

# **Econometrics Toolbox™**

## **Release Notes**

---

## How to Contact MathWorks



[www.mathworks.com](http://www.mathworks.com) Web  
[comp.soft-sys.matlab](mailto:comp.soft-sys.matlab) Newsgroup  
[www.mathworks.com/contact\\_TS.html](http://www.mathworks.com/contact_TS.html) Technical Support



[suggest@mathworks.com](mailto:suggest@mathworks.com) Product enhancement suggestions  
[bugs@mathworks.com](mailto:bugs@mathworks.com) Bug reports  
[doc@mathworks.com](mailto:doc@mathworks.com) Documentation error reports  
[service@mathworks.com](mailto:service@mathworks.com) Order status, license renewals, passcodes  
[info@mathworks.com](mailto:info@mathworks.com) Sales, pricing, and general information



508-647-7000 (Phone)



508-647-7001 (Fax)



The MathWorks, Inc.  
3 Apple Hill Drive  
Natick, MA 01760-2098

For contact information about worldwide offices, see the MathWorks Web site.

*Econometrics Toolbox™ Release Notes*

© COPYRIGHT 2005–2011 by The MathWorks, Inc.

The software described in this document is furnished under a license agreement. The software may be used or copied only under the terms of the license agreement. No part of this manual may be photocopied or reproduced in any form without prior written consent from The MathWorks, Inc.

FEDERAL ACQUISITION: This provision applies to all acquisitions of the Program and Documentation by, for, or through the federal government of the United States. By accepting delivery of the Program or Documentation, the government hereby agrees that this software or documentation qualifies as commercial computer software or commercial computer software documentation as such terms are used or defined in FAR 12.212, DFARS Part 227.72, and DFARS 252.227-7014. Accordingly, the terms and conditions of this Agreement and only those rights specified in this Agreement, shall pertain to and govern the use, modification, reproduction, release, performance, display, and disclosure of the Program and Documentation by the federal government (or other entity acquiring for or through the federal government) and shall supersede any conflicting contractual terms or conditions. If this License fails to meet the government's needs or is inconsistent in any respect with federal procurement law, the government agrees to return the Program and Documentation, unused, to The MathWorks, Inc.

### Trademarks

MATLAB and Simulink are registered trademarks of The MathWorks, Inc. See [www.mathworks.com/trademarks](http://www.mathworks.com/trademarks) for a list of additional trademarks. Other product or brand names may be trademarks or registered trademarks of their respective holders.

### Patents

MathWorks products are protected by one or more U.S. patents. Please see [www.mathworks.com/patents](http://www.mathworks.com/patents) for more information.

<b>Summary by Version</b> .....	<b>1</b>
<b>Version 2.0.1 (R2011b) Econometrics Toolbox Software</b> .....	<b>4</b>
<b>Version 2.0 (R2011a) Econometrics Toolbox Software</b> .....	<b>5</b>
<b>Version 1.4 (R2010b) Econometrics Toolbox Software</b> .....	<b>7</b>
<b>Version 1.3 (R2010a) Econometrics Toolbox Software</b> .....	<b>10</b>
<b>Version 1.2 (R2009b) Econometrics Toolbox Software</b> .....	<b>14</b>
<b>Version 1.1 (R2009a) Econometrics Toolbox Software</b> .....	<b>16</b>
<b>Version 1.0 (R2008b) Econometrics Toolbox Software</b> .....	<b>18</b>
<b>Version 2.4 (R2008a) GARCH Toolbox Software</b> .....	<b>20</b>
<b>Version 2.3.2 (R2007b) GARCH Toolbox Software</b> .....	<b>21</b>
<b>Version 2.3.1 (R2007a) GARCH Toolbox Software</b> .....	<b>22</b>
<b>Version 2.3 (R2006b) GARCH Toolbox Software</b> .....	<b>23</b>
<b>Version 2.2 (R2006a) GARCH Toolbox Software</b> .....	<b>24</b>

<b>Version 2.1 (R14SP3) GARCH Toolbox Software .....</b>	<b>26</b>
<b>Compatibility Summary for Econometrics Toolbox Software .....</b>	<b>27</b>

## Summary by Version

This table provides quick access to what's new in each version. For clarification, see "Using Release Notes" on page 2.

