Generalized Lorenz curves and related graphs: an update for Stata 7

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Abstract.   The `glcurve` command is updated to a Stata 7 version, `glcurve7`, which is described and illustrated.

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Introduction

In Jenkins and Van Kerm (1999), we presented `glcurve`, a program to draw "generalized Lorenz curves and related graphs". The program works very much like the official programs `cumul` or `kdensity`: the program is fed with a single variable to be analyzed and returns a picture in the graph window and/or creates additional variables containing the coordinates of the requested graph. The (generalized) Lorenz curves produced by `glcurve` are of primary interest among economists involved in income distribution analyses.
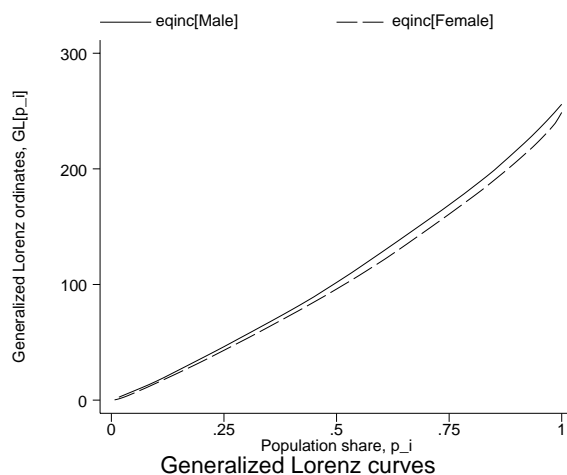

Figure 1: Generalized Lorenz curves for household incomes by head of household gender.
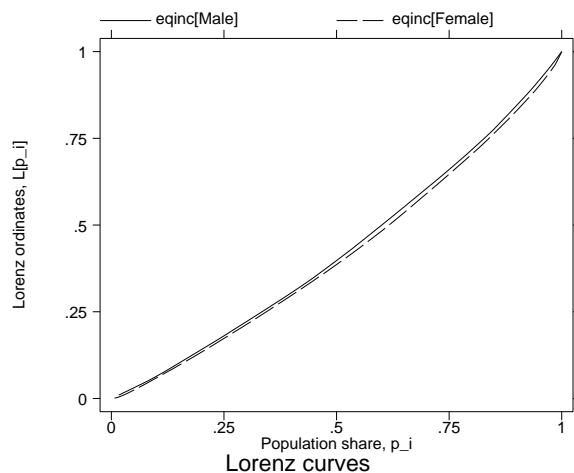
Figure 2: Comparing Lorenz curves for the two groups in Figure 1.
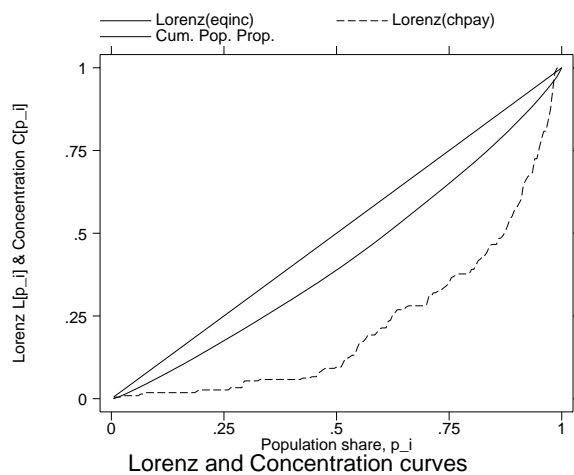

Figure 3: Lorenz and concentration curves for child benefits.
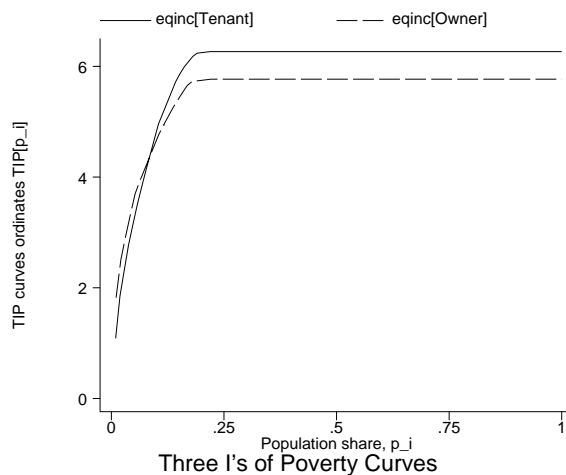
Figure 4: TIP curves of absolute poverty gaps for home owners and renters.
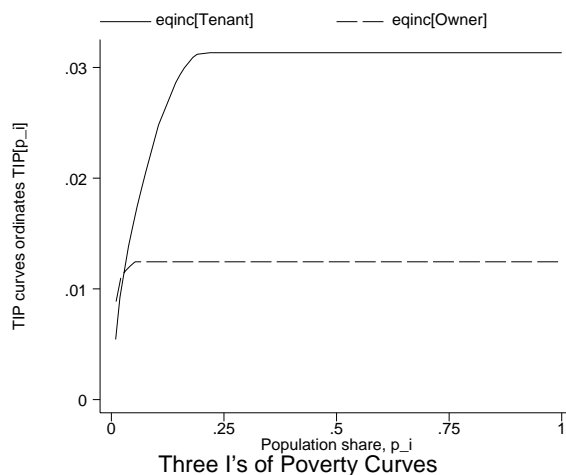
Figure 5: TIP curves of relative poverty gaps.

Using some of the new features of Stata 7.0, we have written an upgrade of the `glcurve` program: `glcurve7`. Changes to the program have been made in the following ways:

1. Most noticeably, three new options have been added to automate the drawing of conventional Lorenz and concentration curves, as well as the Three I's of Poverty (TIP) curves; see Lambert (1993) and Jenkins and Lambert (1997).

