DGE–CRED Practice Session 1: Installation and Usage of Dynare

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giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

IWH Halle Institute for Economic Research
Member of the Leibniz Association

On behalf of:
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
of the Federal Republic of Germany

* Research assistance by Yoshiki Wiskamp is greatly acknowledged.

Outline

1. Installation of Dynare
2. Set path to Dynare in Matlab
3. Usage of Dynare

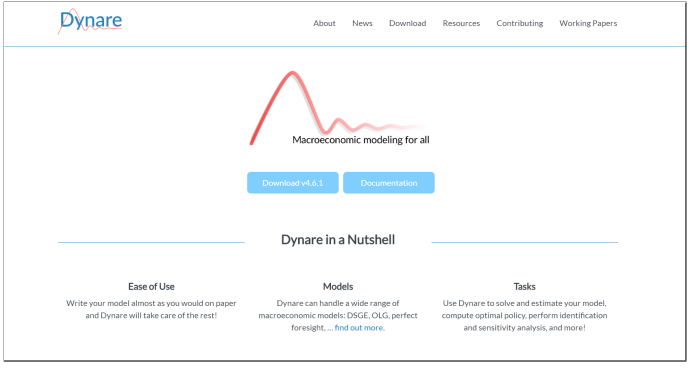
Outline

1.1 Installation of Dynare: Introduction

- Packaged versions of Dynare are available for:
  - Windows (7, 8.1, 10)
  - Several GNU/Linux distributions (Debian, Ubuntu, Linux Mint, Arch Linux)
  - macOS 10.11 or later
  - Should work on other systems, but some compilation steps are necessary
- In order to run Dynare, you need one of the following:
  - MATLAB version 7.9 (R2009b) or above
  - GNU Octave version 4.2.1 or above, with the statistics package from Octave-Forge
- For the DGE–CRED model only Dynare 4.6 and the latest Octave version are suitable

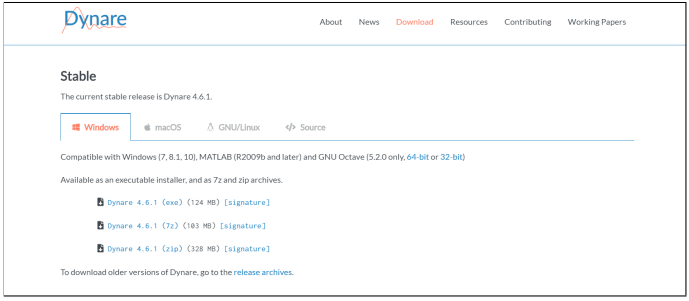
1.2 Installation of Dynare: Windows (1)

- Access the Dynare web page (`https://www.dynare.org`) and click on "Download v4.6.1":



1.2 Installation of Dynare: Windows (2)

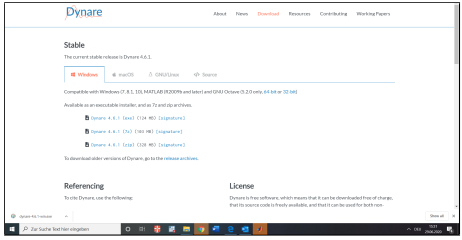
- The following page will be displayed:



- Click on “Dynare 4.6.1 (exe)” to download the executable installer.

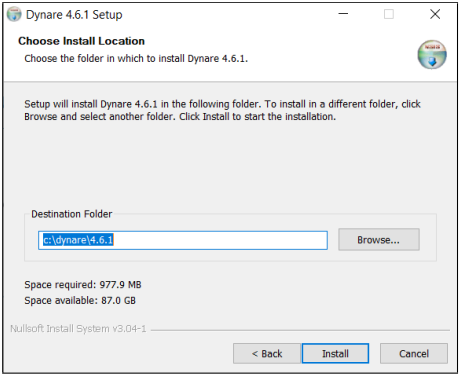
1.2 Installation of Dynare: Windows (3)

- Open the downloaded executable installer “`dynare-4.6.1.exe`”
- Follow the displayed instructions



1.2 Installation of Dynare: Windows (4)

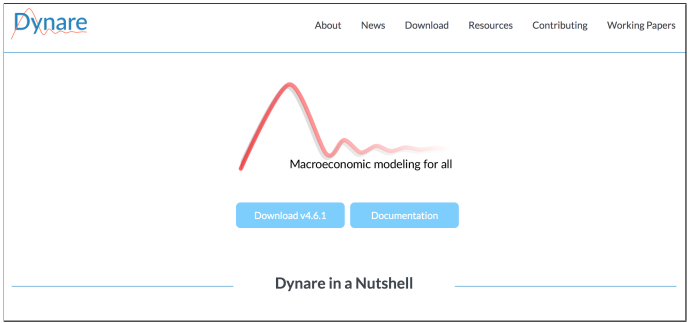
- Finally, choose a folder in which to install Dynare



