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Measuring Global Inequality: How accounting for inequality within the household affects the global profile

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Measuring Global Inequality

How accounting for inequality within the household affects the global profile

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Abstract: One central challenge in measuring global inequality, and in particular decomposing it into within- and cross-country effects, is that the measures of consumption and income used to assess inequality are typically captured at the household level while inequality is typically reported at the level of the individual. In order to address this mismatch between the reporting and the measurement levels, most of the literature makes two assumptions i) that resources are allocated uniformly within the household, and ii) that there is no sharing of resources within the household. The first assumption assumes no inequality within the household. Relaxing this assumption increases within-country inequality, has no effect on cross-country inequality, and increases global inequality. Relaxing the second assumption and allowing for the presence of some within-household public goods (e.g., shelter, light, heat) means that the sum of resources allocated to each individual is greater than the estimated total level of household consumption. Allowing for resource sharing makes larger households relatively richer. Given the general findings that larger households are poorer and that average household size decreases with increases in national income, allowing for resource sharing reduces inequality both within and between countries, and reduces global inequality. Based on nationally representative survey data from 165 countries covering 96.7 percent of the global population, we offer a series of global-inequality estimates where we layer on assumptions regarding resource allocation and sharing within the household. While the findings vary for the level of global inequality, the estimates suggest that within-country inequality is a substantially larger portion of global inequality than current estimates indicate.

JEL codes:

Keywords: global inequality, household inequality, household economies of scale, sustainable development goals

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1. Introduction

Goal 10 of the Sustainable Development Goals (SDGs) targets the reduction of inequality *within and among* countries. A substantial literature focuses on the measurement of global inequality and its decomposition into two sources – the dispersion in mean wellbeing across countries and the dispersion of wellbeing within countries. Generally, it is perceived that the inequality *across* countries accounts for approximately two thirds of total global inequality (REF). One central challenge in decomposing inequality, though, is that measures of wellbeing (typically consumption and income) are usually gathered at the level of the household while inequality is typically reported at the level of the individual. This tension between the reporting level (i.e., the individual) and the measurement level (i.e., the household) in estimating global inequality is pervasive throughout the world. In low-income and lower-middle income countries, wellbeing is assessed based on consumption and consumption is measured at the household level. In richer countries, income is the typical measure of wellbeing. Whilst this is easier to assign to individuals, the measure is typically constructed at the level of the household.[2]

To report on global inequality at an individual level despite measuring at the household level, most of the literature,[3] including the World Bank which serves as the custodian of several of the indicators linked to SDG Goal 10, makes two assumptions. First, resources are allocated uniformly across the household, or in other words, it is assumed that there is no inequality in the

[2] In high-income countries (HICs), the measurement of inequality is frequently based on pooling individual income to the household level and then allocating the income to household individuals (for example, inequality analysis based on data from the Luxembourg Income Study). Whilst inequality is often based on (household) consumption measures in poorer countries, income is often also earned at a household level where family enterprises in agriculture or the informal non-farm sector are more common.

[3] See for example, Lakner and Milanovic (2016), Lakner et al. (2022) and Milanovic (2002, 2005). Even the newer literature on inequality measurement that incorporates administrative tax data often splits household (or tax unit) income equally among adults (e.g., World Inequality Lab, 2024).

allocation of resources within the household. Second, that there is no sharing of resources within the household, i.e., all household resources are private goods.[4]

These two assumptions have several implications with ambiguous effects on inequality within countries which may distort the perception of the importance of within and between country inequality respectively. An implication of the first assumption is that current estimates provide a lower-bound of within-country inequality, and thus global inequality. Chiappori and Meghir (2015), Dunbar et al. (2013), Malghan and Swaminathan (2021) all present evidence of substantial inequality within the household. If this is the case, current estimates of global inequality are downward biased. As for the second assumption, this is reasonable for food consumption (once something is eaten, it cannot also be eaten by someone else), but not very useful for important parts of nonfood consumption (e.g., the use of household shelter by one person largely does not diminish the ability of other household members to benefit from the shelter). Allowing for resource sharing would make larger households relatively richer. Given the finding that larger households are generally poorer with current estimation methods (based on assuming no resource sharing), allowing for resource sharing could reduce within-country inequality for most countries. Furthermore, given that poorer countries on average consist of larger household, we anticipate that allowing for resource sharing will also reduce inequality among countries.[5]

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[4] Analysis based on data, for example, from the Poverty and Inequality Platform (PIP), assumes that there is no sharing of resources within the household by construction of the welfare indicator (i.e., per-capita measure of household consumption). PIP data have informed much analysis on global inequality (e.g., World Bank 2016, 2018, 2020, 2022) and serves as the basis for reporting on the SDGs. In contrast, analysis based on data from the Luxembourg Income Study adjusts household income in a manner that can be interpreted as accounting for economies of scale in household consumption (or resource sharing).

[5] While most likely outside the scope of the first draft of this paper, we also anticipate that the resource sharing assumption will have informative temporal patterns as household size has declined over time (Jolliffe and Tetteh-Baah, 2024).

In the current paper, we draw on nationally representative data for 165 countries covering 96.7 percent of the global population from the Poverty and Inequality Platform (PIP) of the World Bank and the Luxembourg Income Study (LIS) Database. We create three different permutations of the distribution of resources within households and three different permutations of the economies of scale within households to investigate their implications on global inequality and particularly the breakdown of inequality between and within countries. Our approach follows the bounding literature, whereby assumptions are first relaxed and then increasingly tightened to assess their importance.

