Reproducible Research Repository

Assessing the real-world economic value of weather forecasts under compounding extremes: a decision-specific framework

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This review verifies the reproducibility of the exhibits included in the paper *"Assessing the real-world economic value of weather forecasts under compounding extremes: a decision-specific framework"*.

Contents in this review:

Main findings

- **Every exhibit in the main section of the paper and 10 randomly selected exhibits in the appendix were reproduced accurately**
- The code was successfully executed on a new computer after:
  1. Opening the R project "replication.Rproj"
  2. Restoring the environment by running renv::restore() and following the prompts.
  3. Running the files in order: Theoretical.R and Case_studies.R
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 75 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors.
- **Verification Process and Data Handling**:
  - The reproducibility package relies one type of data: open.
  - Open data is included in the public reproducibility package.
  - *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks.
- **Reproducibility Summary**:
  - **Data**: All data sources are publicly available and included in the reproducibility package.

- **Code**: All code files (from cleaning to analysis) are included in the reproducibility package.
- **Outputs**: All outputs are generated by code included in the reproducibility package.
- **Dependencies environment**: The reviewers created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1** Reproduced.
- **Figure 2** Reproduced.
- **Figure 3** Reproduced.
- **Figure 4** Reproduced.
- **Figure 5** Reproduced.
- **Figure 6** Reproduced.
- **Figure 7** Reproduced.
- **Figure 8** Reproduced.
- **Table 1** Does not apply. Exhibit is not an analytical output.
- **Table 2** Does not apply Exhibit is not an analytical output.
- **Table 3** Does not apply Exhibit is not an analytical output.
- **Table 4** Does not apply Exhibit is not an analytical output.

Results in the Annex

For the Appendix, we did not review every exhibit. Instead, we randomly selected 10 exhibits from the remaining datasets to assess the appendix. Our review was based on those 10 exhibits. Since they were chosen randomly, we are operating under the assumption that if all randomly selected exhibits are reproducible, then the rest should be as well. The seed used to generate the random selection was 639274, the Stata version used was 18, and the exhibits selected were: figures 9, 10, 12, 14, 15, 17, 20, 21, 22, and table 8

- **Figure 9** Reproduced.
- **Figure 10** Reproduced.
- **Figure 12** Reproduced.
- **Figure 14** Reproduced.
- **Figure 15** Reproduced.

- **Figure 17** Reproduced.
- **Figure 20** Reproduced.
- **Figure 21** Reproduced.
- **Figure 22** Reproduced.
- **Table 8** Reproduced.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: Windows 11 Enterprise
- Processor: INTEL(R) XEON(R) PLATINUM 8562Y+ 2.80 GHz (2 processors)
- Memory available: 128.0 GB
- Software version: R version 4.4.3