



Getting started with TRAMO and SEATS Programs

The following sections describe the **TRAMO** and **SEATS** programs and how they can be used with Modeleasy+. This includes information about installing these programs, how to use the Modeleasy+ **TRAMO/SEATS** interface, and how to obtain documentation on the programs. The sections covered are:

- ◆ Program Descriptions
- ◆ Installation Notes
- ◆ Using the Modeleasy+ **TRAMO/SEATS** Interface
- ◆ Additional Information

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Program Descriptions

The **TRAMO** and **SEATS** programs were developed by Victor Gomez and Agustin Maravall(*) to deal with problems of data with unobserved or error components.

The **TRAMO** (Time series Regression with ARIMA noise, Missing observations and Outliers) program is a program for estimating and forecasting regression models with possible ARIMA errors and any sequence of missing values. The program interpolates these values, identifies and corrects for several types of outliers, and estimates special effects such as Trading day, Easter, and, in general intervention variable type of effects. Fully automatic model identification and outlier correction procedures are available.

The **SEATS** (Signal Extraction in ARIMA Time Series) program is a program for estimation of unobserved components in time series following the so-called ARIMA-model-based method. The trend, seasonal, irregular and cyclical components are estimated and forecast with signal extraction techniques applied to ARIMA models. The standard errors of the estimates and forecasts are obtained and the model-based structure is exploited to answer questions of interest in short-term analysis of the data.

These programs are now available for download at www.modeleasy.com/downloads.htm. These download files contain the programs and user manuals suitable for direct printing with either a Postscript printer or HP printer.

Comments or requests for more information about these programs should be addressed to maravall@bde.es or msanz@bde.es.

(*)"Programs TRAMO and SEATS" by Victor Gomez and Agustin Maravall, Edited by the Banco de Espana, Servicios de Estudios, Documento de trabajo n. 9628.

Installation Notes

The **TRAMO** and **SEATS** programs are distributed in the \Utilities\TrmoSeat subdirectory of the Modeleasy+ installation. One of the pieces of information that is needed by the Modeleasy+ **TRAMO/SEATS** interface is the location of the **TRAMO** and **SEATS** programs. You may either move the files Tramo.exe and Seats.exe to a directory which is in your path or put the \Utilities\TrmoSeat subdirectory in your path.

If you do not do either of these, then you must define their location during your Modeleasy+ session. This is done by entering (for example)

```
:_tramodir = "c:\tramo_dir"  
:_seatsdir = "c:\seats_dir"
```

in Modeleasy+. The full path name to the programs should be entered inside the "" marks. The **TRAMO** and **SEATS** programs do **NOT** have to be in the same directory. These definitions should not be necessary if you have placed their locations in your path variable.



Using the Modeleasy+ TRAMO/SEATS Interface

Once the steps above have been successfully completed, then the Modeleasy+ **TRAMO/SEATS** interface is ready to be used with the **TRAMO** and **SEATS** programs.

In order to demonstrate how the **TRAMO/SEATS** interface works, consider the Modeleasy+ commands below.

```

:_tsin = timeseries(integers(1,30):1980,1,4)
:_tramo tsin tsout
Linkule TRAMO. Version 12/5/98
Processing 1 / 1 TSIN > TSOUT

```

The first command defines a time series named **TSIN** whose data are the integers from 1 to 30, starting in the first quarter of 1980. The syntax 1980,1,4 means: starting year=1980, starting period=1, frequency=4. See the Help document for **TIMESERIES** for the full syntax.

The second command invokes the **TRAMO/SEATS** interface. The lines appearing after the **TRAMO** command are the response from the interface. In this example, the timeseries **TSIN** is first passed to the **TRAMO** program and the result is then passed to the **SEATS** program. The final result of the **SEATS** program is then defined in the Modeleasy+ work area with the name **TSOUT**. The trend and forecast values associated with this timeseries are also defined in the work area with names **TRND_1** and **FORE_1**. This can be seen by using the **NAMES** command.

```

:_names
FORE_1, TRND_1, TSIN, TSOUT

```

which lists all of the objects defined in the work area. The values of these objects can be examined by simply typing their names or, in the case of time series, using the **TSTABULATE** command as shown below.

```

:_tstabulate tsin tsout trnd_1

```

YEAR	QTR	TSIN	TSOUT	TRND_1	YEAR	QTR	TSIN	TSOUT	TRND_1
1980	1	1	1.2869	1.2818	1983	4	16	15.454	16
1980	2	2	1.9679	2.025	1984	1	17	17.617	17
1980	3	3	2.8908	2.9061	1984	2	18	17.383	18
1980	4	4	3.8544	3.9456	1984	3	19	19.689	19
1981	1	5	5.262	4.995	1984	4	20	19.311	19.985
1981	2	6	5.7908	6.0091	1985	1	21	21.866	21
1981	3	7	7.2403	6.9766	1985	2	22	21.272	22.015
1981	4	8	7.7069	7.9808	1985	3	23	23.803	23.015
1982	1	9	9.3397	8.9917	1985	4	24	23.058	23.93
1982	2	10	9.6622	10	1986	1	25	25.626	24.808
1982	3	11	11.406	10.999	1986	2	26	24.68	25.976
1982	4	12	11.592	11.999	1986	3	27	28.228	27.07
1983	1	13	13.476	13	1986	4	28	27.467	27.856
1983	2	14	13.524	14	1987	1	29	28.153	27.685
1983	3	15	15.546	15	1987	2	30	26.963	26.439



If only the **SEATS** program is to be run, then the command

```
:_seats tsin tsout
```

should be used. If only the **TRAMO** program is to be run, then the command

```
:_tramo tsin tsout : noseats
```

should be used.

Several timeseries may be passed to **TRAMO** and **SEATS** in one command by making **TSIN** and **TSOUT** be namelists. This is shown in the example below.

```
:_tsin1 = tseries(ints(30):1980,1,4)
:_tsin2 = tseries(random(array(50:)):1970,1,12)
:_nmsin = namelist(tsin1,tsin2)
:_nmsout = namelist(tsout1,tsout2)
:_tramo nmsin nmsout
```

In the second timeseries definition, the timeseries data is monthly starting in January of 1970 and whose 50 elements are random numbers.

Additional Information

For more information on how to use the Modeleasy+ **TRAMO/SEATS** interface, see the Help documents for the **TRAMO** and **SEATS** commands.

For more information on the **TRAMO** and **SEATS** programs, the manuals have been included for your convenience. The manuals which are in a form suitable for printing on an HP or Postscript printer are contained in the file named **MANUALS.ZIP** in the \Utilities\TrmoSeat subdirectory of the Modeleasy+ installation. To print the manuals (about 125 pages), unzip the **MANUALS.ZIP** file and then copy the manual you wish to print to your printer using a command such as (for the HP manual):

```
COPY MANUAL.HP LPT1:
```

Additional information about the **Tramo** and **Seats** programs may be found on the Web page of the Bank of Spain at www.bde.es/servicio/software/softwaree.htm which also has contact points for the authors of the software.