Replication Package for "How Workers Keep Up With Inflation"

Authors: Hassan Afrouzi, Andres Blanco, Andres Drenik, and Erik Hurst

Table of Contents

- Overview
- Data Availability and Provenance
- Computational Requirements
- Instructions to Replicators
- Part 1: Model Results
- Part 2: Empirical Results
- List of Figures and Tables
- Pooling Outputs
- License
- References

Overview

This replication package reproduces all results reported in the paper *"How Workers Keep Up With Inflation"* (Afrouzi, Blanco, Drenik, and Hurst, 2026). The package consists of two main parts:

1. **Model Results** (`model/`): Julia code that solves the theoretical model, runs calibration routines, simulates worker and firm decisions under inflation shocks, and generates model-based figures and tables.

2. **Empirical Results** (`empirics/`): Multi-language code (Python, Stata, R, Julia) that processes raw data from multiple sources, generates all empirical figures and tables in the main text and online appendix, and calculates moments used to calibrate the model.

A shell script (`pool_output.sh`) pools all outputs from both parts into a unified `out/` directory for convenience.

Data Availability and Provenance

Model

The model computations rely on **two external data files** stored in `model/input/`:

- `input/cpi_u_fred_updated.csv`: Publicly available CPI-U data from the Federal Reserve Bank of St. Louis (FRED).
- `input/base_wage_change_histogram_07_24_2024.csv`: Distribution of annual nominal wage changes from Grigsby, Hurst, and Yildirmaz (2021).

No proprietary or confidential data are required for model replication.

Empirics

The empirical analysis uses data from multiple sources. Most data are publicly available and provided in the replication package. One dataset (`atl_fed_wage_raw.dta`) contains restricted microdata that cannot be redistributed.

Summary of Availability

All data **except** `atl_fed_wage_raw.dta` are publicly available and included in the package. As for `atl_fed_wage_raw.dta` a **placeholder file with synthetic data** (not the actual restricted microdata) is included for reproducibility of the code. The code includes fallback logic to run with this placeholder, but outputs depending on it will not match the published results (a detailed list is included below).

Details on Each Data Source

Data Name	Data Files	Location	Provided	Citation
Job Openings and Labor Turnover Survey (JOLTS)	`jolts_level.csv`, `jolts_rates.csv`, `jolts_industry_level.xlsx`, `jolts_industry_rates.xlsx`	`data/raw/jolts`	TRUE	U.S. Bureau of Labor Statistics (2025)
Atlanta Fed Wage Tracker (ATL)	`atl_fed_wage.xlsx`, `atl_fed_wage_raw.dta`	`data/raw/atl_fed`	Partial	Federal Reserve Bank of Atlanta (2025)
St. Louis Fed (FRED)	`EU.csv`, `UE.csv`, `NU.csv`, `NE.csv`, `fred_urate.csv`, `fred_emp2pop.csv`, `fred_employment.csv`, `profit_share.csv`, `CPI.csv`	`data/raw/fred`	TRUE	U.S. Bureau of Labor Statistics (2025)
Employer-to-Employer Probability (FMP)	`fmp_ee_flow.csv`	`data/raw/fmp`	TRUE	Fujita, Moscarini, and Postel-Vinay (2024)

Data Name	Data Files	Location	Provided	Citation
ADP Pay Insights (ADP)	adp_pay_history.csv	data/raw/adp	TRUE	ADP (2025)
Longitudinal Employer-Household Dynamics (LEHD)	employment_by_education.csv, flows_by_education.csv	data/raw/lehd	TRUE	U.S. Census Bureau (2025)
Barnichon Vacancy Stocks (BAR)	barnichon_vacancy.xlsx	data/raw/barnichon	TRUE	Barnichon (2010)
Work From Home Measure (WFH)	onet_wfh_code.csv	data/raw/dingelneiman	TRUE	Dingel and Neiman (2020)
Annual Hours Employed By Industry (BLS)	hours_employed_industry.xlsx	data/raw/bls	TRUE	U.S. Bureau of Labor Statistics (2025)
Gallup Analytics (GALL)	gallup_data.xlsx	data/raw/gallup	TRUE	Gallup Poll Social Series (2025)
Current Population Survey (CPS)	cps_00110.dat, cps_00108.dat, cps_00111.dat	data/moments/raw, data/raw	TRUE	Flood et al. (2024)

