



Individual Wealth Inequality: Measurement and Evidence from Low- and Middle-Income Countries

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Paper prepared for the IARIW-TNBS Conference on “Measuring Income, Wealth and Well-being in Africa”, Arusha, Tanzania November 11-13, 2022

Session 1: Inequality and Growth

Time: Friday, November 11, 2022 [9:00 AM- 10:30 AM]

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Abstract

The accumulation of personal wealth, stemming from ownership and control of assets, plays a critical role in advancing women's and men's economic opportunities. Yet, it is an understudied dimension of inequality across the developing world. To study individual-level wealth inequality and gender differences in wealth, this paper leverages unique data from nationally-representative multi-topic household surveys that were conducted in Cambodia, Ethiopia, Malawi and Tanzania and that interviewed men and women in private regarding their personal ownership and valuation of physical and financial assets. The analysis documents substantial gender inequalities in asset ownership and wealth, overall and for specific asset classes. Individual-level wealth inequality measures are substantially higher vis-à-vis comparators based on per capita household consumption expenditures and per capita household wealth — and intra-household wealth inequality has a substantial role in explaining overall wealth inequality. While land is a key contributor to wealth inequality across countries, there is cross-country heterogeneity in the relative contributions of asset classes. Self-reporting on asset ownership and valuation, the internationally-recommended best practice, is also shown to lead to higher inequality estimates compared to the business-as-usual survey practice of interviewing a single, most-knowledgeable household member to identify intra-household asset owners and values. The discussion expands on the implications of the findings for future surveys and methodological research.

JEL Codes: C81, C83, D31, J16, O12.

Keywords: Asset Ownership, Wealth, Inequality, Gender, Respondent Selection, Household Surveys, Cambodia, Ethiopia, Malawi, Tanzania.

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1. Introduction

The accumulation of wealth—stemming from ownership and control of land, durables, and other assets—has critical roles in advancing economic opportunities for men and women. These include improved productivity and investment, raising one’s ability to withstand economic and other shocks, as well as improving economic security for future generations. Land and equipment are necessary for expanding farm and nonfarm enterprise operations, for example; access to credit and other financial services can also be eased through the use of land as collateral and ownership of bank accounts (Cheng et al., 2021; Twumasi et al., 2020). Ownership of vehicles, and other durables such as mobile devices and computers, can improve access to markets and lower transaction costs (Hasanbasri et al., 2021a). Across all these areas, assets can be passed down or transferred to others — improving the economic mobility of younger generations, for example (Quisumbing et al., 2004). All of these channels can also help contribute to individuals’ economic status and bargaining power within households (Doss, 2013).

Understanding wealth inequality along individual dimensions such as gender, age, and sector of work, are important for shaping effective, distributionally-sensitive policies around asset ownership. These include designing programs to expand individual property rights (Wang, 2014; Kilic et al., 2021); access to finance (Dupas et al., 2017; Field et al., 2021); as well as understanding the implications of property taxation (Komatsu et al., 2021; Stephens and Ward-Batts, 2004). Given the critical roles assets play in income generation, investment, and intergenerational economic mobility, individual-level data collection on asset ownership can better inform how these initiatives should be targeted, particularly amid surging wealth inequality across countries, and rising costs of land and capital (Zucman, 2019).

Multi-topic household surveys are an ideal source of information on these different dimensions, and to better highlight the socioeconomic and demographic profiles of asset owners for accurate policy targeting.

When included in surveys, however, variables on wealth (as well as other welfare aggregates such as consumption, on which national measures of inequality are based), are often collected at the household level (De Vryer and Lambert, 2021; OECD, 2013), or by a single “most knowledgeable” member reporting for others, as opposed to individuals themselves (Kilic, Moylan and Koolwal, 2021; Hasanbasri et al., 2021b). In this vein, self-reported, individual-level data collection on asset ownership in these surveys can yield two contributions in developing a more nuanced, policy-relevant understanding of wealth: first, to reveal greater insights on wealth across sub-groups within the population, and second, to shed greater light on intra-household disparities in wealth. A large literature challenging the unitary model of the household has underscored how measures of inequality based on household-level data can inherently mask unequal resource allocation and welfare outcomes among individuals (Chiappori and Meghir, 2015; Haddad and Kanbur, 1990). Relying solely on household-level data collection on asset ownership to inform program targeting, can therefore miss substantial intra-household inequalities in how returns to assets are shared across members — limiting the efficacy of such programs in reducing broader inequalities across different sub-groups. While it can be argued that individuals who do not own assets within the household may still benefit from other members’ ownership (including the possibility to inherit later on) — as well as benefiting from greater household wealth overall, even if they never own assets themselves — this may not always be the case, particularly in contexts where social and cultural restrictions on the ownership and transfer of property and other assets to certain groups, including women and individuals facing shocks such as divorce and widowhood (Djuikom and van de Walle, 2022). In contexts where women face greater legal and cultural restrictions on ownership of physical and financial assets, for example, studies have shown that expanding their personal ownership has been shown to improve their socioeconomic outcomes along different dimensions (see Wang, 2014, and Doss, 2006, on the links between women’s individual property ownership and changes in household expenditure patterns; and Dupas et al., 2017 on the links between individual financial account ownership and women’s savings). Understanding features of ownership,

including exclusive as well as joint ownership in the household, as well as rights over assets to sell, bequeath, and make investments, can shed further light in this area.

In this paper, we use new data from nationally-representative household surveys that were conducted in Cambodia, Ethiopia, Malawi and Tanzania over the period of 2016-2020 with support from the World Bank Living Standards and Measurement Study-Plus (LSMS+) program; the surveys included cross-country comparable questionnaire modules based on intra-household, private interviews with adult household members regarding their personal ownership, control and valuation of a comprehensive set of physical and financial assets, including whether assets were exclusively or jointly owned. The LSMS+ supported questionnaire modules were based on recently developed international guidelines for collecting individual disaggregated survey data on asset ownership and rights (UN Statistical Division (UNSD), 2019). The 2019 UNSD guidelines, in turn, were based on several country pilots supported by the Evidence and Data for Gender Equality (EDGE) initiative, that recommends self-reported data on individuals' asset ownership and rights.² Having self-reported information on asset ownership and values allows us to create individual-level wealth aggregates, whose analysis reveals a number of findings that have important implications for both survey design and understanding of wealth inequalities within populations.

This paper is primarily structured as a measurement study. We discuss how the LSMS+ data were collected across countries, associated measurement issues with reporting data on asset ownership and valuation,

² The EDGE pilots were conducted between 2014-2016, and included Uganda, Mexico, Georgia, Philippines, Mongolia, Maldives, and South Africa. These pilots and the resulting guidelines were also informed by the ongoing work of several survey initiatives that using different approaches have included some individual-level data on ownership and control of assets (also see Doss et al., 2014, for a discussion of the Gender Asset Gap project).

and how individual-level data on wealth sheds greater insights on inequalities within populations, vis-à-vis standard household per capita measures. There are several headline findings from our research:

- First, across countries and different asset classes, there are substantial gender differences in the incidence of asset ownership and values of asset holdings, underscoring the importance of disaggregated data collection (i.e. elicited from individuals, and at the asset-level) for characterizing gender inequities in wealth in low- and middle-income countries.
- Second, inequality as measured by household per capita wealth far outpaces more standard measures based on household per capita consumption expenditure, and individual-level variation in wealth leads to even higher measures of inequality across countries, similar to recent findings on intra-household consumption poverty (Brown et al., 2018; Bose-Duker et al., 2021). Intra-household wealth inequality has a substantial role in explaining overall wealth inequality, and land, in particular, is an important driver of inequality, although there is variation by country as to whether residential or non-residential land plays a greater role. Data on asset values are also not without their own measurement issues, including missing responses and variation in reported values among joint owners, raising questions on how to treat jointly owned assets. We use these features of the data as an opportunity to understand how constructing different specifications of individual-level wealth to account for these sources of measurement error affect our findings, and continue to find that our results are robust to these sensitivity checks.
- Third, within the context of understanding individual wealth inequality, self-reporting on asset valuation matters. In Malawi, we find that measures of individual wealth inequality are higher using self-reported data from the LSMS+ are higher than estimates from a concurrent, national survey that covered similar survey strata, and which had the same identical household and agricultural questionnaires and field teams, with the exception of using the more standard business-as-usual

survey practice of interviewing a single, most-knowledgeable household member to identify asset owners and values within the household.³

Overall, a key contribution of this paper is highlighting the importance of disaggregated data collection — across individuals and asset classes — as well as carefully considering aspects of respondent selection (i.e. self versus proxy reporting) in understanding and targeting economic inequalities. Little is understood as to how specific assets — across land and durables, for example — drive wealth inequality within countries, given data gaps on individual ownership of different asset classes, particularly in national surveys that could allow for a deeper understanding of inequality within populations. And even when these topics are covered in surveys, household members’ asset ownership and control are typically asked only of one person considered by survey enumerators to be knowledgeable about these issues. The significance and consistency of our findings across countries, and robustness to sensitivity checks addressing measurement errors around missing values and jointly owned assets, point to the need to broaden the scope of surveys and methodological research to better understand longer-run inequalities among men and women stemming from differences in personal asset ownership and wealth.

The paper is structured as follows. Section 2 discusses the LSMS+ methodology and survey data. Section 3 provides descriptive statistics on within- and across-household variation in asset ownership and valuation, including how asset valuation are constructed, accounting for different scenarios on how missing data as well as joint ownership of assets/multiple valuations of the same asset are treated. Section 4 discusses the

³ The same surveys were used by Kilic, Moylan and Koolwal (2021) in a separate comparison of how self-reporting affected estimates of men’s and women’s agricultural land ownership; their study found that asking one household member to report on others’ ownership, compared to having all adult members reporting themselves, led to lower reporting of women’s land ownership and higher reporting for men.

findings on inequality measurement using the individual-level data on wealth. Section 5 presents a discussion on implications for how self- versus proxy reporting affects estimates of inequality. Section 6 concludes.

2. LSMS+ Methodology and Survey Data

2.1 Background

Since 2016, and as part of the 18th replenishment of the International Development Association (IDA18) that committed to launch pilot data collection in at least six IDA countries to “gather direct respondent, intra-household level information on employment and assets,”⁴ the LSMS+ program has coordinated with country national statistical offices to include self-reported, individual-level modules on asset ownership and rights, as well as labor, as part of ongoing, multi-topic, nationally-representative surveys. The LSMS+ modules follow 2019 United Nations guidelines for producing statistics on asset ownership from a gender perspective, prepared under the Evidence and Data for Gender Equality (EDGE) project.⁵ With an emphasis on self-reported data to fully capture intra-household gender inequalities in asset ownership, LSMS+ aims to address widespread data gaps on individual wealth and improve the accuracy in estimates of wealth. This is in contrast to more common survey approaches that — when data on wealth are collected — tend

⁴ World Bank, 2016.

⁵ See UN (2019). EDGE was launched in 2013 as part of a collaboration between the US Government, the United Nations Statistics Division and UN Women, along with key regional and international agencies including the OECD and the World Bank. The UN-EDGE guidelines were also informed by country pilots including the Methodological Experiment on Measuring Asset Ownership from a Gender Perspective (MEXA) in Uganda (Kilic and Moylan, 2016).

to either collect this information at the household level, or by one respondent per household that answers for others (see Kilic, Moylan and Koolwal, 2021 for a discussion).

In this paper, we use publicly available data from LSMS+ supported national surveys that were conducted in Malawi (2016 Integrated Household Panel Survey), Tanzania (2019/20 National Panel Survey), Ethiopia (2018/19 Ethiopia Socioeconomic Survey), and Cambodia (2019 LSMS+ Survey).⁶ These countries all have different civil and customary laws around men's and women's land ownership and rights, as well as broader norms around the pursuit of economic opportunities, affecting individuals' ability to accumulate and manage assets (see Hasanbasri et al., 2021d, 2021e). Table 1 presents the main features of these surveys. Individual wealth is constructed in our analysis using data on individuals' self-reported ownership and valuation of different assets in the LSMS+ surveys. The aforementioned UN guidelines recommend that countries collect information, at a minimum, on the principal dwelling, agricultural land, and other real estate as this "core" set of assets has been found to comprise the majority of personal wealth. Additionally, the guidelines advised countries to determine additional assets (including non-agricultural enterprise assets, livestock, large and small agricultural equipment, financial assets and liabilities, valuables, and consumer durables such as vehicles) to collect data on based on the policy needs and prevalence of assets within the country.

In line with these recommendations, LSMS+ supported national surveys have focused on the following asset classes on a cross-country basis: residential and non-residential (which, in these countries, was primarily agricultural) land; mobile phones; and financial accounts. A module on livestock ownership was also

⁶ The anonymized unit-record data from all surveys are publicly available on the World Bank Microdata website: <https://microdata.worldbank.org/index.php/home>

included covered in Ethiopia and Cambodia, and the Cambodia LSMS+ Survey additionally included a module on individual-level ownership of durables, such as computers as well as motorized and non-motorized vehicles, including bicycles, motorcycles, cars, tractors, boats and *tuk tuks* (rickshaws).

Table 1. LSMS+ supported surveys used in the analysis

	Malawi	Tanzania	Ethiopia	Cambodia
Survey	2016 Integrated Household Panel Survey	2019/20 Tanzania National Panel Survey	2018/19 Ethiopia Socioeconomic Survey	2019/20 Cambodia LSMS+ Survey
Implementing agency ⁽¹⁾	Malawi National Statistical Office	Tanzania National Bureau of Statistics	Ethiopia Central Statistical Agency	National Institute of Statistics of Cambodia
Sample size for individual interviews supported by LSMS+ ⁽²⁾	2,508 households	1,184 households	6,770 households	1,512 households
Fieldwork period	4/2016-1/2017	1/2019-1/2020	9/2018-8/2019	10/2019-12/2019
Asset classes included in individual-level data collection	Non-residential (primarily agricultural) and residential land, financial accounts, mobile phones	Non-residential (primarily agricultural) and residential land, financial accounts, mobile phones	Non-residential (primarily agricultural) and residential land, financial accounts, mobile phones, livestock	Non-residential (primarily agricultural) and residential land, financial accounts, mobile phones, livestock, apartments/condos, consumer durables
Other topics of individual-disaggregated data collection	Employment, non-farm enterprises, education, health, food insecurity	Employment, non-farm enterprises, education, health, subjective well-being	Employment, non-farm enterprises, education, health, savings	Employment, non-farm enterprises, education, health, 24-hour time use diary; domestic and international migration

Similar to other national multi-topic surveys under the LSMS program, the LSMS+ supported surveys collected detailed data on the same range of individual and household socioeconomic and demographic outcomes critical for understanding poverty and welfare, with the same questionnaire structure, flow of modules and question wording. This allows for cross-country comparisons in the paper alongside the within-country analysis.

2.2 LSMS+ methodological approach to collecting individual-level data on assets

Survey modules on ownership of and rights to assets should be premised on the basic idea that assets can often be owned by multiple individuals, and in other cases only one individual. To account for these scenarios, a key component of the LSMS+ approach is to conduct intra-household and private interviews with all household members aged 18 and older on their personal ownership of and rights to assets (see Hasanbasri et al., 2021b, for a detailed discussion of the survey methodology as well).⁷ Following the UN guidelines, this involved first obtaining a roster of assets, in each asset class, belonging to household members, and then separately interviewing all adult household members, feeding a common roster of assets into each individual-level interview.⁸ Across all LSMS+ supported surveys, information on individual asset ownership and valuation was entirely self-reported.

