Package ‘orcutt’

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Description Solve first order autocorrelation problems using an iterative method. This procedure estimates both autocorrelation and beta coefficients recursively until we reach the convergence (8th decimal as default). The residuals are computed after estimating Beta using EGLS approach and Rho is estimated using the previous residuals.
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Estimate Procedure in Case of First Order Autocorrelation

Description

This package has been implemented to solve first order autocorrelation problems using an iterative method. This procedure estimates both autocorrelation and beta coefficients recursively until we reach the convergence (8th decimal). The residuals are computed after estimating Beta using EGLS approach and Rho is estimated using the previous residuals.

Details

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Type: Package
Version: 2.3
Date: 2018-09-27
License: GPL-2

Author(s)

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References


Cochrane-Orcutt Estimation

Description

Interactive method using to solve first order autocorrelation problems. This procedure estimates both autocorrelation and beta coefficients recursively until we reach the convergence (8th decimal). The residuals are computed after estimating Beta using EGLS approach and Rho is estimated using the previous residuals.

Usage

cochrane.orcutt(reg, convergence = 8, max.iter=100)
**Arguments**

- **reg**  
  a linear model built with lm function

- **convergence**  
  decimal value to reach for convergence, 8 as default

- **max.iter**  
  the maximum number of interactions, 100 as default

**Value**

An object of class "orcutt", basically a list including elements

- **coefficients**  
  a named vector of coefficients.

- **residuals**  
  residuals.

- **fitted.values**  
  the fitted mean values.

- **t.value**  
  t test of coefficients.

- **p.value**  
  p-value of coefficients.

- **call**  
  the matched call.

- **rho**  
  Spearman’s rho autocorrelation.

- **number.interaction**  
  number of interaction of the model.

- **DW**  
  vector contained Durbin-Watson statistics and p-value.

**Author(s)**

Stefano Spada

**References**


**Examples**

```r
data(icecream, package="orcutt")
lm = lm(cons ~ price + income + temp, data=icecream)
coch = cochrane.orcutt(lm)
coch
```
icecream  Ice Cream Consumption

Description

four weekly observations from 1951-03-18 to 1953-07-11 in United States (30 observations)

Usage

data("icecream")

Format

A data frame with 30 observations on the following 4 variables.

- price  price of ice cream (per pint);
- cons  consumption of ice cream per head (in pints);
- income  average family income per week (in US Dollars);
- temp  average temperature (in Fahrenheit);

Source


References


Examples

data(icecream)
summary(icecream)

predict.orcutt  Predict method for Cochrane-Orcutt Estimation

Description

Predicted values based on orcutt object.

Usage

## S3 method for class 'orcutt'
predict(object, ...)


Arguments

object        An "orcutt" object build with Cochrane-Orcutt function
...           further arguments passed to or from other methods.

Author(s)

Stefano Spada

References


Examples

data(icecream, package="orcutt")
lm = lm(cons ~ price + income + temp, data=icecream)
coch = cochrane.orcutt(lm)
predict.coch = predict(coch)

print.orcutt  Print Cochrane-Orcutt Estimation

Description

Print Cochrane-Orcutt Estimation

Usage

## S3 method for class 'orcutt'
print(x, ...)

Arguments

x          an orcutt object
...        additional arguments for specific methods.

Author(s)

Stefano Spada

References

print.summary.orcutt

Examples

```r
data(icecream, package="orcutt")
lm = lm(cons ~ price + income + temp, data=icecream)
coch = cochrane.orcutt(lm)
coch
```

print.summary.orcutt  
_Summarizing Cochrane-Orcutt Fits_

Description

summary method for class "orcutt".

Usage

```r
## S3 method for class 'summary.orcutt'
print(x, ...)
```

Arguments

- `x` an object of class "orcutt", usually, a result of a call to cochrane.orcutt.
- `...` further arguments passed to or from other methods.

Value

The function summary.orcutt computes and returns a list of summary statistics of the fitted Cochrane-Orcutt.

- `coefficients` a \( p \times 4 \) matrix with columns for the estimated coefficient, its standard error, t-statistic and corresponding (two-sided) p-value. Aliased coefficients are omitted.
- `fstatistic` value of F statistic.
- `df` degrees of freedom of F statistic.
- `r.squared` \( R^2 \), the fraction of variance explained by the model.
- `adj.r.squared` the above \( R^2 \) statistic _adjusted_, penalizing for higher \( p \).
- `DW.t` a 4-vector contained the Durbin-Watson statistic and the p-value for the original "lm" model, and the Durbin-Watson statistic and the p-value for the original "orcutt" model.

Author(s)

Stefano Spada
residual.orcutt

References


Examples

```r
#-- Continuing the cochrane.orcutt(.) example:
summary(coch)
```

---

`residual.orcutt`  
*Accessing Cochrane-Orcutt Fits*

Description

Residual for Cochrane-Orcutt Estimation

Usage

`residual.orcutt(object, ...)`

Arguments

- `object`  
  An "orcutt" object build with Cochrane-Orcutt function
- `...`  
  further arguments passed to or from other methods.

Author(s)

Stefano Spada

References


Examples

```r
data(icecream, package="orcutt")
lm = lm(cons ~ price + income + temp, data=icecream)
coch = cochrane.orcutt(lm)
residuals(coch)
```
### summary.orcutt

#### Summarizing Cochrane-Orcutt Fits

**Description**

summary method for class "orcutt".

**Usage**

```r
## S3 method for class 'orcutt'
summary(object, ...)  
```

**Arguments**

- **object**: an object of class "orcutt", usually, a result of a call to cochrane.orcutt.
- **...**: further arguments passed to or from other methods.

**Value**

The function summary.orcutt computes and returns a list of summary statistics of the fitted Cochrane-Orcutt coefficients:

- **coefficients**: a $p \times 4$ matrix with columns for the estimated coefficient, its standard error, t-statistic and corresponding (two-sided) p-value. Aliased coefficients are omitted.
- **fstatistic**: value of F statistic.
- **df**: degrees of freedom of F statistic.
- **r.squared**: $R^2$, the fraction of variance explained by the model.
- **adj.r.squared**: the above $R^2$ statistic *adjusted*, penalizing for higher $p$.
- **DW.t**: a 4-vector contained the Durbin-Watson statistic and the p-value for the original "lm" model, and the Durbin-Watson statistic and the p-value for the original "orcutt" model.

**Author(s)**

Stefano Spada

**References**


**Examples**

```r
##-- Continuing the cochrane.orcutt(.) example:

summary(coch)
```
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