Rho-Works Software

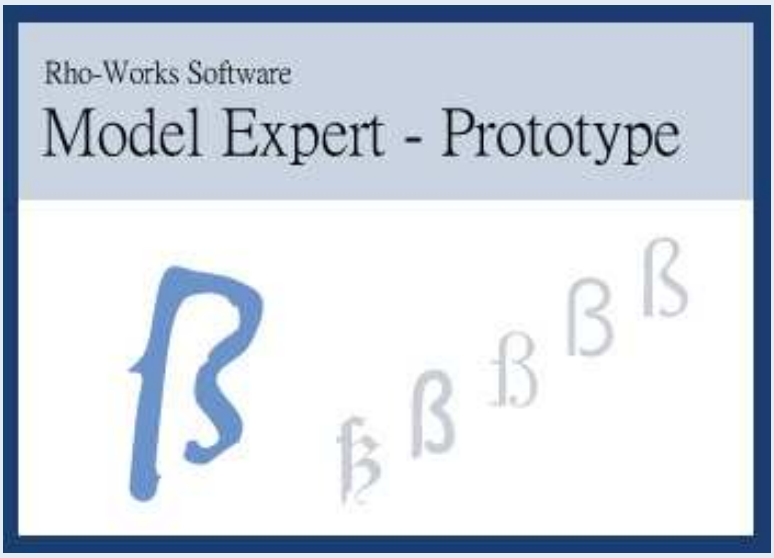
Model Expert

Prototype version – User's Guide

INTRODUCTION

There are many econometric packages available on the market nowadays. Nevertheless, they usually demand the analyst to employ considerable expertise, experience and attention to estimate a model and validate its results. Model Expert is different.

Imagine an econometric application that is always one step ahead of you, testing possible flaws on the analysis and suggesting the best course of action at each stage of the process. Interactively. Trying thousands of possible variations of your work silently, reporting the most interesting findings in real time. Giving you freedom to explore your options with one click. Maximizing the leverage from your experience. Welcome to Model Expert.



1. INSTALLATION

► INSTALLING THE SOFTWARE

Model Expert does not need to be 'installed'. You may invoke ModelExplorer.exe from wherever it is located (a floppy disk, inside a Zip file, your hard drive, a CDROM, etc.) It will be always ready to work.

However, it is a good idea to put it on a folder on your hard drive, so you can find it easily. To do this, follow these two steps:

1. Create a folder for **Model Expert**, using *Windows Explorer*. For instance, you may create C:\Program Files\Model Expert

2. Copy the executable *Model_Expert.exe* into that folder.

Now you can double click *Model_Expert.exe* and execute it for the first time. You may also create a shortcut on your desktop or Start menu in order to access it more easily.

► UNINSTALLING THE SOFTWARE

If you want to 'uninstall' **Model Expert**, just delete *Model_Expert.exe*. If you have created a Model Expert folder, remove it too.

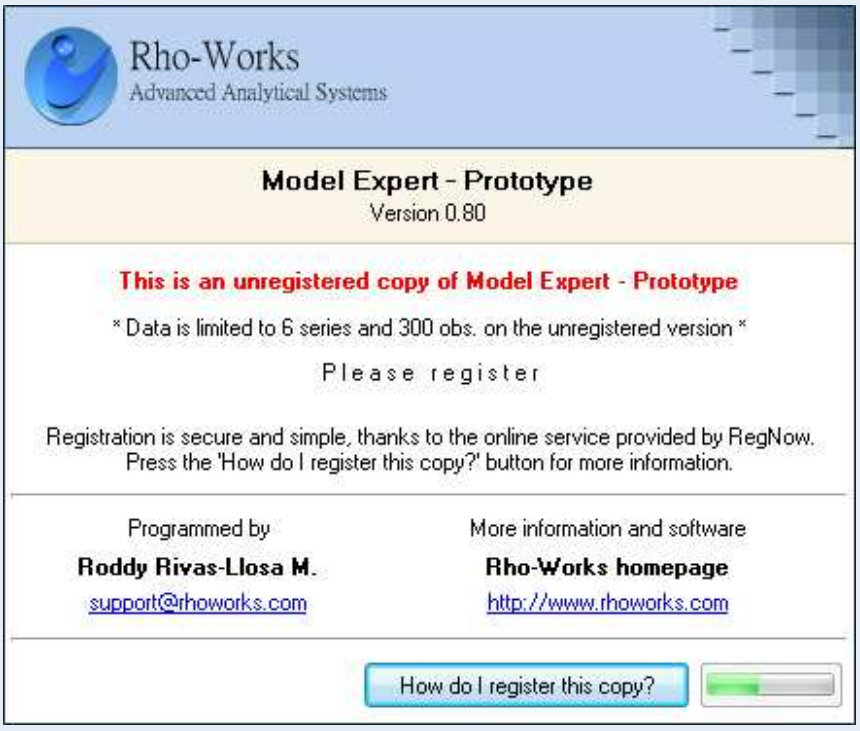
There is no need of using the 'Add/Remove Software' from the Control Panel.

2. THE BASICS

► RUNNING THE PROGRAM

When running the evaluation version of **Model Expert** it is likely that a window will pop-up reminding you to register the product. If you do not want to register, just wait until the progress bar is full and press OK. The registered and evaluation versions of the program only differ in the presence of this introductory window.

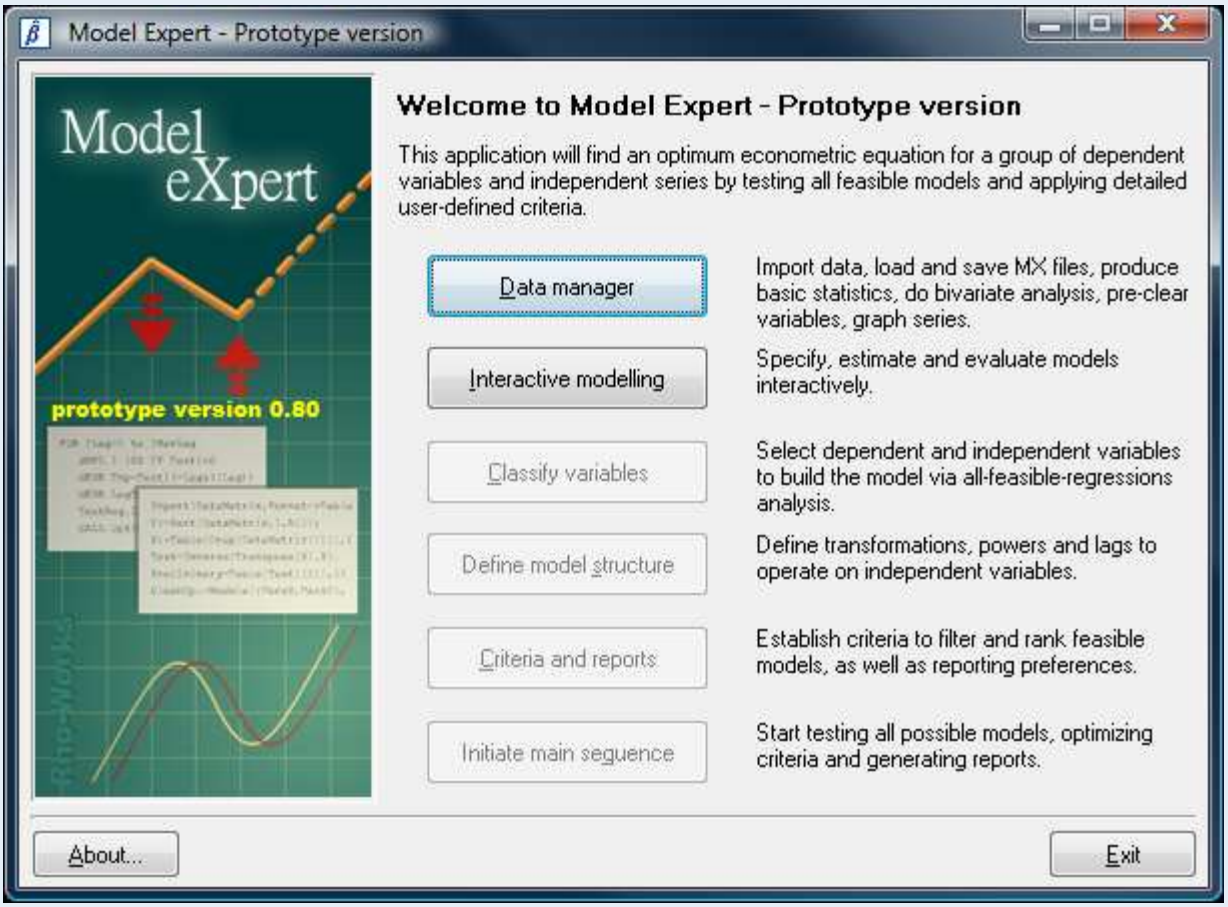
If you want to register the software, please refer to section 5 for further instructions.



► THE MAIN WINDOW

The main window of **Model Expert** shows six main buttons, one for each program module. Only the first two modules are currently implemented.

This is a picture of the main screen:



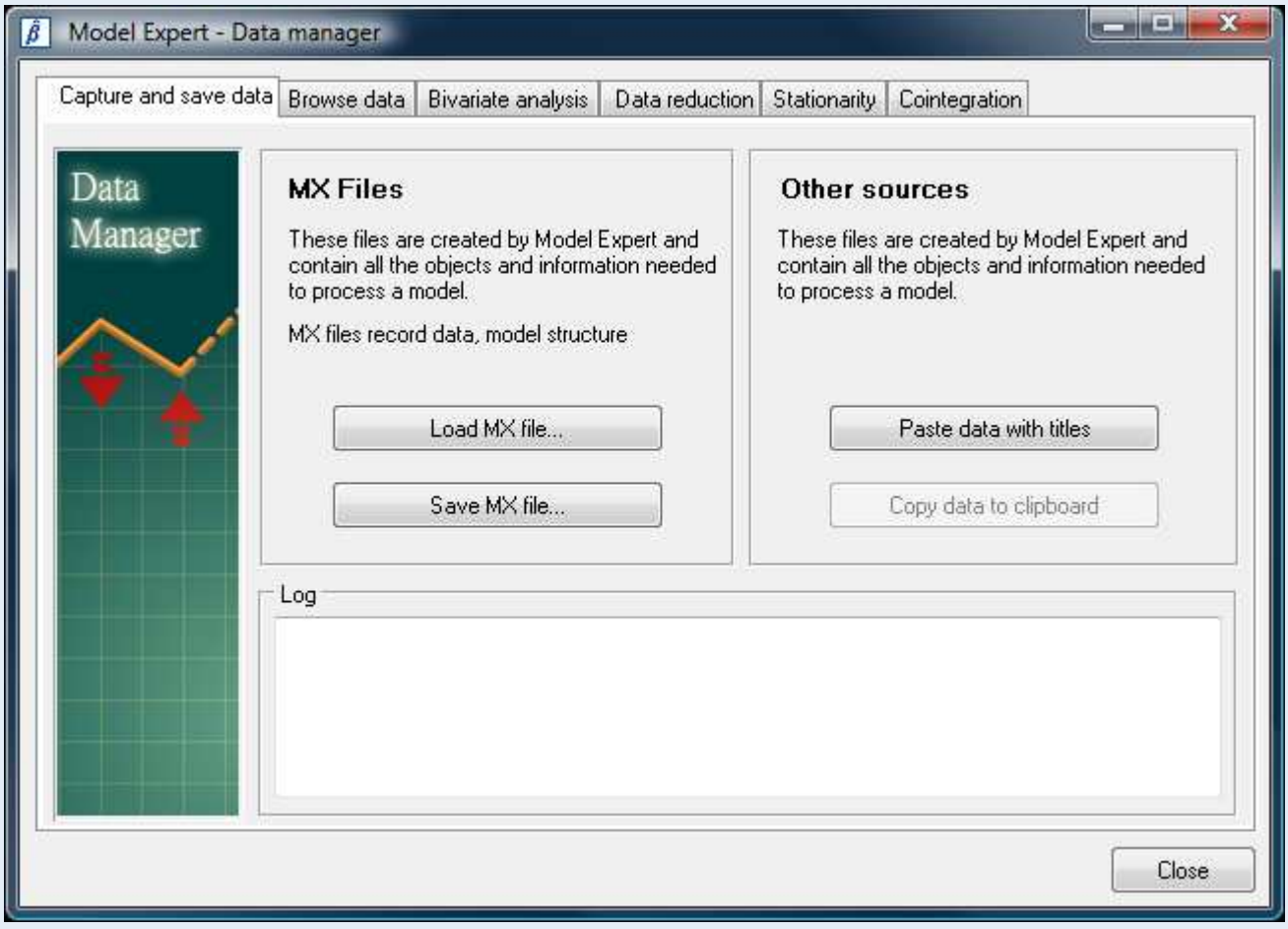
3. THE DATA MANAGER

► OVERVIEW

The Data Manger module allows you to import information from other applications and save your data to a proprietory file format.

This module also helps you having a closer look at your information, analyzing basic trends, bivariate relations, multi-collinearity, stationarity and cointegration.

This is a picture of the Data Manager screen:



► IMPORTING DATA

To import data from a spreadsheet, just put your information using the following structure:

ROWS: Data observations
COLUMNS: Variables

The first row indicates the variable name. Do not include dates as the first column, observations are assumed to be uniformly spaced time series.

