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

The data is about daily returns on selected stocks, the Market portfolio and factors of Fama and French from 1993-01-05 to 2009-01-30 for CAPM and APT analysis.

Availability

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

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:

The data analyzed in the paper can be accessed by the following R code:

```
install.packages("gmm")
library(gmm)
data <- data(Finance)
```

Description

File format(s)

☐ CSV or other plain text.
☒ Software-specific binary format (.Rda, Python pickle, etc.): .Rda
☐ 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: https://www.rdocumentation.org/packages/gmm/versions/1.8/topics/Finance

Part 2: Code

Abstract

The simulation code and real data analysis code are provided. The detailed instruction can be found in the README file in the GitHub provided below.

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

Only R packages are required and they are listed in the `Libraries and dependencies used by the code` section. The citations of these packages can be found by `citation('name_of_package')` or the GitHub folder if it is not on CRAN.

Version of primary software used R version 4.4.1

Libraries and dependencies used by the code All the packages and their version numbers can be found in the following chunk of R code. Note that the instruction for settling the R environment with these packages can be found in the README in the GitHub provided below. In particular, the `renv` package will be used for this purpose.

```
pack_versions <- c(
  "EnvStats" = "3.0.0",
  "FNN" = "1.1.4.1",
  "IndepTest" = "0.2.0",
  "JADE" = "2.0-4",
  "LaplacesDemon" = "16.1.6",
  "MASS" = "7.3-65",
  "Matrix" = "1.7-0",
  "ProDenICA" = "1.1",
  "R6" = "2.5.1",
  "RColorBrewer" = "1.1-3",
  "Rcpp" = "1.0.14",
  "RcppArmadillo" = "14.0.2-1",
  "Rdpack" = "2.6.1",
  "SpatialNP" = "1.1-5",
```

```
"askpass" = "1.2.1",
"base64enc" = "0.1-3",
"boot" = "1.3-31",
"bslib" = "0.8.0",
"cachem" = "1.1.0",
"callr" = "3.7.6",
"cli" = "3.6.3",
"clue" = "0.3-65",
"cluster" = "2.1.6",
"codetools" = "0.2-20",
"colorspace" = "2.1-1",
"combinat" = "0.0-8",
"cowplot" = "1.1.3",
"cpp11" = "0.5.0",
"crosstalk" = "1.2.1",
"curl" = "5.2.3",
"dHSIC" = "2.1",
"data.table" = "1.16.2",
"desc" = "1.4.3",
"digest" = "0.6.37",
"dplyr" = "1.1.4",
"energy" = "1.7-12",
"evaluate" = "1.0.1",
"fansi" = "1.0.6",
"farver" = "2.1.2",
"fastmap" = "1.2.0",
"fontawesome" = "0.5.2",
"foreach" = "1.5.2",
"fs" = "1.6.4",
"gam" = "1.22-5",
"generics" = "0.1.3",
"ggplot2" = "3.5.1",
"glue" = "1.8.0",
"gmm" = "1.8",
"gridExtra" = "2.3",
"gsl" = "2.1-8",
"gtable" = "0.3.6",
"highr" = "0.11",
"htmltools" = "0.5.8.1",
"htmlwidgets" = "1.6.4",
"httr" = "1.4.7",
"igraph" = "2.1.2",
"isoband" = "0.2.7",
"iterators" = "1.0.14",
"jdcov" = "1.0.0",
"jquerylib" = "0.1.4",
"jsonlite" = "1.8.9",
"katlabutils" = "0.0.0.9000",
"kernlab" = "0.9-33",
"knitr" = "1.48",
"labeling" = "0.4.3",
"later" = "1.3.2",
"lattice" = "0.22-6",
"lazyeval" = "0.2.2",
```

```
  "lifecycle" = "1.0.4",
  "magrittr" = "2.0.3",
  "memoise" = "2.0.1",
  "mgcv" = "1.9-1",
  "microbenchmark" = "1.5.0",
  "mime" = "0.12",
  "mixtools" = "2.0.0",
  "multivariance" = "2.4.1",
  "munsell" = "0.5.1",
  "mvtnorm" = "1.3-1",
  "nlme" = "3.1-166",
  "nortest" = "1.0-4",
  "openssl" = "2.2.2",
  "pillar" = "1.9.0",
  "pkgbuild" = "1.4.4",
  "pkgconfig" = "2.0.3",
  "plotly" = "4.10.4",
  "pracma" = "2.4.4",
  "processx" = "3.8.4",
  "promises" = "1.3.0",
  "ps" = "1.8.0",
  "purrr" = "1.0.2",
  "randtoolbox" = "2.0.4",
  "rappdirs" = "0.3.3",
  "rbibutils" = "2.3",
  "renv" = "1.0.10",
  "rlang" = "1.1.4",
  "rmarkdown" = "2.28",
  "rngWELL" = "0.10-9",
  "sandwich" = "3.1-1",
  "sass" = "0.4.9",
  "scales" = "1.3.0",
  "segmented" = "2.1-2",
  "steadyICA" = "1.0",
  "stringi" = "1.8.4",
  "stringr" = "1.5.1",
  "survival" = "3.7-0",
  "sys" = "3.4.3",
  "tibble" = "3.2.1",
  "tidyr" = "1.3.1",
  "tidyselect" = "1.2.1",
  "tinytex" = "0.53",
  "utf8" = "1.2.4",
  "vctrs" = "0.6.5",
  "viridisLite" = "0.4.2",
  "withr" = "3.0.2",
  "xfun" = "0.48",
  "yaml" = "2.3.10",
  "zoo" = "1.8-12"
)
```

Parallelization used

☒ No parallel code used

☐ Multi-core parallelization on a single machine/node
  - Number of cores used:

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

License

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

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: https://anonymous.4open.science/r/RJdCov-project-84EF/README.md
☐ 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

Please follow the README in the GitHub link provided above. The instructions for reproducing the simulation and real data analyses are self-contained there.

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: