N-ARDL Eviews

This add-in can estimate the symmetric and asymmetric ARDL in Eviews. All necessary tests are included in the results panel. This Add-in helps analyze linear and non-linear ARDL. There are four options that users can select:

- Linear Format (ordinary ARDL)
- Asymmetry in both short and long-run
- Asymmetry in short-run and symmetry in long-run
- Symmetry in short-run and asymmetry in long-run

Deterministic variables, like dummy variables, can be added to the model.

Current version

The last version of the executable add-in (N-ARDL.aipz) is **2.57**.

Contributors

I would like to express my sincere gratitude to **Prof. Mohsen Bahmani Oskooee** for his invaluable guidance and insights on econometrics, which significantly influenced the development of this Eviews add-in. His expertise and feedback played a pivotal role in shaping the features and functionality of this tool.

I would like to extend my appreciation to **Yashar Tarverdi** for his prior work on an add-in that served as an essential foundation for this project.

This code has been written by **Huseyin Karamelikli** (Hossein Haghparast Gharamaleki).

For further contributions and advice, please visit https://github.com/karamelikli/Eviews.NARDL

All new commits are welcome.

Installation

Download N-ARDL.aipz file from this repository and click on it or download from addins menu in Eviews.

Manual

Open a series or a group of time series in Eviews. Then, click on Add-in > Make N-ARDL Bound Test

All of your selected series will be displayed in the variables box. The first one is your dependent variable. You can enter dummy variables in the Deterministic Variables box. If you want to define a variable as an asymetric one, you should put its name in both short-run and long-run asymmetric variables boxes.

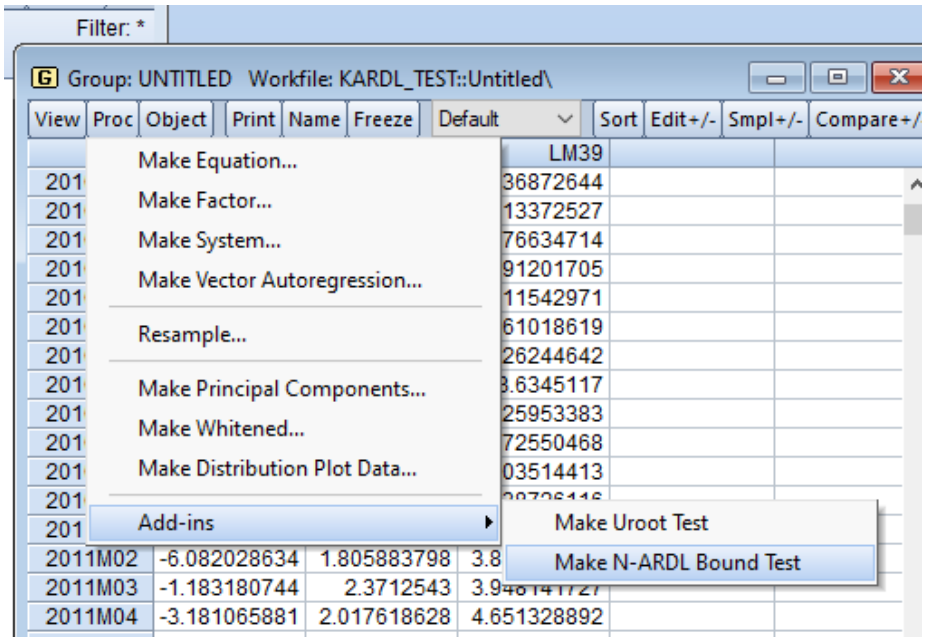

Figure 1: Open the Add-in

Otherwise, you can have asymmetry just in the short-run or long-run based on the boxes filled. By selcting Plot, dynamic multipliers will be plotted. If you prefer to diffentiation of lags of asymetric variables in Negative and Positive decompositions you should check **Different Asymmetric Vars' Lags**.

The results would be as follows. The first page is an abstract of all contained results, which may be useful to see all the results at a glance.

How to Use OpenOffice/LibreOffice to make the model's formulas

All required formulas would be produced in the final panel. It can be copied and pasted to LibreOffice. Then, selecting and clicking on insert formula object or by menu (Insert > Object > Formula Object...) will change it to a regular visible formula. You can continue working on LibreOffice or save it as a .docx file if you are willing to continue in MS Word.

