Spillover, population group targeting and bi-dimensional poverty

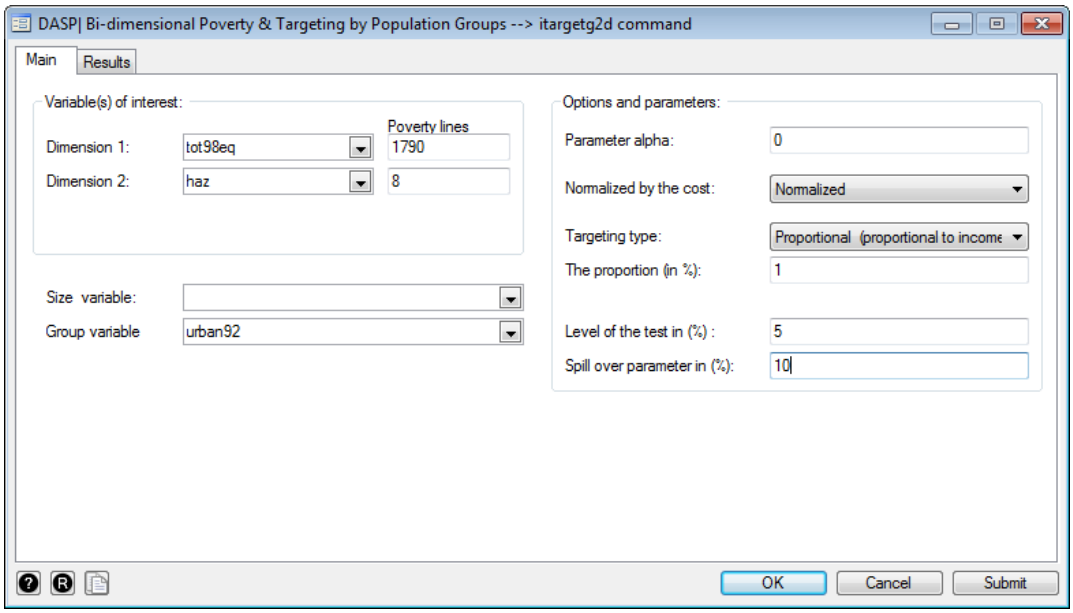
The Stata module *itargetg2d*

The *itargetg2d* Stata module is designed to estimate the optimal group targeting for the reduction of bi-dimensional poverty, by considering the joint distribution of deprivations. Starting from the Duclos, Sahn and Younger (2006) multidimensional poverty index, Duclos, Tiberti and Araar (2018) formally derive efficient targeting rules in a normative multidimensional poverty setting. Following Duclos, Tiberti and Araar (2018), the module considers three channels through which targeting may affect multidimensional poverty: (1) through a direct effect on the targeted dimension, (2) through an indirect effect on the level of joint deprivation, and (3) through a spill-over effect on the other dimensions. The user can estimate the impact on poverty of a lump-sum or a proportional transfer. Also, the user can indicate the spill-over parameter and can normalise the estimated poverty reduction by the cost of the transfer to enable the comparison of the effects across different population groups.

References:

- Duclos, J.-Y., Tiberti, L. & Araar, A. (2018). "Multidimensional Poverty Targeting," *Economic Development and Cultural Change*, forthcoming (en earlier version has been published as Cahier de recherche 1339, CIRPEE).
  Duclos, J. Y., Sahn, D. E., & Younger, S. D. (2006). "Robust multidimensional poverty comparisons". *The Economic journal*, 116(514), 943-968.

As shown in Duclos, Tiberti and Araar (2018), the total effect can be decomposed into different components. The module *itargetg2d* enables to estimate the different components. In addition, an ordinal rank of groups is provided according to the statistical significance of the difference between the group-impacts. The *itargetg2d* module comes with a dialog box as well as a Stata help file.



Example: *It is strongly recommended to consult the Duclos et al. (2018) paper to be more familiarised with the different results.*

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. itargetg2d tot98eq haz, alpha(0) pline1(1790) pline2(8) hgroup(urban92) constam(1) slevel(5) so(10) cnor(yes)

  Targeting population groups and poverty
  Targeting  groups   :  Groups => urban92
  Targeting  scheme   :  Lump-sum (constant)
  Normalized by cost  :  yes
  Parameter alpha     :  0.00
  Parameter Spill-Over:  0.10
  Poverty line 1        : 1790.00
  Poverty line 2        :  8.00
```

Group	Population Share	Mutiplicative index	Impact on Population
Urban	0.152868554	0.223277912	-0.019382950
	0.009406213	0.036942225	0.002444076
Rural	0.847131431	0.517788231	-0.007419763
	0.009406213	0.015651515	0.000738313
Population	1.000000000	0.472766876	-0.009244086
	0.000000000	0.014501242	0.000705459

Impact Based on the component -alpha/z* [P1(alpha-1)]

Rank	Code	Label	Estimated Impact	Standard Error	Test of difference Signif. = 5%
1	0	Rural	-0.000378868	0.000028092	0<-
2	1	Urban	-0.000355837	0.000038113	1<-

Impact Based on the component -alpha/z* [P1(alpha-1)*P2(alpha)]

Rank	Code	Label	Estimated Impact	Standard Error	Test of difference Signif. = 5%
1	0	Rural	-0.000240670	0.000017409	0<-:1
2	1	Urban	-0.000159746	0.000022289	1<-

Total impact without spill-over : -alpha/z* [P1(alpha-1)P2(alpha) + Cov(.)]

Rank	Code	Label	Estimated Impact	Standard Error	Test of difference Signif. = 5%
1	1	Urban	-0.000171177	0.000025403	1<-
2	0	Rural	-0.000170849	0.000018108	0<-

Total impact with spill-over

Rank	Code	Label	Estimated Impact	Standard Error	Test of difference Signif. = 5%
1	1	Urban	-0.019382950	0.002444076	1<-:0
2	0	Rural	-0.007419763	0.000738313	0<-

In the example above, we have a monetary (proxied by the per-capita expenditure) and a health (proxied by the height-for-age z-scores) dimension; also, using the Vietnam Living Standard Survey 1998, we estimate the optimal targeting of a lump-sum transfer of 1$ when we consider two groups (urban and rural areas). The multiplicative poverty index is estimated for $\alpha = 0$. The first panel of results provides the final results and it shows that, per dollar spent, it is better to prioritize urban areas. In the second table, we focus only on the monetary dimension and we find that, although the unidimensional poverty reduction is larger when rural areas are targeted, the results

are not statistically significant. When we also consider the health indicator (see the third panel), rural areas should be statistically preferred. Once the joint deprivation is considered, differently from the previous tables, a larger impact – though not statistically significant – is reached when urban areas are targeted. The reversal in the result is explained by the relatively high level of the density around the two poverty lines in urban areas with respect to rural areas. In other words, in urban areas, health poverty for those around the consumption poverty line is greater for people living in urban areas, i.e. the correlation between the monetary and health dimensions is larger. The spill over effect, which it is related to the post-impact of the monetary transfer on health, makes targeting urban areas statistically preferable to reduce faster our bi-dimensional poverty indicator in Vietnam. From this example we learned how the priority ranking for targeting can be affected when we move from a unidimensional to a multidimensional setting and about role played by each of the components included in the multidimensional indicator.