

Reproducibility Package

"Labor Demand for Digital Skills in Post-2022 Ukraine: Evidence from Online Job Vacancy Data"

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Overview

This package contains the complete R code to replicate all tables and figures in the paper. Starting from the raw parquet/Excel data files described below, running `run_all.R` reproduces every table (`output/tables/*.tex`) and figure (`output/figures/*.pdf` and `*.png`) in the paper.

Data Availability Statement

This package uses four datasets. The online job vacancy (OJV) data (Jooble) are proprietary and **not included** in this package. The ACLED conflict data are publicly available and must be downloaded by the replicator. The two electricity-infrastructure datasets were downloaded from the Energy Map open-data portal (<https://energy-map.info/>) and are **included** in the `data/` folder. See [Instructions for Replicators](#) below.

Dataset 1 — Online Job Vacancy data (Jooble Ukraine)

Field	Details
Filenames	<code>final_weekly.parquet</code> , <code>final_monthly.parquet</code> , <code>final_dataset_occ_digital_month.parquet</code>
Source	Jooble — Ukrainian online job vacancy aggregator (https://ua.jooble.org/)
URL / Access instructions	Not publicly available. The data were transferred directly from Jooble to the research team under an institutional data-sharing arrangement. Researchers wishing to replicate the analysis should contact the corresponding author to enquire about access arrangements.
Access date	April 2025
Citation	Jooble (2025). <i>Ukrainian online job vacancy microdata</i> [proprietary dataset]. Data transferred to the research team under a data-sharing agreement, April 2025.
License	Proprietary. Redistribution is not permitted. The files are not included in this package.

The three files are analysis-ready datasets derived from the raw Jooble online job-vacancy microdata. Each vacancy was parsed for digital-, military- and remote-work skill content and classified into a 1-digit ISCO-08 occupation group; the vacancy-level records were then aggregated to the temporal (and, in one file, occupational) units described below and merged with the ACLED conflict indicators (`num_events`, `total_fatalities`). The underlying vacancy microdata cover job postings on the Jooble Ukraine platform; the aggregated files span **December 2020 – June 2025**.

File 1 — `final_weekly.parquet` (weekly aggregation; 235 weeks, 2020-12-28 to 2025-06-23)

Variable	Description
<code>week</code>	Week-start date (ISO week)
<code>vacancy_count</code>	Number of online job vacancies posted that week
<code>avg_digital_skill_share</code>	Mean share of digital skills per vacancy (fraction, 0–1)
<code>avg_military_skill_share</code>	Mean share of military-related skills per vacancy (fraction, 0–1)
<code>total_digital_skills</code>	Total count of digital-skill mentions across all vacancies that week
<code>remote_share</code>	Share of vacancies offering remote work (fraction, 0–1)
<code>num_events</code>	Number of ACLED conflict events in Ukraine that week (merged)
<code>total_fatalities</code>	Total ACLED-recorded fatalities that week (merged)

File 2 — `final_monthly.parquet` (monthly aggregation; 54 months, 2021-01 to 2025-06)

Variable	Description
<code>year_month</code>	Month (first-of-month date)
<code>year_created</code> , <code>month_created</code>	Calendar year and month components
<code>year</code> , <code>quarter</code>	Calendar year and quarter helpers
<code>vacancy_count</code>	Number of online job vacancies posted that month
<code>avg_digital_skill_share</code>	Mean share of digital skills per vacancy (fraction, 0–1)
<code>share_pct</code>	Digital-skill share expressed as a percentage (<code>avg_digital_skill_share × 100</code>)
<code>avg_military_skill_share</code>	Mean share of military-related skills per vacancy (fraction, 0–1)

Variable	Description
remote_share	Share of vacancies offering remote work (fraction, 0–1)
num_events	Number of ACLED conflict events in Ukraine that month (merged)
total_fatalities	Total ACLED-recorded fatalities that month (merged)

