upward mobility. While we find that most types of FHHs are more likely to experience upward mobility out of poverty (or less likely to fall into poverty), FHHs without children have the strongest upward mobility (or the least downward mobility), to be followed by FHHs with children, and non-FHHs.

These findings offer highly relevant policy inputs for effective social protection interventions that accurately target vulnerable groups and reduce gender inequalities in the Arab region. Our findings run against the conventional wisdom that FHHs are typically poorer than non-FHHs which appears to be the implicit assumption underlying many targeting programs in the region and elsewhere. In contrast, we find households with a major share of women or with more children more vulnerable to (remaining in) poverty. These results suggest the need for a more nuanced understanding of how female headship can be defined, especially in the presence of children. Furthermore, we also need to better understand the extent to which the different types of FHHs'

exposure to poverty can change, depending on various other factors such as whether we examine households' static or dynamic poverty status, whether other household demographic and employment characteristics are considered, and last but not least, the country-specific contexts.

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Table 1. Share of Female-Headed Households in Six Arab Countries (percentages)

	Egypt				Iraq		Jordan		Mauritania				Palestine				Tunisia			
	2012	2015	2017	2020	2007	2012	2010	2013	2004	2008	2014	2019	2007	2009	2011	2017	2005	2010	2015	2021
Type 1. Self-reported FHH	17.80	17.86	18.43	17.59	11.30	9.63	13.88	13.24	18.92	31.30	30.19	36.58	9.12	10.00	11.07	10.05	17.01	14.85	16.24	18.52
	1,346	2,104	2,265	1,967	1,906	2,531	402	669	1,860	4,273	3,033	3,654	108	388	505	397	2,128	1,704	4,088	3,153
De jure FHH	13.98	14.96	15.92	14.03	10.43	8.22	11.29	11.05	16.89	18.90	17.23	16.98	8.26	8.79	9.93	8.04	13.73	11.95	14.12	16.62
	1,058	1,741	1,956	1,599	1,721	2,152	335	592	1,674	2,688	1,839	1,834	97	341	447	308	1,671	1,347	3,462	2,788
Never married	0.48	0.37	0.48	0.59	0.46	0.20	0.89	0.89	0.44	0.45	0.50	0.60	0.59	1.07	1.09	0	1.01	0.56	1.29	1.51
	35	43	57	67	78	101	17	43	44	67	48	72	7	45	56	0	113	65	282	261
Divorced/ separated	0.95	1.33	1.55	1.80	0.78	0.62	0.51	0.66	6.15	6.98	6.22	6.64	0.99	0.65	1.14	0.82	1.28	1.18	1.53	1.90
	74	153	194	210	120	175	19	33	602	974	660	690	11	25	43	29	156	131	360	291
Widow only	12.56	13.26	13.89	11.64	9.19	7.40	9.90	9.50	10.29	11.47	10.52	9.74	6.68	7.07	7.70	7.22	11.44	10.21	11.29	13.21
	949	1,545	1,705	1,322	1,523	1,876	299	516	1,028	1,647	1,131	1,072	79	271	348	279	1,402	1,151	2,820	2,236
Married FHH	3.80	2.89	2.52	3.53	0.87	1.41	2.58	2.19	1.92	12.20	12.96	18.45	0.87	1.22	1.14	2.01	3.28	2.90	2.12	1.91
	287	363	309	365	185	379	67	77	176	1,558	1,194	1,714	11	47	58	89	457	357	624	365
Type 2. Share of female adults>0.5	22.96	22.29	22.46	20.87	24.02	28.92	25.80	22.80	31.50	40.40	39.98	43.96	21.52	19.53	20.97	24.28	29.20	28.98	26.17	27.21
	1,712	2,659	2,797	2,352	4,547	6,525	728	1,105	3,075	5,606	3,897	4,393	265	751	919	955	3,710	3,363	6,907	4,740
Share of employed females> share of employed males	5.42	6.22	6.12	6.02	4.81	3.81	6.02	7.56	11.40	12.90	14.30	14.68	7.65	6.72	6.54	4.59	10.94	9.01	10.17	11.04
	406	733	757	660	916	1,070	178	291	1,056	1,888	1,422	1,454	88	269	300	176	1,313	987	2,382	1,854
Type 3. Potential FHH	16.68	16.49	19.37	18.86	5.73	3.59	13.25	12.78	17.01	27.09	25.02	27.88	11.09	10.35	10.55	9.88	18.30	17.54	18.13	26.75
	1,244	1,935	2,344	2,087	1,007	1,621	359	576	1,643	3,694	2,345	2,824	127	398	482	397	2,280	1,974	4,609	4,618
Core FHH	3.06	3.17	3.49	3.75	1.65	0.86	2.52	3.52	7.07	8.07	9.68	9.12	3.04	2.34	2.84	1.82	5.07	4.11	4.27	5.67
	229	364	419	407	283	388	77	129	635	1,160	939	912	34	97	130	74	620	457	1,022	947
Asset FHH	11.77	11.70	14.05	13.10	4.00	2.61	12.02	10.90	14.85	24.30	22.63	24.67	9.24	8.76	8.52	N.A.	15.56	15.55	15.22	N.A.
	881	1,459	1,765	1,489	783	1,258	321	510	1,417	3,287	2,095	2,523	106	338	402	N.A.	1,967	1,769	4,037	N.A.
Type 4. Most educated adult member is female & no employed males	12.92	13.88	14.30	13.98	8.54	5.87	18.49	18.48	8.76	16.47	13.83	24.67	16.87	15.25	14.82	11.52	15.42	17.75	17.84	20.11
	951	1,610	1,749	1,554	1,485	1,990	499	932	969	2,384	1,378	2,490	201	595	643	419	1,936	2,024	4,479	3,520

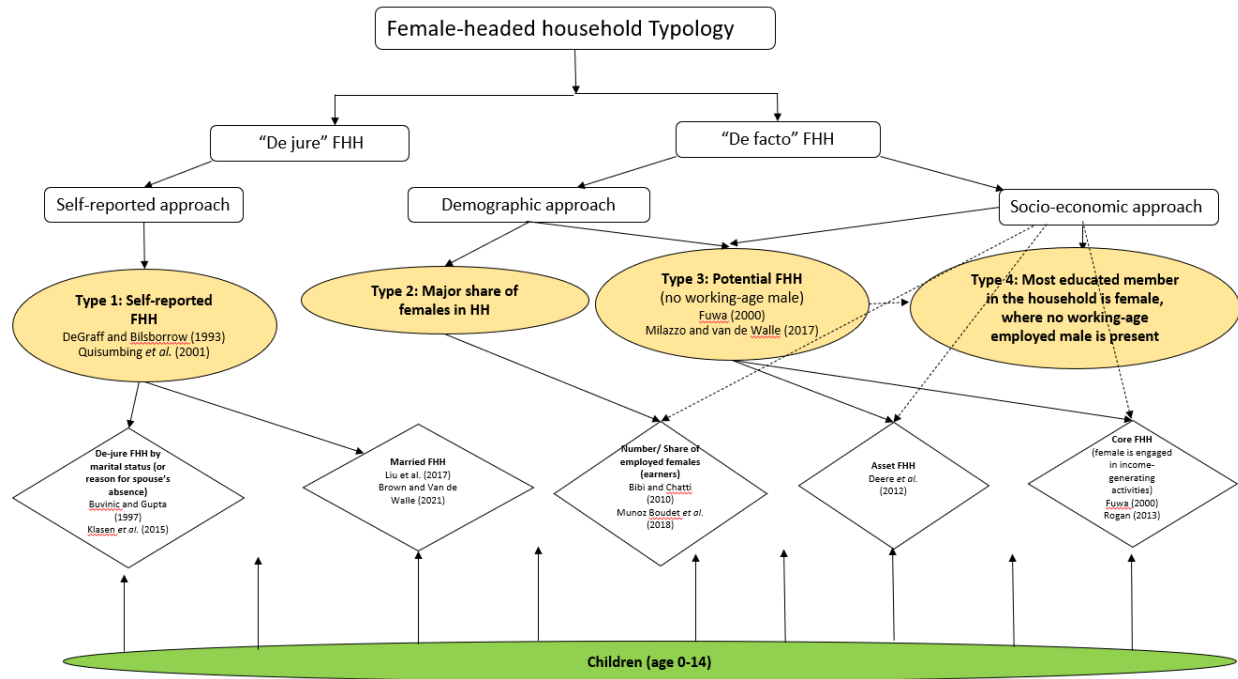
Note: The main definitions of female-headed households are in bold, and the variant definitions are in regular font. The numbers in bold refer to the percent of the cross-sectional sample for each period. The numbers in *italics* refer to the sample size of each group.

Table 2. Probabilities of Being Poor

	Specification 1				Specification 2			
	FHH Type 1 Self-reported	FHH Type 2 Majority-female- adult	FHH Type 3 Potential	FHH Type 4 Most-educated- female-adult	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated- female-adult
Self-reported FHH	-0.007*** (0.00)				-0.044*** (0.00)			
Self-reported FHH # Number of children	0.008*** (0.00)				0.006*** (0.00)			
Share of female adults>0.5		0.052*** (0.00)				0.032*** (0.00)		
Share of female adults>0.5# Number of children		-0.007*** (0.00)				-0.014*** (0.00)		
Potential FHH			-0.027*** (0.00)				-0.017*** (0.00)	
Potential FHH# Number of children			0.014*** (0.00)				0.011*** (0.00)	
Educated females				0.002 (0.00)				-0.006** (0.00)
Educated females# Number of children				0.013*** (0.00)				0.013*** (0.00)
Household head's characteristics	N	N	N	N	Y	Y	Y	Y
Household characteristics	N	N	N	N	Y	Y	Y	Y
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Survey year FE	Y	Y	Y	Y	Y	Y	Y	Y
N	214931	214931	214931	214931	211069	211069	211069	211069

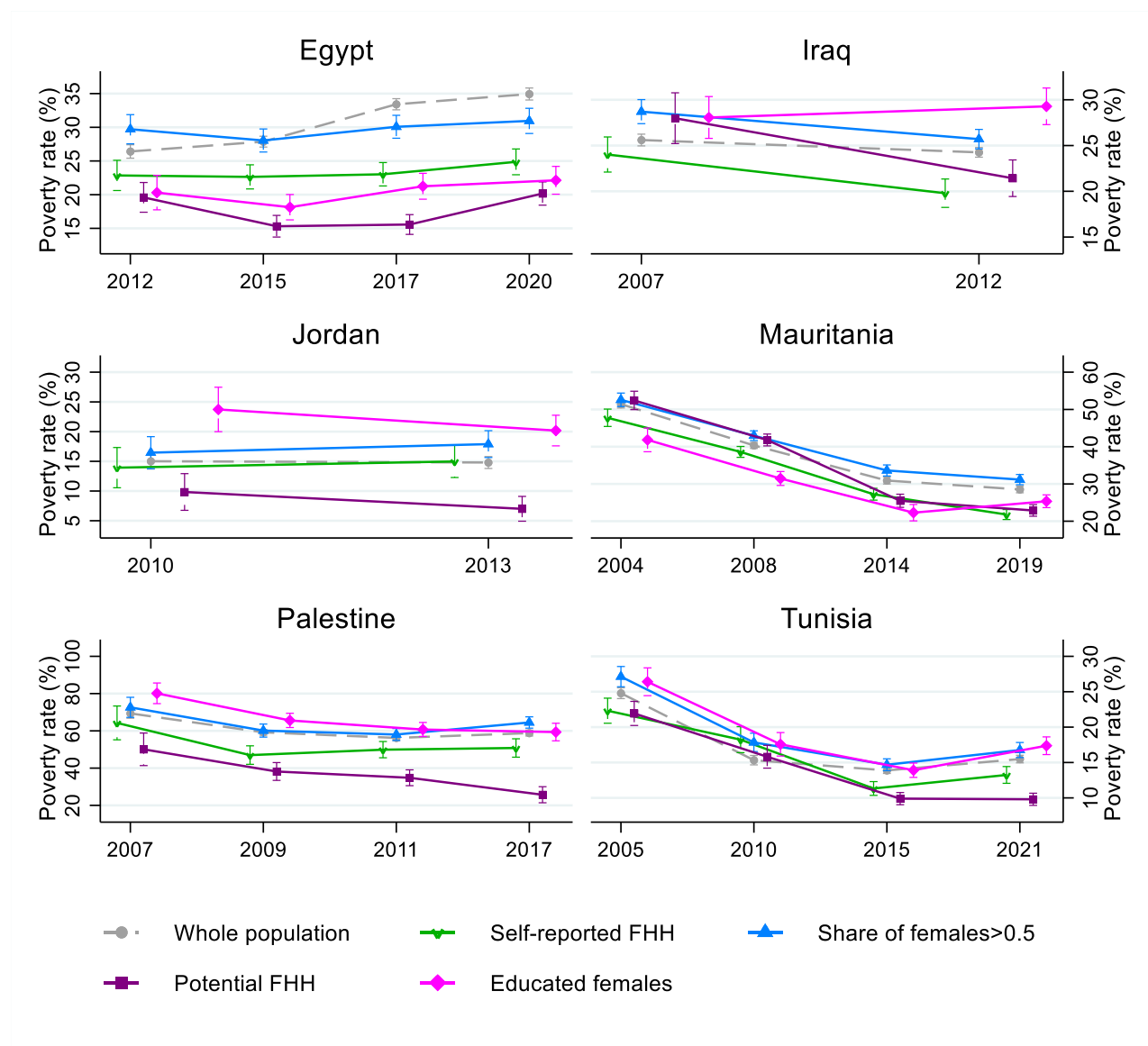
Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses. The full regression results using the linear probability model are provided in Appendix A, Table A.10.

Figure 1. Diagram of Household Types



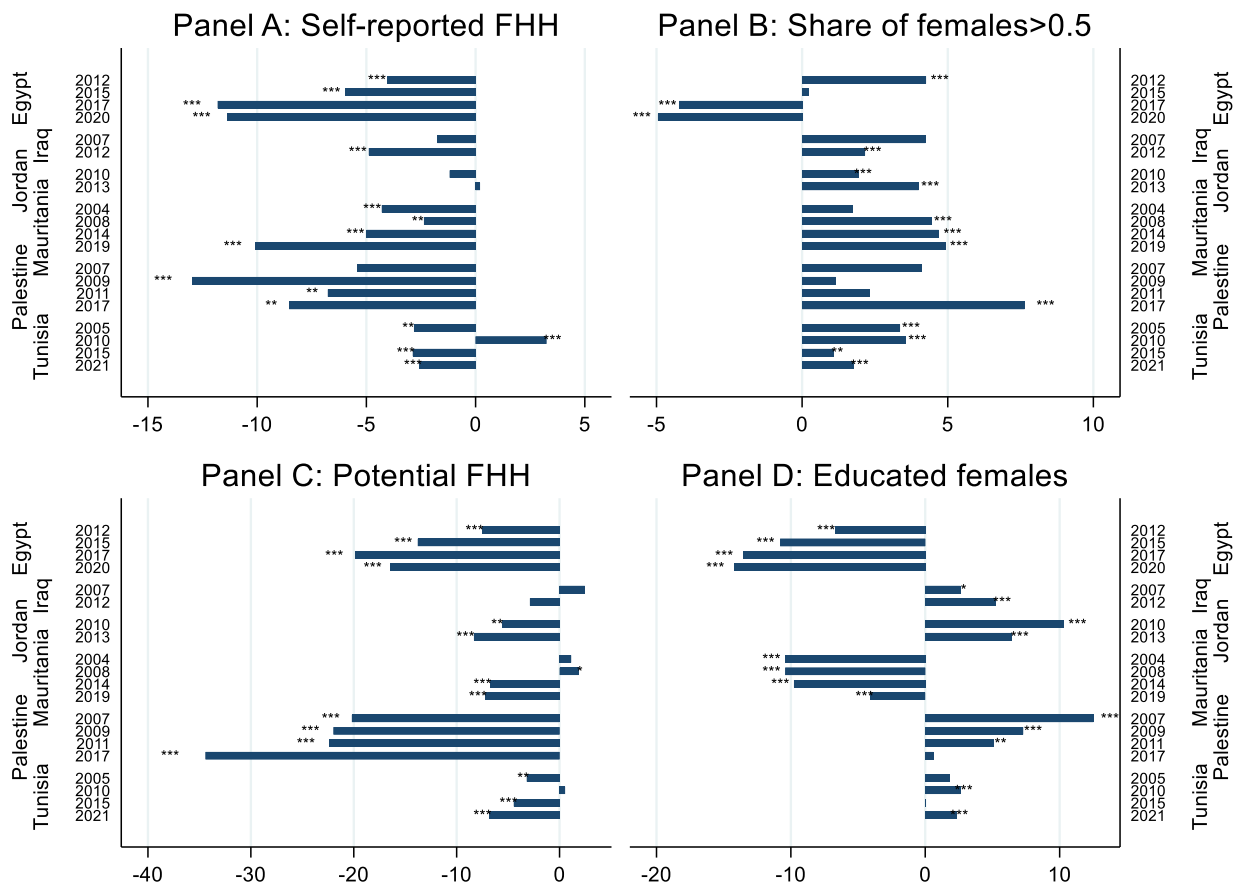
Note: Solid line and dashed line respectively indicate direct and indirect relationship. Some studies are shown for illustrative purposes and do not represent an exhaustive list.

Figure 2. Cross-sectional Headcount Poverty Rate (percentage), by Household Type, Regional Poverty Lines*



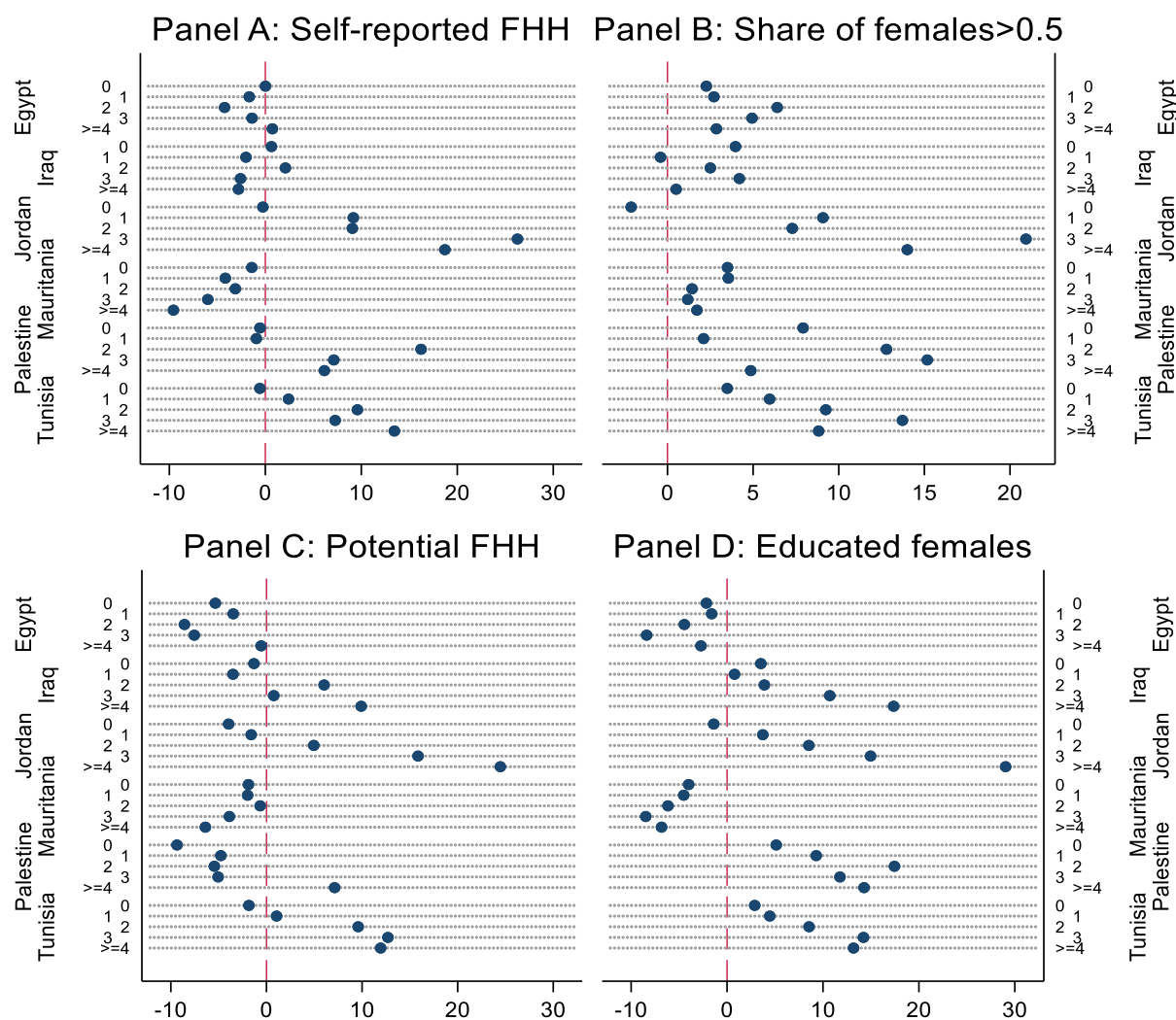
Note: Population sampling weights are applied.

