plm : linear models for panel data

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plm is a package that implements the main estimators and tests used in econometrics for panel data.

Panel datas have an individual and a temporal dimension. plm provides specific functions for reading and applying special transformations to panel data sets, and for estimating and testing linear models.

**reading data** `pdata.frame` takes as main argument a `data.frame`. It returns a `data.frame` with further arguments useful for panel datas, such as the number of individuals and time observations.

**special functions** this includes ` plag` and `pdiff`, which computes lags and differences of series, `pmean` which computes the mean of a serie, conditionnal on the individual or the time index,

**estimation** plm is a general function which implements the main panel data estimators. The basic usage of plm consist of estimating four models :
- **pooling** the ordinary least squares estimator applied to raw observations,
- **within** the ols estimator applied to observations measured as deviations from individual (or time) means,
- **between** the ols estimator applied on individual (or time) means,
- **random** the random effect, a generalized least squares estimator which is a weighted average of the within and the between estimator.

plm returns by default an object of class plms, which is a list of the four models previously described, which are objects of class plm. plms and plm objects have `print` and `summary` methods. These estimators deals with one-way (individual or time) effects or two-ways and with unbalanced panel. Different instrumental variable estimators are also available (for example the **HAUSMAN** and **Taylor** estimator)

**tests** different tests of model specification are provided :
- **pFtest** a simple test for the presence of individual (or/and time) effects based on the comparison of the pooling and the within models,
- **plmtest** a set of likelihood ratio tests for the presence of individual (or/and time) effects based on the comparison of the random and the pooling model,
- **phausman** a hausman test for the correlation between explanatory variables and individual (or/and time) effects, based on the comparison of the within and the random models.

Further developments planed for plm include :

**system estimation** seemingly unrelated regression and three stage least squares estimators, using the `systemfit` package,

**robust covariance matrix** using the `sandwich` package,

**autoregressive models** ARRELANO and BOUND general method of moments estimator.

All the functions of plm have been tested using the examples provided in the book of B. Baltagi “Econometric analysis of panel data”. The data sets used in this book are provided in packages Ecdat and plm.