2. By default, the program with the `by()` and `split` options, now produces dotted lines to distinguish subgroup curves. Furthermore, since the 8 characters variable

name length constraint is now lifted, if `glvar`(*glvarname*) is also specified, the created variable names are not truncated anymore after the first four characters of *glvarname*.

We have updated `glcurve` after the shipping of Stata 7.0, and the program now contains a `version 7.0` statement. As a consequence, `glcurve7` will not work with earlier Stata releases. If you use Stata versions 5.0 or 6.0, please continue to use `glcurve`.

Full syntax

`glcurve7` *varname* [*weight*] [`if` *exp*] [`in` *range*] [, `pvar`(*pvarname*)
    `glvar`(*glvarname*) `sortvar`(*svarname*) `by`(*groupvar*) `split` `nograph` `replace`
    `lorenz` `rtip`(*string*) `atip`(*string*) *graph_options*]

`aweight`s and `fweight`s are allowed.

New options

`lorenz` requires that the coordinates of the Lorenz curve are computed instead of generalized Lorenz coordinates. Lorenz y-ordinates are the generalized Lorenz y-ordinates divided by the mean of *varname*, and are thus bounded by 0 and 1. This option used in conjunction with `sortvar`(*svarname*) produces the conventional concentration curves.

`atip`(*povline*) and `rtip`(*povline*) require that the coordinates of TIP curves are computed instead of generalized Lorenz coordinates. *povline* specifies the value of the poverty line: it can be either a numeric value taken as the poverty line for all observations, or an existing variable name containing the value of individual specific poverty lines. `atip`(*povline*) draws "absolute" TIP curves (by cumulating `max`(*povline-varname*,0)), and `atip`(*povline*) draws "relative" TIP curves (by cumulating `max(1-`(*varname/povline*)`,0)`).

Examples

To illustrate the new options of `glcurve7`, let us reproduce the examples presented in Jenkins and Van Kerm (1999). We use the dataset `subcvse.dta` (extracted from a Belgian survey on low income households, the CVSEW; see the `notes` of `subcvse.dta`) provided in our initial STB insert. The dataset contains four variables: a (single adult equivalent) household income measure (`eqinc`), an indicator of the sex of the household head (`headfem`), an indicator of the home tenancy status of the household (`owner`), and the amount of child benefits received by the household (`chpay`).

Figure 1 in Jenkins and Van Kerm (1999) draws the Generalized Lorenz curves of income separately for female-headed households and male-headed households. This can now be obtained with a single line of command without recourse to Stage (now obsolete). Figure 1 is obtained by typing

```
. glcurve7 eqinc , by(headfem) split xlabel(0,0.25,0.50,0.75,1) ylabel
>l2title("Generalized Lorenz ordinates, GL[p_i]") b2title("Population share, p_i")
>title("Generalized Lorenz curves")
```

In our previous insert, we also showed how to use glcurve to draw and compare Lorenz curves instead of generalized Lorenz curves. This required a first step of variable preparation, which is now obsolete thanks to the addition of the lorenz option. Figure 2 in the previous insert can be obtained with

```
. glcurve7 eqinc , by(headfem) split lorenz
>xlabel(0,0.25,0.50,0.75,1) ylabel(0,0.25,0.50,0.75,1) border
>l2title("Lorenz ordinates, L[p_i]")
>l2title("Population share, p_i") title("Lorenz curves")
```

The sole missing feature of the new graph is the 45 degree line which corresponds to the Lorenz curve in case of an equally distributed income. To add this line one would need to save the Lorenz coordinates in new variables and draw the entire picture with the graph command:

```
. glcurve7 eqinc , by(headfem) split lorenz glvar(lorenzY) pvar(lorenzX) nograph
. graph lorenzY* lorenzX lorenzX , xlabel(0,0.25,0.50,0.75,1)
>ylabel(0,0.25,0.50,0.75,1) c(ll[-]l) s(iii)
>border l2title("Lorenz ordinates, L[p_i]") b2title("Population share, p_i")
>title("Lorenz curves")
```

By the same token, the concentration curves in Figure 3 have also become straightforward to draw:

```
. glcurve7 eqinc , lorenz nograph glvar(lorenzY) pvar(lorenzX) replace

. glcurve7 chpay , sortvar(eqinc) lorenz nograph glvar(concentrationY)

. graph lorenzY concentrationY lorenzX lorenzX ,
xlabel(0,0.25,0.50,0.75,1) ylabel(0,0.25,0.50,0.75,1) c(ll[-]l) s(iii) border
l2title("Lorenz L[p_i] & Concentration C[p_i]")
b2title("Population share, p_i")
title("Lorenz and Concentration curves")
```

Finally, the new options atip(*povline*) and rtip(*povline*) makes it very easy to draw TIP curves, as presented in Figures 4 and 5 in our previous insert. Figure 4 presents absolute TIP curves separately for two household types with a common poverty line of 200 monetary units:

```
. glcurve7 eqinc , by(owner) split atip(200)
>xlabel(0,0.25,0.50,0.75,1) ylabel l2title("TIP curves ordinates TIP[p_i]")
>b2title("Population share, p_i") title("Three I's of Poverty Curves")
```

Figure 5 presents relative TIP curves separately for two household types with distinct poverty lines for the different groups:

```
. gen povline = 170*(owner) + 200*(1-owner)
. glcurve7 eqinc , by(owner) split rtip(povline) xlabel(0,0.25,0.50,0.75,1)
  ylabel l2title("TIP curves ordinates TIP[p_i]")
  b2title("Population share, p_i") title("Three I's of Poverty Curves")
```

References

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About the Authors

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