Dataset List

Raw Data Files

Data File	Source	Notes	Provided
data/raw/adp/adp_pay_history.csv	ADP	Input for Figure 2.3.A and 2.3.B	Yes
data/raw/atl_fed/atl_fed_wage_raw.dta	ATL	Input for Figure 2.4, B.5.B, B.5.C, B.8, and Table B.2	No (Placeholder included)
data/raw/atl_fed/atl_fed_wage.xlsx	ATL	Input for Figure 1.1.B, B.5.A, B.6, B.7	Yes
data/raw/barnichon/barnichon_vacancy.xlsx	BAR	Input for Figure 1.1.A, 6.1.A, and 6.1.B	Yes
data/raw/bls/hours_employed_industry.xlsx	BLS	Input for Figure B.9	Yes
data/raw/cps/cps_00111.dat	CPS	Input for flow_moments.csv	Yes
data/raw/dingelneiman/onet_wfh_code.csv	WFH	Input for Figure 2.4 and Table B.2	Yes
data/raw/fmp/fmp_ee_flow.csv	FMP	Input for Figure 2.2.A	Yes
data/raw/fred/CPI.csv	FRED	Input for Figure 1.1, 2.3, 2.4, 6.1, B.1, B.6, B.7, B.8, B.14, B.15, Table B.3	Yes
data/raw/fred/EU.csv	FRED	Input for Figure B.2, B.4	Yes
data/raw/fred/fred_emp2pop.csv	FRED	Input for Figure B.2	Yes
data/raw/fred/fred_employment.csv	FRED	Input for Figure 1.1.A, 2.2.B, 6.1, B.2, B.4, B.13	Yes
data/raw/fred/fred_urate.csv	FRED	Input for Figure B.2	Yes
data/raw/fred/NE.csv	FRED	Input for Figure B.3	Yes
data/raw/fred/NU.csv	FRED	Input for Figure B.3	Yes
data/raw/fred/profit_share.csv	FRED	Input for Figure B.14, B.15, Table B.4	Yes
data/raw/fred/UE.csv	FRED	Input for Figure 2.2.B, B.4	Yes
data/raw/gallup/gallup_data.xlsx	GALL	Input for Figure B.12	Yes
data/raw/jolts/jolts_industry_level.xlsx	JOLTS	Input for Figure B.9	Yes
data/raw/jolts/jolts_industry_rates.xlsx	JOLTS	Input for Figure B.9	Yes
data/raw/jolts/jolts_level.csv	JOLTS	Input for Figure 1.1.A, 6.1, B.13	Yes
data/raw/jolts/jolts_rates.csv	JOLTS	Input for Figure 2.1, B.1	Yes
data/raw/lehd/employment_by_education.csv	LEHD	Input for Figure B.10	Yes
data/raw/lehd/flows_by_education.csv	LEHD	Input for Figure B.10	Yes
data/moments/raw/CPI.xls	FRED	Same data as CPI.csv	Yes
data/moments/raw/cps_00108.dat	CPS	Input for flow_moments.csv	Yes
data/moments/raw/cps_00110.dat	CPS	Input for flow_moments.csv and wkly_earn_moments.dta	Yes
data/moments/raw/ee_monthly.csv	FMP	Same data as figure_2_2_A	Yes

Data File	Source	Notes	Provided
data/moments/raw/shimer_decomposition_data.csv	FRED	Same data as figure_B_4	Yes