We find that relaxing the assumptions regarding sharing of resources within households significantly impacts the inequality within countries to the extent that within country inequality becomes as important as the inequality between countries when investigating global inequality. At the global level, inequality increases from a Gini coefficient of 0.62 using the current uniform distribution of resources within households to a Gini coefficient of 0.69 in a scenario where each household aspires to ensuring individual consumption at least at the societal poverty line (SPL). When allowing for economies of scale within the household, we find decreasing global inequality with the Gini falling to 0.56. This is due to decreasing inequality both within and between countries.

2. Methods and Data

2.1. Data

We utilize a dataset of nationally representative income and consumption survey data from 165 countries covering 96.7 percent of the global population in 2022. For 156 of the countries, the observations come from the Global Monitoring Database (GMD), an internal World Bank archive of micro-level income and consumption data (for details, see World Bank, 2020, Appendix 1A).

This data is supplemented by household survey data from the Luxembourg Income Survey (LIS) for nine countries.[6] Our approach follows the methodology applied in compiling global data for the Poverty and Inequality Platform (PIP), an interactive online computational tool for the World Bank's poverty and inequality estimates.

For each country, the consumption and income surveys have been conducted in different years and the data are reported in local currency units in current prices. Following the methodology used to, *inter alia*, report on SDG 1.1, we convert all income and consumption data into 2017 constant local prices using Consumer Price Indices (CPIs) from each country. This information is subsequently converted into internationally comparable US dollars using 2017 purchasing power parity exchange rates (PPPs). The CPIs are used to estimate real changes in income and consumption over time, while the PPPs account for relative price differences across countries. In addition to using the same CPI and PPP data as used by the World Bank for global poverty monitoring, we also use the same population and national accounts data. For more details, see World Bank (2024).

The LIS database is the largest available income database of harmonized microdata from 52 countries. We use LIS to obtain information on nine high-income countries where microdata is not available in PIP. This is done by extracting average values of welfare (income) and household size within 400 bins created for each of the countries from the underlying LIS-microdata.

2.2. Methodology

[6] Data from Australia, Canada, Germany, the United Kingdom, Israel, Japan, South Korea, Taiwan and the USA was extracted from the Luxembourg Income Study (LIS) Database, http://www.lisdatacenter.org in October 2024.

The aim of this paper is to document the potential range of measured inequality from relaxing the assumptions of i) complete, within-household equality and ii) no-sharing of household resources. The baseline is the estimates currently used for reporting in SDG 10, i.e. the level of inequality observed when each person *i* in household *h* consisting of *n* individuals receives the same share of consumption; $x_i = \frac{x_h}{n}$.

2.2.1. Intra-household allocation of resources

To assess the importance of resource allocation within the household, we compare the current estimate (baseline) with three different alternative scenarios as described below and summarized in table 1 and box 1.

Scenario A is an upper bound estimate of global inequality based on the theoretical exercise of assigning (close to) all household resources, x_h, to one individual (the 'primary') in the household and then assigning (close to) zero to all other members.[7] This scenario maximizes within household inequality (i.e., provides an upper bound estimate with respect to the decision of how to allocate household resources). We acknowledge this scenario is not credible since without some minimum level of consumption, survival is impossible. The scenario nevertheless serves the purpose of highlighting the potential magnitude of the relative importance of the assumption.

Scenario B eliminates the possibility of driving an individual's consumption to zero. Here, households aspire to ensure each individual within the household consumes at least equivalent to the value of the international poverty line (IPL) used by the World Bank to measure extreme

[7] Instead of assigning USD 0.00 to all other members, we assign USD 0.25, which aligns with the bottom-censoring of the consumption measure in the surveys available through the World Bank databases (see e.g. World Bank 2024). The primary individual in the household therefore receives $(\overline{C_h} - 0.25) * n_h$.

poverty.[8] USD 2.15 in 2017 PPPs). If the household is identified as living in extreme poverty, then the resources are evenly allocated. If the household is not in extreme poverty (following the uniform allocation), resources are allocated evenly up to the value of the IPL, then all remaining resources are allocated to one person ((whom we label 'the primary' household member).

In the final scenario, C, we still assume all households aspire to reach a certain minimum level of consumption. But rather than aspiring to the IPL, which is irrelevant to several countries in the dataset, households aspire to the Societal Poverty Line, SPL. The value of the SPL is derived from 699 harmonized national poverty lines and has an intercept of USD 1.15 per day to which half the median level of national consumption is added. The line therefore varies across countries to reflect average estimated cost of meeting basic needs in that specific country (see Prydz and Jolliffe 2017). In this scenario, households will distribute consumption evenly amongst household members until everyone consumes the value of the SPL specific to their country of residence, after which the primary individual will consume everything above this value.

