

Package Name: L1FILTER

Author: Eren Ocakverdi

Date: 2016/10/30

Add-in Type: Series and Global

Default Proc Name: l1filter

Default Menu Text: L1 Trend Filter

Interface: Dialog and Command Line

Description: This add-in provides a procedure that allows the user to implement ℓ_1 trend filtering method proposed by Kim et. al. (2009).

Dialog: Upon running the add-in from the menus or command line, a dialog will appear:

L1 Trend Filter

Smoothed series
L1TREND01

Cycle series

Blank fields will not generate
☐

Lambda
100

☐ Plot the results

Parameters

Alpha
0.01

Beta
0.5

Mu
2

Maxiter
40

Maxlsiter
20

Tolerance
1e-04

Add-in written by
Eren Ocakverdi, 2016

OK Cancel

In the first and second boxes, you should specify the names of your output series for trend and cycle. If left blank, no series will be generated. The default value of lambda is set to 100. Maximum value of lambda that ensures convergence to the straight-line fit is computed and reported in the chart, which is a finite value unlike Hodrick-Prescott estimated trend. If you check the "Plot the results" box, add-in will generate a graph output similar to that of regular HP filter. If you leave both Trend and Cycle boxes blank, a graph output will be generated by default.

In the original implementation of the solution algorithm, authors take the advantage of sparse matrix representations which lead to faster execution times. Since EViews does not have that functionality (yet), it may take quite a while to find a solution for long series.

Command Line:

Syntax-1: l1filter

Syntax-2: series_name.l1filter(options)

Options:

Argument	Type	Explanation
trend	<i>string</i>	Name of the filtered (trend) series
cycle	<i>string</i>	Name of the cycle series
lambda	<i>string</i>	Lambda (penalty) parameter
draw		Plot the results
prompt		Open the GUI
alpha	<i>numeric</i>	Backtracking line search parameter (0,0.5]
beta	<i>numeric</i>	Backtracking line search parameter (0,1)
mu	<i>numeric</i>	t update
maxiter	<i>numeric</i>	Maximum iteration
maxlsiter	<i>numeric</i>	Maximum iteration of line search
tol	<i>numeric</i>	Tolerance level

Examples:

- 1) myseries.l1filter(trend=yfiltered)
- 2) myseries.l1filter(trend=yfilt,cycle=ycyc,lambda=1200,tol=1e-05,draw)

References:

Kim, S-J., Koh, K., Boyd, S. and Gorinevsky, D. (2009). "L1 Trend Filtering", *SIAM Review*, Vol. 51(2), pp. 339-360.