


```
. imdp_uhi w_1 w_2 w_3, pl1(7) pl2(7) pl3(7)
```

M.D. Poverty index : Union headcount index

| | Estimate | STE | LB | UB |
|-------------------|--------------|--------------|---------------|--------------|
| Population | 0.333 | 0.211 | -0.091 | 0.758 |

```
. // Q2
. gen poor_inter = (w_1<14) & (w_2<14) & (w_3<14)
. mean poor_inter
```

Mean estimation Number of obs = 6

| | Mean | Std. Err. | [95% Conf. Interval] | |
|------------|-----------------|-----------------|----------------------|----------------|
| poor_inter | .1666667 | .1666667 | -.2617636 | .595097 |

```
. imdp_ihi w_1 w_2 w_3, pl1(7) pl2(7) pl3(7)
```

M.D. Poverty index : Intersection headcount index

| | Estimate | STE | LB | UB |
|-------------------|--------------|--------------|--------------|--------------|
| Population | 0.000 | 0.000 | 0.000 | 0.000 |

```
.
. // Q3
. /*
> The intersection headcount index is more sensitive, since we count only those with fu
> ll multiple deprivations.
> */
.
. // Q4
.
. gen dep_1 = (w_1<14)
. gen dep_2 = (w_2<14)
. gen dep_3 = (w_3<14)
. egen sum_dep = rowtotal(dep_*)
. gen af_poor = (sum_dep>=2)
. gen w_af_poor = (sum_dep /3)* af_poor
```

```
Mean estimation      Number of obs      =           6
```

| | Mean | Std. Err. | [95% Conf. Interval] | |
|-----------|----------|-----------|----------------------|----------|
| af_poor | .5 | .2236068 | -.0747996 | 1.0748 |
| w_af_poor | .3888889 | .1808758 | -.0760671 | .8538449 |

```
.
.
. // Q5
. imdp_afi w_1 w_2 w_3, dcut(2) w1(1) p11(7) w2(1) p12(7) w3(1) p13(7)
```

Alkire and Foster (2007) MDP indices

| | | | | | |
|---|------------|------------|-------|-------|-------|
| > | | | | | |
| > | Group | Pop. share | H0 | M0 | M1 |
| > | M2 | | | | |
| > | | | | | |
| > | | | | | |
| > | Population | 1.000 | 0.000 | 0.000 | 0.000 |
| > | 0.000 | | | | |
| > | | 0.000 | 0.000 | 0.000 | 0.000 |
| > | 0.000 | | | | |
| > | | | | | |
| > | | | | | |

The relative contribution of dimensions to the Alkire and Foster (2007) MDP indices estimated at population level (results in %).

| Dimensions | M0 | M1 | M2 |
|------------|------|------|------|
| w_1 | 0.00 | 0.00 | 0.00 |
| w_2 | 0.00 | 0.00 | 0.00 |
| w_3 | 0.00 | 0.00 | 0.00 |

•
•
• // Q6
•

```

. gen poor_union_targ1 = (w_1+4<14) | (w_2<14) | (w_3<14)
. gen poor_union_targ2 = (w_1<14) | (w_2+4<14) | (w_3<14)
. gen poor_union_targ3 = (w_1<14) | (w_2<14) | (w_3+4<14)
.
. gen poor_inter_targ1 = (w_1+4<14) & (w_2<14) & (w_3<14)
. gen poor_inter_targ2 = (w_1<14) & (w_2+4<14) & (w_3<14)
. gen poor_inter_targ3 = (w_1<14) & (w_2<14) & (w_3+4<14)
.
. mean poor_union*

```

Mean estimation Number of obs = 6

| | Mean | Std. Err. | [95% Conf. Interval] | |
|------------------|-----------------|-----------------|----------------------|-----------------|
| poor_union | .8333333 | .1666667 | .404903 | 1.261764 |
| poor_union_targ1 | .8333333 | .1666667 | .404903 | 1.261764 |
| poor_union_targ2 | .8333333 | .1666667 | .404903 | 1.261764 |
| poor_union_targ3 | .6666667 | .2108185 | .1247404 | 1.208593 |

```

. mean poor_inter*