Table 1: Overview of scenarios for intra-household allocation of resources

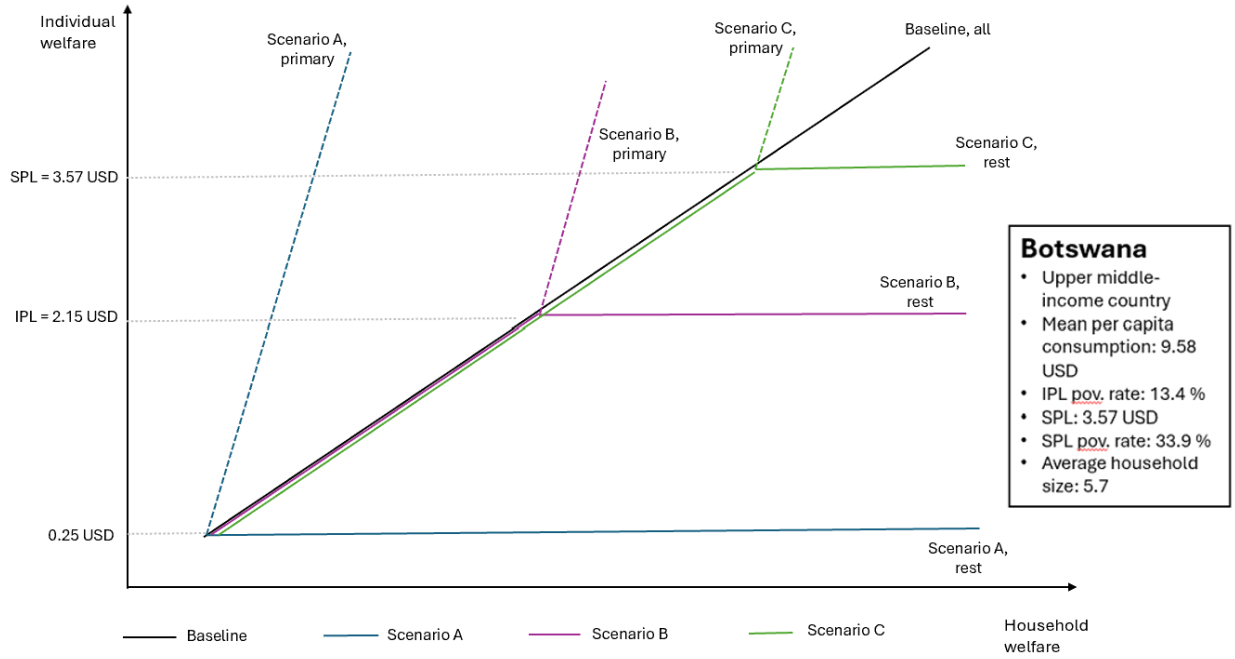
Scenario	Poor households	Non-poor households
Baseline	All individuals: $x_i = \frac{x_h}{n}$	
A: All-for-one	Primary: $x_1 = x_h - 0.25(n-1)$ The rest: $x_{2,..,n} = 0.25$	
B: IPL-aspirations	All individuals: $x_i = \frac{x_h}{n}$	Primary: $x_1 = x_h - 2.15(n-1)$ The rest: $x_{2,..,n} = 2.15$
C: SPL-aspirations	All individuals: $x_i = \frac{x_h}{n}$	Primary: $x_1 = x_h - SPL(n-1)$ The rest: $x_{2,..,n} = SPL$

To illustrate the five scenarios, figure 1 shows their application in the case of Botswana, an upper middle-income country, while the following text box 1 provides a concrete example of

[8] The value of the line used in this analysis is based on the line from World Bank (2024b), USD 2.15 in 2017 PPPs.

how resources are allocated within a Botswanan household across the scenarios. Figure 1 shows the relationship between the average household welfare and the individual welfare of the 'primary' individual as well as the 'rest' of the household. In Botswana in 2022, 13.4 percent of the population lives below the IPL of USD 2.15 a day while a total of 33.9 percent live below the SPL which is set at USD 3.57 in 2022.

Figure 1: Applying the intra-household scenarios – the case of Botswana



Box 1: Applying intra-household allocation scenarios – a Botswanan example

Let us look at a Botswanan household consisting of five individuals, with an average consumption of 3.15 USD a day. The average household consumption is above the IPL, but below the SPL. The following table shows the allocation of household resources to the five individuals in the household across the five scenarios.

Household member	Baseline	Scenario A	Scenario B	Scenario C
# 1 (primary)	3.15	14.75	7.15	3.15
# 2 (the rest)	3.15	0.25	2.15	3.15
# 3 (the rest)	3.15	0.25	2.15	3.15
# 4 (the rest)	3.15	0.25	2.15	3.15
# 5 (the rest)	3.15	0.25	2.15	3.15
Total	**15.75**	**15.75**	**15.75**	**15.75**

2.2.2. Within-household economies of scale

To examine the importance of the assumption of no within-household public goods we extend the work by Jolliffe and Tetteh-Baah (2024). In doing so, we acknowledge that some of the consumption within the household is shared amongst the members of the household, while some consumption is private in nature. This translates into economies of scale at the household level. In following with the notation in Jolliffe and Tetteh-Bah we assume that a share, pvt, of household consumption is private while the rest, $1 - pvt$, is public – i.e. shared amongst the household members. Shared consumption could for instance be the consumption of housing and utilizes. Private consumption, on the other hand, could for instance be food expenditures. Individual i's consumption, x_i, can thus be described by:

$$x_i = pvt\frac{x_h}{n} + (1 - pvt)x_h = \frac{x_h}{n^\theta}$$

Where $x_h$is total household consumption, n is household size and θ is the economies of scale parameter given by:

$$\theta = \frac{-\ln\left(1 - pvt + \frac{pvt}{n}\right)}{\ln(n)}$$

The economies of scale parameter is dependent on both the share of public consumption and the household size. In the current methodology for assessing individual welfare it is assumed that there is no shared consumption within the household and thus that there is no economies of scale ($\theta = 1$).

To assess the importance of this assumption, we have to make alternate assumptions about the share of private and public consumption within the household. We propose two alternatives; i) a square-root-n approach noted as being *common in international poverty comparisons* by Johnson & Torrey (2004) resulting in an economies of scale parameter of 0.5 and ii) allowing for country-specific shares of private consumption based on estimated shares of food consumption.