Figure 3. FHH–non-FHH Differences in Headcount Poverty Rate (percentage points)



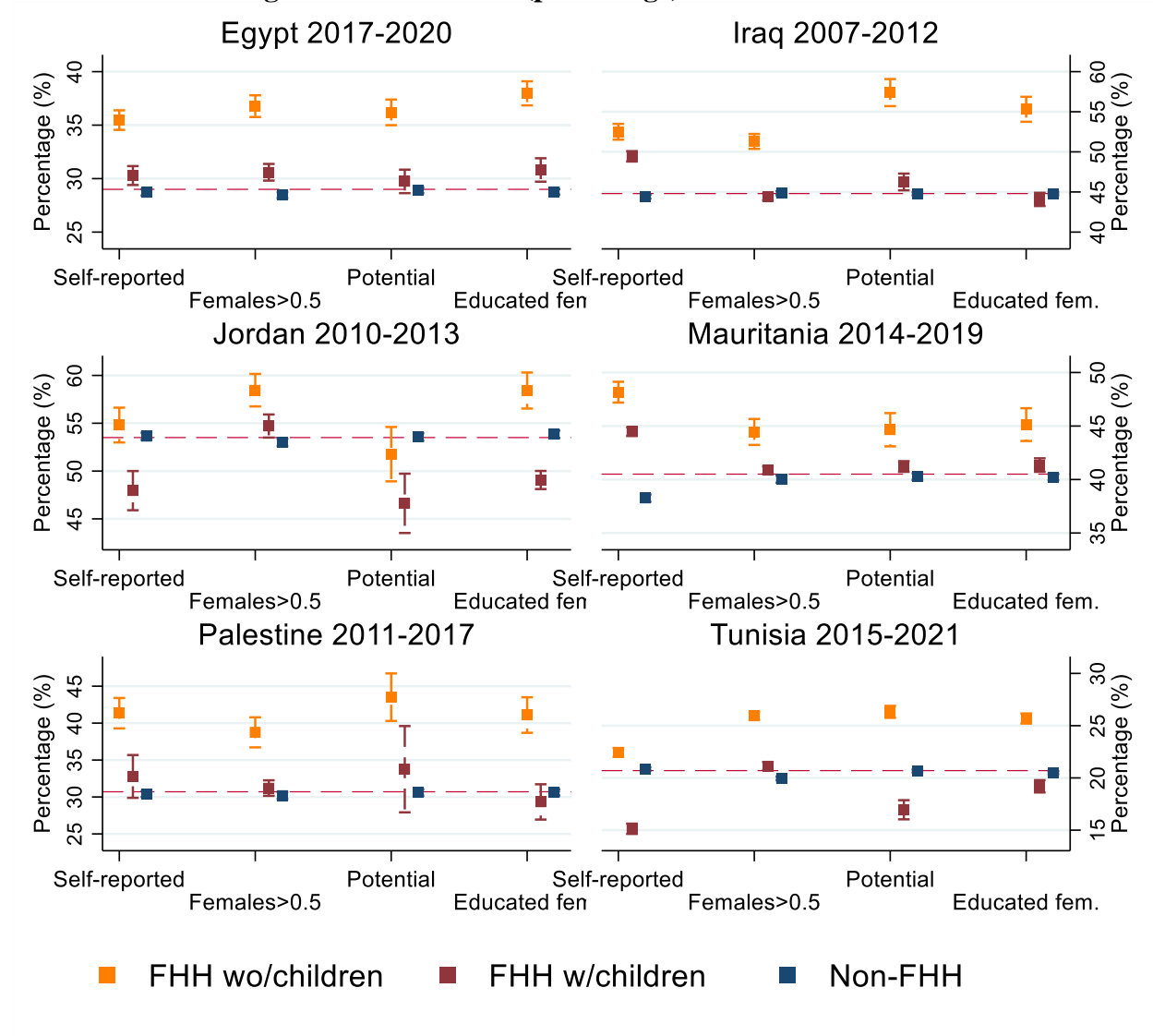
Note: Headcount poverty rates are estimated using per capita household expenditures. Stars indicate significantly higher headcount poverty ratio between FHHs and non-FHHs in each category. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels.

Figure 4. FHH–non-FHH Differences in Headcount Poverty Rate by Number of Children under 14 (percentage points)



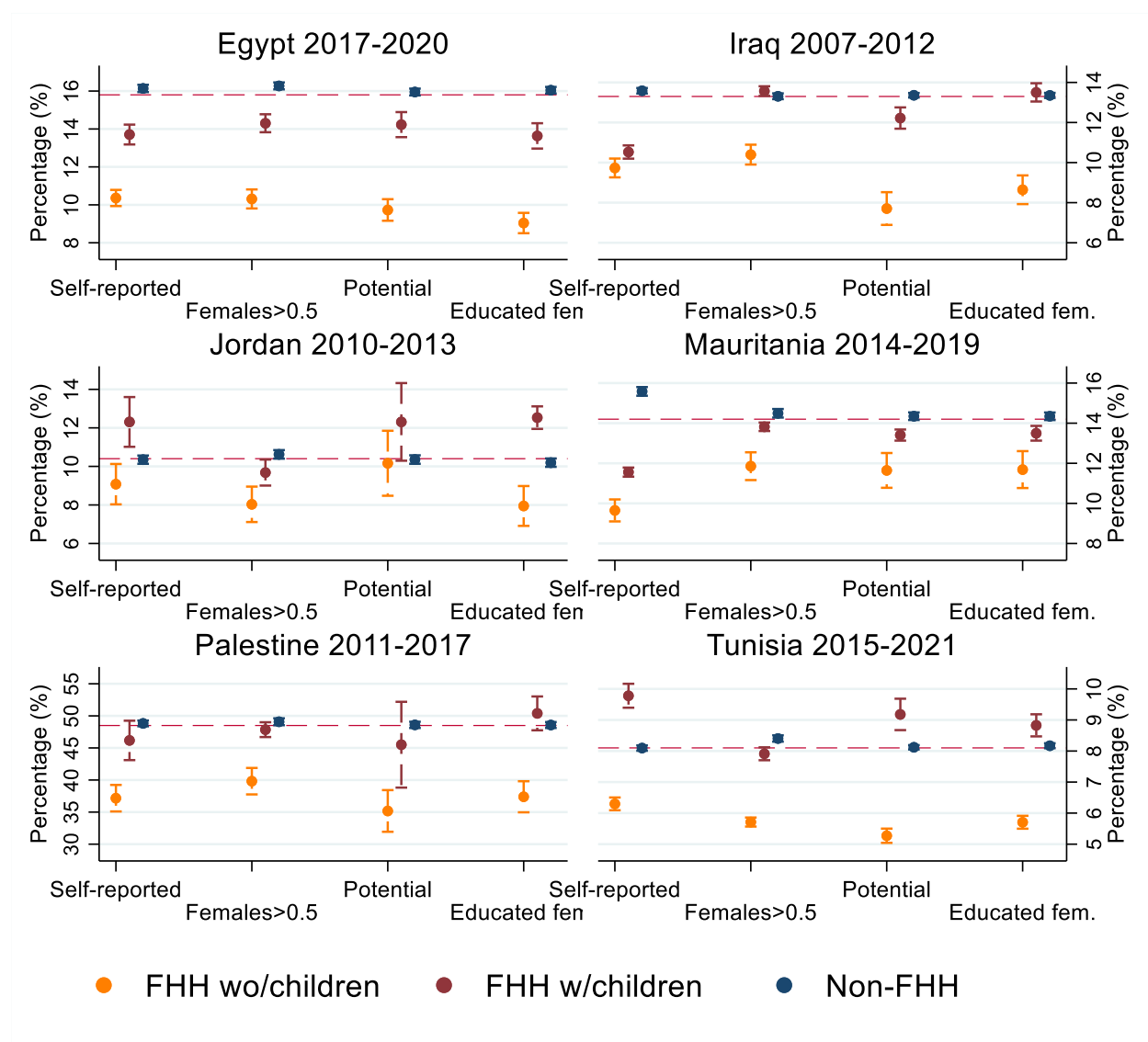
Note: Authors' calculation based on pooled cross section. Headcount poverty rates are estimated using per capita household expenditures.

Figure 5. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure 6. Probabilities of Female-Headed Households Falling in Poverty in Second Year Conditional on Being Non-poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that enters poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Appendix A: Additional Tables and Figures

Table A.1. Overview of the key studies

	Studies	Country	FHH definition	Reference group	Conclusions
1	DeGraff and Bilsborrow (1993)	Ecuador	Self-reported FHH	Self-reported MHH	FHHs have lower income, land ownership, and average level of education than MHHs and are less likely to be employed (with fewer hours if employed). Children of FHHs are significantly less likely to be enrolled in school than children of MHHs.
			Self-reported widowed FHH	Self-reported MHH, other self-reported FHH	Widowed or divorced FHHs have higher income and amount of land owned than MHHs but lower children's school enrollment and are less likely to be in school than are children of MHHs and children of other FHHs.
			Self-reported married FHH	Self-reported MHH, other self-reported FHH	Married FHHs have lower income and amount of land owned than MHHs and enrollment rate similar to MHH, but children of married FHHs are significantly less likely to be enrolled in school than are children of MHHs but more likely than widowed FHHs.
2	Buvinic and Gupta (1997)	65 studies on developing countries	Self-reported FHH, de facto, de jure FHH	Self-reported MHH	Thirty-eight studies - FHHs are poorer than MHHs when poverty is measured by (total/per capita/per equivalent) household income and consumption expenditures, access to services, and ownership of land and assets. Fifteen studies - certain types of FHHs are more vulnerable to poverty than others. Eight studies – poverty in FHHs is not higher than in MHH.
3	Fuwa (2000)	Panama	Self-reported FHH	Self-reported MHH	FHHs are similar to MHHs when poverty is measured by per capita expenditure. The difference between FHHs versus non-FHHs does not change if using different poverty indicators.
			Self-reported de jure, de facto FHH	Non-FHH	Widows/divorced/separated FHHs have significantly higher headcount poverty in indigenous areas when poverty is measured by per capita expenditure. FHHs have lower education than non-FHHs
			Self-reported married FHH, FHH with unmarried partners	Non-FHH	FHHs with unmarried partners have higher headcount poverty ratios in urban and indigenous areas when poverty is measured by per capita expenditure. The result is robust to applying an equivalence scale using alternative poverty measures and poverty lines.
			Potential FHH	Non-FHH	FHHs are not poorer than non-FHHs when poverty is measured by per capita expenditure.
			“Working” FHHs	Non-FHH	FHHs are similar to non-FHHs when poverty is measured by per capita expenditure. FHHs have higher education endowments than non-FHHs, except in indigenous areas.

			core FHH	Non-FHH	FHHs are less poor than non-FHHs when poverty is measured by per capita expenditure.
4	Quisumbing <i>et al.</i> (2001)	10 developing countries	Self-reported FHH, females	Self-reported MHH, males	FHHs and individual females contribute disproportionately to overall poverty in 25-50% of the dataset when headcount poverty is measured by (total/per capita/per equivalent) household income and consumption expenditures and are insensitive to the poverty line. FHHs and individual females are similar to MHHs or males when using stochastic dominance criteria, but they are constantly worse off in Ghana and Bangladesh.
5	Horrell and Krishnan (2007)	Zimbabwe	Self-reported widowed FHH	Self-reported MHH	The income per capita/ adult equivalent is lower in widowed FHHs than in the MHHs.
			Self-reported de-facto FHH		The income per capita/ adult equivalent is higher in the de facto FHHs than in the MHHs.
6	Medeiros and Costa (2007)	8 Latin American countries	FHH, females	MHH, males	Poverty is higher among FHHs, but there is no clear evidence of a recent and widespread feminization of poverty in Latin America. Differences in poverty among FHHs and MHHs increased in Argentina and Mexico, showing specific types of feminization of poverty. The results are robust to different values of poverty lines, the use of equivalence scales, and the distribution of household income.
			Self-reported FHH w/o children	Couple HH w/o children	The insignificant increase in poverty indices when comparing FHHs without children to couple-headed HH without children in Bolivia. The rise in poverty indices is significant at 5% when comparing FHHs with children to MHHs with children in Costa Rica.
	Deere <i>et al.</i> (2012)	Latin American countries	HHs where women have ownership rights	Self-reported FHHs who have ownership rights	The gender of the household head is a poor substitute for a gendered analysis of asset ownership within and among households since an analysis based on headship tends to underestimate women's ownership of assets.
7	Van de Walle (2013)	Mali	Self-reported widowed FHH	Self-reported married FHH	Widowed FHHs have significantly lower consumption per capita than married FHHs, while MHHs do not have any significant differences in per capita consumption between widowed MHHs and married MHHs.
			Self-reported widowed MHH	Self-reported married MHH	
			Self-reported widowed FHH rural	Self-reported widowed FHH urban	Widowed FHH living in rural areas have lower per capita consumption than all other households living in rural areas. The gap between widowed FHHs and other HHs is lower for HHs residing in urban areas.

			Self-reported widowed FHH rural	Self-reported non-widowed FHH rural	Per capita consumption of widowed FHHs is around 12% lower than that of all rural households. The results are robust to using an equivalence scale in measuring consumption.
			Self-reported widowed FHH urban	Self-reported non-widowed FHH urban	Per capita consumption of widowed FHHs is around 6% lower than that of all other urban households. The results are robust to using an equivalence scale in measuring consumption.
8	Rogan (2013)	South Africa	Self-reported de jure FHH, de facto FHH, co-resident FHH	Self-reported MHH	Poverty rates are higher in FHHs than in MHHs, irrespective of how headship is defined.
			Self-reported de jure FHH, de facto FHH	co-resident FHH	Co-resident FHHs are less poor than other types of FHHs.
			core FHH	non-FHH	FHH has the lowest risk of poverty
9	Klasen <i>et al.</i> (2015)	Thailand, Vietnam	Self-reported FHH	Self-reported MHH	No significant differences between FHHs and MHHs were found regarding consumption, the probability of shock exposure, or vulnerability to poverty in Thailand or Vietnam.
			Self-reported de-jure FHH	Self-reported MHH	De jure FHHs have lower consumption than MHHs in Vietnam. There are no significant differences between de-jure FHHs and MHHs regarding the probability of shock exposure or vulnerability to poverty in Thailand or Vietnam.
			Self-reported de-facto FHH	Self-reported MHH	De facto FHHs have higher consumption than MHHs in Thailand. There are no significant differences between de-facto FHHs and MHHs regarding the probability of shock exposure or vulnerability to poverty in Thailand or Vietnam.
			Self-reported single, widowed FHH	Self-reported MHH	FHHs with an absent spouse have higher consumption levels than MHHs in Thailand. Single FHH has a lower consumption level than Vietnam. There are no significant differences between FHHs and MHHs regarding the probability of any shock exposure in Thailand or Vietnam. Single FHHs are less vulnerable to poverty in Thailand but more vulnerable to poverty in Vietnam.
10	Liu <i>et al.</i> (2017)	14 Latin American countries	Self-reported married w/o spouse, single, separated,	Self-reported married FHH with spouse	In eight of the 14 countries, FHHs are more likely to live in poor conditions. However, MHHs are in more impoverished conditions than FHHs when married status, urban or rural setting, ownership, and the presence of children are controlled in the regression. Generally, married FHHs with the spouse present are better off than any other category. The worst living conditions are associated with single, separated, divorced, or widowed FHHs.

			widowed FHH		
11	Milazzo and van de Walle (2017)	20 countries in Sub-Saharan Africa	Self-reported FHH	Self-reported MHH	While the share of FHHs in the population is growing during 1990-2012, poverty has been falling faster among FHHs. FHHs contributed more to the overall decline in poverty despite their smaller overall population share.
			Self-reported FHH w/o a resident adult male	Self-reported MHH	The poverty trends of the various types of FHHs followed different paths across countries and periods, with no one type consistently outperforming the others.
12	Alazzawi (2018)	Egypt	Self-reported urban FHH with children	Self-reported urban MHH with children	FHHs have a higher predicted poverty rate than MHHs in urban areas. The factors contributing to the poverty differential between FHH and MHH households are education, employment status, occupation, sector, and region of residence.
			Self-reported rural FHH with children	Self-reported rural MHH with children	FHHs have a higher predicted poverty rate than MHHs in rural areas. Education, employment status, occupation, number of rooms per capita, and region of residence are factors that contribute to the poverty differential between FHHs and MHHs
13	Munoz Boudet <i>et al.</i> (2018)	71 developing countries	couple/single females w/o children	other HH	Adult couple households with children, children, and other adults (extended family) are the most frequent among poor households. Poor and non-poor women concentrate in the adult couple household with children. One adult female household with children is more prevalent among the poor in Latin America, the Caribbean, and Sub-Saharan Africa.
			Male/female earner with and w/o children		Poor women live in households with children and with children and earner dependents, where the earner is a single male or a head couple. Single female-earner households comprise the largest percentage of poor households in Latin America, the Caribbean, and Sub-Saharan Africa.
14	Brown and Van de Walle (2021)	43 African countries	Self-reported FHH	Self-reported MHH	FHHs have lower poverty rates than MHHs when using per capita welfare measures. FHHs are significantly worse than MHH when poverty is measured using consumption adjusted for economies of scale.
			Self-reported married FHH		MHHs are poorer than married FHHs

Table A.2. Poverty Line, Egypt by Region, in LCU, Per Capita Annual Consumption in Survey Year Prices

Region	Food poverty line				Poverty line			
	2012/2013	2015	2017/2018	2019/2020	2012/2013	2015	2017/2018	2019/2020
Urban governorates	2748	4318	6065.3	7071	4320	6141	9280.1	11285
Urban lower Egypt	2484	3835	5667.6	6304	3840	5631	8536.9	9755
Rural lower Egypt	2568	3854	5901.7	6570	3852	5675	8673	10108
Urban upper Egypt	2568	3968	5752.1	6553	3972	5823	8728.5	10225
Rural upper Egypt	2496	3760	5896.5	6484	3756	5694	8865.6	10068
Urban frontier	2736	3990	5924.3	6696	3996	6247	8568.7	10409
Rural frontier	2688	3979	6304.7	7074	3984	5788	8979.3	10788
Total	2568	3921	5889.6	6604	3924	6141	8827	10279

Source: Compiled from various CAPMAS Poverty assessment updates.

Table A.3. Poverty Lines, Jordan, in LCU, Per Capita Annual Consumption in Survey Year Prices

	Food poverty line		Poverty line	
	2010	2013	2010	2013
Jordan	336	383	814	929

Source: Jordan Department of Statistics: DOS https://jorinfo.dos.gov.jo/Databank/pxweb/en/Poverty/Poverty_Poverty-Indicators/

Table A.4. Poverty Lines, Iraq, in LCU, Per Capita Annual Consumption in Survey Year Prices

	2007	2012
Kurdistan	1212	1709
Baghdad	987	1391
Rest of Iraq	865	1220
Total	1073	1266

Source: World Bank “Poverty Estimates and Trends in Iraq” <https://microdata.worldbank.org/index.php/catalog/2334/download/34771>

Table A.5. Poverty Lines, Palestine, in LCU, Per Capita Annual Consumption in Survey Year Prices

	Food poverty line			Poverty line		
	2009	2011	2017	2009	2011	2017
Gaza	567	570	567	712	714	710
West bank	609	632	710	765	792	889
Total	603	620	668	757	776	836

Source: Compiled from various PCBS poverty reports. Spatial deflator provided by PCBS was used to calculate regional poverty lines for Gaza and the West Bank relative to the national poverty line available from PCBS publications.

Table A.6. Poverty Lines, Tunisia, in LCU, Per Capita Annual Consumption in Survey Year Prices

	Food poverty line				Poverty line			
	2005	2010	2015	2021	2005	2010	2015	2021
Cities (metropolitan)	615	757	1085	1346.526	902	1038	1878	2682.997
Small & medium towns (urban)	596	733	1050.154	--	818	941	1702.871	--
Noncommunal (rural)	466	571	951.668	1529.233	581	669	1500.530	2223.527

Source: World Bank (2016). "Tunisia Poverty Assessment 2015". Table A1.3.

Table A.7. Poverty Lines, Mauritania, in LCU, Per Capita Annual Consumption in Survey Year Prices

	Extreme poverty line		Poverty line			
	2004	2008	2004	2008	2014	2019
Total	70400	96000	94650	129000	169445	191000

Source: IMF (2011) Table 1.1.

Table A.8. Correlation between Main Types of Female-Headed Households

	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated-female-adult
FHH Type 1	1.000	0.265*** (0.000)	0.415*** (0.000)	0.298*** (0.000)
FHH Type 2		1.000	0.319*** (0.000)	0.304*** (0.000)
FHH Type 3			1.000	0.510*** (0.000)
FHH Type 4				1.000

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels.

Table A.9. Headcount Poverty Rate of Female and Non-female Headed Households by Headship Definition (percent)

	Egypt (2012-2020)		Iraq (2007-2012)		Jordan (2010-2013)		Mauritania (2004-2019)		Palestine (2007-2017)		Tunisia (2005-2021)	
	FHH	non-FHH	FHH	non-FHH	FHH	non-FHH	FHH	non-FHH	FHH	non-FHH	FHH	non-FHH
Panel A: All												
Self-Reported FHH	23.32	32.01*	20.22	24.79*	14.46	14.94	29.52	38.03*	50.63	59.70*	16.04	17.34*
Reported de jure FHH	21.51	31.92*	19.24	24.80*	16.08	14.80	29.66	36.80*	48.17	59.73*	13.46	17.57*
Reported married FHH	29.15	31.01	25.96	24.36	7.76	15.03*	28.35	36.73*	62.71	59.10	26.55*	16.96
Potential FHH	17.41	32.41*	22.28	24.43	8.42	15.35*	31.43	36.80*	35.30	60.18*	13.46	17.69*
Core FHH	19.53	31.25*	15.41	24.43*	4.16	15.11*	30.47	36.17*	34.38	59.47*	13.41	17.32*
Asset FHH	16.33	32.05*	21.76	24.42	8.38	15.30*	32.88	36.37*	39.06	59.69*	15.78	17.28*
Share of female adults>0.5	29.62	31.32*	25.94*	23.64	17.15*	14.19	37.36*	34.61	62.04*	58.33	19.10*	16.42
Share of employed females>employed males	22.3	31.44*	22.11	24.48*	7.48	15.37*	33.11	36.18*	54.89	59.38*	16.68	17.24
Most educated member is female adult & no employed males	20.43	32.11*	29.12*	24.17	21.87	13.61	27.55	37.22*	64.52*	58.46	18.15*	17.01
Panel B: Rural												
Self-Reported FHH	28.16	37.9*	36.29	35.34	13.20	17.70	32.42	44.98*	45.81	56.02*	23.95	25.50
Reported de jure FHH	25.89	37.69*	34.15	35.45	13.55	17.61	33.94	43.01*	42.56	56.07*	18.79	25.85*
Reported married FHH	32.87	36.92*	43.82*	35.28	11.18	17.39	30.16	43.30*	61.12	55.38	33.52*	24.98
Potential FHH	22.05	38.24*	38.52	35.33	15.50	17.41	33.14	44.18*	37.66	56.25*	22.28	25.77*
Core FHH	25.67	37.00*	28.11	35.42	1.93	17.50*	34.21	42.46*	37.72	55.73*	22.96	25.41
Asset FHH	20.52	38.07*	38.85	35.34	12.51	17.54	33.88	43.83*	40.33	55.89*	24.28	25.42
Share of female adults>0.5	36.19	36.9	38.08*	33.89	21.37*	16.00	42.93*	40.94	60.23*	54.05	27.51*	24.34
Share of employed females>employed males	27.46	37.17*	34.11	35.46	13.03	17.51	39.58	42.13*	59.83	55.11	25.30	25.32
Most educated member is female adult & no employed males	24.25	37.90*	51.45*	34.76	23.55*	16.19	33.68	43.27*	60.50	54.97	28.20*	24.82
Panel C: Urban												
Self-Reported FHH	16.96	23.08*	15.19	18.52*	14.70	14.36	26.68	30.24*	50.17	58.89*	12.29	13.27*
Reported de jure FHH	16.96	22.97*	15.08	18.48*	16.61	14.21	25.75	29.90*	47.92	58.92*	11.59	13.33*
Reported married FHH	16.81	22.39*	15.97	18.20	7.29	14.53*	26.42	29.62*	61.23	58.33	17.25*	13.09
Potential FHH	11.5	23.56*	14.49	18.25*	7.33	14.91*	29.05	29.28	32.54	59.48*	8.69	13.75*
Core FHH	13.47	22.58*	9.54	18.21*	4.43	14.60*	25.24	29.51*	31.97	58.70*	8.68	13.32*
Asset FHH	9.11	23.18*	12.56	18.25*	7.72	14.82*	31.32*	28.90	36.09	58.94*	9.64	13.37*
Share of female adults>0.5	21.27	22.61	17.92	18.28	16.24*	13.81	31.12*	27.94	60.55*	57.77	14.40*	12.68
Share of employed females>employed males	17.58	22.65*	11.31	18.40*	6.65	14.91*	26.20	29.73*	52.13	58.69*	12.50	13.23
Most educated member is female adult & no employed males	16.40	23.10*	18.57	18.15	21.52	13.06	20.58	30.74*	63.05*	57.76	13.38	13.11
Panel D: Have children under 14												
Self-Reported FHH	35.2	39.33*	22.15	25.99*	29.00*	18.18	31.91	40.75*	67.33	64.40	28.70*	22.48
Reported de jure FHH	37.62	39.05	21.27	26.01*	34.42*	18.11	33.39	39.21*	65.85	64.47	25.84*	22.81
Reported married FHH	31.51	39.24*	26.85	25.66	13.71	18.82	29.33	39.71*	72.35	64.45	33.15*	22.64
Potential FHH	32.83	39.34*	27.84	25.64	25.95*	18.55	33.94	39.50*	59.40	64.60	29.98*	22.55
Core FHH	30.60	39.13*	23.68	25.68	21.68	18.73	32.23	38.93*	48.35	64.63*	25.61	22.89
Asset FHH	32.24	39.24*	28.13	25.65	27.28*	18.55	35.51	39.04*	64.80	64.51	33.36*	22.60
Share of female adults>0.5	40.1	38.72	27.32	24.90	26.82*	16.80	39.83*	37.41	70.08*	63.15	27.90*	21.48
Share of employed females>employed males	35.69	39.1*	25.57	25.68	17.43	18.79	35.55	38.89*	67.74	64.38	26.60*	22.68
Most educated member is female adult & no employed males	32.09	39.48*	33.62*	25.37	34.47*	16.46	30.61	39.74*	77.00*	63.23	29.63*	22.22
Panel E: No children under 14												
Self-Reported FHH	10.53	10.52	6.79	6.15	3.88	4.13	12.21	13.63	30.83	31.39	8.71	9.28
Reported de jure FHH	10.39	10.55	6.26	6.26	4.54	3.98	12.76	13.34	30.16	31.50	8.69	9.28

