Title

tssmooth nl — Nonlinear filter

Syntax

`tssmooth nl` [*type*] *newvar* = *exp* [*if*] [*in*] , `smoother(`*smoother*[`, twice`]`)`

[`replace`]

where *smoother* is specified as *Sm*[*Sm*[...]] and *Sm* is one of

```
{1|2|3|4|5|6|7|8| 9}[R]
3[R]S[S|R][S|R]...
E
H
```

The numbers specified in *smoother* represent the span of a running median smoother. For example, a number 3 specifies that each value be replaced by the median of the point and the two adjacent data values. The letter `H` indicates that a Hanning linear smoother, which is a span-3 smoother with binomial weights, be applied.

The letters `E`, `S`, and `R` are three refinements that can be combined with the running median and Hanning smoothers. First, the end points of a smooth can be given special treatment. This is specified by the `E` operator. Second, smoothing by 3, the span-3 running median, tends to produce flat-topped hills and valleys. The splitting operator, `S`, "splits" these repeated values, applies the end-point operator to them, and then "rejoins" the series. Third, it is sometimes useful to repeat an odd-span median smoother or the splitting operator until the smooth no longer changes. Following a digit or an `S` with an `R` specifies this type of repetition.

Finally, the `twice` operator specifies that after smoothing, the smoother be reapplied to the resulting rough, and any recovered signal be added back to the original smooth.

Letters may be specified in lowercase, if preferred. Examples of *smoother*[`, twice`] include

```
3RSSH     3RSSH,twice     4253H     4253H,twice     43RSR2H,twice
3rssh     3rssh,twice     4253h     4253h,twice     43rsr2h,twice
```

You must `tsset` your data before using `tssmooth nl`; see [TS] **tsset**.

exp may contain time-series operators; see [U] **11.4.4 Time-series varlists**.

Menu

Statistics > Time series > Smoothers/univariate forecasters > Nonlinear filter

Description

tssmooth nl uses nonlinear smoothers to identify the underlying trend in a series.

Options

Main

smoother(*smoother*[, twice]) is required; it specifies the nonlinear smoother to be used.

replace replaces *newvar* if it already exists.

Remarks and examples

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tssmooth nl works as a front end to smooth. See [R] **smooth** for details.

Stored results

tssmooth nl stores the following in r():

Scalars	
r(N)	number of observations
Macros	
r(method)	nl
r(smoother)	specified smoother
r(timevar)	time variable specified in tsset
r(panelvar)	panel variable specified in tsset

Methods and formulas

The methods are documented in [R] **smooth**.

A truncated description of the specified nonlinear filter labels the new variable. See [D] **label** for more information on labels.

An untruncated description of the specified nonlinear filter is saved in the characteristic tssmooth for the new variable. See [P] **char** for more information on characteristics.

Also see

[TS] **tsset** — Declare data to be time-series data

[TS] **tssmooth** — Smooth and forecast univariate time-series data