

READ ME FILE

Title: Financial Conditions and Downside Risk to Economic Activity in Australia

Authors: Luke Hartigan and Michelle Wright

Description

This 'read me' file contains information on the files used to generate the results presented in RDP 2021-03.

All our analysis was done using the statistical programming language R. To help users to more easily replicate our work we have included the RStudio project file 'rdp-2021-03-supplementary-information.Rproj'. By loading this project file into the program RStudio, users can run the replication codes as follows: Open the 'Run_GaR_Replication.R' file by clicking on it in the Files window (usually located in the lower right panel). Next, either click 'Source' in the Console window or type 'CTRL + SHIFT + S' in the Console window.

Please note, our codes are distributed as is and without any warranty and are solely for replicating our results. Any alternative use of our codes is not supported.

Publically available data used in the figures appearing in the paper can be found in the spreadsheet 'rdp-2021-03-graph-data.xls'. The survey series in Figure A3 is not available due to 3rd party provider restrictions.

If you make use of any of these files you should clearly attribute the authors in any derivative work.

Folder Structure

The project folder 'rdp-2021-03-supplementary-information' contains this read me file ('rdp-2021-03-readme.pdf'), the spreadsheet 'rdp-2021-03-graph-data.xlsx', the RStudio project file 'rdp-2021-03-supplementary-information.Rproj' and the R script 'Run_GaR_Replication.R' which runs the replication.

This folder also contains the following subfolders:

Code

This folder contains the R scripts to reproduce our analysis. R scripts are listed below in the order they should be executed in. This order is important because results from one script are used by other scripts.

- Transform_Data.R – transforms the dataset to make each series stationary with zero mean and unit variance
- Determine_DFM_Estimation_Options.R – used to ascertain dynamic factor model (DFM) estimation options
- DFM_LogLike_Ratio_Test.R – checks if the DFM specification we use fit the data
- Estimate_FCI.R – estimates the FCI using a DFM
- Activity_and_Financial_Conditions.R – investigates if the FCI has predictive information for various measures of economic activity
- Growth_at_Risk.R – conducts the growth-at-risk analysis for various measures of economic activity.

This folder also contains the subfolder:

methods

This folder contains all the R functions sourced by the R scripts in the folder above.

- gar_methods.R – functions for growth-at-risk analysis
- misc_methods.R – miscellaneous functions used by other scripts
- qmle_dfm_methods.R – functions for estimating DFMs similar to those used in the paper
- qreg_spacing_methods.R – functions for estimating quantile spacing models.

Data

This folder contains the primary inputs used by the R scripts in the 'Codes' folder. For descriptions of these data, their sources and the transformations we apply to them, see Table A1 in Appendix A of the paper.

Note: Due to licensing restrictions and confidentiality concerns we have removed the following series:

- | | |
|----------------------------------------|-----------------------------------------|
| 1 Business: difficulty getting finance | 2 Consumer: family finances now |
| 34 Dwelling price index | 35 House price index |
| 36 Apartment price index | 38 All commercial property return index |
| 39 Retail property return index | 40 Office property return index |
| 41 Industrial property return index | 42 ASX 200 Index |
| 43 ASX 200 Financials Index | 44 ASX 200 Real Estate Index |
| 45 ASX 200 Resources Index | 46 ASX 200 Industrials Index |
| 66 Wholesale debt spread to AGS | |

With the removal of these series the replication results based on 'fci_panel.csv' will not be the same as that of the RDP. To overcome this problem, we have included two additional files that will ensure the results match those of the RDP. These two files are the actual FCI we estimated using the complete dataset. These files are used in subsequent analysis instead of the files created using the smaller dataset. This ensures the results are consistent with the results shown in the RDP.

- fci_panel.csv – raw financial series
- fci_info.csv – provides information on data transformation and categories
- macro_data.csv – contains the various measures of economic activity we use in our GaR analysis
- fci_q_1_s_1_p_1_rdp.csv – estimate of FCI using uncensored dataset (csv format)
- fci_q_1_s_1_p_1_rdp.RData – estimate of FCI using uncensored dataset (Rdata format).

Results

This folder is empty and is where all the output from the replication will be saved. It contains the following two subfolders:

graphs

All graphs will be saved here, but these are not the same graphs as those which appear in the paper.

csv

All the results in csv format will be saved here.

Software

We used the 'Microsoft R Open' version of R (version 3.5.1, 64-bit) which is an enhanced distribution of R that comes bundled with Intel's Math Kernel Library for faster linear algebra calculations. For more information, see <<https://mran.microsoft.com/open>>.

Using standard R with the reference BLAS and LAPACK implementations may result in some minor differences to the results we present in the paper. However, any differences should not affect the interpretation of the results in a material way.

The program 'RStudio' is needed to open and use the 'rdp-2021-03-supplementary-information.Rproj' file. In our work we used version 1.2.5001. For more information, see <<https://rstudio.com/>>.

Our analysis uses some additional R packages not provided by the base installation. We recommend you install these packages (including any dependencies) before trying to run the replication files. The packages include:

- quantreg (version 5.36), available at <<https://cran.r-project.org/package=quantreg>>
- sgt (version 2.0), available at <<https://cran.r-project.org/package=sgt>>
- ucminf (version 1.1-4), available at <<https://cran.r-project.org/package=ucminf>>.

23 March 2021