Dynare2TeX, Version 1.1*

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Abstract

Dynare is a useful tools in analyzing Dynamic Stochastic General Equilibrium (DSGE) models. This software contains different capabilities in manipulating DSGE models. Dynare gives its plot outputs as different formats which are available in MATLAB. However, Dynare has no option for comparing the Impulse Response Functions of different `*.mod` files. Dynare2TeX helps users to compare the IRFs of different `*.mod` files and gives the results in formats supported by MATLAB and new formats of `*.tex` and `*.tikz`. These two last formats are useful when the results are to be used in LaTeX. They are also small files, the user can easily use them in his/her `*.tex` file and have high quality plots on paper. To do this, Dynare2TeX uses a very useful toolbox, matlab2tikz available on both MathWorks and github.

1 Software requirements

Dynare2Tex has been tested on Windows and Mac osx operating systems. To run it, the following software are needed:

- MATLAB 2014 or higher,
- LaTeXinstalled on OS,
- matlab2tikz, available on both MathWorks and github,
- pdf file readers like Adobe Reader, Adobe Acrobat Reader, Foxit PDF Editor, ...

*Any comments or suggestions are highly welcome.

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2 Getting started

Dynare2TeX in its first version includes 2 mfiles: `IRF_plots.m` is the main function and `IRF_plots_manager.m` is a handler. For simple use, it is just enough to change the inputs of `IRF_plot_manager.m` and run it.

3 IRF_plots

`IRF_plots.m` function runs some different dynare `FILENAME.mod` files and plots their IRFs so that one can easily compare them. The function inputs can be both `FILENAME.mod` and `FILENAME_results.mat` files where `FILENAME` is the name of `*.mod` specified by user. Indeed, when the inputs are `FILENAME.mod`, the function runs Dynare first for all `*.mod` files, then removes all extra files and directories made by Dynare and keeps just `FILENAME_results.mat` files of all models. In the next step, the function extracts the information it needs to make a joint plot of models' IRFs which user wants to compare. `IRF_plots.m` then uses matlab2tikz toolbox to convert MATLAB plots to `*.tex` or `*.tikz` formats or save the plots in other format specified by user. To Run this code, `FILENAME.mod` and `FILENAME_results.mat` files should be in the same directory of the function.

The arguments of `IRF_plots.m` are `Path`, `Mfile`, `VList`, `SList`, `Tmod`, `Image_Format`, `ReScale`, `Row`, `Column`, `irf_duration`.

3.1 `Path`

`Path` is the path where the output is saved. The default `Path` is

```
Path='Comp'
```

All the plot formats and `*.tex` files will be saved in this directory. It should be noted that the files and directories in this folder will be deleted in every run of the `IRF_plot_manager.m`.

3.2 `Mfile`

Mfile: a cell that in each elemets determine The .mod or .mat files The mat file must be Dynare results and should be in the same folder of this function. For new cases just follow the pattern `Mfile{#}='New.mod(mat)'`; If the Mfiles are `*.mod` files, using `nograph`, `noprint` and `graph_format=none` in `*.mod` files are highly recomended to speed up the code.

3.3 VList

VList{i} is a cell that in each model determines the IRF of which endogenous variable(s) to be drawn. The Vlist{i} includes the endogenous variables in the Mfile{i}. The order of variables is important for cross *.mod files. To plot the IRF of all variables just leave it empty.

CAUTION: In the last case ensure that all variables have the same order in all mod (mat) files.

If the IRFs of just some variables are of interest, variable names are just needed in the first VList{i} and @ sign can be used in the others. For example, if just y, pi and i are the preferred endogenous variables, the following format is needed:

```
VList{1}='x pi i';
VList{2}='@';
```

3.4 SList

SList is a cell which determines the IRFs with respect to which shocks to be drawn. The SList{i} includes the shocks in the Mfile{i}. To plot IRFs with respect to all shocks, just leave SList empty.

CAUTION: The order of shocks in SList{i} is important for cross *.mod files.

Use @ sign instead of repeating shock names in the remaining SLists{i}. For example, if just e_i and e_pi are the preferred endogenous variables, the following format is needed:

```
VList{1}='e_pi';
VList{2}='@';
```

3.5 Tmod

Tmod is a cell that in each elements determines corresponding title of *.mod files. For instance, if the *.mod files are New_Keynesian_Discretionary.mod, New_Keynesian.mod and New_Keynesian_Optimal_Policy.mod and the corresponding name of models are Discretionary Policy, Rule-based Policy and Optimal Policy, then the following commands is needed:

```
Tmod{3}='Optimal Policy';
Tmod{2}='Discretionary Policy';
```

3.6 Image_Format

Image_Format is a cell determining the format of Dynare2TeX outputs. The formats supported by Dynare2TeX are bmp, eps, emf, jpg, pcx, pbm, pdf, pgm, png, ppm, svg, tif1, tif2, tex and tikz. Image_Format also accepts more than one format. For instance, if user needs both eps and tex formats, the following command is needed:

```
Image_Format={'eps'; 'tex'};
```

3.7 ReScale

ReScale is useful when comparing IRFs with different scales. For example, when the maximum value of an IRF is 0.5 and maximum value of another IRF is 0.0001, the comparison of two IRFs is not easy in joint plot of them. In this case, ReScale=1 asks the IRF_plots.m function to divide each IRF to its corresponding maximum value. To see the exact scale of the IRFs in plots, use ReScale=0.

3.8 Page Setting

The final output of Dynare2TeX is a pdf file of all plots. The user can determine the number of rows and columns of plots in each page. The commands are Column and Row.

Column indicates the number of columns in each page. If nan, it would be determined automatically. It must also be an integer

Row indicates the number of rows in each page. If nan it would be determined automatically. It must also be an integer.

3.9 irf_duration

irf_duration determines number of periods on which to plot the IRFs. It is recommended to use a high value of irf command in *.mod files so that it can be easily managed here.

4 The Outputs

Output folder includes:

1. A series of folders entitled by "Graphs_ext" where ext is format(s) introduced in Image_Format,

2. An excell file named "FileGuid.xls" containing name of all figures and corresponding variable and shock names for each *.mod(mat) file,

3. A sample `tex` file by the name of "`Multi_ext.tex`" that show how to use the outcomes in LaTeXwhere where `ext` is format(s) introduced in `Image_Format`.

5 IRF_plots_manager

`IRF_plots_manager.m` file is used to introduce all the arguments of `IRF_plots.m`. All the arguments introduced in section 2 can be managed in this file.

To have outputs just run `IRF_plots_manager.m`

6 Default examples

There are 3 default`*.mod` files in Dynare2TeX. The examples are based on basic New Keynesian model explained in Walsh (2010), Chapter 8. The 3 examples are

- `New_Keynesian_disc.mod` is NK model with discretionary monetary policy,
- `New_Keynesian_ramsey.mod`is NK model with optimal Ramsey monetary policy.