The LSMS+ assets modules also examine nuances of ownership that are not well-covered in surveys on wealth. This includes differentiating between respondents' exclusive versus joint reported ownership of

⁷ As part of the Malawi Integrated Household Panel Survey 2016, the first LSMS+ supported survey, up to 4 adults were randomly selected for interview, following the approach used in MEXA in Uganda. This covered 99 percent of adults in the survey sample. Interviews prioritized the selection of the head of household, and his or her spouse, if working in a couple household, and the rest of the respondents were selected at random. By the second LSMS+ supported survey in Tanzania, the survey team decided it was feasible to interview all adults aged 18 and older. Tanzania, Ethiopia and Cambodia LSMS+ asset modules cover all adult household members 18 and older.

⁸ Time and budget constraints can hamper interviewing all adult household members, leading to the risk of nonresponse. Among the LSMS+ surveys that have been completed so far, however response rates have been relatively high among eligible adults. In Malawi, 82 percent of all eligible adults were successfully interviewed; in Tanzania, Ethiopia and Cambodia, these shares were 80, 96, and 92 percent, respectively (see Hasanbasri et al., 2021c, 2021d for more details).

each asset in a given asset class.⁹ In the case of joint ownership, respondents were asked to identify who shared the asset within the household (through those individuals' unique household roster identifiers), as well as the number of men and women outside the household who shared ownership of the asset. For residential and non-residential land, different ownership and rights constructs were covered as well. For residential and non-residential land, for example, individuals were asked about overall reported ownership, economic ownership (being able to control money over the proceeds from hypothetical land sales), as well as documented ownership/whether the respondent's name was on a title or certificate to the land. Whether landowning respondents had rights to sell, bequeath, rent, use as collateral, and invest were also asked. Additional questions were asked on whether these nuances of ownership and rights were held jointly or exclusively. This level of detail highlights important patterns of ownership and decision-making that can inform policy efforts to expand access to financial services, land, and property rights in general. Our results also show, under the individual-level survey approach, a substantial share of agreement among couples on ownership and rights to dwelling and non-dwelling land — around 70 and 75 percent of land parcels in Tanzania and Malawi, respectively, 90 percent in Ethiopia, and 94 percent in Cambodia (Appendix Table A1).¹⁰

On valuation specifically, the UN guidelines recommend that in estimating wealth, each asset should be valued individually at its current market price (the *potential sales value* or *realization value*, namely how much the respondent would expect to receive if they sold the asset today). This recommendation had been based on the experience under the World Bank Living Standards Measurement Study-Integrated Surveys

⁹ The one exception was for consumer durables in Cambodia (computers, as well as motorized and non-motorized vehicles), where respondents were only asked about ownership overall, and not asked to identify joint owners. This stems from the protocol and questionnaire used in MEXA, also in line with the sample durable module in the UN-EDGE guidelines.

¹⁰ A parcel is defined as a continuous piece of land which can have more than one plot.

on Agriculture (LSMS-ISA), the Gender Asset Gap Project, and the surveys that were supported by the EDGE project, which found that the potential sales value provides a more consistent measure of asset prices as compared to the construction value or rental value of the asset, as well as other approaches to sales valuation such as the “quick sale” price and “reservation” price.¹¹ The LSMS+ assets modules followed the UN guidelines and asked respondents that of each asset they owned, *“if you were to sell <THIS ASSET> today at current market prices, how much would you receive for it (in local currency)?”*¹² The approach was item-by-item and was asked of respondents for a point estimate valuation for each asset they owned (each land parcel, for example), as opposed to an aggregate estimate for all assets within a specific asset class. For financial accounts, respondents were asked about the current value of each account.

3. Descriptive statistics: individual-level variation in wealth

Wealth is a function of accumulated asset value but can also be viewed through the lens of ownership overall. Understanding inequalities in wealth rely on a careful examination of both, particularly in contexts and among groups where ownership of specific assets may be very limited. In this section, we first examine statistics on ownership of different asset classes, and then discuss aggregate measures of wealth we construct based on asset values reported by owners.

¹¹ The “quick sale” price is what the owner could expect to receive if he/she sold right away, i.e. not necessarily at current market prices, and which could lead to an undervaluation of the asset. The “reservation” price is the price that would induce the respondent to sell the asset, even if he/she was not intending to sell; this might lead to an overvaluation. For more discussion see UN (2019).

¹² In Ethiopia, since land is owned by the state, respondents were asked to provide the rental as opposed to sales value. In practice, however, land has been bought and sold through side channels.

3.1 Asset ownership

Table 2 presents the share of men and women owning assets covered in each survey — and shows that depending on the country, gender differences in ownership can vary substantially. Women are not always less likely to own assets — for residential and non-residential land, for example, women are more likely in Malawi and Cambodia to have reported as well as economic ownership, with higher shares of ownership for residential as compared to non-residential land. These differences are much greater in Malawi, where exclusive ownership of land among women tends to be substantially higher than men's, attributable to higher share of women-headed households and matrilineal communities where land is inherited through the matrilineal line (Kilic, Moylan and Koolwal, 2021).¹³ In Cambodia, joint ownership of land is greater overall compared to other countries, likely due to civil law designating most assets acquired during marriage as joint. In Ethiopia and Tanzania, on the other hand, we find lower shares of property ownership overall, with women being less likely to own land in both countries. Table 2 reveals statistically significant gender inequalities in reported and economic ownership in Ethiopia, as well as economic ownership in Tanzania. Women are also significantly less likely in Ethiopia to own livestock.

¹³ Ownership, however, may not necessarily correlate with rights — in separate estimates among landowners, gender disparities widen substantially in rights to sell and bequeath land (Hasanbasri et al., 2021b, 2021c).

Table 2. Share of men and women that own specific assets, by country

	Ethiopia		Tanzania		Malawi		Cambodia	
	Men	Women	Men	Women	Men	Women	Men	Women
(A) Mobile phone	0.50***	0.27***	0.78***	0.58***	0.56***	0.36***	0.91***	0.77***
Exclusive	0.48***	0.25***	0.76***	0.56***	0.55***	0.35***	0.47***	0.40***
Joint	0.03***	0.01***	0.02	0.02	0.01	0.01	0.44***	0.37***
(B) Financial account	0.31***	0.18***	0.15***	0.09***	0.24	0.25	0.14**	0.12**
Exclusive	0.27***	0.16***	0.15***	0.09***	0.22	0.23	0.09	0.08
Joint	0.06***	0.03***	0.00	0.00	0.03	0.02	0.05***	0.04***
(C) Livestock	0.51***	0.45***					0.39**	0.42**
Exclusive	0.22*	0.21*					0.16***	0.21***
Joint	0.35***	0.28***					0.23	0.23
(D) Non-residential land								
<i>Reported ownership</i>	0.27***	0.23***	0.31	0.29	0.35***	0.49***	0.56	0.57
Exclusive	0.05	0.04	0.15	0.13	0.18***	0.32***	0.17	0.18
Joint	0.22***	0.19***	0.16	0.16	0.20	0.20	0.39	0.38
<i>Economic ownership</i>	0.26***	0.21***	0.25*	0.20*	0.22***	0.32***	0.43**	0.45**
Exclusive	0.06	0.04	0.08*	0.05*	0.07***	0.15***	0.05**	0.06**
Joint	0.20***	0.17***	0.17	0.15	0.16**	0.20**	0.38	0.38
(E) Residential land								
<i>Reported ownership</i>	0.41**	0.39**	0.47	0.48	0.56***	0.64***	0.75**	0.78**
Exclusive	0.06***	0.08***	0.24	0.22	0.42***	0.51***	0.19**	0.22**
Joint	0.36***	0.31***	0.24	0.26	0.16	0.16	0.55	0.55
<i>Economic ownership</i>	0.40**	0.37**	0.34	0.31	0.42***	0.48***	0.56***	0.62***
Exclusive	0.07**	0.09**	0.11**	0.07**	0.10***	0.17***	0.02***	0.05***
Joint	0.33***	0.28***	0.23	0.24	0.33	0.32	0.53	0.54
Durables (Cambodia)⁽³⁾								
(F1) Computer							0.05***	0.02***
(F2) Bicycle							0.30***	0.36***
(F3) Motorcycle							0.78***	0.60***
(F4) Car							0.09***	0.07***
(F5) Tuk tuk							0.04**	0.03**
(F6) Boat							0.04**	0.03**
(F7) Tractor							0.15***	0.11***
Any asset (exclusive or joint) ⁽²⁾	0.83***	0.77***	0.70	0.69	0.80	0.81	0.87***	0.91***
Any asset excluding mobile phones	0.74***	0.69***	0.54	0.55	0.64***	0.72***	0.86*	0.88*
Number of respondents	7,235	8,153	1,407	1,576	2,243	2,669	1,845	2,093

Notes:

(1) Estimates weighted with the household sampling weights. Significant gender differences are indicated by asterisks; ***p<0.01 **p<0.05 *p<0.10 (2) Because of some missing observations for specific assets, the share of men and women with any asset can be lower than the shares of individual assets (Hasanbasri et al., 2021b, 2021c).

(3) In Cambodia, joint versus exclusive ownership of durables was not asked explicitly.

Furthermore, the results point to the importance of collecting data on different asset classes, when trying to better understand differences in ownership across groups, including by gender. In Cambodia, for example, women's ownership of livestock and durables like bicycles was greater than for men. Men, however, were more likely to own mobile phones, financial accounts, computers and different classes of motorized vehicles. In Ethiopia, Tanzania, and Malawi, gender differences in mobile phone ownership (where women were less likely to own) widened considerably compared to other asset classes; the same was true for financial account ownership in Ethiopia and Tanzania. In addition, nuances of ownership can vary by country as well as asset class. The share of men and women in Cambodia with joint ownership of land and mobile phones is much higher compared to countries in Sub-Saharan Africa, for example, but not for financial accounts or livestock.

In separate OLS regression estimates controlling for socioeconomic and demographic variables including age, marital status and employment, along with household consumption quintiles and enumeration-area fixed effects (Appendix Tables A2 and A3), we find a set of cross-country consistent correlates of men's and women's asset ownership. As would be expected, ownership of different assets is significantly higher among respondents who are household heads and/or older. Being married has, in fact, a stronger positive association with women's ownership of different assets than for men, and particularly for residential and non-residential land. Ownership of specific assets is also often tied to specific employment and education outcomes — land ownership, for example, is higher among respondents working in agriculture (with stronger effects in Cambodia and Tanzania), while financial asset and mobile phone ownership are higher among those working for a salary or in a non-farm enterprise, and with higher schooling. Table A4 also highlights a substantial degree of within-household heterogeneity in asset ownership, among households with both adult men and women. For example, in the countries from Sub-Saharan Africa, 15-20 percent of households have men owning land, while women do not; in general around 10 percent or more of

households in these countries, and in each asset class, have women not owning any assets, while men report exclusive or joint ownership with other household members. In many households as well, women and men are each exclusive owners of different assets within the same asset class, including livestock in Cambodia and Ethiopia.

3.2 Constructing individual-level wealth measures, and addressing measurement issues around missing valuations and joint ownership of assets

Following the UN guidelines that were discussed in Section 2.2, we use respondents' self-reported valuations of each asset they own, based on the potential sales value, to construct aggregate valuations of their wealth. Data on asset valuation, however, can be subject to different forms of measurement error, that might affect an overall understanding of inequality within populations. There are two measurement issues with the valuation data that we address in the paper, specifically related to missing valuations in respondents' self-reports, as well as how valuations around joint ownership are treated.

Missing valuations: multiple imputation approach

On the first issue, a key measurement challenge is that in Ethiopia and Tanzania, a substantial number of respondents not report values for specific assets, such as land and livestock (see Appendix Table A5). In Ethiopia, for example, 43 percent of men and 56 percent of women who were residential landowners did not report a potential sales value. In Tanzania these shares were 19 percent of men and 48 percent of women. Appendix Table A5 shows that among those with missing valuations, women were generally more likely to have missing data, and the most common reason among men and women was not knowing the value of the asset. In Malawi and Cambodia, on the other hand, the shares of respondents with missing valuations across asset classes was much lower — 5 percent or less among landowners in Malawi, and on average 15 percent in Cambodia. In Cambodia and Ethiopia as well, there were no missing observations on

valuation for financial accounts, mobile phones and durables. Aggregating missing data will lead to zeros within specific asset classes and could lead to an underreport of individuals' total wealth.

Missing data are not uncommon in household surveys, and in this case we used the presence of missing data as an opportunity to understand how alternate approaches to treating this issue could lead to overall differences in findings on individual wealth. Specifically, we compared individual wealth when leaving missing values as is (and hence treated as zeroes when aggregating values across asset categories), with a multiple imputation model (Rubin, 1987). Multiple imputation is commonly used to address issues related to missing data or the need to replace sensitive data in large-scale surveys (see Reiter, 2012 for a discussion) and Kilic et al. (2017) also rely on multiple imputation to derive predicted GPS-based area measures for up to 1/3 of agricultural plots that are not visited for GPS-based area measurement in the context of LSMS-ISA-supported national surveys in Tanzania and Uganda.

The multiple imputation approach uses information on observed values of variables that are predictive of the missing values — for example, individual, household, enumeration-area and interviewer variables — and conducts a predictive mean matching model based on repeated imputations. In our analysis, following the approach used by Kilic et al. (2017), on the individual-level data, the imputation is based on running the model 50 times, yielding 50 complete datasets, the distribution of which is intended to reflect the sampling variability. The average of these 50 predictions is taken to be the estimated value of a specific asset whose value was not reported by its owner.

Overall, the LSMS+ supported surveys have a rich set of individual, household and community characteristics — along with data on features of asset ownership — that were used explanatory variables in our multiple imputation model that relies on predictive mean matching with 5 neighbors. The covariates

that are used in the multiple imputation model are detailed in Appendix Table A2. These variables are strongly associated with asset valuation and factors related to the missing data generation process, and include survey design features in accordance with the guidance provided by Rubin (1996) and van Buuren et al. (1999). We provide a set of estimates that are obtained with no imputation and another set that is based on multiple imputation to recover missing asset values.

Approaches to treating multiple valuations on jointly-owned assets

Among joint owners of the same asset (for example, the same land parcel), while there was a substantial share of agreement over ownership (as discussed in Section 2.2), there was some variation in asset valuation. If some individuals or groups tend to systematically underreport their asset valuation relative to others, their overall wealth will be lower even among the same set of assets owned. Within each of the no-imputation and multiple imputation approaches, we examined how results would vary by either (a) retaining joint owners' self-reports (hence ignoring the intra-household discrepancy) or (b) assigning the maximum asset value reported among any of the joint owners.

In total, then, we have four different versions of the individual wealth variable that allows us to understand how the distribution of wealth and trends in wealth inequality change depending on differences sources of measurement error:

- (A) No imputation – using self-reports for joint owners,
- (B) No imputation – for joint owners, taking maximum of reported values,
- (C) Missing data imputed via multiple imputation – for joint owners, self-reports used, and
- (D) Missing data imputed via multiple imputation– for joint owners, taking maximum of reported values.

3.3 Descriptive statistics on asset valuation and individual wealth

Table 3 presents the valuation of assets, converting local currency estimates to USD, for men and women across the four specifications above. Because of the focus of the analysis on overall wealth in the population, and since there are many men and women in the country samples that do not own any assets, Table 3 examines the entire sample including non-owners — Appendix Table A6, however, includes the same estimates conditional on ownership. Significant differences are also indicated across men and women, within each specification.

