Read Me

This replication folder (MSReplicationFiles) consists of codes and helper functions to replicate the Regime Switching Output Gap analysis. The codes can be decomposed to three steps; estimating parameters $d, P, \mu, \sigma, etc.$, reporting descriptive statistics of the results and generating plots. All outputs are saved to disk.

The codes are designed in R project version 3.42 for Windows, developed on Windows 10 64bit operating system but also adapted for Ubuntu 16.04 LTS. Only dependency is "urca" package (version 1.3). To run the code trouble-free, please check your R version, install "urca" package and save the replication file (MSReplicationFiles) to Documents folder in Windows or Ubuntu.

Usage

Run all the commands in main.R. The file contains commands used for reading, estimating parameters, reporting and plotting results for all pairs for each data. The preliminary results are saved in Results folder as .rda files. NOTE: The tables in these files are re-formed for the paper but both shares same outline.

Codes

1. lnviD2.R: Estimates d and transition probabilities for a given series.

   Inputs:

   - b: Initial set of parameters with 2 d's and 1 μ
   - w: series to be fitted MS-ARFIMA$(0, d, 0)$

   Output: Log-likelihood of the estimate

2. lnviDM2.R: Estimates d and transition probabilities for a given series.

   Inputs:

   - b: Initial set of parameters with 2 d's and 2 μ's
   - w: series to be fitted MS-ARFIMA$(0, d, 0)$

   Output: Log-likelihood of the estimate

3. convDLV_d.R: Calls lnviD2.R for all log-differentiated gap series.

   Input:

   - yearOrRegion: Name of the data (1930,1940,1950,Europe+G7,Europe+S&P,G7+S&P)

   Outputs: Parameter estimates and Loglikelihoods for all gap series (both saved to "output" folder and returned to prompt)

4. convDLV_dm.R: Calls lnviDM2.R for all log-differentiated gap series.

   Input:

- yearOrRegion: Name of the data (1930,1940,1950,Europe+G7,Europe+S&P,G7+S&P)

Outputs: Parameter estimates for all gap series (both saved to "output" folder and returned to prompt)

5. plot_d.R: Calls and reformats results saved to disk, extracts the path by using dlvPath_d under dlvPath.R file, plots paths of d estimations of pairs and overall proportions of $d < 1$.

   Input: No input needed.

   Output:

   - Paths of d estimations of pairs: Saved to pairplots folder
   - Overall proportions of $d < 1$ for each dataset: Saved to rejplots folder

6. plot_dm Calls and reformats d and μ switching results saved to disk, extracts the path by using dlvPath_dm under dlvPath.R file, plots paths of d estimations of pairs and overall proportions of $d < 1$.

   Input: No input needed.

   Output:

   - Paths of d estimations of pairs: Saved to pairplots folder
   - Overall proportions of $d < 1$ for each dataset: Saved to rejplots folder

7. main.R: Calls all above codes. Additionally processes outputs, creates tables presented in the paper and saves into "results" folder. Input: No input needed.

   Output:

   - report_d.csv
   - report_dm.csv