Processed and Intermediate Data Files

Data File	Source	Notes
data/processed/figure_1_1_A.csv	BAR, FRED, JOLTS	Combines barnichon_vacancy, fred_employment, jolts_level, and CPI
data/processed/figure_1_1_B.csv	ATL, FRED	Combines atl_fed_wage and CPI
data/processed/figure_2_1.csv	JOLTS	Uses jolts_rates
data/processed/figure_2_2_A.csv	FMP	Uses fmp_ee_flow
data/processed/figure_2_2_B.csv	FRED	Uses fred_employment and UE
data/processed/figure_2_3.csv	ADP, FRED	Combines adp_pay_history and CPI
data/processed/figure_2_4.csv	ATL, WFH, FRED	Combines atl_fed_wage_raw, onet_wfh_code, and CPI
data/processed/figure_2_4_temp1.csv	ATL, WFH, FRED	Intermediate file for Figure 2.4
data/processed/figure_2_4_temp2.csv	ATL, WFH, FRED	Intermediate file for Figure 2.4
data/processed/figure_6_1.csv	BAR, FRED, JOLTS	Combines barnichon_vacancy, fred_employment, jolts_level, and CPI
data/processed/figure_B_1.csv	JOLTS, FRED	Combines jolts_rates and CPI
data/processed/figure_B_2.csv	FRED	Combines fred_employment, UE, fred_urate, and fred_emp2pop
data/processed/figure_B_3.csv	FRED	Combines NE and NU
data/processed/figure_B_4.csv	FRED	Combines fred_employment, EU, and UE
data/processed/figure_B_5_A.csv	ATL	Uses atl_fed_wage
data/processed/figure_B_5_B_C.csv	ATL	Uses atl_fed_wage_raw
data/processed/figure_B_6.csv	ATL, FRED	Combines atl_fed_wage and CPI
data/processed/figure_B_7.csv	ATL, FRED	Combines atl_fed_wage and CPI
data/processed/figure_B_8.csv	ATL, FRED	Combines atl_fed_wage_raw and CPI
data/processed/figure_B_8_temp1.csv	ATL, FRED	Intermediate file for Figure B.8
data/processed/figure_B_8_temp2.csv	ATL, FRED	Intermediate file for Figure B.8
data/processed/figure_B_8_temp3.csv	ATL, FRED	Intermediate file for Figure B.8
data/processed/figure_B_9.csv	BLS, JOLTS	Combines hours_employed_industry, jolts_industry_level, and jolts_industry_rates
data/processed/figure_B_10.csv	LEHD	Combines flows_by_education and employment_by_education
data/processed/figure_B_12.csv	GALL	Uses gallup_data
data/processed/figure_B_13.csv	JOLTS, FRED	Combines jolts_level and fred_employment
data/processed/figure_B_14_A.csv	FRED, BAR, JOLTS	Combines CPI, profit_share
data/processed/figure_B_14_B.csv	FRED, BAR, JOLTS	Combines CPI, profit_share
data/processed/figure_B_15.csv	FRED, BAR, JOLTS	Combines CPI, profit_share
data/processed/table_B_2.dta	ATL, WFH	Processed data for Table B.2
data/moments/output/flow_moments.csv	FRED, CPS, FMP	Calculated moments
data/moments/output/wkly_earn_moments.csv	FRED, CPS, FMP	Calculated moments
data/moments/temp/asec_weekly_earnings_dist.dta	CPS	Intermediate file for moments calculation
data/moments/temp/asec_wkly_earnings_dist.xlsx	CPS	Intermediate file for moments calculation

Data File	Source	Notes
data/moments/temp/asec_workers_by_earn_decile.dta	CPS	Intermediate file for moments calculation
data/moments/temp/cpi_clean.dta	FRED	Intermediate file for moments calculation
data/moments/temp/cps_basic_monthly_matched.dta	CPS	Intermediate file for moments calculation
data/moments/temp/gross_flows_v1.dta	CPS	Intermediate file for moments calculation
data/moments/temp/pre_period_macro_average_1.dta	FRED, CPS, FMP	Intermediate file for moments calculation
data/moments/temp/pre_period_macro_average_2.dta	FRED, CPS, FMP	Intermediate file for moments calculation
data/moments/temp/pre_period_micro_average.dta	CPS	Intermediate file for moments calculation
data/moments/temp/scaling_factors.dta	CPS	Intermediate file for moments calculation
data/moments/temp/wkly_earn_moments.dta	CPS	Intermediate file for moments calculation
data/moments/temp/wkly_earn_moments_all.dta	CPS	Intermediate file for moments calculation
data/moments/temp/wkly_earn_moments_young_age.dta	CPS	Intermediate file for moments calculation

