Replication Package for the Model Simulation Results in "Bottom-Up Markup Fluctuations"

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This version: June 4, 2025

Specifications for Replication:

Ubuntu 20.04.6 LTS, Matlab R2020a,

Python libraries:

Python version: 3.10.14
numpy version: 1.26.4
pandas version: 2.2.1
linearmodels version: 4.31
statsmodels version: 0.14.0
quantecon version: 0.7.0
matplotlib version: 3.8.4

Note: The results are subject to the seed settings of the random number generators in MATLAB and Python. The folders data_export and data_matlab contain the original simulated files, each labeled with an underscore after the specification name (e.g., baseline_, robust1_, robust2_, robust3_).

To reproduce the results, unzip the files in replication_simulation_files.zip into a local directory, and follow steps A and B described below. Running these codes takes about 36 hours on an Intel Xeon E-2186G CPU @ 3.80 GHz x 12 Processor with 62.6 GB memory.

A- Calibrate, Simulate, and Solve

The first step consists in calibrating, simulating, and solving the model. There are four specifications: baseline (epsilon=5, sigma=1.8), robust1 (epsilon=7, sigma=2.01), robust2 (epsilon=6, sigma=1.92), rosust3 (epsilon=4, sigma=1.66).

Running the following files generates CSV files (saved in the data_export folder) and MATLAB files (saved in the data_matlab folder), which are then used to produce the results.

Baseline:
main_baseline.m

Robustness:
main_robust1_sigma2d01_epsi7.m
main_robust2_sigma2d92_epsi6.m
main_robust3_sigma1d66_epsi4.m

This file calls several intermediate functions, which are listed below.

A-I - Calibrate model

calibrate_fun.m: Calibrates the model parameters.

A-II- Simulate firms' distribution
simulate_france_sampling_fun.m: Simulates the model at the sector level.

A-III-Solve the model
solve_france_sampling_fun.m: Solves the model at the sector level.

A-IV- Export sector-level panel
export_SectorPanel_naf2008_sampling_fun.m: Exports the simulated and solved sector-level panel data to a CSV file.

A-V- Simulate and Solve firm panel
solve_france_firmpanel_sampling_fun.m: Simulates and solves the model for a firm-level panel.

A-VI- Export firm-level panel
export_FirmPanel_naf2008_sampling_lowspace_fun.m: Exports the firm-level panel data to a CSV file.

B- Produce Simulation Results

In this section, we describe how to reproduce the results for each table in the paper.

B-I - Sector-Level regressions in the model (baseline)

Sector-level regression:
(Table 8 columns 3&4, Table 9 columns 3&4, Table 10 columns 3&4, Table A13 columns 3&4, Table A14 columns 3&4, Table A15 column 2)

In python Jupyter:
Bils_Ramey_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline.ipynb

Sector-level regression with aggregate TFP shocks:
(Table 10 columns 5&6, Table A15 column 3)

In python Jupyter:
Bils_Ramey_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_aggshockFD.ipynb
Bils_Ramey_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_aggshockHA.ipynb
Bils_Ramey_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_aggshockHP.ipynb

B-II - Firm-level regressions in the model (baseline)

(Tables 6 and 7)

In python Jupyter:
Firm_cyclicality_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_Log.ipynb
Firm_cyclicality_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_FDonFD.ipynb

(Tables A11 and A12)

In python Jupyter:

Firm_cyclicality_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_HP.ipynb
Firm_cyclicality_regressions_cournot_sigma1d8_epsi5_vol27_sampling_baseline_HA.ipynb

B-II - Aggregate Results in the model (baseline)

(Figure 1, Figure A1, Table 1 Panel B, Table 2 Panel B, Tables 11 and A16)

In matlab: *aggregate_results_baseline.m*

B-III - Robustness (Appendix F)

(Table A17 and A18)

In python Jupyter:
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust1_Log.ipynb
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust1_FDonFD.ipynb
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust2_Log.ipynb
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust2_FDonFD.ipynb
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust3_Log.ipynb
Firm_cyclicality_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust3_FDonFD.ipynb

(Tables A19, A20, A21)

In python Jupyter:
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust1.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust2.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust3.ipynb

(Table A22)

In python Jupyter:
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust1_aggshockHA.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust1_aggshockFD.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust2_aggshockHA.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust2_aggshockFD.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust3_aggshockHA.ipynb
Sector_regressions_cournot_sigma2d01_epsi7_vol27_sampling_robust3_aggshockFD.ipynb

(Tables A23 and A24)

In matlab:
aggregate_results_robust1.m
aggregate_results_robust2.m
aggregate_results_robust3.m