

Problem Set 2: Macroeconomics and Inequality in Uganda.

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For this problem set we will use the [2011-2012 wave of the Ugandan National Panel Survey](#). The survey is under the umbrella of the ISA-LSMS surveys and offers nationally representative household data on consumption, income, wealth and other key variables in Uganda. The file *UNPS_1112_PS2.xls* contains the data while the file *variables_description_UNPS_1112_PS2.xls* contains a description of the variables. Import the data and answer the following exercises.

Exercise 1. Exploring the data (25 points).

- Are there duplicate households in the data? That is check if there are repeated observations in the unique household identifier variable. How many observations are there in the data?
- Present some basic summary statistics for the following variables: *head_gender*, *head_age*, *familysize*, *consumption*, *income*, *wealth*. Comment your results in 2 lines. In particular, you might mention if there are missing observations or potential outliers for some of the variables.
- Using the *head_gender* variable, create a dummy variable for household head being female (1=female, 0=male). What is the proportion of households where the head is female?
- Using the *groupby* method, compute the average consumption, average household size, and average household head age for households where the head is male vs where the head is female. Do we observe noticeable differences across the two groups?

Exercise 2. Inequality in Uganda (50 points).

- Create the variables *log_c*, *log_inc*, *log_w* that are the log of consumption, income, and wealth, respectively. Plot in the same graph the distribution of the log of consumption and the log of income. Do the distributions resemble some known distribution? Is inequality higher in consumption or in income?
- A commonly used statistic to measure inequality is the variance of the logs. Compute the variance of the log of consumption, of the log of income, and of the log of wealth. How do these measures of inequality in Uganda compare to the same measures of inequality in the United States? Use table 3, column 5—PSID in [De Magalhães, L., & Santaaulàlia-Llopis, R. \(2018\)](#) for the comparison.
- Measuring between rural and urban inequality in Uganda. Compute the average consumption, income, and wealth for rural and urban areas separately (*groupby*). Are the differences between the two areas large?
- Measuring within rural and urban inequality in Uganda. Compute the variance of the log of consumption, income, and wealth for rural and urban areas separately.
- Compute the Gini coefficient in consumption, in income, and in wealth in Uganda. Compare these values with the Gini coefficients in the United States—table 3, column 5—PSID in [De Magalhães, L., & Santaaulàlia-Llopis, R. \(2018\)](#)

- f. Compute the share of the wealth that the bottom 50 percent hold. Compute the share of the wealth that the top 10, 5, and 1 percent hold.
- g. Although in the last years, there has been a big debate on inequality, the debate has mostly focused on rich countries. From your results of this exercise, discuss whether inequality is relatively large in Uganda with respect to rich countries.
- h. The few previous studies on income inequality in Africa had to rely on consumption measures to estimate income inequality. See, for example, [Alvaredo & Gasparini \(2005\)](#). Debate on the advantages and disadvantages of using consumption measures to study income inequality.

Exercise 3. The lifecycle of male vs female head households in Uganda (25 points).

Before going to the plots, you might want to drop ages for where there are few households—as above 80 years old and below 18 years old. You might also want to group the ages in bins so that that the plots are more smooth.

Then, using seaborn lineplot with the argument *hue='female'*, or any other variable to distinguish the gender of the head,

- a. Plot the lifecycle of the log of consumption for households where the head is male and for households where the head is female.
- b. Redo the same plot but for the log of income (i) and for the log of wealth (ii).
- c. What are the differences in the lifecycle of consumption, income, and wealth of households across the gender of the household heads? Comment your results.