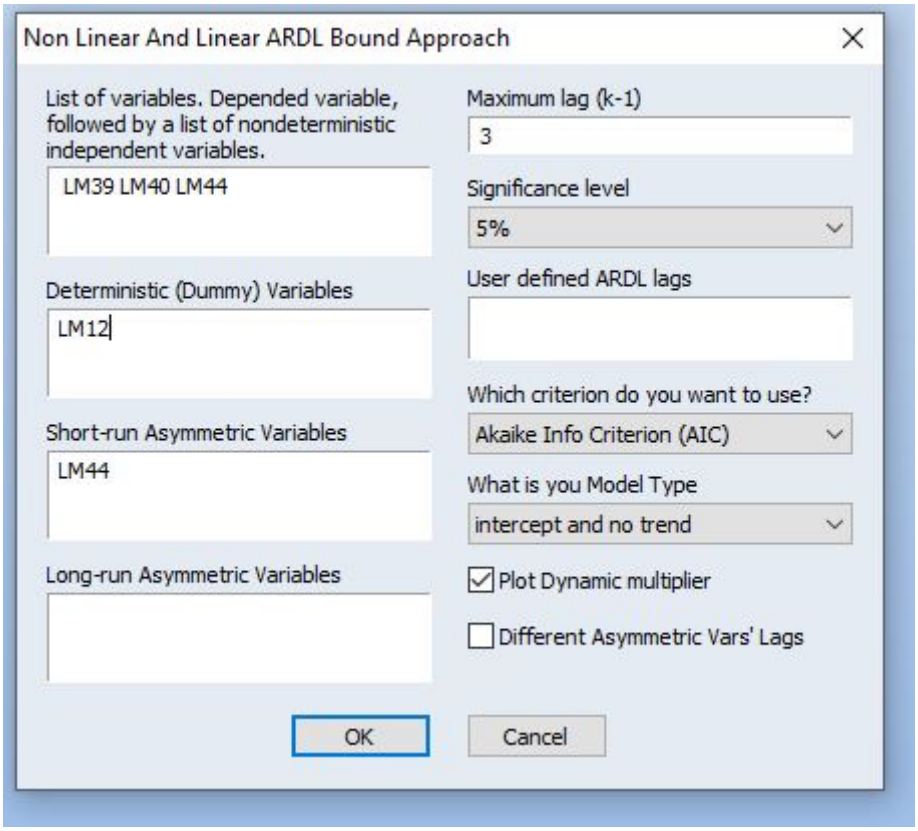

Figure 2: Main menu

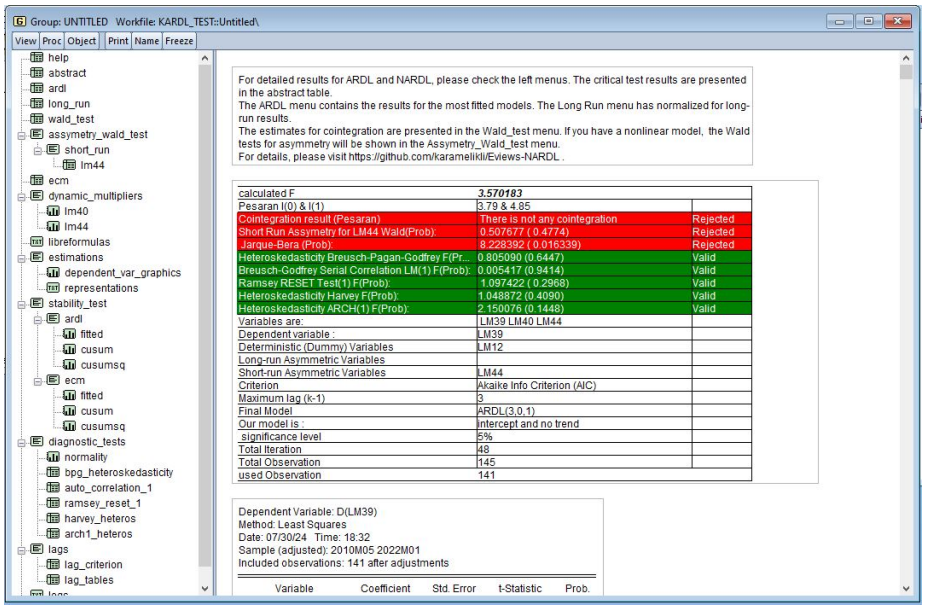

Figure 3: The reulsts

Theoretical Framework

The long-run model is defined as follow:

$$y_t = \alpha_0 + \alpha_1 x_t + \alpha_2 z_t + \epsilon_t$$

The error correction model can be defined as:

$$\Delta y_t = \beta_0 + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-j} + \sum_{j=0}^{q} \beta_{2j} \Delta x_{t-j} + \sum_{j=0}^{n} \beta_{3j} \Delta z_{t-j} + \gamma_1 W_t + \theta \epsilon_{t-1} + e_t$$

