**Hands-on training on poverty measurement**

**Exercises – Durables**

This problem set consists of two parts and are based on a hypothetical country dataset using Stata. Throughout this exercise, use “**04\_durables\_ex.dta**” and “**cpi.xlsx**” available on the Spark page. We strongly recommend that you create a do-file for this exercise so that you can reproduce the results whenever necessary.

**EXERCISE 1**: Estimate of the flow of services from durables

Consider the case when there is complete information in the household survey: *current value* (**val\_td**) of durable goods, year in which the durables were purchased (**yr\_aq**) or *age* in years and *value* of each item *when purchased* (**val\_aq**). At the same time, information about *inflation* rate and *nominal interest* rate is provided by other sources: 4% for the first one; and 7% and 9% for savings and deposits, respectively.

1. Calculate a depreciation rate for each durable good at the household level based on the information provided. The inflation rates for the last past 13 years are given in the table below. Note that the value of durable goods at the time of purchase (**val\_aq**) in the dataset is expressed in nominal price and thus need to be inflation-adjusted.

|  |  |
| --- | --- |
| Year | Inflation rates |
| 2000 |  |
| 2001 | 4.40 |
| 2002 | 5.70 |
| 2003 | 3.98 |
| 2004 | 5.19 |
| 2005 | 3.33 |
| 2006 | 4.05 |
| 2007 | 3.76 |
| 2008 | 6.53 |
| 2009 | 3.57 |
| 2010 | 4.40 |
| 2011 | 3.82 |
| 2012 | 3.57 |
| 2013 | 4.02 |

1. Calculate the median depreciation rate by item considering the nation as reference.
2. Estimate the consumption flow by each durable good.
3. Estimate the total per capita consumption including per capita food, non-food and durables.
4. Calculate the headcount ratio using the national poverty line.
5. Calculate the headcount ratio by regions using the national poverty line

**APPENDIX 1 to EXERCISE 1**: Sensitivity of depreciation rates

Two households (A & B) reside in the different regions (R1 & R2) and have the same car. The first region (A) is characterized by extreme weather variation and difficult terrain with very few paved roads. The second (B) has much better weather and almost all roads are paved. Both goods will be deflated by the same median item depreciation rate in the case of using the national rate. This will produce the same utility level for A & B. To tackle this difficulty, let the depreciation rate varies by item and province.

A1.1.2 Calculate the median depreciation rate by item by province.

A1.1.3 Repeat point 1.3

A1.1.4 Repeat point 1.4

A1.1.5 Repeat point 1.5. Compare these results with previous exercises.

**APPENDIX 2 to EXERCISE 1:** Sensitivity of depreciation rates

Now, assume that two households (A & B) which reside in the same region (R) have the same good (na = nb) but differ in the year acquisition: na is older than nb. Both goods will be deflated by the same geographical depreciation rate producing the same utility levels for A & B. In order to avoid this problem, estimate a depreciation rate by item, province and vintage. The following intervals of years define the vintage variable: almost a year old, between 2 and 3 years old and more or equal to 4 years old.

A2.1.2 Calculate the median depreciation rate by item, by province and by vintage.

A2.1.3 Repeat point 1.3

A2.1.4 Repeat point 1.4

A2.1.5 Repeat point 1.5. Compare these results with previous exercises.

**EXERCISE 2**: Rough estimate of the flow of services from durables

Assume that the only information available in the dataset is the *current value* and *age* for each durable good. In order to estimate the flow of the service that each good provides to each household, apply the following simple approach:

1. Calculate the remaining life of each good as: 2 – *T* where equals the average age for each durable good and *T* is the age of the good;
2. Are these reasonable values? If not, use an arbitrary decision and censor the variable to 2 years when the estimate is less.
3. Calculate the flow of services by dividing the current value by its expected remaining life.
4. Estimate the total per capita consumption including per capita food, non-food and durables.
5. Create the budget share of each component of the consumption aggregate and calculate the mean for each deciles of total per capita consumption.
6. Calculate the headcount ratio using the national poverty line.