Data Download Instructions

- **JOLTS**: Download from https://www.bls.gov/jlt/data.htm using the One Screen or Multi-Screen tools.
- **Atlanta Fed Wage Tracker**: Processed data from https://www.atlantafed.org/chcs/wage-growth-tracker. Underlying microdata requires separate access.
- **FRED**: Download individual series:
  - `EU.csv`: https://fred.stlouisfed.org/series/LNS17400000
  - `UE.csv`: https://fred.stlouisfed.org/series/LNS17100000
  - `fred_urate.csv`: https://fred.stlouisfed.org/series/UNRATE
  - `fred_emp2pop.csv`: https://fred.stlouisfed.org/series/LREM64TTUSM156S
  - `CPI.csv`: https://fred.stlouisfed.org/series/CPIAUCSL
  - `NE.csv`: LNS17200000 divided by LNS15000000
  - `NU.csv`: LNS17600000 divided by LNS15000000
  - `fred_employment.csv`: CE16OV merged with UNEMPLOY
  - `profit_share.csv`: CP divided by GDP
- **FMP**: https://www.philadelphiafed.org/surveys-and-data/macroeconomic-data/employer-to-employer-transition-probability
  - Also available from FRED: https://fred.stlouisfed.org/series/FMPSA3MA
  - Note that the 3-months moving averages differ between two datasets due to the different initial time periods, and we used the series downloaded from the FRED website for our analysis.
- **ADP**: https://payinsights.adp.com/
- **LEHD**: https://ledextract.ces.census.gov/
  - To download `employment_by_education.csv`: Go to 'All QWI Measures' page, select 'Sex and Education' in '3. Worker Characteristics' tab, select all the education levels from E1 to E5, and select the quarters from 2016Q1 to 2024Q1.
  - To download `flows_by_education.csv`: The same procedure must be done in 'Job Flows' page.
- **Barnichon Vacancy**: https://sites.google.com/site/regisbarnichon/research
  - See under '19. Building a composite Help-Wanted Index' and click the associated Google Sheets link to download the data.
- **Dingel-Neiman WFH**: https://github.com/jdingel/DingelNeiman-workathome/tree/master/onet_to_BLS_crosswalk/output
- **BLS Hours**: https://www.bls.gov/productivity/technical-notes/industry-hours-and-employment.htm
  - Data on annual hours worked and employment by industry can be downloaded from the link in the bottom paragraph.
- **CPS**: https://cps.ipums.org/cps/
  - In 'Select Data' tab, replicators can select the data filters to obtain the same datasets used for moment generation of this paper.
  - To extract the yearly ASEC data (`cps_00110.dat`): Select the yearly 'IPUMS-CPS.ASEC' series from 2015 to 2023 and select the same set of variables as detailed in `/code/4_moments/4_0_build.do`.
  - To extract the monthly worker flows data (`cps_00108.dat`, `cps_00111.dat`): Select the monthly 'IPUMS-CPS' series from January 2014 to June 2024.
- **Gallup Analytics**: Requires institutional subscription (accessed via University of Chicago proxy at https://analyticscampus-gallup-com.proxy.uchicago.edu/Tables).

Computational Requirements

Software Requirements

Model:

- Julia 1.12
  (All dependencies listed in `model/Project.toml` and `model/Manifest.toml`)

Empirics:

- Stata 19
- Python 3.13.5 with packages: `pandas`, `numpy`, `matplotlib`, `scikit-learn`, `statsmodels`, `openpyxl`, `xlrd`, `jinja2`

- Julia 1.12 with packages: `Binscatters`, `CSV`, `CategoricalArrays`, `DataFrames`, `DataFramesMeta`, `FileIO`, `LaTeXStrings`, `PGFPlotsX`, `PanelDataTools`, `PeriodicalDates`, `Plots`, `Revise` (see `empirics/code/Project.toml`)
- R with packages: `dplyr`, `haven`, `ipumsr`, `writexl`
- Stata packages: `esttab`, `egenmore`

Controlled Randomness

Model: Random seeds are set for reproducibility. The main seed is `Random.seed!(1234)` in `0_run_main.jl`. Additional seeds (`42`, `43`, `123`, `1234`) are set in `6_simulations.jl` for specific simulation routines.

Empirics: Stata uses `set seed 12345` for generating synthetic placeholder data when the restricted `atl_fed_wage_raw.dta` file is unavailable (see fallback logic in `1_0_process_main.do` and `1_2_process_appendix.do`).

Memory, Runtime, and Storage Requirements

Model:

- Runtime: 36~48 hours
- Memory: Standard laptop sufficient
- Storage: < 100 MB for produced output

Empirics:

- Runtime: ~10 minutes
- Memory: Standard laptop sufficient
- Storage: < 1 GB for produced processed files and output

The code was last run on a 16-inch MacBook Pro (2024) with Apple M4 Max, 48 GB unified memory, macOS Tahoe 26.3 (b).

Instructions to Replicators

Quick Start

1. **Empirics**: Run `empirics/code/run_all.py` after editing executable paths for Stata, Julia, and R at the top of the file.
2. **Model**: Run `model/0_run_main.jl` in Julia with the project environment activated.
3. **Pool outputs**: Run `./pool_output.sh` from the replication root to consolidate all outputs into `out/`.

