

# Package ‘nardl’

February 6, 2018

**Type** Package

**Title** Nonlinear Cointegrating Autoregressive Distributed Lag Model

**Version** 0.1.2

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**Description** Computes the nonlinear cointegrating autoregressive distributed lag model with  $p$  lags of the dependent variables and  $q$  lags of independent variables proposed by (Shin, Yu & Greenwood-Nimmo, 2014 <doi:10.1007/978-1-4899-8008-3\_9>).

**License** GPL-3

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.0.1

**Imports** stats, methods, car, strucchange, tseries, lmtest, matlab,  
Formula

**NeedsCompilation** no

**Repository** CRAN

**Date/Publication** 2018-02-06 21:20:15 UTC

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Nardl-package

*Nonlinear Cointegrating Autoregressive Distributed Lag Model*

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## Description

Computes the nonlinear cointegrating autoregressive distributed lag model with  $p$  lags of the dependent variable and  $q$  lags of independent variables proposed by (Shin, Yu & Greenwood-Nimmo, 2014 <doi:10.1007/978-1-4899-8008-3\_9>).

## Details

Package: Nardl  
Type: Package  
Version: 1.2  
Date: 2018-01-06  
License: GPL-3

In this package, we apply the ordinary least squares method to estimate the cointegrating nonlinear ARDL (NARDL) model in which short and long-run nonlinearities are introduced via positive and negative partial sum decompositions of the explanatory variables. Besides, we provide the CUSUM, CUSUMSQ model stability tests, model selection via aic, bic and rsquared criteria and the dynamic multipliers plot.

## Author(s)

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## References

Shin, Y., Yu, B., Greenwood-Nimmo, M. (2011): Modelling asymmetric cointegration and dynamic multipliers in a nonlinear ARDL framework. *Working paper* <http://ssrn.com/abstract=1807745>

## Examples

```
# Load data
data(fod)
# Fit the nonlinear cointegrating autoregressive distributed lag model
reg<-nardl(food~inf,fod,p=3,q=3,ic="aic",graph=TRUE)
summary(reg)
```

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fod	<i>Indian yearly data of inflation rate and percentage food import to total import</i>
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**Description**

- foodpercentage food import to total import
- ininflation rate
- yearthe year

**Usage**

```
data(fod)
```

**Format**

A data frame with 54 rows and 2 variables

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nardl	<i>Nonlinear ARDL function</i>
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**Description**

Nonlinear ARDL function

**Usage**

```
nardl(formula, data, p = NULL, q = NULL, ic = c("aic", "bic", "R2"),
      maxlags = TRUE, graph = FALSE)
```

**Arguments**

formula	food~inf or food~infl(inf^2)
data	the dataframe
p	lags of dependent variable
q	lags of independent variables
ic	: c("aic","bic","R2") criteria model selection
maxlags	if TRUE auto lags selection
graph	TRUE to show stability tests plot

## Examples

```
#####
# Fit the nonlinear cointegrating autoregressive distributed lag model
#####
# Load data
data(fod)
#####
#example 1: nardl with fixed p and q lags
#####
reg<-nardl(food~inf,p=4,q=4,fod,ic="aic",maxlags = FALSE,graph = FALSE)
summary(reg)

#####
# example 2:auto selected lags (maxlags=TRUE)
#####
reg<-nardl(food~inf,fod,ic="aic",maxlags = TRUE,graph = FALSE)
summary(reg)

#####
# example 3: Cusum and CusumQ plot (graph=TRUE)
#####
reg<-nardl(food~inf,fod,ic="aic",maxlags = TRUE,graph = TRUE)
```

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plotmplier

*Dynamic multiplier plot*

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## Description

Dynamic multiplier plot

## Usage

```
plotmplier(model, np, k, h)
```

## Arguments

model	the fitted model
np	the selected number of lags
k	number of decomposed independent variables
h	is the horizon over which multipliers will be computed

**Examples**

```
#####  
# Dynamic multipliers plot  
#####  
# Load data  
data(fod)  
reg<-nardl(food~inf,p=4,q=4,fod,ic="aic",maxlags = FALSE,graph = TRUE)  
plotmplier(reg,reg$np,1,10)
```

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summary.nardl	<i>summary</i>
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**Description**

summary

**Usage**

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

**Arguments**

object	is the object of the function
...	not used

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