- You will later need to tell MATLAB the path where Dynare is installed

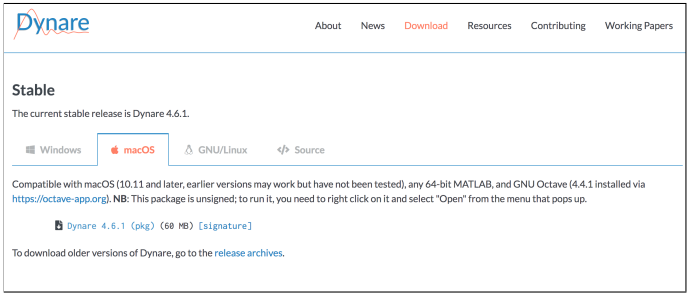
1.3 Installation of Dynare: macOS (1)

- Access the Dynare web page (`https://www.dynare.org`) and click on “Download v4.6.1”:



1.3 Installation of Dynare: macOS (2)

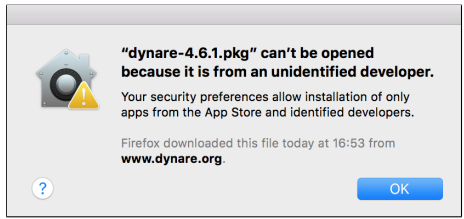
- The following page will be displayed:



- Click on “Dynare 4.6.1 (pkg)” to download the installation package.

1.3 Installation of Dynare: macOS (3)

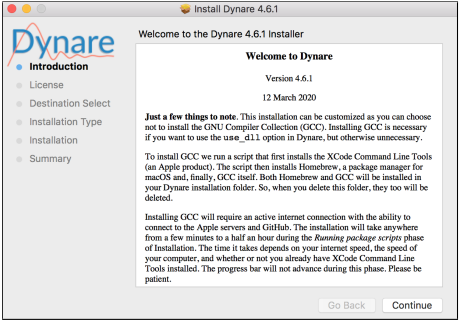
- Open the downloaded installation package “`dynare-4.6.1.pkg`”
- In case that the following security notification is displayed:



  - Access: “System Preferences” –> “Security & Privacy” –> press: “Open Anyway”

1.3 Installation of Dynare: macOS (4)

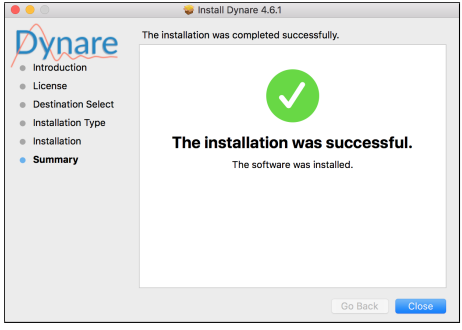
- The following window should appear:



- Follow the displayed instructions.

1.3 Installation of Dynare: macOS (5)

- If the installation was successful the following window will appear:

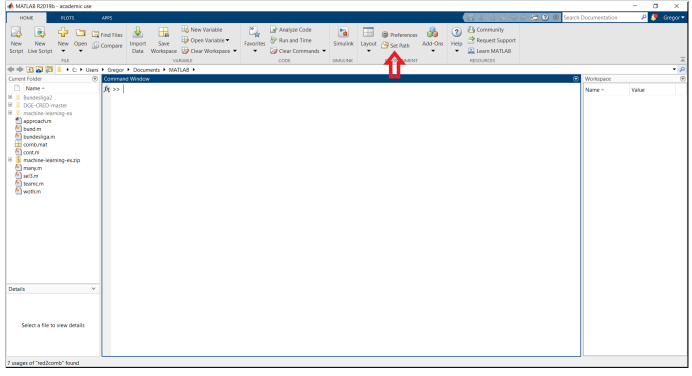


- The Dynare folder should now be listed under “Applications”.
- Dynare is now ready to use and the installation package “`dynare-4.6.1.pkg`” can be deleted.

Outline

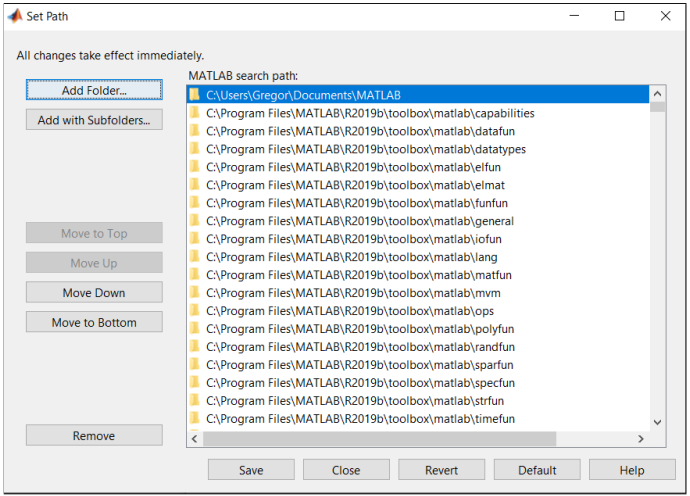
2.1 Set path to Dynare in Matlab: permanently (1)