In general, the results show that as one moves from specification (A) to (D), the average value of landed assets tends to increase for both men and women, with greater increases for residential as opposed to non-residential land. Comparing (A) and (C), however, the magnitude of gender differences does not change substantially. The results also again highlight importance of examining different asset classes separately, when considering gender differences as well as the overall contribution to wealth. While the overall value of assets is not significantly different across men and women in Malawi, Ethiopia and Cambodia, for example, women's value of livestock assets is significantly lower than men's in Ethiopia and Cambodia, as well as for mobile phones, computers and motorized vehicles in Cambodia. Despite variations in ownership that were discussed earlier, as well as some differences in magnitude of land values (these disappear among the sample of owners in Appendix Table A6) the value of non-residential and residential land was not significantly different across men and women in these countries. In Tanzania, however, women's value of non-residential and residential land is significantly lower than men's.

Figure 1, which relies on the asset value specification (C) (multiple imputation with self-reported values for joint owners)¹⁴, shows that important intra-household differences can be masked when only considering the distribution of household wealth. Even among the top 20th quintile of household wealth, for example, around 20-30 percent of men and women in these households have either no assets or are in the bottom two quintiles of the individual wealth distribution. Appendix Table A7, which presents results from OLS household fixed effects regressions, shows that women in this group are more likely to be young (30 years of age or less), with less schooling, and less likely to be married (for men in this group, on the other hand, only age had a significant positive association). Figure 1 also shows that in Sub-Saharan Africa, among households in the top two quintiles (above 60th percentile) of household wealth, the share of women in the top two quintiles of individual wealth is smaller than for men.

Since it is feasible that the factors affecting gender differences in wealth may vary along the distribution of wealth, Appendix Figure A1 presents predicted means of recentered influence function (RIF) regressions of men's and women's total wealth, estimated at 10 percentage point increments from 10th to 90th percentile (see Firpo, Fortin, and Lemieux, 2009, for a discussion). The recentered means at each percentile are presented separately for specifications (A) and (C), separately for men and women and by different age groups, given the strong links between age and overall asset values that were highlighted earlier in Table 5. The RIF regressions control for the same individual and household variables as in Appendix Table A2 along with geographic fixed effects, and the selected results from the estimations of RIF regressions at selected percentiles of men's and women's total wealth are presented in Appendix Table A8 to better illustrate distributional gender differences in relationships between covariates and total wealth.¹⁵

¹⁴ The results were similar for the other specifications and are available upon request.

¹⁵ The results for the RIF regressions by age group are available on request.

Importantly, the RIF results show that gender inequalities in wealth widen for older (51+) age groups, compared to younger cohorts, although men and women in this group are more likely to own assets overall. Appendix Table A8 shows that in general, across countries, the negative association of age with wealth is stronger for lower as opposed to higher wealth quantiles. This is also the case for the positive effect of marriage, which has a stronger effect on total wealth for women at lower quantiles of wealth.

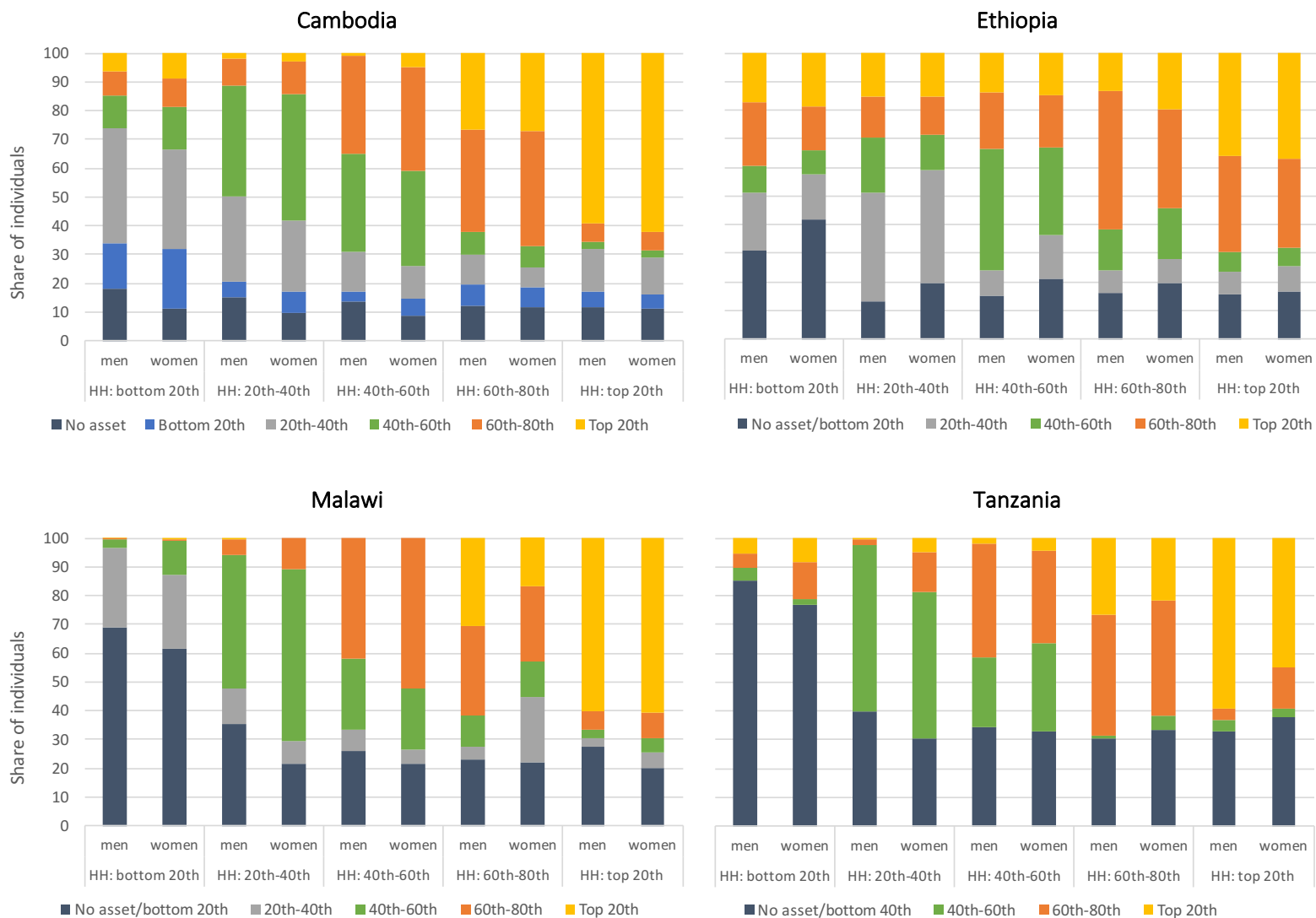
Table 3. Valuation of assets (USD), among full sample

	(A) No imputation – for joint owners, self-reports		(B) No imputation – for joint owners, max of reported values		(C) Missing data imputed via multiple imputation model – for joint owners, self-reports used		(D) Missing data imputed via multiple imputation model – for joint owners, max of reported values used	
	Men	Women	Men	Women	Men	Women	Men	Women
Malawi (Obs = 2243 men, 2669 women)								
Non-residential land	763.8	929.1	778.8	1,240.4	764.6	929.1	789.3	1,255.1
Residential land	772.0	1,920.0	892.6	2,037.1	845.2	2,022.8	976.3	2,103.1
ALL ASSETS	1,688.4	2,846.4	1,822.9	3,272.9	1,769.3	2,980.7	1,916.4	3,352.5
Tanzania (Obs = 1407 men, 1576 women)								
Non-residential land	477.2***	169.8***	514.3***	198.7***	535.8***	265.2***	588.3**	390.1**
Residential land	1,453.6***	808.3***	1,533.5***	934.4***	1,652.6	1,372.3	1,822.1	1,731.4
Financial accounts	21.7	15.4	21.7	15.4	31.9	18.7	31.9	18.7
ALL ASSETS	1,952.5***	993.5***	2,069.5***	1,148.5***	2,220.3**	1,656.1**	2,442.3	2,140.1
Ethiopia (Obs = 7235 men, 8153 women)								
Non-residential land	25.50	17.69	27.48	21.08	38.90	31.24	43.97	39.77
Residential land	1,707.3	1,013.1	2,163.9	1,335.7	4,226.64	3,473.72	7,478.71	4,861.80
Financial accounts	138.30	49.89	155.81	53.64	138.30	49.89	155.81	53.64
Mobile phones	18.11	9.32	18.39	9.55	18.11	9.32	18.39	9.55
Livestock	354.53***	167.58***	355.63***	169.22***	427.12***	313.12***	435.77***	317.19***
ALL ASSETS	2,706.3	1,633.1	3,283.3	2,062.7	6,335.2	6,640.2	11,500.1	8,739.9
Cambodia (Obs = 1845 men, 2093 women)								
Non-residential land	4,607.4	4,960.0	5,556.8	5,809.0	5,160.4	5,739.3	6,323.5	6,801.7
Residential land	7,968.8	8,424.1	9,022.7	9,530.1	9,050.3	10,218.3	10,989.3	12,500.0
Financial accounts	31.0	30.9	36.8	33.8	31.0	30.9	36.8	33.8
Mobile phones	48.1**	36.9**	64.9*	50.5*	48.1**	36.9**	64.9*	50.5*
Livestock	269.7***	232.8***	273.7***	238.2***	279.6***	248.6***	310.3***	280.2***
Durables:								
(1) Computer	15.6***	6.2***	15.6***	6.2***	15.6***	6.2***	15.6***	6.2***
(2) Bicycle	6.8	5.7	6.8	5.7	6.8	5.7	6.8	5.7
(3) Motorcycle	721.7***	552.5***	721.7***	552.5***	721.7***	552.5***	721.7***	552.5***
(4) Car	1,191.3***	847.7***	1,191.3***	847.7***	1,191.3***	847.7***	1,191.3***	847.7***
(5) Tuk tuk	36.4*	28.0*	36.4*	28.0*	36.4*	28.0*	36.4*	28.0*
(6) Boat	12.4	9.1	12.4	9.1	12.4	9.1	12.4	9.1
(7) Tractor	326.7***	237.3***	326.7***	237.3***	326.7***	237.3***	326.7***	237.3***
ALL ASSETS	14,872.3	15,148.4	16,887.1	17,116.8	16,887.1	17,116.8	19,656.9	21,121.4

Notes:

(1) Estimates weighted with the household sampling weights. Significant gender differences within each category are indicated by asterisks; ***p<0.01 **p<0.05 *p<0.10. (2) Results conditional on asset ownership are available in Appendix Table A5.

Figure 1. Share of men and women in individual wealth quintiles (along with share owning no assets), by household wealth quintiles



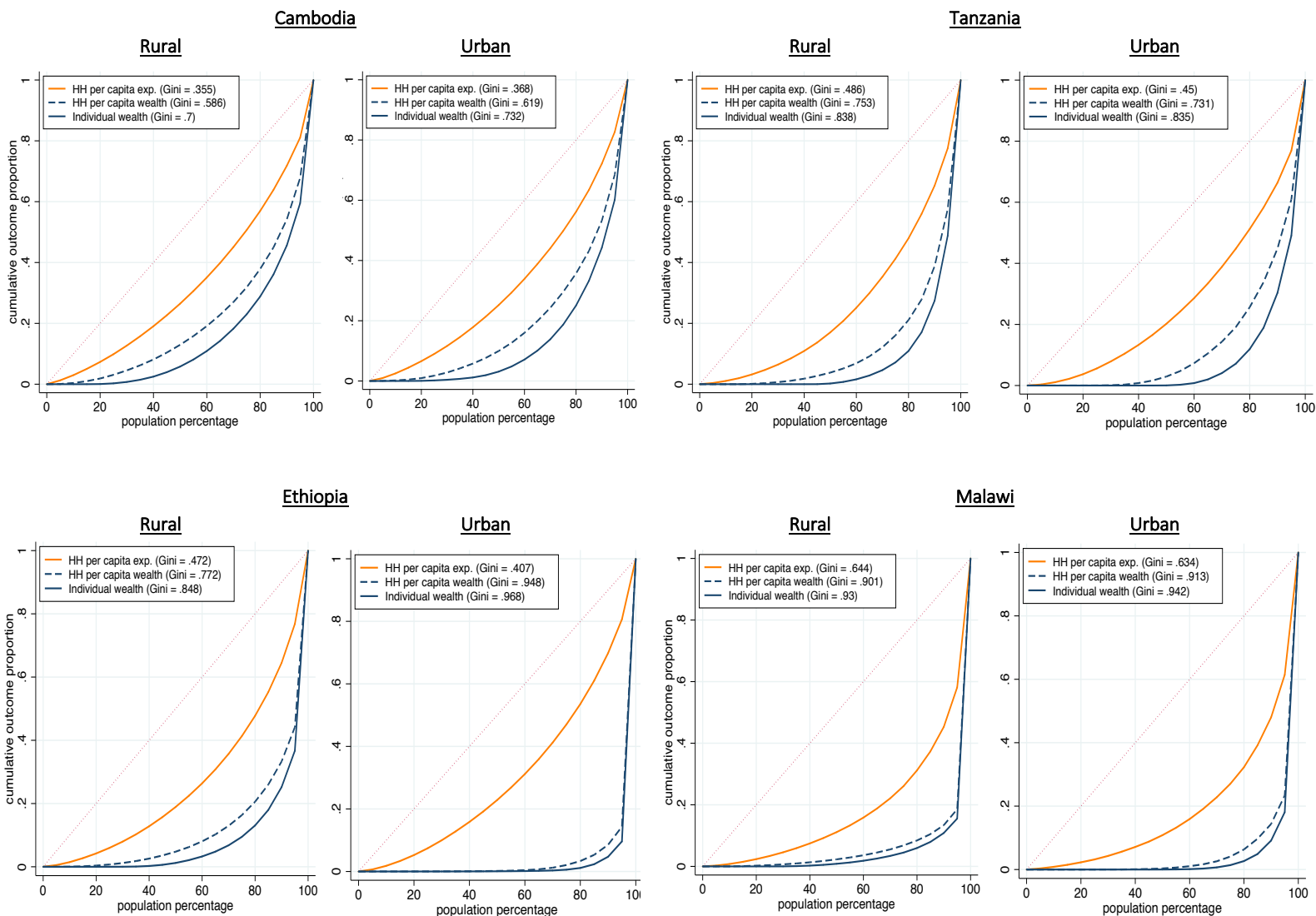
Notes:

(1) Results are based on specification (C), i.e. the multiple imputation approach, with self-reported values for joint owners. Results allocating the maximum reported value among joint owners were similar and are available upon request.

4. Comparing Measures of inequality using the individual wealth data

Using the total value of assets across different asset classes, Figure 2 presents estimates of competing measures of inequality among individuals as measured by Lorenz curves based on (i) household per capita expenditure, (ii) household per capita wealth (scaling individual wealth up to the household level), and (iii) individual wealth as measured by specification (C). A striking factor is how high inequality is in wealth overall, as compared to household per capita consumption expenditure (see Boyer, 2020, for a discussion of measurements of wealth and consumption inequality across countries, as well as underlying data issues). The results underscore the importance of individual-level data collection on wealth: across countries, as compared to the Lorenz curves for household per capita expenditure and household per capita wealth (aggregating individual wealth to the household level and dividing by household size), inequality as measured by individual wealth is significantly greater in all countries. With the exception of Tanzania, urban inequality tends to be somewhat greater than rural inequality well across countries. Greater inequality as measured through individual-level wealth data is consistent with other recent studies that have examined how consumption-based poverty measures can be underestimated when examining outcomes only at the household level (Brown et al., 2018; Bose-Duker et al., 2021).

