Short description of model database accommodating models with adaptive learning (AL) – GACR project P402-11-J018.

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This version of the database is kept as close as possible to the standard version. Current version works under DYNARE 4 (tested under DYNARE 4.2.5).

The version orders the models into logical groups, as given in the header of `MMB_AL.m` file, and adds 6th model group for models with AL. As a result, adding the model to the database is slightly different – one needs to add the model identifier to a vector `modelbase.names_full`, namely, into the proper group. Otherwise, the functionality of the database remains exactly the same as in the original version.

If a model under AL is selected, when this model is being computed, the user is presented with two additional menus. First allows selecting the value of constant *gain*, a number between 0.0 and 0.05. Gain measures how fast agents' beliefs change in response to forecasting errors, with *gain*=0 meaning the beliefs stay fixed. If the user selects *gain*=0 and '*MSV set*' in the second menu, the model under RE and AL should produce exactly the same IRFs, conditional on the parameters having exactly the same value in the two versions of the model. Any user adding an AL model to the database is advised to make sure that the corresponding RE counterpart is also present and has parameters calibrates at the same values, because setting *gain*=0 and *MSV* variable set provides the most straightforward check of correctness of AL model.

In the second menu, the used has a choice of selecting an arbitrary subset of right-hand side variables which the agents populating the model would use to forecast forward-looking variables. Selecting a set which is a strict subset of *MSV set* leads to the model's transmission mechanism being different from the RE one. The presence of these two menus allows the user to get an idea regarding relative importance of information used by the agents to forecast the forward-looking variables *vs.* the speed of belief adjustment. It is likely that selecting the set which differs significantly from the MSV set will result in dramatically different IRFs.

It is possible to compute ACFs and print unconditional variances of the variables for models under AL. However, take into account that under AL these derivations are, in general, impossible to perform analytically. Therefore, the version of the model database is using simulations (10 set of length 500) to generate the data that is then used to produce second order moment statistics. Extensive simulation of US_SW07 (Smets and Wouters 07) *vs.* US_SW12 (Slobodyan and Wouters 2012) models have shown that even with *gain*=0 and *MSV set*, theoretical second moments tend to differ from the simulated ones: typically, under RE unconditional variances and ACFs are higher. It is possible to achieve near equality, especially for ACFs, if one uses very long simulation (10,000-50,000), but selecting this value would be impractical for most users of the database.

Currently, the model database includes 3 models under AL:

1. US_SW12 (Slobodyan and Wouters 2012), with parameters calibrated at the same values as in US_SW07 (Smets and Wouters 07)
2. US_M07 (Milani 2007). No RE counterpart as yet.
3. US_YR13 (Rychalovska 2013) and its RE counterpart. This is a model, as yet published as CERGE-EI Working Paper 482, which incorporates financial frictions into a US_SW12 type of model.

My plan for 2013 is to make sure at least 20% of the models present in the database have an AL counterpart, plus possible a software tool, standalone or part of the model database code, which will assist users in selecting the *MSV set* which currently needs to be specified in the corresponding `.mod` file. The choice is, regretfully, not trivial in medium-scale models of SW type (but immediate in small models such as Milani 07).