```

Mean estimation Number of obs = 6

| | Mean | Std. Err. | [95% Conf. Interval] | |
|------------------|-----------------|-----------------|----------------------|----------------|
| poor_inter | .1666667 | .1666667 | -.2617636 | .595097 |
| poor_inter_targ1 | .1666667 | .1666667 | -.2617636 | .595097 |
| poor_inter_targ2 | 0 | (omitted) | | |
| poor_inter_targ3 | .1666667 | .1666667 | -.2617636 | .595097 |

```

.
. /* With the union approach, we focus in less deprived individuals (the case of indiv
> idual number 6, the is only deprived in dimension 3) */
. /* With the intersection approach, we focus in we focus in most deprived individuals
> (the case of individual number 3, and we target the dimension 2) */
.
.
. // EXERCICE 2
.
. // Q1
.

```

```
. clear

. input w_1 w_2 w_3

      w_1      w_2      w_3
1.  4      20      12
2.  8      12       0
3. 16      16      24
4. 12      12      16
5. 28      20       8
6. 24      16      12
7. end

.
. cap drop ngap*

. gen ngap1 = (7-w_1)/7*(7>w_1)
. gen ngap2 = (7-w_2)/7*(7>w_2)
. gen ngap3 = (7-w_3)/7*(7>w_3)

. gen pi = ( (1/3)*ngap1^1 + (1/3)*ngap2^1 + (1/3)*ngap3^1 )^(1/1)

. if ngap1==0 & ngap2==0 & ngap3==0 replace pi=0

. qui sum pi

. scalar BC_0 = `r(mean)''

. dis "The B&C index = " %6.3f BC_0
The B&C index = 0.079

.
.
. // Q2
. imdp_bci w_1 w_2 w_3, alpha(1) gamma(1) b1(0.3333333) p11(7) b2(0.3333333) p12(7) b3(
> 0.3333333) p13(7)

      M.D. Poverty index : Bourguignon and Chakravarty (2003)
```

| | Estimate | STE | LB | UB |
|-------------------|--------------|--------------|---------------|--------------|
| Population | 0.079 | 0.056 | -0.033 | 0.192 |

```
.
. // Q3
. gen nw_1 = (w_1+ w_2+w_3)/3
. gen nw_2 = (w_1+ w_2+w_3)/3
```

```
. gen nw_3 = (w_1+ w_2+w_3)/3

. imdp_bci nw_1 nw_2 nw_3, alpha(1) gamma(1) b1(0.3333333) pl1(7) b2(0.3333333) pl2(7)
> b3(0.3333333) pl3(7)
```

M.D. Poverty index : Bourguignon and Chakravarty (2003)

| | Estimate | STE | LB | UB |
|-------------------|--------------|--------------|---------------|--------------|
| Population | 0.008 | 0.008 | -0.008 | 0.024 |

```
. /*
> The BC index decreases because the expenditure share of each dimension of each indiv
> idual (1/3)
> matches with the normative imposed expenditure shares (the parameter beta = 1/3).
> Thus, the generated utility is high and gap is low.
> */
.
. // Q4
. gen b1=w_1/(w_1+w_2+w_3)

. gen b2=w_2/(w_1+w_2+w_3)

. gen b3=w_3/(w_1+w_2+w_3)

.
. replace pi = ( b1*ngap1^1 + b2*ngap2^1 + b3*ngap3^1 )^(1/1)
(2 real changes made)

. qui sum pi

. scalar BC_0 = `r(mean)''

. dis "The B&C index = " %6.3f BC_0
The B&C index = 0.008

. /*
> The BC index decreases because now the beta parameters of each individual matches wi
> th their observed expenditure shares
> and this optimizes the utility.
> */
.
.
end of do-file

. use "C:\Users\lutib\Dropbox\PEP_distance_Poverty Course (Exercises)\2019\weeks_semain
> es 10-11\versions\Canada_Incomes&Taxes_1996_2005_random_sample_3.dta", clear
(Enquete sur la dynamique du travail et du revenu, 1996: FAMILLES ECONOMIQUES (FE))

. do "C:\Users\lutib\AppData\Local\Temp\STD130c_000000.tmp"
```

```

. // EXERCICE 3
.
. // Q1
.
end of do-file

. do "C:\Users\lutib\AppData\Local\Temp\STD130c_000000.tmp"

. preserve

. keep if year==2005
(91,664 observations deleted)

. #delimit ;
delimiter now ;
. cnpe T B N, xvar(X) hsize(hhsize) type(dnp) min(1000) max(31000)
> title(Marginal rates of taxes and benefits)
> subtitle(Canada 2005)
> xtitle(Gross income)
> ytitle(Estimated marginal rates)
> ;

. #delimit cr
delimiter now cr
. restore

.
. // Q2
. preserve

. keep if year==1999
(90,765 observations deleted)