Detailed Instructions

See the sections below for each component.

Part 1: Model Results

This section describes the replication of the theoretical model results.

Overview

Running **`0_run_main.jl`** reproduces all model results reported in the paper. This includes:

- Solving the steady state
- Computing distributions
- Running calibration routines
- Simulating worker and firm decisions under inflation shocks
- Generating all model figures and tables

By default, the scripts write:

- **PDF figures** to `model/figures/`
- **LaTeX tables** (`.tex`) to `model/tables/`
- Intermediate objects to `model/temp/`

The codebase is entirely in Julia.

Instructions

macOS/Linux

Open the `model/` folder in a terminal and run:

```
julia --project -e 'using Pkg; Pkg.instantiate(); include("0_run_main.jl")'
```

Windows

Open the `model/` folder in Command Prompt and run:

```
julia --project -e "using Pkg; Pkg.instantiate(); include(\"0_run_main.jl\")"
```

Alternative: Using IDE or REPL

1. Start Julia with the working directory set to `model/`.
2. Run:

```
using Pkg
Pkg.activate(".")
Pkg.instantiate()
include("0_run_main.jl")
```

Directory Structure

```
model/
├── 0_run_main.jl              # Master script
├── 1_setup.jl                 # Parameters, grids, primitives
├── 2_menufun.jl               # Core model functions
├── 3_solve_ss.jl              # Steady-state solver
├── 4_check_solution.jl        # Diagnostics and consistency checks
├── 5_solve_distributions.jl   # Stationary distribution and dynamics
├── 6_simulations.jl           # Stochastic simulation
├── 7_calibration.jl           # Calibration routines
├── 8_main_exercises.jl        # Main exercises
├── 9_figures_tables.jl        # Figure and table generation
├── input/                     # External data files
├── figures/                   # Output figures (.pdf)
├── tables/                    # Output tables (.tex)
├── temp/                      # Temporary objects
├── Project.toml               # Julia environment
└── Manifest.toml              # Exact package versions
```

Part 2: Empirical Results

This section describes the replication of the empirical results.

Overview

The program files in this replication package analyze data from multiple sources using Python, Stata, R and Julia. One main file (`run_all.py`) runs the codes that:

1. Generate all figures and tables in the main text and the online appendix of the paper.
2. Calculate moments to calibrate this paper's model.

Replicators should expect the code to run about 10 minutes.

Description of Programs

- `code/run_all.py`: Master script that runs all dependencies. Paths are automatically adjusted.
- `code/1_process/`: Programs that process primitive data in `data/raw/` and save processed data in `data/processed/`.
- `code/2_figures/`: Programs that use processed data and generate outputs in `output/figures/` and `output/tables/`.
- `code/4_moments/`: Programs that calculate model moments using primitive data in `data/moments/raw/` and save output in `data/moments/output/`.

Instructions

1. Download the data files referenced above. Each data file must be stored in the prepared subdirectories inside the `data/` folder.
2. Run files in `code/0_setup/` to ensure that required packages are installed for all programming languages.
3. Edit the lines at the top of `run_all.py` to adjust the executable paths for Stata, Julia, and R.
4. Run `run_all.py`.

Note: Replicators can also manually install the required packages listed in the "Computational Requirements" section.

Outputs Affected by Missing Data

The following figures and table depend on the restricted `atl_fed_wage_raw.dta` file and **cannot be exactly replicated** without access to the actual Atlanta Fed Wage Tracker microdata (a placeholder file with synthetic data is included):

Figures:

- Figure 2.4 (Panels A, B, C)
- Figure B.5 (Panels B, C)
- Figure B.8 (Panels A, B, C, D)

Tables:

- Table B.2

When running with synthetic/fake data, the code includes fallback logic that generates placeholder outputs for these figures and table, but they will not match the published results.