Copy that information matrix from your spreadsheet and press the “Paste data with titles” button on **Model Expert.**

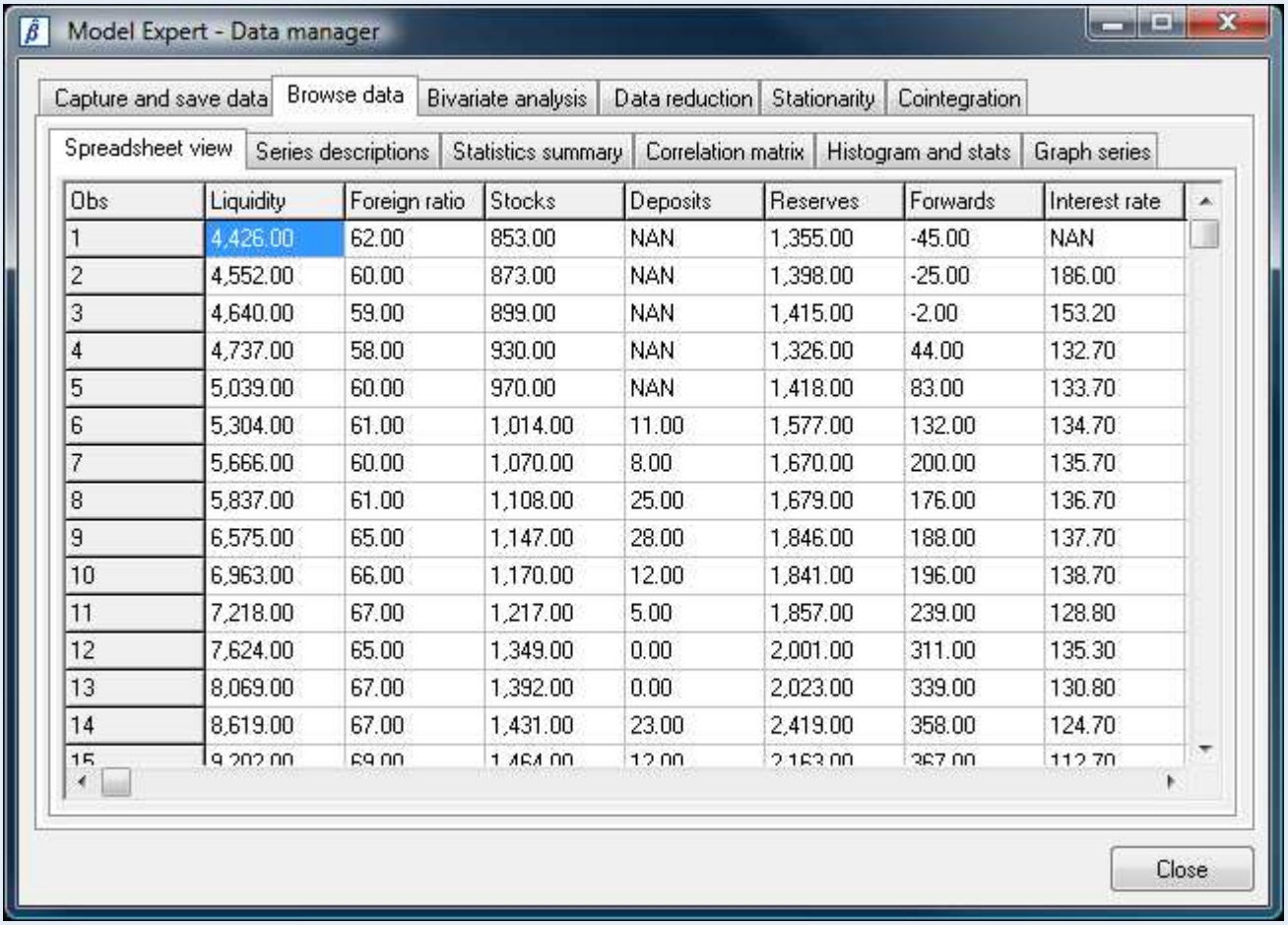
► EXPORTING DATA

To export all recorded information to a spreadsheet, press the “Copy data to clipboard” button.

4. BROWSING DATA

► SPREADSHEET VIEW

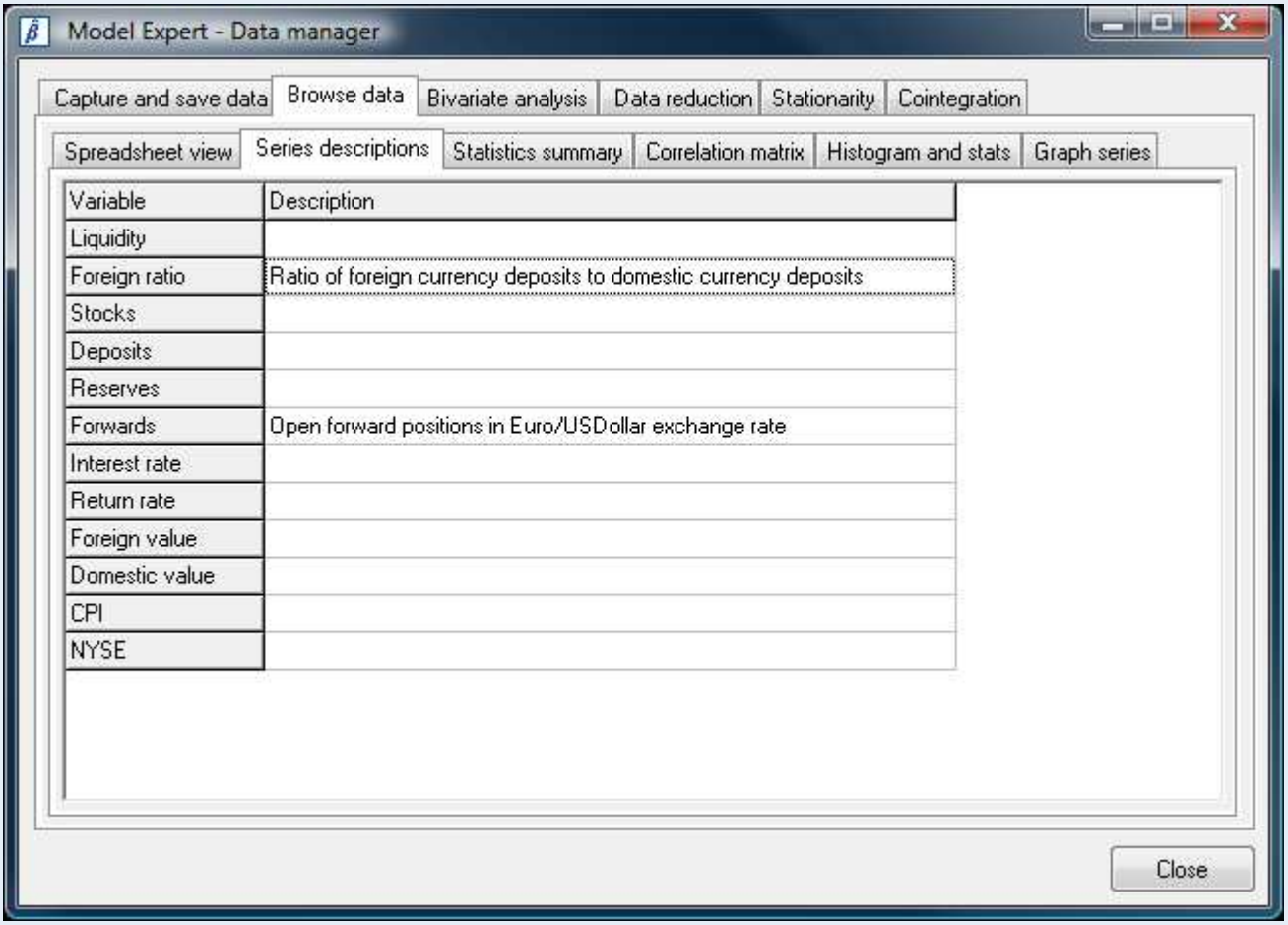
This window will allow you to check the imported data.



Obs	Liquidity	Foreign ratio	Stocks	Deposits	Reserves	Forwards	Interest rate
1	4,426.00	62.00	853.00	NAN	1,355.00	-45.00	NAN
2	4,552.00	60.00	873.00	NAN	1,398.00	-25.00	186.00
3	4,640.00	59.00	899.00	NAN	1,415.00	-2.00	153.20
4	4,737.00	58.00	930.00	NAN	1,326.00	44.00	132.70
5	5,039.00	60.00	970.00	NAN	1,418.00	83.00	133.70
6	5,304.00	61.00	1,014.00	11.00	1,577.00	132.00	134.70
7	5,666.00	60.00	1,070.00	8.00	1,670.00	200.00	135.70
8	5,837.00	61.00	1,108.00	25.00	1,679.00	176.00	136.70
9	6,575.00	65.00	1,147.00	28.00	1,846.00	188.00	137.70
10	6,963.00	66.00	1,170.00	12.00	1,841.00	196.00	138.70
11	7,218.00	67.00	1,217.00	5.00	1,857.00	239.00	128.80
12	7,624.00	65.00	1,349.00	0.00	2,001.00	311.00	135.30
13	8,069.00	67.00	1,392.00	0.00	2,023.00	339.00	130.80
14	8,619.00	67.00	1,431.00	23.00	2,419.00	358.00	124.70
15	9,202.00	69.00	1,464.00	12.00	2,163.00	367.00	112.70

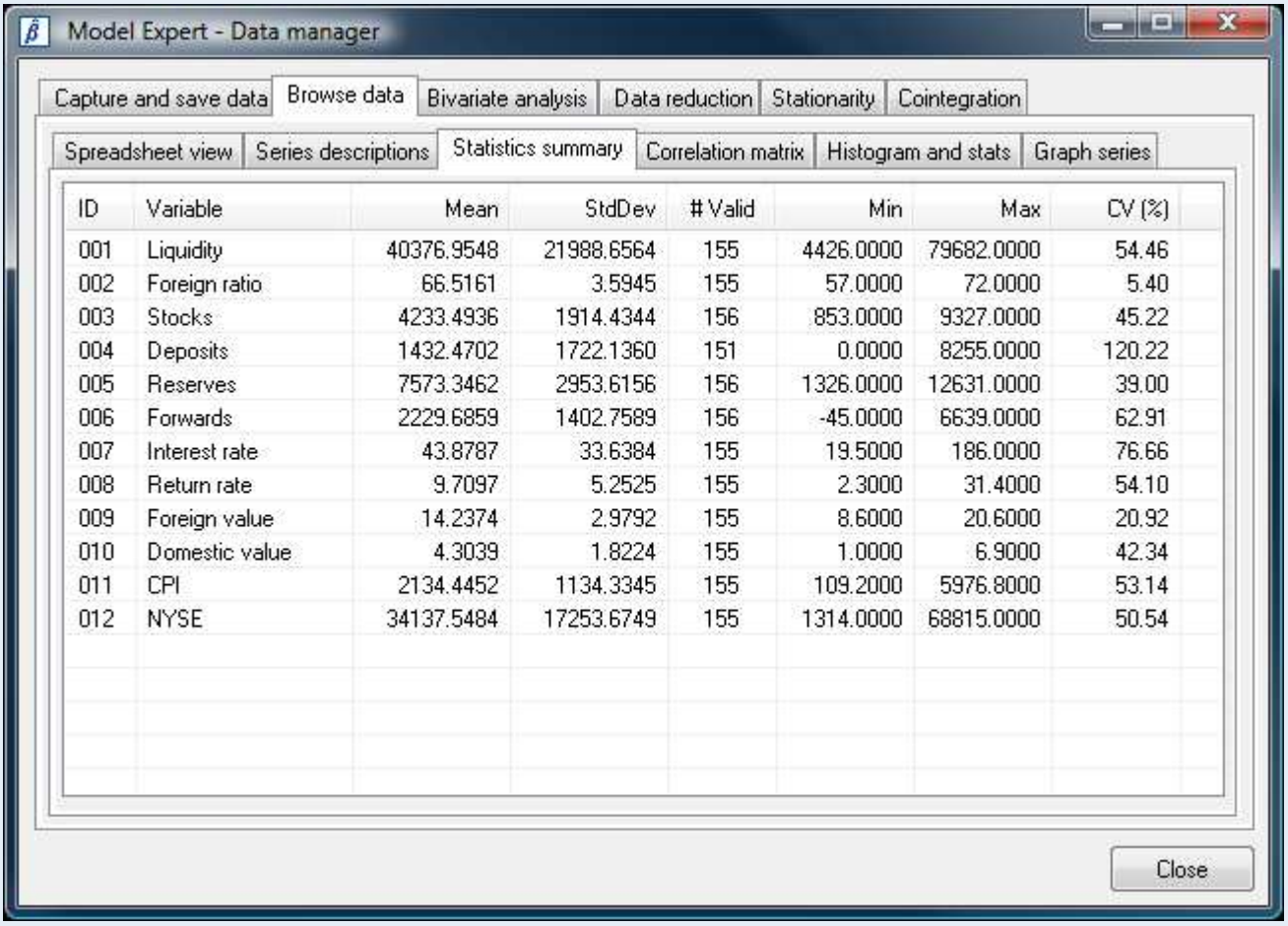
► SERIES DESCRIPTIONS

You may attach a long description to clearify the contents of each series. This information is saved if you use the MX format file.



► STATISTICS SUMMARY

The statistics summary presents general statistical indicators calculated for each data series.

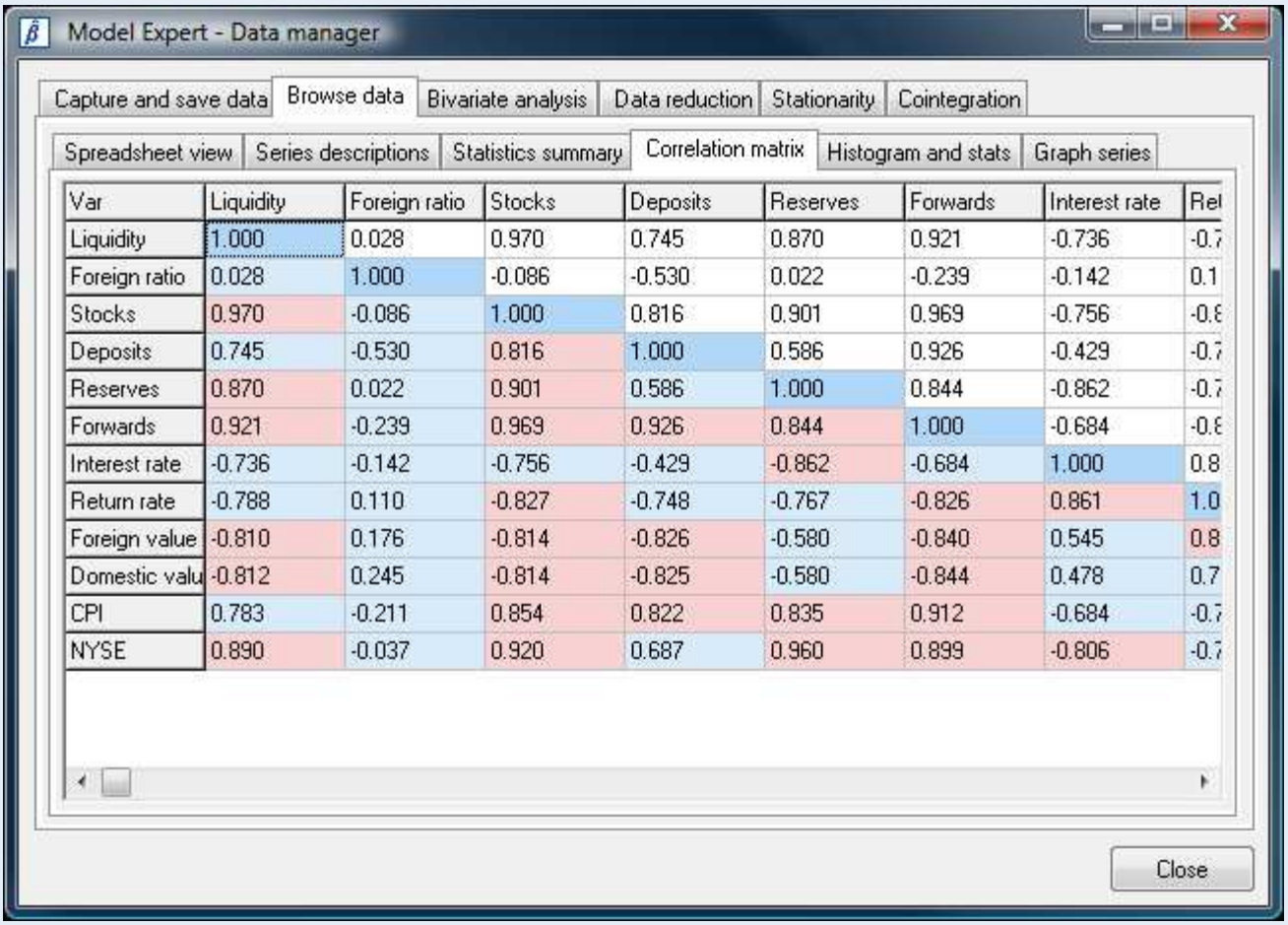


ID	Variable	Mean	StdDev	# Valid	Min	Max	CV (%)
001	Liquidity	40376.9548	21988.6564	155	4426.0000	79682.0000	54.46
002	Foreign ratio	66.5161	3.5945	155	57.0000	72.0000	5.40
003	Stocks	4233.4936	1914.4344	156	853.0000	9327.0000	45.22
004	Deposits	1432.4702	1722.1360	151	0.0000	8255.0000	120.22
005	Reserves	7573.3462	2953.6156	156	1326.0000	12631.0000	39.00
006	Forwards	2229.6859	1402.7589	156	-45.0000	6639.0000	62.91
007	Interest rate	43.8787	33.6384	155	19.5000	186.0000	76.66
008	Return rate	9.7097	5.2525	155	2.3000	31.4000	54.10
009	Foreign value	14.2374	2.9792	155	8.6000	20.6000	20.92
010	Domestic value	4.3039	1.8224	155	1.0000	6.9000	42.34
011	CPI	2134.4452	1134.3345	155	109.2000	5976.8000	53.14
012	NYSE	34137.5484	17253.6749	155	1314.0000	68815.0000	50.54

► CORRELATION MATRIX

The pairwise correlation matrix is shaded for you convenience. Values higher than 0.8 in absolte values appear in red.