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
<b>Latest Version V2.0.1 (R2011b) Econometrics Toolbox™ Software</b>	Yes Details	Yes Summary	No
V2.0 (R2011a) Econometrics Toolbox Software	Yes Details	No	No
V1.4 (R2010b) Econometrics Toolbox Software	Yes Details	Yes Summary	No
V1.3 (R2010a) Econometrics Toolbox Software	Yes Details	Yes Summary	No
V1.2 (R2009b) Econometrics Toolbox Software	Yes Details	Yes Summary	No
V1.1 (R2009a) Econometrics Toolbox Software	Yes Details	Yes Summary	No
V1.0 (R2008b) Econometrics Toolbox Software	Yes Details	No	No
V2.4 (R2008a) GARCH Toolbox™ Software	Yes Details	No	No

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
V2.3.2 (R2007b) GARCH Toolbox Software	Yes Details	No	No
V2.3.1 (R2007a) GARCH Toolbox Software	No	No	No
V2.3 (R2006b) GARCH Toolbox Software	Yes Details	No	No
V2.2 (R2006a) GARCH Toolbox Software	Yes Details	No	No
V2.1 (R14SP3) GARCH Toolbox Software	Yes Details	Yes Summary	No

## Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks® products required for this product (for example, MATLAB® or Simulink®). Determine if enhancements, bugs, or compatibility considerations in other products impact you.

If you are upgrading from a software version other than the most recent one, review the current release notes and all interim versions. For example, when you upgrade from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

## What Is in the Release Notes

### New Features and Changes

- New functionality
- Changes to existing functionality

### Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product release appear under Bug Reports at the MathWorks Web site. Bug fixes can sometimes result in incompatibilities, so review the fixed bugs in Bug Reports for any compatibility impact.

### Fixed Bugs and Known Problems

MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. Bug Reports include provisions for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

### Documentation on the MathWorks Web Site

Related documentation is available on [mathworks.com](http://mathworks.com) for the latest release and for previous releases:

- Latest product documentation
- Archived documentation

## Version 2.0.1 (R2011b) Econometrics Toolbox Software

This table summarizes new features in V2.0.1 (R2011b).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes Summary	No

### Warning and Error ID Changes

Many warning and error IDs have changed from their previous versions. These warnings or errors typically appear during a function call.

### Compatibility Considerations

If you use warning or error IDs, you might need to change the strings you use. For example, if you turned off a warning for a certain ID, the warning might now appear under a different ID. If you use a `try/catch` statement in your code, replace the old identifier with the new identifier. There is no definitive list of the differences, or of the IDs that changed.



## Version 2.0 (R2011a) Econometrics Toolbox Software

This table summarizes new features in V2.0 (R2011a).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	No	No

New features and changes follow.

- “New Cointegration Functionality” on page 5
- “Convert Vector Autoregressive Models to and from Vector Error-Correction Models” on page 5
- “Data Sets for Calibrating Economic Models” on page 5

### **New Cointegration Functionality**

Econometrics Toolbox now offers functions for cointegration testing and modeling. The `egcitest` function uses Engle-Granger methods to test for individual cointegrating relationships, and estimates their parameters. The `jcitest` function uses Johansen methods to test for multiple cointegrating relationships, and estimates parameters in corresponding vector error-correction models. The `jctest` function tests linear restrictions on both error-correction speeds and the space of cointegrating vectors, and estimates restricted model parameters.

### **Convert Vector Autoregressive Models to and from Vector Error-Correction Models**

The functions `vectovar` and `vartovec` allow you to convert between vector autoregressive (VAR) models and vector error-correction (VEC) models.

### **Data Sets for Calibrating Economic Models**

Econometrics Toolbox includes three new data sets:

- **Data\_Canada.** Mackinnon's data on inflation and interest rates in Canada, 1954–1994. Data are those used in: MacKinnon, J. G. "Numerical Distribution Functions for Unit Root and Cointegration Tests." *Journal of Applied Econometrics*. v. 11, 1996, pp. 601–618.
- **Data\_JDanish, Data\_JAustralian.** Johansen's data on money and income in Denmark, 1974–1987, and Australia/U.S. purchasing power and interest parity, 1972–1991. Data are those used in: Johansen, *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models*. Oxford: Oxford University Press, 1995.

## Version 1.4 (R2010b) Econometrics Toolbox Software

This table summarizes new features in V1.4 (R2010b).

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
Yes Details below	Yes Summary	No

New features and changes follow.