Directory Structure

```
empirics/
├── code/
│   ├── run_all.py              # Master script
│   ├── 0_setup/                # Setup scripts for all languages
│   ├── 1_process/              # Data processing scripts
│   ├── 2_figures/              # Figure generation scripts
│   ├── 3_tables/               # Table generation scripts
│   └── 4_moments/              # Moment calculation scripts
├── data/
│   ├── raw/                    # Raw input data
│   ├── processed/              # Processed intermediate data
│   └── moments/                # Moment calculation data
└── output/
    ├── figures/                # Output figures (.pdf)
    └── tables/                 # Output tables (.tex)
```

List of Figures and Tables

Figure/Table	Program	Output File
Figure 1.1, Panel A	`empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_1_1_A.pdf`
Figure 1.1, Panel B	`empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_1_1_B.pdf`
Figure 2.1, Panels A–C	`empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_2_1_A/B/C.pdf`
Figure 2.2, Panels A–B	`empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_2_2_A/B.pdf`
Figure 2.3, Panels A–B	`empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_2_3_A/B.pdf`
Figure 2.4, Panels A–C	`empirics/code/1_process/1_0_process_main.do`, `empirics/code/1_process/1_1_process_main.py`, `empirics/code/2_figures/2_0_figures_main.jl`	`figure_2_4_A/B/C.pdf`
Figure 3.1, Panel A	`model/8_main_exercises.jl`	`SS_policy_values_normalized.pdf` → `figure_3_1_A.pdf`
Figure 3.1, Panel B	`model/8_main_exercises.jl`	`SS_policy_hazard_rates.pdf` → `figure_3_1_B.pdf`
Figure 3.1, Panel C	`model/8_main_exercises.jl`	`SS_policy_bargaining_search_wages.pdf` → `figure_3_1_C.pdf`
Figure 4.1, Panel A	`model/9_figures_tables.jl`	`Calibration_job_finding_rate.pdf` → `figure_4_1_A.pdf`
Figure 4.1, Panel B	`model/9_figures_tables.jl`	`Calibration_job_to_job_rate.pdf` → `figure_4_1_B.pdf`
Figure 4.1, Panel C	`model/9_figures_tables.jl`	`Calibration_separation_rate_total.pdf` → `figure_4_1_C.pdf`

Figure/Table	Program	Output File
Figure 4.2, Panel A	model/9_figures_tables.jl	Calibration_markdown_by_z_decile.pdf → figure_4_2_A.pdf
Figure 4.2, Panel B	model/9_figures_tables.jl	Calibration_distribution_onthejob_wage_changes.pdf → figure_4_2
Figure 5.1	model/8_main_exercises.jl	MIT_shock_deltap_dist_what_employed.pdf → figure_5_1.pdf
Figure 5.2, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_avg_logrinc_emp_normlevel.pdf → figure_5_2_A.p
Figure 5.2, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_agg_tightness_normratio.pdf → figure_5_2_B.pdf
Figure 5.2, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_beveridge.pdf → figure_5_2_C.pdf
Figure 5.3, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_avg_seffort_emp_normratio.pdf → figure_5_3_A.p
Figure 5.3, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_jj_rate_normratio.pdf → figure_5_3_B.pdf
Figure 5.3, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_avg_w_star_jj_normratio.pdf → figure_5_3_C.pdf
Figure 5.4, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_vacancies_jj_normratio.pdf → figure_5_4_A.pdf
Figure 5.4, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_vfilling_rate_jj_normratio.pdf → figure_5_4_B.
Figure 5.4, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_dur_vacancies_jj_normratio.pdf → figure_5_4_C.
Figure 5.5, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_freq_wage_increase.pdf → figure_5_5_A.pdf
Figure 5.5, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_avg_barg_Δw.pdf → figure_5_5_B.pdf
Figure 5.5, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_avg_jj_Δw.pdf → figure_5_5_C.pdf
Figure 5.6, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_avg_seffort_emp_by_z_normratio.pdf → figure_5_
Figure 5.6, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_jj_rate_by_z_normratio.pdf → figure_5_6_B.pdf
Figure 5.6, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_avg_logrinc_emp_by_z_normlevel.pdf → figure_5_
Figure 5.7, Panel A	model/8_main_exercises.jl	MIT_shock_sequence_deltap_jj_rate_by_z_normratio.pdf → figure_5
Figure 5.7, Panel B	model/8_main_exercises.jl	MIT_shock_sequence_deltap_avg_logrinc_emp_by_z_normlevel.pdf → figure_5_7_B.pdf
Figure 5.7, Panel C	model/8_main_exercises.jl	MIT_shock_sequence_deltap_agg_tightness_normratio.pdf → figure_
Figure 5.8, Panel A	model/8_main_exercises.jl	MIT_comparison_p_fw_value_w_emp_avg.pdf → figure_5_8_A.pdf
Figure 5.8, Panel B	model/8_main_exercises.jl	MIT_comparison_p_fw_value_w_emp_hist.pdf → figure_5_8_B.pdf
Figure 5.8, Panel C	model/8_main_exercises.jl	MIT_shock_deltap_welfare_decomposition_alternative.pdf → figure
Figure 6.1, Panels A–B	empirics/code/1_process/1_1_process_main.py, empirics/code/2_figures/2_0_figures_main.jl, empirics/code/2_figures/2_1_figures_main.py	figure_6_1_A/B.pdf
Figure B.1, Panels A–B	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_1_A/B.pdf
Figure B.2, Panels A–C	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_2_A/B/C.pdf