Both of these alternate assumptions are fairly crude. They nevertheless serve as useful alternatives in assessing the importance of the equally crude current assumption that all consumption is private. In this baseline, individual consumption is simply $x_i = \frac{x_h}{n}$. In our first alternative approach individual consumption is given by $x_i = \frac{x_h}{\sqrt{n}}$. In this scenario, the economies of scale parameter is constant across countries, consumption levels and household size.

In the second scenario, we allow the economies of scale parameter to vary across countries – and therefore implicitly by the level of consumption – as well as by household size. To do so, we estimate a linear model of the relationship between the food share of a country using survey data from the Global Monitoring Database for 71 countries and the estimated average household

consumption level as well as average household size from our global household dataset along with and income and regional group dummies[9]. This approach is similar to the one used by e.g. Jolliffe and Tetteh-Bah (2024). We then use the predicted values for the countries for which data on food shares are available and imputed values for the remaining countries. For high-income countries we use a slightly different approach. Here we take advantage of availability of data on most high-income countries in the IMF consumer price index (CPI) series and use the weight of food expenditure in the CPI for each country[10]. We translate these two types of estimated shares of food consumption into shares of private and public consumption by i) assuming that all food consumption is private consumption and ii) making an additional *ad hoc* assumption that half of the non-food consumption is private consumption, while the other half is public. Table 2 presents the estimated food share and resulting private consumption shares in our dataset as well as by income classification and region.

While these assumptions may seem crude, national accounts data points to the importance of allowing for different shares of private consumption across different income levels, as the share of food consumption decreases significantly as income increases (see figure A1 in the appendix). For the countries for which information is available in the 2022 IMF CPI database, the average weight of Housing, water, electricity, gas and other fuels (an obvious candidate for a public good within the household) ranges from an average 12.8 percent across the 12 LICs for which

[9] Specifically, we estimate the following model at the country level: $FS_i = \beta_0 + \beta_1 cons_i + \beta_2 hsize_i + \sum_{j=1}^{J} \sigma_j region_{ij} + \sum_{k=1}^{K} \gamma_k income_{ik} + \varepsilon_i$, where: *FSi* is the food share of country *i* in the selected survey year, $cons_i$ is the survey-based mean consumption per capita for country *I,* $hsize_i$ is the survey-based average household size for country *i,* $region_{ij}$ is a dummy variable indicating that country *i* belongs to region *j,* $income_{ik}$ is a dummy variable indicating that country *i* belongs to income group *k* and ε_i is an error term.

[10] For seven HIC's there is no recent information on the share of "food and non-alcoholic beverages". For those countries we use the average food share within the group of HIC where data is available.

information is available to an average of 22.3 percent in the 40 HIC's where information is available. Our estimated private consumption shares range from 0.539 in USA to 0.847 in the Syrian Arab Republic.

Table 2: Estimated food and private consumption shares

	Mean welfare (USD, PPP)	Food share	Private consumption (share)	Average household size	Economies of scale parameter
World	**12.29**	**0.47**	**0.73**	**4.24**	**0.58**
By income classification					
High income	42.49	0.19	0.60	2.61	0.48
Upper middle income	16.81	0.38	0.69	3.51	0.55
Lower middle income	6.72	0.53	0.77	4.53	0.60
Low income	2.68	0.61	0.81	5.78	0.63
By region					
East Asia & Pacific	11.37	0.48	0.74	3.94	0.59
Europe and Central Asia	23.90	0.34	0.67	3.14	0.54
Latin America and Caribbean	18.89	0.34	0.67	3.19	0.53
Middle East & North Africa	10.56	0.54	0.77	4.79	0.60
Other High Income	58.73	0.17	0.58	2.28	0.48
South Asia	7.16	0.52	0.76	4.44	0.60
Sub-Saharan Africa	3.62	0.56	0.78	5.35	0.60

Having an estimate of the private share of consumption within each country allows us to exploit different scenarios of how the consumption is distributed amongst household members. First, we assess the importance of simply allowing for shared consumption within the household by distributing the private consumption evenly amongst all household members. Second, we apply the most extreme scenario from the first part of the analysis by assigning all private consumption to one individual within the household.

Box 2: Example of application of sharing rules

Let us look at the same Botswanan household assessed in the first part of the paper. The household still consists of five individuals, their average consumption in the current baseline is USD 3.15 a day resulting in total household consumption of USD 15.75. The estimated share of private consumption in Botswana is 0.699.

In the square-root N approach, each household member would consume USD 7.04 a day. Thus by allowing for economies of scale within the household, consumption more than doubles. This approach results in total consumption of the household to increase to USD 35.22 a day. We get a similar result when using the estimated country-specific private consumption where each household member consumes USD 6.95 a day. This level of consumption is made up of USD 4.75 worth of public consumption and USD 2.20 of private consumption. In the final scenario, we assign the total value of private consumption (USD 11.00) to one individual within the household.

Household member	Baseline	Scenario I $(\sqrt{n}, \theta = 0.5)$	Scenario II (θ = Country specific)	Scenario III (θ = Country specific, all private for one)
# 1 (primary)	3.15	7.04	6.95	15.75
# 2 (the rest)	3.15	7.04	6.95	4.75
# 3 (the rest)	3.15	7.04	6.95	4.75
# 4 (the rest)	3.15	7.04	6.95	4.75
# 5 (the rest)	3.15	7.04	6.95	4.75
Total	**15.75**	**35.22**	**34.74**	**34.74**