File 3 — `final_dataset_occ_digital_month.parquet` (month × occupation-group panel; 488 rows, 2021-01 to 2025-06)

Variable	Description
date	Month (first-of-month date)
year_created, month_created	Calendar year and month components
occ1d	1-digit ISCO-08 major occupation code (0–9)
occupation_group	ISCO-08 major-group label (e.g. <i>Professionals, Service and sales workers</i> ; None = unclassified / armed-forces code 0)
vacancy_count	Number of vacancies in that occupation group and month
avg_digital_skill_share	Mean share of digital skills per vacancy in the cell (fraction, 0–1)
sum_digital_share	Sum of vacancy-level digital-skill shares in the cell
nonmissing_share_obs	Number of vacancies in the cell with a non-missing digital-skill share

Dataset 2 — ACLED Conflict Event Data

Field	Details
Filename	<code>europe-central-asia_full_data_up_to-2025-07-25.xlsx</code>
Source	Armed Conflict Location & Event Data Project (ACLED), https://acleddata.com/
URL / Access instructions	Freely available via the ACLED Data Export Tool at https://acleddata.com/data-export-tool/ . A free ACLED account is required. Apply the following filters when downloading: Region = Europe & Central Asia ; Event date = 1 January 2020 – 25 July 2025 ; export format Excel (.xlsx) . The filename generated will include the download date.
Access date	25 July 2025
Citation	Raleigh, C., Linke, A., Hegre, H. & Karlsen, J. (2010). Introducing ACLED: An Armed Conflict Location and Event Dataset. <i>Journal of Peace Research</i> , 47(5), 651–660. Data retrieved from https://acleddata.com/data-export-tool/ on 25 July 2025.
License	Freely available for non-commercial academic use under the ACLED Terms of Use . Attribution required. The file is not included in this package; replicators must download it directly.

Dataset 3 — Electricity Outage Schedule (energy-map.info)

Field	Details
Filename	<code>2025_10_14_electricity_outages.xlsx</code> (included in <code>data/</code>)
Source	Energy Map — open-data energy portal operated by the DiXi Group NGO, https://energy-map.info/ . Dataset: “ <i>Information on electricity consumption limitation measures</i> ” (unique identifier <code>0f8f9882-1fb2-47c6-81dc-31fbad914f16</code>). Energy Map compiles this series from NPC Ukrenergo’s data on the application of planned stabilization (nationwide/large-scale) electricity outages.
Contents	Hourly nationwide electricity-outage schedule (24,097 rows × 4 columns): <code>Дата</code> (date), <code>Година</code> (hour slot, e.g. 00:00–01:00), <code>Запровадження відключень електроенергії</code> (outage introduced: <code>так/ні</code> = yes/no), and <code>Кількість черг відключень</code> (number of outage queues, where reported).
Time period / granularity	Hourly; from 1 January 2023 (source is ongoing; this snapshot was downloaded 14 October 2025).
URL / Access instructions	Available at https://energy-map.info/en/datasets/0f8f9882-1fb2-47c6-81dc-31fbad914f16 ; a free account is required to export the dataset as Excel/CSV, and the free tier applies download limits. This file is already included in <code>data/</code>, so no download is needed to reproduce the analysis.
Access date	14 October 2025
Citation	Energy Map / DiXi Group (2025). <i>Information on electricity consumption limitation measures</i> [online dataset]. Compiled from NPC Ukrenergo data. Retrieved from https://energy-map.info/en/datasets/0f8f9882-1fb2-47c6-81dc-31fbad914f16 on 14 October 2025.
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Dataset 4 — Combat-Related Power Disconnections (Ministry of Energy, via energy-map.info)