Reported married FHH	12.7	10.49	13.20*	6.17	0.00	4.20	9.25	13.42*	36.90	31.19	8.97	9.18
Potential FHH	6.24	11.58*	5.05	6.36	0.81	4.77*	11.70	13.58*	23.57	32.92*	7.74	9.57*
Core FHH	7.59	10.65*	1.33	6.39*	0.00	4.33*	11.32	13.31	23.75	31.66*	7.38	9.29*
Asset FHH	6.14	11.29*	4.76	6.36	0.68	4.72*	12.19	13.42	25.22	32.03*	8.97	9.21
Share of female adults>0.5	12.16*	9.89	8.69*	4.83	2.74	4.86*	15.30*	11.80	33.93*	29.72	11.40*	7.91
Share of employed females>employed males	8.79	10.7*	3.09	6.57*	0.47	4.64*	10.29	13.61*	31.32	31.29	10.27*	8.99
Most educated member is female adult & no employed males	8.74	10.90*	9.36*	5.84	3.02	4.41	10.04	14.05*	35.36*	30.23	11.40	8.51

Note: The data are pooled across all available years for each country. Headcount poverty rates are estimated using per capita household expenditures. Stars indicate statistically significant difference in headcount poverty between FHHs and non-FHHs in each category at the 5% or lower level. Population sampling weights are applied.

Table A.10. Probabilities of Being Poor, Linear Probability Model (Main FHH Types)

	Specification 1				Specification 2			
	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated-female-adult	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated-female-adult
Self-reported FHH	-0.007*** (0.00)				-0.044*** (0.00)			
Self-reported FHH # Number of children age 0-14	0.008*** (0.00)				0.006*** (0.00)			
Share of female adults>0.5		0.052*** (0.00)				0.032*** (0.00)		
Share of female adults>0.5# Number of children age 0-14		-0.007*** (0.00)				-0.014*** (0.00)		
Potential FHH			-0.027*** (0.00)				-0.017*** (0.00)	
Potential FHH# Number of children age 0-14			0.014*** (0.00)				0.011*** (0.00)	
Educated females				0.002 (0.00)				-0.006** (0.00)
Educated females# Number of children age 0-14				0.013*** (0.00)				0.013*** (0.00)
<i>Household head's characteristics</i>								
Head's age					-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
Highest education level is primary					-0.066*** (0.00)	-0.064*** (0.00)	-0.065*** (0.00)	-0.065*** (0.00)
Highest education level is secondary					-0.123*** (0.00)	-0.121*** (0.00)	-0.121*** (0.00)	-0.121*** (0.00)
Highest education level is tertiary					-0.178*** (0.00)	-0.176*** (0.00)	-0.176*** (0.00)	-0.176*** (0.00)
Head is married					-0.020*** (0.00)	0.007*** (0.00)	0.005** (0.00)	0.006*** (0.00)
Head is employed					-0.037*** (0.00)	-0.032*** (0.00)	-0.031*** (0.00)	-0.027*** (0.00)
<i>Household characteristics</i>								
Household size					0.022*** (0.00)	0.024*** (0.00)	0.023*** (0.00)	0.023*** (0.00)
Number of children age 0-14	0.077*** (0.00)	0.081*** (0.00)	0.076*** (0.00)	0.077*** (0.00)	0.050*** (0.00)	0.054*** (0.00)	0.049*** (0.00)	0.049*** (0.00)
Share of household members age 15-24					-0.008*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)
Share of household members age 60 and older					-0.022*** (0.00)	-0.019*** (0.00)	-0.017*** (0.00)	-0.020*** (0.00)
Urban					-0.084*** (0.00)	-0.084*** (0.00)	-0.084*** (0.00)	-0.084*** (0.00)
Iraq	-0.149*** (0.00)	-0.152*** (0.00)	-0.149*** (0.00)	-0.148*** (0.00)	-0.181*** (0.00)	-0.182*** (0.00)	-0.179*** (0.00)	-0.180*** (0.00)
Jordan	-0.144*** (0.01)	-0.147*** (0.01)	-0.144*** (0.01)	-0.146*** (0.01)	-0.092*** (0.01)	-0.094*** (0.01)	-0.090*** (0.01)	-0.092*** (0.01)
Mauritania	-0.155*** (0.01)	-0.160*** (0.01)	-0.156*** (0.01)	-0.158*** (0.01)	-0.207*** (0.01)	-0.208*** (0.01)	-0.213*** (0.01)	-0.212*** (0.01)
Palestine	0.181*** (0.01)	0.178*** (0.01)	0.181*** (0.01)	0.180*** (0.01)	0.185*** (0.01)	0.183*** (0.01)	0.186*** (0.01)	0.185*** (0.01)
Tunisia	-0.060*** (0.00)	-0.063*** (0.00)	-0.060*** (0.00)	-0.061*** (0.00)	-0.054*** (0.00)	-0.055*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)
_cons	0.127*** (0.00)	0.112*** (0.00)	0.133*** (0.00)	0.126*** (0.00)	0.312*** (0.01)	0.261*** (0.01)	0.270*** (0.01)	0.267*** (0.01)
r2_a	0.16	0.17	0.16	0.16	0.21	0.21	0.21	0.21
N	214931	214931	214931	214931	211069	211069	211069	211069

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses. All regressions control for survey rounds fixed effects. The reference groups for head's education without formal education. The reference group for share of household members is share of members aged between 25 and 59 years. The reference country is Egypt.

Table A.11. Probabilities of Being Poor for Other FHH Types, Linear Probability Model

	Specification 1					Specification 2				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
De-jure FHH	-0.003 (0.00)					-0.027*** (0.00)				
De-jure FHH # Number of children age 0-14	0.013*** (0.00)					0.009*** (0.00)				
Married FHH		-0.031*** (0.01)					-0.058*** (0.01)			
Married FHH # Number of children age 0-14		0.005** (0.00)					0.006** (0.00)			
Employed FHH			0.009** (0.00)					0.008** (0.00)		
Employed FHH # Number of children age 0-14			-0.001 (0.00)					-0.004* (0.00)		
Asset FHH				-0.019*** (0.00)					-0.018*** (0.00)	
Asset FHH # Number of children age 0-14				0.014*** (0.00)					0.011*** (0.00)	
Core FHH					-0.023*** (0.00)					-0.010** (0.00)
Core FHH # Number of children age 0-14					0.006** (0.00)					0.007*** (0.00)
<i>Household head's characteristics</i>										
Head's age						-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
Highest education level is primary						-0.065*** (0.00)	-0.065*** (0.00)	-0.064*** (0.00)	-0.064*** (0.00)	-0.064*** (0.00)
Highest education level is secondary						-0.122*** (0.00)	-0.122*** (0.00)	-0.121*** (0.00)	-0.121*** (0.00)	-0.121*** (0.00)
Highest education level is tertiary						-0.177*** (0.00)	-0.177*** (0.00)	-0.176*** (0.00)	-0.177*** (0.00)	-0.176*** (0.00)
Head is married						-0.008** (0.00)	0.011*** (0.00)	0.006*** (0.00)	0.006** (0.00)	0.006*** (0.00)
Head is employed						-0.033*** (0.00)	-0.038*** (0.00)	-0.032*** (0.00)	-0.031*** (0.00)	-0.032*** (0.00)
<i>Household characteristics</i>										
Household size						0.023*** (0.00)	0.023*** (0.00)	0.023*** (0.00)	0.023*** (0.00)	0.023*** (0.00)
Number of children age 0-14	0.077*** (0.00)	0.078*** (0.00)	0.078*** (0.00)	0.077*** (0.00)	0.078*** (0.00)	0.050*** (0.00)	0.050*** (0.00)	0.050*** (0.00)	0.049*** (0.00)	0.050*** (0.00)
Share of household members age 15-24						-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)
Share of household members age 60 and older						-0.021*** (0.00)	-0.021*** (0.00)	-0.021*** (0.00)	-0.018*** (0.00)	-0.021*** (0.00)
Urban						-0.084*** (0.00)	-0.084*** (0.00)	-0.084*** (0.00)	-0.084*** (0.00)	-0.084*** (0.00)
Iraq	-0.149*** (0.00)	-0.150*** (0.00)	-0.149*** (0.00)	-0.149*** (0.00)	-0.149*** (0.00)	-0.181*** (0.00)	-0.182*** (0.00)	-0.181*** (0.00)	-0.180*** (0.00)	-0.181*** (0.00)
Jordan	-0.145*** (0.01)	-0.145*** (0.01)	-0.145*** (0.01)	-0.144*** (0.01)	-0.145*** (0.01)	-0.091*** (0.01)	-0.093*** (0.01)	-0.093*** (0.01)	-0.090*** (0.01)	-0.092*** (0.01)
Mauritania	0.122*** (0.01)	0.123*** (0.01)	0.123*** (0.01)	0.125*** (0.01)	0.124*** (0.01)	0.058*** (0.01)	0.059*** (0.01)	0.059*** (0.01)	0.061*** (0.01)	0.059*** (0.01)
Palestine	0.181*** (0.01)	0.180*** (0.01)	0.180*** (0.01)	0.180*** (0.01)	0.180*** (0.01)	0.185*** (0.01)	0.184*** (0.01)	0.184*** (0.01)	0.184*** (0.01)	0.184*** (0.01)
Tunisia	-0.060*** (0.00)	-0.061*** (0.00)	-0.061*** (0.00)	-0.060*** (0.00)	-0.060*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)
_cons	0.126*** (0.00)	0.126*** (0.00)	0.125*** (0.00)	0.126*** (0.00)	0.127*** (0.00)	0.289*** (0.01)	0.284*** (0.01)	0.272*** (0.01)	0.268*** (0.01)	0.273*** (0.01)
Adjuster R2	0.16	0.16	0.16	0.16	0.16	0.21	0.21	0.21	0.21	0.21
Number of observations	214931	214931	214931	214931	214931	211069	211069	211069	211069	211069

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses. All regressions control for survey rounds fixed effects. The reference groups for head's education without formal education. The reference group for share of household members is share of members aged between 25 and 59 years. The reference country is Egypt.

Table A.12. Probabilities of Being Poor, Logit Model

	Specification 1				Specification 2			
	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated-female-adult	FHH Type 1 Self-reported	FHH Type 2 Majority-female-adult	FHH Type 3 Potential	FHH Type 4 Most-educated-female-adult
Self-reported FHH	-0.110*** (0.02)				-0.290*** (0.03)			
Self-reported FHH # Number of children age 0-14	0.057*** (0.01)				0.036*** (0.01)			
Share of female adults>0.5		0.415*** (0.02)				0.323*** (0.02)		
Share of female adults>0.5# Number of children age 0-14		-0.072*** (0.01)				-0.116*** (0.01)		
Potential FHH			-0.339*** (0.02)				-0.165*** (0.03)	
Potential FHH# Number of children age 0-14			0.124*** (0.01)				0.075*** (0.01)	
Educated females				-0.037 (0.02)				-0.040 (0.03)
Educated females# Number of children age 0-14				0.086*** (0.01)				0.074*** (0.01)
<i>Household head's characteristics</i>								
Head's age					-0.009*** (0.00)	-0.009*** (0.00)	-0.007*** (0.00)	-0.008*** (0.00)
Highest education level is primary					-0.451*** (0.02)	-0.443*** (0.02)	-0.443*** (0.02)	-0.448*** (0.02)
Highest education level is secondary					-0.911*** (0.02)	-0.903*** (0.02)	-0.900*** (0.02)	-0.903*** (0.02)
Highest education level is tertiary					-1.572*** (0.03)	-1.568*** (0.03)	-1.563*** (0.03)	-1.562*** (0.03)
Head is married					-0.097*** (0.03)	0.083*** (0.02)	0.059*** (0.02)	0.068*** (0.02)
Head is employed					-0.256*** (0.02)	-0.213*** (0.02)	-0.212*** (0.02)	-0.178*** (0.02)
<i>Household characteristics</i>								
Household size					0.160*** (0.00)	0.167*** (0.00)	0.160*** (0.00)	0.165*** (0.00)
Number of children age 0-14	0.468*** (0.00)	0.508*** (0.00)	0.456*** (0.00)	0.470*** (0.00)	0.301*** (0.01)	0.338*** (0.01)	0.298*** (0.01)	0.293*** (0.01)
Share of household members age 15-24					-0.092*** (0.01)	-0.095*** (0.01)	-0.095*** (0.01)	-0.100*** (0.01)
Share of household members age 60 and older					-0.325*** (0.02)	-0.316*** (0.02)	-0.286*** (0.02)	-0.315*** (0.02)
Urban					-0.614*** (0.01)	-0.610*** (0.01)	-0.611*** (0.01)	-0.611*** (0.01)
Iraq	-1.072*** (0.03)	-1.106*** (0.03)	-1.065*** (0.03)	-1.070*** (0.03)	-1.441*** (0.03)	-1.457*** (0.03)	-1.422*** (0.03)	-1.429*** (0.03)
Jordan	-1.184*** (0.07)	-1.203*** (0.07)	-1.180*** (0.07)	-1.204*** (0.07)	-0.886*** (0.08)	-0.903*** (0.08)	-0.863*** (0.08)	-0.880*** (0.08)
Mauritania	-1.117*** (0.05)	-1.152*** (0.05)	-1.125*** (0.05)	-1.137*** (0.05)	-1.622*** (0.05)	-1.628*** (0.05)	-1.665*** (0.05)	-1.664*** (0.05)
Palestine	0.796*** (0.04)	0.784*** (0.04)	0.797*** (0.04)	0.795*** (0.04)	0.887*** (0.04)	0.880*** (0.04)	0.896*** (0.04)	0.892*** (0.04)
Tunisia	-0.468*** (0.03)	-0.481*** (0.03)	-0.466*** (0.03)	-0.473*** (0.03)	-0.438*** (0.03)	-0.445*** (0.03)	-0.433*** (0.03)	-0.434*** (0.03)
_cons	-1.917*** (0.04)	-2.062*** (0.04)	-1.861*** (0.04)	-1.932*** (0.04)	-0.606*** (0.06)	-0.975*** (0.06)	-0.877*** (0.06)	-0.915*** (0.06)
N	214931	214931	214931	214931	211069	211069	211069	211069

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses. All regressions control for survey rounds fixed effects. The reference groups for head's education without formal education. The reference group for share of household members is share of members aged between 25 and 59 years. The reference country is Egypt.

Table A.13. Probabilities of Being Poor for Other FHH Types, Logit Model

	Specification 1					Specification 2				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
De-jure FHH	-0.098*** (0.02)					-0.098** (0.05)				
De-jure FHH # Number of children age 0-14	0.094*** (0.01)					0.059*** (0.01)				
Married FHH		-0.182*** (0.05)					-0.392*** (0.06)			
Married FHH # Number of children age 0-14		0.024 (0.02)					0.029* (0.02)			
Employed FHH			0.036 (0.03)					-0.135*** (0.05)		
Employed FHH # Number of children age 0-14			-0.002 (0.01)					0.058*** (0.02)		
Asset FHH				-0.235*** (0.03)					-0.103*** (0.03)	
Asset FHH # Number of children age 0-14				0.106*** (0.01)					0.056*** (0.01)	
Core FHH					-0.259*** (0.04)					0.028 (0.03)
Core FHH # Number of children age 0-14					0.060*** (0.02)					-0.016 (0.01)
<i>Household head's characteristics</i>										
Head's age						-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)
Highest education level is primary						-0.443*** (0.02)	-0.449*** (0.02)	-0.442*** (0.02)	-0.442*** (0.02)	-0.442*** (0.02)
Highest education level is secondary						-0.902*** (0.02)	-0.909*** (0.02)	-0.900*** (0.02)	-0.900*** (0.02)	-0.901*** (0.02)
Highest education level is tertiary						-1.563*** (0.03)	-1.570*** (0.03)	-1.562*** (0.03)	-1.562*** (0.03)	-1.564*** (0.03)
Head is married						0.061 (0.04)	0.104*** (0.02)	0.065*** (0.02)	0.065*** (0.02)	0.066*** (0.02)
Head is employed						-0.216*** (0.02)	-0.267*** (0.02)	-0.216*** (0.02)	-0.210*** (0.02)	-0.216*** (0.02)
<i>Household characteristics</i>										
Household size						0.162*** (0.00)	0.161*** (0.00)	0.163*** (0.00)	0.162*** (0.00)	0.163*** (0.00)
Number of children age 0-14	0.470*** (0.00)	0.477*** (0.00)	0.478*** (0.00)	0.465*** (0.00)	0.474*** (0.00)	0.298*** (0.01)	0.303*** (0.01)	0.300*** (0.01)	0.298*** (0.01)	0.303*** (0.01)
Share of household members age 15-24						-0.096*** (0.01)	-0.092*** (0.01)	-0.100*** (0.01)	-0.099*** (0.01)	-0.100*** (0.01)
Share of household members age 60 and older						-0.316*** (0.02)	-0.326*** (0.02)	-0.323*** (0.02)	-0.304*** (0.02)	-0.324*** (0.02)
Urban						-0.613*** (0.01)	-0.616*** (0.01)	-0.611*** (0.01)	-0.610*** (0.01)	-0.612*** (0.01)
Iraq	-1.077*** (0.03)	-1.081*** (0.03)	-1.079*** (0.03)	-1.071*** (0.03)	-1.076*** (0.03)	-1.434*** (0.03)	-1.446*** (0.03)	-1.436*** (0.03)	-1.432*** (0.03)	-1.441*** (0.03)
Jordan	-1.188*** (0.07)	-1.194*** (0.07)	-1.191*** (0.07)	-1.183*** (0.07)	-1.189*** (0.07)	-0.876*** (0.08)	-0.895*** (0.08)	-0.881*** (0.08)	-0.872*** (0.08)	-0.885*** (0.08)
Mauritania	-1.115*** (0.05)	-1.080*** (0.05)	-1.097*** (0.05)	-1.098*** (0.05)	-1.091*** (0.05)	-1.649*** (0.05)	-1.597*** (0.05)	-1.647*** (0.05)	-1.649*** (0.05)	-1.636*** (0.05)
Palestine	0.795*** (0.04)	0.794*** (0.04)	0.794*** (0.04)	0.786*** (0.04)	0.795*** (0.04)	0.889*** (0.04)	0.883*** (0.04)	0.889*** (0.04)	0.887*** (0.04)	0.887*** (0.04)
Tunisia	-0.468*** (0.03)	-0.469*** (0.03)	-0.469*** (0.03)	-0.465*** (0.03)	-0.467*** (0.03)	-0.434*** (0.03)	-0.436*** (0.03)	-0.434*** (0.03)	-0.433*** (0.03)	-0.435*** (0.03)
_cons	-1.923*** (0.04)	-1.935*** (0.04)	-1.943*** (0.04)	-1.926*** (0.04)	-1.927*** (0.04)	-0.849*** (0.07)	-0.781*** (0.06)	-0.866*** (0.06)	-0.888*** (0.06)	-0.871*** (0.06)
N	214931	214931	214931	214931	214931	211069	211069	211069	211069	211069

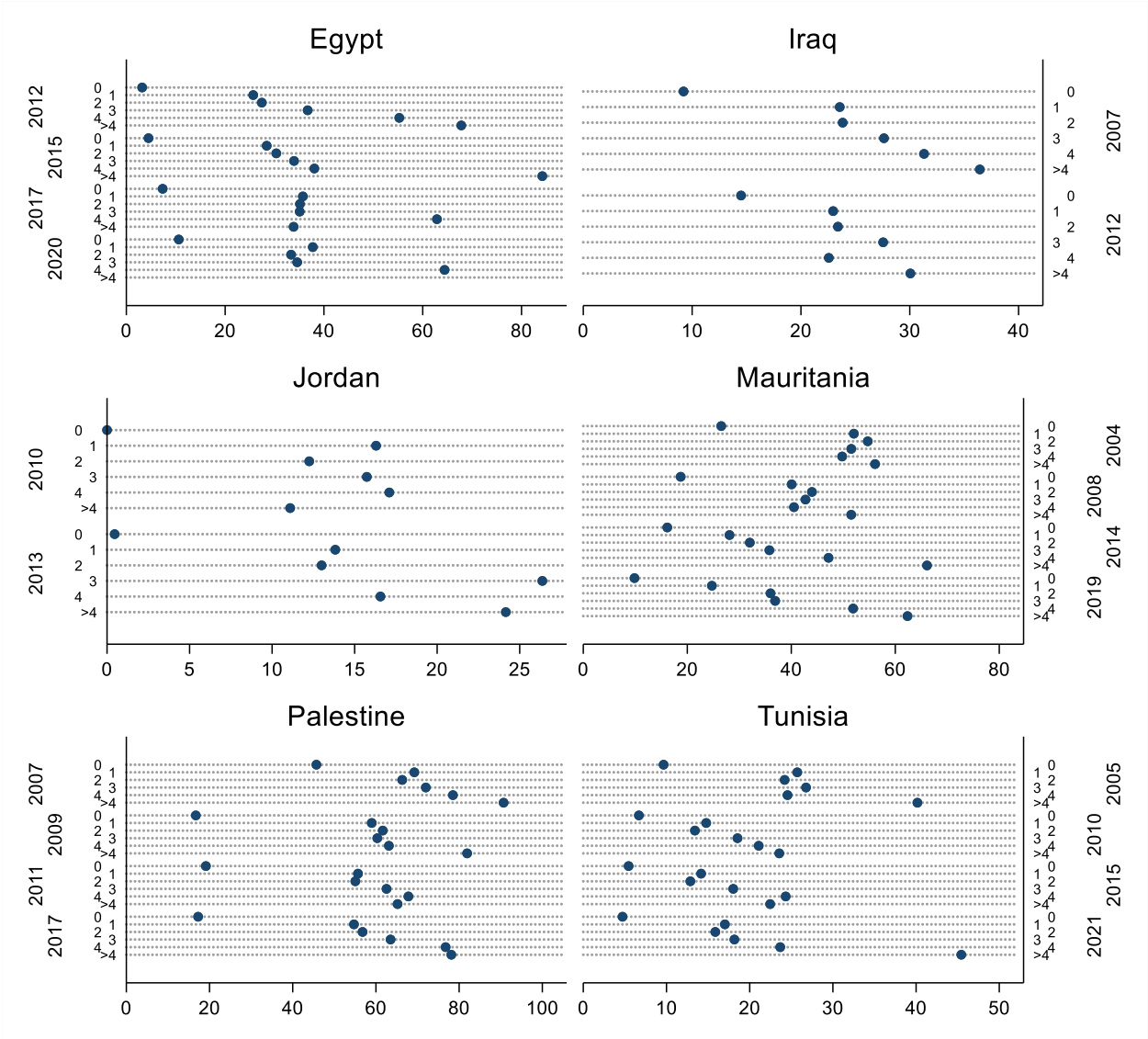
Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses. All regressions control for survey rounds fixed effects. The reference groups for head's education without formal education. The reference group for share of household members is share of members aged between 25 and 59 years. The reference country is Egypt.