By using the long-run model into the ECM model we can have:

$$\Delta y_t = \psi + \eta_0 y_{t-1} + \eta_1 x_{t-1} + \eta_2 z_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-j} + \sum_{j=0}^{q} \beta_{2j} \Delta x_{t-j} + \sum_{j=0}^{n} \beta_{3j} \Delta z_{t-j} + \gamma_1 W_t + e_t$$

We have ARDL model with following definiation:

$$ARDL(p, q, n)$$

We used following modifications to obtain the ARDL model:

$$\psi = \beta_0 - \theta\alpha_0 \ , \ \eta_0 = \theta \ , \ \eta_1 = -\theta\alpha_1 \ , \ \eta_2 = -\theta\alpha_2$$

Then, for reobtaining the long-run coefficients...:

$$\theta = \eta_0 \ , \ \alpha_1 = -\frac{\eta_1}{\theta} \ , \ \alpha_2 = -\frac{\eta_2}{\theta}$$

Asymetrics :

$$x_t^+ = \sum_{i=1}^{t} \Delta x_i^+ = \sum_{i=1}^{t} max(\Delta x_i, 0)$$

$$x_t^- = \sum_{i=1}^{t} \Delta x_i^- = \sum_{i=1}^{t} min(\Delta x_i, 0)$$

Asymetrics Long Run :

$$y_t = \alpha_0 + \alpha_1^+ x_t^+ + \alpha_1^- x_t^- + \alpha_2 z_t + \epsilon_t$$

Asymetrics Model :

$$\Delta y_t = \psi + \eta_0 y_{t-1} + \eta_1^+ x_{t-1}^+ + \eta_1^- x_{t-1}^- + \eta_2 z_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-j} + \sum_{j=0}^{q} \beta_{2j}^+ \Delta x_{t-j}^+ + \sum_{j=0}^{m} \beta_{2j}^- \Delta x_{t-j}^- + \sum_{j=0}^{n} \beta_{3j} \Delta z_{t-j} + \gamma_1 W_t + e_t$$

Where:

$$\psi = \beta_0 - \theta\alpha_0 \ , \ \eta_0 = \theta \ , \ \eta_1^+ = -\theta\alpha_1^+ \ , \ \eta_1^- = -\theta\alpha_1^- \ , \ \eta_2 = -\theta\alpha_2$$

Long run Coeficients:

$$\theta = \eta_0 \ , \ \alpha_1^+ = -\frac{\eta_1^+}{\theta} \ , \ \alpha_1^- = -\frac{\eta_1^-}{\theta} \ , \ \alpha_2 = -\frac{\eta_2}{\theta}$$

Asymetrics Short Run Model:

$$\Delta y_t = \psi + \eta_0 y_{t-1} + \eta_1 x_{t-1} + \eta_2 z_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-j} + \sum_{j=0}^{q} \beta_{2j}^+ \Delta x_{t-j}^+ + \sum_{j=0}^{m} \beta_{2j}^- \Delta x_{t-j}^- + \sum_{j=0}^{n} \beta_{3j} \Delta z_{t-j} + \gamma_1 W_t + e_t$$

Asymetrics Long Run Model:

$$\Delta y_t = \psi + \eta_0 y_{t-1} + \eta_1^+ x_{t-1}^+ + \eta_1^- x_{t-1}^- + \eta_2 z_{t-1} + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-j} + \sum_{j=0}^{q} \beta_{2j} \Delta x_{t-j} + \sum_{j=0}^{n} \beta_{3j} \Delta z_{t-j} + \gamma_1 W_t + e_t$$

Asymetrics Dynamic:

$$m_h^+ = \sum_{i=0}^{h} \frac{\partial y_{t+i}}{\partial x_t^+}$$

$$\lim_{h\to\infty} m_h^+ = \alpha_1^+$$

$$m_h^- = \sum_{i=0}^{h} \frac{\partial y_{t+i}}{\partial x_t^-}$$

$$\lim_{h\to\infty} m_h^- = \alpha_1^-$$

Normalization

To obtain the long-run estimated parameters, the following method was utilized:

$$\alpha_1^+ = -\frac{\eta_1^+}{\eta_0}\ ,\ \alpha_1^- = -\frac{\eta_1^-}{\eta_0}\ ,\ \alpha_2 = -\frac{\eta_2}{\eta_0}$$