Field	Details
Filename	2025_10_14_elektro_boiovi_dii_ukraina_minenergo.xlsx (included in data/)
Source	Energy Map — open-data energy portal operated by the DiXi Group NGO, https://energy-map.info/ . Dataset: "Number of consumers who lost electricity supply due to hostilities in Ukraine (according to the Ministry of Energy)" (unique identifier 85a0e29e-e9aa-4e5d-8f97-01ba4bf0ed59). Energy Map compiles this series from the Ministry of Energy of Ukraine's daily "Operational update regarding the russian invasion" bulletins.
Contents	Daily record of hostilities-related power disconnections nationwide. Columns (Ukrainian headers in the file; energy-map field names in brackets): <i>Дата, станом на</i> (date), <i>Кількість знеструмлених споживачів</i> (number_blackout_consumers — consumers without supply), <i>Кількість знеструмлених населених пунктів</i> (number_blackout_settlements — settlements without supply), <i>Кількість споживачів, для яких відновлено електропостачання</i> (number_restored — consumers restored during the previous day), <i>Причина знеструмлень</i> (notes — cause, e.g. <i>бойові дії</i> = hostilities), and <i>Посилання на офіційне першоджерело</i> (link — hyperlink to the official Ministry of Energy source for each record).
Time period / granularity	Daily; 1 March 2022 – 26 March 2025. (On 27 March 2025 the Ministry of Energy stopped publishing aggregated nationwide restoration data.)
URL / Access instructions	Available at https://energy-map.info/en/datasets/85a0e29e-e9aa-4e5d-8f97-01ba4bf0ed59 ; a free account is required to export the dataset as Excel/CSV, and the free tier applies download limits. This file is already included in data/, so no download is needed to reproduce the analysis.
Access date	14 October 2025
Citation	Energy Map / DiXi Group (2025). <i>Number of consumers who lost electricity supply due to hostilities in Ukraine (according to the Ministry of Energy)</i> [online dataset]. Compiled from Ministry of Energy of Ukraine operational updates. Retrieved from https://energy-map.info/en/datasets/85a0e29e-e9aa-4e5d-8f97-01ba4bf0ed59 on 14 October 2025.
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Statement of Rights

The authors confirm the following:

- 1. **Online job vacancy data (Jooble):** The data were obtained via a direct institutional data-sharing arrangement between the research team and Jooble. The authors hold authorisation to use these data for academic research. Redistribution of the raw data is not permitted; the files are accordingly not included in this package. Researchers seeking access should contact the corresponding author.
- 2. **ACLED conflict event data:** The data were downloaded from the publicly accessible ACLED Data Export Tool (<https://acleddata.com/data-export-tool/>) in accordance with ACLED's Terms of Use. The data are freely available for non-commercial academic research.
- 3. **Electricity outage data (NPC Ukrenergo, via Energy Map / DiXi Group):** The data were obtained from the Energy Map open-data portal (<https://energy-map.info/en/datasets/0f8f9882-1fb2-47c6-81dc-31fbad914f16>), which compiles NPC Ukrenergo's data on planned stabilization outages. Under the portal's [Terms of Service](#) (§6.1.5), free content may be reused in any manner with attribution via a source hyperlink. The file is included in this package with attribution to energy-map.info.
- 4. **Combat disconnection data (Ministry of Energy, via Energy Map / DiXi Group):** The data were obtained from the Energy Map open-data portal (<https://energy-map.info/en/datasets/85a0e29e-e9aa-4e5d-8f97-01ba4bf0ed59>), which compiles the Ministry of Energy of Ukraine's daily operational updates. Under the portal's [Terms of Service](#) (§6.1.5), free content may be reused in any manner with attribution via a source hyperlink. The file is included in this package with attribution to energy-map.info; each record additionally retains a hyperlink to its official Ministry of Energy source.

The authors have complied with all applicable data use agreements and take responsibility for the proper use of all datasets described in this package.