Figure 2. Lorenz curves: comparing overall inequality across household per capita consumption expenditure, household per capita wealth, and individual wealth (full sample)



Notes:

(1) The graphs above reflect specification (C) of the individual wealth variable: where missing values are imputed using multiple imputation, and among joint owners, self reported values are used.

Table 4 compares additional inequality indicators, apart from the Gini, across different specifications of individual wealth: the 75/25 ratio, which compares how many times greater wealth is at the 75th compared to the 25th percentile of the distribution; as well as the Generalized Entropy measures GE(0) (mean log deviation, or Theil L index) and GE(1) (Theil T index).¹⁶ Bootstrapped standard errors (250 repetitions) are also estimated for the different measures, and t-tests that were conducted revealed statistically significant differences across household per capita wealth and individual wealth for every wealth specification and inequality measure. The magnitudes of these differences do vary, with larger differences between different household per capita wealth and individual wealth inequality measures in Cambodia, Tanzania and Ethiopia. We also find, for the most part, that inequality measures do not vary substantially by individual wealth specification (A)-(D), and particularly among the Gini and Theil indices. The 75/25 ratio, on the other hand, is more sensitive to specification, particularly in Ethiopia and Tanzania where there was a greater share of missing data on land valuation.¹⁷ The general trend, regardless of which specification (A)-(D) of individual wealth we examine, however, is that individual-level data on wealth leads to greater variation and higher inequality estimates than household-level approaches. Results also did not change when dropping respondents for whom there was disagreement within the household over whether they owned specific assets.

¹⁶ Theil indices are based on ratios of incomes to the mean, and while they increase with greater inequality, they are not capped at one, like the Gini.

¹⁷ The ratio might have increased substantially in Ethiopia, for example, under the multiple imputation approach, where a sizeable share of asset values is missing would have been valued at zero under specification (A) but are then imputed with market prices that might in some cases be quite large/at the higher end of the distribution, depending on land size. In Tanzania, on the other hand, based on the distribution of land values, the multiple imputation model allocated land values that shrank the ratio. In Cambodia and Malawi, the ratio is less sensitive to specification.

Table 4. Inequality measures for household per capita consumption expenditure, household per capita wealth, and individual wealth, by specification of individual wealth
(all differences significant at $p < 0.001$)⁽¹⁾

Among full sample:			Among only those owning any assets (value > 0):											
Gini index			Gini index			75/25			GE(0): Theil L			GE(1): Theil T		
HH per capita wealth	Indiv. wealth		HH per capita exp.	HH per capita wealth	Indiv. wealth	HH per capita exp.	HH per capita wealth	Indiv. wealth	HH per capita exp.	HH per capita wealth	Indiv. wealth	HH per capita exp.	HH per capita wealth	Indiv. wealth
Cambodia														
<i>Indiv. wealth specification:⁽²⁾</i>														
(A)	66.7 [0.92]	76.5 [0.82]		66.5 [0.95]	73.2 [0.96]		7.4 [0.27]	13.3 [0.57]		1.1 [0.04]	1.6 [0.04]		0.92 [0.06]	1.15 [0.06]
(B)	67.7 [0.96]	76.7 [0.79]		67.5 [0.89]	73.4 [0.79]		8.1 [0.27]	15.2 [0.81]		1.1 [0.03]	1.6 [0.04]		0.95 [0.05]	1.15 [0.06]
(C)	62.2 [1.05]	73.0 [0.79]	37.7 [0.70]	62.0 [1.05]	69.5 [0.92]	2.4 [0.03]	4.9 [0.15]	10.2 [0.54]	0.24 [0.01]	0.87 [0.03]	1.3 [0.03]	0.27 [0.02]	0.79 [0.06]	1.02 [0.05]
(D)	63.1 [0.95]	72.7 [0.77]		63.0 [0.93]	69.2 [0.84]		5.0 [0.17]	9.8 [0.53]		0.88 [0.03]	1.3 [0.03]		0.82 [0.05]	1.00 [0.04]
Tanzania														
<i>Indiv. wealth specification:⁽²⁾</i>														
(A)	78.4 [0.62]	89.0 [0.48]		70.4 [0.85]	72.2 [1.03]		13.9 [0.86]	17.5 [1.73]		1.4 [0.04]	1.5 [0.05]		0.97 [0.04]	1.02 [0.04]
(B)	78.4 [0.68]	88.5 [0.51]		70.3 [0.86]	71.2 [1.01]		13.7 [1.1]	15.0 [1.4]		1.4 [0.03]	1.4 [0.05]		0.96 [0.04]	0.98 [0.04]
(C)	74.6 [0.71]	83.8 [0.50]	49.8 [0.85]	69.5 [0.84]	70.4 [0.88]	4.1 [0.13]	10.1 [0.79]	11.7 [0.94]	0.49 [0.02]	1.2 [0.03]	1.3 [0.04]	0.46 [0.03]	0.961 [0.03]	0.964 [0.03]
(D)	74.0 [0.67]	82.3 [0.53]		68.8 [0.80]	67.8 [0.84]		10.9 [0.82]	9.9 [1.0]		1.24 [0.03]	1.16 [0.03]		0.92 [0.03]	0.87 [0.03]
Ethiopia														
<i>Indiv. wealth specification:⁽²⁾</i>														
(A)	96.2 [1.1]	97.7 [1.2]		95.8 [1.1]	96.6 [1.8]		23.8 [0.8]	30.0 [1.3]		3.5 [0.25]	3.8 [0.40]		5.0 [0.49]	5.5 [0.76]
(B)	96.9 [1.1]	98.1 [0.78]		96.6 [1.2]	97.2 [1.2]		24.5 [0.8]	31.4 [1.1]		3.7 [0.31]	4.0 [0.36]		5.4 [0.47]	5.6 [0.61]
(C)	92.0 [1.2]	94.9 [1.0]	51.5 [0.30]	91.7 [1.3]	93.6 [1.7]	4.6 [0.07]	29.8 [1.1]	49.3 [1.5]	0.52 [0.01]	2.9 [0.14]	3.3 [0.19]	0.47 [0.01]	3.7 [0.34]	4.0 [0.44]
(D)	94.1 [1.1]	95.8 [0.83]		93.8 [1.1]	94.8 [1.1]		33.8 [1.1]	59.8 [2.9]		3.3 [0.19]	3.6 [0.18]		4.13 [0.31]	4.15 [0.32]
Malawi														
<i>Indiv. wealth specification:⁽²⁾</i>														
(A)	91.7 [1.4]	94.5 [1.4]		90.8 [1.5]	92.0 [1.6]		8.2 [0.29]	9.0 [0.48]		2.5 [0.17]	2.7 [0.23]		3.3 [0.25]	3.6 [0.35]
(B)	92.1 [1.2]	94.5 [1.1]		91.2 [1.4]	92.0 [1.6]		8.4 [0.40]	9.3 [0.53]		2.5 [0.16]	2.7 [0.19]		3.2 [0.19]	3.4 [0.28]
(C)	91.7 [1.3]	94.3 [1.3]	70.8 [0.84]	90.7 [1.5]	91.8 [1.8]	5.7 [0.17]	8.1 [0.33]	9.1 [0.46]	1.03 [0.03]	2.5 [0.15]	2.7 [0.21]	1.14 [0.05]	3.2 [0.23]	3.5 [0.31]
(D)	91.7 [1.2]	94.1 [1.1]		90.8 [1.3]	91.6 [1.8]		8.4 [0.41]	9.4 [0.55]		2.5 [0.14]	2.7 [0.20]		3.2 [0.20]	3.4 [0.28]

Notes:

(1) Bootstrapped standard errors (250 repetitions) are in brackets. For each specification (A)-(D) above, all differences between HH per capita and individual wealth inequality estimates were statistically significant at $p < 0.001$ (and, likewise, from the inequality indicators based on household per capita consumption).

(2) For individual wealth specification, (A) = No imputation, self-reported values for joint owners; (B) = No imputation, max value for joint owners; (C) = Missing values imputed through multiple imputation, self-reported values for joint owners; (D) = Missing values imputed through multiple imputation, max value for joint owners.

Table 5 discusses which asset classes matter more in understanding individual wealth inequality, by examining the Gini decomposition of the Gini by asset class. Land is the most important driver of inequality across countries. Table 8 also shows the importance of examining residential versus non-residential land separately, where residential land is the more important component across countries. Other asset classes have a smaller contribution but nevertheless substantial, including livestock in Ethiopia, as well as vehicles in Cambodia, underscoring again the need for a disaggregated perspective on asset ownership. The overall contributions to wealth inequality do not vary substantially by specification (A)-(D) of individual wealth, except for Ethiopia where there was a much higher share of missing data on land, and hence a greater role for land in the multiple imputation specifications.

Table 5. Are certain asset classes more important for understanding wealth inequality?
Gini decomposition by asset class

Factor shares by individual asset class:									
	Non-residential land	Residential land	Financial accounts	Mobile phones	Livestock	Motorcycle	Car	Tractor	Other ⁽¹⁾
Cambodia									
<i>Indiv. wealth specification:⁽²⁾</i>									
(A)	0.33	0.54	0.002	0.003	0.015	0.04	0.06	0.02	-
(B)	0.34	0.54	0.002	0.003	0.02	0.03	0.05	0.01	0.005
(C)	0.33	0.55	0.002	0.003	0.02	0.03	0.05	0.01	0.005
(D)	0.33	0.57	0.002	0.003	0.01	0.03	0.04	0.01	0.005
Tanzania									
<i>Indiv. wealth specification:⁽²⁾</i>									
(A)	0.22	0.77	0.01	-	-	-	-	-	-
(B)	0.22	0.77	0.01	-	-	-	-	-	-
(C)	0.20	0.78	0.01	-	-	-	-	-	-
(D)	0.21	0.78	0.01	-	-	-	-	-	-
Ethiopia									
<i>Indiv. wealth specification:⁽²⁾</i>									
(A)	0.01	0.78	0.05	0.01	0.15	-	-	-	-
(B)	0.01	0.82	0.05	0.01	0.12	-	-	-	-
(C)	0.01	0.89	0.02	0.003	0.08	-	-	-	-
(D)	0.01	0.93	0.01	0.002	0.05	-	-	-	-
Malawi									
<i>Indiv. wealth specification:⁽²⁾</i>									
(A)	0.39	0.61	-	-	-	-	-	-	-
(B)	0.41	0.59	-	-	-	-	-	-	-
(C)	0.37	0.63	-	-	-	-	-	-	-
(D)	0.40	0.60	-	-	-	-	-	-	-

Notes:

(1) "Other" in the case of Cambodia includes computers, tuk tuks, boats and bicycles.

(2) (-) = no valuation data collected for that particular asset class.

Finally, an advantage of the Theil T index is that it can be decomposed into within-group and between-group components of inequality (see Liao, 2016, for a discussion). Table 9 conducts this decomposition by households, to better understand the relative importance of intra-household inequalities in overall wealth inequality. Decompositions are also compared by each specification of individual wealth (A)-(D). The results show that while most of the variation is due to between-household inequality, a substantial share of overall wealth inequality – roughly 25-30 percent in Cambodia and Tanzania, and about 12-14 percent in Malawi and Ethiopia, depending on the specification of individual wealth — is nevertheless explained by within-household inequality. The role of intra-household wealth inequality can depend on household size, the number of asset owners within households, as well as other characteristics of household composition and livelihood. The results overall, however, continue to reinforce the importance of an intra-household perspective.

Table 6. Theil T Decompositions: examining the relative role of intra-household inequalities

	Within-group component of Theil T (1)	Between-group component of Theil T (2)	Share of overall wealth inequality attributable to within-household inequality $[(2) / ((1)+(2))] * 100$
Cambodia			
<i>Individual wealth specification:⁽¹⁾</i>			
(A)	0.36 [0.02]	0.92 [0.05]	28.1%
(B)	0.33 [0.02]	0.95 [0.06]	25.8%
(C)	0.35 [0.02]	0.79 [0.06]	30.7%
(D)	0.30 [0.02]	0.82 [0.04]	26.8%
Tanzania			
<i>Individual wealth specification:⁽¹⁾</i>			
(A)	0.66 [0.03]	1.28 [0.05]	34.0%
(B)	0.62 [0.04]	1.28 [0.04]	32.6%
(C)	0.42 [0.02]	1.14 [0.04]	26.9%
(D)	0.37 [0.02]	1.10 [0.04]	25.2%
Ethiopia			
<i>Individual wealth specification:⁽¹⁾</i>			
(A)	0.39 [0.32]	3.9 [0.49]	8.9%
(B)	0.58 [0.33]	3.6 [0.45]	14.1%
(C)	0.40 [0.11]	4.3 [0.51]	8.6%
(D)	0.58 [0.09]	3.9 [0.20]	13.0%
Malawi			
<i>Individual wealth specification:⁽¹⁾</i>			
(A)	0.57 [0.12]	3.4 [0.46]	14.4%
(B)	0.47 [0.11]	3.3 [0.22]	12.5%
(C)	0.55 [0.12]	3.3 [0.46]	14.3%
(D)	0.47 [0.13]	3.3 [0.3]	12.5%

Notes:

(1) Bootstrapped standard errors (250 repetitions) in brackets.

(2) For individual wealth specification, (A) = No imputation, self-reported values for joint owners; (B) = No imputation, max value for joint owners; (C) = Missing values imputed through multiple imputation, self-reported values for joint owners; (D) = Missing values imputed through multiple imputation, max value for joint owners.

5. How can respondent selection affect the measurement of inequality?

Given the emphasis on self-reported asset ownership in the LSMS+, a natural question might arise as to how different individual-level data on wealth might be if collected instead by one representative per household (i.e., who would report as a proxy for others). Malawi provides a unique setting to make this comparison, where the LSMS+ supported Malawi IHPS 2016 was conducted concurrently with another national survey, the Malawi Fourth Integrated Household Survey (IHS4) 2016/17.¹⁸ Both surveys were implemented by the Malawi National Statistical Office, relying identical household and agricultural questionnaires and field teams that covered both IHPS and IHS4 EAs.¹⁹ Unlike the IHPS, the IHS4 did not include an individual questionnaire that included LSMS+ assets modules, and a “most knowledgeable” member was to report on other members’ land ownership and valuation (see Kilic, Moylan and Koolwal, 2021, who compare statistics on men’s and women’s agricultural land ownership across the two surveys).²⁰ Both surveys identical household and agriculture questionnaires and following the same protocol for administering interview questions. The two national survey samples were also similarly distributed across interview months and survey strata (see Kilic, van den Broeck, Koolwal and Moylan, 2020, for a detailed discussion).

¹⁸ The data, questionnaires and basic information document for the IHS4 2016/17 can be accessed here: <https://microdata.worldbank.org/index.php/catalog/2936>. As with the IHPS 2016, the IHS4 2016/17 was also implemented with technical and financial assistance from the World Bank Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA), using the Surveys Solutions Computer-Assisted Personal Interviewing (CAPI) platform.

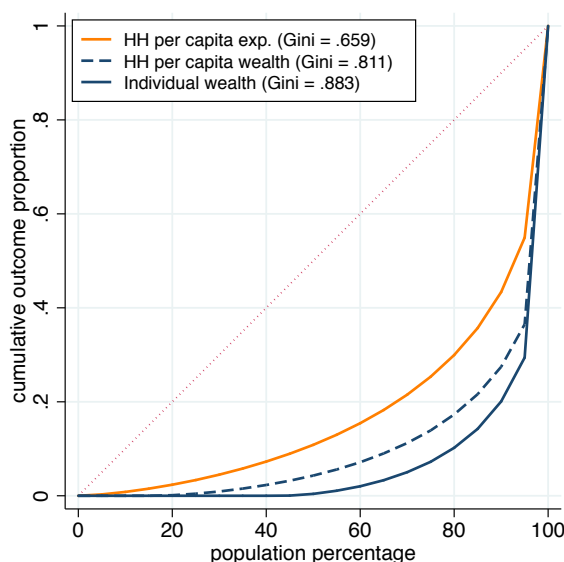
¹⁹ On average, field teams spent approximately 3.4 days in an IHS4 EA, with one enumerator visiting each household. The same field teams spent an average of 4.5 days in an IHPS EA, which involved interviewing, if possible, simultaneously, up to four adults in each household.