Table A.14. Probabilities of Being Poor for Combination of Main Female-Headed Household Types, Linear Probability Model

	Specification 1		Specification 2	
	(1)	(2)	(3)	(4)
Overlap of self-reported FHHs, potential FHHs, and most-educated-female-adult FHHs	-0.037*** (0.00)		-0.033*** (0.00)	
Overlap of self-reported FHHs, potential FHHs, and most-educated-female-adult FHHs # Number of children age 0-14	0.005** (0.00)		0.007*** (0.00)	
Overlap of self-reported FHHs, potential FHHs, majority of females and most-educated-female-adult FHHs		-0.037*** (0.00)		-0.033*** (0.00)
Overlap of self-reported FHHs, potential FHHs, majority of females and most-educated-female-adult FHHs # Number of children age 0-14		0.005** (0.00)		0.007*** (0.00)
<i>Household head's characteristics</i>				
Head's age			-0.001*** (0.00)	-0.001*** (0.00)
Highest education level is primary			-0.064*** (0.00)	-0.064*** (0.00)
Highest education level is secondary			-0.121*** (0.00)	-0.121*** (0.00)
Highest education level is tertiary			-0.176*** (0.00)	-0.176*** (0.00)
Head is married			0.001 (0.00)	0.001 (0.00)
Head is employed			-0.033*** (0.00)	-0.033*** (0.00)
<i>Household characteristics</i>				
Household size			0.023*** (0.00)	0.023*** (0.00)
Number of children age 0-14	0.078*** (0.00)	0.078*** (0.00)	0.050*** (0.00)	0.050*** (0.00)
Share of household members age 15-24			-0.009*** (0.00)	-0.009*** (0.00)
Share of household members age 60 and older			-0.021*** (0.00)	-0.021*** (0.00)
Urban			-0.084*** (0.00)	-0.084*** (0.00)
Iraq	-0.150*** (0.00)	-0.150*** (0.00)	-0.181*** (0.00)	-0.181*** (0.00)
Jordan	-0.145*** (0.01)	-0.145*** (0.01)	-0.093*** (0.01)	-0.093*** (0.01)
Mauritania	-0.150*** (0.01)	-0.150*** (0.01)	-0.209*** (0.01)	-0.209*** (0.01)
Palestine	0.180*** (0.01)	0.180*** (0.01)	0.184*** (0.01)	0.184*** (0.01)
Tunisia	-0.061*** (0.00)	-0.061*** (0.00)	-0.054*** (0.00)	-0.054*** (0.00)
_cons	0.129*** (0.00)	0.129*** (0.00)	0.283*** (0.01)	0.283*** (0.01)
Adjusted R2	0.16	0.16	0.21	0.21
Number of observations	214931	214931	211069	211069

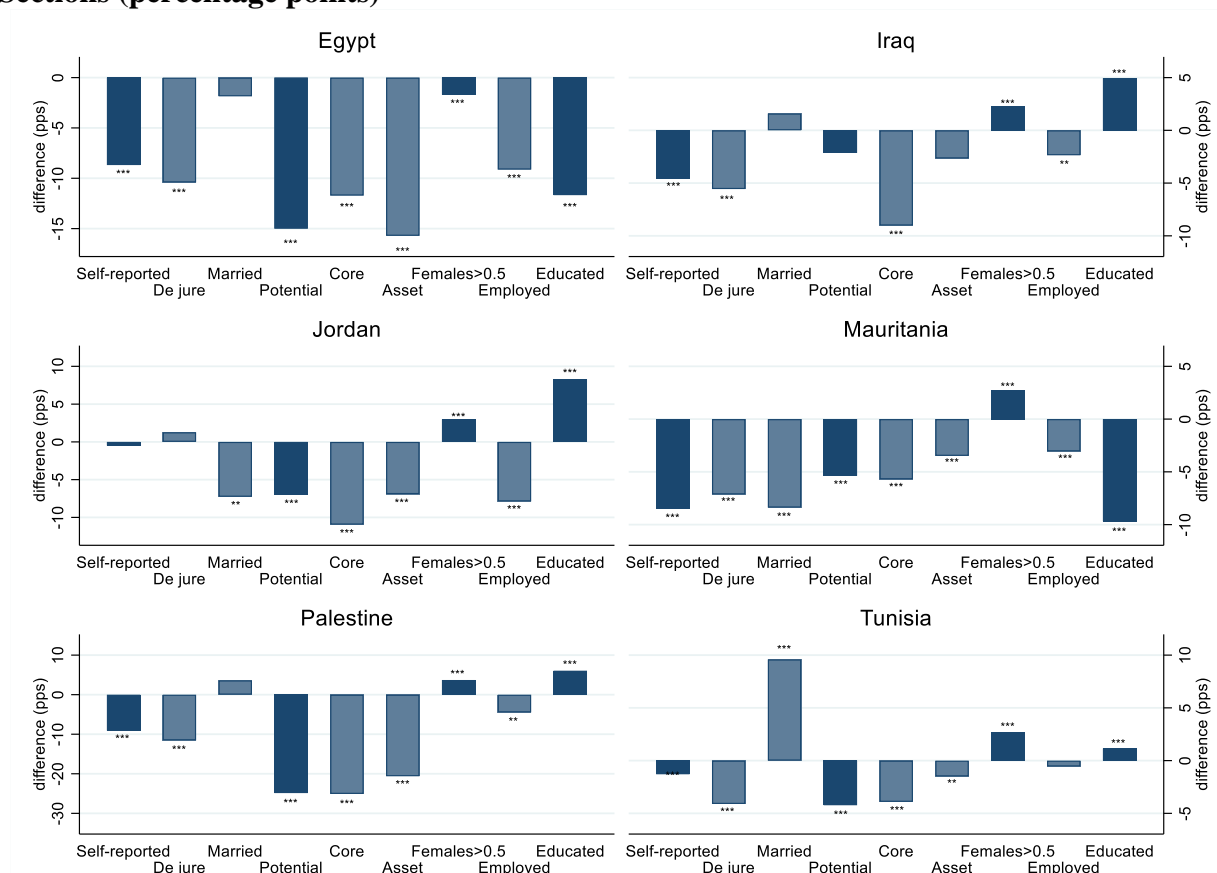
Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Robust standard errors are in parentheses.

Figure A.1. Headcount Poverty Rates in Self-Reported Male-Headed Households (%), by Number of Female Adults



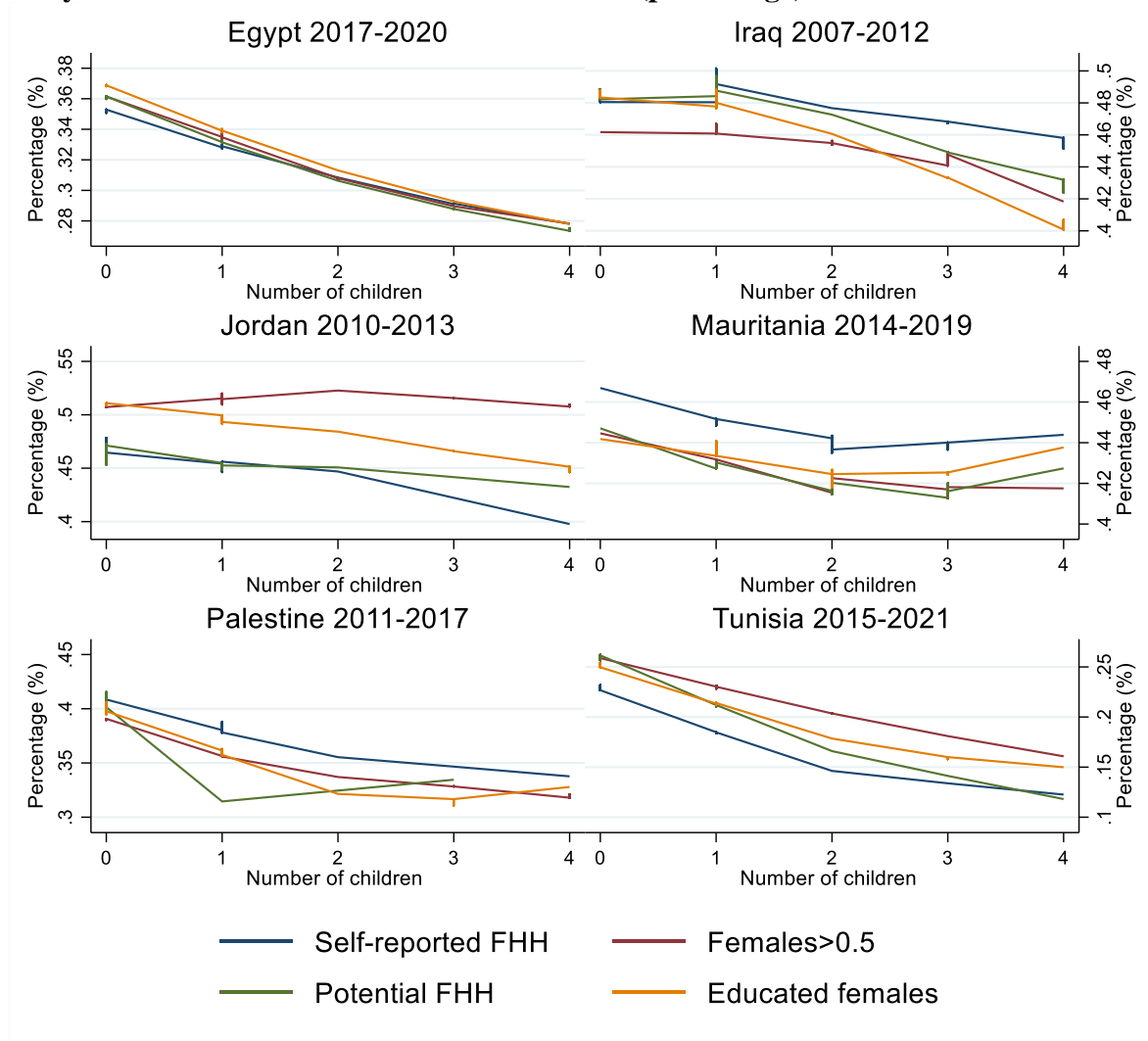
Note: Headcount poverty rates are estimated using per capita household expenditures.

Figure A.2. FHH–non-FHH Differences in Headcount Poverty Rate in MENA, Pooled Cross Sections (percentage points)



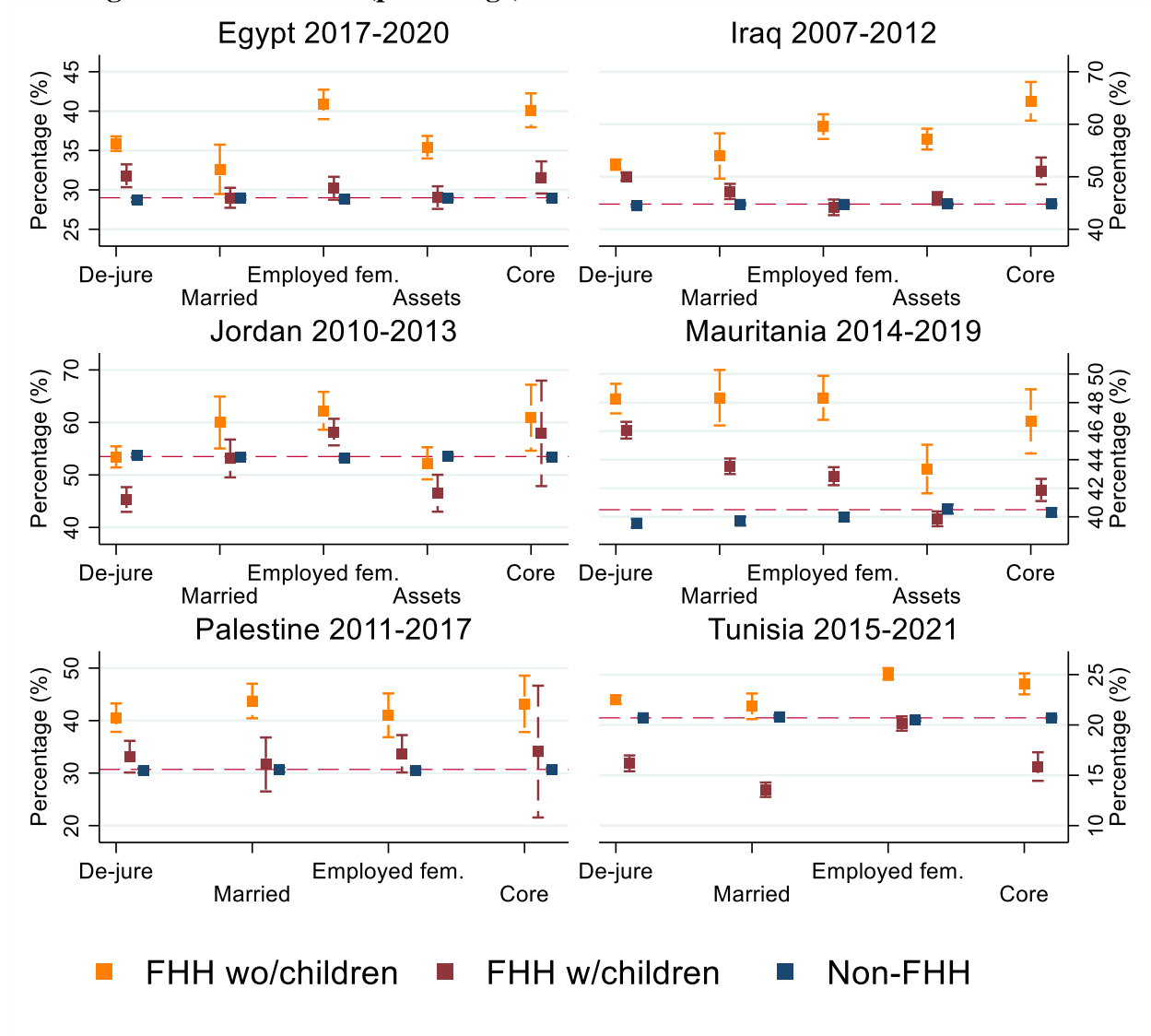
Note: Authors' calculation based on pooled cross sections. The four main types of FHHs are shown in darker color, the five sub-types of FHHs are shown in lighter color. The headcount poverty rate is applied to per capita household expenditures, of FHHs versus the rest of the households. Stars indicate statistically significantly higher headcount poverty ratio between FHHs and non-FHHs in each category. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels respectively.

Figure A.3. Correlation Between Probabilities of Female-Headed Households Escaping Poverty in Second Year and Number of Children (percentage)



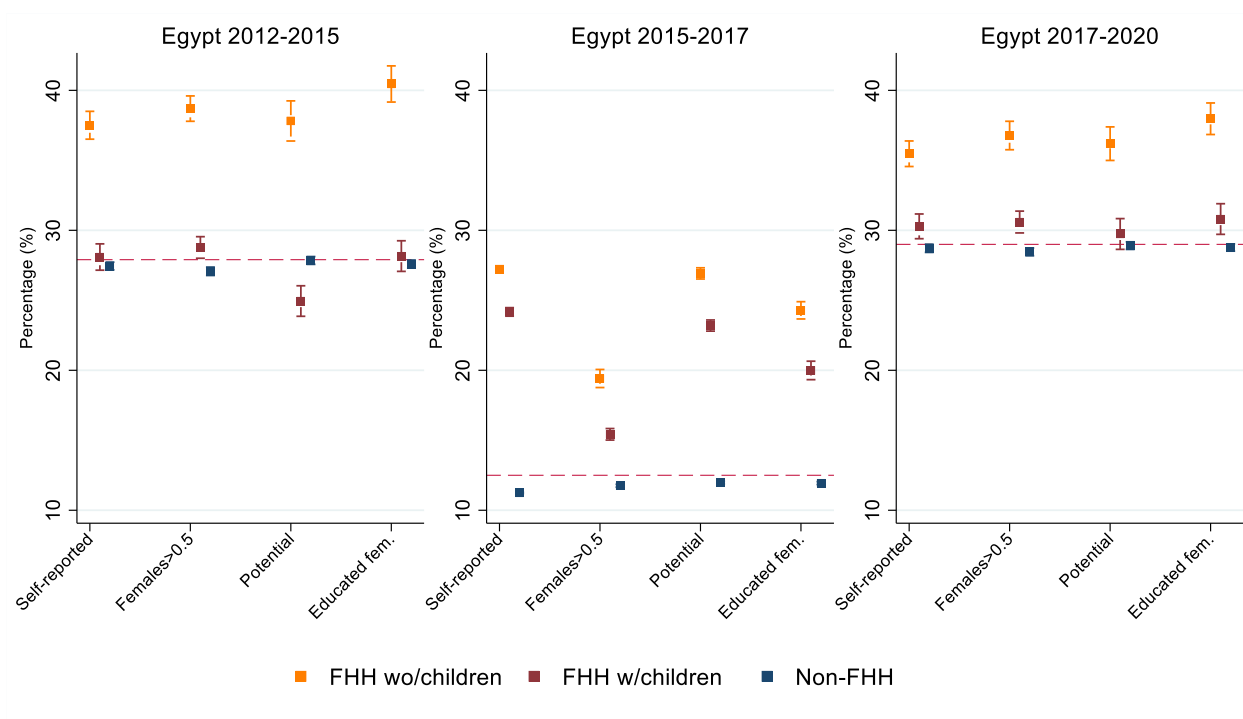
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round.