Folder structure

```
reproducibility_package/  
├── R/                                ← Analysis scripts (see pipeline map below)  
│   ├── 00_acled_data_prep.R          ← ACLED conflict data aggregation  
│   ├── 01_load_data.R                ← Data QC / exploration (optional)  
│   ├── 02_baseline_regression.R  
│   ├── 03_structural_break.R  
│   ├── 04_stationarity.R  
│   ├── 05_cointegration_ecm.R  
│   ├── 06_decomposition.R  
│   ├── 07_robustness_ovb.R  
│   ├── 08_robustness_monthly.R  
│   ├── 09_robustness_smoothing.R  
│   ├── 10_seasonality_diagnostics.R  
│   ├── 11_decomp_within_between.R  
│   └── 12_mechanisms_remoteshare.R  
├── data/                             ← Place raw data files here  
├── output/  
│   ├── figures/                      ← Generated figures (.pdf, .png)  
│   └── tables/                       ← Generated LaTeX tables (.tex)  
└── renv/                             ← renv package library (auto-managed)
```

— renv.lock	← Locked package versions
— run_all.R	← Master run script
— ukraine_skills.Rproj	← RStudio project file (sets working directory)
— README.md	← This file

Instructions for Replicators

1. Install R

Download and install **R 4.3.0** (or a compatible version $\geq 4.2.0$) from [CRAN](#).
We recommend using [RStudio](#) as the IDE.

2. Open the project

Open `ukraine_skills.Rproj` in RStudio.
This anchors all relative paths via the [here](#) package so that scripts run correctly regardless of where the project folder is located on your machine.

3. Restore the package environment

In the R console (inside the project), run:

```
renv::restore()
```

This reads `renv.lock` and installs every package at the exact version used by the authors. An internet connection is required on first restore.
Accept any prompts to activate the renv environment.

Tip: If `renv` itself is not yet installed, run `install.packages("renv")` first.

4. Obtain and place raw data files

All data files must be placed in the `data/` folder before running the pipeline.

Included in this package (already in `data/` — no action needed):

File	Notes
<code>2025_10_14_electricity_outages.xlsx</code>	Energy Map hourly outage schedule (see Dataset 3).
<code>2025_10_14_elektro_boiovi_dii_ukraina_minenergo.xlsx</code>	Ministry of Energy combat-disconnection series, from energy-map.info (see Dataset 4).

Datasets requiring download:

File to place in <code>data/</code>	Where to download
<code>europe-central-asia_full_data_up_to-2025-07-25.xlsx</code>	ACLED Data Export Tool — Region: Europe & Central Asia; dates: 2020–2025

Dataset requiring author contact:

File	Action
<code>final_weekly.parquet</code> , <code>final_monthly.parquet</code> , <code>final_dataset_occ_digital_month.parquet</code>	Contact the corresponding author to request access to the Jooble OJV data under the institutional data-sharing arrangement.

Note: Scripts 02 and 07 read the two energy Excel files (already included). Scripts 02–12 will fail if the parquet files are absent.

5. Run the full pipeline

```
source("run_all.R")
```

Or open `run_all.R` in RStudio and click **Source**.
The script runs all 13 analysis scripts in order and saves outputs to `output/tables/` and `output/figures/`.
Total runtime: approximately 10–30 minutes depending on hardware.

All scripts are fully offline.

Script pipeline map

The table below documents what each script does, its inputs, and its outputs.