2.2.3. Decomposing into between and within country inequality

For both parts of the analysis, we show the implications of the different scenarios on global inequality measured by the Gini coefficient. However, to examine the extent to which the scenarios impact the decomposition of poverty within and among countries, we have to use a different measure. In keeping with the most common decomposition measures used in the inequality literature, we investigate the General Entropy class, and specifically the mean-log deviation (also called Theil L) of the different scenarios (see Elbers et al. 2008). The measure is given by:

$$GE = \sum_i f_i \log\left(\frac{\mu}{x_i}\right)$$

Where f_i is the population share of household i, x_i is the per capita consumption of household i and μ is average per capita consumption. This measure can be decomposed into inequality between and within countries g_j:

$$GE = \sum_j g_j \log\left(\frac{\mu}{\mu_j}\right) + \sum_j GE_j g_j$$

It is worth noting, that in our exercise of altering the assumption of resource allocation within household members, we do not make any changes to the average per capita consumption in country *j* – we simply change the distribution of the existing resources. Hence the value of between country inequality will be unaffected across the scenarios of the first part of our analysis. When we investigate the importance of shared consumption within the household, however, we do increase the average per capita consumption across countries since we allow for economies of scale which varies by household size.

3. Results

3.1. Intra household allocation of resources

Given the widespread use of the Gini coefficient in inequality measurement we start by assessing the impacts of altering resource allocation within households on the global Gini coefficient. Based on the existing assumption of equal sharing of resources within households, the global Gini stands at 0.620 in our dataset. As is evident from *figure 2* global inequality increases substantially to 0.855 in Scenario A, where we maximize inequality within households. Even in the more realistic scenarios, however, where households aspire for individuals to consume the IPL or the country-specific SPL the global Gini increases to 0.785 and 0.694 respectively.

Figure 2: Impact of intra-household resource allocation on global Gini

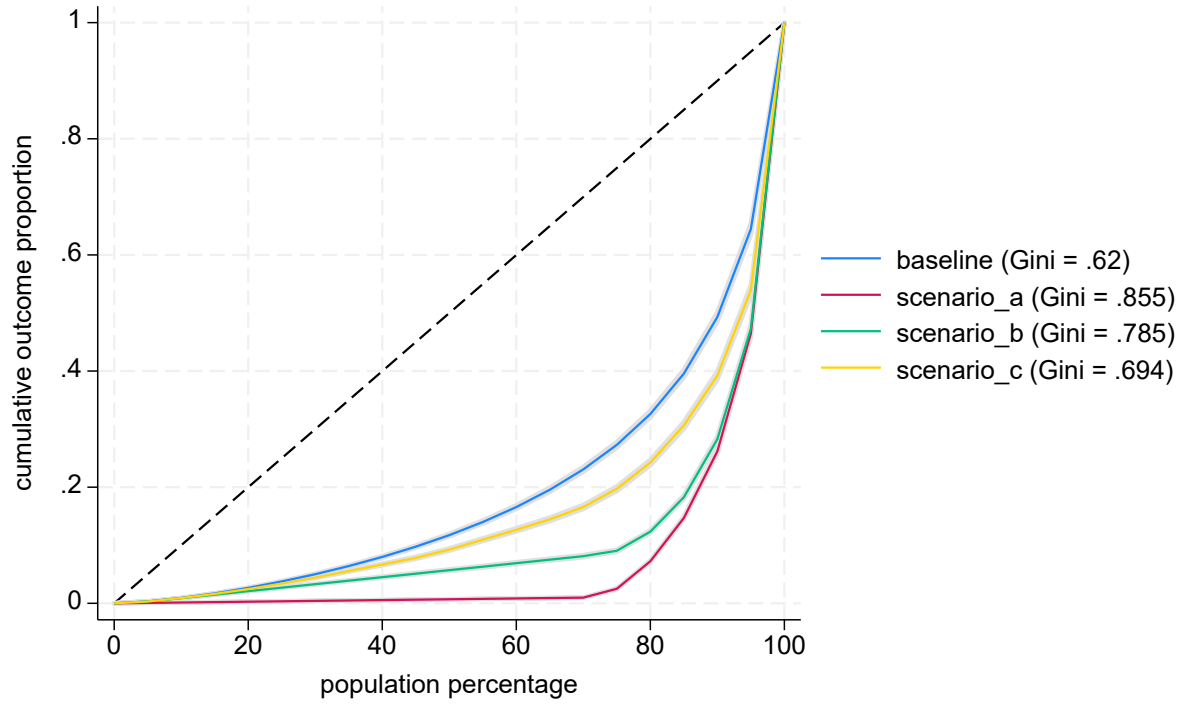
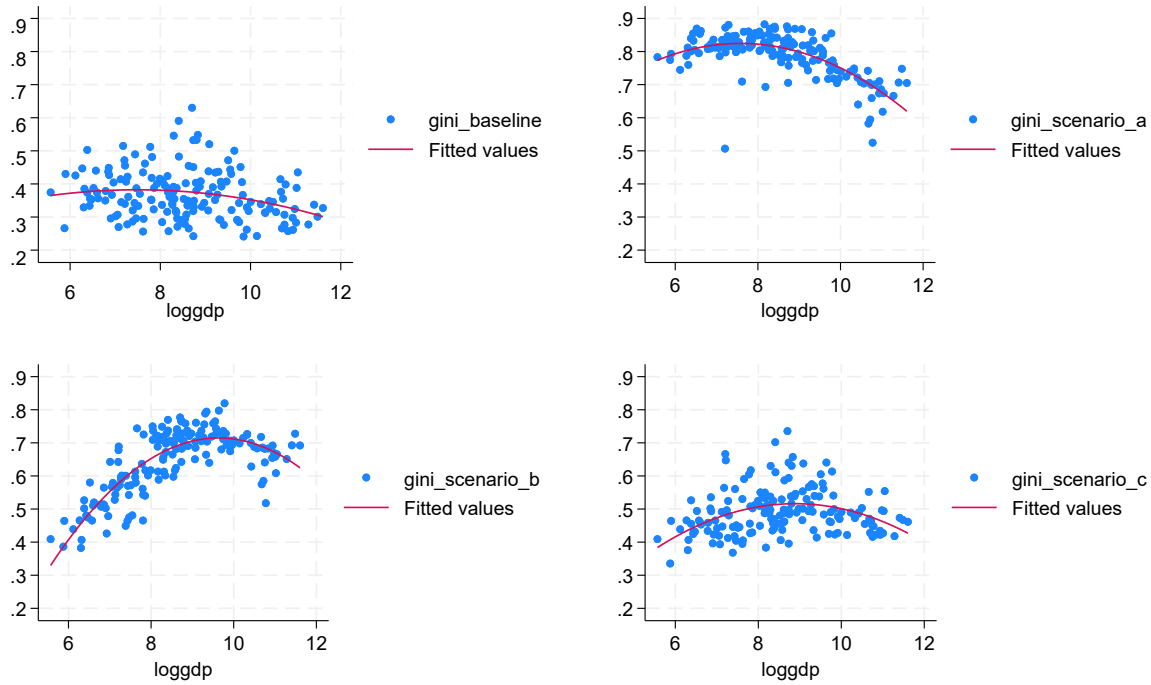