Figure/Table	Program	Output File
Figure B.3, Panels A–B	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_3_A/B.pdf
Figure B.4	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_4.pdf
Figure B.5, Panel A	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_5_A.pdf
Figure B.5, Panels B–C	empirics/code/1_process/1_2_process_appendix.do, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_5_B/C.pdf
Figure B.6, Panels A–D	empirics/code/1_process/1_1_process_main.py, empirics/code/2_figures/2_2_figures_appendix.jl	figure_B_6_A/B/C/D.pdf
Figure B.7, Panels A–C	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_7_A/B/C.pdf
Figure B.8, Panels A–D	empirics/code/1_process/1_2_process_appendix.do, empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_2_figures_appendix.jl	figure_B_8_A/B/C/D.pdf
Figure B.9	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_9.pdf
Figure B.10, Panels A–B	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_10_A/B.pdf
Figure B.11	Source: Grigsby, Hurst, and Yildirmaz (2021)	-
Figure B.12	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_12.pdf
Figure B.13	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_13.pdf
Figure B.14, Panels A–B	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_2_figures_appendix.jl, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_14_A/B.pdf
Figure B.15	empirics/code/1_process/1_3_process_appendix.py, empirics/code/2_figures/2_3_figures_appendix.py	figure_B_15.pdf
Figure B.16, Panel A	model/8_main_exercises.jl	MIT_shock_deltap_jf_rate.pdf → figure_B_16_A.pdf
Figure B.16, Panel B	model/8_main_exercises.jl	MIT_shock_deltap_layoff_rate_normratio.pdf → figure_B_16_B.pdf
Figure B.17, Panel A	model/8_main_exercises.jl	MIT_shock_sequence_deltap_jf_rate.pdf → figure_B_17_A.pdf
Figure B.17, Panel B	model/8_main_exercises.jl	MIT_shock_sequence_deltap_layoff_rate_normratio.pdf → figure_B_
Figure C.1, Panel A	model/8_main_exercises.jl	MIT_shock_sequence_deltap_jj_rate_normratio_robustness_phi_s.p figure_C_1_A.pdf
Figure C.1, Panel B	model/8_main_exercises.jl	MIT_shock_sequence_deltap_avg_w_star_jj_normratio_robustness_p figure_C_1_B.pdf
Figure C.1, Panel C	model/8_main_exercises.jl	MIT_shock_sequence_deltap_avg_logrinc_emp_normlevel_robustness figure_C_1_C.pdf
Figure C.1, Panel D	model/8_main_exercises.jl	MIT_shock_sequence_deltap_agg_tightness_normratio_robustness_p figure_C_1_D.pdf
Figure C.2, Panel A	model/8_main_exercises.jl	MIT_shock_sequence_deltap_avg_logrinc_emp_normlevel_robustness figure_C_2_A.pdf
Figure C.2, Panel B	model/8_main_exercises.jl	MIT_shock_sequence_deltap_jj_rate_normratio_robustness_tau.pdf figure_C_2_B.pdf
Figure C.2, Panel C	model/8_main_exercises.jl	MIT_shock_sequence_deltap_agg_tightness_normratio_robustness_t figure_C_2_C.pdf
Figure C.3, Panel A	model/8_main_exercises.jl	MIT_shock_sequence_deltap_avg_logrinc_emp_normlevel_robustness → figure_C_3_A.pdf
Figure C.3, Panel B	model/8_main_exercises.jl	MIT_shock_sequence_deltap_jj_rate_normratio_robustness_gamma_e figure_C_3_B.pdf

