

## HDCA Summer School, 2008

Assignment  
MD Inequality and Well-Being Indices

Date: Sept 3  
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### 1. Paper Based Prpbles:

Consider the following normalized achievement matrices.

$$X = \begin{array}{|c|c|c|c|} \hline & \text{Inc} & \text{Edu} & \text{Hel} \\ \hline \text{Per 1} & 0.8 & 0.8 & 0.3 \\ \hline \text{Per 2} & 0.4 & 0.3 & 0.8 \\ \hline \text{Per 3} & 0.3 & 0.4 & 0.4 \\ \hline \end{array}, Y = \begin{array}{|c|c|c|c|} \hline & \text{Inc} & \text{Edu} & \text{Hel} \\ \hline \text{Per 1} & 0.6 & 0.55 & 0.55 \\ \hline \text{Per 2} & 0.6 & 0.55 & 0.55 \\ \hline \text{Per 3} & 0.3 & 0.4 & 0.4 \\ \hline \end{array}, Z = \begin{array}{|c|c|c|c|} \hline & \text{Inc} & \text{Edu} & \text{Hel} \\ \hline \text{Per 1} & 0.8 & 0.8 & 0.8 \\ \hline \text{Per 2} & 0.4 & 0.3 & 0.3 \\ \hline \text{Per 3} & 0.3 & 0.4 & 0.4 \\ \hline \end{array}$$

- (a) Calculate the well-being index from X, Y and Z using  $W_A$ ,  $W_H$ ,  $W_F$  for  $\alpha = -2$ , and  $W_S$  for  $\alpha = -2$ ,  $\beta = 0.5$ . (FYI - All measures for X has already been calculated in the class.)
- (b) For which measures, the over well-being between X and Y, and X and Z differ?

### 2. Reconsider the following matrix:

$$X = \begin{array}{|c|c|c|c|} \hline & \text{Inc} & \text{Edu} & \text{Hel} \\ \hline \text{Per 1} & 0.8 & 0.8 & 0.3 \\ \hline \text{Per 2} & 0.4 & 0.3 & 0.8 \\ \hline \text{Per 3} & 0.3 & 0.4 & 0.4 \\ \hline \end{array}$$

- (a) Assume that the value of  $\beta$  is fixed at 0.9. Calculate the Bourguignon inequality index for  $\alpha = 0.1, 0.6$ , and 0.85. Is the inequality increasing with  $\alpha$  or decreasing with  $\alpha$ ?

### 3. Computer-Based Problem (using STATA).

Import the dataset "**Achievement1.csv**" into STATA. To import the dataset, go to 'File → Import → ASCII dataset created by spreadsheet' and select the dataset.

There are achievement levels of 100 households for three dimensions - income (\$), health (BMI), and education (Literacy Rate). Generate a variable **logincome** by taking logarithm of income.

First, normalize the achievements with respect to the following lower and upper limits (as it is done for the HDI).

Dimensions	Lower	Upper
Income	1.5	4.7
Health	16	25
Education	0	1

Check the mean and standard deviation of each dimension across households. Calculate the correlation among the dimensions. (use the command `corr(var1, var2, var3)`).

Calculate the  $W_A$ , the  $W_F$  with  $\alpha = -2$ , and  $W$  with  $\alpha = -2$  and  $\beta = 0.5$  using the dataset. ('egen' might be a helpful command. Type 'help egen' in STATA command window or look at the handout distributed)

**Repeat** the exercise for the second dataset "**Achievement2.csv**". What difference did you have from the earlier results.