

# Package: pglm (via r-universe)

November 6, 2024

**Version** 1.0-0

**Date** 2023-12-02

**Title** Panel Generalized Linear Models

**Depends** R (>= 3.5.0), micsr

**Imports** statmod, Formula, plm, Rdpack

**Suggests** lmtest, car, knitr

**Description** Estimation of panel models for glm-like models: this includes binomial models (logit and probit), count models (poisson and negbin) and ordered models (logit and probit), as described in: Baltagi (2013) Econometric Analysis of Panel Data <doi:10.1007/978-3-030-53953-5> Hsiao (2014) Analysis of Panel Data <doi:10.1017/CBO9781139839327> and Croissant and Millo (2018), Panel Data Econometrics with R <doi:10.1002/9781119504641>.

**Encoding** UTF-8

**License** GPL (>=2)

**URL** <https://www.r-project.org/package=pglm>

**VignetteBuilder** knitr

**NeedsCompilation** yes

**RoxygenNote** 7.2.3

**Roxygen** list(markdown = TRUE)

**LazyData** true

**RdMacros** Rdpack

**Config/pak/sysreqs** libicu-dev

**Repository** <https://ycroissant.r-universe.dev>

**RemoteUrl** <https://github.com/ycroissant/pglm>

**RemoteRef** HEAD

**RemoteSha** 3638c930392d05dd27aa08c4db6ce08fcd6466dc

Contents

fairness . . . . .	2
health_ins . . . . .	3
hedonic . . . . .	4
patents_rd . . . . .	5
pglm . . . . .	5
union_wage . . . . .	7
<b>Index</b>	<b>9</b>

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fairness	<i>Perveived Fairness of rules for allocating seats in trains and parking spaces</i>
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Description

a pseudo-panel of 401 individuals from 2003

Format

a tibble containing:

- id: the individual index
- answer: a factor with levels 0 (very unfair), 1 (essentially unfair), 2 (essentially fair) and 3 (very fair)
- good: one of 'tgv' (French fast train) and 'Parking'
- rule: the allocation rule, a factor with levels 'peak', 'admin', 'lottery', 'addsupply', 'queuing', 'moral' and 'compensation'
- driving: does the individual has the driving license ?
- education: does the individual has a diploma ?
- recurring: does the allocation problem is reccuring ?

Source

provided by the authors

References

Raux C, Souche S, Croissant Y (2009). “How Fair Is Pricing Perceived to Be? An Empirical Study.” *Public Choice*, **139**(1/2), 227–240. ISSN 00485829, 15737101, <http://www.jstor.org/stable/40270755>.

health\_ins

*Health Insurance and Doctor Visits***Description**

a cross-section of 5908 individuals from 1974 to 1982

**Format**

a tibble containing:

- id: the individual index
- year: the year
- mdu: number of outpatient visits to an MD
- opu: number of outpatient visits to all providers
- coins: coinsurance rate (0, 25, 50 or 100 percent)
- idp: if individual deductible plan: 1, otherwise 0
- lpi: log of the max of 1 and annual participation incentive payment
- fmde: if idp = 1: 0 otherwise ln of the max of 1 and MDE / (0.01 coins)
- income: family income
- size: family size
- age: the age
- sex: a factor with level 'male' and 'female'
- child: a factor with levels 'no' and 'yes'
- race: a factor with levels 'white' and 'black'
- health: self-rated health, a factor with levels poor, fair, good and verygood
- educ: education of the household head in years
- physlim: if the person has a physical limitation: 1
- disease: index of chronic diseases

**Source**

<http://cameron.econ.ucdavis.edu/musbook/mus.html>

**References**

- Manning WG, Newhouse JP, Duan N, Keeler EB, Leibowitz A (1987). "Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment." *The American Economic Review*, **77**(3), 251–277. ISSN 00028282, <http://www.jstor.org/stable/1804094>.
- Deb P, Trivedi PK (2002). "The structure of demand for health care: latent class versus two-part models." *Journal of Health Economics*, **21**(4), 601–625. ISSN 0167-6296, doi:10.1016/S0167-6296(02)000085, <https://www.sciencedirect.com/science/article/pii/S0167629602000085>.

hedonic

*Hedonic Prices of Census Tracts in the Boston Area***Description**

a cross-section of 506 census tracts

**Format**

a tibble containing:

- mv: median value of owner-occupied homes
- crim: crime rate
- zn: proportion of 25,000 square feet residential lots
- indus: proportion of no-retail business acres
- chas: is the tract bounds the Charles River?
- nox: annual average nitrogen oxide concentration in parts per hundred million
- rm: average number of rooms
- age: proportion of owner units built prior to 1940
- dis: weighted distances to five employment centers in the Boston area
- rad: index of accessibility to radial highways
- tax: full value property tax rate (\$/\$10,000)
- ptratio: pupil/teacher ratio
- blacks: proportion of blacks in the population
- lstat: proportion of population that is lower status
- townid: town identifier

**Source**

Online complements to Baltagi (2013): <https://bcs.wiley.com/he-bcs/Books?action=resource&bcsId=4338&itemId=1118672321&resourceId=13452>

