

Replication files for results in:

Dou (2024) “Optimal HAR Inference”

Overview

This is the replication package for the paper “Optimal HAR Inference.” The package consists of the US unemployment rate data extracted from the U.S. Bureau of Labor Statistics (BLS, 2024), the inflation forecast data from Li, Liao, and Quaedvlieg (2021a), and the codes for producing the tables and figures in the paper using Matlab. Four main files run the code to generate 1 figure and 2 tables in Section 1, 4 figures (6 subfigures in total) and 3 tables in Section 3, 2 figures (4 subfigures in total) and 2 tables in Section 4, and 1 figure (2 subfigures in total) and 2 tables in Section 6, respectively. The replicator should expect the code to run for less than 2 hours on an Apple M2 Max CPU with 12 cores (and 96 GB RAM memory).

Data Availability and Provenance Statements

Statement about Rights

- I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

Summary of Availability

- All data **are** publicly available.

Details on each Data Source

- The data on the U.S. unemployment rate (in Section 6 of the paper) were extracted from the U.S. Bureau of Labor Statistics (BLS, 2024). I used Series LNS14000000 from 1948:1 to 2019:12. Data can be downloaded from <https://beta.bls.gov/dataViewer/view/timeseries/LNS14000000>.
- The data on the inflation forecast (in Section 6 of the paper) is part of the replication package of Li, Liao, and Quaedvlieg (2021a). The package (Li, Liao, and Quaedvlieg, 2021b) can be downloaded from <http://doi.org/10.5281/zenodo.4884813>. I used two sets of series (errorCPI1.xlsx and errorCPI12.xlsx) from their Section 5. The two original Excel files can be found under their directory Replication_Code/Empirics_Inflation/Data/.

The summary of these two data in my replication package is (.csv version of the data files are also provided):

Data.Name	Data.Files	Location	Provided	Citation
“U.S. Unemployment rate”	usun.xlsx	data/	TRUE	BLS (2024)
“Inflation Forecasts”	errorCPI1.xlsx; errorCPI12.xlsx	data/	TRUE	Li, Liao, and Quaedvlieg (2021b)

Computational requirements

All the codes are written in Matlab. The Parallel Computing Toolbox is needed for running `main_Sec4.m`.

Software Requirements

- Matlab (code was run with Matlab Release 2024a)

Controlled Randomness

- Random seed is set at lines 59, 149, and 208 of program `main_Sec1.m`
- Random seed is set at lines 327, 377, and 433 of program `main_Sec3.m`
- Random seed is set at lines 43, 117, 186, 265, 341, 364, 387, 410, 433, 456, 479, 505, 550, 629, 652, 675, 698, 721, 744, 767, and 790 of program `main_Sec4.m`

Memory and Runtime Requirements

Summary

The approximate time needed to reproduce the analyses on a standard (2024) desktop machine is 1-2 hours.

Details

The code was last run on a **12-core MacBook Pro laptop with M2 Max CPU, 96 GB of RAM, and MacOS version 14.4.1.**

The more accurate runtime to produce each table or subfigure is commented on in the respective `.m` files.

Description of programs/code

- The main files generating all tables and figures in the paper are in the default directory with one main file for each section in the paper. The associated subroutines and outputs are in the subdirectories and are organized section by section. For example, the file `main_Sec1.m` generates Figure 1 and Tables 1 and 2 in the manuscript. The necessary subroutine functions to run `main_Sec1.m` are collected in `/codes` and `outputs/Section 1/`. The outputs (`.mat` format for tables; `.eps` and `.pdf` format for figures) are in `/codes` and `outputs/Section 1/outputs/`.

Instructions to Replicators

- Each main file contains the codes to reproduce the tables and figures, organized in the same order as they appear in the manuscript. **After running each main file, please make sure to clear all variables from the current workspace and return to the default directory before running another main file.**
- The outputs for tables are in `.mat` format. Each output table should exactly reproduce its counterpart in the manuscript, except for Table 9, in which I separately generated

outputs for the first and second numbers in each cell and named them `table9Number1.mat` and `table9Number2.mat`, respectively.

- If the figure contains more than one subfigure in the manuscript, I output them one by one and name them with the corresponding panel label (e.g., `figure4a.eps` and `figure4b.eps`).

List of tables and programs

The provided code reproduces:

- All tables and figures in the paper

	Program	Line Number	Output file
Table 1	<code>main_Sec1.m</code>	116-169	<code>table1.mat</code>
Table 2	<code>main_Sec1.m</code>	170-231	<code>table2.mat</code>
Table 3	<code>main_Sec3.m</code>	299-345	<code>table3.mat</code>
Table 4	<code>main_Sec3.m</code>	346-400	<code>table4.mat</code>
Table 5	<code>main_Sec3.m</code>	401-453	<code>table5.mat</code>
Table 6	<code>main_Sec4.m</code>	251-536	<code>table6.mat</code>
Table 7	<code>main_Sec4.m</code>	537-813	<code>table7.mat</code>
Table 8	<code>main_Sec6.m</code>	46-122	<code>table8.mat</code>
Table 9	<code>main_Sec6.m</code>	123-248	<code>table9Number1.mat</code> ; <code>table9Number2.mat</code>
Figure 1	<code>main_Sec1.m</code>	3-115	<code>figure1.eps</code> ; <code>figure1.pdf</code>
Figure 2	<code>main_Sec3.m</code>	3-43	<code>figure2.eps</code> ; <code>figure2.pdf</code>
Figure 3	<code>main_Sec3.m</code>	44-162	<code>figure3.eps</code> ; <code>figure3.pdf</code>
Figure 4	<code>main_Sec3.m</code>	163-298	<code>figure4a.eps</code> ; <code>figure4a.pdf</code> ; <code>figure4b.eps</code> ; <code>figure4b.pdf</code>
Figure 5	<code>main_Sec3.m</code>	454-677	<code>figure5a.eps</code> ; <code>figure5a.pdf</code> ; <code>figure5b.eps</code> ; <code>figure5b.pdf</code>
Figure 6	<code>main_Sec4.m</code>	3-155	<code>figure6a.eps</code> ; <code>figure6a.pdf</code> ; <code>figure6b.eps</code> ; <code>figure6b.pdf</code>
Figure 7	<code>main_Sec4.m</code>	156-250	<code>figure7a.eps</code> ; <code>figure7a.pdf</code> ; <code>figure7b.eps</code> ; <code>figure7b.pdf</code>
Figure 8	<code>main_Sec6.m</code>	8-45	<code>figure8a.eps</code> ; <code>figure8a.pdf</code> ; <code>figure8b.eps</code> ; <code>figure8b.pdf</code>

References

Bureau of Labor Statistics (BLS). 2024. "Series LNS14000000, 1948:1 to 2019:12." <https://beta.bls.gov/dataViewer/view/timeseries/LNS14000000>. Accessed January 9, 2024.

Li, J., Z. Liao, and R. Quaedvlieg (2021a): "Conditional Superior Predictive Ability," *The Review of Economic Studies*, 89(2), 843–875.

Li, J., Z. Liao, and R. Quaedvlieg (2021b): "Replication package for: Conditional Superior Predictive Ability (Version v4)," Zenodo. <http://doi.org/10.5281/zenodo.4884813>.

Acknowledgment

This file is based on a template by the Social Sciences Data Editor.