```

```

. digini X N, hs(hhsize)

```

| Index | Estimate | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-----------|-----------|-----------|----------|--------|----------------------|-----------|
| GINI_Dis1 | .4408765 | .0054663 | 80.6535 | 0.0000 | .4301613 | .4515917 |
| GINI_Dis2 | .3329367 | .0044062 | 75.561 | 0.0000 | .3242996 | .3415738 |
| diff. | -.1079398 | .003527 | -30.6039 | 0.0000 | -.1148535 | -.1010261 |

```

. restore

.
. preserve

. keep if year==2002
(91,116 observations deleted)

. digini X N, hs(hhsize)

```

| Index | Estimate | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-----------|-----------|-----------|----------|--------|----------------------|-----------|
| GINI_Dis1 | .4522923 | .0055367 | 81.6899 | 0.0000 | .4414391 | .4631455 |
| GINI_Dis2 | .3445672 | .0045788 | 75.2527 | 0.0000 | .3355917 | .3535427 |
| diff. | -.1077251 | .0035825 | -30.0698 | 0.0000 | -.1147476 | -.1007026 |

```

. restore

.
. preserve

. keep if year==2005
(91,664 observations deleted)

. digini X N, hs(hhsize)

```

| Index | Estimate | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-----------|-----------|-----------|----------|--------|----------------------|-----------|
| GINI_Dis1 | .439986 | .0052274 | 84.1692 | 0.0000 | .429739 | .450233 |
| GINI_Dis2 | .3359711 | .0047152 | 71.2528 | 0.0000 | .3267281 | .3452141 |
| diff. | -.1040149 | .0035911 | -28.9646 | 0.0000 | -.1110543 | -.0969755 |

```

. restore

.
. // Q3
. iprog T, ginc(X) hsize(hhsize) gobs(year) type(t) index(ka)

      Index                : Kakwani progressivity index
      Gross income variable : X
      Household size        : hhsize
      Sampling weight       : sweight
      gobs variable         : year

```

| gobs | Estimate | STE | LB | UB |
|------|----------|----------|----------|----------|
| 1993 | 0.067648 | 0.003749 | 0.060300 | 0.074996 |
| 1994 | 0.073560 | 0.004038 | 0.065645 | 0.081476 |
| 1996 | 0.101285 | 0.004609 | 0.092250 | 0.110320 |
| 1997 | 0.086321 | 0.006556 | 0.073470 | 0.099171 |
| 1998 | 0.102671 | 0.004524 | 0.093804 | 0.111539 |
| 1999 | 0.111415 | 0.003578 | 0.104401 | 0.118429 |
| 2000 | 0.106796 | 0.003699 | 0.099546 | 0.114046 |
| 2002 | 0.111500 | 0.004233 | 0.103202 | 0.119798 |
| 2003 | 0.112625 | 0.003303 | 0.106150 | 0.119099 |
| 2004 | 0.110759 | 0.003881 | 0.103152 | 0.118366 |
| 2005 | 0.115607 | 0.003546 | 0.108657 | 0.122558 |

```

.
. // Q4
. preserve

. keep if year==2005
(91,664 observations deleted)