²⁰ Only residential and non-residential land were covered in the IHS4.

Figure 3 below presents the same Lorenz curve for the IHS4, which shows that even asking only a “most knowledgeable” household member about others’ land ownership and valuation leads to a higher Gini coefficient than household per capita wealth. Table 10, however, shows that when comparing individual-level wealth inequality estimates across the IHPS and IHS4, inequality across different measures is still significantly higher in the IHPS (and substantially greater in magnitude as well) compared to the IHS4. There were other differences as well; the Gini decomposition revealed that non-residential land contributed more to the Gini coefficient (factor share of 59 percent), compared to residential land (41 percent).

Apart from collecting individual-level data, therefore, the mode of reporting (self- versus proxy) also matters significantly in estimating inequality, and can vary by asset class. Lower inequality in individual-level wealth in the IHS4 may be due to the key respondent reporting the same valuation among all joint owners of a given asset. Even among those not owning jointly, however, the intra-household variation in reporting (as measured by the standard deviation in land values) for the most knowledgeable household member was also significantly lower in the IHS4 than in the IHPS (results available upon request). Relying strictly on one individual per household to report on asset valuations, therefore clearly leads to less variation in reporting in the context of Malawi. Going forward, conducting similar experiments across other country contexts — and perhaps for other key assets, such as financial accounts and durables — can shed further light on the role of respondent selection on how inequality is assessed within populations. Relying strictly on one individual per household to report on asset valuations, therefore clearly leads to less variation in reporting in the context of Malawi. Going forward, conducting similar experiments across other country contexts — and perhaps for other key assets, such as financial accounts and durables — can shed further light on the role of respondent selection on how inequality is assessed within populations.

Figure 3. Lorenz curve, Malawi Fourth Integrated Household Survey (IHS4): comparing overall inequality across household per capita consumption expenditure, household per capita wealth, and individual wealth



Note: based on the full sample in the IHS4 (26,079 adults).

Table 7. Comparison of inequality measures, for individual-level wealth, across the Malawi IHPS 2016 (LSMS+) and Malawi IHS4 2016/17

	Among full sample:		Among only those owning any assets (value>0):							
	Gini index		Gini index		75/25		GE(0): Theil L		GE(1): Theil T	
	IHPS (LSMS+)	IHS4	IHPS (LSMS+)	IHS4	IHPS (LSMS+)	IHS4	IHPS (LSMS+)	IHS4	IHPS (LSMS+)	IHS4
<i>For IHPS:</i> ⁽¹⁾ Missing values imputed through multiple imputation; self-reported values for joint owners	94.3*** [1.3]	88.3*** [2.3]	92.0*** [1.6]	79.2*** [4.2]	9.0*** [0.48]	5.4*** [0.14]	2.7*** [0.23]	1.4*** [0.20]	3.6*** [0.35]	2.9*** [0.77]

Notes:

(1) For IHS4, no imputation versus the multiple imputation model yielded the same inequality estimates (Only 5 percent of land parcels had missing valuations in the IHS4). The specifications varying how joint owners' valuations are also not relevant in the IHS4, since only one person reported for others' ownership and valuation of each land parcel (hence one valuation per parcel).

(2) Bootstrapped standard errors (250 repetitions) are in brackets. Similar to Table 7, all differences between HH per capita and individual wealth inequality estimates were statistically significant at $p < 0.001$ (and, likewise, from the inequality indicators based on household per capita consumption). Differences between the IHPS and IHS4 estimates are statistically significant at $p < 0.001$.

6. Conclusions and looking ahead

Using nationally-representative, self-reported survey data elicited from men and women in Sub-Saharan Africa (Malawi, Tanzania and Ethiopia) and Southeast Asia (Cambodia), this paper highlights how intra-household, individual-disaggregated survey data collection on ownership and valuation of physical and financial assets can cast a brighter light on economic inequality among men and women. The data from the surveys supported by the World Bank LSMS+ program reveal significant (i) intra-household differences in asset ownership and wealth aggregates among men and women, and (ii) more pronounced estimates of overall inequality based on individual asset wealth vis-à-vis household per capita expenditures and per capita asset wealth. Land, in particular, is an important component of individual wealth inequality, and the contribution of residential versus non-residential land varies by country context. Compared to the survey approach of interviewing a single, most knowledgeable household member to report asset owners and values, self-reported information on asset ownership and valuation leads to greater estimates of wealth inequality. Additional sensitivity checks to address missing asset values and variation in asset valuation among joint asset owners yield similar results.

Overall, this paper makes an important contribution towards a more nuanced understanding of longer-term economic inequalities among men and women that are often disguised in existing survey data. The demonstrated utility of individual-disaggregated survey data on asset ownership and values further contributes to the broader momentum, including as part of the World Bank LSMS program, to improve the scope of and approach to data collection in household surveys for better capturing the extent and drivers of gender inequities in development outcomes. In the context of future large-scale household surveys in which the target variables include “wealth,” the estimated parameters informing sampling design simulations (e.g. intra-cluster correlation) are expected to be different for individual wealth vis-à-vis per

capita consumption expenditures. Our findings regarding the asset classes that contribute the most to the measures of wealth inequality among individuals could influence the approach to sampling design simulations and questionnaire design (particularly when assets modules cannot be as extensive as those implemented as part of LSMS+ supported surveys). Future methodological research can better document the drivers of measurement error in asset valuation, including missingness, variation in asset valuation among joint owners, and possibly with respect to third-party, more objective valuation approaches (highly dependent on the country context and asset class).

References

- Acosta, M.; M. van Wessel; S. Van Bommel; E. L. Ampaire; J. Twyman; L. Jassogne; and P.H. Feindt. 2020. "What does it mean to make a 'Joint' Decision? unpacking intra-household decision making in agriculture: implications for policy and practice." *The Journal of Development Studies* 56(6): 1210-1229.
- Bose-Duker, T.; I. Gaddis; T. Kilic; V. Lechene; and K. Pendakur. 2021. "Diamonds in the rough?: repurposing multi-topic surveys to estimate individual-level consumption poverty." World Bank Policy Research Working Paper No. 9661.
- Boyer, M. 2020. "Inequalities: income, wealth and consumption." Working Paper, Toulouse School of Economics and Université de Montréal.
- Brown, C.; M. Ravallion; and D. van de Walle. 2018. "Most of Africa's nutritionally deprived women and children are not found in poor households." *Review of Economics and Statistics* 101(4).
- Cheng, W.; N. Zhou; and L. Zhang. 2021. "How does land titling affect credit demand, supply, access, and rationing: Evidence from China." *Canadian Journal of Agricultural Economics* 69(3): 383-414.
- Chiappori, PA and C. Meghir. 2015. "Intrahousehold inequality." In *Handbook of Income Distribution* (A. B. Atkinson and F. Bourguignon, eds.).
- De Vryer, P. and S. Lambert. 2021. "Inequality, poverty, and the intra-household allocation of consumption in Senegal." *World Bank Economic Review* 35(2): 414-435.
- Djuikom, Marie Albertine, and D. van de Walle. 2022. "Marital status and women's nutrition in Africa." *World Development* 158.
- Doss, C.; C. Kieran; and T. Kilic. 2020. "Measuring ownership, control, and use of assets." *Feminist Economics*, 26(3), 144-168.
- Doss, C. R.; C. D. Deere; A. D. Oduro; & H. Swaminathan. 2014. "The Gender Asset and Wealth Gaps." *Development*: 57(3-4).
- Doss, C. 2013. "Intrahousehold bargaining and resource allocation in developing countries." *World Bank Research Observer* 28: 52-78.
- Dupas, P. ; A. Keats ; and J. Robinson. 2017. "The effect of savings accounts on interpersonal financial relationships: evidence from a field experiment in rural Kenya." *The Economic Journal* 129: 273-310.
- Firpo, S., N.M, Fortin, and T. Lemieux. 2009. "Unconditional quantile regressions." *Econometrica* 77, 953-973.
- Haddad, L. and R. Kanbur. 1990. "How serious is the neglect of intra-household inequality?" *Economic Journal*.

Hasanbasri, A.; T. Kilic; G. Koolwal; and H. Moylan. 2021a. "Individual wealth and time use: evidence from Cambodia." World Bank Policy Research Working Paper 9765.

Hasanbasri, A.; T. Kilic; G. Koolwal; and H. Moylan. 2021b. *LSMS+ program : overview and recommendations for improving individual-disaggregated data on asset ownership and labor outcomes*. Washington, D.C.: World Bank Group.

Hasanbasri, A.; T. Kilic; G. Koolwal; and H. Moylan. 2021c. *LSMS+ program in Sub-Saharan Africa: findings from individual-level data collection on labor and asset ownership*. Washington, D.C.: World Bank Group.

Hasanbasri, A.; T. Kilic; G. Koolwal; and H. Moylan. 2021d. *LSMS+ program in Cambodia: findings from individual-level data collection on labor and asset ownership*. Washington, D.C.: World Bank Group.

Hasanbasri, A.; T. Kilic; G. Koolwal; and H. Moylan. 2021e. "Multidimensionality of land ownership among men and women in Sub-Saharan Africa." World Bank Policy Research Working Paper No. 9900.

Kilic, T.; H. Moylan; and G. Koolwal. 2021. "Getting the (gender disaggregated) lay of the land: Impact of survey respondent selection on measuring land ownership and rights." *World Development* 146.

Kilic, T.; A. Zezza; C. Carletto; and S. Savastano. 2017. "Missing(ness) in action: selectivity bias in GPS-based land area measurements." *World Development* 92: 143-157.

Komatsu, H.; A. A. Ambel; G. Koolwal; M. B. Yonis. 2021. "Gender and Tax Incidence of Rural Land Use Fee and Agricultural Income Tax in Ethiopia." World Bank Policy Research Working Paper 9715.

Liao, T. F. "Evaluating Distributional Differences in Income Inequality." *Socius* 2: 1 –14.

OECD, 2013. *OECD Guidelines for Micro Statistics on Household Wealth*.

Quisumbing, A.; J. P. Estudillo; and K. Otsuka. 2004. *Land and schooling: transferring wealth across generations*. Johns Hopkins University Press for the International Food Policy Research Institute, Baltimore and London.

Reiter, J. 2012. "Protecting data confidentiality in publicly released datasets: approaches based on multiple imputation." *Handbook of Statistics* Vol 28: 533-545.

Rubin, D. 1996. "Multiple imputation after 18+ years." *Journal of the American Statistical Association* 91: 473–489.

Rubin, D. 1987. *Multiple imputation for nonresponse in surveys*. New York, NY: John Wiley and Sons.

Stephens, M.; J. Ward-Batts. 2004. "The impact of separate taxation on the intra-household allocation of assets: evidence from the UK." *Journal of Public Economics* 88: 1989-2007.

Twumasi, M. A.; Y. Jiang; F. O. Danquah ; A. A. Chandio ; and W. Agbenyo. 2020. "The role of savings mobilization on access to credit: a case study of smallholder farmers in Ghana." *Agricultural Finance Review* 80(2).

United Nations Statistics Division (UNSD). 2019. "Guidelines for producing statistics on asset ownership from a gender perspective." https://unstats.un.org/edge/publications/docs/Guidelines_final.pdf.

van Buuren, S.; H. Boshuizen; and D. Knook. 1999. "Multiple imputation of missing blood pressure covariates in survival analysis." *Statistics in Medicine* 18: 681–694.

Wang, S-Y. 2014. "Property rights and intra-household bargaining." *Journal of Development Economics* 107: 192-201.

World Bank. 2016. "IDA 18, special theme: gender and development." Accessed on January 10, 2022 from: <https://documents1.worldbank.org/curated/en/846661468196734005/pdf/106181-BR-IDA-18-Gender-Development-PUBLIC-disclosed-6-2-2016-11-31PM-IDA-SecM2016-0114-Box360260B.pdf>.

Zucman, G. 2019. "Global wealth inequality." *Annual Review of Economics* 11: 109-138.

Appendix

Individual Wealth Inequality: Measurement and Evidence from Low- and Middle-Income Countries

Table A1. Share of non-residential and residential land parcels,
over which spouses agree on ownership (reported and economic)

	Tanzania		Ethiopia		Malawi		Cambodia	
	Reported	Economic	Reported	Economic	Reported	Economic	Reported	Economic
Non-residential land								
Agree over ownership:	0.75	0.85	0.89	0.87	0.71	0.58	0.94	0.92
Husband is sole owner	0.15	0.22	0.05	0.07	0.14	0.05	0.02	0.01
Jointly owned	0.37	0.40	0.71	0.37	0.10	0.14	0.76	0.72
Wife is sole owner	0.01	0.00	0.00	0.00	0.22	0.09	0.02	0.01
Neither spouse has ownership	0.22	0.23	0.13	0.43	0.24	0.31	0.15	0.18
Disagree over ownership:	0.22	0.12	0.10	0.12	0.15	0.20	0.03	0.04
<i>Most common scenarios:</i>								
Husb: H, Wife: J	0.08	0.03	0.02	0.03	0.05	0.02	0.01	0.00
Husb: H, Wife: W	0.11	0.00	0.00	0.01	0.01	0.00	0.00	0.00
Husb: J, Wife: Doesn't own	0.04	0.09	0.06	0.06	0.08	0.18	0.02	0.04
Husb: J, Wife: W	-	-	0.01	0.02	-	-	-	-
Residential land								
Agree over ownership:	0.71	0.89	0.88	0.82	-	-	0.94	0.92
Husband is sole owner	0.11	0.20	0.04	0.07	-	-	0.01	0.00
Jointly owned	0.39	0.39	0.76	0.54	-	-	0.76	0.72
Wife is sole owner	0.01	0.01	0.00	0.01	-	-	0.02	0.01
Neither spouse has ownership	0.19	0.29	0.08	0.21	-	-	0.16	0.19
Disagree over ownership:	0.27	0.09	0.11	0.16	-	-	0.028	0.04
<i>Most common scenarios:</i>								
Husb: H, Wife: J	0.07	0.04	0.02	0.03	-	-	0.002	0.00
Husb: H, Wife: W	0.16	0.00	0.01	0.02	-	-	0.004	0.00
Husb: J, Wife: Doesn't own	0.04	0.06	0.06	0.07	-	-	0.02	0.04
Husb: J, Wife: W	-	-	0.01	0.04	-	-	-	-

Notes:

(1) In Malawi, there was an issue in the data on how respondents identified other joint members for residential land ownership, so discrepancies could not be constructed.