**References**

- Baltagi BH (2001). *Econometric analysis of panel data*. John Wiley and sons.
- Baltagi BH (2013). *Econometric analysis of panel data*. John Wiley and sons.
- Belsley DA, Kuh E, Welsch RE (1980). *Regression diagnostics: identifying influential data and sources of collinearity*. John Wiley.
- Harrison D, Rubinfeld DL (1978). "Hedonic housing prices and the demand for clean air." *Journal of Environmental Economics and Management*, **5**(1), 81-102. ISSN 0095-0696, doi:10.1016/0095-0696(78)900062, <https://www.sciencedirect.com/science/article/pii/0095069678900062>.

patents\_rd

*Dynamic Relation Between Patents and R&D***Description**

yearly observations of 346 production units

**Format**

a tibble containing:

- cusip: Compustat's identifying number for the firm
- year: year
- ardssic: a two-digit code for the applied R
- scisect: is the firm in the scientific sector ?
- capital72: book value of capital in 1972
- sumpat: the sum of patents applied for between 1972-1979
- rd: R and D spending during the year (in 1972 dollars)
- patents: the number of patents applied for during the year that were eventually granted

**Source**

<http://cameron.econ.ucdavis.edu/racd/racddata.html>, chapter 9.

**References**

Hall BH, Griliches Z, Hausman JA (1986). "Patents and R and D: Is There a Lag?" *International Economic Review*, **27**(2), 265–283. ISSN 00206598, 14682354, <http://www.jstor.org/stable/2526504>.

pglm

*Panel Estimators for Generalized Linear Models***Description**

Estimation by maximum likelihood of glm (binomial and Poisson) and 'glm-like' models (Negbin and ordered) on longitudinal data

**Usage**

```
pglm(
  formula,
  data,
  subset,
  na.action,
  effect = c("individual", "time", "twoways"),
  model = c("random", "pooling", "within", "between"),
  family,
  other = NULL,
  index = NULL,
  start = NULL,
  R = 20,
  method = c("bfgs", "newton"),
  trace = 0,
  ...
)

ordinal(link = c("probit", "logit"))

negbin(link = c("log"), vlink = c("nb1", "nb2"))
```

**Arguments**

<code>formula</code>	a symbolic description of the model to be estimated,
<code>data</code>	the data: a <code>pdata.frame</code> object or an ordinary <code>data.frame</code> ,
<code>subset</code>	an optional vector specifying a subset of observations,
<code>na.action</code>	a function which indicates what should happen when the data contains NAs,
<code>effect</code>	the effects introduced in the model, one of "individual", "time" or "twoways",
<code>model</code>	one of "pooling", "within", "between", "random",
<code>family</code>	the distribution to be used,
<code>other</code>	for developer's use only,
<code>index</code>	the index,
<code>start</code>	a vector of starting values,
<code>R</code>	the number of function evaluation for the gaussian quadrature method used,
<code>method</code>	the optimization method, one of "bfgs" (the default) and "newton"
<code>trace</code>	an integer
<code>...</code>	further arguments.
<code>link, vlink</code>	arguments of family functions

**Value**

An object of class "miscr", a list with elements:

**Author(s)**

Yves Croissant

**Examples**

```
## a binomial (probit) example
anb <- pglm(union ~ wage + exper + rural, union_wage, family = binomial('probit'),
            model = "pooling", method = "bfgs", trace = 3, R = 5)

## a gaussian example on unbalanced panel data
ra <- pglm(mv ~ crim + zn + indus + nox + age + rm, hedonic, family = gaussian,
            model = "random", trace = 3, method = "newton", index = "townid")

## some count data models
la <- pglm(patents ~ lag(log(rd), 0:5) + scisect + log(capital72) + factor(year), patents_rd,
            family = negbin, model = "within", trace = 3, method = "newton",
            index = c('cusip', 'year'))
la <- pglm(patents ~ lag(log(rd), 0:5) + scisect + log(capital72) + factor(year), patents_rd,
            family = poisson, model = "pooling", index = c("cusip", "year"),
            tracen = 0, method="newton")
```

union\_wage

*Unionism and wage rate determination***Description**

yearly observations of 545 individuals from 1980 to 1987

**Format**

a tibble containing:

- id: the individual index
- year: the year
- exper: the experience, computed as age - 6 - schooling
- health: does the individual has health disability ?
- hours: the number of hours worked
- married: is the individual married ?
- rural: does the individual lives in a rural area ?
- school: years of schooling
- union: does the wage is set by collective bargaining
- wage: hourly wage in US dollars
- sector: one of agricultural, mining, construction, trade, transportation, finance, businessrepair, personalservice, entertainment, manufacturing, pro.rel.service, pub.admin

- occ: one of proftech, manoffpro, sales, clerical, craftfor, operative, laborfarm, farmlabor, service
- com: one of black, hisp and other
- region: the region, one of NorthEast, NothernCentral, South and other

**Source**

Journal of Applied Econometrics Data Archive : <http://qed.econ.queensu.ca/jae/>

**References**

Vella F, Verbeek M (1998). "Whose Wages do Unions Raise? A Dynamic Model of Unionism and Wage Rate Determination for Young Men." *Journal of Applied Econometrics*, **13**(2), 163–183. ISSN 08837252, 10991255, <http://www.jstor.org/stable/223257>.



# Index

## \* **dataset**

- fairness, [2](#)
- health\_ins, [3](#)
- hedonic, [4](#)
- patents\_rd, [5](#)
- union\_wage, [7](#)

fairness, [2](#)

health\_ins, [3](#)

hedonic, [4](#)

negbin (pglm), [5](#)

ordinal (pglm), [5](#)

patents\_rd, [5](#)

pglm, [5](#)

union\_wage, [7](#)