Figure/Table	Program	Output File
Figure C.3, Panel C	model/8_main_exercises.jl	MIT_shock_sequence_deltap_agg_tightness_normratio_robustness_g figure_C_3_C.pdf
Table 1	model/9_figures_tables.jl	calibration_table_exogenous.tex → table_1.tex
Table 2	model/9_figures_tables.jl	calibration_table_calibrated.tex → table_2.tex
Table 3	model/9_figures_tables.jl	goodness_of_fit_table.tex → table_3.tex
Table 4	empirics/code/1_process/1_1_process_main.py, empirics/code/3_tables/3_0_tables_main.py	table_4.tex
Table B.1	empirics/code/3_tables/3_2_tables_appendix.do	table_B_1.tex
Table B.2	empirics/code/1_process/1_2_process_appendix.do, empirics/code/3_tables/3_2_tables_appendix.do	table_B_2.tex
Table B.3	empirics/code/3_tables/3_1_tables_appendix.py	table_B_3.tex
Table B.4	empirics/code/1_process/1_3_process_appendix.py, empirics/code/3_tables/3_1_tables_appendix.py	table_B_4.tex
Table B.5	empirics/code/1_process/1_3_process_appendix.py, empirics/code/3_tables/3_1_tables_appendix.py	table_B_5.tex
Table C.1	model/7_calibration.jl	Calibration_GS_sensitivity_avg_plain.pdf → table_C_1.pdf
Table C.2	model/8_main_exercises.jl	Robustness_welfare_counterfactual_1_elasticity.tex → table_C_2.
Table D.1	model/8_main_exercises.jl	comparison_shocks.tex → table_D_1.tex

Pooling Outputs

A shell script pool_output.sh is provided at the root of the replication package to consolidate all outputs from both the model and empirical components into a single out/ directory.

Usage

From the replication root directory, run:

```
./pool_output.sh
```

This will:

1. Create the out/ directory (if it doesn't exist).
2. Copy all figures from model/figures/ and empirics/output/figures/ to out/.
3. Copy all tables from model/tables/ and empirics/output/tables/ to out/.
4. Log all operations with timestamps to pool_output.log.

The log file provides a record of all files copied, useful for verifying the replication was complete.

License

This replication package is released under the **MIT License**. See the included LICENSE file.

References

ADP Research Institute. (2025, June). ADP® Pay Insights. Retrieved July 21, 2025.

Barnichon, R. (2010). "Building a composite Help-Wanted Index." *Economics Letters*, 109(3), 175–178.

Bureau of Labor Statistics, Office of Productivity and Technology. Annual Hours Worked and Employment: Detailed Industries. Data released April 24, 2025. Retrieved July 21, 2025.

Dingel, J. I., and B. Neiman (2020). "How many jobs can be done at home?" *Journal of Public Economics*, 189, 104235.

Federal Reserve Bank of Atlanta. Wage Growth Tracker. https://www.atlantafed.org/chcs/wage-growth-tracker (accessed July 21, 2025).

Federal Reserve Bank of Philadelphia. 3-Month Moving Average of Average Probability of U.S. Workers Making Employer to Employer Transitions [FMPSA3MA]. Retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FMPSA3MA, July 21, 2025.

Flood, S., M. King, R. Rodgers, S. Ruggles, J. R. Warren, D. Backman, A. Chen, G. Cooper, S. Richards, M. Schouweiler, and M. Westberry (2024). IPUMS CPS: Version 12.0 [dataset]. Minneapolis, MN: IPUMS. https://doi.org/10.18128/D030.V12.0

Fujita, S., G. Moscarini, and F. Postel-Vinay (2024). "Employer-to-Employer Transitions." Federal Reserve Bank of Philadelphia.

Gallup Poll Social Series (2025). Gallup Analytics Campus Portal.

Grigsby, J., E. Hurst, and A. Yildirmaz (2021). "Aggregate Nominal Wage Adjustments: New Evidence from Administrative Payroll Data." *American Economic Review*, 111(2), 428–471.

U.S. Bureau of Labor Statistics. Job Openings and Labor Turnover Survey (JOLTS). Retrieved July 21, 2025.

U.S. Bureau of Labor Statistics. Consumer Price Index for All Urban Consumers [CPIAUCSL]. Retrieved from FRED, July 21, 2025.

U.S. Bureau of Economic Analysis. Corporate Profits After Tax [CP] and Gross Domestic Product [GDP]. Retrieved from FRED, July 21, 2025.

U.S. Census Bureau, Center for Economic Studies. LEHD. https://ledextract.ces.census.gov/, accessed July 21, 2025.

Last updated: January 2026