Identification using stability restrictions: Matlab Codes

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1 Introduction

This file explains the Matlab codes used to generate the results of "Identification using stability restrictions" paper. The algorithm details are in supplementary paper which accompanies the main manuscript.

2 Core Folders

Most of the m.files are dependent of the function files stored in the "functions" folder and on the matlab data files stored in the "tables" folder. In order to replicate the results it is important to add both folders in the search path of matlab. This can be accomplished, for example, by including the following command lines in the beginning of the m.files.

```
addpath('c:/matlab/myfiles/functions');
addpath('c:/matlab/myfiles/tables');
```

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It is recommended to remove both folders from the search path after executing the program using the command `rmpath` in the end of the `m.`files.

There are 17 function files in the `functions` folder. Explanations about each of the functions are in the commentary block located at the top of the files. In `tables` folder the file `nkpc_data.mat` file contains the date set used in the empirical application of Section 5. Explanation of the data set variables are found in the `data_input_nkpc.m` file, located at the `functions` folder. The remaining files in the `tables` folder are critical values tables of the *gen–S*, *gen–*$\widetilde{S}$, *CLR* and *split–CLR* tests. There are in total 6 matlab data files in the `tables` folder.

3 Simulation and Empirical Files

Below is the description of the m.files used in the computation of confidence regions and in the Monte Carlo simulation exercises:

- `_Figure_Empirical_Application_NKPC` folder: (6 files)

`nkpc1_baseline_1966_2010.m`	`nkpc1_baseline_1984_2010.m`
`nkpc2_ar_erros_1966_2010.m`	`nkpc2_ar_erros_1984_2010.m`
`nkpc3_trend_inflation_1966_2010.m`	`nkpc3_trend_inflation_1984-2010.m`

  The codes files generate the confidence sets reported in Section 5 of the paper and in Section 5 of the supplementary material. The `nkpc1` and `nkpc2` files generates 11 confidence sets each. The execution of `nkpc1` files needs the `Global Optimization Toolbox`. If this toolbox is not available, two steps should be taken. First, on line 68, replace the whole line by `options=optimset('Display', 'off', 'MaxFunEvals', 350);`. Second, replace the `ga` by `fminsearch` function on line 259. However, the results will not be the same as one reported in the paper.

- `Point_Optimal_Single_Break.m` and `Point_Optimal_PTV.m`

  The files produce the asymptotic power curves of point optimal tests and generalized S–tests under the single break and persistent time variation (PTV) alternatives. They generate the graphs reported in Subsection 4.1 of the paper.

Prior running the files, one should set the values of $\omega = (0, 0.5, 1)$ on line 37 of `Point_Optimal_Single_Break.m` and on line 28 of `Point_Optimal_PTV.m`. The execution of the files needs the `Parallel Computing Toolbox`. If this toolbox is unavailable, replace the command `parfor` by `for`.

- `Power_Function_IV_Model.m` and `Power_Function_IV_Model_Table.m`

  `Power_Function_IV_Model.m` file generate the power curves derived from the linear instrumental variable model with single break in the first stage. Before running the file, one should set the values of $k = (2, 5)$ on line 33, $\lambda_F = (0, 5)$ on line 39,[1] and $\rho = (0.20, 0.95)$ on line 48. In order to replicate the results of Table 2 on page 41, it is necessary to run several times the `Power_Function_IV_Model.m` file, setting $\lambda_F = 5$, $\rho = 0.95$ and changing the values of k accordingly. In the end of the execution, a matlab data file is generated. It is important that the saved files have the same names as the ones used by the `load` command on lines 8, 13, 16, 20 and 24 of the `Power_Function_IV_Model_Table.m` file. This latter .m file loads the saved matlab data files and produce a table with the results of Table 2. The execution of `Power_Function_IV_Model.m` needs the `Parallel Computing Toolbox`. If not available, simply replace the command `parfor` by `for`.

- `Size_NKPC.m` and `Size_NKPC_Graph.m`

  `Size_NKPC.m` file computes the sizes of the stylized new-Keynesian Phillips Curve presented on Subsection 4.2. The results reported on Table 3 and Figures 3 and 4 are obtained after executing several times this file with each time using different values for $\kappa = (0, 0.5, \ldots, 6)$ and $\phi = (0, 0.5, \ldots, 8)$ on lines 60 and 61. At the end of the execution, a table in the `Command Windows` and the matlab data file are generated. Renamed the saved data files according to `label` variable on lines 4, 56 and 111 of `Size_NKPC_Graph.m` file for the changes in κ, in ϕ, and in ϕ with $\kappa = 2$, respectively. The saved data sets should be in the same folder as `Size_NKPC_Graph.m`, which loads the data sets and produces the graphs.

[1] $\lambda_F = 0$ and $\lambda_F = 5$ corresponds to the case of $\omega = 1$ and $\omega = 0$, respectively.