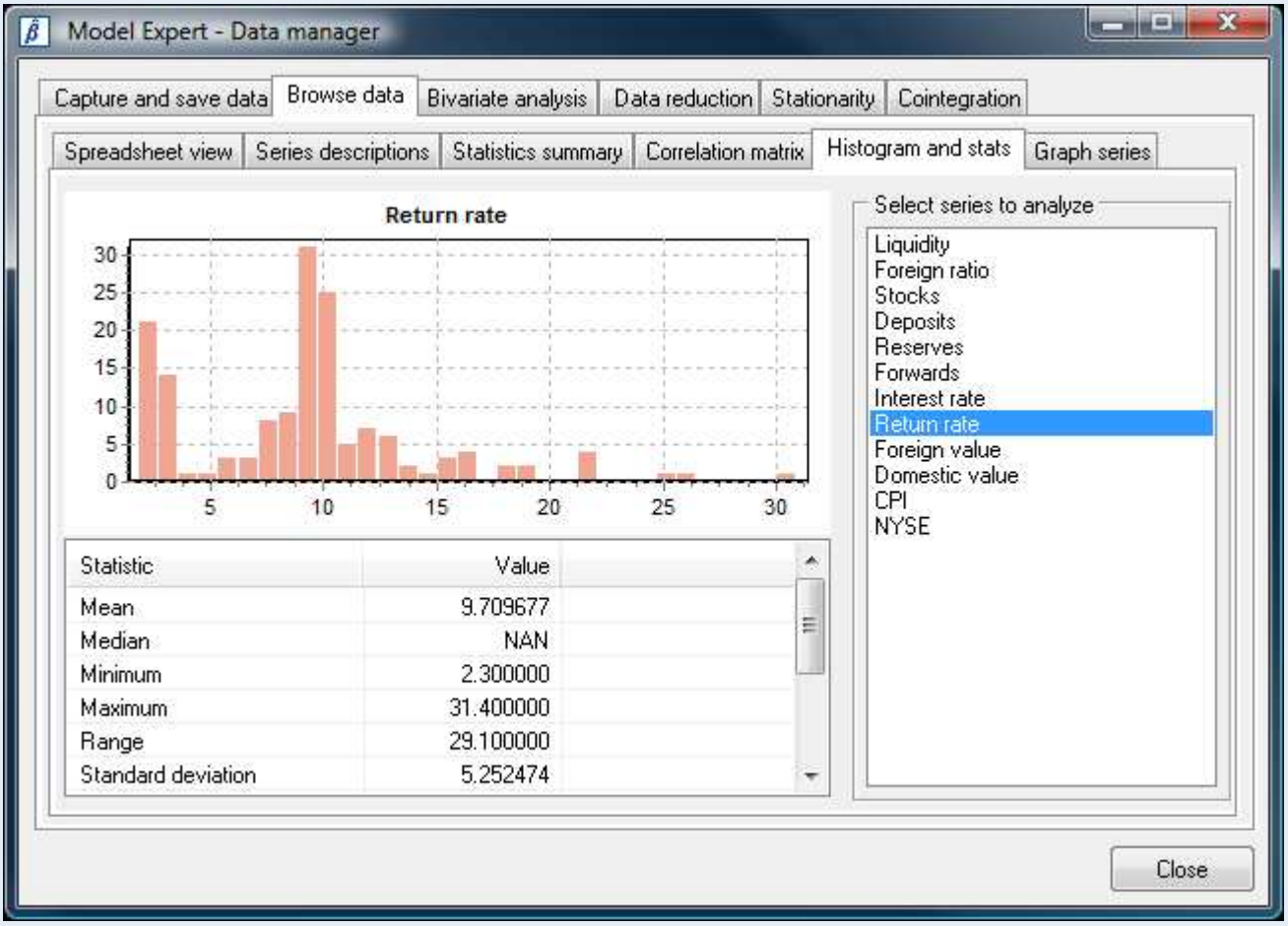
Remember that this matrix is symmetrical.



Var	Liquidity	Foreign ratio	Stocks	Deposits	Reserves	Forwards	Interest rate	Rel
Liquidity	1.000	0.028	0.970	0.745	0.870	0.921	-0.736	-0.7
Foreign ratio	0.028	1.000	-0.086	-0.530	0.022	-0.239	-0.142	0.1
Stocks	0.970	-0.086	1.000	0.816	0.901	0.969	-0.756	-0.8
Deposits	0.745	-0.530	0.816	1.000	0.586	0.926	-0.429	-0.7
Reserves	0.870	0.022	0.901	0.586	1.000	0.844	-0.862	-0.7
Forwards	0.921	-0.239	0.969	0.926	0.844	1.000	-0.684	-0.8
Interest rate	-0.736	-0.142	-0.756	-0.429	-0.862	-0.684	1.000	0.8
Return rate	-0.788	0.110	-0.827	-0.748	-0.767	-0.826	0.861	1.0
Foreign value	-0.810	0.176	-0.814	-0.826	-0.580	-0.840	0.545	0.8
Domestic valu	-0.812	0.245	-0.814	-0.825	-0.580	-0.844	0.478	0.7
CPI	0.783	-0.211	0.854	0.822	0.835	0.912	-0.684	-0.7
NYSE	0.890	-0.037	0.920	0.687	0.960	0.899	-0.806	-0.7

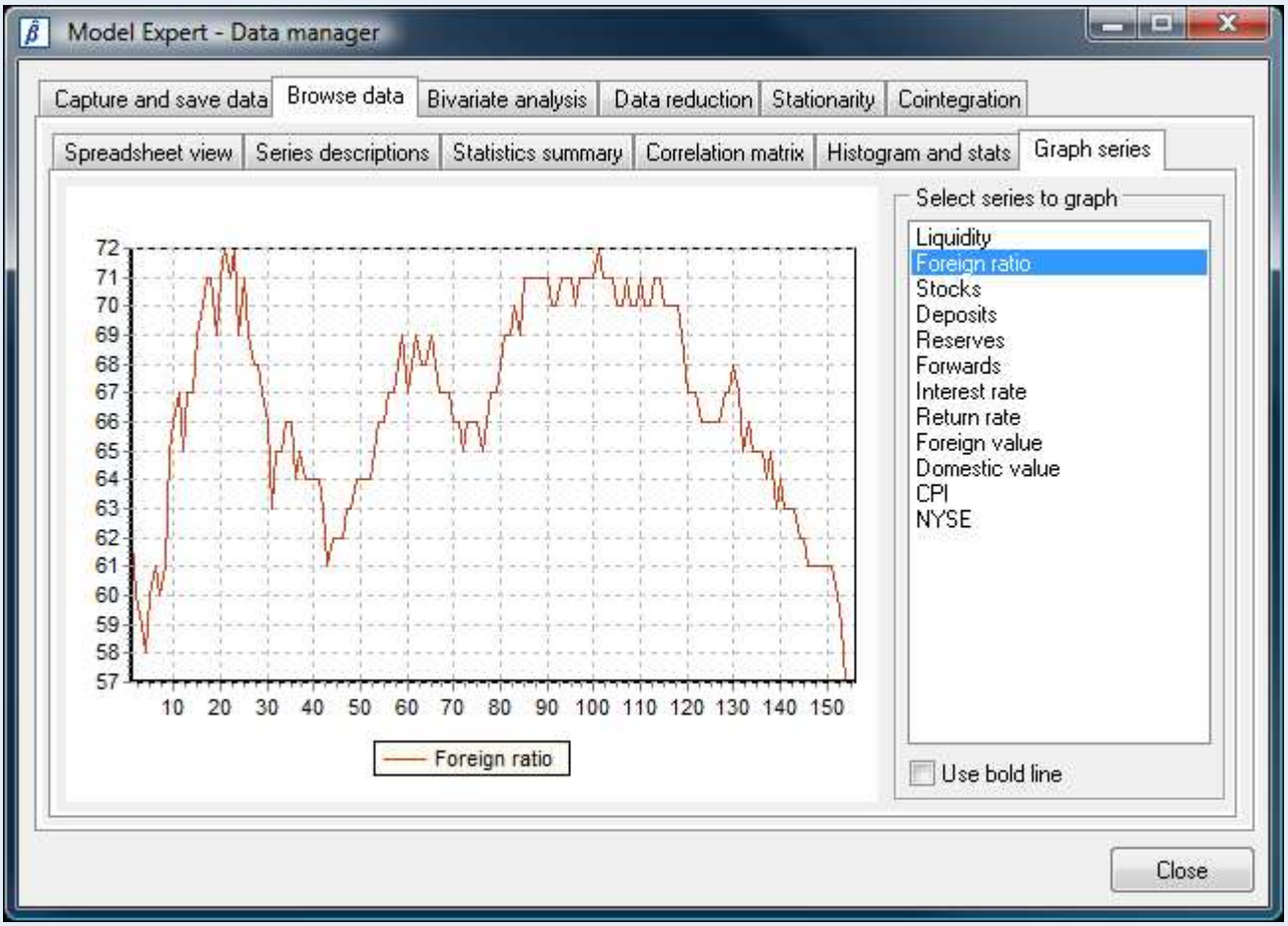
► HISTOGRAM AND STATS

This window allows you to take a quick look at the frequency distribution of values in each data series.



► GRAPH SERIES

The graph series window draws a time-series graph of each data series.



5. BIVARIATE ANALYSIS

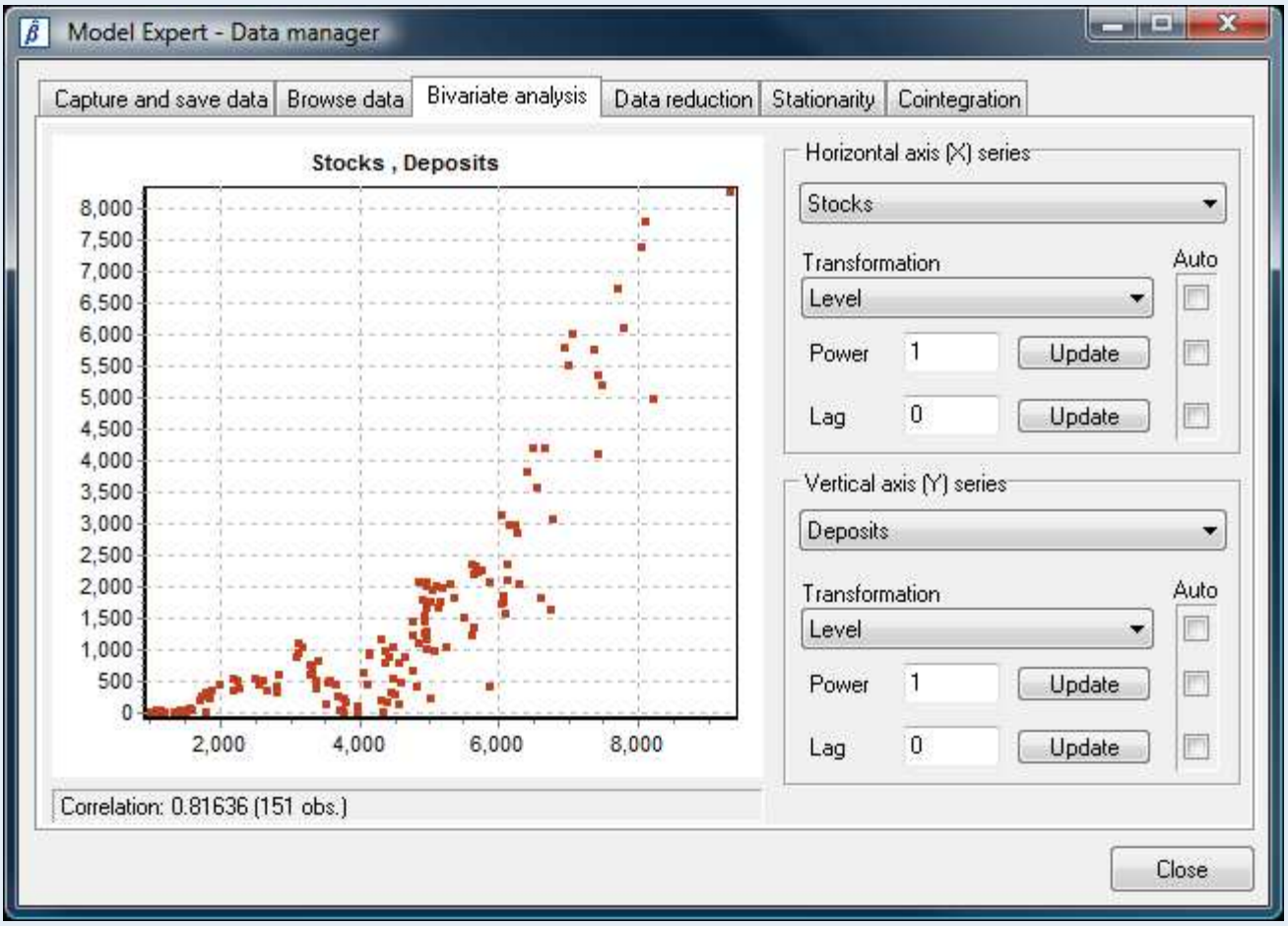
Bivariate analysis may provide important insights on the internal relationships between data series.