Table A2. Demographic and socioeconomic characteristics of adult household members aged 18+,
LSMS+ supported surveys

	Ethiopia		Tanzania		Malawi		Cambodia	
	Men	Women	Men	Women	Men	Women	Men	Women
HH head	0.66***	0.22***	0.64***	0.20***	0.67***	0.21***	0.64***	0.15***
Age: 18-24	0.25	0.25	0.22*	0.27*	0.30	0.29	0.15*	0.13*
Age: 25-34	0.28**	0.30**	0.36***	0.27***	0.26	0.28	0.26**	0.24**
Age: 45-54*	0.12**	0.11**	0.12	0.12	0.11	0.11	0.14	0.15
Age: 55+	0.16***	0.13***	0.15	0.18	0.13*	0.15*	0.21***	0.26***
Never attended school	0.42***	0.61***	0.10***	0.20***	0.07***	0.15***	0.90***	0.77***
Years of school, if attended	7.82	7.67	7.43	7.67	8.14***	6.93***	7.29***	6.18***
Married	0.63	0.62	0.53	0.49	0.67	0.67	0.78***	0.69***
Separated/divorced	0.02***	0.08***	0.06***	0.11***	0.03***	0.10***	0.01***	0.04***
Widowed	0.01***	0.10***	0.01***	0.10***	0.01***	0.11***	0.03***	0.15***
Months resp. is away from HH	0.38***	0.32***	1.00	0.91	0.67***	0.47***	0.72***	0.38***
Last 7 days: work in salary/wage	0.10***	0.04***	0.30***	0.13***	0.19***	0.07***	0.44***	0.26***
Last 7 days: work in NFE	0.089	0.086	0.18*	0.15*	0.18**	0.16**	0.16*	0.18*
Last 7 days: work in agriculture	0.57***	0.36***	0.43	0.43	0.35**	0.38**	0.46	0.43
HH size	5.42***	5.19***	6.29	6.13	5.47	5.45	4.80**	4.69**
HH dependency ratio†	0.68	0.72	0.81***	0.95***	0.82***	0.98***	1.50***	1.41***
HH has electricity †	0.30***	0.34***	0.66	0.64	0.20**	0.17**	0.85	0.86
HH has piped water †	0.17***	0.19***	0.41	0.40	0.19**	0.16**	0.26	0.27
HH: walls made of concrete †	0.06***	0.07***	0.20	0.22	0.03	0.02	0.26	0.26
Lives in urban area	0.28***	0.31***	0.31	0.28	0.31***	0.26***	0.27	0.27
Observations	7235	8153	1407	1576	2243	2669	1845	2093

Notes:

(1) All estimates are weighted. Statistically significant differences between men and women, within each survey, are indicated by asterisks (***)p<0.01, (**)p<0.05, (*)p<0.10).

* Excluded category is 35-44.

†Indicates dependency ratio of children and elderly.

Table A3. Socioeconomic correlates of asset ownership across countries

Table A3: (a) Ethiopia										
Dependent variable: Is the individual is an asset owner?	Women					Men				
	non-dwelling land (1)	dwelling land (2)	financial asset (3)	mobile phone (4)	livestock (5)	non-dwelling land (1)	dwelling land (2)	financial asset (3)	mobile phone (4)	livestock (5)
Household Head	0.055** [0.022]	0.122*** [0.029]	0.109*** [0.020]	0.101*** [0.017]	0.198*** [0.026]	0.158*** [0.026]	0.246*** [0.030]	0.118*** [0.025]	0.145*** [0.033]	0.322*** [0.029]
Age	0.017*** [0.003]	0.024*** [0.003]	0.010*** [0.002]	0.005** [0.002]	0.014*** [0.003]	0.012*** [0.004]	0.015*** [0.003]	0.010*** [0.003]	-0.004 [0.003]	0.012*** [0.003]
Age squared	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000 [0.000]	-0.000*** [0.000]
Years of schooling	-0.003 [0.002]	-0.000 [0.002]	0.019*** [0.002]	0.027*** [0.002]	-0.005*** [0.002]	-0.002 [0.003]	0.002 [0.002]	0.017*** [0.002]	0.024*** [0.002]	-0.004** [0.002]
Married	0.115*** [0.020]	0.199*** [0.026]	0.072*** [0.017]	0.004 [0.020]	0.244*** [0.026]	0.028 [0.027]	0.036 [0.026]	0.030 [0.025]	0.063** [0.025]	0.105*** [0.026]
Divorced/Separated	-0.080*** [0.031]	-0.031 [0.033]	0.035 [0.028]	-0.023 [0.029]	-0.026 [0.036]	-0.049 [0.053]	-0.095* [0.057]	-0.001 [0.050]	0.013 [0.055]	-0.115*** [0.041]
Widow	-0.010 [0.037]	0.007 [0.044]	0.013 [0.027]	-0.026 [0.027]	0.086** [0.042]	-0.034 [0.052]	-0.016 [0.069]	-0.016 [0.047]	-0.002 [0.063]	-0.077 [0.071]
Work in Salary	-0.050*** [0.019]	-0.035 [0.030]	0.160*** [0.034]	0.069** [0.027]	-0.040 [0.026]	-0.018 [0.027]	-0.052** [0.024]	0.110*** [0.026]	0.059** [0.026]	-0.093*** [0.022]
Work in NFE	-0.006 [0.021]	0.013 [0.026]	0.036 [0.023]	0.036 [0.030]	0.011 [0.026]	-0.086*** [0.027]	-0.044 [0.029]	0.160*** [0.028]	0.140*** [0.025]	-0.026 [0.025]
Work in Agriculture	0.006 [0.023]	0.051** [0.023]	-0.009 [0.015]	-0.019 [0.015]	0.129*** [0.022]	0.075*** [0.025]	0.066*** [0.025]	-0.028 [0.023]	0.033 [0.025]	0.157*** [0.023]
Log household size	0.008 [0.017]	0.004 [0.018]	-0.034** [0.015]	-0.077*** [0.013]	-0.002 [0.019]	0.018 [0.018]	0.064*** [0.021]	-0.058*** [0.018]	-0.029 [0.020]	0.030 [0.019]
Quantile 2 Non-food exp (base quantile 1, annual exp)	0.061** [0.024]	0.032 [0.024]	0.054*** [0.017]	0.091*** [0.017]	0.028 [0.025]	0.075*** [0.026]	-0.008 [0.027]	0.030 [0.023]	0.099*** [0.025]	0.034 [0.025]
Quantile 3 Non-food exp	0.111*** [0.027]	0.025 [0.025]	0.074*** [0.024]	0.121*** [0.020]	-0.002 [0.027]	0.114*** [0.033]	-0.016 [0.031]	0.112*** [0.034]	0.180*** [0.030]	0.001 [0.026]
Quantile 4 Non-food exp	0.062** [0.029]	0.003 [0.031]	0.093*** [0.028]	0.147*** [0.028]	0.051 [0.032]	0.088*** [0.033]	-0.049 [0.037]	0.164*** [0.037]	0.252*** [0.030]	0.022 [0.031]
Quantile 5 Non-food exp	0.062** [0.029]	-0.019 [0.039]	0.143*** [0.030]	0.193*** [0.036]	0.042 [0.033]	0.111*** [0.038]	-0.066 [0.045]	0.225*** [0.048]	0.287*** [0.041]	0.048 [0.030]
Constant	-0.219*** [0.057]	-0.402*** [0.067]	-0.158*** [0.045]	-0.098** [0.046]	-0.056 [0.063]	-0.145* [0.077]	-0.370*** [0.067]	0.242*** [0.061]	0.129** [0.064]	-0.252*** [0.065]
Observations	7,941	7,941	7,941	7,842	7,941	6,960	6,960	6,958	6,892	6,960
R-squared	0.425	0.407	0.454	0.543	0.482	0.431	0.462	0.483	0.433	0.597

Notes: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Enumeration area fixed effects were included.

Table A3: (b) Cambodia

Dependent variable: Is the individual is an asset owner?	Women					Men				
	non-dwelling land	dwelling land	financial asset	mobile phone	livestock	non-dwelling land	dwelling land	financial asset	mobile phone	livestock
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Household Head	0.130*** [0.036]	0.198*** [0.048]	0.033 [0.026]	0.176*** [0.039]	0.050 [0.032]	0.253*** [0.039]	0.442*** [0.038]	0.041 [0.029]	0.008 [0.025]	0.133*** [0.029]
Age	0.025*** [0.004]	0.038*** [0.004]	0.007** [0.003]	0.003 [0.004]	0.012*** [0.003]	0.014*** [0.005]	0.012** [0.005]	0.008** [0.003]	0.015*** [0.004]	0.010*** [0.004]
Age squared	-0.000*** [0.000]	-0.000*** [0.000]	-0.000** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000** [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000*** [0.000]	-0.000** [0.000]
Years of schooling	0.004 [0.003]	0.002 [0.003]	0.018*** [0.003]	0.012*** [0.003]	-0.001 [0.003]	0.005* [0.003]	0.003 [0.003]	0.022*** [0.003]	0.010*** [0.002]	-0.002 [0.003]
Married	0.214*** [0.036]	0.253*** [0.038]	0.019 [0.028]	0.063* [0.035]	0.112*** [0.032]	0.054 [0.039]	-0.006 [0.040]	-0.004 [0.038]	0.078** [0.034]	0.035 [0.034]
Divorced/Separated	-0.032 [0.062]	-0.045 [0.058]	-0.023 [0.051]	-0.052 [0.076]	-0.064 [0.050]	-0.058 [0.095]	-0.181** [0.092]	-0.027 [0.082]	0.063 [0.057]	-0.132** [0.054]
Widow	-0.030 [0.054]	-0.033 [0.051]	-0.020 [0.034]	-0.054 [0.049]	0.012 [0.043]	0.019 [0.079]	0.034 [0.093]	-0.077 [0.048]	-0.160* [0.086]	0.011 [0.065]
Work in Salary	-0.075** [0.031]	-0.053* [0.028]	0.124*** [0.025]	0.038 [0.030]	-0.017 [0.024]	-0.019 [0.027]	-0.005 [0.026]	0.095*** [0.024]	0.009 [0.017]	0.012 [0.026]
Work in NFE	0.032 [0.033]	0.054 [0.033]	0.003 [0.020]	0.077*** [0.026]	0.049* [0.026]	0.064* [0.035]	0.063** [0.031]	0.015 [0.026]	0.045** [0.019]	0.027 [0.031]
Work in Agriculture	0.220*** [0.028]	0.096*** [0.027]	-0.017 [0.019]	-0.015 [0.024]	0.484*** [0.027]	0.250*** [0.030]	0.147*** [0.028]	-0.009 [0.020]	-0.022 [0.017]	0.442*** [0.028]
Log household size	-0.087*** [0.029]	-0.069** [0.029]	-0.014 [0.019]	-0.118*** [0.028]	0.024 [0.023]	0.010 [0.036]	0.074** [0.033]	-0.014 [0.028]	-0.101*** [0.023]	-0.014 [0.027]
Quantile 2 Non-food exp (base quantile 1, annual exp)	-0.003 [0.041]	0.031 [0.032]	-0.000 [0.019]	0.039 [0.035]	0.010 [0.030]	0.001 [0.047]	0.049 [0.036]	0.069*** [0.024]	0.002 [0.031]	-0.000 [0.031]
Quantile 3 Non-food exp	0.041 [0.038]	-0.017 [0.030]	0.031 [0.024]	0.059* [0.035]	0.034 [0.033]	0.037 [0.043]	0.040 [0.040]	0.067** [0.028]	-0.003 [0.031]	0.029 [0.032]
Quantile 4 Non-food exp	0.043 [0.039]	0.011 [0.036]	0.082*** [0.026]	0.062 [0.040]	0.034 [0.033]	0.003 [0.046]	0.051 [0.043]	0.100*** [0.030]	-0.021 [0.028]	0.026 [0.033]
Quantile 5 Non-food exp	0.120*** [0.041]	0.075* [0.039]	0.137*** [0.032]	0.073 [0.046]	0.047 [0.037]	0.074 [0.050]	0.098** [0.039]	0.162*** [0.033]	0.029 [0.033]	0.058 [0.036]
Constant	-0.442*** [0.096]	-0.610*** [0.101]	-0.385*** [0.091]	0.822*** [0.096]	-0.176** [0.083]	-0.319*** [0.117]	-0.432*** [0.115]	-0.561*** [0.099]	0.784*** [0.078]	-0.194** [0.096]
Observations	2,093	2,093	1,977	1,832	2,093	1,845	1,845	1,648	1,550	1,845
R-squared	0.394	0.417	0.322	0.360	0.552	0.438	0.518	0.407	0.324	0.545

Notes: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Enumeration area fixed effects were included.

Table A3: (c) Tanzania

Dependent variable: Is the individual is an asset owner?	Women				Men			
	non-dwelling land	dwelling land	financial asset	mobile phone	non-dwelling land	dwelling land	financial asset	mobile phone
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Household Head	0.071 [0.064]	0.074 [0.063]	0.059 [0.042]	-0.199*** [0.071]	0.065 [0.073]	0.213*** [0.069]	0.073* [0.039]	0.087 [0.071]
Age	0.026*** [0.005]	0.026*** [0.006]	0.005** [0.002]	0.025*** [0.008]	0.007 [0.007]	0.011 [0.007]	0.005 [0.004]	0.005 [0.010]
Age squared	-0.000*** [0.000]	-0.000*** [0.000]	-0.000** [0.000]	-0.000*** [0.000]	0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
Years of schooling	-0.009 [0.007]	0.004 [0.005]	0.013*** [0.003]	0.029*** [0.007]	0.003 [0.005]	-0.000 [0.005]	0.011*** [0.004]	0.030*** [0.007]
Married	0.059 [0.039]	0.046 [0.043]	-0.026 [0.026]	-0.057 [0.069]	0.077 [0.058]	0.074 [0.051]	0.049 [0.041]	0.120** [0.059]
Divorced/Separated	0.082 [0.068]	0.195*** [0.063]	-0.009 [0.049]	0.020 [0.084]	-0.081 [0.057]	-0.067 [0.080]	0.011 [0.042]	-0.158 [0.106]
Widow	-0.109 [0.073]	0.047 [0.074]	-0.042 [0.040]	0.034 [0.107]	-0.069 [0.154]	0.177 [0.109]	0.304*** [0.109]	0.110 [0.159]
Work in Salary	0.007 [0.056]	-0.007 [0.062]	0.193*** [0.052]	-0.030 [0.068]	0.068 [0.057]	0.000 [0.058]	0.047 [0.036]	-0.019 [0.067]
Work in NFE	-0.016 [0.051]	0.070 [0.065]	0.041 [0.035]	0.160*** [0.058]	0.082 [0.068]	0.075 [0.053]	0.009 [0.041]	0.054 [0.053]
Work in Agriculture	0.217*** [0.043]	0.162*** [0.044]	-0.027 [0.020]	0.023 [0.060]	0.106** [0.045]	0.090** [0.043]	0.053** [0.024]	0.016 [0.044]
Log household size	-0.098** [0.043]	-0.219*** [0.040]	-0.055*** [0.017]	-0.142*** [0.046]	-0.028 [0.038]	-0.128*** [0.044]	-0.086*** [0.026]	-0.016 [0.052]
Quantile 2 Non-food exp (base quantile 1, annual exp)	0.017 [0.053]	0.004 [0.063]	0.054** [0.027]	0.002 [0.074]	0.025 [0.075]	0.017 [0.065]	0.042 [0.027]	0.016 [0.064]
Quantile 3 Non-food exp	0.127 [0.078]	0.160** [0.063]	0.039 [0.032]	0.169** [0.065]	-0.005 [0.064]	-0.043 [0.095]	0.063* [0.033]	0.002 [0.074]
Quantile 4 Non-food exp	0.140** [0.068]	0.222*** [0.076]	0.070* [0.042]	0.177** [0.070]	0.194** [0.075]	0.220*** [0.069]	0.188*** [0.050]	0.157** [0.066]
Quantile 5 Non-food exp	0.028 [0.072]	0.222*** [0.080]	0.158** [0.062]	0.166* [0.087]	-0.025 [0.072]	0.137* [0.071]	0.303*** [0.049]	0.157* [0.086]
Constant	0.078 [0.135]	0.079 [0.130]	-0.124** [0.050]	-0.089 [0.195]	-0.209 [0.137]	-0.107 [0.156]	-0.221*** [0.075]	0.154 [0.153]
Observations	1,201	1,201	1,201	984	1,084	1,084	1,084	811
R-squared	0.419	0.393	0.387	0.434	0.422	0.422	0.443	0.459

Notes: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Enumeration area fixed effects were included.