- “Functions Being Removed” on page 7
- “Additional Syntax Options for `archtest` and `lbqtest`” on page 8
- “New Data Set for Calibrating Economic Models” on page 8

### Functions Being Removed

<b>Function Name</b>	<b>What Happens When You Use This Function?</b>	<b>Use This Function Instead</b>	<b>Compatibility Considerations</b>
<code>dfARDTest</code>	Error	<code>adftest</code>	The new function syntax differs. Replace all existing instances of <code>dfARDTest</code> with the correct <code>adftest</code> syntax.
<code>dfARTest</code>	Error	<code>adftest</code>	The new function syntax differs. Replace all existing instances of <code>dfARTest</code> with the correct <code>adftest</code> syntax.

<b>Function Name</b>	<b>What Happens When You Use This Function?</b>	<b>Use This Function Instead</b>	<b>Compatibility Considerations</b>
<code>dfTSTest</code>	Error	<code>adftest</code>	The new function syntax differs. Replace all existing instances of <code>dfTSTest</code> with the correct <code>adftest</code> syntax.
<code>ppARDTest</code>	Error	<code>pptest</code>	The new function syntax differs. Replace all existing instances of <code>ppARDTest</code> with the correct <code>pptest</code> syntax.
<code>ppARTest</code>	Error	<code>pptest</code>	The new function syntax differs. Replace all existing instances of <code>ppARTest</code> with the correct <code>pptest</code> syntax.
<code>ppTSTest</code>	Error	<code>pptest</code>	The new function syntax differs. Replace all existing instances of <code>ppTSTest</code> with the correct <code>pptest</code> syntax.

### **Additional Syntax Options for `archtest` and `lbqtest`**

The functions `archtest` and `lbqtest` now take name-value pair arguments as inputs. The old syntax of individual arguments will continue to work but will not be documented.

### **New Data Set for Calibrating Economic Models**

The economic data from the paper by Nielsen and Risager, “Stock Returns and Bond Yields in Denmark, 1922–99,” (Department of Economics,

Copenhagen Business School; Working paper 3-2001, 2001) is now included with Econometrics Toolbox in the file `Data_Danish`.

## Version 1.3 (R2010a) Econometrics Toolbox Software

This table summarizes new features in V1.3 (R2010a).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes Summary	No

New features and changes follow.

- “Functions Being Removed” on page 10
- “Demo Showing Multivariate Modeling of the U.S. Economy” on page 11
- “Lag Operator Polynomial Objects” on page 12
- “Leybourne-McCabe Test for Stationarity” on page 12
- “Historical Data Sets for Calibrating Economic Models” on page 12
- “New Organization and Naming Standard for Data Sets” on page 12
- “New Naming Convention for Demos and Example Functions” on page 13

### Functions Being Removed

Function Name	What Happens When You Use This Function?	Use This Function Instead	Compatibility Considerations
dfARDTest	Error	adftest	The new function syntax differs. Replace all existing instances of dfARDTest with the correct adftest syntax.
dfARTest	Error	adftest	The new function syntax differs. Replace all existing instances of

<b>Function Name</b>	<b>What Happens When You Use This Function?</b>	<b>Use This Function Instead</b>	<b>Compatibility Considerations</b>
			dfARTest with the correct adftest syntax.
dfTSTest	Error	adftest	The new function syntax differs. Replace all existing instances of dfTSTest with the correct adftest syntax.
ppARDTest	Error	pptest	The new function syntax differs. Replace all existing instances of ppARDTest with the correct pptest syntax.
ppARTest	Error	pptest	The new function syntax differs. Replace all existing instances of ppARTest with the correct pptest syntax.
ppTSTest	Error	pptest	The new function syntax differs. Replace all existing instances of ppTSTest with the correct pptest syntax.

## **Demo Showing Multivariate Modeling of the U.S. Economy**

A new demo, “Modeling the United States Economy,” develops a small macroeconomic model. This model is used to examine the impact of various shocks on the United States economy, particularly around the period of the 2008 fiscal crisis. It uses the multiple time series tools from the Econometrics Toolbox.

To run the demo in the command window, use the command `echodemo Demo_USEconModel`.

## Lag Operator Polynomial Objects

The new `LagOp` polynomial class provides methods to create and manipulate lag operator polynomials and filter time series data, as well as methods to perform polynomial algebra including addition, subtraction, multiplication, and division.

## Leybourne-McCabe Test for Stationarity

The new Leybourne-McCabe test function `lmctest` assesses the null hypothesis that a univariate time series  $y$  is a trend-stationary  $AR(p)$  process against the alternative that  $y$  is a nonstationary  $ARIMA(p,1,1)$  process.

