Package 'uqr'

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Type Package

Title Unconditional Quantile Regression

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Description Estimation and Inference for Unconditional Quantile Regression for cross-sectional and panel data (see Firpo et al. (2009) <DOI:10.3982/ECTA6822>).

License GPL (>= 2)

LazyData TRUE

Imports stats, base

Depends R(>= 3.3.1), Hmisc(>= 3.17-4), gtools(>= 3.5.0)

Suggests knitr

RoxygenNote 6.0.1

NeedsCompilation no

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Engel Data *Engel Data*

Description

Engel food expenditure data used in Koenker and Bassett(1982). This is a regression data set consisting of 235 observations on income and expenditure on food for Belgian working class households.

Usage

```
data(engel)
```

Format

A data frame containing 235 observations on 2 variables

income annual household income in Belgian francs

foordexp annual household food expenditure in Belgian francs

References

Koenker, R. and Bassett, G (1982) Robust Tests of Heteroscedasticity based on Regression Quantiles; Econometrica 50, 43-61.

Trust Data *Trust Data*

Description

Data on 12 European Countries

Usage

```
data(trust)
```

Format

A data frame containing 180 observations for 12 countries. Data taken from the Eurobarometer, The Hertie School of Governance.

Trust_in_the_ECB Trust in the European Central Bank

Trust_in_the_EU Trust in the European Union

countryname countryname identifier

year year identifier

urq *Unconditional Quantile Regression*

Description

Returns an object of class urq. that represents an Unconditional Quantile Regression Fit

Usage

```
urq(formula,data,tau=NULL,kernel=NULL,cre=NULL,id=NULL)
```

Arguments

formula	a formula object, with the response on the left of a ~ operator, and the terms, separated by + operators, on the right.
data	a dataframe in which to interpret the variables named in the formula
tau	the quantile(s) to be estimated, this must be a number (or a vector of numbers) strictly between 0 and 1.
kernel	a character string giving the smoothing kernel to be used. This must match one of "gaussian", "rectangular", "triangular", "epanechnikov", "biweight", "cosine" or "optcosine", with default "gaussian".
cre	The CRE formula (right hand side only) is a specification of the variables in the CRE component. These are possibly endogenous variables (in the sense that they are affected by the fixed effects) and must be time-varying. If left empty, a cross-sectional analysis is performed.
id	defines the structure of the panel.

Details

This function returns a Recentered Influence Function regression of given quantiles as proposed by Firpo, S., Fortin, N. M., & Lemieux, T. (2009). Panel data analysis is performed extending the correlated random effects (CRE) model by Mundlak (1978) and Chamberlain (1984) to an unconditional quantile regression framework. See Abrevaya and Dahl (2008) and Bache et al (2011) for more details.

References

Firpo, S., Fortin, N. M., & Lemieux, T. (2009). Unconditional quantile regressions. Econometrica, 77(3), 953-973.

Mundlak, Y. 1978. On the pooling of time series and cross section data. Econometrica 46: 69-85.

Chamberlain G (1984) Panel Data. In: Griliches Z, Intriligator MD (eds) Handbook of Econometrics, vol 2, Elsevier Science B. V., pp 1247-1318

Abrevaya, Jason and Christian M. Dahl. 2008. The effects of birth inputs on birthweight. Jounal of Business and Economic Statistics. 26-4. Pages 379-397.

Bache, Stefan Holst; Christian M. Dahl; Johannes Tang Kristensen. 2011. Headlights on tobacco road to low birthweight - Evidence from a battery of quantile regression estimators and a heterogeneous panel.

See Also

density,urqCI

Examples

```
### example for cross-sectional data ###

data(engel)
formula = foodexp ~ income
rifreg=urq(formula,data = engel)

### example for panel data ###

data(trust)
formula=Trust_in_the_ECB~Trust_in_the_EU+Trust_in_National_Government
cre=~Trust_in_the_EU+Trust_in_National_Government
rif=urq(formula,data=trust,cre=cre,id="countryname")
```

---

urqb *Unconditional Quantile Regression*

Description

Function Not intended for user. Returns an object of class "urq" that represents an Unconditional Quantile Regression Fit.

Usage

```
urqb(data,tau,formula,kernel=NULL,cluster=cluster)
```

Arguments

data	a data.frame in which to interpret the variables named in the formula
tau	the quantile(s) to be estimated, this must be a number (or a vector of numbers) strictly between 0 and 1.
formula	a formula object, with the response on the left of a ~ operator, and the terms, separated by + operators, on the right.
kernel	a character string giving the smoothing kernel to be used. This must match one of "gaussian", "rectangular", "triangular", "epanechnikov", "biweight", "cosine" or "optcosine", with default "gaussian".
cluster	column name of variable to be used in order to obtain cluster robust standard errors.

See Also

density,urq

Examples

```
NULL
```

---

urqCI *Inference for Unconditional Quantile Regression*

Description

Returns a summary list for an Unconditional Quantile Regression Fit.

Usage

```
urqCI(urq,R=20,seed=NULL,colour=NULL,confidence=NULL,graph=TRUE,cluster=NULL,BC=FALSE)
```

Arguments

urq	an object of class urq.
R	the number of bootstrap replications to be used.
seed	random number generator.
colour	colour of plot: default is lightblue.
confidence	significance level.
graph	boolean, if TRUE a graph is produced. At least two quantiles are needed for plot to work.
cluster	column name of variable to be used in order to obtain cluster robust standard errors and confidence intervals.
BC	plot option: If set to TRUE, Bias-Corrected Bootstrap confidence bands are plotted (black dashed lines), along with the bootstrap median (orange dashed line).

Details

This function provides standard errors and confidence intervals for the Recentered Influence Function regression fit urq. If the cluster option is used, standard errors are cluster robust according to the variable supplied by the user, otherwise observations are assumed to be iid. Inference is obtained though a bayesian bootstrap drawing observation (or cluster) weights from a Dirichlet distribution. If the option graph is TRUE, then a quantile plot is provided showing estimates and confidence intervals (t approximation) or Bias-Corrected (BC) intervals. Confidence intervals using the BC percentile method typically require 1000 or more replications.

References

Rubin, D. B. (1981). The bayesian bootstrap. The annals of statistics, 9(1), 130-134.

Efron, B. and R. J. Tibshirani. Bootstrap methods for standard errors, confidence intervals, and other measures of statistical accuracy. Statistical science (1986): 54-75.

See Also

urq

Examples

```
### example for cross-sectional data ###

data(engel)
formula=foodexp ~ income
rifreg=urq(formula=formula,data=engel)
summary=urqCI(urq = rifreg,R = 10,graph = TRUE,seed = 1234)

### example for panel data ###

data(trust)
formula=Trust_in_the_ECB~Trust_in_the_EU+Trust_in_National_Government
cre=~Trust_in_the_EU+Trust_in_National_Government
rif=urq(formula,data=trust,cre=cre,id="countryname")
summary=urqCI(urq = rif,R = 10,graph = TRUE,seed = 1234,cluster="countryname")
```

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