

Package ‘orcutt’

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Type Package

Title Estimate Procedure in Case of First Order Autocorrelation

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Depends lmtest

Imports stats

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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NeedsCompilation no

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`orcutt-package`*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

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

Author(s)

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References

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd, ISBN:978-88-08-17054-5

`cochrane.orcutt`*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

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd, ISBN:978-88-08-17054-5

Examples

```
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

Hildreth, C. and J. Lu (1960) Demand relations with autocorrelated disturbances, Technical Bulletin No 2765, Michigan State University.

References

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

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 fuction
... further arguments passed to or from other methods.

Author(s)

Stefano Spada

References

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

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

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

Examples

```
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

```
## 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.

<code>coefficients</code>	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.
<code>fstatistic</code>	value of F statistic.
<code>df</code>	degrees of freedom of F statistic.
<code>r.squared</code>	R^2 , the fraction of variance explained by the model.
<code>adj.r.squared</code>	the above R^2 statistic <i>adjusted</i> , penalizing for higher p .
<code>DW.t</code>	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

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

Examples

```
##-- 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 fuction
...	further arguments passed to or from other methods.

Author(s)

Stefano Spada

References

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

Examples

```
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

```
## 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	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 <i>adjusted</i> , 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

Verbeek M. (2004) *A guide to modern econometrics*, John Wiley & Sons Ltd

Examples

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


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