## Historical Data Sets for Calibrating Economic Models

The new data set `Data_SchwertMacro` contains original data from G. William Schwert's article "Effects of Model Specification on Tests for Unit Roots in Macroeconomic Data," (*Journal of Monetary Economics*, Vol. 20, 1987, pp. 73–103.). These data are a benchmark for unit root tests. The new data set `Data_SchwertStock` contains indices of U.S. stock prices as published in G. William Schwert's article "Indexes of U.S. Stock Prices from 1802 to 1987," (*The Journal of Business*, Vol. 63, 1990, pp. 399–42.). The new data set `Data_USEconModel` contains the macroeconomic series for the new demo `Demo_USEconModel`.

## New Organization and Naming Standard for Data Sets

Econometrics Toolbox has a new set of naming conventions for data sets. Data set names are prefixed by `Data_`.

For full information on the available data sets, demos, and examples, see "Data Sets, Demos, and Example Functions" or type `help econ/econdemos` at the command line. For more information on Dataset Array objects, see `dataset` in the Statistics Toolbox™ documentation.



## **Compatibility Considerations**

Replace any instances of `load Old_Data` with `load` and the new file name.

## **New Naming Convention for Demos and Example Functions**

All demos and examples in the Econometrics Toolbox have been moved to the folder `econ/econdemos` and renamed according to the following convention:

- Demos are named `Demo_DemoName`
- Examples are named `Example_ExampleName`

For full information on the available, demos, and examples, see “Data Sets, Demos, and Example Functions” or type `help econ/econdemos` at the command line.

## Version 1.2 (R2009b) Econometrics Toolbox Software

This table summarizes new features in V1.2 (R2009b).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes Summary	No

New features and changes follow.

- “Unit Root Tests” on page 14
- “Financial Toolbox Required” on page 15
- “Nelson-Plosser Data” on page 15

### Unit Root Tests

There are now four classes of unit root tests. More information on the tests is available in the “Unit Root Tests” section of the User’s Guide.

### Dickey-Fuller and Phillips-Perron Tests

Dickey-Fuller and Phillips-Perron tests now have single interfaces, with new capabilities for multiple testing. Both `adftest` and `pptest` test a unit root null hypothesis against autoregressive, autoregressive with drift, or trend-stationary alternatives.

### KPSS Test

The new `kpsstest` function tests a null hypothesis of (trend) stationarity against nonstationary unit root alternatives.

### Variance Ratio Test

The new `vratiotest` function tests a null hypothesis of a random walk against alternatives with innovations that are not independent and identically distributed.

### **Compatibility Considerations**

The `ardtest` function replaces the `dfARDTest`, `dfARTest`, and `dfTSTest` functions. The `pptest` function replaces the `ppARDTest`, `ppARTest`, and `ppTSTest` functions. The new function syntax differs from the functions they replace.

### **Financial Toolbox Required**

Econometrics Toolbox requires Financial Toolbox™ as of this version.

### **Nelson-Plosser Data**

The Nelson and Plosser [50] data set is now available. To access the data, enter `load Data_NelsonPlosser` at the MATLAB command line.

## Version 1.1 (R2009a) Econometrics Toolbox Software

This table summarizes new features in V1.1 (R2009a).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes Summary	No

New features and changes follow.

- “Hypothesis Tests” on page 16
- “Structural VAR, VARX, and VARMAX models” on page 16
- “New Demo” on page 17

### Hypothesis Tests

There are two new hypothesis tests for model misspecification:

- Lagrange Multiplier tests, `lmtest`
- Wald tests, `waldtest`

Furthermore, the likelihood ratio test, `lratiotest`, has been enhanced to be able to “test up” as well as “test down” when performing multiple model comparisons. It now accepts vectors of model parameters for restricted log likelihoods, for unrestricted log likelihoods, or for both.

There is a new demo about these tests; see “New Demo” on page 17.

### Compatibility Considerations

`lratiotest` error messages and message IDs differ from previous versions.

### Structural VAR, VARX, and VARMAX models

Econometrics Toolbox multiple time series functions now include structural multiple time series. Structural models have the general form

$$A_0 Y_t = a + X_t b + \sum_{i=1}^p A_i Y_{t-i} + \sum_{j=1}^q B_j W_{t-j} + B_0 W_t.$$

Previously, Econometrics Toolbox multiple time series functions addressed models of the form

$$Y_t = a + X_t b + \sum_{i=1}^p A_i Y_{t-i} + \sum_{j=1}^q B_j W_{t-j} + W_t.$$

The mathematical difference is the inclusion of  $A_0$  and  $B_0$  matrices. These matrices allow practitioners to specify structural dependencies between variables. For more information, see the “Multivariate Time Series Models” chapter of the Econometrics Toolbox User’s Guide.