Use this module to generate XY scatter plots of two variables, applying different transformations or combinations of them:

- Logarithms, differences
- Powers
- Lags

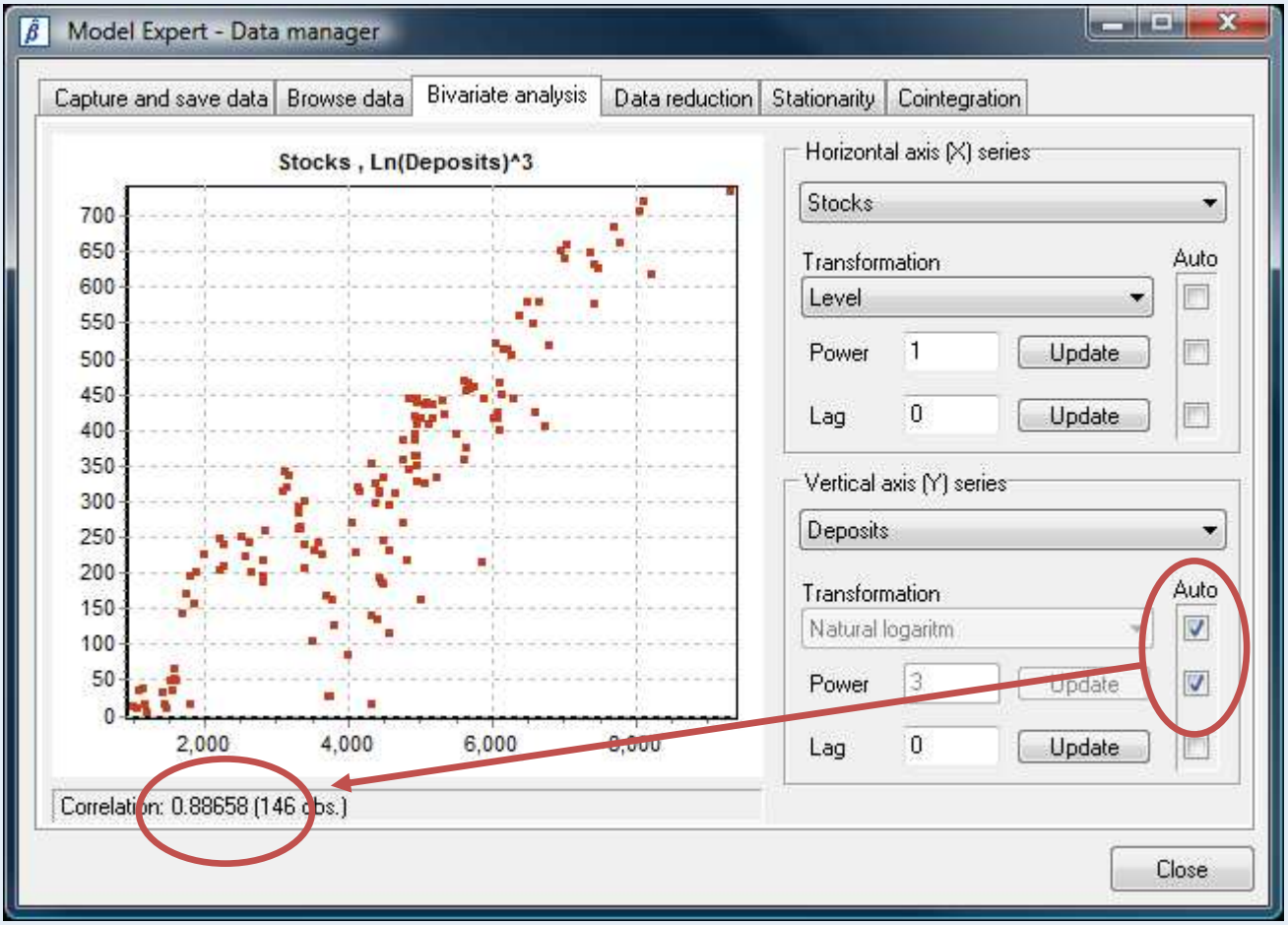
► MANUAL ANALYSIS

By manually specifying the transformations, you can create the graph you need. Check the correlation value at the bottom left to have a notion of the degree of linear association between the data series.



► AUTOMATIC ANALYSIS

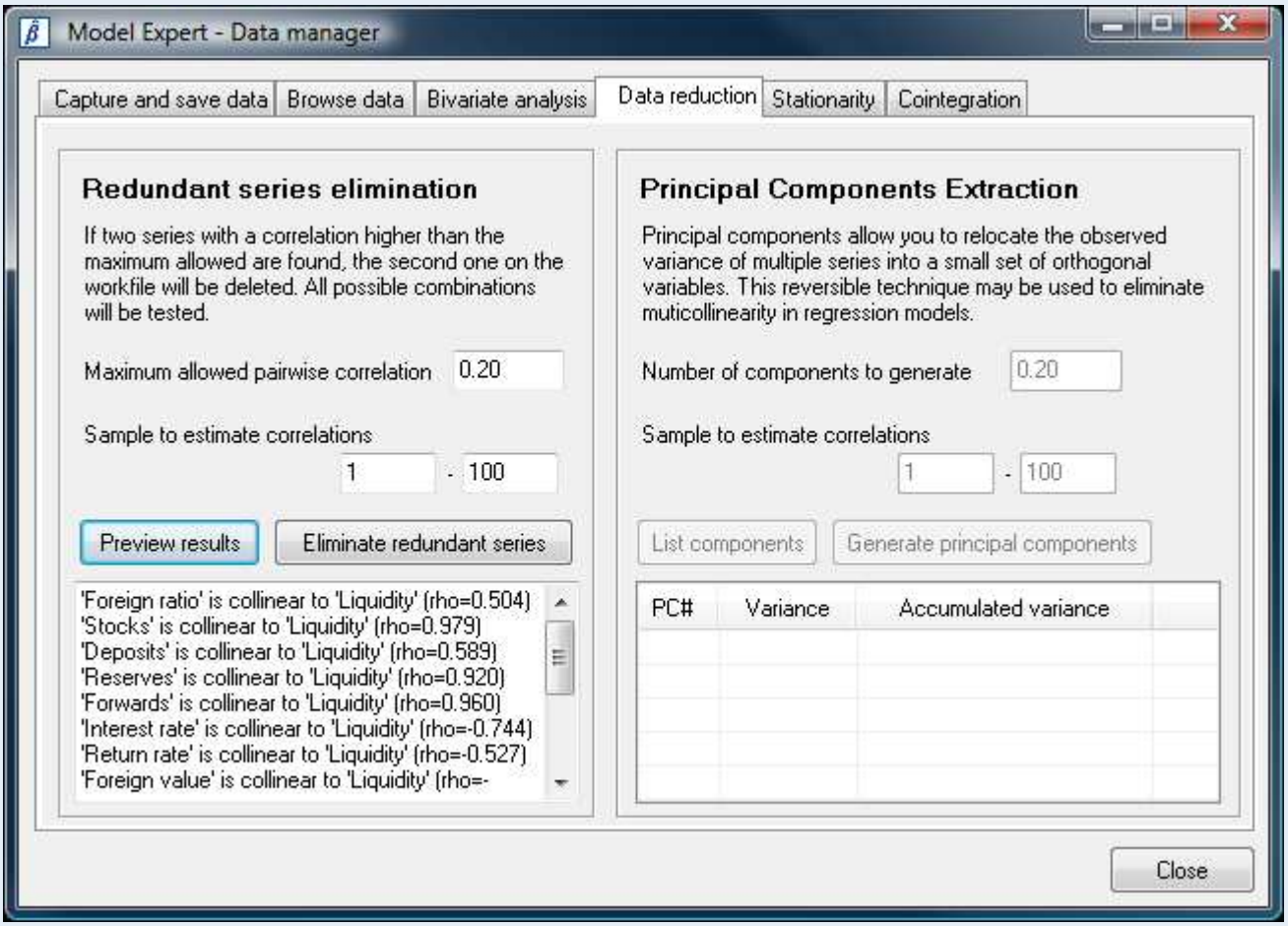
If you activate the checkmarks to the right of each parameter, the system will test all possible combinations and report the best alternative to maximize the correlation between the transformed variables.



6. DATA REDUCTION

With this tool you will be able to detect high correlations among variables and, if appropriate, remove redundant series from the data file.

The Principal Components Extraction section is not enabled yet.



7. STATIONARITY

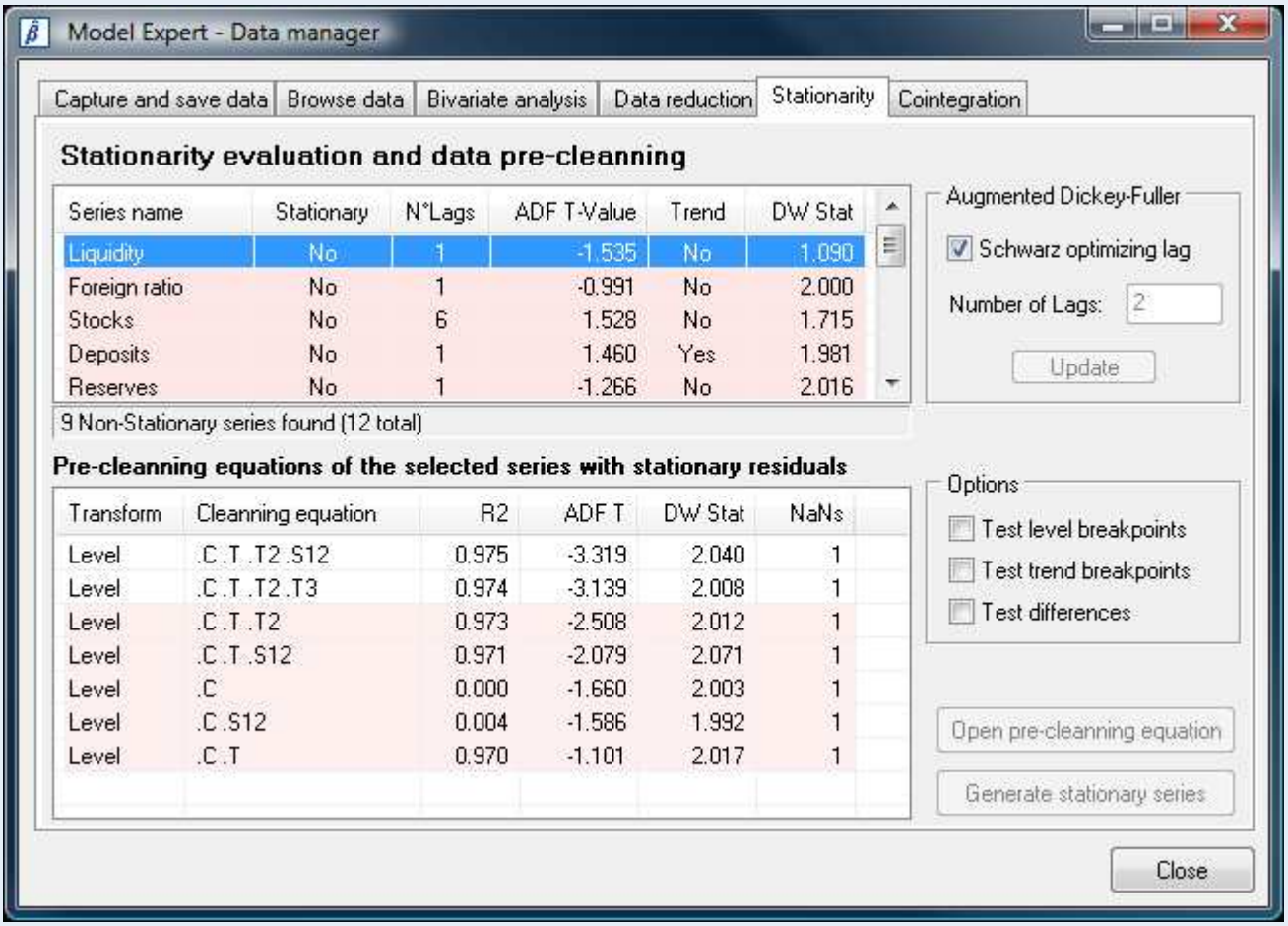
One of the most common problems found when modeling a data series is the presence of unit-roots. Use the stationarity tool to quickly detect non-stationary series and generate stationary transformations in one quick process.

When you enter this window, it will show the list of all data series and, in red, the ones that are not stationary.

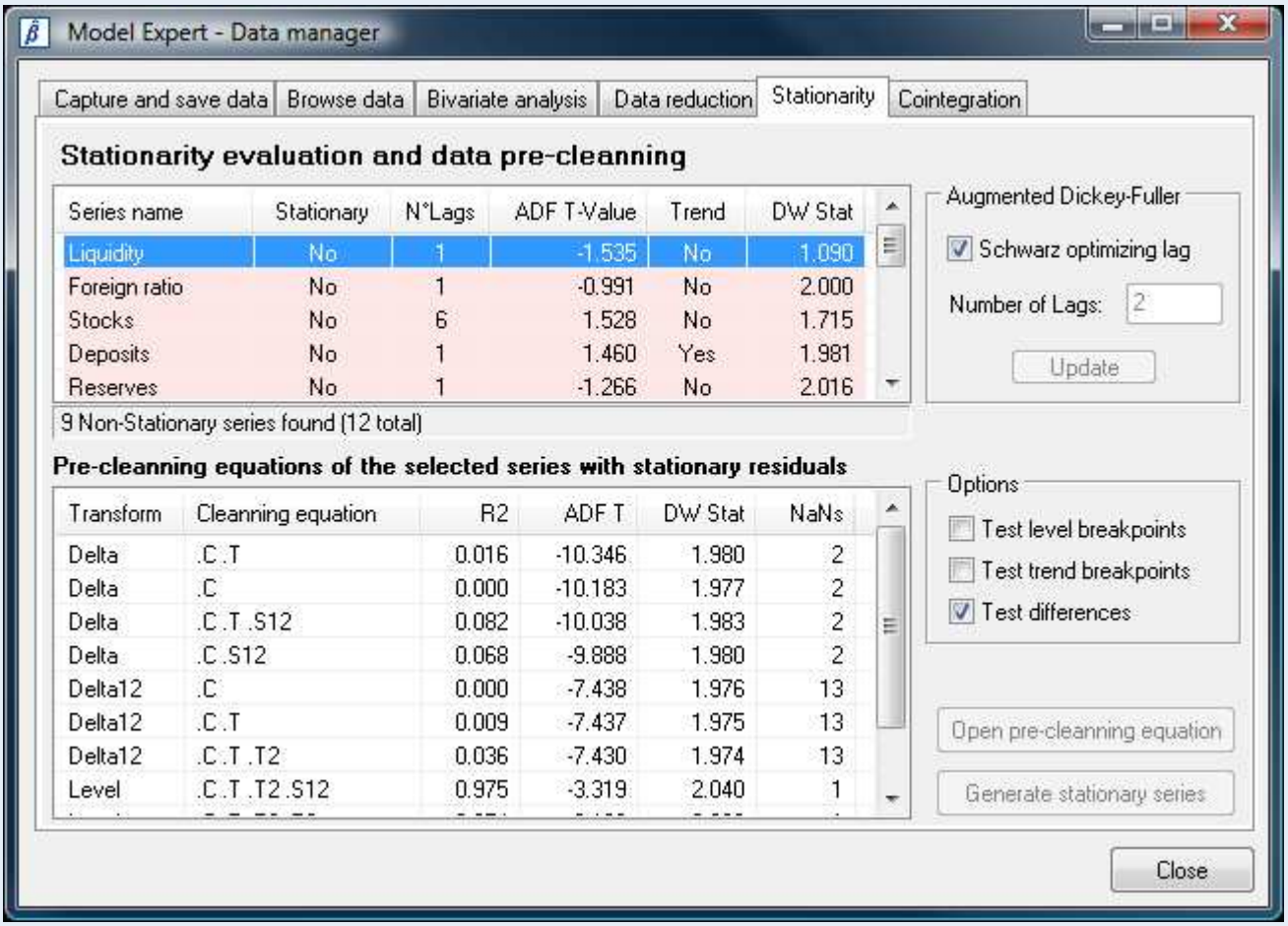
To detect if a series is not stationary, the program runs an Augmented Dickey-Fuller (ADF) test. If you check the option on the rightmost section, the number of lags in the test will be optimized using the Schwarz criterion. Remember that a low ADF value suggests the presence of a unit root.

