tssmooth — Smooth and forecast univariate time-series data

Description   Syntax   Remarks and examples   References   Also see

Description

tssmooth creates new variable *newvar* and fills it in by passing the specified expression (usually a variable name) through the requested smoother.

Syntax

tssmooth *smoother* [*type*] *newvar* = *exp* [*if*] [*in*] [, ...]

Smoother category	*smoother*
Moving average	ma
Recursive	
exponential	exponential
double exponential	dexponential
nonseasonal Holt–Winters	hwinters
seasonal Holt–Winters	shwinters
Nonlinear filter	nl

Remarks and examples

The recursive smoothers may also be used for forecasting univariate time series; indeed, the Holt–Winters methods are used almost exclusively for this. All can perform dynamic out-of-sample forecasts, and the smoothing parameters may be chosen to minimize the in-sample sum-of-squared prediction errors.

The moving-average and nonlinear smoothers are generally used to extract the trend—or signal—from a time series while omitting the high-frequency or noise components.

All smoothers work both with time-series data and panel data. When used with panel data, the calculation is performed separately within panel.

Several texts provide good introductions to the methods available in tssmooth. Chatfield (2004) discusses how these methods fit into time-series analysis in general. Abraham and Ledolter (1983); Montgomery, Johnson, and Gardiner (1990); Bowerman, O'Connell, and Koehler (2005); and Chatfield (2001) discuss using these methods for modern time-series forecasting. Becketti (2020) includes a Stata-centric discussion of these techniques. As he emphasizes, these methods often work as well as more complicated methods and are easier to explain to lay audiences. Do not dismiss these techniques as being too simplistic or inferior.

References

Abraham, B., and J. Ledolter. 1983. *Statistical Methods for Forecasting*. New York: Wiley.

Becketti, S. 2020. *Introduction to Time Series Using Stata*. Rev. ed. College Station, TX: Stata Press.

Bowerman, B. L., R. T. O'Connell, and A. B. Koehler. 2005. *Forecasting, Time Series, and Regression: An Applied Approach*. 4th ed. Pacific Grove, CA: Brooks/Cole.

Chatfield, C. 2001. *Time-Series Forecasting*. London: Chapman and Hall/CRC.

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Chatfield, C., and M. Yar. 1988. Holt-Winters forecasting: Some practical issues. *Statistician* 37: 129–140. https://doi.org/10.2307/2348687.

Holt, C. C. 2004. Forecasting seasonals and trends by exponentially weighted moving averages. *International Journal of Forecasting* 20: 5–10. https://doi.org/10.1016/j.ijforecast.2003.09.015.

Montgomery, D. C., L. A. Johnson, and J. S. Gardiner. 1990. *Forecasting and Time Series Analysis*. 2nd ed. New York: McGraw–Hill.

Winters, P. R. 1960. Forecasting sales by exponentially weighted moving averages. *Management Science* 6: 324–342. https://doi.org/10.1287/mnsc.6.3.324.

Also see

[TS] **arima** — ARIMA, ARMAX, and other dynamic regression models

[TS] **sspace** — State-space models

[TS] **tsfilter** — Filter a time series for cyclical components

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

[R] **smooth** — Robust nonlinear smoother

For suggested citations, see the FAQ on citing Stata documentation.