## **Assignment weeks 1 and 2**

## *To answer all the questions below, you must use Stata (and, specifically, DASP, if requested). Be concise and clear in your answers.*

## *The assignment is divided into three exercises (the points assigned to each exercise are indicated next to each exercise). Please answer (A) directly in this file after each question (Q) and please attach the \*.do file (do-file) that you generated. Rename both files as: “Assignment weeks 1-2-3 - Name, Surname”. Please submit this completed file and the \*.do through the virtual drop box (boîte de dépôt) in the course portal, no later than Tuesday, February 5 11:59 a.m. (*[*Québec time*](https://www.timeanddate.com/worldclock/converter.html?iso=20190205T165900&p1=189)*).*

## **Exercise 1 (4%)**

Assume that the population is of composed 14 households that live in regions *A, B and C*.

|  |  |  |  |
| --- | --- | --- | --- |
| identifier | region | *income* | hhsize |
| 1 | A | 210 | 4 |
| 2 | A | 450 | 6 |
| 3 | A | 300 | 5 |
| 4 | A | 210 | 3 |
| 5 | B | 560 | 2 |
| 6 | B | 400 | 4 |
| 7 | C | 140 | 4 |
| 8 | C | 250 | 2 |
| 9 | C | 340 | 2 |
| 10 | C | 220 | 2 |
| 11 | C | 360 | 3 |
| 12 | C | 338 | 2 |
| 13 | C | 330 | 3 |
| 14 | C | 336 | 4 |

**Q 1.1:** Using Stata, generate per capita income (*pcinc*).

**A:** Done in the do file.

**Q 1.2:** Using Stata, estimate the average per capita income and the total incomes of our population.

**A:** 96.6087

**Q 1.3:** Assume that, the poverty line is equal to 120, generate the variable “per capita poverty gap (*pgap*)”, and then estimate its average (the per capita poverty gap should be normalized by the poverty line).

**A:** 0.2905797

**Q 1.4:** Redo question Q 1.3 using DASP.

**A:** 0.290580

**Q 1.5:** Assume that the purchasing power in region B is higher than that of region A by 15% and that of region C is higher than that of region A by 20%. In the case where the region A is the region of reference, generate the variable (*deflator*) as a price deflator index, and then generate the variable real per capita income (*rpcinc*).

**A:** Done in the do file.

**Q 1.6:** Redo the question 1.3 and 1.4 using the real per capita income when the poverty line is 130.

**A:** Q1.2 = 85.50252

Q1.3 **=** 0.387766

Q1.4 = 0.387766

**Exercise 2 (3%)**

The Bureau of Statistics asks you to construct the variable “adult-equivalent size (*aes*)” to monitor the change in the average well-being between two periods, *t*1 and *t*2. The sample has a panel structure since the same households were selected in each of the two periods (see the table below). Based on the recommendation of experts, the adult-equivalent size is defined as follows:

## 

where is the number of adults within the household and is the number of children

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *identifier* | *period* | *income* | *hhsize* |  |
| 1 | 1 | 29 | 4 | 2 |
| 2 | 1 | 50 | 3 | 2 |
| 3 | 1 | 36 | 4 | 3 |
| 1 | 2 | 30 | 4 | 2 |
| 2 | 2 | 48 | 3 | 3 |
| 3 | 2 | 46 | 5 | 2 |

**Q 2.1:** Using Stata, estimate the average per capita income and the average per adult-equivalent income for each period.

**A:** Average per capita income:

* Period 1: 10.45455
* Period 2: 10.33333

Average per adult-equivalent income:

* Period 1: 16.24709
* Period 2: 16.46645

**Q 2.2:** Discuss the changes in each measure of well-being.

**A:** There is a contrasting trend in the change of the average per capita income and average per adult-equivalent income overtime. Analysis results show that the former slightly declined from 10.45 at *t1* to 10.33 at *t2*. Meanwhile, the latter rose from 16.25 to 16.47 between two periods. This discrepancy results from the increase of number of children, who take a lower weight in terms of well-being compared to adults, in the surveyed households.

### Exercise 3 (5.5%)

**Q 3.1** Use the data\_3.dta data file, and then compute the population size of the sampled households.

**A:** 15250

**Q 3.2** Rank the per capita expenditures in ascending order and then generate the variable population share (*ps*) that includes the proportion of the sampled population with corresponding per capita expenditures. Based on this, generate the variable percentiles (*p*) and quantiles (*q*).

**A:** Done in the do file.

**Q 3.3** Draw the cumulative distribution curve (X-Axis: the percentiles and Y-Axis: the corresponding per capita expenditures) (range of percentiles: min=0 and max=0.90).

**A:**

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**Q 3.4** Plot the quantile curve (X-axis: percentiles and Y-axis: quantiles) (range of percentiles: min=0 and max=0.90), and briefly discuss the results.

**A:**

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The quantile curve represents the distribution of per capita expenditure of the surveyed households corresponding to their percentile of population share. The graph shows that the per capita expenditures of most households are lower than 200000, while less than 1 percent of the population have significantly higher levels of per capita expenditure than the rest, which might indicate extreme inequality level.

**Q 3.5** Using DASP, draw the quantile curve for each of the rural and urban regions (range of percentiles: min=0 and max=0.90), and briefly discuss the results.

**A:**



The quantile curves in graph Q3.5 show a notable difference in the level of expenditure among the rural and urban population. The blue line, which represents the maximum level of per capita expenditure corresponding to each percentile of rural population, is mostly flat and does not show significantly high values of expenditure. The red line, which stands for the trend in urban area, has an upward sloping shape and shows significantly higher values than the one of rural region. The curves might imply that the expenditure and inequality levels in the urban region are higher than those of the rural regions.

**Q 3.6** Using DASP, draw the density curves of the per capita expenditures by the sex of the household head (range of per capita expenditures: min=0 and max=800000) and briefly discuss the results.

**A:**



Graph Q3.6 represents the density curves of the per capita expenditures by the sex of household head. Both curves have a bell shape and are right-skewed, representing a mode of approximately 70000-80000. The curve of female household head is flatter than the one of male household head, implying that households with a female household head share more equal levels of expenditure than the households with a male household head.