



```
. 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
<b>Population</b>	<b>0.833</b>	<b>0.167</b>	<b>0.497</b>	<b>1.169</b>

```
. // Q2
. gen poor_inter = (w_1<7) & (w_2<7) & (w_3<7)
. mean poor_inter
```

Mean estimation                      Number of obs    =                      6

	Mean	Std. Err.	[95% Conf. Interval]	
poor_inter	<b>.1666667</b>	<b>.1666667</b>	<b>-.2617636</b>	<b>.595097</b>

```
. 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
<b>Population</b>	<b>0.167</b>	<b>0.167</b>	<b>-0.169</b>	<b>0.503</b>

```
.
. // Q3
. /*
> The intersection headcount index is more sensitive, since we count only those with fu
> ll multiple deprivations.
> */
.
. // Q4
.
. gen dep_1 = (w_1<7)
. gen dep_2 = (w_2<7)
. gen dep_3 = (w_3<7)
. 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 M2	Pop. share	H0	M0	M1
	Population 0.099	1.000	0.500	0.389	0.151
	0.067	0.000	0.224	0.181	0.087

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	<b>42.86</b> 5.48	<b>47.37</b> 17.81	<b>40.23</b> 26.07
w_2	<b>28.57</b> 11.40	<b>10.53</b> 5.90	<b>2.30</b> 1.49
w_3	<b>28.57</b> 11.40	<b>42.11</b> 16.96	<b>57.47</b> 25.91

•  
•  
• // Q6  
•

```

. gen poor_union_targ1 = (w_1+2<7) | (w_2<7) | (w_3<7)
. gen poor_union_targ2 = (w_1<7) | (w_2+2<7) | (w_3<7)
. gen poor_union_targ3 = (w_1<7) | (w_2<7) | (w_3+2<7)
.
. gen poor_inter_targ1 = (w_1+2<7) & (w_2<7) & (w_3<7)
. gen poor_inter_targ2 = (w_1<7) & (w_2+2<7) & (w_3<7)
. gen poor_inter_targ3 = (w_1<7) & (w_2<7) & (w_3+2<7)
.
. mean poor_union*

```

Mean estimation                      Number of obs    =                      6

	Mean	Std. Err.	[95% Conf. Interval]	
poor_union	<b>.8333333</b>	<b>.1666667</b>	<b>.404903</b>	<b>1.261764</b>
poor_union_targ1	<b>.8333333</b>	<b>.1666667</b>	<b>.404903</b>	<b>1.261764</b>
poor_union_targ2	<b>.8333333</b>	<b>.1666667</b>	<b>.404903</b>	<b>1.261764</b>
poor_union_targ3	<b>.6666667</b>	<b>.2108185</b>	<b>.1247404</b>	<b>1.208593</b>

```

. mean poor_inter*

```

Mean estimation                      Number of obs    =                      6

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

```

.
. /* 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.  2    10     6
2.  4     6     0
3.  8     8    12
4.  6     6     8
5. 14    10     4
6. 12     8     6
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 = 0.183

.
.
. // 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
<b>Population</b>	<b>0.183</b>	<b>0.079</b>	<b>0.023</b>	<b>0.342</b>

```

.
. // 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
<b>Population</b>	<b>0.119</b>	<b>0.084</b>	<b>-0.050</b>	<b>0.288</b>

```
. /*
> 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)
(5 real changes made)

. qui sum pi

. scalar BC_0 = `r(mean)''

. dis "The B&C index = " %6.3f BC_0
The B&C index = 0.094

. /*
> 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

. do "C:\Users\lutib\AppData\Local\Temp\STD2dd8_000000.tmp"

. // EXERCICE 3
.
. // Q1
.
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_2.dta", clear
(Enquete sur la dynamique du travail et du revenu, 1996: FAMILLES ECONOMIQUES (FE))

. do "C:\Users\lutib\AppData\Local\Temp\STD2dd8_000000.tmp"

. preserve

. keep if year==2005
(91,629 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
(90,975 observations deleted)