To make a non-stationary series stationary (i.e. remove the unit root), use one of the possible "pre-cleaning equations" shown below when you click a variable on the topmost list. The simplest of these equations is just a trivial regression of the series and a constant (.C). More sophisticated pre-cleaning equations include:

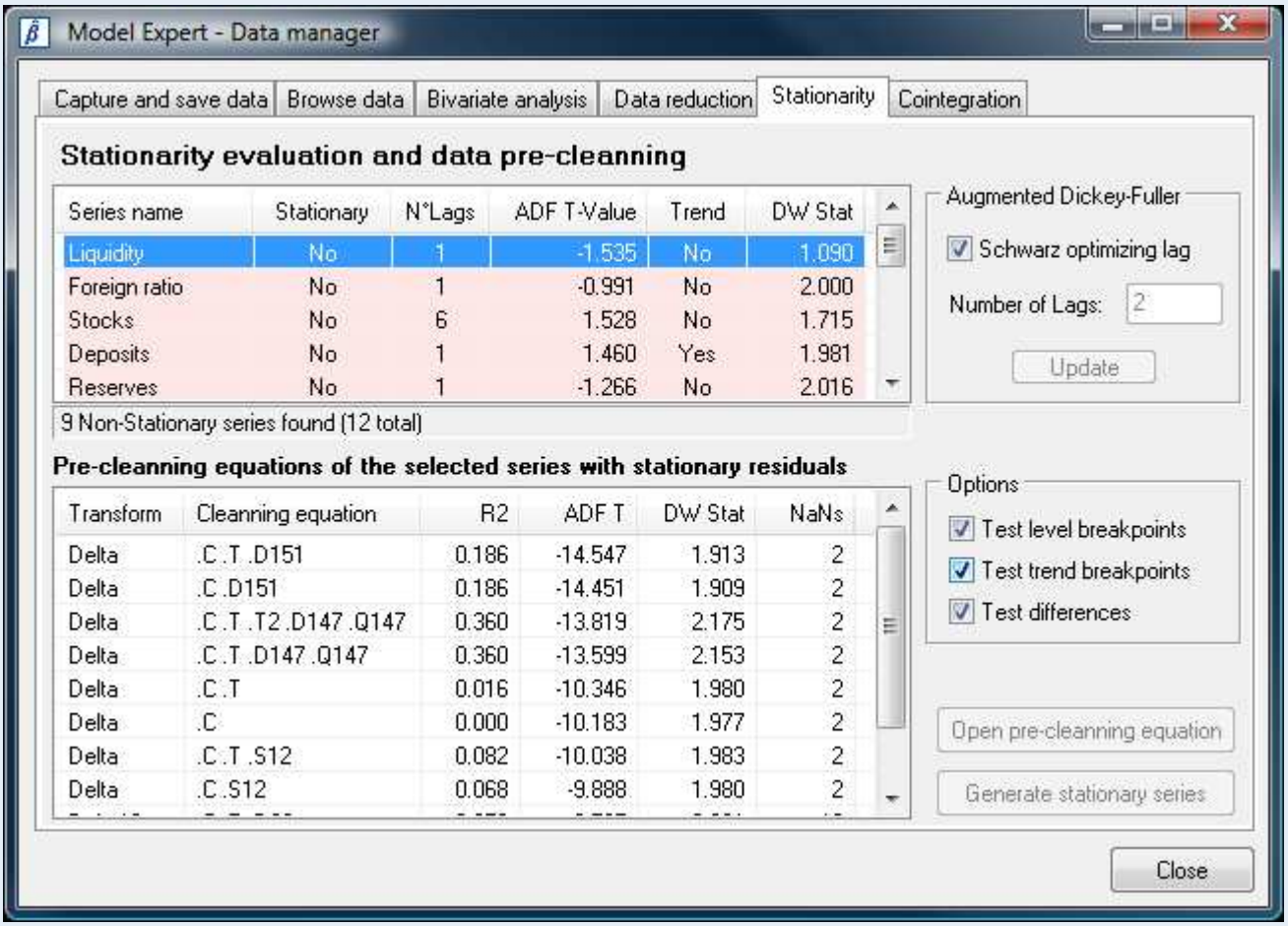
- Differences of one period (Delta) or twelve periods (Delta12)
- Linear trends (.T)
- Second-degree trends (.T2)
- Third-degree trends (.T3)
- Breakpoint dummy variables of level (.Dx) on a specific observation (x)
- Trend breakpoint dummy variables (.Qx) on a specific observation (x), and
- Seasonal removal variables (.Sn) of different frequencies (n).



Review the pre-cleaning equations. They are sorted in such a way that the first one should have the best ADF test for the residuals (the residual is the *stationarized* original series).



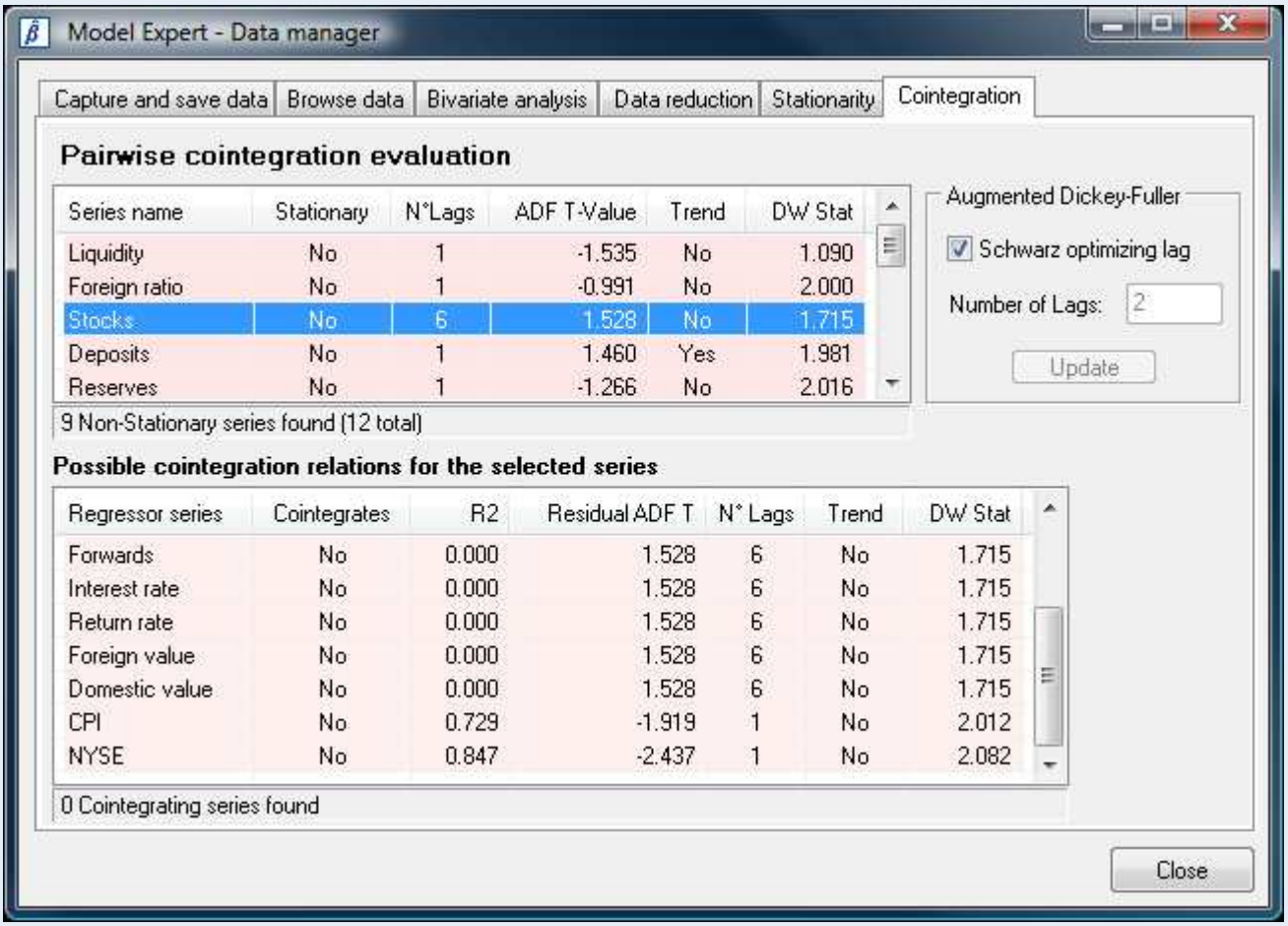
It may be advisable to enable the testing of breakpoints in order to produce a more stable residual behavior.



Once you have picked the pre-cleaning equation of your choice, just press the “Generate stationary series” to create a new residual series based on that equation.

8. COINTEGRATION

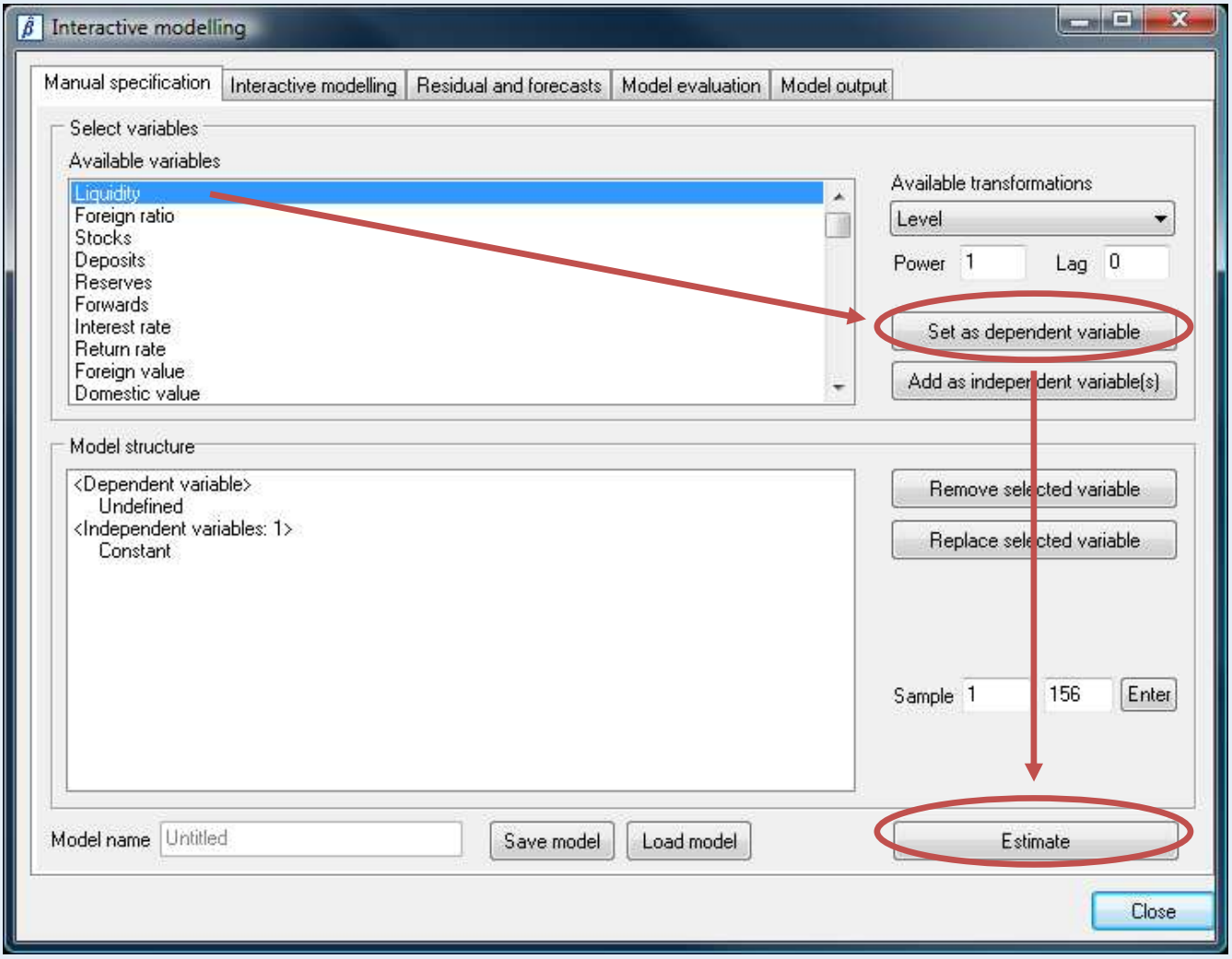
Use the next screen to analyze cointegration between series. On the top list each series will be labeled as stationary or non-stationary. If a non-stationary series can be regressed with another non-stationary series and produce a stationary residual, then you have a basic cointegration equation.



9. INTERACTIVE MODELLING

The interactive modeling module makes it very easy to optimize the structure of an Ordinary Least Squares regression model.

First of all, select one variable as the dependent (explained) series.

