Dynare Add On Readme for

Solving DSGE Models with a Nonlinear Moving Average

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1   Overview

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This is an add on for Dynare (see www.dynare.org) in MATLAB. Tested with Dynare 4.2.1, 4.2.2, and 4.2.4 and MATLAB 7.9.0.

2   Setup

Add the directory containing the unzipped files to you MATLAB path.

3   Usage

You can now call our set of programs directly from your .mod files by placing

```
[MA_]=nonlinear_MA(M_,oo_,options_);
```

after a call to Dynare's stochastic simulation alogrithm. E.g.,

```
stoch_simul(order = 3);
[MA_]=nonlinear_MA(M_,oo_,options_);
```

would have Dynare produce a third-order approximation, calculating IRFs out 40 periods. Our program would then do the same using our alternative policy function. In general, our programs 'adapt' to the options you send to Dynare. So, for example

```
stoch_simul(irf=0, order = 2, periods=100, drop=0);
[MA_]=nonlinear_MA(M_,oo_,options_);
```

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would produce a second-order approximation, no impulses, and a 100 period simulation with no initial periods discarded, both from Dynare and under our alternative infinite moving average policy function.

Should you want to override defaults taken from Dynare or if you would like to calculate and plot the nonlinear kernel functions (default is not to, as this can be very computationally intensive, especially for third order approximations), create a structure array (named, e.g., `myoptions`) in MATLAB and pass it to our programs as follows

```
[MA_]=nonlinear_MA(M_,oo_,options_,myoptions);
```

You can change any default option by adding a filed to the structure array with the name of the option (see next section) and setting it equal to the desired value.

4 Options

Here the set of options are listed. The symbol `***` is the user-defined name of the structure array passed to `nonlinear_MA` as a fourth argument (`myoptions` was the example name used in the previous section).

- `***.max_kernel_length` is a scalar that selects the horizon out to which kernels will be calculated and plotted. Default is 40.

- `***.calculate_kernels` takes on the value 1 (calculate kernels) or 0 (don't calculate kernels). Default is 0.

- `***.plot_kernels` takes on the value 1 (plot kernels) or 0 (don't plot kernels). Default is 0. If `***.calculate_kernels=` 0, this option is ignored.

- `***.calculate_simulations` takes on the value 1 (calculate simulations) or 0 (don't calculate simulations). Default is 0 if Dynare's `options.periods=` 0 and 1 otherwise.

- `***.plot_simulations` takes on the value 1 (plot simulations) or 0 (don't plot simulations). Default is 0 if Dynare's `options.periods=` 0 and 1 otherwise. If `***.calculate_simulations=` 0, this option is ignored.

- `***.shock_scale` is a scalar that scales the shocks used in IRFs with respect to their standard deviations. E.g., a value of -10 would lead any IRFs calculated to be impulses to minus 10 standard deviation shocks. Default is 1.

- `***.calculate_irf` takes on the value 1 (calculate impulse responses) or 0 (don't calculate impulse responses). Default is 0 if Dynare's `options.irf` $= 0$ and 1 otherwise.

- `***.plot_irf` takes on the value 1 (plot impulse responses) or 0 (don't plot impulse responses). Default is 0 if Dynare's `options.irf` $= 0$ and 1 otherwise. If `***.calculate_irf` $= 0$, this option is ignored.

5 Example

Placing

```
stoch_simul(irf=100, order = 3, periods=200, drop=50);
my_nonlinear_MA_options.plot_simulations=0;
my_nonlinear_MA_options.shock_scale=10;
my_nonlinear_MA_options.plot_irf=0;
my_nonlinear_MA_options.plot_kernels=1;
my_nonlinear_MA_options.calculate_kernels=1;
my_nonlinear_MA_options.max_kernel_length=100;
[MA_]=nonlinear_MA(M_,oo_,options_,my_nonlinear_MA_options);
```

at the end of your .mod file, our programs will

- not plot the simulation (200 periods long) that it calculates;

- will calculate impulse responses to positive 10 standard deviation shocks,

- but will not plot these impulse;

- will plot the kernels

- that it will calculate

- out to a horizon of 100 periods.