Identification of Global and Local Shocks in International Financial Markets via General Dynamic Factor Models

Guide for the use of Matlab codes

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First, estimate the Forni et al. (2017) dynamic factor model on returns: run `main.m`. This routine will produce the common and idiosyncratic panels for returns, given the number of factors obtained using `nfactors_returns.m` (see below), it generates the panel of innovations needed to compute volatility proxies, which are needed in all following functions and are saved in `global_datiret_day.mat`.

The following Matlab routines can be used to replicate the figures and tables in the paper.

- To replicate Table 1 with number of factors:
  - Run `nfactors_returns.m` for the returns (sub)panels. You can either run the Hallin Liška criterion (time consuming) or load the output of the criterion to obtain the graphs from which the number of factors can be inferred. If you run the criterion the original output is overwritten.
  - Run `nfactors_vola.m` for the volatiltity (sub)panels. You can either run the Hallin Liška criterion (time consuming) or load the output of the criterion to obtain the graphs from which the number of factors can be inferred. If you run the criterion the original output is overwritten.
- To obtain explained variances: run `Explained_variances.m`. It uses the original code provided by Roman Liška.
- To replicate Table 2: run `Explained_variances_3subsamples.m`. It uses the original code provided by Roman Liška.
- To replicate Figure 6: run `irfs.m` which produces also identified volatility shocks needed for replicating Figure 4. It can either estimate the factor model for volatilities and identify shocks and impulse responses (time consuming) or load the saved identified shocks and impulse responses.

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- To replicate Figures 3 and 4: run `figure_ret_shocks.m` and `figure_vol_shocks.m`, respectively.
- To replicate Table 4: run `rv_proj_insample.m`.
- To replicate Table 5: run `rv_proj_oos.m`.

Additional comments:

Figures 1 and 2 can be replicated by just computing cross-correlations of returns and volatilities using standard Matlab routines.

The folder `data` contains the returns in `.mat` format.

The folder `mat_files` contains intermediate outputs.

The folder `subroutines` contains auxiliary functions.

The routines named `ML_*` are written by Matteo Luciani.

All figures are generated within Matlab.

Results of the Bayesian estimation can be obtained by using the Matlab package DHFM available at `https://sites.google.com/site/sn2294/home/code-and-data`