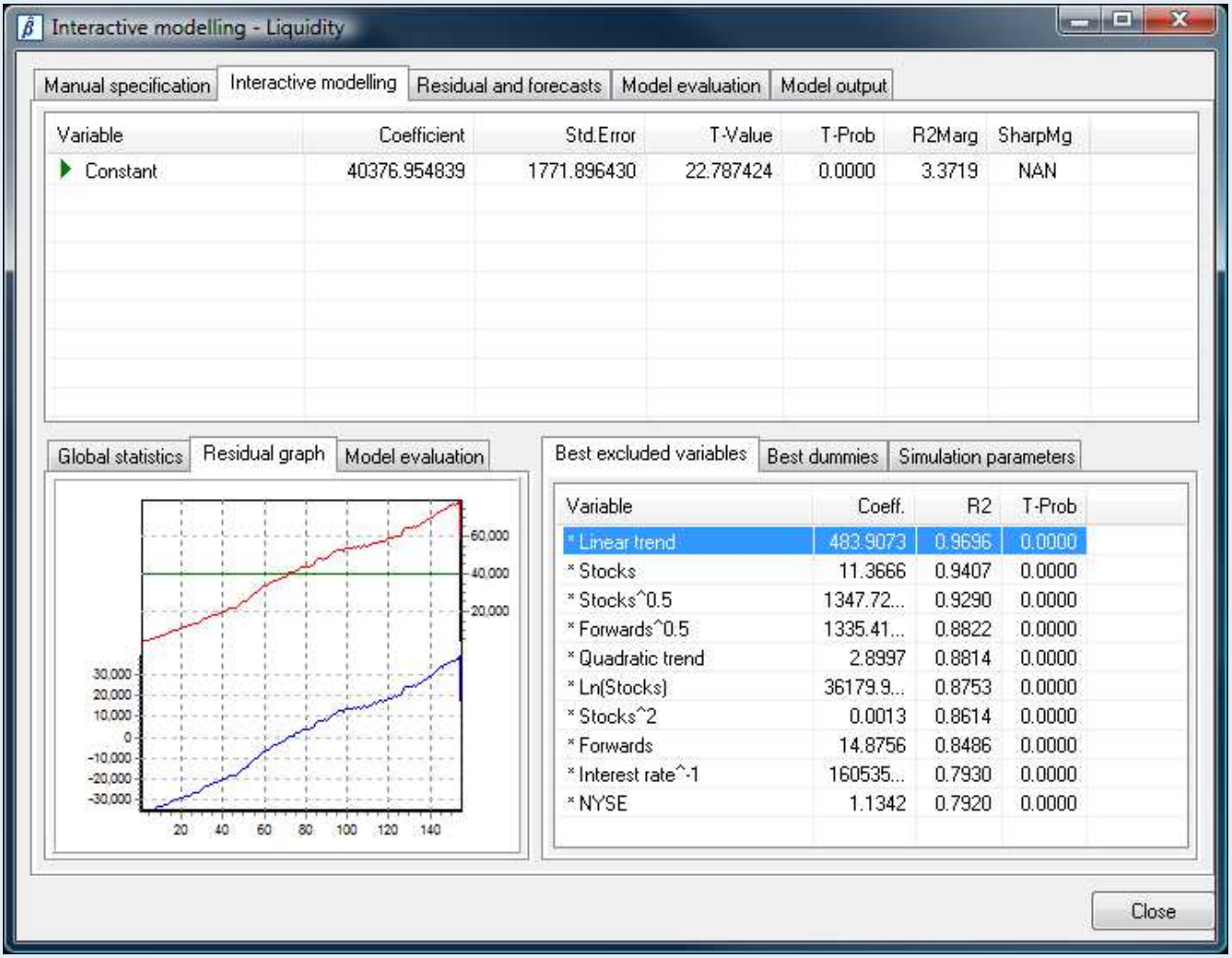


Then, press the estimate button. If you would like to manually add independent variables of change the sample, you can do that using the 'Model structure' panel. Nevertheless, the interactive method that will be explained below is preferable.

When you enter the second tab, you will see a simplified model structure on the top (at this point with just a constant as the only independent variable).

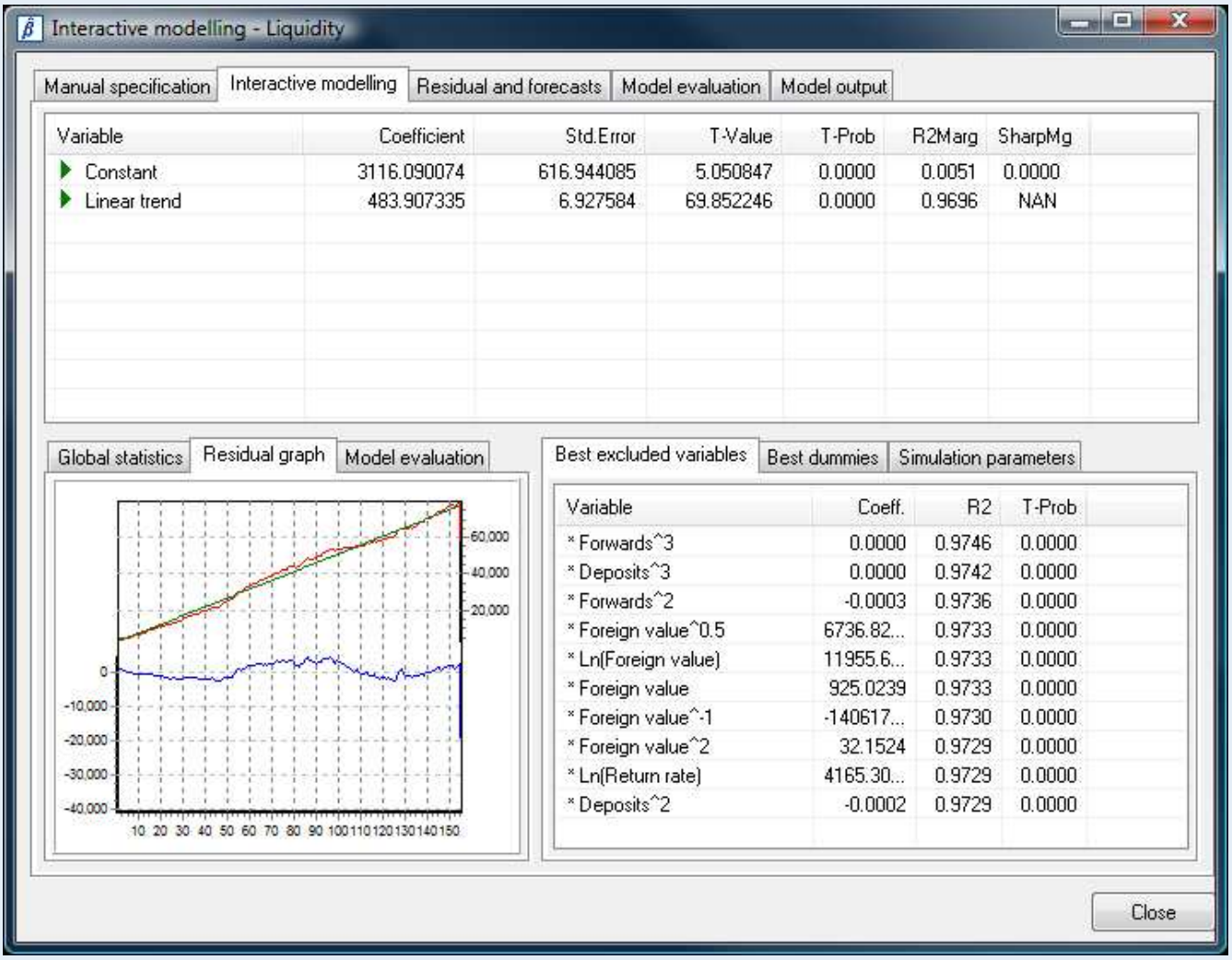
On the bottom left you will have the quick model appraisal panel. There you will find a summary of the main statistical indicators for the equation, a observed-fitted-residual graph (shown below) and a model evaluation panel.

To the right, you will find the ranking of the *best omitted* variables. The first one will be the variable that, if added to the model, increases the R2 coefficient to the highest level, and so on.



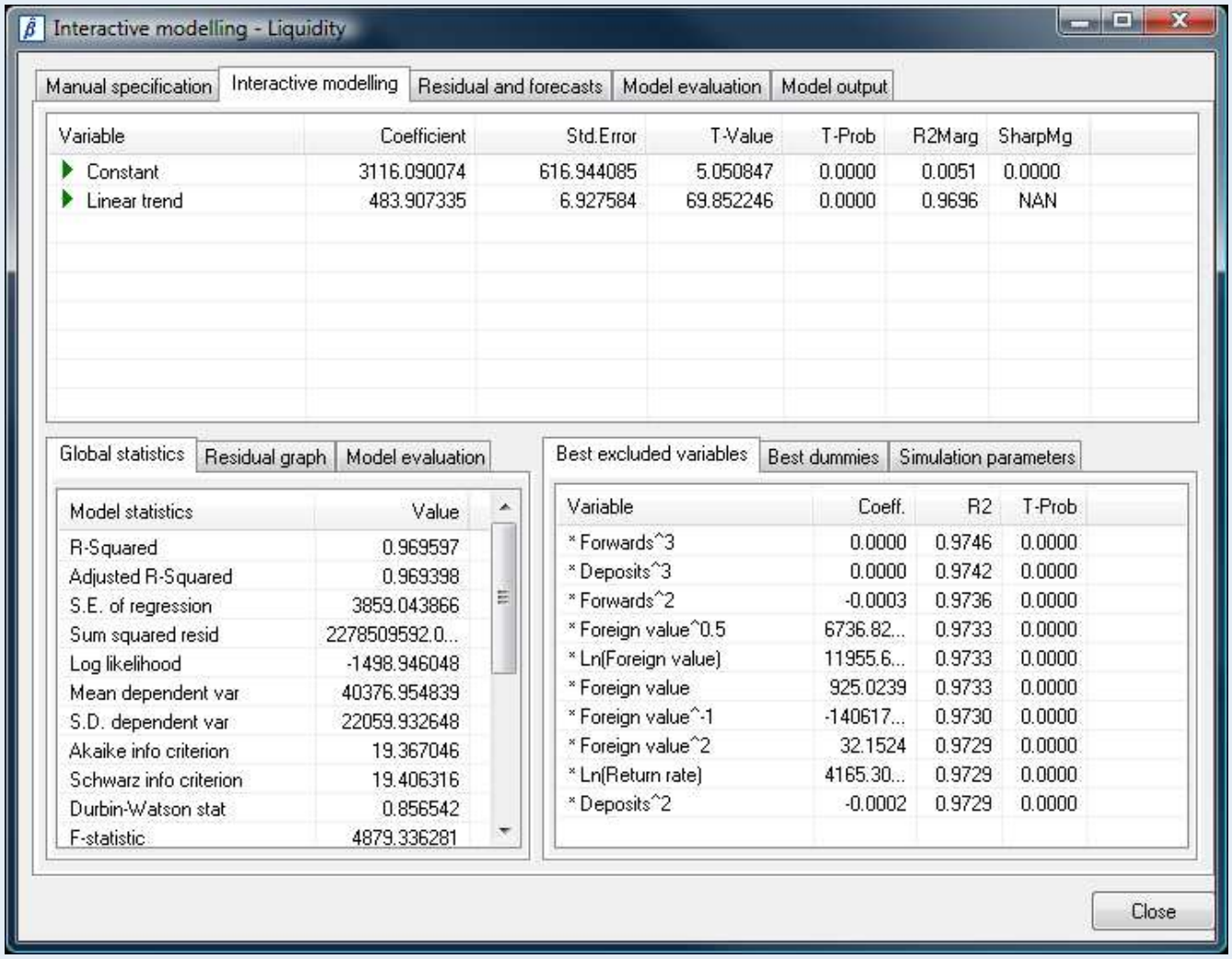
Adding a variable from this list is as easy as right-clicking it and selecting the menu option.

For each candidate variable, you will see to the right the estimated Beta, R2 and probability that it *would have* if added to the model. This will allow you to select variables even before adding them.

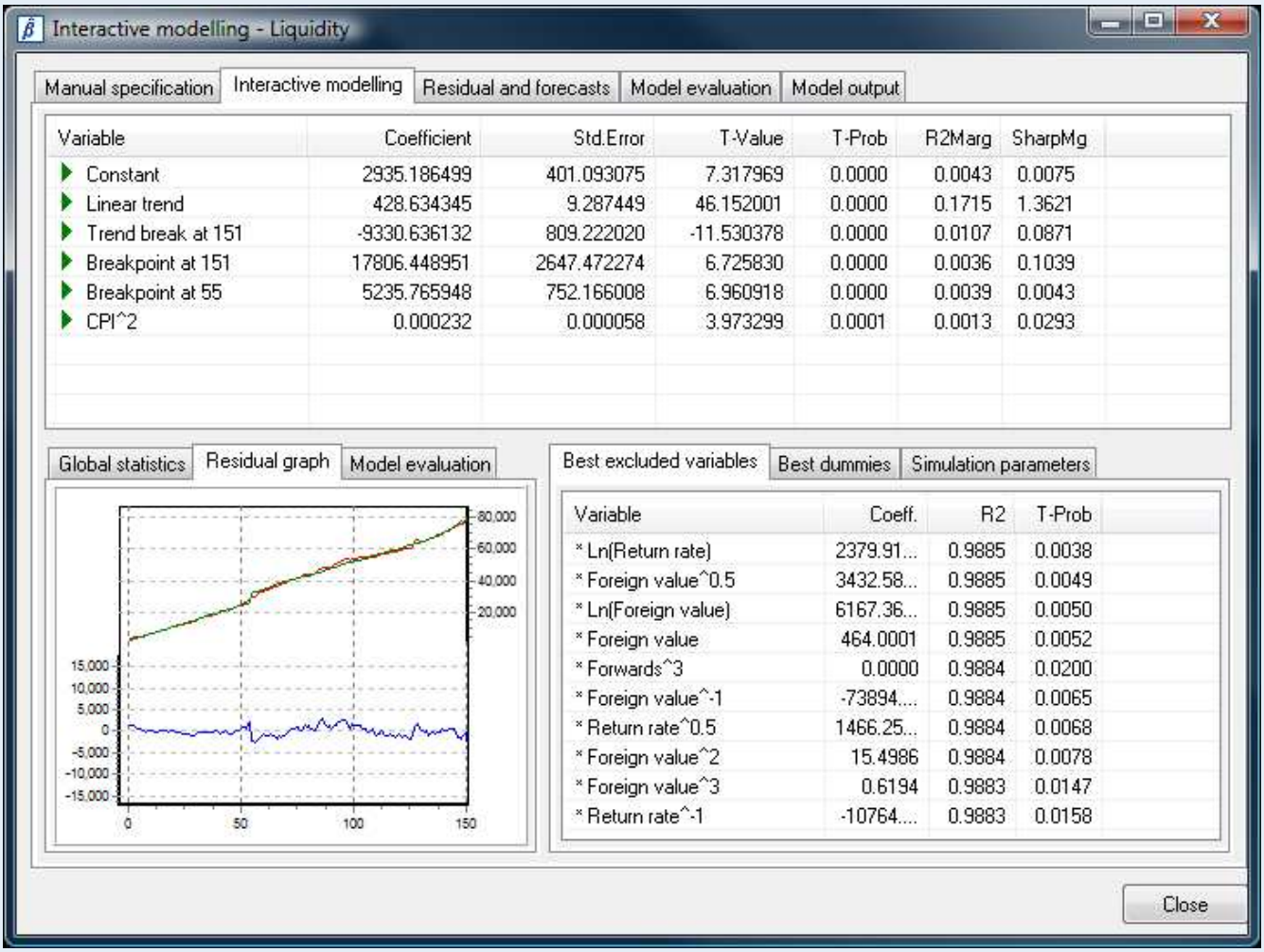


Omitted level variables and breakpoint or seasonal dummies are presented on separate tabs.