Figure 3 shows the implications of the three scenarios for national Gini-measures plotted against log(GDP) of the countries, i.e. the Kuznets curves associated with the scenarios. The permutations of the distribution of welfare within households have substantial impacts on the inequality *within* countries.

Figure 3: Impact of intra-household resource allocation on national Gini



To assess the implications of the scenarios on between and within country inequality, we turn to the mean-log deviation. Table 3 provides an overview of the decomposition of global inequality within and between countries across the five scenarios. The first column describes the decomposition of global inequality under the current assumptions of equality sharing of resources within households (baseline). The results confirm the current notion that approximately two-thirds of global inequality stems from differences in average consumption levels between countries. When we allow for maximizing the inequality within households, the within-country inequality explodes and accounts for 83.2 percent of the global inequality. This serves as the upper bound of inequality when altering the assumption of resource sharing within households. When households aspire for members to consume at least the equivalent of the IPL, it is now still within-country inequality that makes up approximately two-thirds of global inequality. Even in the more realistic scenario, where households aspire to giving each household member at least

the basic needs of their specific society (the SPL) the within-country inequality becomes as important as between-country inequality.

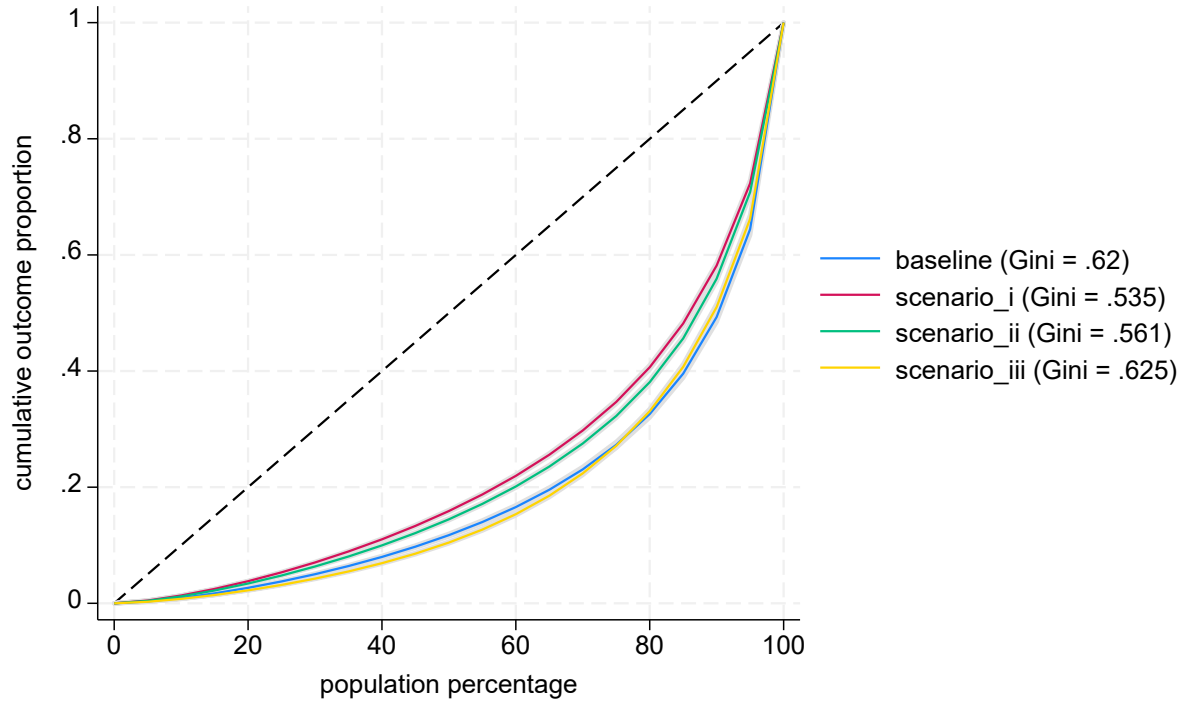
Table 3: Decomposition of inequality – intra-household allocation