Figure A.4. Probability of Other FHH Types Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage)



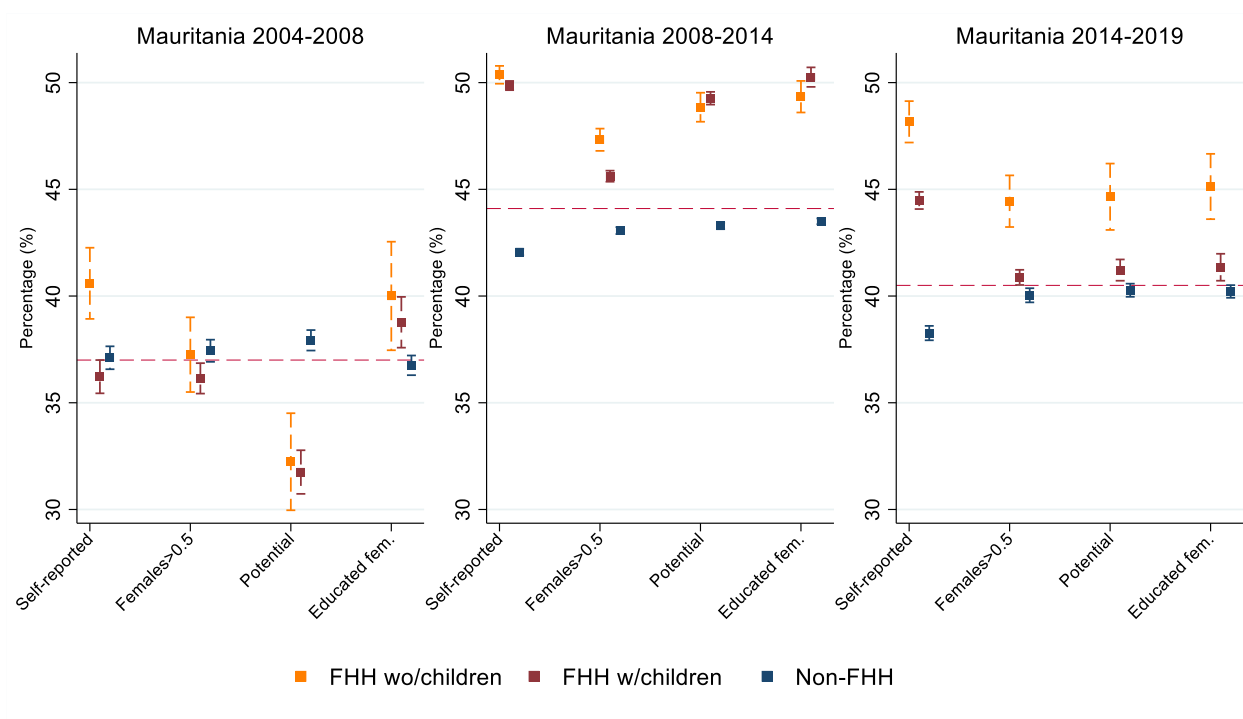
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.5. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage), Egypt



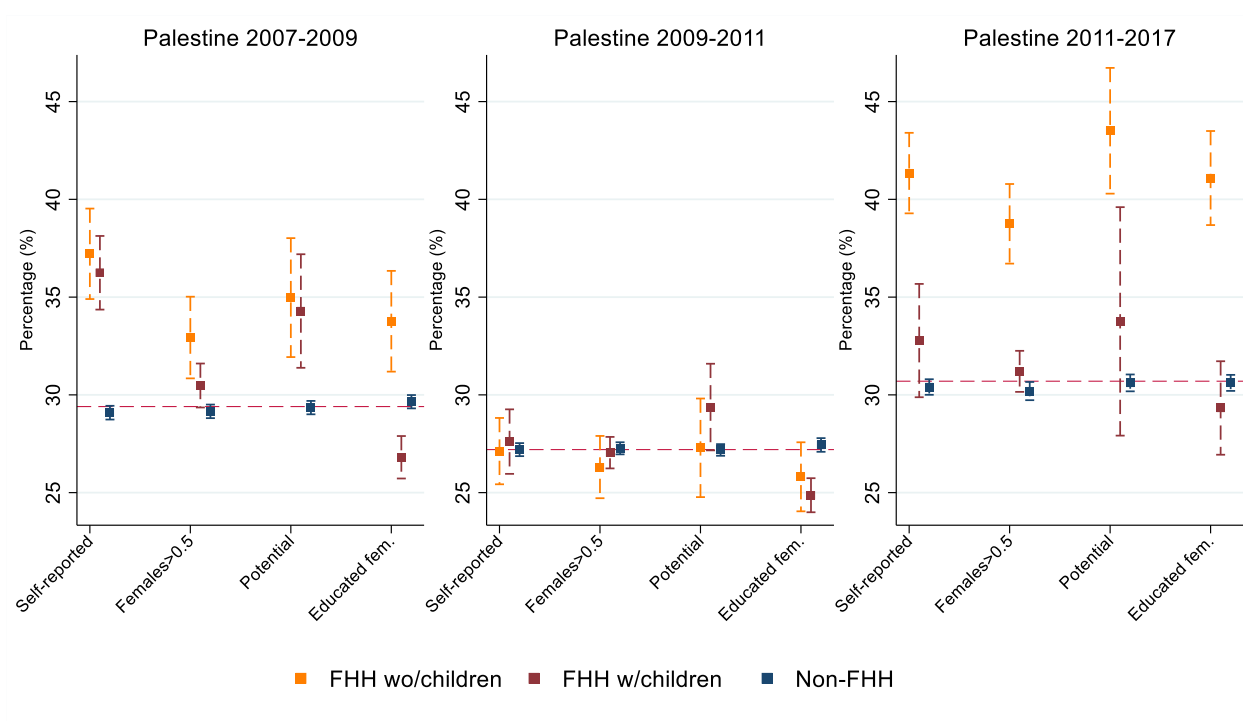
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.6. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage), Mauritania



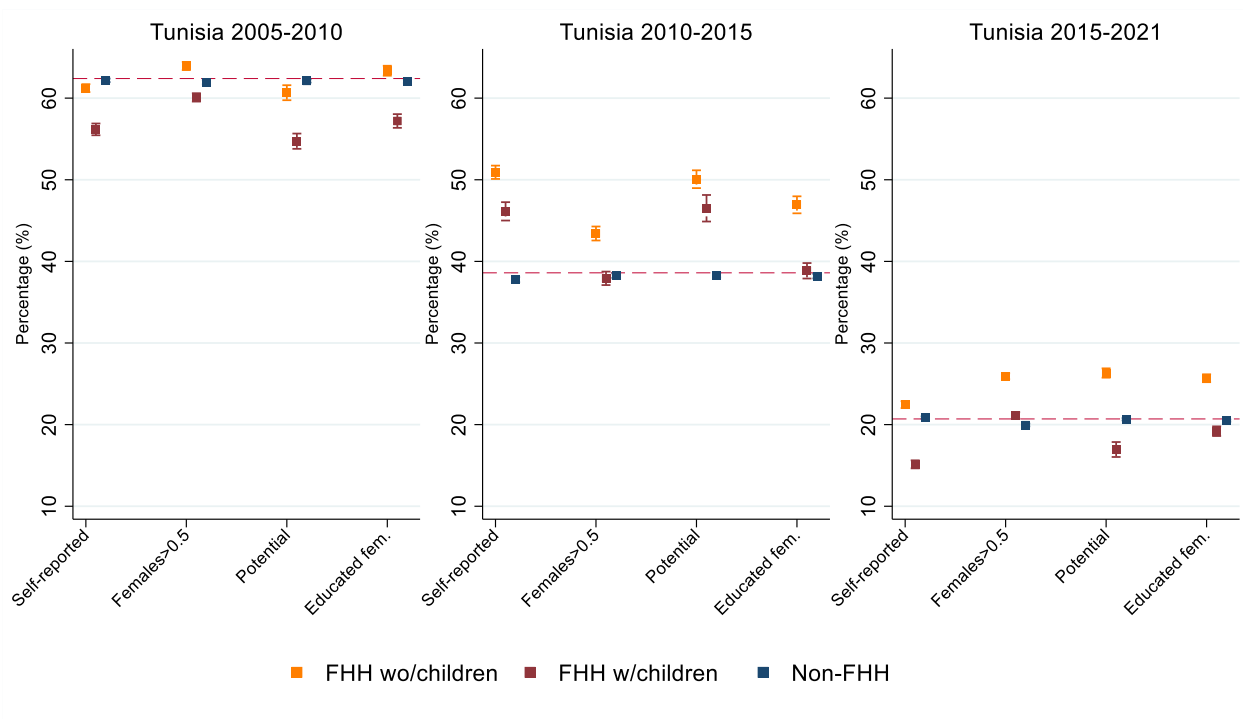
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.7. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage), Palestine



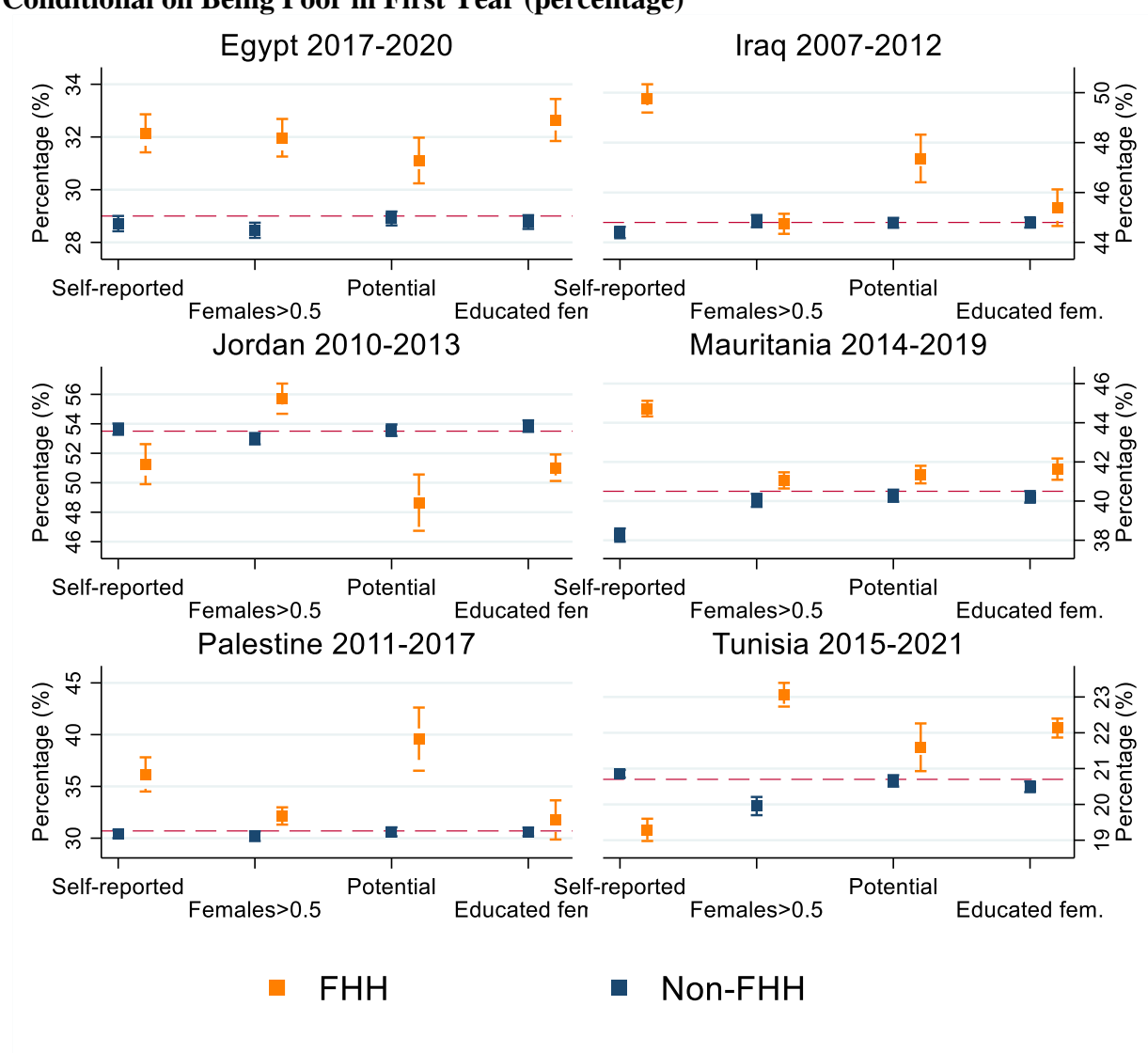
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.8. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage), Tunisia



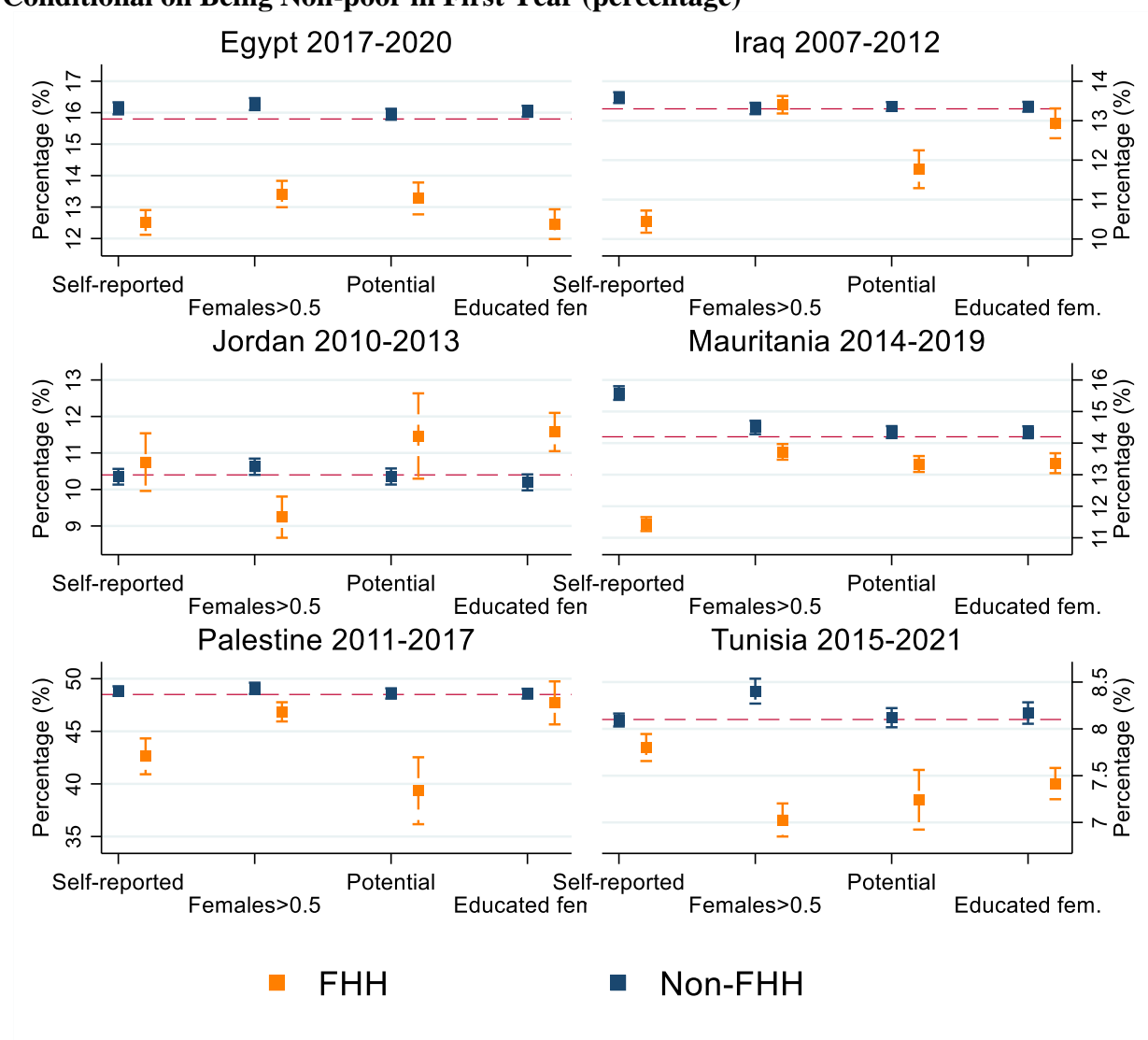
Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.9. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Figure A.10. Probabilities of Female-Headed Households Falling in Poverty in Second Year Conditional on Being Non-poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that enters poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps.

Appendix B: Additional Descriptive Statistics for Self-reported FHHs and MHHs

Table B.1. Descriptive Statistics, Egypt 2012-2020

	Egypt									
	2012		2017		2017		2020		Pooled 2012-2020	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	47.17 (13.44)	54.11 (15.13)	48.71 (13.13)	56.05 (14.43)	49.99 (12.87)	57.19 (14.01)	47.01 (13.79)	55.49 (16.04)	48.37 (13.34)	55.91 (14.89)
Head does not complete primary school	0.40 (0.49)	0.69 (0.46)	0.36 (0.48)	0.63 (0.48)	0.34 (0.47)	0.63 (0.48)	0.31 (0.46)	0.58 (0.49)	0.35 (0.48)	0.63 (0.48)
Head's highest education level is primary	0.13 (0.33)	0.09 (0.29)	0.15 (0.36)	0.12 (0.32)	0.15 (0.36)	0.11 (0.31)	0.14 (0.35)	0.11 (0.31)	0.15 (0.35)	0.11 (0.31)
Head's highest education level is secondary	0.28 (0.45)	0.14 (0.35)	0.29 (0.45)	0.16 (0.36)	0.30 (0.46)	0.15 (0.36)	0.33 (0.47)	0.19 (0.39)	0.30 (0.46)	0.16 (0.37)
Head's highest education level is tertiary	0.19 (0.40)	0.08 (0.27)	0.20 (0.40)	0.09 (0.29)	0.20 (0.40)	0.10 (0.30)	0.22 (0.41)	0.12 (0.33)	0.20 (0.40)	0.10 (0.30)
Head is never married	0.02 (0.13)	0.03 (0.16)	0.01 (0.12)	0.02 (0.14)	0.01 (0.11)	0.03 (0.16)	0.01 (0.12)	0.03 (0.18)	0.01 (0.12)	0.03 (0.16)
Head is mono married	0.95 (0.22)	0.21 (0.41)	0.93 (0.25)	0.16 (0.37)	0.95 (0.22)	0.14 (0.34)	0.95 (0.21)	0.20 (0.40)	0.95 (0.23)	0.17 (0.38)
Head is poly married	0.01 (0.07)	0.00 (0.00)	0.02 (0.12)	0.00 (0.00)	0.00 (0.06)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.08)	0.00 (0.00)
Head is divorced/separated	0.01 (0.08)	0.05 (0.22)	0.01 (0.09)	0.07 (0.26)	0.01 (0.09)	0.08 (0.28)	0.01 (0.09)	0.10 (0.30)	0.01 (0.09)	0.08 (0.27)
Head is widowed	0.02 (0.15)	0.71 (0.46)	0.03 (0.17)	0.74 (0.44)	0.03 (0.16)	0.75 (0.43)	0.02 (0.15)	0.66 (0.47)	0.03 (0.16)	0.72 (0.45)
Head is employed	0.86 (0.34)	0.19 (0.40)	0.83 (0.37)	0.20 (0.40)	0.81 (0.39)	0.19 (0.39)	0.85 (0.36)	0.21 (0.41)	0.84 (0.37)	0.20 (0.40)
Head is unemployed	0.01 (0.09)	0.00 (0.05)	0.01 (0.07)	0.00 (0.06)	0.01 (0.08)	0.01 (0.08)	0.01 (0.08)	0.02 (0.13)	0.01 (0.08)	0.01 (0.08)
Head is homemaker/housewife	0.00 (0.00)	0.20 (0.40)	0.00 (0.00)	0.48 (0.50)	0.00 (0.00)	0.51 (0.50)	0.00 (0.00)	0.49 (0.50)	0.00 (0.00)	0.44 (0.50)
Head is student	0.00 (0.05)	0.00 (0.00)	0.00 (0.04)	0.00 (0.04)	0.00 (0.01)	0.00 (0.04)	0.00 (0.03)	0.01 (0.07)	0.00 (0.03)	0.00 (0.05)
Head is pensioner/retired/disabled	0.11 (0.31)	0.51 (0.50)	0.15 (0.36)	0.31 (0.46)	0.18 (0.38)	0.29 (0.46)	0.14 (0.35)	0.27 (0.45)	0.15 (0.36)	0.33 (0.47)
Head is other activities	0.02 (0.13)	0.09 (0.29)	0.01 (0.08)	0.00 (0.06)	0.00 (0.07)	0.00 (0.02)	0.00 (0.06)	0.00 (0.03)	0.01 (0.08)	0.02 (0.13)
Per capita consumption	6,718.96 (5,294)	8,409.76 (6,273)	10,221.28 (10,335)	13,114.56 (12,830)	14,350.90 (11,865)	19,356.74 (13,604)	16,744.03 (18,062)	21,530.11 (16,090)	12,483.20 (13,131)	16,279.27 (14,000)
Per capita transfers	1,201.68 (3,334)	5,234.46 (5,406)	2,281.21 (5,429)	8,402.00 (9,957)	3,864.17 (8,474)	12,784.78 (11,940)	4,060.60 (8,253)	15,846.50 (15,900)	3,007.98 (7,046)	11,034.81 (12,376)
Household size	4.63 (1.81)	2.97 (1.85)	4.54 (1.71)	3.00 (1.92)	4.49 (1.71)	2.72 (1.73)	4.35 (1.60)	2.63 (1.67)	4.50 (1.70)	2.82 (1.80)
Number of children age 0-14	1.47 (1.35)	0.72 (1.14)	1.43 (1.39)	0.72 (1.21)	1.39 (1.40)	0.56 (1.04)	1.53 (1.38)	0.69 (1.18)	1.45 (1.38)	0.67 (1.15)
Number of seniors	0.20 (0.49)	0.31 (0.47)	0.21 (0.50)	0.32 (0.47)	0.25 (0.55)	0.36 (0.49)	0.21 (0.51)	0.36 (0.49)	0.22 (0.51)	0.34 (0.48)
1-2 adults, no child	0.12 (0.32)	0.42 (0.49)	0.13 (0.34)	0.42 (0.49)	0.15 (0.36)	0.49 (0.50)	0.14 (0.35)	0.50 (0.50)	0.14 (0.34)	0.46 (0.50)
1-2 adults, 1-2 children	0.23 (0.42)	0.18 (0.38)	0.19 (0.39)	0.16 (0.37)	0.16 (0.36)	0.15 (0.35)	0.25 (0.43)	0.18 (0.38)	0.20 (0.40)	0.16 (0.37)
1-2 adult, 3 or more children	0.23 (0.42)	0.11 (0.31)	0.25 (0.43)	0.10 (0.30)	0.26 (0.44)	0.09 (0.29)	0.25 (0.43)	0.11 (0.31)	0.25 (0.43)	0.10 (0.30)
3 adults or more, 0-1 child	0.23 (0.42)	0.20 (0.40)	0.25 (0.43)	0.21 (0.41)	0.26 (0.44)	0.20 (0.40)	0.21 (0.41)	0.16 (0.36)	0.24 (0.43)	0.19 (0.40)
3 adults or more, 2-3 children	0.14 (0.35)	0.07 (0.25)	0.14 (0.34)	0.08 (0.28)	0.14 (0.35)	0.05 (0.23)	0.12 (0.33)	0.04 (0.21)	0.14 (0.34)	0.06 (0.24)
3 adults or more, 4 children or more	0.05 (0.21)	0.02 (0.14)	0.04 (0.19)	0.02 (0.15)	0.03 (0.18)	0.01 (0.12)	0.03 (0.17)	0.01 (0.11)	0.04 (0.19)	0.02 (0.13)
Rural area	0.56 (0.50)	0.55 (0.50)	0.55 (0.50)	0.52 (0.50)	0.55 (0.50)	0.49 (0.50)	0.57 (0.50)	0.54 (0.50)	0.56 (0.50)	0.52 (0.50)
Urban area	0.44 (0.50)	0.45 (0.50)	0.45 (0.50)	0.48 (0.50)	0.45 (0.50)	0.51 (0.50)	0.43 (0.50)	0.46 (0.50)	0.44 (0.50)	0.48 (0.50)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.2. Descriptive Statistics, Palestine 2007-2017