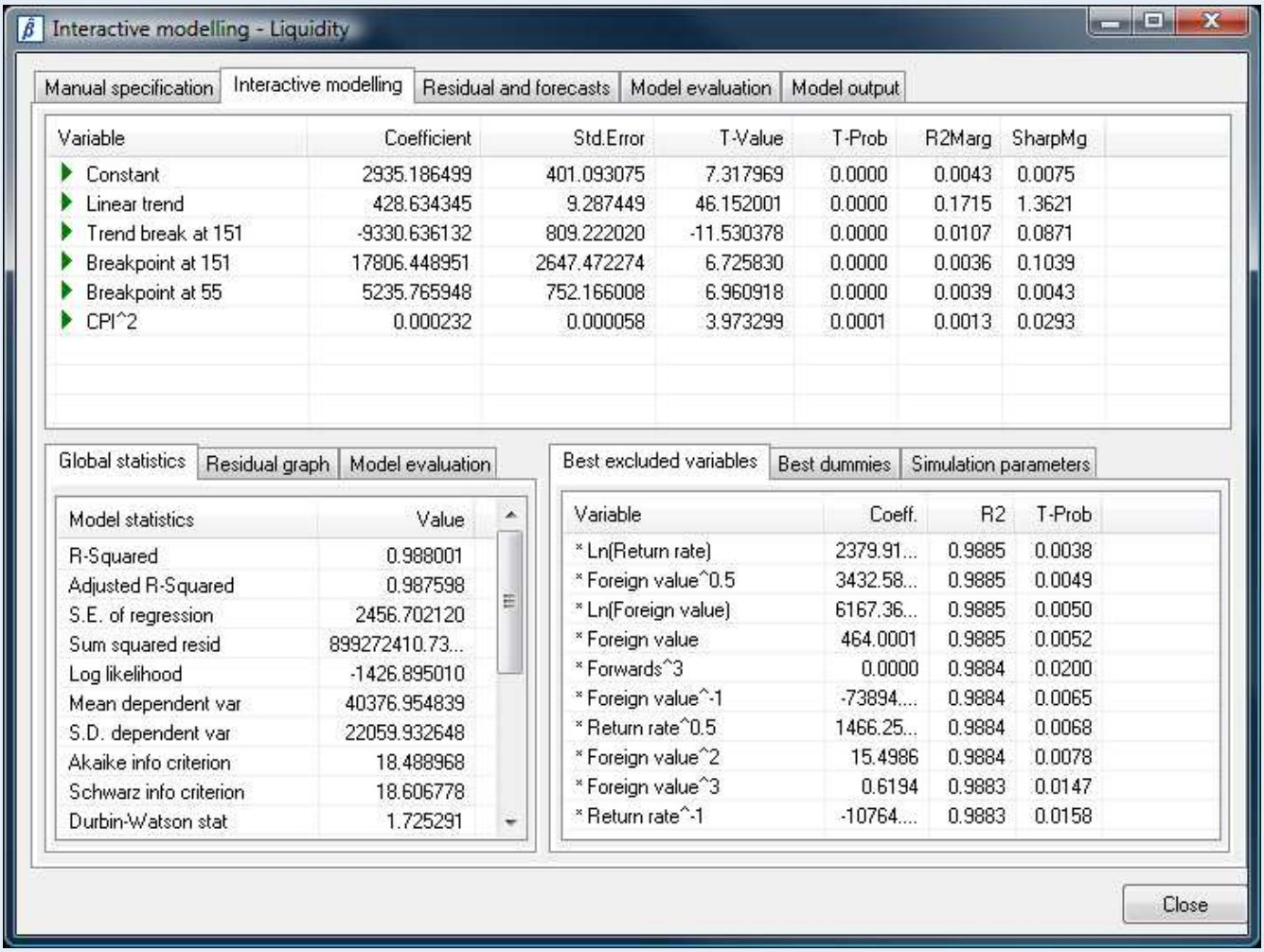
The asterisk to the left of some variables on the right panel indicates that there is a better omitted variable on the other tab (the Best Dummies tab on this example).



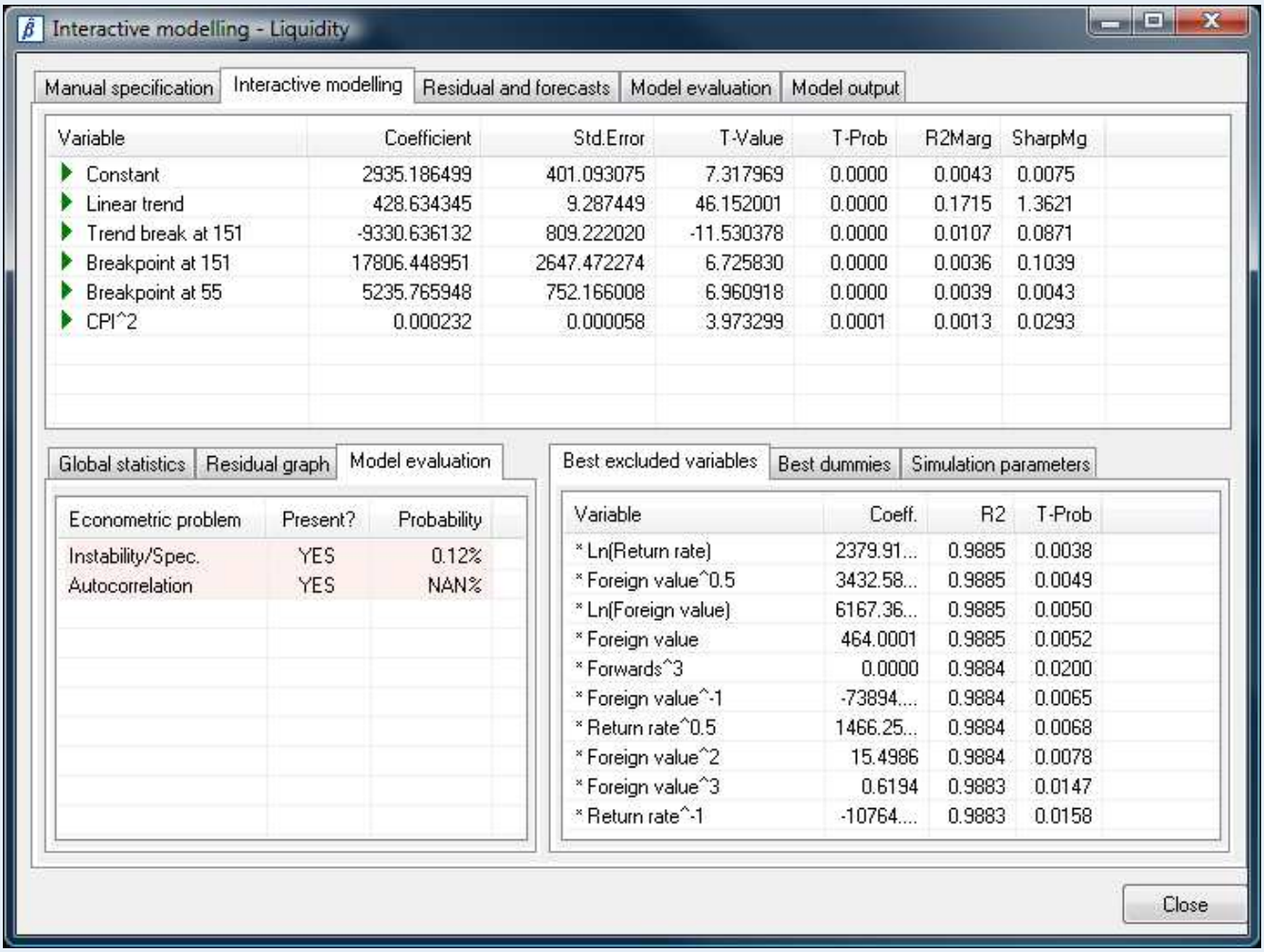
Look how easily we configure a model to reach a very nice R2 and T-values for all variables.



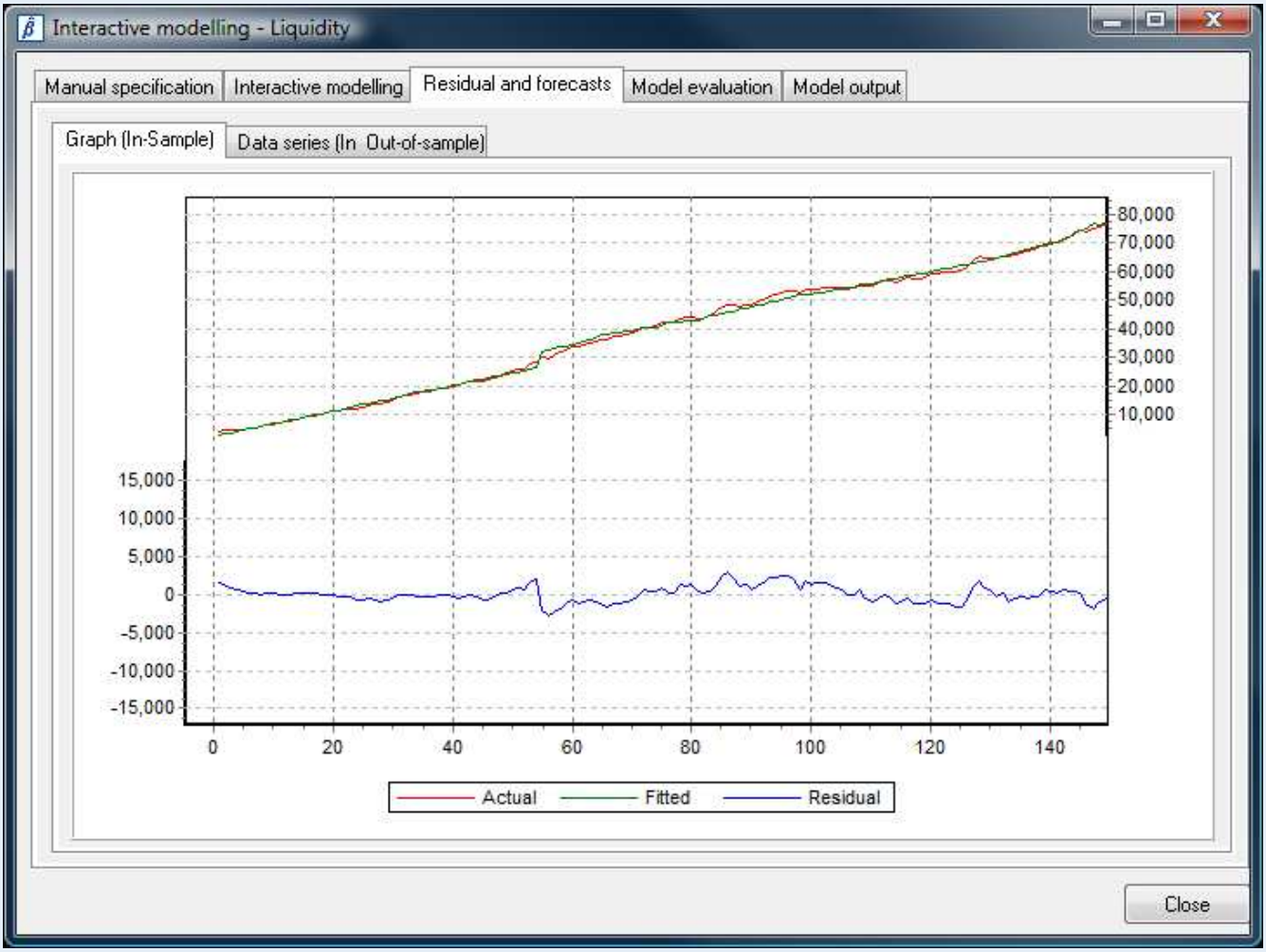
Here you see a summary of the global statistics:

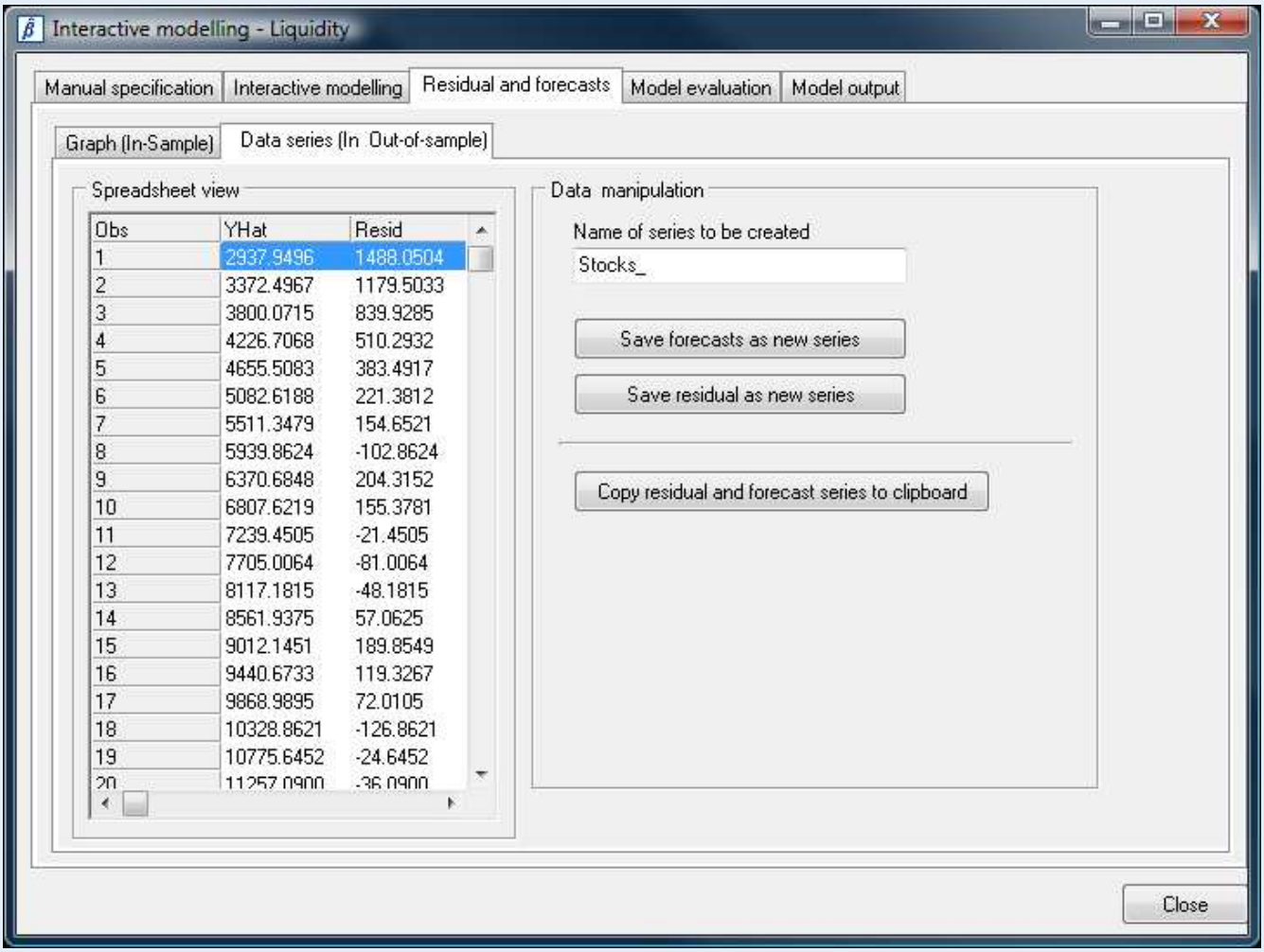


And the model evaluation window summarizes if there are econometrical problems:

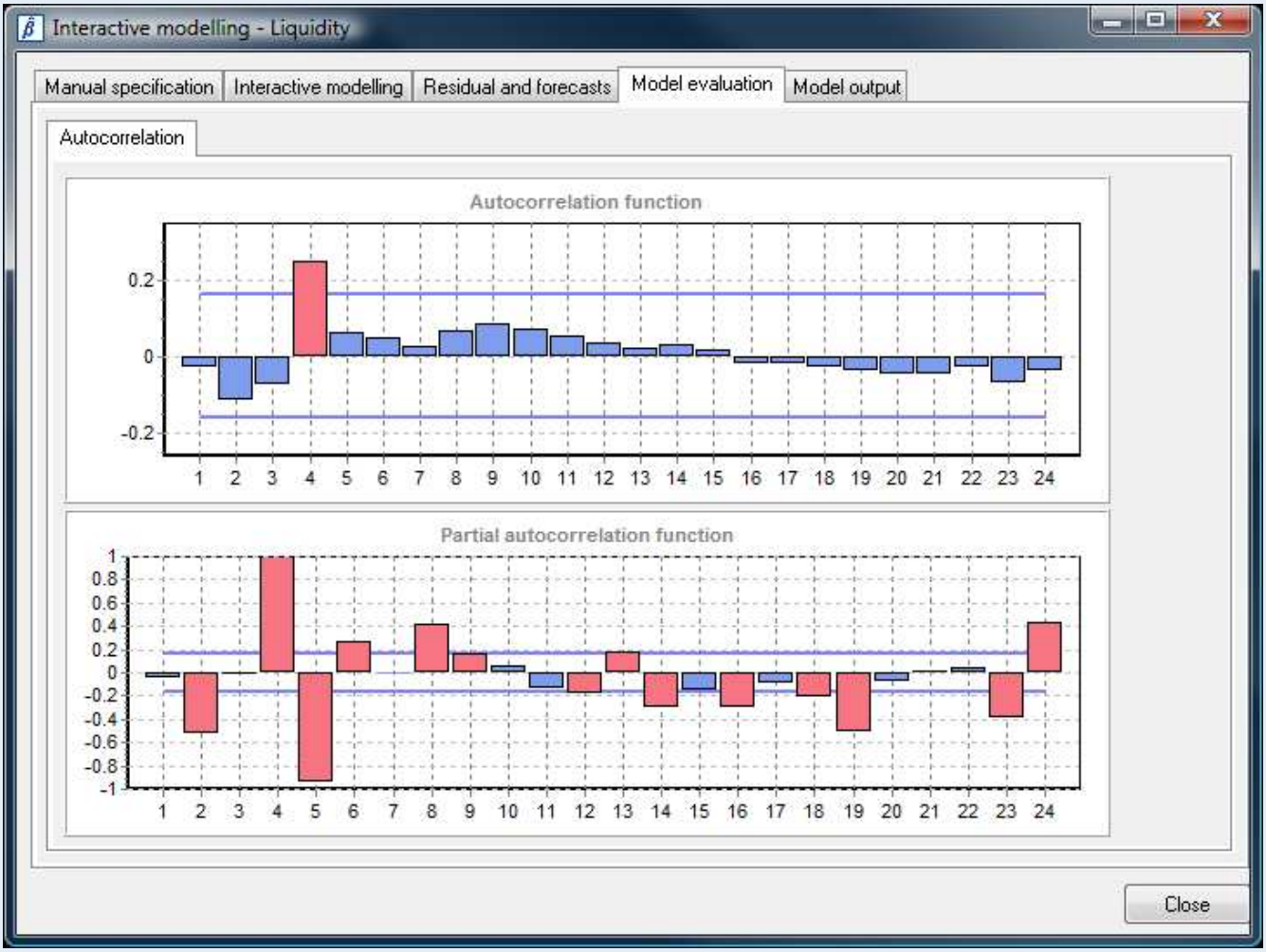

Interactive modelling - Liquidity
Manual specification
Interactive modelling
Residual and forecasts
Model evaluation
Model output
Variable | Coefficient | Std.Error | T-Value | T-Prob | R2Marg | SharpMg
Constant | 2935.186499 | 401.093075 | 7.317969 | 0.0000 | 0.0043 | 0.0075
Linear trend | 428.634345 | 9.287449 | 46.152001 | 0.0000 | 0.1715 | 1.3621
Trend break at 151 | -9330.636132 | 809.222020 | -11.530378 | 0.0000 | 0.0107 | 0.0871
Breakpoint at 151 | 17806.448951 | 2647.472274 | 6.725830 | 0.0000 | 0.0036 | 0.1039
Breakpoint at 55 | 5235.765948 | 752.166008 | 6.960918 | 0.0000 | 0.0039 | 0.0043
CPI^2 | 0.000232 | 0.000058 | 3.973299 | 0.0001 | 0.0013 | 0.0293
Global statistics
Residual graph
Model evaluation
Econometric problem | Present? | Probability
Instability/Spec. | YES | 0.12%
Autocorrelation | YES | NAN%
Best excluded variables
Best dummies
Simulation parameters
Variable | Coeff. | R2 | T-Prob
* Ln(Return rate) | 2379.91... | 0.9885 | 0.0038
* Foreign value^0.5 | 3432.58... | 0.9885 | 0.0049
* Ln(Foreign value) | 6167.36... | 0.9885 | 0.0050
* Foreign value | 464.0001 | 0.9885 | 0.0052
* Forwards^3 | 0.0000 | 0.9884 | 0.0200
* Foreign value^-1 | -73894.... | 0.9884 | 0.0065
* Return rate^0.5 | 1466.25... | 0.9884 | 0.0068
* Foreign value^2 | 15.4986 | 0.9884 | 0.0078
* Foreign value^3 | 0.6194 | 0.9883 | 0.0147
* Return rate^-1 | -10764.... | 0.9883 | 0.0158
Close

The residual and forecast window gives you a more detailed look into these values and allow you to create data series from them.



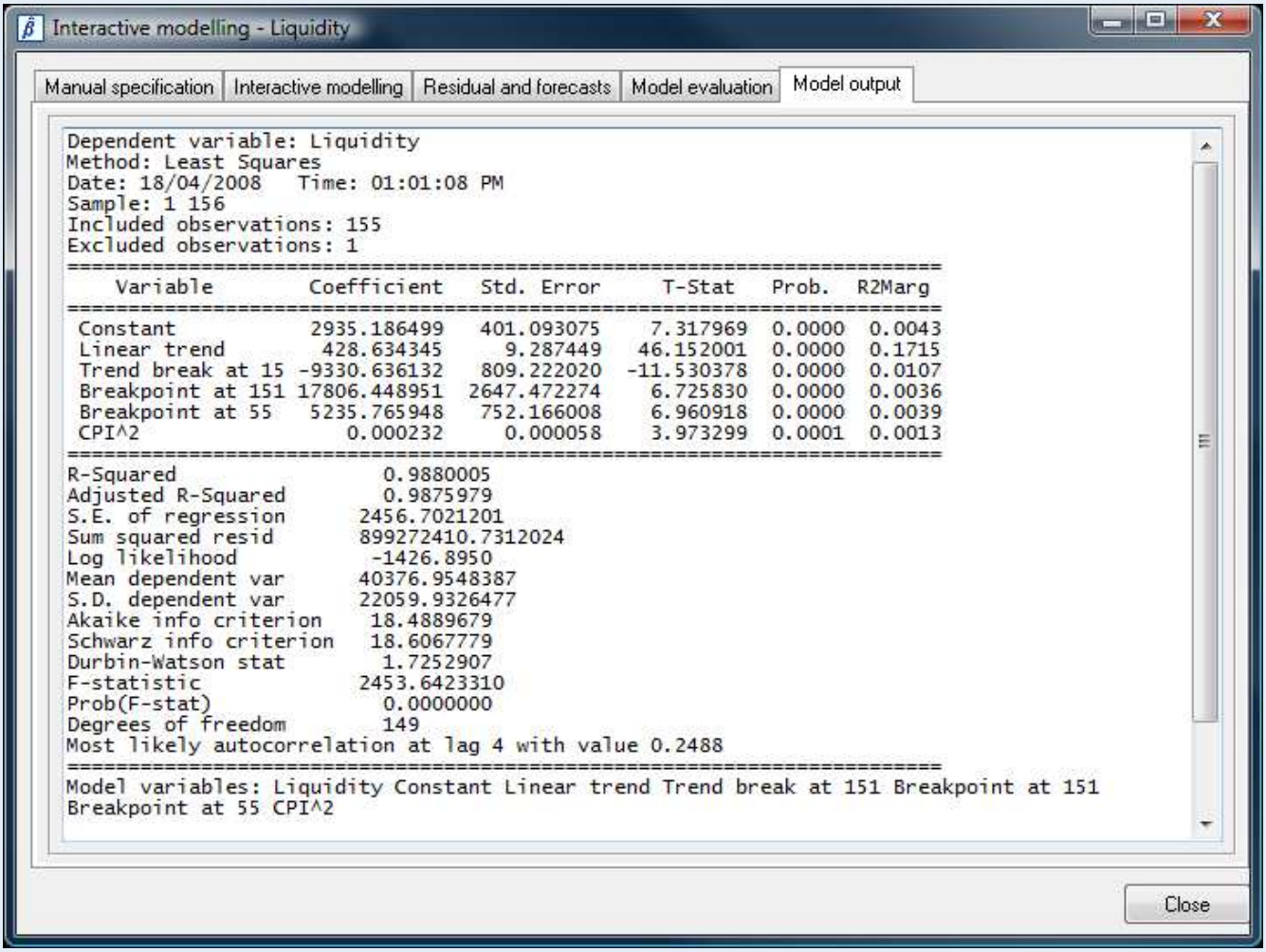

Interactive modelling - Liquidity
Manual specification
Interactive modelling
Residual and forecasts
Model evaluation
Model output
Graph (In-Sample)
Data series (In Out-of-sample)
Spreadsheet view
Obs YHat Resid
1 2937.9496 1488.0504
2 3372.4967 1179.5033
3 3800.0715 839.9285
4 4226.7068 510.2932
5 4655.5083 383.4917
6 5082.6188 221.3812
7 5511.3479 154.6521
8 5939.8624 -102.8624
9 6370.6848 204.3152
10 6807.6219 155.3781
11 7239.4505 -21.4505
12 7705.0064 -81.0064
13 8117.1815 -48.1815
14 8561.9375 57.0625
15 9012.1451 189.8549
16 9440.6733 119.3267
17 9868.9895 72.0105
18 10328.8621 -126.8621
19 10775.6452 -24.6452
Data manipulation
Name of series to be created
Stocks_
Save forecasts as new series
Save residual as new series
Copy residual and forecast series to clipboard
Close

The model evaluation contains a detailed view of the auto-correlogram of the residual series.



Finally, the last tab gives you a text-version of the output, so you can copy and paste it to a word-processing application.

Note the R2Marginal, which is the increase in R2 produced by the variable inclusion.

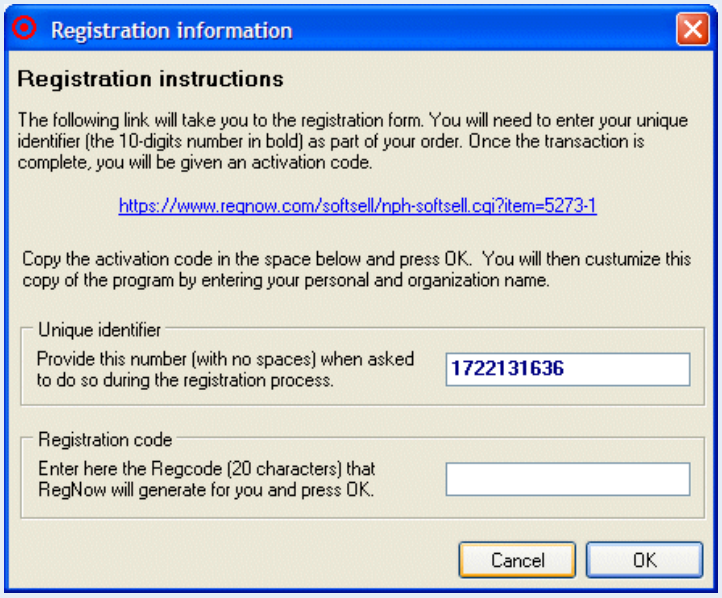


5. Registering

Registering **Model Expert** is a very simple process. Once you register the program, you will be entitled to automatic registration of updated versions.

To register, press the About button in the main window and then press the Register online button.

You will a screen with a LINK, a 20-digits unique identifier and a space to introduce a registration code.



Click on the link in order to visit the registration page. Enter your 20 digits unique identifier into the corresponding box on the web page to order the product.

Once your transaction is completed, you will receive a registration code of the form:

RW-xxxxxxxxxxxxxxxx

Enter your registration code into the corresponding space into the Registration window of the software. After that, you will enter your name and organization to customize your copy of the program.

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CONTACTING US

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