Sou				
	Baseline	Scenario A All-for-one	Scenario B IPL-aspiration	Scenario C SPL-aspiration
Gini	0.620	0.855	0.785	0.694
Mean-log-deviation (GE(0))				
Total	0.7141	2.8483	1.4114	0.9187
Within-country	*0.2359*	*2.3700*	*0.9332*	*0.4421*
(share)	*33.0%*	*83.2%*	*66.1%*	*48.1%*
Between-country	*0.4782*	*0.4782*	*0.4782*	*0.4766*
(share)	*67.0%*	*16.8%*	*33.9%*	*51.9%*

3.2. Within-household economies of scale

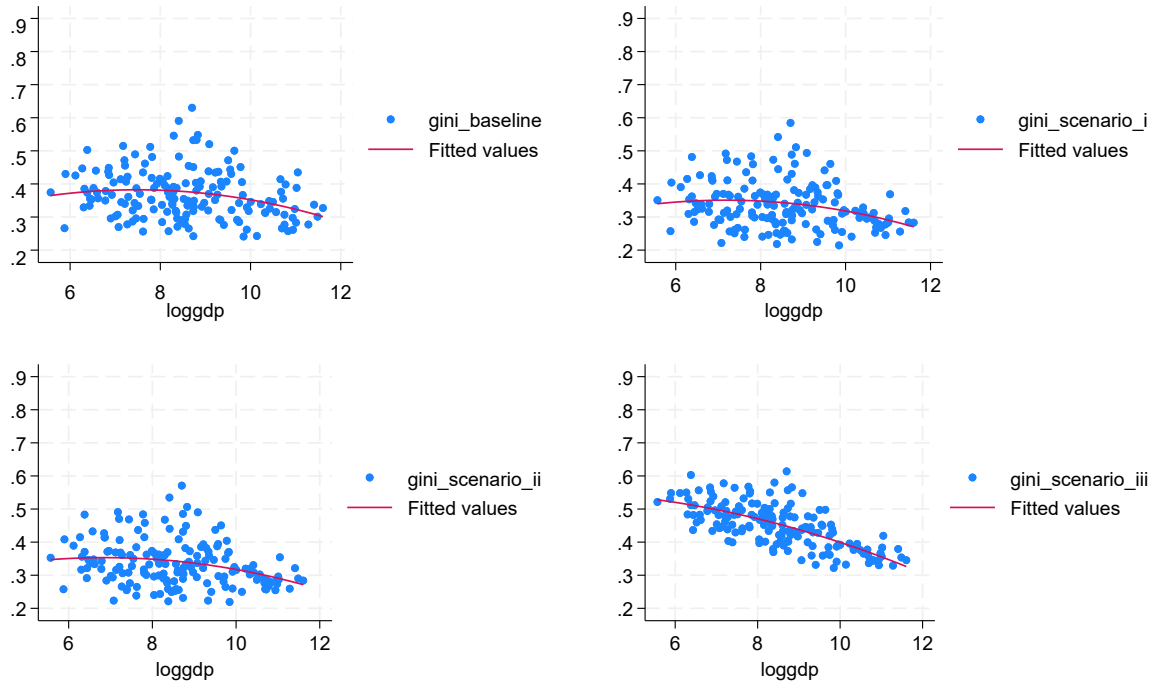
Figure 4 below shows the impacts of allowing for economies of scale within households on global inequality as measured by the Gini coefficient and shown by the Lorenz curve. From the baseline Gini of 0.620, the Gini coefficient drops when allowing for resource sharing within the household (scenario I). The Gini coefficient drops to 0.535 when applying the square-root N approach whereby larger households are made relatively better off but by a constant factor across different countries. By doing so, the welfare of households in poorer countries is – on average – increased relative to households in richer countries, since the average household size decreases as income levels increase (see table 2 as well as appendix figure A2). When we allow for country-specific shares of private and public consumption, the Gini coefficient still drops compared to the baseline, but not as much as in scenario I. The Gini coefficient of 0.561 reflects that larger (and poorer) households become relatively better off thereby decreasing global inequality. However, this impact is to some extent countered by the fact that the share of public consumption within the household increases by income level (see table 2).

Figure 4: Impact of within-household economies of scale on global Gini



In scenario III we combine the country-specific shares of private consumption within the household with our extreme scenario from the first part of the analysis of assigning all (private) consumption to one individual within the household. In this scenario, however, 'the rest' of the household members still consume the public part of total household consumption. In this scenario the two effects seem to almost cancel each other, as the Gini coefficient becomes 0.625, i.e. a small increase compared to the baseline scenario. When looking closely at the Lorenz curves of scenario III and the baseline, it can be seen that the similar Gini coefficients conceal different distributions of global welfare.

Figure 5: Impact of intra-household economies of scale on national Gini



The distributional implications of the scenarios are also evident when we turn to the decomposition of inequality. The two methods for allowing for economies of scale within the household (the $\sqrt{n}$-approach and the country specific measures of private consumption shares) result in similar estimates of within-country inequality. However, the $\sqrt{n}$-approach results in a greater decrease in the between country inequality as the economies of scale parameter is constant across countries, whereas the country-specific measure results in relatively greater economies of scale in higher income countries, where the share of public goods within the household is relatively higher.

In Scenario III the Gini coefficient is similar to the baseline scenario, as highlighted from Figure 4. Here, the decrease in between-country inequality due to poorer, but relatively larger households gaining more from the economies of scale within households, is countered by an increase in within-country inequality due to assigning all private consumption to one individual

within the household. In other words, once we allow for a share of consumption being public goods within the households, the upper bound of possible increased global inequality due to maximizing the inequality within households is of approximately same order of magnitude as the resulting decrease in global inequality due to these public goods being of relatively greater importance in poorer, larger households.