#	Script	Purpose	Inputs	Key Outputs
00	<code>00_acled_data_prep.R</code>	Load ACLED conflict event data, filter to Ukraine, aggregate to monthly and weekly frequency	<code>data/europe-central-asia_full_data_up_to-*.xlsx</code>	<code>acled_uk_monthly.pdf/png</code> , <code>acled_uk_weekly.pdf/png</code>
01	<code>01_load_data.R</code>	Data QC / exploration (optional)	<code>final_weekly.parquet</code>	Console output; <code>final_weekly_cl</code>
02	<code>02_baseline_regression.R</code>	Main results — weekly OLS (Log Fatalities and Log Events) with progressive controls	<code>final_weekly.parquet</code> , <code>2025_10_14_electricity_outages.xlsx</code> , <code>2025_10_14_elektro_boiovi_dii_ukraina_minenergo.xlsx</code>	<code>table_ols_combined.tex</code> , <code>table_ols_events_combined.te</code>
03	<code>03_structural_break.R</code>	Structural break tests (Chow, CUSUM, Bai-Perron) + ITS regressions	<code>final_weekly.parquet</code>	<code>table_structural_break.tex</code> , <code>table_break_tests.tex</code> , <code>fig1b_digital_share_loess.pdf</code> <code>fig1_digital_share_structura</code> <code>fig2_cusum_test.pdf</code> , <code>fig3_supF_breakpoints.pdf/pn</code> <code>fig4_its_fitted_vs_actual.pdf</code>
04	<code>04_stationarity.R</code>	Unit root tests (ADF, PP, KPSS) + first-difference regressions	<code>final_weekly.parquet</code>	<code>table_unit_roots.tex</code> , <code>table_fd_robustness.tex</code>
05	<code>05_cointegration_ecm.R</code>	Engle-Granger cointegration test + ECM + detrended regressions	<code>final_weekly.parquet</code>	<code>table_cointegration.tex</code> , <code>tabl</code> <code>table_detrended.tex</code> , <code>table_la</code>
06	<code>06_decomposition.R</code>	Decompose digital skill share into numerator (digital postings) vs denominator (total vacancies)	<code>final_weekly.parquet</code>	<code>table_decomposition.tex</code> , <code>table_digital_count.tex</code> , <code>fig_decomposition.pdf/png</code>
07	<code>07_robustness_ovb.R</code>	Omitted variable bias robustness — progressive control addition; loads energy Excel files	<code>final_weekly.parquet</code> , <code>2025_10_14_electricity_outages.xlsx</code> , <code>2025_10_14_elektro_boiovi_dii_ukraina_minenergo.xlsx</code>	<code>table_coef_stability.tex</code> , <code>table_its_robustness.tex</code>
08	<code>08_robustness_monthly.R</code>	Monthly-frequency replication of main OLS models	<code>final_monthly.parquet</code>	<code>table_monthlyols.tex</code> , <code>table_monthlyols_events.tex</code>
09	<code>09_robustness_smoothing.R</code>	Moving-average distributed lag (MADL) + Almon polynomial distributed lag	<code>final_weekly.parquet</code>	<code>table_smoothing_ma.tex</code> , <code>table</code> <code>smoothing_coefplot.pdf/png</code> , <code>almond_coefplot.pdf/png</code>
10	<code>10_seasonality_diagnostics.R</code>	Seasonal diagnostics (quarterly mean plots, ACF/PACF, Kruskal-Wallis, Friedman tests)	<code>final_weekly.parquet</code>	<code>fig_seasonal_means.pdf/png</code> , <code>fig_acf_*.pdf/png</code> , <code>table_seasonality_tests.tex</code>
11	<code>11_decomp_within_between.R</code>	Within/between occupation Oaxaca-Blinder decomposition	<code>final_dataset_occ_digital_month.parquet</code>	<code>table_occ_digital.tex</code> , <code>table_</code> <code>fig_decomp_timeseries.pdf/pn</code> <code>fig_decomp_occ.pdf/png</code> , <code>fig_decomp_counterfactual.pdf</code>
12	<code>12_mechanisms_remoteshare.R</code>	Causal mediation via remote work share (direct/indirect/total)	<code>final_weekly.parquet</code>	<code>table_remote_channel.tex</code> , <code>table_remote_channel_events.</code> <code>table_first_stage_remote.tex</code>

#	Script	Purpose	Inputs	Key Outputs
		effect decomposition)		

Figure and table mapping (paper → output file)

The tables below map every R-generated output to its exhibit number in the paper PDF.