. digini X N, hs(hhsize)

```

Index	Estimate	Std. Err.	t	P> t	[95% Conf. Interval]	
GINI_Dis1	<b>.4526402</b>	<b>.0058429</b>	<b>77.4684</b>	<b>0.0000</b>	<b>.4411868</b>	<b>.4640936</b>
GINI_Dis2	<b>.3369835</b>	<b>.004458</b>	<b>75.5907</b>	<b>0.0000</b>	<b>.3282448</b>	<b>.3457222</b>
diff.	<b>-.1156568</b>	<b>.0036534</b>	<b>-31.6573</b>	<b>0.0000</b>	<b>-.1228183</b>	<b>-.1084953</b>

```

. restore

.
. preserve

. keep if year==2002
(91,198 observations deleted)

. digini X N, hs(hhsize)

```

Index	Estimate	Std. Err.	t	P> t	[95% Conf. Interval]	
GINI_Dis1	<b>.4438926</b>	<b>.0062677</b>	<b>70.8222</b>	<b>0.0000</b>	<b>.4316064</b>	<b>.4561788</b>
GINI_Dis2	<b>.3412446</b>	<b>.0061853</b>	<b>55.1703</b>	<b>0.0000</b>	<b>.32912</b>	<b>.3533692</b>
diff.	<b>-.102648</b>	<b>.0041571</b>	<b>-24.6922</b>	<b>0.0000</b>	<b>-.1107969</b>	<b>-.0944991</b>

```

. restore

.
. preserve

. keep if year==2005
(91,629 observations deleted)

. digini X N, hs(hhsize)

```

Index	Estimate	Std. Err.	t	P> t	[95% Conf. Interval]	
GINI_Dis1	.4497718	.0055075	81.6653	0.0000	.4389757	.4605679
GINI_Dis2	.3537501	.0056024	63.1426	0.0000	.342768	.3647322
diff.	-.0960217	.0037898	-25.3369	0.0000	-.1034506	-.0885928

```

. 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	0.061372	0.003533	0.054447	0.068297
1994	0.075898	0.003858	0.068335	0.083462
1996	0.095611	0.003406	0.088934	0.102287
1997	0.089836	0.005535	0.078985	0.100687
1998	0.101021	0.004634	0.091938	0.110104
1999	0.115967	0.004124	0.107883	0.124051
2000	0.105970	0.003623	0.098869	0.113071
2002	0.111361	0.005013	0.101536	0.121187
2003	0.111909	0.003289	0.105462	0.118356
2004	0.113497	0.003507	0.106623	0.120371
2005	0.124771	0.003457	0.117994	0.131548

```

.
. // Q4
. preserve

. keep if year==2005
(91,629 observations deleted)

```



```

. cprog T, rank(X) hsize(X) type(t) appr(tr)
(8,371 real changes made)
(7,831 real changes made)

. restore

.
. // Q5
. preserve

. keep if year==2005
(91,629 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			0.102952	0.008571	0.086095
> 119809					
Prince_Edward_Island			0.087415	0.011291	0.065166
> 109663					
Nova_Scotia			0.105938	0.008141	0.089945
> 121931					
New_Brunswick			0.102859	0.009680	0.083838
> 121880					
Quebec			0.130415	0.006498	0.117668
> 143161					
Ontario			0.128550	0.006008	0.116769
> 140331					
Manitoba			0.104015	0.010400	0.083589
> 124441					
Saskatchewan			0.103237	0.007024	0.089444
> 117030					
Alberta			0.127118	0.008994	0.109463
> 144772					
British_Columbia			0.145633	0.008678	0.128598
> 162669					

```

> _____

. 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			0.475471	0.018922	0.438379
> 0.512563					
2: Prince_Edward_Island			0.424665	0.023374	0.378847

>	0.470484			
3: Nova_Scotia		0.452575	0.015920	0.421368
>	0.483782			
4: New_Brunswick		0.455956	0.016077	0.424441
>	0.487470			
5: Quebec		0.438884	0.010564	0.418176
>	0.459591			
6: Ontario		0.450969	0.009944	0.431477
>	0.470461			
7: Manitoba		0.398881	0.014726	0.370014
>	0.427748			
8: Saskatchewan		0.449735	0.014310	0.421684
>	0.477787			
9: Alberta		0.440282	0.015486	0.409927
>	0.470638			
10: British_Columbia		0.439922	0.013535	0.413389
>	0.466455			
<hr/>				
>	_____			
Population		0.449772	0.005507	0.438976
>	0.460568			
<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				
.				