**Assignment weeks 9, 10 and 11**

*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 directly in this file after each question and please attach the \*.do file (do-file) that you generated. Rename both files as: “Assignment weeks 9-10-11 - 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, April 13 11:59 p.m. (*[***Québec time***](https://www.timeanddate.com/worldclock/converter.html?iso=20190410T035900&p1=189)*).*

# Exercise 1 (4.5%):

Assume that the population is composed of six individuals. The scores of each of the three dimensions of well-being are reported in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Individual 1 | 4 | 20 | 12 |
| Individual 2 | 8 | 12 | 0 |
| Individual 3 | 16 | 16 | 24 |
| Individual 4 | 12 | 12 | 16 |
| Individual 5 | 28 | 20 | 8 |
| Individual 6 | 24 | 16 | 12 |

Assume that the poverty threshold of each of the three dimensions is 14. Perform the following computations with Stata.

* 1. Using the union approach, estimate the proportion of poor individuals. Redo the estimation using the appropriate DASP command.

**A:** Union headcount index is 0.833.

* 1. Using the intersection approach, estimate the proportion of poor individuals. Redo the estimation using the appropriate DASP command.

**A:** Intersection headcount index is 0.167.

* 1. Which approach is more sensitive to the increase in individual multiple deprivations?

**A:** The union approach is more sensitive to the increase in individual multiple deprivations. It can result in a substantial increase in poverty because if an individual falls short of a poverty dimension, he/she is considered poor.

* 1. Estimate the Alkire and Foster (2007) index MPI( when the dimensional cut-off is equal to 2 (the poor are those with two or three dimensions of deprivation).

**A:** Please see the answer in do file.

* 1. Now estimate the same indices using the appropriate DASP command. Discuss the findings.

**A:** Please see the answer in do file.

* 1. Assume that the government has 24$ and can target one dimension with a universal transfer. Which targeted dimension would most reduce the union index, and the intersection index? Discuss your findings.

**A:** If the government transfer is targeted for dimension 3, it will reduce the union index the most. Whichever dimension the government transfer is targeted, it yields the same intersection index.

# Exercise 2 (4%):

For the case of tri-dimensional well-being dimensions, the Bourguignon and Chakravarty (2003) poverty index (henceforth the BC index ) is defined as follows:

Where is the contribution of the individual to the total poverty:

*and*

Using the data of exercise 1,

* 1. Estimate the Bourguignon and Chakravarty (2003) poverty index when .

**A:** The MDP\_BC is 0.182. Please see do file for further detail.

* 1. Redo the estimation using the appropriate DASP command.

**A:** The MDP\_BC is 0.182, which is the same as in Q2.1. Please see do file for further detail.

* 1. Generate three new variables (nw\_\*) wherein individuals equalize their well-being dimensions (example: gen nw\_1 = (w\_1+ w\_2+w\_3)/3) (i.e. For instance, individual 1 has 4, 20, 12 in the three dimensions respectively. After the equalisation, we will have: 12, 12, 12). Then, using DASP, re-estimate the BC index with the new vectors of well-being. Explain the direction of the change in the BC index.

**A:** The BC index does not change because the weight of each well-being dimension is equalized.

# Exercise 3 (4%):

The data file ***Canada\_1996\_2005\_random\_sample\_3*** is a randomly drawn sample of 100 000 observations. It contains the information on gross incomes, taxes and transfers.

* 1. Using the observations from 2005, estimate the expected marginal tax, benefit and net income rates for the range of gross incomes between 1000 and 31000$ (hints: use the DASP ***cnpe*** command with the option: type(dnp)).

**A:**



* 1. Estimate the redistributive impact on the Gini inequality index for the years of 1999, 2002 and 2005 (hints: use the Stata commands preserve/restore to preserve the data after using the Stata command keep if year==…).

**A:** Please see the answer in do file.

* 1. Estimate the Kakwani progressivity index per year using the DASP command ***iprog*** (hints: use the option gobs(year)).

**A:** Please see the answer in do file.

* 1. Using the observations from 2005, check the TR progressivity condition for the tax T by using the DASP command ***cprog***.

**A:**



* 1. In which province was inequality the highest in 2005? In which province was the Kakwani tax progressivity index the highest in 2005?

**A:**

Based on the estimates, inequality in Newfoundland is the highest.

Based on the estimates, the Kakwani tax progressivity index in Alberta is the highest.

Please see do file for further detail.