- On the MATLAB Home tab, in the Environment section, click on Set Path



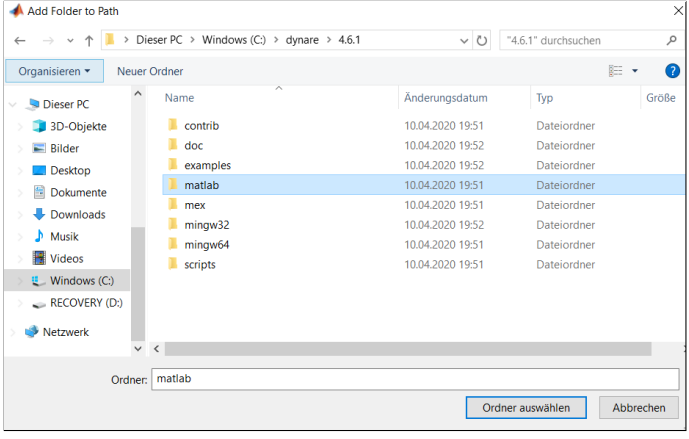
2.1 Set path to Dynare in Matlab: permanently (2)

- Click Add Folder



2.1 Set path to Dynare in Matlab: permanently (3)

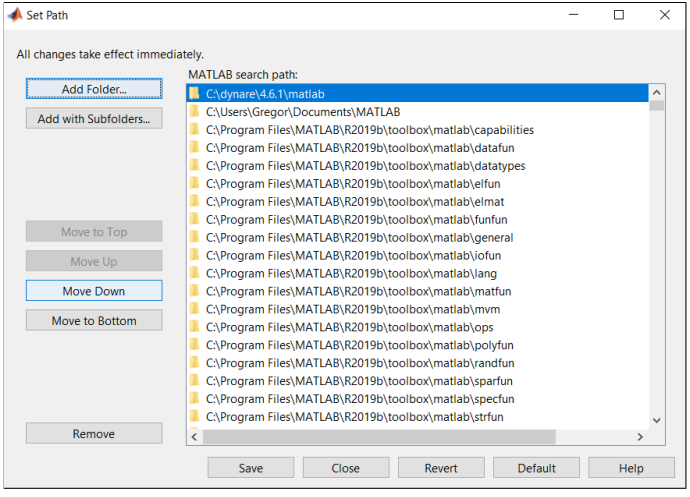
- Select the matlab subdirectory of your Dynare installation



- Then select choose folder

2.1 Set path to Dynare in Matlab: permanently (4)

- Apply the setting by clicking Save button



2.2 Set path to Dynare in Matlab: temporarily

- Alternatively, the path to Dynare can be set *temporarily* in Matlab
  - This allows to switch between different versions of Dynare
- The following command has to be entered in Matlab:
  - Windows: `addpath C:\dynare\4.6.1\matlab`
  - macOS: `addpath /Applications/Dynare/4.X.Y/matlab`

Outline

3. Usage of Dynare
   - Examples
   - Run a Mod File
   - Preprocessor
   - Steady State Results
   - Stability of the Model
   - Output

3.1 Examples

- The dynare path contains a folder with examples.
- First we need to create a new folder, e.g. `NK Baseline Model`.
- We can copy one of the example mod files and use them.
- Note the name is completely arbitrary.

3.2 Run `NK_Baseline.mod`

- Copy the file `NK_Baseline.mod` into the newly created folder.
- Enter the following command in your command window in Matlab:
  `dynare NK_Baseline`
- We can copy one of the example mod files and use them.
- First, we need to create a new folder, e.g. `NK Baseline Model`.

3.3 Preprocessor

- The command window first shows you that the preprocessor worked fine for our example.

```
Using 64-bit preprocessor
Starting Dynare (version 4.6.1).
Calling Dynare with arguments: none
Starting preprocessing of the model file ...
Found 28 equation(s).
Evaluating expressions...done
Computing static model derivatives (order 1).
Computing dynamic model derivatives (order 1).
Processing outputs ...
done
Preprocessing completed.
```

3.4 Steady State Results

- The New Keynesian baseline model has a well defined steady state.

```
STEADY-STATE RESULTS:

d                              1
c                              0.40819
....
```

- The concept of a steady state is defined in the next sessions.
- Each endogenous model variable has a corresponding steady state.

3.5 Stability of the Model

- Another important issue is the stability of the model.
- Dynare has the command `check` to verify that the model has a unique and stable solution.

```
EIGENVALUES:
         Modulus          Real        Imaginary

      1.044e-13      -1.044e-13                0
...
             Inf            -Inf                0


There are 15 eigenvalue(s) larger than 1 in modulus
for 15 forward-looking variable(s)

The rank condition is verified.
```

3.6 Output

- All results are stored in the file `NK_baseline_results.mat`.
- The structure `oo_` contains all computation results.
- The structure `M_` contains the corresponding model setup.
- The structure `options_` contains the used options.
- A folder `NK_baseline` is created with optional output.