### **Compatibility Considerations**

Objects created with the Econometrics Toolbox V1.0 `vgxset` function, and saved in MAT files, do not work with Econometrics Toolbox V1.1 functions. Recreate the objects with the Econometrics Toolbox V1.1 `vgxset` function.

### **New Demo**

There is a new demo on hypothesis tests. Run the demo at the MATLAB command line by entering `showdemo classicalTestsDemo`.

## Version 1.0 (R2008b) Econometrics Toolbox Software

This table summarizes new features in V1.0 (R2008b).

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
Yes Details below	No	No

New features and changes follow.

- “Multivariate VAR, VARX, and VARMA Models” on page 18
- “Heston Stochastic Volatility Models” on page 19

### Multivariate VAR, VARX, and VARMA Models

A new suite of functions, listed in the following table, adds support for multivariate VAR, VARX, and VARMA models.

<b>Function</b>	<b>Description</b>
vgxar	Convert VARMA specification into a pure vector autoregressive (VAR) model
vgxcount	Count restricted and unrestricted parameters in VAR or VARX models
vgxdisp	Display VGX model parameters and standard errors in different formats
vgxget	Get multivariate time-series specification parameters
vgxinfer	Infer innovations of a VGX process
vgxloglik	Compute conditional log-likelihoods of VGX process
vgxma	Convert VARMA specification into a pure vector moving average (VMA) model
vgxplot	Plot multivariate time series process
vgxpred	Generate transient response of VGX process during a specified forecast period

<b>Function</b>	<b>Description</b>
vgxproc	Generate a VGX process from an innovations process
vgxqual	Determine if a VGX process is stable and invertible
vgxset	Set or modify multivariate time-series specification parameters
vgxsim	Simulate VGX processes
vgxvarx	Solve VAR or VARX model using maximum likelihood estimation

## **Heston Stochastic Volatility Models**

The new heston function adds support for Heston stochastic volatility models to the SDE engine.

## Version 2.4 (R2008a) GARCH Toolbox Software

This table summarizes new features in V2.4 (R2008a).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	No	No

New features and changes follow:

### **Monte Carlo Simulation of Stochastic Differential Equations**

The GARCH Toolbox software now allows you to model dependent financial and economic variables, such as interest rates and equity prices, via Monte Carlo simulation of multivariate diffusion processes. For more information, see “Stochastic Differential Equations” in the GARCH Toolbox documentation.



## Version 2.3.2 (R2007b) GARCH Toolbox Software

This table summarizes new features in V2.3.2 (R2007b).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	No	No

New features and changes follow:

### Changes to `garchsim`

The `garchsim` function previously allowed you to specify the `State` argument as either a scalar or a time series matrix of standardized, independent, identically distributed disturbances to drive the output Innovations in a time series process. The `State` argument must now be a time series matrix. See the `State` input argument on the `garchsim` reference page for more information.

## Version 2.3.1 (R2007a) GARCH Toolbox Software

This table summarizes new features in V2.3.1 (R2007a).

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>
No	No	No

There are no new features or changes in this version.

## Version 2.3 (R2006b) GARCH Toolbox Software

This table summarizes new features in V2.3 (R2006b).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	No	No

New features and changes follow:

- “Data Preprocessing” on page 23
- “Demos” on page 23

### Data Preprocessing

A new Hodrick-Prescott filter, `hpfilter`, separates time series into trend and cyclical components

### Demos

A new demo uses the `hpfilter` function to reproduce the results in Hodrick and Prescott’s original paper on U.S. business cycles

## Version 2.2 (R2006a) GARCH Toolbox Software

This table summarizes new features in V2.2 (R2006a).

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	No	No

New features and changes follow:

- “User’s Guide” on page 24
- “Statistical Functions” on page 24

### User’s Guide

A new chapter in the *GARCH Toolbox User’s Guide* explains how to conduct Dickey-Fuller and Phillips-Perron unit root tests with the new statistical functions in the toolbox.

### Statistical Functions

Version 2.2 of the GARCH Toolbox software has six new functions. All of them support the ability to conduct univariate unit root tests on time series data. Three functions support augmented Dickey-Fuller unit root tests. The remaining three support Phillips-Perron unit root tests.

