Panel Data in gretl

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Basic commands in gretl

- `setobs`: to specify the data structure.
- `unitdum` y `timedum`: to create unit and time dummies
- the lag operator: (-1)
- estimation: `panel`

Inputting the data

- Panel data in `gretl` can be arranged in two ways:
  - Stacked time series: each block is a time series for one unit
  - Stacked cross sections: each block is a cross section for one period
- `gretl` stores panel data in the form of stacked time series
- when importing data, you need to tell `gretl` the structure of the data

Telling `gretl` the panel data structure

1. using index variables: `setobs unitvar timevar --panel-vars`
   - The data contain a variable for the units (for instance *state*) and another one for time (for instance *year*):
     `setobs state year --panel-vars`

2. using the structure of the block: `setobs freq 1:1 structure`
   - If each block is a time series for one unit:
     - `freq` is the number of periods
     - `structure` is `--stacked-time-series`
   - If each block is a cross section per period:
     - `freq` is the number of units
     - `structure` is `--stacked-cross-section`
   - Example: 48 states and 7 years per state:
     - as stacked time series (a block per state):
     `setobs 7 1:1 --stacked-time-series`
     - as stacked cross-sections (a block per year):
     `setobs 48 1:1 --stacked-cross-section`

Dummy variables of units and time

It is easy to create two types of dummy variables:

- for units: `genr unitdum`
  creates a set of dummies identifying the cross-sectional units:
  $du\_1, du\_2, ..., du\_N$.

- for periods: `genr timedum`
  creates a set of dummies identifying the periods:
  $dt\_1, dt\_2, ..., dt\_T$.

Differences

- With panel data we may want to construct first differences of some variables.
- We use the lag operator:

```
genr DX = X - X(-1)
```

- It creates a variable (DX) containing the variation in `X` if it is possible, and the missing value code otherwise.
- When we run a regression the program will automatically skip the missing observations.

Estimation

- First Differences estimator: we compute the variables in first differences and use `ols`.

- Fixed Effects or Within estimator: `panel depvar indepvars --robust --time-dummies`
  - it works like ols
  - it is possible to include time dummies with the option `--time-dummies`
  - it is possible to compute robust standard errors with the option `--robust`
  - Example:
    ```
    panel TM const ImpCerv --robust --time-dummies
    ```

  By default `gretl` uses the Fixed Effects or Within estimator, but you can add the option `--fixed-effects`.