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# nardl:An R package to estimate the nonlinear cointegrating autoregressive distributed lag model

**Taha Zaghdoudi**[1]

**1** Faculty of Law, Economics and Management of Jendouba, Tunisia

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**Software**

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## Summary

In the nardl package (**???**), we apply the ordinary least squares method to estimate the cointegrating nonlinear ARDL (NARDL) model developed by (Shin, Yu, and Greenwood-Nimmo 2014) 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 rsqaured criteria and the dynamic multipliers plot.

## Example

In this example we examine the impact of both long and short-run asymmetries effect of inflation on food price in India. we specify the following asymmetric long-run equation of inflation:

$$Food_t = \alpha_0 + \alpha_1 infp_t + \alpha infn_t + \varepsilon_t$$

Where $Food_t$ refers to the food price and$\alpha = (\alpha_0, \alpha_1, \alpha_2$ is a $infp_t$ and$infn_t$ are partial sums of positive and negative changes in $inf_t$:

$$infp_t = \sum_{i=1}^{t} \Delta infp_t = \sum_{i=1}^{t} max(\Delta inf_t, 0)$$

and

$$infn_t = \sum_{i=1}^{t} \Delta infn_t = \sum_{i=1}^{t} min(\Delta inf_t, 0)$$

```
# Loading package
library(nardl)
# Importing data from Excel sheet
data(fod)
# Estimate the NARDL model
# food: the dependent variable
# inf : the decomposed dependent variable in infp and infn
# (p,q)=(4,4): max lags for dependent and independent variables
```

```
# ic=c(aic,bic, R2): selection model criteria
# if graph=TRUE this make a stability tests plot
reg<-nardl(food~inf,p=4,q=4,fod,ic="aic",maxlags = FALSE,graph = TRUE)
summary(reg)
```

## Dynamic multipliers plot

```
############################
# Dynamic multipliers plot
############################
plotmplier(reg,reg$np,1,10)
```

nardl is GPL-3 licensed and can be retrieved from GitHub Repository

nardl CRAN

Archive

## References

Shin, Yongcheol, Byungchul Yu, and Matthew Greenwood-Nimmo. 2014. "Modelling Asymmetric Cointegration and Dynamic Multipliers in a Nonlinear Ardl Framework." In *Festschrift in Honor of Peter Schmidt*, 281–314. Springer.