

This form documents the artifacts associated with the article (i.e., the data and code supporting the computational findings) and describes how to reproduce the findings.

## Part 1: Data

- ☐ This paper does not involve analysis of external data (i.e., no data are used or the only data are generated by the authors via simulation in their code).
- ☒ I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

## Abstract

Our data includes three CSV datasets. The file “X at 20220104 and Y at 20220401.csv” contains the returns of 800 stocks for the first quarter of 2022 and the standardized covariates values from the fourth quarter of 2021. The file “X at 20220401 and Y at 20220701.csv” includes the returns of 800 stocks for the second quarter of 2022 and the standardized covariates values from the first quarter of 2022. The file “network.csv” represents the network connections between the 800 stocks.

## Availability

- ☒ Data **are** publicly available.
- ☐ Data **cannot be made** publicly available.

If the data are publicly available, see the *Publicly available data* section. Otherwise, see the *Non-publicly available data* section, below.

### Publicly available data

- ☐ Data are available online at:
- ☒ Data are available as part of the paper’s supplementary material.
- ☐ Data are publicly available by request, following the process described here:
- ☐ Data are or will be made available through some other mechanism, described here:

### Non-publicly available data

## Description

### File format(s)

- ☒ CSV or other plain text.
- ☐ Software-specific binary format (.Rda, Python pickle, etc.): pkcle
- ☐ Standardized binary format (e.g., netCDF, HDF5, etc.):
- ☐ Other (please specify):

## Data dictionary

- ☒ Provided by authors in the following file(s):
- ☒ Data file(s) is(are) self-describing (e.g., netCDF files)
- ☐ Available at the following URL:

## Additional Information (optional)

## Part 2: Code

### Abstract

Our code is stored in the “code-tables and figures” folder. Inside, there are two files: to generate the figures in the paper, run the files in the “Code for figures” folder, and to generate the tables in the paper, run the files in the “Code for tables” folder. All code is saved as .R files. For detailed instructions on running them, please refer to the workflow. ## Description

### Code format(s)

- ☒ Script files
  - ☒ R
  - ☐ Python
  - ☐ Matlab
  - ☐ Other:
- ☐ Package
  - ☐ R
  - ☐ Python
  - ☐ MATLAB toolbox
  - ☐ Other:
- ☐ Reproducible report
  - ☐ R Markdown
  - ☐ Jupyter notebook
  - ☐ Other:
- ☐ Shell script
- ☐ Other (please specify):

### Supporting software requirements

**Version of primary software used** R version 4.1.3 (2022-03-10)

**Libraries and dependencies used by the code** package:grpreg,3.4.0; gglasso 1.5; MASS, 7.3.55; flexmix,2.3.17

### Supporting system/hardware requirements (optional)

#### Parallelization used

- ☐ No parallel code used
- ☒ Multi-core parallelization on a single machine/node

- Number of cores used: 60
- ☐ Multi-machine/multi-node parallelization
  - Number of nodes and cores used:

### License

- ☒ MIT License (default)
- ☐ BSD
- ☐ GPL v3.0
- ☐ Creative Commons
- ☐ Other: (please specify)

### Additional information (optional)

## Part 3: Reproducibility workflow

### Scope

The provided workflow reproduces:

- ☐ Any numbers provided in text in the paper
- ☐ The computational method(s) presented in the paper (i.e., code is provided that implements the method(s))
- ☒ All tables and figures in the paper
- ☐ Selected tables and figures in the paper, as explained and justified below:

### Workflow

#### Location

The workflow is available:

- ☒ As part of the paper's supplementary material.
- ☐ In this Git repository:
- ☐ Other (please specify):

#### Format(s)

- ☐ Single master code file
- ☐ Wrapper (shell) script(s)
- ☐ Self-contained R Markdown file, Jupyter notebook, or other literate programming approach
- ☒ Text file (e.g., a readme-style file) that documents workflow
- ☐ Makefile
- ☐ Other (more detail in *Instructions* below)

### Instructions

In the R working environment, you can obtain the tables and figures in the paper by running the relevant scripts according to the instructions in the Workflow file.

**Expected run-time**

Approximate time needed to reproduce the analyses on a standard desktop machine:

- ☐ < 1 minute
- ☐ 1-10 minutes
- ☐ 10-60 minutes
- ☐ 1-8 hours
- ☒ > 8 hours
- ☐ Not feasible to run on a desktop machine, as described here:

**Additional information (optional)**

**Notes (optional)**