```



```

. cprog T, rank(X) hsize(X) type(t) appr(tr)
(8,336 real changes made)
(7,783 real changes made)

. restore

.
. // Q5
. preserve

. keep if year==2005
(91,664 observations deleted)

. iprog T, ginc(X) hsize(hhsize) gobs(province) type(t) index(ka)

```

```

      Index                : Kakwani progressivity index
      Gross income variable : X
      Household size       : hhsize
      Sampling weight      : sweight
      gobs variable        : province

```

| > _____ | | gobs | Estimate | STE | LB | |
|----------------------|--|------|----------|----------|----------|----|
| > UB | | | | | | |
| > _____ | | | | | | |
| Newfoundland | | | 0.080721 | 0.011745 | 0.057617 | 0. |
| > 103824 | | | | | | |
| Prince_Edward_Island | | | 0.084045 | 0.009817 | 0.064704 | 0. |
| > 103386 | | | | | | |
| Nova_Scotia | | | 0.105204 | 0.011450 | 0.082707 | 0. |
| > 127702 | | | | | | |
| New_Brunswick | | | 0.097575 | 0.010682 | 0.076588 | 0. |
| > 118563 | | | | | | |
| Quebec | | | 0.123007 | 0.007267 | 0.108754 | 0. |
| > 137260 | | | | | | |
| Ontario | | | 0.113571 | 0.006214 | 0.101386 | 0. |
| > 125755 | | | | | | |
| Manitoba | | | 0.100702 | 0.009570 | 0.081904 | 0. |
| > 119499 | | | | | | |
| Saskatchewan | | | 0.094838 | 0.006093 | 0.082874 | 0. |
| > 106803 | | | | | | |
| Alberta | | | 0.130815 | 0.007674 | 0.115753 | 0. |
| > 145877 | | | | | | |
| British_Columbia | | | 0.126228 | 0.010334 | 0.105942 | 0. |
| > 146515 | | | | | | |

```

> _____

. igini X, hs(hhsize) hg(province)

```

```

      Index      : Gini index
      Household size : hhsize
      Sampling weight : sweight
      Group variable : province

```

| > _____ | | Group | Estimate | STE | LB | |
|-------------------------|--|-------|----------|----------|----------|--|
| > UB | | | | | | |
| > _____ | | | | | | |
| 1: Newfoundland | | | 0.490275 | 0.020733 | 0.449633 | |
| > 0.530917 | | | | | | |
| 2: Prince_Edward_Island | | | 0.421796 | 0.020863 | 0.380899 | |

| | | | | |
|--|------------|----------|----------|----------|
| > | 0.462693 | | | |
| 3: Nova_Scotia | | 0.423137 | 0.018260 | 0.387342 |
| > | 0.458931 | | | |
| 4: New_Brunswick | | 0.463801 | 0.015796 | 0.432837 |
| > | 0.494765 | | | |
| 5: Quebec | | 0.449668 | 0.010670 | 0.428752 |
| > | 0.470584 | | | |
| 6: Ontario | | 0.430211 | 0.009545 | 0.411501 |
| > | 0.448921 | | | |
| 7: Manitoba | | 0.405863 | 0.017405 | 0.371745 |
| > | 0.439980 | | | |
| 8: Saskatchewan | | 0.452759 | 0.013695 | 0.425914 |
| > | 0.479604 | | | |
| 9: Alberta | | 0.436993 | 0.013981 | 0.409587 |
| > | 0.464399 | | | |
| 10: British_Columbia | | 0.430104 | 0.013511 | 0.403619 |
| > | 0.456588 | | | |
| <hr/> | | | | |
| > | Population | 0.439986 | 0.005227 | 0.429739 |
| > | 0.450233 | | | |
| <hr/> | | | | |
| > | | | | |
| <hr/> | | | | |
| . restore | | | | |
| . | | | | |
| . /* | | | | |
| > The highest inequality in Gross incomes in 2005 was in Newfoundland. | | | | |
| > The highest progressivity in Taxes in 2005 was in British_Columbia. | | | | |
| > */ | | | | |
| . | | | | |
| . | | | | |
| end of do-file | | | | |
| . | | | | |