	Palestine									
	2007		2009		2011		2017		Pooled 2007-2017	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	44.45 (13.29)	57.75 (16.31)	43.99 (13.21)	57.96 (15.03)	45.06 (12.95)	58.27 (13.21)	45.37 (12.96)	59.97 (13.16)	44.77 (13.08)	58.61 (14.16)
Head does not complete primary school	0.15 (0.35)	0.52 (0.50)	0.14 (0.35)	0.53 (0.50)	0.12 (0.33)	0.50 (0.50)	0.12 (0.32)	0.43 (0.50)	0.13 (0.34)	0.49 (0.50)
Head's highest education level is primary	0.52 (0.50)	0.24 (0.43)	0.48 (0.50)	0.28 (0.45)	0.49 (0.50)	0.31 (0.46)	0.49 (0.50)	0.37 (0.48)	0.49 (0.50)	0.31 (0.46)
Head's highest education level is secondary	0.16 (0.36)	0.12 (0.32)	0.17 (0.38)	0.11 (0.31)	0.18 (0.38)	0.10 (0.30)	0.16 (0.37)	0.08 (0.28)	0.17 (0.38)	0.10 (0.30)
Head's highest education level is tertiary	0.17 (0.38)	0.11 (0.32)	0.21 (0.41)	0.08 (0.28)	0.21 (0.41)	0.09 (0.29)	0.23 (0.42)	0.11 (0.31)	0.21 (0.41)	0.10 (0.30)
Head is never married	0.01 (0.10)	0.06 (0.25)	0.01 (0.09)	0.11 (0.31)	0.01 (0.08)	0.10 (0.30)	0.00 (0.00)	0.00 (0.00)	0.01 (0.08)	0.07 (0.26)
Head is mono married	0.96 (0.19)	0.09 (0.29)	0.97 (0.18)	0.12 (0.33)	0.97 (0.17)	0.10 (0.30)	0.99 (0.10)	0.20 (0.40)	0.97 (0.16)	0.13 (0.34)
Head is poly married	0.02 (0.12)	0.00 (0.00)	0.01 (0.11)	0.00 (0.00)	0.01 (0.10)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.01 (0.09)	0.00 (0.00)
Head is divorced/separated	0.00 (0.00)	0.11 (0.31)	0.00 (0.05)	0.06 (0.25)	0.00 (0.06)	0.10 (0.30)	0.01 (0.09)	0.72 (0.45)	0.00 (0.06)	0.26 (0.44)
Head is widowed	0.01 (0.11)	0.73 (0.44)	0.01 (0.10)	0.71 (0.46)	0.01 (0.10)	0.70 (0.46)	0.00 (0.05)	0.08 (0.27)	0.01 (0.09)	0.53 (0.50)
Head is employed	0.76 (0.43)	0.21 (0.41)	0.76 (0.43)	0.23 (0.42)	0.78 (0.42)	0.24 (0.43)			0.77 (0.42)	0.23 (0.42)
Head is unemployed	0.12 (0.32)	0.02 (0.14)	0.08 (0.27)	0.01 (0.11)	0.08 (0.27)	0.02 (0.15)			0.08 (0.28)	0.02 (0.13)
Head is homemaker/housewife	0.00 (0.05)	0.56 (0.50)	0.00 (0.05)	0.47 (0.50)	0.14 (0.34)	0.08 (0.28)			0.06 (0.24)	0.29 (0.45)
Head is student	0.00 (0.06)	0.00 (0.00)	0.00 (0.03)	0.00 (0.06)	0.00 (0.04)	0.00 (0.04)			0.00 (0.04)	0.00 (0.04)
Head is pensioner/retired/disabled	0.08 (0.27)	0.18 (0.39)	0.10 (0.30)	0.27 (0.44)	0.00 (0.00)	0.00 (0.00)			0.05 (0.22)	0.13 (0.33)
Head is other activities	0.04 (0.20)	0.03 (0.18)	0.06 (0.24)	0.02 (0.13)	0.01 (0.10)	0.66 (0.48)			0.03 (0.18)	0.33 (0.47)
Per capita consumption	9,147.45 (9,668)	14,179.85 (13,757)	11,758.84 (10,971)	15,823.72 (12,594)	13,164.33 (12,794)	16,983.40 (13,025)	12,202.69 (9,668)	16,567.52 (13,757)	12,095.51 (11,135)	16,304.18 (12,622)
Household size	6.62 (2.75)	3.84 (2.86)	6.31 (2.67)	3.44 (2.34)	6.27 (2.54)	3.63 (2.86)	5.76 (2.31)	3.34 (2.51)	6.17 (2.55)	3.51 (2.62)
Number of children age 0-14	2.69 (1.95)	0.99 (1.60)	2.42 (1.93)	0.71 (1.41)	2.38 (1.85)	0.81 (1.52)	2.31 (1.86)	0.70 (1.32)	2.40 (1.89)	0.77 (1.44)
Number of seniors	0.22 (0.51)	0.40 (0.50)	0.19 (0.50)	0.42 (0.51)	0.19 (0.49)	0.42 (0.53)	0.17 (0.46)	0.41 (0.50)	0.19 (0.49)	0.42 (0.51)
1-2 adults, no child	0.07 (0.25)	0.37 (0.49)	0.07 (0.25)	0.42 (0.49)	0.07 (0.25)	0.44 (0.50)			0.07 (0.25)	0.43 (0.49)
1-2 adults, 1-2 children	0.09 (0.29)	0.15 (0.36)	0.13 (0.34)	0.08 (0.28)	0.10 (0.31)	0.08 (0.27)			0.11 (0.32)	0.09 (0.28)
1-2 adult, 3 or more children	0.37 (0.48)	0.12 (0.32)	0.33 (0.47)	0.11 (0.32)	0.34 (0.47)	0.09 (0.29)			0.34 (0.47)	0.10 (0.31)
3 adults or more, 0-1 child	0.13 (0.33)	0.22 (0.42)	0.14 (0.35)	0.26 (0.44)	0.17 (0.37)	0.22 (0.42)			0.15 (0.36)	0.23 (0.42)
3 adults or more, 2-3 children	0.15 (0.36)	0.07 (0.25)	0.15 (0.36)	0.08 (0.28)	0.14 (0.35)	0.09 (0.29)			0.15 (0.35)	0.09 (0.28)
3 adults or more, 4 children or more	0.20 (0.40)	0.08 (0.27)	0.18 (0.38)	0.04 (0.20)	0.18 (0.38)	0.07 (0.26)			0.18 (0.38)	0.06 (0.24)
Rural area	0.29 (0.45)	0.26 (0.44)	0.17 (0.37)	0.22 (0.42)	0.17 (0.38)	0.18 (0.39)	0.18 (0.38)	0.17 (0.37)	0.18 (0.39)	0.20 (0.40)
Urban area	0.57 (0.50)	0.60 (0.49)	0.74 (0.44)	0.68 (0.47)	0.74 (0.44)	0.72 (0.45)	0.73 (0.44)	0.72 (0.45)	0.72 (0.45)	0.70 (0.46)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.3. Descriptive Statistics, Tunisia 2005-2021

	Tunisia									
	2005		2010		2015		2021		Pooled 2005-2021	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	52.12 (14.07)	57.74 (15.18)	53.44 (13.74)	59.52 (15.60)	53.38 (13.65)	60.99 (14.86)	55.40 (13.53)	61.95 (14.47)	53.72 (13.78)	60.31 (15.04)
Head does not complete primary school	0.75 (0.43)	0.92 (0.27)	0.77 (0.42)	0.93 (0.26)	0.19 (0.39)	0.57 (0.50)	0.13 (0.34)	0.48 (0.50)	0.42 (0.49)	0.68 (0.47)
Head's highest education level is primary	0.04 (0.20)	0.01 (0.12)	0.03 (0.18)	0.02 (0.12)	0.39 (0.49)	0.25 (0.43)	0.42 (0.49)	0.30 (0.46)	0.25 (0.43)	0.17 (0.38)
Head's highest education level is secondary	0.12 (0.32)	0.05 (0.21)	0.11 (0.31)	0.04 (0.20)	0.29 (0.46)	0.13 (0.34)	0.32 (0.47)	0.16 (0.36)	0.22 (0.42)	0.10 (0.31)
Head's highest education level is tertiary	0.09 (0.28)	0.02 (0.14)	0.09 (0.29)	0.02 (0.14)	0.13 (0.33)	0.05 (0.22)	0.13 (0.33)	0.06 (0.23)	0.11 (0.31)	0.04 (0.20)
Head is never married	0.02 (0.13)	0.06 (0.24)	0.01 (0.11)	0.04 (0.19)	0.03 (0.17)	0.08 (0.27)	0.03 (0.17)	0.08 (0.27)	0.02 (0.15)	0.07 (0.25)
Head is mono married	0.96 (0.20)	0.19 (0.39)	0.97 (0.18)	0.20 (0.40)	0.95 (0.22)	0.13 (0.34)	0.95 (0.22)	0.10 (0.30)	0.95 (0.21)	0.15 (0.35)
Head is divorced/separated	0.01 (0.07)	0.08 (0.26)	0.00 (0.06)	0.08 (0.27)	0.01 (0.07)	0.09 (0.29)	0.01 (0.07)	0.10 (0.30)	0.00 (0.07)	0.09 (0.29)
Head is widowed	0.02 (0.14)	0.67 (0.47)	0.02 (0.14)	0.69 (0.46)	0.02 (0.13)	0.70 (0.46)	0.02 (0.13)	0.71 (0.45)	0.02 (0.13)	0.69 (0.46)
Head is employed	0.74 (0.44)	0.24 (0.43)	0.71 (0.46)	0.17 (0.38)					0.72 (0.45)	0.21 (0.40)
Head is unemployed	0.02 (0.15)	0.01 (0.10)	0.02 (0.15)	0.01 (0.07)					0.02 (0.15)	0.01 (0.09)
Head is homemaker/housewife	0.00 (0.05)	0.41 (0.49)	0.01 (0.07)	0.49 (0.50)					0.00 (0.06)	0.45 (0.50)
Head is student	0.00 (0.04)	0.01 (0.09)	0.00 (0.02)	0.00 (0.02)					0.00 (0.03)	0.00 (0.06)
Head is pensioner/retired/disabled	0.22 (0.42)	0.32 (0.46)	0.26 (0.44)	0.33 (0.47)					0.24 (0.43)	0.32 (0.47)
Head is other activities	0.00 (0.07)	0.02 (0.15)	0.00 (0.05)	0.01 (0.08)					0.00 (0.06)	0.01 (0.12)
Per capita consumption	2,027.76 (2,206.66)	2,252.64 (2,473.81)	2,823.94 (2,604.83)	3,156.40 (2,640.10)	4,310.95 (4,590.12)	4,892.92 (4,002.85)	5,999.25 (7,378.56)	6,886.89 (6,515.51)	3,976.12 (5,136.62)	4,634.09 (4,910.49)
Household size	4.77 (1.88)	3.25 (1.96)	4.55 (1.73)	3.11 (1.75)	4.26 (1.60)	2.79 (1.60)	3.97 (1.45)	2.61 (1.39)	4.35 (1.68)	2.89 (1.67)
Number of children age 0-14	1.21 (1.26)	0.57 (1.07)	1.01 (1.19)	0.50 (0.99)	1.08 (1.23)	0.40 (0.86)	0.95 (1.18)	0.36 (0.83)	1.05 (1.21)	0.44 (0.93)
Number of seniors	0.38 (0.66)	0.43 (0.52)	0.38 (0.66)	0.46 (0.54)	0.35 (0.66)	0.47 (0.53)			0.37 (0.66)	0.45 (0.53)
1-2 adults, no child	0.10 (0.31)	0.38 (0.49)	0.11 (0.32)	0.40 (0.49)			0.19 (0.39)	0.52 (0.50)	0.14 (0.35)	0.45 (0.50)
1-2 adults, 1-2 children	0.20 (0.40)	0.12 (0.32)	0.20 (0.40)	0.13 (0.33)			0.18 (0.38)	0.09 (0.29)	0.19 (0.39)	0.11 (0.31)
1-2 adult, 3 or more children	0.17 (0.37)	0.08 (0.28)	0.14 (0.35)	0.08 (0.27)			0.10 (0.30)	0.03 (0.17)	0.13 (0.34)	0.06 (0.23)
3 adults or more, 0-1 child	0.32 (0.47)	0.32 (0.47)	0.39 (0.49)	0.33 (0.47)			0.44 (0.50)	0.32 (0.47)	0.39 (0.49)	0.32 (0.47)
3 adults or more, 2-3 children	0.16 (0.37)	0.08 (0.27)	0.14 (0.35)	0.06 (0.24)			0.09 (0.28)	0.04 (0.19)	0.13 (0.33)	0.06 (0.23)
3 adults or more, 4 children or more	0.04 (0.20)	0.02 (0.14)	0.02 (0.15)	0.01 (0.08)			0.01 (0.07)	0.00 (0.04)	0.02 (0.14)	0.01 (0.09)
Rural area	0.32 (0.46)	0.33 (0.47)	0.32 (0.47)	0.34 (0.47)	0.30 (0.46)	0.26 (0.44)	0.31 (0.46)	0.27 (0.44)	0.31 (0.46)	0.29 (0.45)
Urban area	0.68 (0.46)	0.67 (0.47)	0.68 (0.47)	0.66 (0.47)		0.74 (0.44)	0.69 (0.46)	0.73 (0.44)	0.69 (0.46)	0.71 (0.45)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.4. Descriptive Statistics, Jordan 2010-2013

	Jordan					
	2010		2013		Pooled 2010-2013	
	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	47.62 (14.13)	58.63 (13.68)	47.49 (14.04)	58.96 (13.24)	47.55 (14.08)	58.80 (13.45)
Head does not complete primary school	0.15 (0.36)	0.53 (0.50)	0.12 (0.32)	0.49 (0.50)	0.13 (0.34)	0.51 (0.50)
Head's highest education level is primary	0.47 (0.50)	0.27 (0.44)	0.47 (0.50)	0.30 (0.46)	0.47 (0.50)	0.28 (0.45)
Head's highest education level is secondary	0.15 (0.36)	0.08 (0.28)	0.14 (0.34)	0.09 (0.28)	0.15 (0.35)	0.09 (0.28)
Head's highest education level is tertiary	0.22 (0.42)	0.12 (0.33)	0.28 (0.45)	0.12 (0.33)	0.25 (0.44)	0.12 (0.33)
Head is never married	0.02 (0.13)	0.06 (0.25)	0.02 (0.14)	0.07 (0.25)	0.02 (0.14)	0.07 (0.25)
Head is mono married	0.97 (0.17)	0.19 (0.39)	0.96 (0.20)	0.17 (0.37)	0.97 (0.18)	0.18 (0.38)
Head is poly married	0.00 (0.06)	0.00 (0.00)	0.00 (0.06)	0.00 (0.00)	0.00 (0.06)	0.00 (0.00)
Head is divorced/separated	0.00 (0.03)	0.04 (0.19)	0.00 (0.06)	0.05 (0.22)	0.00 (0.05)	0.04 (0.20)
Head is widowed	0.01 (0.08)	0.71 (0.45)	0.01 (0.11)	0.72 (0.45)	0.01 (0.10)	0.72 (0.45)
Head is employed	0.66 (0.47)	0.04 (0.20)	0.67 (0.47)	0.05 (0.22)	0.66 (0.47)	0.05 (0.21)
Head is unemployed	0.04 (0.20)	0.01 (0.09)	0.07 (0.26)	0.04 (0.19)	0.06 (0.24)	0.02 (0.15)
Head is homemaker/housewife	0.00 (0.02)	0.79 (0.41)	0.00 (0.00)	0.75 (0.43)	0.00 (0.01)	0.77 (0.42)
Head is student	0.00 (0.01)	0.00 (0.00)	0.00 (0.05)	0.00 (0.04)	0.00 (0.04)	0.00 (0.03)
Head is pensioner/retired/disabled	0.12 (0.33)	0.15 (0.35)	0.14 (0.35)	0.14 (0.34)	0.13 (0.34)	0.14 (0.35)
Head is other activities	0.17 (0.38)	0.02 (0.13)	0.12 (0.32)	0.02 (0.15)	0.14 (0.35)	0.02 (0.14)
Per capita consumption	2,063.45 (3,263.14)	2,916.21 (2,417.35)	2,238.36 (1,578.64)	3,100.82 (2,442.96)	2,155.59 (2,521.48)	3,010.97 (2,431.02)
Per capita transfers	377.77 (703.55)	1,107.40 (1,489.48)	469.79 (839.28)	1,114.52 (1,364.42)	426.24 (779.30)	1,111.05 (1,425.88)
Household size	5.66 (2.18)	3.64 (2.28)	5.36 (2.12)	3.49 (2.51)	5.50 (2.15)	3.56 (2.40)
Number of children age 0-14	1.93 (1.70)	0.59 (1.14)	1.80 (1.66)	0.57 (1.42)	1.86 (1.68)	0.58 (1.29)
Number of seniors	0.26 (0.57)	0.38 (0.49)	0.23 (0.54)	0.41 (0.51)	0.24 (0.55)	0.40 (0.50)
1-2 adults, no child	0.07 (0.26)	0.36 (0.48)	0.09 (0.28)	0.39 (0.49)	0.08 (0.27)	0.37 (0.48)
1-2 adults, 1-2 children	0.13 (0.34)	0.14 (0.35)	0.15 (0.35)	0.10 (0.30)	0.14 (0.35)	0.12 (0.32)
1-2 adult, 3 or more children	0.30 (0.46)	0.06 (0.25)	0.29 (0.45)	0.06 (0.23)	0.29 (0.46)	0.06 (0.24)
3 adults or more, 0-1 child	0.23 (0.42)	0.29 (0.46)	0.25 (0.43)	0.34 (0.47)	0.24 (0.43)	0.32 (0.47)
3 adults or more, 2-3 children	0.15 (0.36)	0.10 (0.30)	0.13 (0.34)	0.08 (0.27)	0.14 (0.35)	0.09 (0.29)
3 adults or more, 4 children or more	0.11 (0.31)	0.05 (0.22)	0.09 (0.29)	0.04 (0.18)	0.10 (0.30)	0.04 (0.20)
Rural area	0.16 (0.37)	0.13 (0.34)	0.17 (0.37)	0.19 (0.39)	0.17 (0.37)	0.16 (0.37)
Urban area	0.84 (0.37)	0.87 (0.34)	0.83 (0.37)	0.81 (0.39)	0.83 (0.37)	0.84 (0.37)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.5. Descriptive Statistics, Iraq 2007-2013

	Iraq					
	2007		2012		Pooled 2007-2013	
	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	45.15 (13.71)	54.29 (13.04)	46.93 (13.06)	54.28 (12.51)	46.73 (13.14)	54.28 (12.58)
Head does not complete primary school	0.31 (0.46)	0.75 (0.43)	0.34 (0.47)	0.72 (0.45)	0.34 (0.47)	0.72 (0.45)
Head's highest education level is primary	0.41 (0.49)	0.17 (0.38)	0.41 (0.49)	0.20 (0.40)	0.41 (0.49)	0.20 (0.40)
Head's highest education level is secondary	0.11 (0.31)	0.02 (0.14)	0.09 (0.28)	0.03 (0.17)	0.09 (0.28)	0.03 (0.17)
Head's highest education level is tertiary	0.17 (0.38)	0.06 (0.23)	0.16 (0.36)	0.05 (0.22)	0.16 (0.37)	0.05 (0.22)
Head is never married	0.02 (0.13)	0.04 (0.20)	0.01 (0.09)	0.02 (0.14)	0.01 (0.10)	0.02 (0.15)
Head is mono married	0.95 (0.21)	0.08 (0.27)	0.95 (0.22)	0.15 (0.35)	0.95 (0.22)	0.14 (0.34)
Head is poly married	0.01 (0.11)	0.00 (0.00)	0.03 (0.17)	0.00 (0.00)	0.03 (0.16)	0.00 (0.00)
Head is divorced/separated	0.00 (0.04)	0.07 (0.25)	0.00 (0.04)	0.06 (0.25)	0.00 (0.04)	0.06 (0.25)
Head is widowed	0.01 (0.12)	0.81 (0.39)	0.01 (0.10)	0.77 (0.42)	0.01 (0.11)	0.77 (0.42)
Head is employed	0.79 (0.41)	0.19 (0.40)	0.78 (0.42)	0.15 (0.36)	0.78 (0.42)	0.16 (0.36)
Head is unemployed	0.03 (0.18)	0.02 (0.13)	0.02 (0.15)	0.01 (0.08)	0.02 (0.15)	0.01 (0.09)
Head is homemaker/housewife	0.00 (0.02)	0.69 (0.46)	0.00 (0.03)	0.53 (0.50)	0.00 (0.03)	0.55 (0.50)
Head is student	0.00 (0.04)	0.00 (0.00)	0.00 (0.04)	0.00 (0.02)	0.00 (0.04)	0.00 (0.02)
Head is pensioner/retired/disabled	0.14 (0.35)	0.08 (0.27)	0.18 (0.39)	0.30 (0.46)	0.18 (0.38)	0.27 (0.45)
Head is other activities	0.03 (0.17)	0.03 (0.16)	0.02 (0.12)	0.01 (0.08)	0.02 (0.13)	0.01 (0.10)
Per capita consumption	1,878,839.75 (1,662,430)	2,011,498.91 (1,562,966)	2,855,613.71 (2,612,256)	3,072,404.17 (2,728,793)	2,746,443.13 (2,542,574)	2,933,690.42 (2,630,373)
Per capita transfers	166.71 (415.53)	409.56 (941.59)	249.20 (902.11)	647.95 (1,940.46)	239.98 (861.86)	616.79 (1,842.51)
Household size	7.00 (3.43)	5.76 (3.46)	8.49 (4.21)	7.64 (4.22)	8.33 (4.16)	7.39 (4.18)
Number of children age 0-14	2.69 (2.12)	1.64 (2.00)	3.46 (2.55)	2.75 (2.68)	3.37 (2.51)	2.61 (2.63)
Number of seniors	0.22 (0.51)	0.27 (0.49)	0.24 (0.52)	0.24 (0.46)	0.24 (0.52)	0.25 (0.46)
1-2 adults, no child	0.04 (0.20)	0.14 (0.35)	0.01 (0.11)	0.04 (0.19)	0.01 (0.12)	0.05 (0.22)
1-2 adults, 1-2 children	0.14 (0.34)	0.08 (0.28)	0.06 (0.25)	0.05 (0.23)	0.07 (0.26)	0.06 (0.23)
1-2 adult, 3 or more children	0.29 (0.45)	0.13 (0.34)	0.27 (0.44)	0.15 (0.35)	0.27 (0.44)	0.15 (0.35)
3 adults or more, 0-1 child	0.15 (0.35)	0.30 (0.46)	0.11 (0.31)	0.21 (0.41)	0.11 (0.32)	0.22 (0.42)
3 adults or more, 2-3 children	0.16 (0.37)	0.18 (0.38)	0.18 (0.39)	0.26 (0.44)	0.18 (0.39)	0.25 (0.43)
3 adults or more, 4 children or more	0.22 (0.42)	0.16 (0.37)	0.36 (0.48)	0.29 (0.45)	0.35 (0.48)	0.27 (0.45)
Rural area	0.27 (0.44)	0.20 (0.40)	0.33 (0.47)	0.22 (0.42)	0.32 (0.47)	0.22 (0.41)
Urban area	0.73 (0.44)	0.80 (0.40)	0.67 (0.47)	0.78 (0.42)	0.68 (0.47)	0.78 (0.41)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.6. Descriptive Statistics, Mauritania 2004-2019

