Package Name: DMA
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Add-in Type: Global
Default Proc Name: dma
Default Menu Text: Dynamic Model Averaging
Interface: Dialog and command line

Description

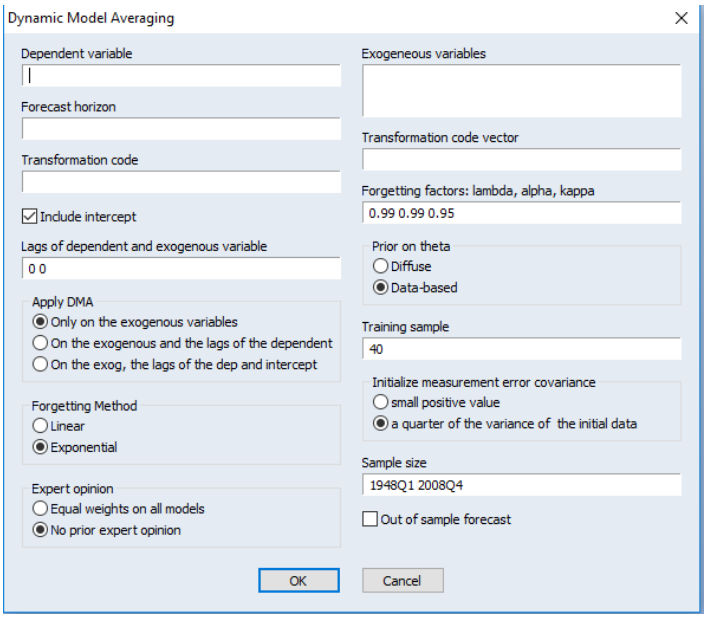
Suppose that we have a set of *K* models that are characterized by having different subsets of z_t as predictors. Denoting these by $z_t^{(k)}$ for $k = 1, \dots, K$ our set of models can be written as

$$y_t = z_t^{(k)}\theta_t^{(k)} + \varepsilon_t^{(k)}$$
$$\theta_{t+1}^{(k)} = \theta_t^{(k)} + \eta_t^{(k)}$$

where $\varepsilon_t^{(k)}$ is $N(0, H_t^{(k)})$ and $\eta_t^{(k)}$ is $N(0, Q_t^{(k)})$. Let $L_t \in \{1, 2, \dots, K\}$ denote which model applies to at each time period $\Theta_t = \left(\theta_t^{(1)\prime}, \dots, \theta_t^{(k)\prime}\right)'$ and $y^t = (y_1, \dots, y_t)'$.
When forecasting time t variables using information through time $t-1$, DMA involves calculating $\Pr(L_t = k|y^{t-1})$ for $k = 1, \dots, K$ and averaging forecast across models using these probabilities. DMS involves selecting the single model with highest value for $\Pr(L_t = k|y^{t-1})$ and using this to forecast. Details on on calculation of this model is provided in Koop and Korobilis (2012).

Dialog

Upon running the add-in from the menus, a dialog will appear:



The first box lets you specify the dependent variable to forecast. On the next box enter the forecast horizon. On the third box enter the transformation code for the dependent variable.

code	explanation
1	Level
2	First Difference
3	Second Difference
4	Log-Level
5	Log-First-Difference
6	Log-Second-Difference

On the fourth box put the exogenous variables. On the next blank box enter the transformation code vector for the exogenous variables. For example, 1,2,2,5,4,1. Don't forget commas. Other boxes are optional.

Command line:

dma(options) dep_variable f_horizon t_code tcode @ exog_variables

for example:

vector tcode=@fill(1,1,4)

dma(phlag="2 0") y 4 5 tcode @ z1 z2 z3

Options

intercept	Include intercept (intercept=1)
phlag	Lag number for dep and exog variables (phlag="0 0")
adma	Apply DMA: 1 – only on exog variables 2 - on exog variables and lagged dep variables 3 - on exog variables, lagged dep variables and intercept
fmethod	Forgetting method: 1 – linear 2 – exponential
eopinion	Expert opinion 1 – equal weights on all models 2 – no prior expert opinion
ffactors	Forgetting factors: (ffactors = "0.90 0.90 0.99")
prtheta	Prior on theta: 1 – diffuse prior 2 – data based prior
prsample	Training sample (prsample="40")
initial_v_0	Initialize measurement error covariance 1 – small positive value

	2 – quarter of the variance of initial data
sample	Sample size (sample=”1990q1 2015q4”)
out	Out of sample forecasting (out=1)

References:

Koop, G., and Korobilis, D., 2012, “Forecasting Inflation Using Dynamic Model Averaging” International Economic Review, 53-3, 867-886.