# Replication package for “Local Projections Inference with High-Dimensional Covariates without Exact Sparsity”

This package reproduces the simulation study and monetary policy empirical application in the paper.

## Components

- `simulations/` contains the calibrated dynamic factor model, simulation code, archived Monte Carlo output, cluster wrappers, and scripts used to reproduce the simulation figures and tables.
- `empirics/` contains the monetary policy application, including the empirical input file, estimation code, figures, and OGA selection diagnostics. Data provenance and the redistribution statement are provided in `empirics/data/README.md`.

The two components should be run from their respective directories.

Each component contains an `install_packages.R` script with executable, version-pinned setup and check profiles. The corresponding component README gives the required R version and the exact command to use before running the analysis.

## Reproducing the paper output

### Simulation results

No external data are required. From the `simulations/` directory, run:

```
Rscript run_analysis.R
```

This reads the included CSV files produced by the original cluster runs and regenerates Figures 1–3, Figure S1, and Tables S3–S4. It does not rerun the individual Monte Carlo replications. Instructions for rerunning the full Monte Carlo experiment and then rebuilding these outputs are provided in the simulation README. Tables 1, S1, and S2 are descriptive tables authored directly in the manuscript and are not generated by code.

### Empirical results

From the `empirics/` directory, run:

```
Rscript run_analysis.R
```

The default run re-estimates double OGA, FALP, and FAVAR and uses the included archived estimates for the computationally intensive HDLP method. Those HDLP estimates were generated by the documented CRC run and are the estimates used in Figure 4. Instructions for recomputing them with the full workflow are provided in the empirical README.

## Data availability statement

All data required to reproduce the results are included in this replication package.

The empirical application uses the September 2021 vintage of FRED-MD, maintained by the Federal Reserve Bank of St. Louis (FRED-MD data and historical vintages). The data used in the analysis were obtained from the replication package accompanying Adamek, Smeekes, and Wilms (2024), downloaded on January 18, 2026, rather than directly from the FRED-MD website. The R-format data file supplied with those replication materials and a CSV copy are included in `empirics/data/`. Variable definitions and transformations are documented in `empirics/data/README.md`.

The simulation calibration and its open-format companion files are included in `simulations/`. Their provenance, including the repository links, commit identifiers, and snapshot dates, is documented in `simulations/README.md`.

No restricted or proprietary data are required, and no external data access is needed to reproduce the reported results.

## Software and runtime

The simulations and full empirical estimation, including HDLP, were run on the CRC cluster using R 4.5.2. The default empirical replication workflow was verified separately on an Apple Silicon laptop using R 4.4.3. This workflow re-estimates double OGA, FALP, and FAVAR, uses the archived HDLP estimates from the CRC run, and regenerates Figure 4. Package versions, computing environments, installation instructions, and verification commands are documented in the corresponding component READMEs and recorded in:

```
empirics/install_packages.R
simulations/install_packages.R
```

The installers pin the packages directly used by the replication. The complete resolved environments are recorded in the component session-information logs.

Regenerating the code-produced simulation figures and tables from the included Monte Carlo CSV files took approximately 34 seconds on an Apple silicon laptop. The default empirical workflow, which uses the included HDLP estimates, took approximately 3.2 minutes on an Apple silicon laptop.

Recomputing the full empirical results, including HDLP, took 9,844 seconds—approximately 2 hours 44 minutes—on the CRC cluster using 16 threads. Rerunning the complete Monte Carlo experiment requires substantially more computation; task-level allocations and recorded runtimes are reported in the simulation README.

All reported runtimes are approximate and depend on the processor, available memory, number of threads or concurrent tasks, software versions, and system load.

## Output mapping

The mapping from every reported simulation and empirical exhibit to its generated file is given in the Outputs section of the simulation README and the empirical README. The simulation README also identifies the three descriptive tables that are authored directly in the manuscript and are not generated by code.

## References

Adamek, R., Smeekes, S., and Wilms, I. (2024). "Local Projection Inference in High Dimensions." *The Econometrics Journal* 27(3), 323–342. https://doi.org/10.1093/ectj/utae012.

Adamek, R., Smeekes, S., and Wilms, I. (2024). *HDLPrepro: Replication Package for "Local Projection Inference in High Dimensions."* GitHub repository, version 1.12, commit `e9fe6071c5c91966cd7a6585a6f7bdafcb3624ba`, dated 8 March 2024. Direct source of `empirics/data/CDbmedium.RData`; the file was downloaded on 18 January 2026.

Federal Reserve Bank of St. Louis (2021). "FRED-MD: September 2021 Vintage." FRED-MD database. https://www.stlouisfed.org/research/economists/mccracken/fred-databases. Processed copy obtained from the replication materials of Adamek, Smeekes, and Wilms on January 18, 2026.

Li, D., Plagborg-Møller, M., and Wolf, C. K. (2024). "Local Projections vs. VARs: Lessons From Thousands of DGPs." *Journal of Econometrics* 244(2), 105722. https://doi.org/10.1016/j.jeconom.2024.105722.

McCracken, M. W., and Ng, S. (2016). "FRED-MD: A Monthly Database for Macroeconomic Research." *Journal of Business & Economic Statistics* 34(4), 574–589. https://doi.org/10.1080/07350015.2015.1086655.

Montiel Olea, J. L., Plagborg-Møller, M., Qian, E., and Wolf, C. K. (2026). "Local Projections or Vector Autoregressions? A Primer for Macroeconomists." *NBER Macroeconomics Annual* 40(1), 111–152. https://doi.org/10.1086/738945.

Montiel Olea, J. L., Plagborg-Møller, M., Qian, E., and Wolf, C. K. (2025). *lp_var_nberma: Replication Files for "Local Projections or VARs? A Primer for Macroeconomists."* GitHub repository, commit `b3315b97540f003005180b13fa78da4fc84a8b39`, dated 22 May 2025. Direct source of `simulations/dfm_calibration.mat`.

## Third-party material and licenses

Licensing differs across the two components. The license and third-party notices in each component apply only as stated there. The included empirical input remains third-party material and is redistributed with permission; it is not covered by the license for the original replication code.