Table A3: (d) Malawi

Dependent variable: Is the individual is an asset owner?	Women				Men			
	non-dwelling land (1)	dwelling land (2)	financial asset (3)	mobile phone (4)	non-dwelling land (1)	dwelling land (2)	financial asset (3)	mobile phone (4)
Household Head	0.257*** [0.036]	0.251*** [0.037]	0.007 [0.023]	0.143*** [0.025]	0.244*** [0.039]	0.257*** [0.049]	0.018 [0.050]	0.061 [0.051]
Age	0.012*** [0.004]	0.028*** [0.004]	0.016*** [0.003]	0.015*** [0.003]	0.004 [0.005]	0.007** [0.003]	0.009** [0.003]	0.018*** [0.005]
Age squared	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000*** [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000** [0.000]	-0.000*** [0.000]
Years of schooling	0.000 [0.003]	-0.007** [0.004]	0.025*** [0.003]	0.035*** [0.003]	-0.002 [0.003]	-0.010*** [0.003]	0.031*** [0.002]	0.032*** [0.003]
Married	0.232*** [0.038]	0.172*** [0.052]	0.139*** [0.029]	0.037 [0.040]	-0.004 [0.048]	0.150*** [0.051]	0.170*** [0.050]	0.115* [0.062]
Divorced/Separated	0.065 [0.044]	-0.063 [0.055]	0.051 [0.035]	0.003 [0.049]	0.055 [0.077]	0.072 [0.083]	0.157** [0.062]	0.016 [0.085]
Widow	0.166*** [0.058]	-0.013 [0.059]	0.081* [0.042]	-0.047 [0.049]	0.420*** [0.098]	0.182** [0.082]	0.040 [0.076]	0.111 [0.095]
Work in Salary	-0.047 [0.049]	-0.073 [0.073]	0.243*** [0.047]	0.086** [0.038]	-0.102*** [0.029]	-0.198*** [0.042]	0.182*** [0.034]	0.131*** [0.029]
Work in NFE	-0.007 [0.026]	0.007 [0.028]	0.061** [0.030]	0.073** [0.031]	-0.058* [0.031]	-0.043 [0.030]	0.065** [0.028]	0.120*** [0.030]
Work in Agriculture	0.008 [0.024]	0.099*** [0.024]	-0.001 [0.016]	-0.015 [0.022]	0.037 [0.024]	0.098*** [0.022]	0.030 [0.021]	0.041 [0.026]
Log household size	-0.018 [0.022]	0.017 [0.027]	-0.025 [0.022]	0.044* [0.025]	-0.036 [0.029]	0.009 [0.024]	-0.032 [0.023]	0.029 [0.029]
Quantile 2 Non-food exp (base quantile 1, annual exp)	0.004 [0.032]	-0.025 [0.029]	0.008 [0.024]	0.013 [0.029]	0.022 [0.033]	-0.034 [0.030]	0.004 [0.026]	0.043 [0.037]
Quantile 3 Non-food exp	-0.034 [0.030]	-0.015 [0.031]	0.041 [0.028]	0.026 [0.029]	-0.028 [0.029]	-0.000 [0.032]	0.021 [0.023]	0.046 [0.035]
Quantile 4 Non-food exp	0.018 [0.033]	-0.058** [0.027]	0.073*** [0.027]	0.105*** [0.029]	-0.084*** [0.029]	-0.069* [0.040]	0.097*** [0.026]	0.084*** [0.031]
Quantile 5 Non-food exp	-0.095*** [0.033]	-0.010 [0.038]	0.155*** [0.032]	0.142*** [0.033]	0.034 [0.040]	0.020 [0.039]	0.174*** [0.041]	0.164*** [0.038]
Constant	-0.085 [0.082]	-0.185** [0.074]	-0.503*** [0.071]	-0.349*** [0.064]	0.414*** [0.094]	0.172** [0.078]	-0.398*** [0.076]	-0.539*** [0.093]
Observations	2,239	2,239	2,239	2,239	1,815	1,815	1,815	1,815
R-squared	0.268	0.288	0.290	0.352	0.257	0.394	0.379	0.330

Notes: Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Enumeration area fixed effects were included.

**Table A4. Among households owning specific assets:
share with different ownership profiles across adult men and women**

Combinations of men and women's ownership status, by asset class (households with both adult men and women): each row adds to 100%						
	Neither women nor men have ownership (1)	<u>Women:</u> do not own, <u>Men:</u> exclusive or joint (2)	<u>Men:</u> do not own, <u>Women:</u> exclusive or joint (3)	<u>Women:</u> only exclusive, <u>Men:</u> only exclusive (4)	<u>Women:</u> only joint, <u>Men:</u> only joint (5)	<u>Men and women:</u> mix of exclusive and joint (6)
Malawi						
<u>Among HH with:</u>						
Non-residential land	0.38	0.23	0.36	0.01	0.00	0.02
Residential land	0.26	0.11	0.17	0.28	0.06	0.12
Financial account	0.56	0.15	0.16	0.10	0.00	0.03
Mobile phone	0.33	0.28	0.06	0.31	0.00	0.01
Tanzania						
<u>Among HH with:</u>						
Non-residential land	0.47	0.13	0.10	0.06	0.16	0.07
Residential land	0.25	0.17	0.12	0.11	0.26	0.09
Financial account	0.76	0.15	0.04	0.05	0.00	0.00
Mobile phone	0.14	0.27	0.15	0.41	0.02	0.01
Ethiopia						
<u>Among HH with:</u>						
Non-residential land	0.60	0.08	0.04	0.00	0.24	0.03
Residential land	0.37	0.12	0.09	0.00	0.39	0.03
Financial account	0.63	0.20	0.03	0.10	0.02	0.02
Mobile phone	0.43	0.32	0.03	0.20	0.01	0.01
Livestock	0.27	0.16	0.06	0.17	0.22	0.12
Cambodia						
<u>Among HH with:</u>						
Non-residential land	0.35	0.03	0.09	0.02	0.49	0.03
Residential land	0.12	0.03	0.13	0.00	0.70	0.02
Financial account	0.77	0.08	0.07	0.03	0.04	0.01
Mobile phone	0.07	0.13	0.09	0.28	0.31	0.12
Livestock	0.43	0.03	0.09	0.16	0.24	0.05
<u>Durables:</u>						
Computer ⁽⁴⁾	0.94	0.04	0.01			0.02
Bicycle ⁽⁴⁾	0.55	0.05	0.12			0.28
Motorcycle ⁽⁴⁾	0.16	0.16	0.07			0.62
Car ⁽⁴⁾	0.89	0.02	0.01			0.08
Tuk tuk ⁽⁴⁾	0.96	0.01	0.00			0.03
Boat ⁽⁴⁾	0.96	0.01	0.00			0.03
Tractor ⁽⁴⁾	0.84	0.03	0.01			0.12

Notes:

- (1) Estimates weighted with the household sampling weights. For land, the statistics reflect reported ownership.
- (2) Share of HH with both adult men and women: 76 percent in Tanzania, 74 percent in Ethiopia, 63 percent in Malawi, and 88 percent in Cambodia.
- (3) Each row adds to 100 percent (of households owning that particular asset). Cells with shares of HH between 10-20 percent are shaded in light grey, with darker shading for shares with 20 percent or greater.
- (4) Exclusive versus joint ownership of durables was not distinguished in Cambodia.

Table A5. Share of asset data for which valuations are missing, by men and women

	Missing data on asset values, among asset owners:				Among missing data, share across:					
	Men		Women		Men			Women		
	Number of missing obs. on values	Share with missing values, among asset owners	Number of missing obs. on values	Share with missing values, among asset owners	No value reported	Refused	Don't know	No value reported	Refused	Don't know
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Malawi										
Non-residential land	39	0.04	69	0.04	-	0.33	0.67	-	0.20	0.80
Residential land	19	0.02	67	0.05	-	0.32	0.68	0.03	0.19	0.78
Tanzania										
Non-residential land	89	0.13	243	0.38	-	0.07	0.93	-	0.05	0.95
Residential land	134	0.19	374	0.48	0.01	0.05	0.94	0.003	0.04	0.96
Financial account	114	0.50	164	0.40	0.31	0.39	0.30	0.32	0.37	0.31
Ethiopia										
Non-residential land	877	0.38	1253	0.59	0.27	0.09	0.64	0.19	0.04	0.77
Residential land	1198	0.43	1604	0.56	0.01	0.15	0.84	0.01	0.11	0.88
Financial account	-	-	-	-	-	-	-	-	-	-
Mobile phones	-	-	-	-	-	-	-	-	-	-
Livestock	3864	0.44	3880	0.50	0.82	0.04	0.14	0.82	0.02	0.16
Cambodia										
Non-residential land	156	0.13	244	0.17	-	0.22	0.78	-	0.16	0.84
Residential land	184	0.17	269	0.19	-	0.18	0.82	-	0.19	0.81
Financial account	-	-	-	-	-	-	-	-	-	-
Mobile phones	-	-	-	-	-	-	-	-	-	-
Livestock	14	0.01	28	0.02	0.71	0.29	-	0.86	0.14	-
Durables	-	-	-	-	-	-	-	-	-	-

Notes:

Number of observations in columns (1) and (3) reflect asset-level observations.

Table A6. Valuation of assets (USD), conditional on those who are asset owners

	(1) No imputation – for joint owners, self-reports		(2) No imputation – for joint owners, max of reported values		(3) Multiple imputation – for joint owners, self-reports		(4) Multiple imputation – for joint owners, max of reported values	
	Men	Women	Men	Women	Men	Women	Men	Women
Malawi (Obs = 1896 men, 2221 women)								
Non-residential land	2,390.7	1,899.6	2,437.6	2,536.1	2,393.0	1,899.6	2,470.6	2,566.1
Residential land	1,173.2	2,500.4	1,356.5	2,652.9	1,271.5	2,599.3	1,483.7	2,738.8
ALL ASSETS	1,457.8	2,464.7	1,574.0	2,834.0	1,527.7	2,581.0	1,654.7	2,903.0
Tanzania (Obs = 1014 men, 1137 women)								
Non-residential land	1,529.2***	585.6***	1,648.1***	685.2***	1,717.0***	914.6***	1,885.1**	1,345.3**
Residential land	3,064.5***	1,700.1***	3,233.0***	1,965.4***	3,483.9	2,886.3	3,841.4	3,641.7
Financial accounts	143.1	177.9	143.1	177.9	210.4	215.3	210.4	215.3
ALL ASSETS	2,784.9***	1,429.8***	2,951.8***	1,652.9***	3,166.8***	2,383.4***	3,483.5	3,079.9
Ethiopia (Obs = 6008 men, 6294 women)								
Non-residential land	93.42	75.98	100.67	90.54	137.90	130.44	154.35	165.98
Residential land	4,123.5	2,579.8	5,221.1	3,397.2	10,976.0	11,960.7	19,572.0	16,021.2
Financial accounts	439.5	271.1	495.2	291.4	439.5	271.1	495.2	291.4
Mobile phones	36.3	34.9	36.9	35.8	36.3	34.9	36.9	35.8
Livestock	692.7***	373.1***	694.9***	376.8***	848.5***	705.4***	866.3***	714.4***
ALL ASSETS	2,706.3	1,633.1	3,283.3	2,062.7	6,335.2	6,640.2	11,500.1	8,739.9
Cambodia (Obs = 1607 men, 1891 women)								
Non-residential land	10,468.8	10,407.9	12,626.2	12,189.4	11,725.4	12,043.2	14,368.2	14,272.6
Residential land	13,709.3	12,853.8	15,522.4	14,541.4	15,668.0	15,739.5	18,905.6	19,073.0
Financial accounts	243.2	274.1	254.6	281.5	243.2	274.1	254.6	281.5
Mobile phones	63.5**	55.1**	71.4**	65.7**	63.5**	55.1**	71.4**	65.7**
Livestock	694.1***	555.5***	704.5***	568.5***	719.8***	593.1***	798.8***	668.6***
Durables:								
(1) Computer	327.8	260.1	327.8	260.1	327.8	260.1	327.8	260.1
(2) Bicycle	22.3	16.1	22.3	16.1	22.3	16.1	22.3	16.1
(3) Motorcycle	922.0	919.9	922.0	919.9	922.0	919.9	922.0	919.9
(4) Car	12,656.7	12,696.1	12,656.7	12,696.1	12,656.7	12,696.1	12,656.7	12,696.1
(5) Tuk tuk	1,016.9	1,021.1	1,016.9	1,021.1	1,016.9	1,021.1	1,016.9	1,021.1
(6) Boat	316.1	302.3	316.1	302.3	316.1	302.3	316.1	302.3
(7) Tractor	2,243.7	2,098.1	2,243.7	2,098.1	2,243.7	2,098.1	2,243.7	2,098.1
ALL ASSETS	17,298.3	16,891.6	19,641.8	19,086.5	19,120.1	19,578.6	22,863.5	23,552.0

Notes:

(1) All estimates weighted by the household sampling weight. Significant gender differences are indicated by asterisks; ***p<0.01 **p<0.05 *p<0.10

**Table A7. OLS regressions with household fixed effects:
Probability of being in the bottom quintile of individual wealth, but in top quintile of household wealth**

