

# FEEMProbit

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## R topics documented:

FEEMProbit . . . . .	<a href="#">1</a>
<b>Index</b>	<a href="#">3</a>

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FEEMProbit	<i>Estimate the individual fixed effects expectation-maximization probit model in Chen (2016)</i>
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## Description

Function to estimate the individual fixed effects expectation-maximization estimator in Chen (2016)

## Usage

```
FEEMProbit(formula, data, tol = 1e-9, show.progress = FALSE)
```

## Arguments

formula	A symbolic description of the model to be estimated.
data	A <code>pdata.frame</code> .
tol	Tolerance level to use for the EM algorithm. Lower tolerances increase computation time.
show.progress	If TRUE, print the norm between parameter vectors in between each iteration.

## Details

A `pdata.frame` from the package `plm` must be used. The fixed effects that will be estimated are the `id` variables in that `pdata.frame`. They do not need to be specified in the formula.

**Value**

call	The function call.
coefficients	The estimated coefficients.
fixed.effects	The estimated individual fixed effects.

**Examples**

```
library(data.table)
library(plm)
set.seed(1)
N <- 100
nT <- 50

df <- data.table(id = rep(1:N, each = nT),
                 t = rep(1:nT, N))

# Individual fixed effects:
alpha <- rnorm(N, sd = 0.2)
df[, alpha := rep(alpha, each = nT)]

# Explanatory variable:
df[, x := rnorm(N * nT, mean = -2, sd = 0.5)]

# Coefficient to be estimated:
beta <- 0.5

# Latent variable:
df[, ystar := x * beta + alpha + rnorm(N * nT)]

# Observed variable:
df[, y := as.numeric(ystar > 0)]

# Convert to pdata.frame:
df <- pdata.frame(df, index = c("id", "t"))

# Estimate the model:
FEEMProbit(y ~ x, data = df)
```

# Index

FEEMProbit, [1](#)