Main text — tables

Paper exhibit	LaTeX label	Output file	Script
Table 1	tab:occ_digital	output/tables/table_occ_digital.tex	11_decomp_within_between.R
Table 2	tab:ols_combined	output/tables/table_ols_combined.tex	02_baseline_regression.R
Table 3	tab:ols_events_combined	output/tables/table_ols_events_combined.tex	02_baseline_regression.R
Table 4	tab:smoothing_ma	output/tables/table_smoothing_ma.tex	09_robustness_smoothing.R
Table 5	tab:almon	output/tables/table_almon.tex	09_robustness_smoothing.R
Table 6	tab:its_robustness	output/tables/table_its_robustness.tex	07_robustness_ovb.R

Main text — figures

Paper exhibit	LaTeX label	Output file	Script
Figure 1	fig:digitalskills	output/figures/fig1b_digital_share_loess.pdf	03_structural_break.R
Figure 2	fig:acledweekly	output/figures/acled_uk_weekly.pdf	00_acled_data_prep.R
Figure 3	fig:smoothing	output/figures/smoothing_coefplot.pdf	09_robustness_smoothing.R
Figure 4	fig:almon	output/figures/almond_coefplot.pdf	09_robustness_smoothing.R
Figure 5	fig:structuralbreakraw	output/figures/fig1_digital_share_structural_break.pdf	03_structural_break.R
Figure 6	fig:itsfitted	output/figures/fig4_its_fitted_vs_actual.pdf	03_structural_break.R

Robustness appendix — tables

Paper exhibit	LaTeX label	Output file	Script
Appendix Table B1	tab:occupation	(L2UKR household survey — not produced by R pipeline)	—
Appendix Table B2	tab:seasonality	output/tables/table_seasonality_tests.tex	10_seasonality_diagnostics.R
Appendix Table B3	tab:monthlyols	output/tables/table_monthlyols.tex	08_robustness_monthly.R
Appendix Table B4	tab:monthlyols_events	output/tables/table_monthlyols_events.tex	08_robustness_monthly.R
Appendix Table B5	tab:break_tests	output/tables/table_break_tests.tex	03_structural_break.R
Appendix Table B6	tab:structural_break	output/tables/table_structural_break.tex	03_structural_break.R
Appendix Table B7	tab:unit_roots	output/tables/table_unit_roots.tex	04_stationarity.R
Appendix Table B8	tab:cointegration	output/tables/table_cointegration.tex	05_cointegration_ecm.R
Appendix Table B9	tab:ecm	output/tables/table_ecm.tex	05_cointegration_ecm.R
Appendix Table B10	tab:detrended	output/tables/table_detrended.tex	05_cointegration_ecm.R
Appendix Table B11	tab:digital_count	output/tables/table_digital_count.tex	06_decomposition.R
Appendix Table B12	tab:decomposition	output/tables/table_decomposition.tex	06_decomposition.R
Appendix Table B13	tab:first_stage_remote	output/tables/table_first_stage_remote.tex	12_mechanisms_remoteshare.R

Mechanisms section — tables and figures

Paper exhibit	LaTeX label	Output file	Script
Table 7	tab:remote_channel	output/tables/table_remote_channel.tex	12_mechanisms_remoteshare.R
Table 8	tab:remote_channel_evt	output/tables/table_remote_channel_events.tex	12_mechanisms_remoteshare.R
Table 9	tab:decomp	output/tables/table_decomp.tex	11_decomp_within_between.R
Figure 7	fig:digital_occ	output/figures/fig_decomp_counterfactual.pdf	11_decomp_within_between.R
Figure 8	fig:decomp_timeseries	output/figures/fig_decomp_timeseries.pdf	11_decomp_within_between.R
Figure 9	fig:decomp_occ	output/figures/fig_decomp_occ.pdf	11_decomp_within_between.R