	Mauritania									
	2004		2008		2014		2019		Pooled 2004-2019	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Heads age	48.10 (13.60)	53.29 (14.09)	48.22 (14.06)	47.33 (15.24)	49.11 (14.49)	48.05 (15.80)	49.63 (14.29)	46.83 (15.25)	48.83 (14.16)	48.01 (15.40)
Head does not complete primary school	0.77 (0.42)	0.93 (0.25)	0.72 (0.45)	0.85 (0.35)	0.70 (0.46)	0.81 (0.39)	0.48 (0.50)	0.50 (0.50)	0.66 (0.47)	0.72 (0.45)
Head's highest education level is primary	0.08 (0.28)	0.03 (0.17)	0.11 (0.31)	0.09 (0.29)	0.11 (0.32)	0.11 (0.32)	0.26 (0.44)	0.33 (0.47)	0.15 (0.35)	0.18 (0.38)
Head's highest education level is secondary	0.11 (0.31)	0.03 (0.18)	0.12 (0.33)	0.05 (0.21)	0.13 (0.34)	0.07 (0.25)	0.18 (0.38)	0.16 (0.36)	0.14 (0.34)	0.09 (0.29)
Head's highest education level is tertiary	0.04 (0.19)	0.01 (0.08)	0.05 (0.22)	0.01 (0.08)	0.06 (0.24)	0.01 (0.08)	0.08 (0.27)	0.01 (0.10)	0.06 (0.23)	0.01 (0.09)
Head is never married	0.03 (0.17)	0.02 (0.15)	0.02 (0.16)	0.01 (0.12)	0.03 (0.17)	0.02 (0.13)	0.03 (0.17)	0.02 (0.13)	0.03 (0.16)	0.02 (0.13)
Head is mono married	0.94 (0.24)	0.10 (0.30)	0.95 (0.22)	0.39 (0.49)	0.94 (0.23)	0.43 (0.50)	0.88 (0.32)	0.50 (0.50)	0.93 (0.26)	0.41 (0.49)
Head is poly married	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.06 (0.23)	0.03 (0.17)	0.02 (0.12)	0.01 (0.11)
Head is divorced/separated	0.02 (0.14)	0.33 (0.47)	0.01 (0.12)	0.22 (0.42)	0.02 (0.13)	0.21 (0.40)	0.02 (0.13)	0.18 (0.39)	0.02 (0.13)	0.21 (0.41)
Head is widowed	0.01 (0.11)	0.55 (0.50)	0.01 (0.11)	0.37 (0.48)	0.01 (0.11)	0.35 (0.48)	0.01 (0.12)	0.27 (0.44)	0.01 (0.11)	0.35 (0.48)
Head is employed	0.86 (0.35)	0.54 (0.50)	0.78 (0.41)	0.40 (0.49)	0.87 (0.33)	0.40 (0.49)	0.81 (0.39)	0.37 (0.48)	0.83 (0.37)	0.41 (0.49)
Head is unemployed	0.02 (0.15)	0.02 (0.12)	0.04 (0.19)	0.02 (0.13)	0.01 (0.08)	0.02 (0.13)	0.01 (0.11)	0.01 (0.11)	0.02 (0.14)	0.02 (0.12)
Head is not searched and not work	0.12 (0.32)	0.45 (0.50)	0.18 (0.38)	0.59 (0.49)	0.12 (0.32)	0.58 (0.49)	0.18 (0.38)	0.61 (0.49)	0.15 (0.36)	0.58 (0.49)
Per capita consumption	184,984.25 (2587509)	147,570.28 (205663)	240,551.50 (234972)	219,258.68 (168764)	341,658.92 (299510)	350,431.69 (247036)	373,240.01 (264805)	403,696.14 (268529)	294,662.55 (1,189,714)	315,850.25 (252,048)
Household size	5.94 (2.77)	4.40 (2.44)	5.87 (2.88)	4.68 (2.47)	6.05 (3.44)	5.03 (2.61)	6.46 (3.59)	5.59 (2.98)	6.10 (3.24)	5.08 (2.73)
Number of children age 0-14	2.56 (2.01)	1.63 (1.73)	2.53 (2.03)	2.12 (1.84)	2.68 (2.29)	2.33 (1.98)	2.86 (2.41)	2.66 (2.01)	2.67 (2.21)	2.32 (1.96)
Number of seniors	0.19 (0.44)	0.27 (0.46)	0.21 (0.47)	0.20 (0.41)	0.25 (0.51)	0.23 (0.44)	0.27 (0.56)	0.23 (0.46)	0.23 (0.50)	0.23 (0.44)
1-2 adults, no child	0.08 (0.28)	0.19 (0.39)	0.10 (0.29)	0.13 (0.33)	0.10 (0.29)	0.11 (0.31)	0.09 (0.28)	0.07 (0.25)	0.09 (0.29)	0.11 (0.31)
1-2 adults, 1-2 children	0.16 (0.37)	0.21 (0.40)	0.16 (0.36)	0.22 (0.41)	0.14 (0.35)	0.19 (0.40)	0.12 (0.33)	0.19 (0.39)	0.14 (0.35)	0.20 (0.40)
1-2 adult, 3 or more children	0.20 (0.40)	0.14 (0.35)	0.20 (0.40)	0.24 (0.43)	0.23 (0.42)	0.26 (0.44)	0.20 (0.40)	0.26 (0.44)	0.21 (0.41)	0.24 (0.43)
3 adults or more, 0-1 child	0.19 (0.39)	0.26 (0.44)	0.19 (0.39)	0.20 (0.40)	0.18 (0.38)	0.20 (0.40)	0.18 (0.38)	0.17 (0.37)	0.18 (0.39)	0.19 (0.40)
3 adults or more, 2-3 children	0.17 (0.38)	0.13 (0.34)	0.18 (0.38)	0.13 (0.34)	0.17 (0.38)	0.14 (0.34)	0.19 (0.39)	0.17 (0.37)	0.18 (0.38)	0.15 (0.35)
3 adults or more, 4 children or more	0.19 (0.39)	0.07 (0.25)	0.18 (0.38)	0.09 (0.28)	0.18 (0.39)	0.11 (0.31)	0.23 (0.42)	0.15 (0.36)	0.20 (0.40)	0.12 (0.32)
Rural area	0.62 (0.49)	0.57 (0.49)	0.54 (0.50)	0.64 (0.48)	0.49 (0.50)	0.56 (0.50)	0.52 (0.50)	0.57 (0.50)	0.54 (0.50)	0.58 (0.49)
Urban area	0.38 (0.49)	0.43 (0.49)	0.46 (0.50)	0.36 (0.48)	0.51 (0.50)	0.44 (0.50)	0.48 (0.50)	0.43 (0.50)	0.46 (0.50)	0.42 (0.49)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Table B.7. Descriptive Statistics, all countries - years

	MHH	FHH
Heads age	48.14 (13.61)	55.52 (14.10)
Head does not complete primary school	0.36 (0.48)	0.70 (0.46)
Head's highest education level is primary	0.38 (0.48)	0.19 (0.40)
Head's highest education level is secondary	0.12 (0.32)	0.06 (0.23)
Head's highest education level is tertiary	0.15 (0.36)	0.05 (0.21)
Head is never married	0.01 (0.11)	0.04 (0.19)
Head is mono married	0.95 (0.22)	0.17 (0.37)
Head is poly married	0.02 (0.15)	0.03 (0.16)
Head is divorced/separated	0.01 (0.07)	0.25 (0.43)
Head is widowed	0.01 (0.11)	0.71 (0.45)
Head is employed	0.77 (0.42)	0.19 (0.39)
Head is unemployed	0.03 (0.16)	0.01 (0.10)
Head is homemaker/housewife	0.01 (0.08)	0.55 (0.50)
Head is student	0.00 (0.04)	0.00 (0.03)
Head is pensioner/retired/disabled	0.18 (0.39)	0.27 (0.45)
Head is other activities	0.02 (0.15)	0.01 (0.11)
Per capita consumption	2,034,242.98 (2,496,523)	1,731,419.27 (2,451,185)
Per capita transfers	204.12 (805.10)	471.50 (1,655.70)
Household size	7.39 (4.05)	5.75 (3.99)
Number of children	2.85 (2.46)	1.89 (2.38)
Number of seniors	0.26 (0.54)	0.29 (0.48)
1-2 adults, no child	0.04 (0.19)	0.16 (0.37)
1-2 adults, 1-2 children	0.10 (0.29)	0.09 (0.28)
1-2 adult, 3 or more children	0.25 (0.43)	0.13 (0.34)
3 adults or more, 0-1 child	0.16 (0.37)	0.25 (0.43)
3 adults or more, 2-3 children	0.17 (0.38)	0.19 (0.39)
3 adults or more, 4 children or more	0.28 (0.45)	0.19 (0.39)
Rural area	0.32 (0.47)	0.27 (0.45)
Urban area	0.68 (0.47)	0.73 (0.45)

Note: Household sampling weights are applied. Standard deviations are in parentheses. FHHs and MHHs are self-reported.

Appendix C: Synthetic Panel Method

This appendix offers a brief overview of the synthetic panel method based on Dang and Lanjouw (2023). Recent validations and applications of the synthetic panel methods by various researchers for different country contexts ranging from Africa to Latin America, the Middle East, and Europe have been encouraging in terms of accurate projections of economic status (Ferreira *et al.*, 2012; Beegle *et al.*, 2016; UNDP, 2016; OECD, 2018; Salvuci and Tarp, 2021; Ghomi, 2022).

Let x_{ij} be a vector of household characteristics observed in survey round j ($j= 1$ or 2) that are also observed in the other survey round for household i , $i= 1, \dots, N$.¹⁶ These household characteristics can include such time-invariant variables as ethnicity, religion, language, place of birth, parental education, and other time-varying household characteristics if retrospective questions about the round-1 values of such characteristics are asked in the second round survey. To reduce spurious changes due to changes in household composition over time, we usually restrict the estimation samples to household heads in a certain age range, say 25 to 55, in the first cross section and adjust this age range accordingly in the second cross section. This restriction also helps ensure certain variables such as heads' education attainment remains relatively stable over time (assuming most heads are finished with their schooling).¹⁷ This age range is usually used in traditional pseudo-panel analysis but can vary depending on the cultural and economic factors in each specific setting. Population weights are then employed to provide estimates that represent the whole population.

Then let y_{ij} represent household consumption or income in survey round j , $j= 1$ or 2 . The linear projection of household consumption (or income) on household characteristics for each survey round is given by

$$y_{ij} = \beta_j' x_{ij} + \varepsilon_{ij} \quad (C1)$$

Let z_j be the poverty line in period j . We are interested in knowing the unconditional measures of poverty mobility such as

$$P(y_{i1} < z_1 \text{ and } y_{i2} > z_2) \quad (C2)$$

which represents the percentage of households that are poor in the first survey round (year) but nonpoor in the second survey round, or the conditional measures such as

$$P(y_{i2} > z_2 | y_{i1} < z_1) \quad (C3)$$

which represents the percentage of poor households in the first round that escape poverty in the second round.

If true panel data are available, we can straightforwardly estimate the quantities in (C2) and (C3); but in the absence of such data, we can use synthetic panels to study mobility. To operationalize the framework, we make two standard assumptions. First, we assume that the underlying population being sampled in survey rounds 1 and 2 are identical such that their time-invariant characteristics remain the same over time. More specifically, coupled with equation (C1), this implies the conditional distribution of expenditure in a given period is identical whether it is conditional on the given household characteristics in period 1 or period 2 (i.e., $x_{i1} = x_{i2}$ implies $y_{i1}|x_{i1}$ and $y_{i1}|x_{i2}$ have identical distributions) (Assumption 1). Second, we assume that ε_{i1} and ε_{i2} have a bivariate normal distribution with positive correlation coefficient ρ and standard deviations σ_{ε_1} and σ_{ε_2} respectively (Assumption 2). Quantity (2) can be estimated by

¹⁶ We suppress the index for countries and FHH types to make notation less cluttered in this appendix.

¹⁷ While household heads may still increase their education achievement in theory, this rarely happens in practice.

$$P(y_{i1} < z_1 \text{ and } y_{i2} > z_2) = \Phi_2\left(\frac{z_1 - \beta'_1 x_{i2}}{\sigma_{\varepsilon_1}}, -\frac{z_2 - \beta'_2 x_{i2}}{\sigma_{\varepsilon_2}}, -\rho\right) \quad (C4)$$

where $\Phi_2(\cdot)$ stands for the bivariate normal cumulative distribution function (cdf), and $\phi_2(\cdot)$ stands for the bivariate normal probability density function (pdf). Note that in Equation (1), the estimated parameters obtained from data in both survey rounds are applied to data from the second survey round (x_2) (or the base year) for prediction, but we can use data from the first survey round as the base year as well. It is then straightforward to estimate quantity (C3) by dividing quantity (C2) by $\Phi\left(\frac{z_1 - \beta'_1 x_{i2}}{\sigma_{\varepsilon_1}}\right)$, where $\Phi(\cdot)$ stands for the univariate normal cumulative distribution function (cdf).

In Equation (4), the parameters β_j and σ_{ε_j} are estimated from Equation (C1), and ρ can be estimated using an approximation of the correlation of the cohort-aggregated household consumption between the two surveys ($\rho_{y_{c1}y_{c2}}$). In particular, given an approximation of $\rho_{y_{c1}y_{c2}}$, where c indexes the cohorts constructed from the household survey data, the partial correlation coefficient ρ can be estimated by

$$\rho = \frac{\rho_{y_{i1}y_{i2}} \sqrt{\text{var}(y_{i1})\text{var}(y_{i2})} - \beta'_1 \text{var}(x_i) \beta_2}{\sigma_{\varepsilon_1} \sigma_{\varepsilon_2}} \quad (C5)$$

An alternative way to estimate ρ is to further assume that there is a cohort fixed effect in the error terms and aggregate all the time-invariant variables to the cohort level and use the following equation

$$y_{cj} = \beta'_j x_{cj} + \varepsilon_{cj} \quad (C6)$$

where the error term ε_{cj} includes a cohort fixed effect τ_c and the error v_{cj} .

Note that the standard errors of estimates based on the synthetic panels can in fact be even smaller than that of the true (or design-based) rate if there is a good model fit (or the sample size in the target survey is significantly larger than that in the base survey; see Dang and Lanjouw, 2023, for discussion).

Tables C.1-C.6 present the estimation results using Equation (C1) for all the countries and survey rounds. Tables C.7-C.12 present the descriptive statistics of the estimation sample. These tables show that while most of the time-invariant characteristics show similar distributions across survey rounds (and satisfy Assumption 1), some do not. For example, these include the shares of household heads achieving primary education or secondary education in Egypt during 2012-2015 (Table C.7). But the differences are practically very close to 0. Table C.13 presents the estimates for ρ using Equations (C5) and (C6), where ρ are estimated using Equation (C5) for all countries with cohorts being defined by age interacted with household heads' education.

We also provide alternative estimates for ρ using Equation (C6). Using these estimates, Figures C.1 and C.2 offer qualitatively similar results to Figures 5 and 6.

Table C.1 First-stage regressions, Egypt

	2012-2015		2015-2017		2017-2020	
	2012	2015	2015	2017	2017	2020
Head's age	0.006*** (0.00)	0.012*** (0.00)	0.010*** (0.00)	0.011*** (0.00)	0.009*** (0.00)	0.012*** (0.00)
Head is female	0.141*** (0.02)	0.141*** (0.02)	0.136*** (0.02)	0.234*** (0.02)	0.226*** (0.02)	0.198*** (0.02)
Highest education level is primary	0.142*** (0.02)	0.126*** (0.01)	0.123*** (0.01)	0.097*** (0.01)	0.099*** (0.01)	0.091*** (0.02)
Highest education level is secondary	0.199*** (0.01)	0.215*** (0.01)	0.209*** (0.01)	0.179*** (0.01)	0.173*** (0.01)	0.194*** (0.01)
Highest education level is tertiary	0.461*** (0.02)	0.482*** (0.01)	0.481*** (0.01)	0.395*** (0.01)	0.394*** (0.01)	0.486*** (0.02)
Urban	0.241*** (0.01)	0.210*** (0.01)	0.215*** (0.01)	0.126*** (0.01)	0.126*** (0.01)	0.162*** (0.01)
_cons	7.995*** (0.03)	8.091*** (0.03)	8.196*** (0.03)	8.555*** (0.03)	8.604*** (0.03)	8.632*** (0.03)
adjusted R2	0.23	0.25	0.24	0.17	0.16	0.21
N	5102	8338	7836	8301	7799	7286

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.2 First-stage regressions, Iraq

	2007-2012	
	2007	2012
Head's age	-0.001** (0.00)	0.005*** (0.00)
Head is female	0.012 (0.02)	0.114*** (0.02)
Highest education level is primary	-0.015 (0.01)	0.069*** (0.01)
Highest education level is secondary	0.059*** (0.02)	0.305*** (0.02)
Highest education level is tertiary	0.183*** (0.02)	0.441*** (0.01)
Urban	0.326*** (0.01)	0.317*** (0.01)
_cons	13.917*** (0.03)	13.966*** (0.03)
adjusted R2	0.08	0.13
N	12895	18552

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.3 First-stage regressions, Jordan

	2010-2013	
	2010	2013
Head's age	-0.002 (0.00)	0.004*** (0.00)
Head is female	0.213*** (0.05)	0.107*** (0.03)
Highest education level is primary	0.171*** (0.04)	0.280*** (0.03)
Highest education level is secondary	0.320*** (0.05)	0.449*** (0.04)
Highest education level is tertiary	0.666*** (0.05)	0.729*** (0.03)
Urban	0.022 (0.03)	0.037* (0.02)
_cons	6.976*** (0.08)	6.718*** (0.06)
adjusted R2	0.16	0.18
N	1873	3437

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.4 First-stage regressions, Mauritania

	2004-2008		2008-2014		2014-2019	
	2004	2008	2008	2014	2014	2019
Head's age	-0.007*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.007*** (0.00)	-0.004*** (0.00)
Head is female	0.022 (0.02)	0.075*** (0.01)	0.065*** (0.01)	0.128*** (0.02)	0.103*** (0.02)	0.130*** (0.01)
Highest education level is primary	0.187*** (0.03)	0.143*** (0.02)	0.146*** (0.02)	0.073*** (0.02)	0.079*** (0.02)	-0.014 (0.02)
Highest education level is secondary	0.384*** (0.03)	0.383*** (0.02)	0.382*** (0.02)	0.223*** (0.02)	0.245*** (0.02)	0.145*** (0.02)
Highest education level is tertiary	0.708*** (0.04)	0.609*** (0.03)	0.621*** (0.03)	0.382*** (0.03)	0.408*** (0.03)	0.382*** (0.03)
Urban	0.342*** (0.02)	0.605*** (0.01)	0.596*** (0.01)	0.353*** (0.01)	0.380*** (0.02)	0.368*** (0.01)
_cons	11.532*** (0.05)	11.710*** (0.04)	11.819*** (0.04)	12.279*** (0.04)	12.356*** (0.04)	12.421*** (0.04)
adjusted R2	0.18	0.32	0.32	0.16	0.18	0.18
N	6065	9269	9088	6672	6219	6425

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.5 First-stage regressions, Palestine

	2007-2009		2009-2011		2011-2017	
	2007	2009	2009	2011	2011	2017
Head's age	0.005 (0.00)	0.006*** (0.00)	0.005*** (0.00)	0.002 (0.00)	-0.000 (0.00)	0.012*** (0.00)
Head is female	0.226** (0.11)	0.206*** (0.05)	0.226*** (0.06)	0.133*** (0.05)	0.141*** (0.05)	0.160*** (0.06)
Highest education level is primary	0.177** (0.07)	0.220*** (0.04)	0.214*** (0.04)	0.218*** (0.04)	0.210*** (0.04)	0.260*** (0.04)
Highest education level is secondary	0.276*** (0.09)	0.344*** (0.04)	0.346*** (0.04)	0.339*** (0.04)	0.341*** (0.04)	0.373*** (0.05)
Highest education level is tertiary	0.585*** (0.08)	0.607*** (0.04)	0.606*** (0.04)	0.602*** (0.04)	0.606*** (0.04)	0.518*** (0.04)
Urban	-0.034 (0.05)	0.014 (0.03)	0.012 (0.03)	-0.064** (0.03)	-0.070** (0.03)	-0.240*** (0.03)
Refugee	-0.327*** (0.07)	-0.039 (0.05)	-0.034 (0.05)	-0.314*** (0.04)	-0.314*** (0.04)	-0.538*** (0.05)
_cons	8.288*** (0.15)	8.388*** (0.07)	8.457*** (0.07)	8.718*** (0.08)	8.828*** (0.08)	8.381*** (0.08)
adjusted R2	0.08	0.09	0.09	0.09	0.09	0.11
N	962	2944	2938	3288	3229	2815

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.6 First-stage regressions, Tunisia

	2005-2010		2010-2015		2015-2021	
	2005	2010	2010	2015	2015	2021
Head's age	0.004*** (0.00)	0.008*** (0.00)	0.005*** (0.00)	0.008*** (0.00)	0.006*** (0.00)	0.014*** (0.00)
Head is female	0.143*** (0.03)	0.053** (0.02)	0.006 (0.03)	0.197*** (0.02)	0.184*** (0.02)	0.113*** (0.02)
Highest education level is primary	0.312*** (0.04)	0.305*** (0.04)	0.300*** (0.04)	0.210*** (0.01)	0.227*** (0.02)	0.142*** (0.02)
Highest education level is secondary	0.386*** (0.02)	0.293*** (0.02)	0.266*** (0.02)	0.443*** (0.02)	0.460*** (0.02)	0.354*** (0.02)
Highest education level is tertiary	0.945*** (0.03)	0.764*** (0.02)	0.754*** (0.03)	0.904*** (0.02)	0.911*** (0.02)	0.704*** (0.02)
Urban	0.495*** (0.02)	0.497*** (0.01)	0.499*** (0.02)	0.355*** (0.01)	0.370*** (0.01)	0.287*** (0.01)
_cons	6.547*** (0.05)	6.747*** (0.04)	6.881*** (0.05)	7.006*** (0.03)	7.084*** (0.03)	7.183*** (0.04)
adjusted R2	0.30	0.29	0.29	0.29	0.29	0.21
N	6769	7507	6425	16456	13635	10520

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. Regression is estimated using Weighted Ordinary Least Squares. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second round. The reference groups are household with no primary education and living in rural areas.