Table 4: Decomposition of inequality –within household economies of scale

	Baseline	Scenario I $(\sqrt{n}, \theta = 0.5)$	Scenario II (θ = Country specific)	Scenario III (θ = Country specific, all private for one)
Gini	0.620	0.535	0.561	0.625
Mean-log-deviation (GE(0))				
Total	0.7141	0.5067	0.5656	0.7549
Within-country	*0.2359*	*0.1963*	*0.1953*	*0.3669*
(share)	*33.0%*	*38.7%*	*34.5%*	*48.6%*
Between-country	*0.4782*	*0.3105*	*0.3703*	*0.3880*
(share)	*67.0%*	*61.3%*	*65.5%*	*51.4%*

4. Conclusion

Our understanding of global inequality – and its decomposition into inequality within and between countries respectively – hinges on key assumptions. We use a novel approach inspired by the bounding literature to assess the importance of two of those key assumptions: i) that all resources are distributed evenly within the household and ii) that all consumption is private in nature. These assumptions are necessary since we only have information about the consumption and income at a household level while we are interested in outcomes – in this case inequality – at an individual level.

We utilize a dataset of nationally representative income and consumption survey data from 165 countries covering 96.7 percent of the global population in 2022. And we develop three alternative global distributions of welfare for each of the two assumptions under scrutiny. First,

we exploit the impacts on inequality by allowing for three alternative ways of distributing the total consumption within households. In scenario a, we give all resources to one individual within the household, thereby maximizing the inequality within the household and providing an upper bound of the impact of intra-household inequality on global inequality. In scenario b, we add an assumption that all households aspire for each of its members to consume at least equivalent to the value of the international poverty line (IPL), i.e. USD 2.15 a day, while any additional consumption beyond the IPL is given to one individual within the household. In scenario c, we apply a stricter version of this assumption by assuming households aspire to the societal poverty line of the country in which the household resides. Second, we allow for some sharing of goods within the household – i.e. allowing for some degree of economies of scale in three different scenarios. In scenario I we use the so-called root-n approach where the economy of scale is identical across all countries. In scenario II we estimate country-specific food shares to obtain a country-specific measure of the share of private and public consumption respectively within the household. And in the final scenario III we combine the country-specific shares of public consumption within the household with the case in which one individual within the household consumes all private consumption of the household.

We find that the two assumptions have significant implications for the level of inequality globally. The assumption of uniform distribution of resources within the household significantly underestimates the level of inequality within each country to the extent that it impacts the relative importance of within and between inequality in explaining global inequality. Our estimates suggest that taking account of the inequality within households would make inequality within countries as important as inequality between countries. On the other hand, the assumption of all consumption being private in nature possibly overestimates the level of global inequality. Households are on

average larger in poorer countries (and larger at the lower end of the welfare distribution within a given country) and despite indications that the share of public consumption increases with income levels our estimates show that allowing for economies of scale within the household decreases global inequality both through lower estimated inequality within *and* between countries.

While our approach does not necessarily provide evidence of which assumptions are most plausible when it comes to the distribution and consumption of resources within households, our paper shows that taking these assumptions should not be taken for granted, as they have a non-negligible impact on the outcomes of interest to policy makers and practitioners alike.

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Appendix

Figure A1: Food share by welfare per capita per day (USD)

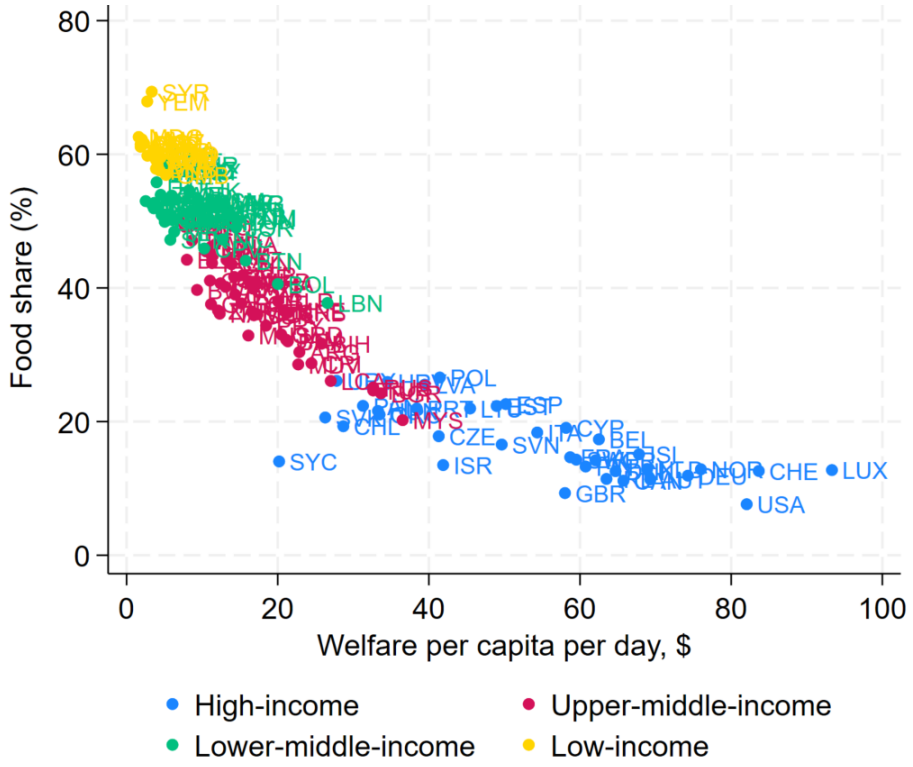

Figure A2: Average household size by log(GDP) across 165 countries in dataset