Appendix — figures

Paper exhibit	LaTeX label	Output file	Script
Appendix Figure B1	fig:occ_comp	(Python preprocessing pipeline — not produced by R)	—
Appendix Figure B2	fig:seasonal_means	output/figures/fig_seasonal_means.pdf	10_seasonality_diagnostics.R
Appendix Figure B3	fig:acf_raw	output/figures/fig_acf_raw.pdf	10_seasonality_diagnostics.R
Appendix Figure B4	fig:acf_demeaned	output/figures/fig_acf_demeaned.pdf	10_seasonality_diagnostics.R
Appendix Figure B5	fig:cusum	output/figures/fig2_cusum_test.png	03_structural_break.R
Appendix Figure B6	fig:supf	output/figures/fig3_supF_breakpoints.pdf	03_structural_break.R
Appendix Figure B7	fig:decomposition	output/figures/fig_decomposition.pdf	06_decomposition.R

Outputs not referenced in the paper

Some scripts produce additional outputs not cited in the paper:

Script	Extra output
00_acled_data_prep.R	acled_uk_monthly.pdf/png (monthly ACLED series — not cited in paper)
04_stationarity.R	table_fd_robustness.tex
05_cointegration_ecm.R	table_lagged_fd.tex
06_decomposition.R	fig_decomposition_linear.pdf/png (linear-scale variant of Appendix Figure B7)
07_robustness_ovb.R	table_coef_stability.tex

Package dependencies

All R packages are managed with `renv`. `renv.lock` records the exact package versions used by the authors.

Core packages used:

Package	Version	Purpose
arrow	19.0.1.1	Read Parquet files
tidyverse	2.0.0	Data manipulation and ggplot2
here	1.0.2	Relative file paths
janitor	2.2.1	Column name cleaning
lubridate	1.9.4	Date arithmetic
strucchange	1.5.4	Chow / CUSUM / Bai-Perron tests
sandwich	3.1.1	Newey-West HAC standard errors
lmtest	0.9.40	Robust coefficient tests
modelsummary	2.3.0	Regression tables
kableExtra	1.4.0	LaTeX table formatting
tseries	0.10.58	ADF, PP, KPSS unit root tests
readxl	1.4.5	Read Excel energy data files
httr + jsonlite	1.4.7 / 2.0.0	HTTP utilities (unused in active scripts)
zoo	1.8.13	Moving-average smoothing
msm	1.8.2	Delta-method SEs for Almon PDL
car	3.1.3	F-tests for seasonal dummies
forecast	8.24.0	ACF/PACF plots
patchwork	1.3.0	Combine ggplot panels
skimr	2.2.2	Summary statistics (script 01)

Known limitations and manual steps

1. **LaTeX compilation:** The `.tex` table files use the `booktabs`, `siunitx`, `graphicx`, and `array` LaTeX packages. Ensure your Overleaf preamble includes:

```
\usepackage{booktabs}
\usepackage{siunitx}
\usepackage{graphicx}
\usepackage{array}
```

Notes on library loading style

Each script follows a self-contained pattern:

1. Declares `packages_needed` at the top.
2. Auto-installs any missing packages before loading.
3. Loads all libraries in a single `suppressPackageStartupMessages({...})` block.

This means each script can be run **independently** (not just via `run_all.R`), which is convenient for debugging or partial re-runs.

Reproducibility checklist before sharing

- ☐ All six data files placed in `data/` (three parquet files received from author + three publicly downloaded files)
 - ☐ `renv::restore()` runs without errors
 - ☐ `run_all.R` completes end-to-end
 - ☐ Delete temporary setup scripts: `renv_setup.R`, `renv_hydrate.R`, `generate_lock.R`, `check_packages.R` and their associated `.txt` log files (`renv_setup_log.txt`, `renv_hydrate_log.txt`, `check_packages_log.txt`, `pkg_versions.txt`)
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Citation

If you use this code, please cite the paper:

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