Table C.7. Descriptive statistics of estimation sample, Egypt

Variables	2012-2015			2015-2017			2017-2020		
	2012	2015	diff	2015	2017	diff	2017	2020	diff
Log of per capita consumption	8.58 (0.01)	8.97 (0.01)	0.4*** (0.0)	8.95 (0.01)	9.32 (0.01)	0.4*** (0.0)	9.30 (0.01)	9.48 (0.01)	0.2*** (0.0)
Head's age	41.32 (0.12)	43.97 (0.09)	2.7*** (0.1)	42.23 (0.09)	44.20 (0.09)	2.0*** (0.1)	43.14 (0.09)	42.89 (0.10)	-0.3* (0.1)
Head is female	0.13 (0.00)	0.13 (0.00)	0.0 (0.0)	0.12 (0.00)	0.13 (0.00)	0.0 (0.0)	0.12 (0.00)	0.13 (0.00)	0.0 (0.0)
Head's highest education level is primary	0.13 (0.00)	0.15 (0.00)	0.0*** (0.0)	0.15 (0.00)	0.15 (0.00)	0.0 (0.0)	0.15 (0.00)	0.14 (0.00)	-0.0*** (0.0)
Head's highest education level is secondary	0.31 (0.01)	0.34 (0.01)	0.0** (0.0)	0.35 (0.01)	0.36 (0.01)	0.0 (0.0)	0.37 (0.01)	0.37 (0.01)	0.0 (0.0)
Head's highest education level is tertiary	0.20 (0.01)	0.19 (0.00)	-0.0 (0.0)	0.19 (0.00)	0.18 (0.00)	-0.0 (0.0)	0.18 (0.00)	0.21 (0.00)	0.0*** (0.0)
Urban area	0.42 (0.01)	0.42 (0.01)	-0.0 (0.0)	0.41 (0.01)	0.42 (0.01)	0.0 (0.0)	0.41 (0.01)	0.43 (0.01)	0.0** (0.0)

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.8 Descriptive statistics of estimation sample, Iraq

		2007-2012	
	2007	2012	diff
Log of per capita consumption	14.22 (0.01)	14.67 (0.01)	0.1*** (0.0)
Head's age	40.46 (0.07)	44.28 (0.06)	1.7*** (0.2)
Head is female	0.09 (0.00)	0.09 (0.00)	0.0 (0.0)
Head's highest education level is primary	0.41 (0.00)	0.40 (0.00)	0.0*** (0.0)
Head's highest education level is secondary	0.12 (0.00)	0.08 (0.00)	-0.0 (0.0)
Head's highest education level is tertiary	0.19 (0.00)	0.15 (0.00)	-0.0*** (0.0)
Urban area	0.68 (0.00)	0.60 (0.00)	-0.1*** (0.0)

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.9 Descriptive statistics of estimation sample, Jordan

	2010	2010-2013	diff
	2013		
Log of per capita consumption	7.29 (0.01)	7.35 (0.01)	0.1*** (0.0)
Head's age	41.00 (0.18)	42.72 (0.14)	1.7*** (0.2)
Head is female	0.09 (0.01)	0.09 (0.00)	0.0 (0.0)
Head's highest education level is primary	0.51 (0.01)	0.55 (0.01)	0.0*** (0.0)
Head's highest education level is secondary	0.16 (0.01)	0.15 (0.01)	-0.0 (0.0)
Head's highest education level is tertiary	0.23 (0.01)	0.19 (0.01)	-0.0*** (0.0)
Urban area	0.74 (0.01)	0.63 (0.01)	-0.1*** (0.0)

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.10 Descriptive statistics of estimation sample, Mauritania

	2004-2008			2008-2014			2014-2019		
	2004	2008	diff	2008	2014	diff	2014	2019	diff
Log of per capita consumption	11.66 (0.01)	12.09 (0.01)	0.4*** (0.0)	12.10 (0.01)	12.54 (0.01)	0.4*** (0.0)	12.56 (0.01)	12.68 (0.01)	0.1*** (0.0)
Head's age	42.41 (0.10)	43.90 (0.08)	1.5*** (0.1)	41.90 (0.08)	46.40 (0.10)	4.5*** (0.1)	42.42 (0.10)	45.49 (0.11)	3.1*** (0.1)
Head is female	0.16 (0.00)	0.29 (0.00)	0.1*** (0.0)	0.30 (0.00)	0.30 (0.01)	0.0 (0.0)	0.31 (0.01)	0.37 (0.01)	0.1*** (0.0)
Head's highest education level is primary	0.10 (0.00)	0.11 (0.00)	0.0 (0.0)	0.12 (0.00)	0.12 (0.00)	-0.0 (0.0)	0.14 (0.00)	0.29 (0.01)	0.1*** (0.0)
Head's highest education level is secondary	0.13 (0.00)	0.13 (0.00)	-0.0 (0.0)	0.13 (0.00)	0.13 (0.00)	0.0 (0.0)	0.15 (0.00)	0.19 (0.00)	0.0*** (0.0)
Head's highest education level is tertiary	0.05 (0.00)	0.05 (0.00)	0.0 (0.0)	0.05 (0.00)	0.05 (0.00)	0.0** (0.0)	0.05 (0.00)	0.06 (0.00)	0.0 (0.0)
Urban area	0.51 (0.01)	0.48 (0.01)	-0.0*** (0.0)	0.47 (0.01)	0.59 (0.01)	0.1*** (0.0)	0.59 (0.01)	0.50 (0.01)	-0.1*** (0.0)

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.11. Descriptive statistics of estimation sample, Palestine

	2007-2009			2009-2011			2011-2017		
	2007	2009	difference	2009	2011	difference	2011	2017	difference
Log of per capita consumption	8.78 (0.02)	9.06 (0.01)	0.3*** (0.0)	9.06 (0.01)	9.13 (0.01)	0.1*** (0.0)	9.13 (0.01)	9.23 (0.01)	0.1*** (0.0)
Head's age	40.03 (0.25)	40.72 (0.15)	0.7** (0.3)	39.80 (0.15)	41.65 (0.14)	1.9*** (0.2)	40.71 (0.14)	44.94 (0.16)	4.2*** (0.2)
Head is female	0.06 (0.01)	0.06 (0.00)	0.0 (0.0)	0.06 (0.00)	0.07 (0.00)	0.0* (0.0)	0.07 (0.00)	0.08 (0.00)	0.0 (0.0)
Head's highest education level is primary	0.55 (0.02)	0.50 (0.01)	-0.0*** (0.0)	0.50 (0.01)	0.51 (0.01)	0.0 (0.0)	0.51 (0.01)	0.51 (0.01)	-0.0 (0.0)
Head's highest education level is secondary	0.18 (0.01)	0.17 (0.01)	-0.0 (0.0)	0.17 (0.01)	0.18 (0.01)	0.0 (0.0)	0.18 (0.01)	0.16 (0.01)	-0.0** (0.0)
Head's highest education level is tertiary	0.17 (0.01)	0.22 (0.01)	0.0*** (0.0)	0.21 (0.01)	0.22 (0.01)	0.0 (0.0)	0.22 (0.01)	0.23 (0.01)	0.0 (0.0)
Urban area	0.54 (0.02)	0.70 (0.01)	0.2*** (0.0)	0.70 (0.01)	0.53 (0.01)	-0.2*** (0.0)	0.53 (0.01)	0.56 (0.01)	0.0*** (0.0)
Refugee area	0.18 (0.01)	0.12 (0.01)	-0.1*** (0.0)	0.12 (0.01)	0.21 (0.01)	0.1*** (0.0)	0.21 (0.01)	0.12 (0.01)	-0.1*** (0.0)

Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.12. Descriptive statistics of estimation sample, Tunisia

	2005-2010			2010-2015			2015-2021		
	2005	2010	diff	2010	2015	diff	2015	2021	diff
Log of per capita consumption	7.23 (0.01)	7.58 (0.01)	0.4*** (0.0)	7.55 (0.01)	7.98 (0.00)	0.4*** (0.0)	7.96 (0.01)	8.36 (0.01)	0.4*** (0.0)
Head's age	43.55 (0.09)	46.72 (0.09)	3.2*** (0.1)	44.24 (0.09)	47.23 (0.06)	3.0*** (0.1)	44.32 (0.06)	48.40 (0.08)	4.1*** (0.1)
Head is female	0.12 (0.00)	0.11 (0.00)	-0.0* (0.0)	0.11 (0.00)	0.11 (0.00)	0.0 (0.0)	0.10 (0.00)	0.12 (0.00)	0.0*** (0.0)
Head's highest education level is primary	0.04 (0.00)	0.03 (0.00)	-0.0*** (0.0)	0.03 (0.00)	0.46 (0.00)	0.4*** (0.0)	0.44 (0.00)	0.44 (0.00)	0.0 (0.0)
Head's highest education level is secondary	0.14 (0.00)	0.11 (0.00)	-0.0*** (0.0)	0.12 (0.00)	0.30 (0.00)	0.2*** (0.0)	0.32 (0.00)	0.32 (0.00)	0.0 (0.0)
Head's highest education level is tertiary	0.08 (0.00)	0.09 (0.00)	0.0 (0.0)	0.09 (0.00)	0.11 (0.00)	0.0*** (0.0)	0.12 (0.00)	0.12 (0.00)	0.0 (0.0)
Urban area	0.65 (0.01)	0.66 (0.01)	0.0 (0.0)	0.65 (0.01)	0.62 (0.00)	-0.0*** (0.0)	0.61 (0.00)	0.62 (0.00)	0.0** (0.0)

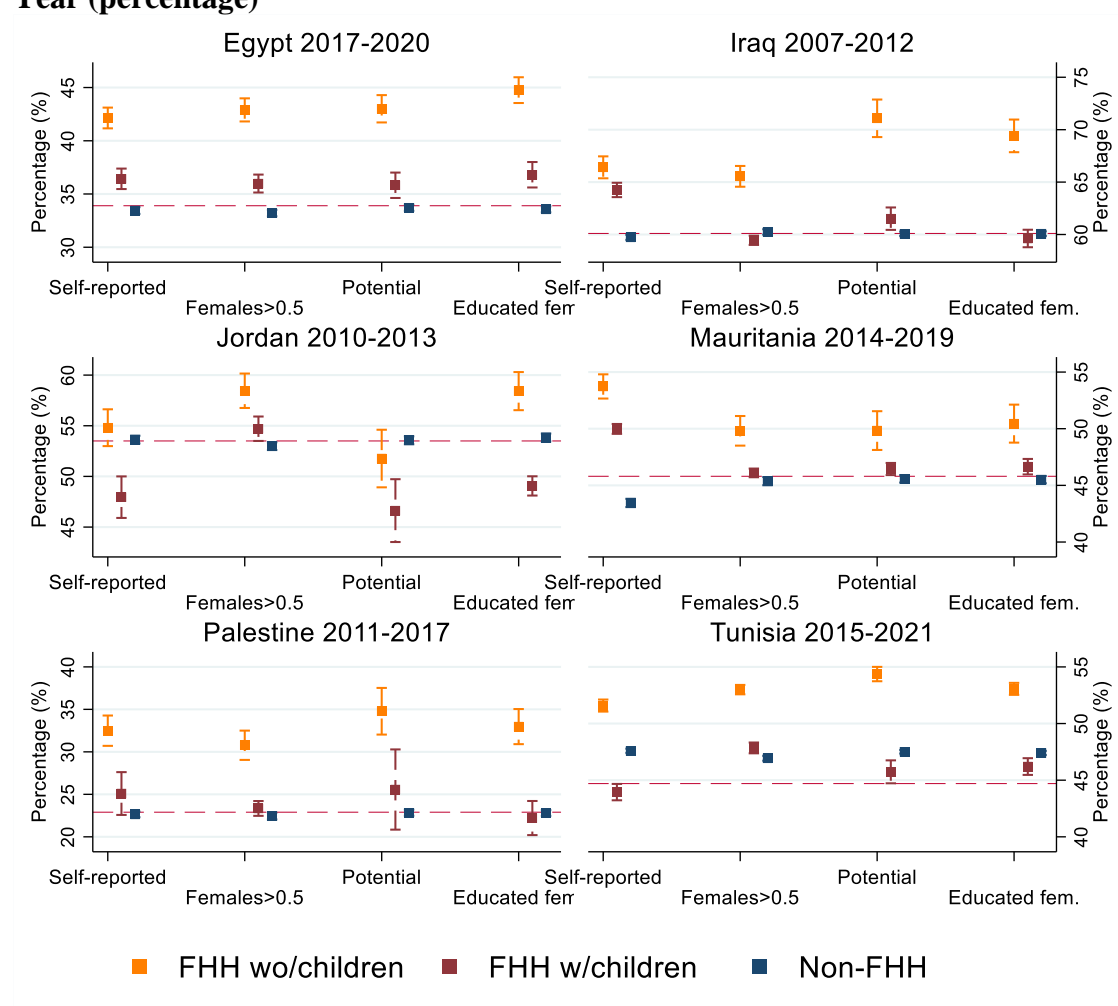
Note: ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels. Standard errors are in parentheses. The data are unweighted. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round. The reference groups are household with no primary education and living in rural areas.

Table C.13. Estimated rho (ρ) from cross-sectional data

Country	Period	ρ	Alternative ρ
Egypt	2012-2015	0.84	0.52
	2015-2017	0.89	0.46
	2017-2020	0.79	0.61
Palestine	2007-2009	0.54	0.56
	2009-2011	0.62	0.66
	2011-2017	0.34	0.59
Tunisia	2005-2010	0.57	0.67
	2010-2015	0.73	0.65
	2015-2021	0.89	0.61
Mauritania	2004-2008	0.77	0.57
	2008-2014	0.63	0.56
	2014-2019	0.70	0.61
Iraq	2007-2012	0.68	0.37
Jordan	2010-2013	0.63	0.63

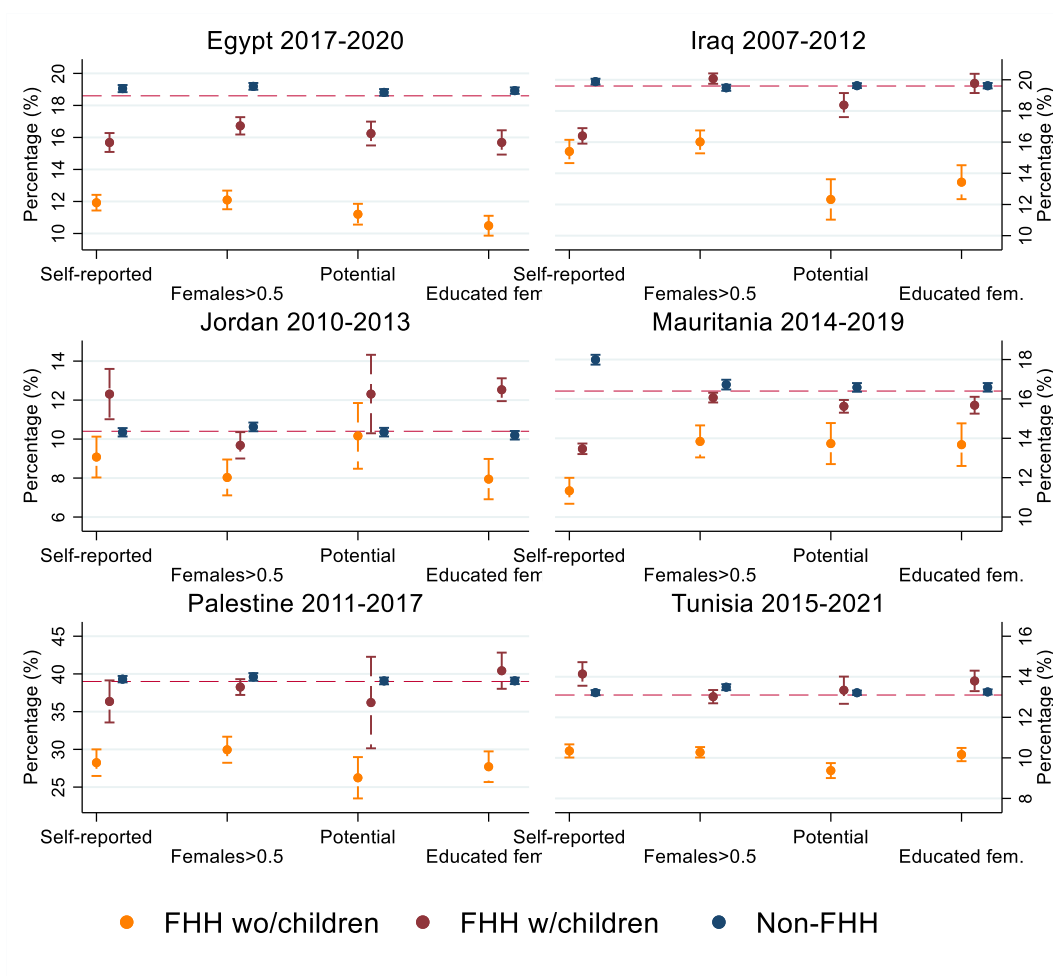
Note: ρ are estimated using Equation (C5) for all countries with cohorts being defined by age interacted with household heads' education. Alternative ρ 's are estimated using Equation (C6).

Figure C.1. Probabilities of Female-Headed Households Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that moves out of poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps. ρ 's are estimated using Equation (C6).

Figure C.2. Probabilities of Female-Headed Households Falling in Poverty in Second Year Conditional on Being Non-poor in First Year (percentage)



Note: Estimates are obtained with synthetic panel data and weighted with population weights where the second survey round is used as the base year. The figure shows the percentage of the population that enters poverty in the second year. FHH characteristics are measured in second period. Dashed red lines represent the national average for each period. Household heads' ages are restricted to 25-55 for the first survey round and adjusted accordingly for the second survey round. Standard errors are estimated with 1,000 bootstraps. ρ 's are estimated using Equation (C6).

Appendix D: Further analysis with equivalence scale

Given our consistent observation of self-reported FHHs having an advantage in terms of greater mobility, the question arises as to whether this conclusion remains valid if we extend to selecting a measure of household members' welfare that goes beyond household expenditure per capita.

Within the context of poverty dynamics, we show two scenarios for self-reported FHHs as an example: one in which FHHs have a greater probability to escape poverty compared to non-FHHs (denoted by the orange-shaded region in Figure D.1), and another where FHHs are less likely to escape poverty than non-FHHs (represented by the blue-shaded area in Figure D.1). Importantly, the selection of specific scale parameters can significantly alter the conclusions drawn regarding poverty dynamics among FHHs.

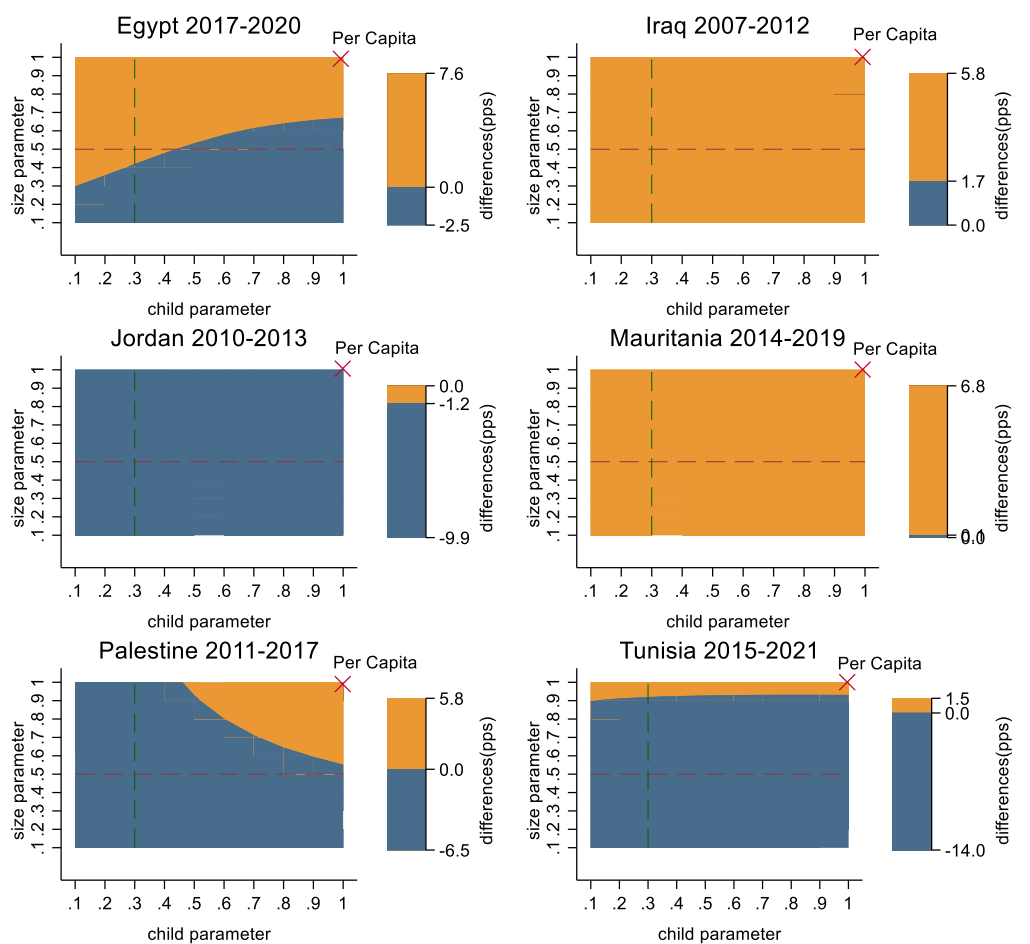
In particular, when assessing consumption on a per capita basis (i.e., when $\beta=1$ and $\theta=1$), self-reported FHHs consistently exhibit a higher probability of escaping poverty than non-FHHs and it holds true across all countries. Intriguingly, these findings align with those in Abanokova *et al.* (2022), which demonstrated a persistent upward mobility when income is evaluated on a per capita basis.

The conclusions regarding poverty dynamics shift when adopting OECD-recommended (modified) equivalence scales, which assign a value of 0.3 to each child aged 0-13 (indicated by the green dashed line) and/or the "square root scale" set at 0.5 (represented by the red dashed line). Under the "square root scale," self-reported FHHs become less likely to escape poverty than non-FHHs in Jordan, Palestine, and Tunisia, regardless of the child parameter value. The use of a lower scale parameter than the "square root scale" alters the conclusion in Egypt, but the sensitivity to the child parameter is also observed. Significant sensitivity to the child parameter is found in Palestine. When the child parameter is set to 0.4 or lower, there is a shift in the scenario from FHHs experiencing upward mobility to FHHs facing downward mobility. However, varying the parameters of economies of scale and child parameters from 0 to 1 does not alter the conclusions regarding poverty dynamics for Mauritania, Iraq and Jordan.

The absolute difference in the percentage of the population transitioning out of poverty between FHHs and non-FHHs is also influenced by the scale parameters. In the case of Mauritania, where self-reported FHHs are more likely to escape poverty than non-FHHs, fluctuations in scale parameters can result in significant changes in the percentage of self-reported FHHs escaping poverty. These variations can yield a discrepancy of up to 6.8 percentage points, depending on the scale parameters applied.

The overarching finding is that the parameter dictating the economies of scale and the private–public nature of household consumption contributes non-trivially to the poverty ranking between FHHs and non-FHHs across most countries and FHH definitions, while the child parameter having a comparatively smaller impact compared to household size. These results mirror our earlier observation in Abanokova *et al.* (2022) regarding the sensitivity of income dynamics to scale parameters.

Figure D.1. Self-reported FHHs– non-FHHs Differences in Probabilities of Escaping Poverty in Second Year Conditional on Being Poor in First Year (percentage points), by Scale Parameters



Note: Each figure shows 2-parameter equivalence scale that adjusts household consumption: $(a_{ij} + \alpha k_{ij})^\delta$ where a — number of adults in the household, k – number of children in the household, α is “child parameter” that accounts for the needs of children aged 0-13 and δ is “size parameter” that measures the degree of economies of scale in household consumption. Both parameters are varying between 0 and 1. The blue zone indicates lower probabilities of escaping poverty among FHHs compared to non-FHHs. The orange zone indicates higher probabilities of escaping poverty among FHHs compared to non-FHHs. Each bar shows the difference in the percentage of the population that moves out of poverty among FHHs compared to non-FHHs in the second year (expressed in percentage points). We use OECD recommended (modified) equivalence scale that assigns a value of 0.3 to each child aged 0-13 (green dashed line) and “square root scale” that equals to 0.5 (red dashed line). The top right corner of the box (marked \times) illustrates the case when $\beta = 1$ and $\theta = 1$ representing per capita expenditure (“Per Capita”).