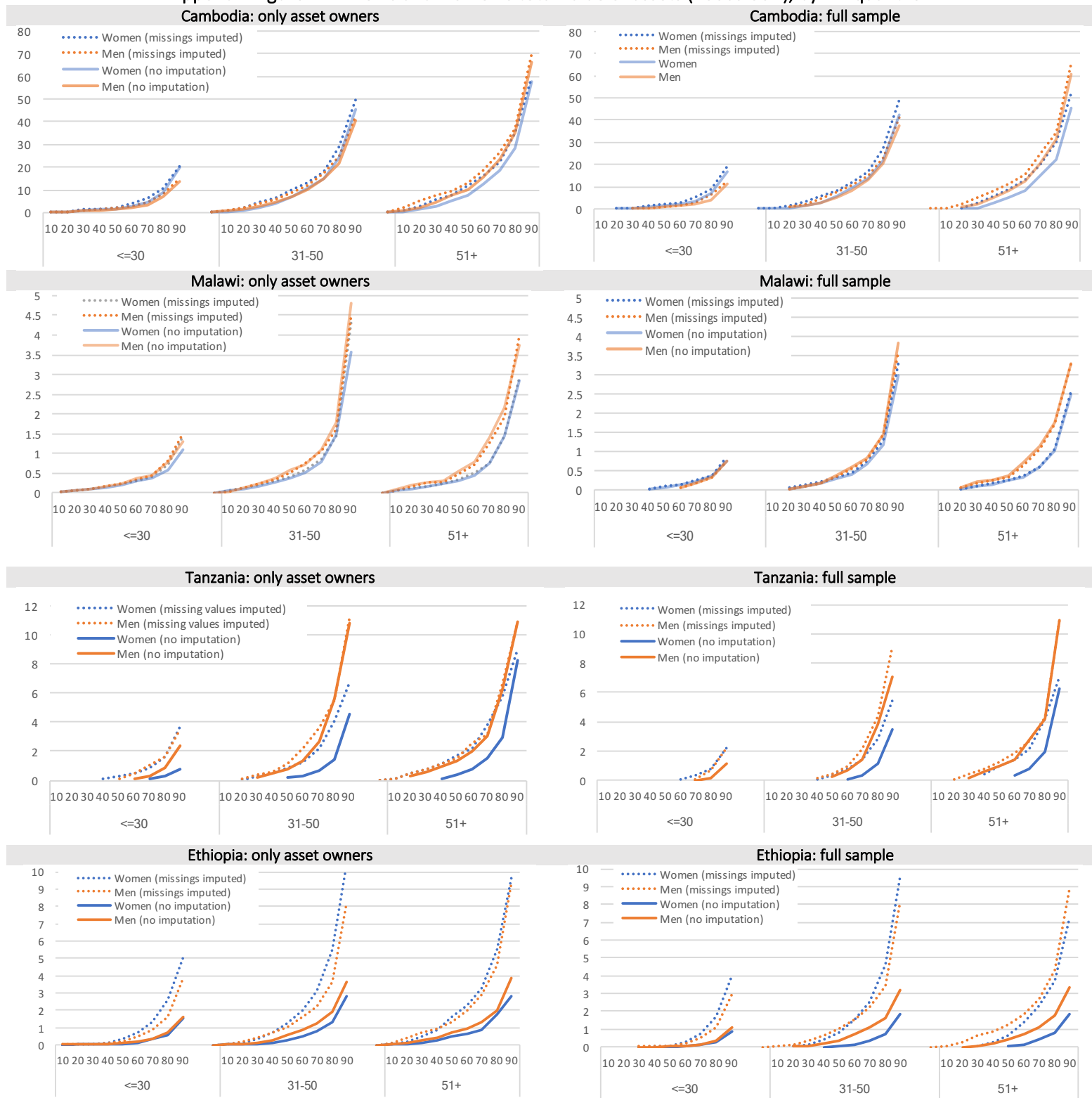
	Cambodia			Malawi			Ethiopia			Tanzania		
	Full sample	Men	Women	Full sample	Men	Women	Full sample	Men	Women	Full sample	Men	Women
Female	-0.021**			-0.024*			-0.002			0.02		
HH head	-0.023**	-0.070***	-0.078**	-0.023*	-0.096	0.015	-0.016***	-0.047***	-0.058***	0.017	-0.012	0.024
Age: <=30	0.024	-0.012	0.075***	0.035**	-0.105	0.120***	0.033***	0.023	0.084***	0.024*	-0.022	0.036
Age: 50+	-0.023*	-0.005	-0.037*	-0.026	-0.102	0.036	-0.026***	-0.033	-0.03	-0.042**	-0.075*	-0.058*
Years of schooling	-0.002	0.001	-0.010**	-0.004**	-0.007	-0.008	-0.003***	-0.003	-0.007***	-0.009***	-0.004	-0.013***
Marital status: married	-0.059***	-0.022	-0.074***	-0.152***	-0.212***	-0.097***	-0.097***	-0.060***	-0.096***	-0.106***	-0.078*	-0.121***
Marital status: separated	0.045	0.073	0.069	-0.029	-0.092	-0.022	-0.005	-0.019	0.029	-0.063***	-0.077	-0.063*
Marital status: widowed	0.04	-0.031	0.067*	-0.084*	-0.119	-0.102*	-0.033*	0.052	0.005	-0.065**	-0.172*	-0.031
Last 7 days: work for wage/salary	-0.003	-0.003	-0.003	-0.036**	-0.096*	-0.044	-0.008	-0.029	0.007	-0.012	-0.014	0.043
Last 7 days: worked/ran NFE	-0.035**	-0.085**	-0.001	-0.032**	-0.059	-0.089*	-0.014	-0.029	-0.019	-0.025	-0.051	-0.034
Last 7 days: work in agriculture	-0.008	0.016	-0.009	-0.024**	-0.013	-0.047*	-0.006	-0.016	0.002	-0.043***	-0.105***	-0.003
Observations	3,938	1,845	2,093	4,912	2,243	2,669	15,388	7,235	8,153	2,983	1,407	1,576
R-squared	0.061	0.079	0.103	0.13	0.263	0.148	0.082	0.109	0.111	0.106	0.121	0.167
Number of HH	1,512	1,363	1,479	2,445	1,786	2,200	6,770	5,514	6,294	1,184	987	1,098

Notes:

(1) All estimates weighted with the household sampling weights, and standard errors clustered by enumeration area. ***p<0.01 **p<0.05 *p<0.10

(2) Estimates based on specification (C), i.e. imputing missing data on valuation, and using self-reports among joint owners. Results were similar for the other specifications (A), (B) and (D) as described in Table 4.

Appendix Figure A1. Men's and women's total value of assets (1000s USD), by RIF quantile



Notes:

- (1) Predicted means at selected percentiles are presented, based on RIF regressions for the separate samples of men and women (and by imputation approach). For joint owners, self-reported values are used; results allocating the maximum reported value among joint owners are included in the Appendix.
- (2) For certain age groups/quantiles, the number of observations was not large enough to run the RIF regression and obtain a predicted mean.

**Appendix Table A8. RIF regressions: characteristics associated with log asset value by quantiles,
among asset owners
(Specification C: multiple imputation approach, all self-reports used among joint owners)**

Table A8(a). RIF regressions, Cambodia										
	Women					Men				
	10	25	50	75	90	10	25	50	75	90
<i>Individual variables</i>										
HH head	1.21	0.23	0.21	0.17	0.29	1.60***	1.71***	0.99***	0.57***	0.43***
Age: <=30	-2.95***	-1.31***	-1.16***	-0.72***	-0.61***	-0.99***	-0.55***	-0.74***	-0.54***	-0.36**
Age: 50+	2.17***	0.66***	0.55***	0.41***	0.24*	0.97***	0.76***	0.65***	0.72***	0.55***
Years of schooling	0.24***	0.02	0.07***	0.05***	0.07***	0.16***	0.09***	0.09***	0.07***	0.04***
Marital status: married	7.77***	2.21***	1.13***	0.56***	0.46**	2.27***	1.36***	0.56***	0.14	0.01
Marital status: separated	-2.26	0.14	0.43	0.4	0.60*	-0.26	-0.51	-0.46	-0.12	-0.86
Marital status: widowed	1.39	0.74**	0.55**	0.58***	0.59**	0.33	0.59	0.51	0.67**	0.6
Last 7 days: worked for wage/salary	-0.08	-0.2	-0.11	-0.16	-0.45***	0.74***	-0.15	-0.17	-0.19*	0.06
Last 7 days: worked/ran NFE	1.36**	0.3	0.33***	0.43***	0.1	0.88**	0.27	0.26*	0.25*	0.09
Last 7 days: worked in agriculture	2.07***	0.78***	0.38***	0.27***	0.15	0.82***	0.52***	0.36***	0.17	0.13
<i>Household variables</i>										
Rural area	1.16	0.42**	-0.09	-0.44***	-0.64***	0.19	0.47**	0.02	-0.16	-0.28*
Household size	-0.14	-0.09**	0.01	0.01	0.02	0.05	0.05	0.08***	0.09***	0.06*
Household dependency ratio	0.34	0.18*	0.01	0.01	-0.14*	0.19	0.07	-0.08	0.07	0.03
House: has electricity access	0.68	0.87***	0.28*	0.28**	0.14	0.02	0.45**	0.15	0.17	0.2
House: piped water connection	-1.08	0	0.04	0.24**	0.12	-0.81**	-0.29	-0.01	0.29**	0.33**
House: concrete/brick construction	0.54	0.31*	0.37***	0.49***	0.53***	1.01***	0.34*	0.16	0.54***	0.69***
Geographic fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,887	1,887	1,887	1,887	1,887	1,605	1,605	1,605	1,605	1,605
R-squared	0.141	0.201	0.188	0.173	0.12	0.158	0.269	0.247	0.208	0.124

Table A8(b). RIF regressions, Malawi										
	Women					Men				
	10	25	50	75	90	10	25	50	75	90
<i>Individual variables</i>										
HH head	0.78***	0.24	0.27**	0.06	0.01	1.09**	0.41	0.11	0.15	0.72*
Age: <=30	-0.58***	-0.43***	-0.58***	-0.62***	-0.73***	-0.05	-0.21	-0.56***	-0.55***	-0.48*
Age: 50+	0	0.08	0.24*	0.42***	0.56**	0.03	0.18	-0.13	0.30*	0.18
Years of schooling	-0.01	0.03**	0.06***	0.07***	0.09***	-0.12***	0	0.01	0.03*	0.05**
Marital status: married, matrilineal	2.11***	0.89***	0.87***	0.70***	0.45	0.15	0.45	0.27	0.26	0.16
Marital status: married, patrilineal	1.99***	0.47**	0.64***	0.55**	0.47	0.43	0.66**	0.38	0.4	0.6
Marital status: separated	1.08**	0.44	0.55**	0.47	0.22	-0.57	0.76	0.56	0.21	0.51
Marital status: widowed	1.36***	0.36	0.48*	0.38	0.77	1.28	0.84	0.92*	0.64	0.18
Last 7 days: worked for wage/salary	-0.6	-0.64***	-0.51**	-0.64**	0.02	-0.51	-0.64***	-0.15	-0.32*	-0.15
Last 7 days: worked for ganyu	-0.1	-0.18	-0.04	-0.22	-0.38	0.48	-0.1	-0.11	-0.01	-0.2
Last 7 days: worked/ran NFE	0.17	0.21	0.33***	0.59***	0.56**	-0.07	-0.23	0.11	0.07	0.26
Last 7 days: worked in agriculture	-0.08	0.01	0.07	0.04	0.09	0.05	0.09	0.21*	0.12	0.17
<i>Household variables</i>										
Rural area	-0.67*	-0.38*	-0.78***	-0.83***	-1.31***	0.92*	0.27	-0.37	-0.79***	-0.67*
Household size	0.09**	0.05**	0.05***	0.07***	0.12**	0	0.05	0.03	0.08***	0.14***
Household dependency ratio	0.03	-0.12**	-0.06	-0.03	-0.17	-0.02	0.07	-0.06	-0.06	-0.24
House: has electricity access	-0.2	-0.05	0.02	0.32	2.33***	-1.61***	-0.74***	-0.33	0.2	1.33***
House: piped water connection	-0.68	-0.56**	-0.32	0.12	0.55	1.32**	0.92***	0.71***	0.22	0.21
House: concrete/brick construction	-0.34	0.14	0.31***	0.74***	0.58**	-0.57*	-0.1	0.30*	0.30*	-0.1
Geographic fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1,713	1,713	1,713	1,713	1,713	1,292	1,292	1,292	1,292	1,292
R-squared	0.069	0.074	0.133	0.195	0.202	0.159	0.108	0.107	0.142	0.139

Table A8(c). RIF regressions, Ethiopia

	Women					Men				
	10	25	50	75	90	10	25	50	75	90
<u>Individual variables</u>										
HH head	0.23*	0.52***	0.35***	0.50***	0.55***	1.25***	2.79***	0.98***	0.59***	0.62***
Age: <=30	-0.27***	-0.94***	-0.55***	-0.44***	-0.56***	-0.22**	-0.63***	-0.43***	-0.30***	-0.34***
Age: 50+	0.47***	0.42**	0.58***	0.23**	-0.08	0.29***	0.57***	0.39***	0.38***	0.36***
Years of schooling	0.01	-0.03*	-0.02*	-0.01	0.01	0.03***	0	-0.01	0	0
Marital status: married	1.25***	3.16***	1.40***	0.78***	0.64***	-0.1	0.64***	0.08	-0.05	-0.09
Marital status: separated	0.46**	1.19***	0.42**	0.1	-0.1	-0.23	-0.92**	-0.27	0.02	0.42
Marital status: widowed	0.87***	2.47***	0.86***	0.55***	0.39**	0.06	0.11	0.24	0.47*	0.13
Last 7 days: worked for wage/salary	0.75***	0.56**	0.21	0.09	0.02	0.26*	0.41**	0.07	0.14	-0.12
Last 7 days: worked/ran NFE	-0.08	-0.04	0.08	0.04	0.44***	0.18	-0.13	0.01	0.14	0.2
Last 7 days: worked in agriculture	0.53***	0.67***	0.59***	0.32***	0.06	0.74***	1.33***	0.40***	0.33***	0.16
<u>Household variables</u>										
Rural area	-0.76***	-1.63***	-0.69***	-0.08	-0.17	-0.85***	-1.31***	-0.48***	-0.22*	0.11
Household size	0.03	0.05*	0.12***	0.09***	0.08***	0.03	0.06**	0.11***	0.09***	0.10***
Household dependency ratio	0.09**	0.07	-0.02	-0.06*	0	0.04	0.25***	0.11***	0.04	0.06
House: has electricity access	-0.29*	-0.84***	0.27**	0.23**	0.32***	-0.1	-0.52***	0.15	0.44***	0.53***
House: piped water connection	-0.43***	-1.15***	-0.31**	0	0.31**	0.32**	-0.18	-0.24**	0.09	0.30**
House: concrete/brick construction	0.61***	1.13***	0.21	0.26**	0.57***	0.72***	1.37***	0.50***	0.39***	1.06***
Geographic fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	6,228	6,228	6,228	6,228	6,228	5,957	5,957	5,957	5,957	5,957
R-squared	0.086	0.24	0.134	0.052	0.046	0.087	0.266	0.169	0.067	0.06

Table A8(d). RIF regressions, Tanzania

	Women				Men			
	25	50	75	90	25	50	75	90
<u>Individual variables</u>								
HH head	0.58	0.15	0.44*	0.35	3.40**	0.36	0.4	-0.16
Age: <=30	-2.99***	-0.90***	-0.60***	-0.30*	-6.48***	-1.01***	-1.00***	-0.58**
Age: 50+	2.65***	0.93***	0.40*	0.42**	3.39***	1.11***	0.21	0.60**
Years of schooling	-0.16**	-0.02	0.06***	0.05**	-0.04	0.06**	-0.01	0.04
Marital status: married	0.6	0.28	0.25	0.09	2.13*	0.24	0.26	0.56**
Marital status: separated	-0.54	0.44	0.63**	0.70***	2.63	0.06	0.63	1.24***
Marital status: widowed	0.37	0.89**	1.50***	1.39***	1.14	0.5	1.08	1.36
Last 7 days: worked for wage/salary	2.08***	-0.32	-0.16	0.50**	-0.36	0.04	0.18	0.02
Last 7 days: worked/ran NFE	0.49	0.24	0.21	0.40**	-0.24	-0.03	-0.1	0.26
Last 7 days: worked in agriculture	2.18***	-0.07	-0.54***	-0.16	1.53	0.64***	0.98***	0.23
<u>Household variables</u>								
Rural area	-1.31**	-0.29	-0.16	-0.09	-1.81	0.2	0.31	0.66***
Household size	-0.19**	0	0.05**	0.02	-0.22	0.01	0.02	0.01
Household dependency ratio	0.45	-0.09	-0.16*	-0.13	1.01	0.12	-0.16	-0.17
House: has electricity access	0.13	0.66***	0.67***	0.61***	-0.01	0.88***	1.12***	0.83***
House: piped water connection	-0.58	0.33*	0.27*	0.54***	1.26	0.90***	1.12***	0.34
House: concrete/brick construction	1.82***	0.55***	0.31*	0.43**	-3.20***	-0.44*	0.56***	0.18
Observations	1,137	1,137	1,137	1,137	1,014	1,014	1,014	1,014
R-squared	0.125	0.143	0.149	0.144	0.171	0.133	0.185	0.105