### Dickey-Fuller Unit Root Tests

Function	Purpose
dfARDTest	Augmented Dickey-Fuller unit root test based on AR model with drift.
dfARTest	Augmented Dickey-Fuller unit root test based on zero drift AR model.
dfTSTest	Augmented Dickey-Fuller unit root test based on trend stationary AR model.

## Phillips-Perron Unit Root Tests

Function	Purpose
ppARDTest	Phillips-Perron unit root test based on AR(1) model with drift.
ppARTest	Phillips-Perron unit root test based on zero drift AR(1) model.
ppTSTest	Phillips-Perron unit root test based on trend stationary AR(1) model.

## Version 2.1 (R14SP3) GARCH Toolbox Software

This table summarizes what's new in V2.1 (R14SP3):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems
Yes Details below	Yes Summary	No bug fixes

New features and changes follow:

### Changes to `garchsim`

A change introduced in V2.1 of the GARCH Toolbox software concerns user-specified noise processes. The `garchsim` function now allows you to provide a time series matrix of standardized, i.i.d. disturbances to drive the output Innovations in a time series process. In previous versions, you could only provide a state that was used to generate a random noise process. See the `State` input argument on the `garchsim` reference page for more information.

### Compatibility Considerations

**`garchsim` argument `Is` renamed.** In V2.1, the `garchsim` argument `Seed` is renamed to `State` for consistency with the MATLAB `rand` and `randn` functions. The name change, in itself, introduces no backward incompatibilities. The following topic explains a related change.

**`garchsim` defaults to current random number generator state.** In V2.0.1 of the GARCH Toolbox software, the `garchsim` function used the initial random number generator state, 0, if you did not specify a value for the `Seed` argument. The `Seed` argument corresponded to the `rand` and `randn` state value.

In V2.1, if you do not specify a value for the `State` (formerly `Seed`) argument, `garchsim` uses the current state of `rand` and `randn`, rather than the initial state. Use the commands `s = rand('state')` and `s = randn('state')` to determine the current state of these random number generators. For more information, see the `rand` and `randn` reference pages.

## Compatibility Summary for Econometrics Toolbox Software

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions.

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
<b>Latest Version Econometrics Toolbox Software V2.0.1 (R2011b)</b>	See the <b>Compatibility Considerations</b> subheading for each of these new features and changes: <ul style="list-style-type: none"> <li>• “Warning and Error ID Changes” on page 4</li> </ul>
Econometrics Toolbox Software V2.0 (R2011a)	None
Econometrics Toolbox Software V1.4 (R2010b)	See the <b>Compatibility Considerations</b> subheading for each of these new features and changes: <ul style="list-style-type: none"> <li>• “Functions Being Removed” on page 7</li> </ul>
Econometrics Toolbox Software V1.3 (R2010a)	See the <b>Compatibility Considerations</b> subheading for each of these new features and changes: <ul style="list-style-type: none"> <li>• “Functions Being Removed” on page 10</li> <li>• “New Organization and Naming Standard for Data Sets” on page 12</li> </ul>

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
	<ul style="list-style-type: none"> <li>• “New Naming Convention for Demos and Example Functions” on page 13</li> </ul>
Econometrics Toolbox Software V1.2 (R2009b)	<p>See the <b>Compatibility Considerations</b> subheading for each of these new features and changes:</p> <ul style="list-style-type: none"> <li>• “Unit Root Tests” on page 14</li> </ul>
Econometrics Toolbox Software V1.1 (R2009a)	<p>See the <b>Compatibility Considerations</b> subheading for each of these new features and changes:</p> <ul style="list-style-type: none"> <li>• “Hypothesis Tests” on page 16</li> <li>• “Structural VAR, VARX, and VARMAX models” on page 16</li> </ul>
Econometrics Toolbox Software V1.0 (R2008b)	None
GARCH Toolbox Software V2.4 (R2008a)	None
GARCH Toolbox Software V2.3.2 (R2007b)	None
GARCH Toolbox Software V2.3.1 (R2007a)	None
GARCH Toolbox Software V2.3 (R2006b)	None



<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
GARCH Toolbox Software V2.2 (R2006a)	None
GARCH Toolbox Software V2.1 (R14SP3)	See the <b>Compatibility Considerations</b> subheading for each of these new features and changes: <ul style="list-style-type: none"><li>• “Changes to garchsim” on page 26</li></ul>