The standard errors are performed by following the Formula:

$$\sigma^2(-\frac{\eta_1^+}{\eta_0}) = (\frac{1}{\eta_0})^2\sigma^2(\eta_1^+) - 2\frac{\eta_1^+}{\eta_0^3}COV(\eta_1^+,\eta_0) + (\frac{\eta_1^+}{\eta_0^2})^2\sigma^2(\eta_0)$$

Please note that the standardized calculation of the constant is under the following assumption:

$$\frac{\beta_0}{\alpha_0} \approx 0$$

Options

Please don't change the default options unless you have the required knowledge about them. For any additional options, open `C:\Users\YOURUSERNAME\Documents\EViews Addins\N-ARDL\settings.prg` and modify the values in the parentheses.

Option	Default	Description
%vars		All vars that should be in the all variables boxes
%evars		Exogenous Variables

Option	Default	Description
%asvars		Short-run Asymmetric Variables
%alvars		Long-run Asymmetric Variables
%maxlag	3	Max lag
!sig	2	significance level for automatic differencing test 1 = 1%, 2=5%, 3=10%
!rest	2	1 “No intercept and no trend” 2 “intercept and no trend” 3”Intercept and trend”
!Astype	1	1 “Short Run” 2”Long Run” 3”Both”
%userdefined		User defined ARDL lags
!criterion	1	1 “Akaike Info Criterion(AIC)” 2 “Schwarz Criterion(SC)” 3”Hannan-Quinn criter” 4 “General to Specified”

Process Settings

Yes=1 No=0

Option	Default	Description
!KeepMainFrame	1	Save All results in workfile
!KeepEquation	1	Save final equation in workfile
!keepAbstract	0	Save final Abstract in workfile
!AddCriterionTable	1	Add Criterion Table values in output
!MakeLibreFormulas	1	Add Libre Office formulas in output
!incZeroLag	1	start Zero lag of ind vars? Sum from 0 to p

Plot Settings

Yes=1 No=0

Option	Default	Description
!PlotShortRun	0	Plot short run effects in model.
!DifferentAsymLag	0	different Asymmetric Variables Lag.
!KeepPlot	0	Save all Plots in model
!Graphlength	39	multiplier Graph length
!PlotDiffs	1	Add differences of two options.
!PlotTrashhold	1	Add trasholds for Asymmetric ARDL.

Option	Default	Description
%IncreaseColor	black	regular colors
%DecreaseColor	blue	Decrease Color
%DiffColor	red	Diff Color
%TrashholdColor	red	Trashhold Color
!IncreaseWidth	2	Increase Width
!DecreaseWidth	2	Decrease Width
!DiffWidth	2	Diff Width
!TrashholdWidth	1	Trashhold Width
!IncreasePat	4	Increase Pat
!DecreasePat	1	Decrease Pat
!DiffPat	1	Diff Pat
!TrashholdPat	2	Trashhold Pat

Texts

Option	Default
%caption	Non Linear And Linear ARDL Bound Approach
%nameofvars	List of variables. Depended variable, followed by a list of nondeterministic independent variables.
%ExogenousTxt	Deterministic (Dummy) Variables
%LAsymmetricTxt	Long-run Asymmetric Variables
%SAsymmetricTxt	Short-run Asymmetric Variables
%ResUnresText	What is you Model Type
%ResUnres	““No intercept and no trend”” ““intercept and no trend”” ““Intercept and trend”“”
%maxlagT	Maximum lag (k-1)
%sigprompt	Significance level
%sigchoice	““1%”” ““5%”” ““10%””
%userdefinedText	User defined ARDL lags
%critprompt	Which criterion do you want to use?
%critchoice	““Akaike Info Criterion (AIC)”” ““Schwarz Criterion (SC)”” ““Hannan-Quinn Criterion (HQ)”” ““General to Specified””
%TableStatus	““Valid”” ““Rejected”” ““Ambiguous””
%incZeroStartTxt	include Zero lag of model?
%PlotShortRun	Plot Dynamic multiplier
%DifferentAsymLag	Different Asymmetric Vars' Lags